BALDWIN LOCOMOTIVE WORKS

Specifications
VOL. 53

MSS 61

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4 28 6	60 to 63	Bethlehem Steel Co.	111
6 32 D	1096	Bethlehem Steel Co.	113
6 32 D	1099-1100	Bethlehem Steel Co	115
6 36 D	242 to 247	Bethlehem Steel Co.	117
6 38 D	65-66	Bingham & Garfield	300
0 24½ D	113	Blount Decker Lumber Co	18
4 30 6	57	Bush Terminal Co.	221

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4	14	C.	265-266	Cuban American Sugar Co.	2						
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M 31½ C.	111	Interstate Railroad Co.	260
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L 32 D.	1092	Jacksonville Port Comm. Florida	190
L 32 D.	1057	Jacksonville Terminal Co.	200
L 311 D.	958	Jacksonville Terminal Co.	203
S 30 D.	683-684	Jonesboro, Lake City & Eastern	317
H 111 C.	2611	Juniata White Sand Co.	2

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S 111 E.	1 to 3	Lake Terminal R.R. Co.	172
S 111 E.	4	Lake Terminal R.R. Co.	176
S 116 E.	42 to 44	Lake Superior & Ishpeming	1104
L 38 D.	112	LaSalle & Bureau County	272
S 18½ D.	33	Lightsey Bros. Inc.	14
S 36 E.	1245	Lignoner Valley R.R.	388
H 111 C.	2603	Lima & Chilco (Peru)	2
S 38 D.	192-193	Louisiana & Arkansas	347
S 32 E.	133	Louisiana & Pacific	357
S 18½ D.	34	Lyon Pine Co.	16

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4 14 C	267-268	McDermott, Chas., Estate of	2
6 38 D	62-63	Pa. Rustless Connecting	1411
6 38 D	75-76	Pa. Rustless Connecting	148

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4 22 C	214 to 216	Mark Manufacturing Co.	56
6 36 D	236 & 241	Mark Manufacturing Co.	58
6 26 D	107-108	Marsch John	4
6 32 D	1074-1075	Maryland Steel Co.	119
6 32 D	231 to 2311	Maryland Steel Co.	121
6 32 D	1111	Michigan & Kalamazoo Co.	147
6 30 D	1167	Middletown Car Co.	67
8 30 C	699	Midland Pennsylvania	250
6 32 D	1110	Midland Valley	242
12 38½ E	118-119	Midland Valley	246
10 34 E	2031	Minneapolis, Dakota & Western	280
6 32 D	1047	Minnesota Steel Co.	139
10 32 D	1159	Mississippi Eastern	345
12 36½ D	849	Mississippi River & Bonne Terra	359
8 30 C	698	Mitchkun, M. & Co.	325
10 32 E	127	Mount Hope Mineral	366
10 46 E	45	Munising, Marquette & Southeastern	409

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6 34 D	955-956	National Slag Co.	75
8 32½ D	3-4	Nevada Consolidated Copper	63
10 36 E	1246	Nevada Northern	283
6 34 D	926	Newburgh & South Shore	152
6 38 D	68 to 70	Newburgh & South Shore	155
8 40 D	6	Newburgh & South Shore	154
8 40 D	7-8	Newburgh & South Shore	163
8 42 E	11	Newburgh & South Shore	167
8 26 D	196	New York & Lawn Grove	313
6 30 D	465	Newport Chemical Works Inc.	115
6 34 D	943	Norfolk & Portsmouth Belt Line	207
6 34 D	944	Norfolk & Portsmouth Belt Line	210
6 26 D	109-110	Norte de Cuba (Cuba)	4

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10 32 E	131	Oneida & Western	395

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4 8 C	44-45	Paxson Co., J. W.	51
12 31¼ E	114	Pennsylvania Ry. Co.	115
6 34 D	926	Philadelphia Electric Co.	33
4 20 C	551	Phila. Suburban Gas & Electric	31
4 16 C	1118	Phoenix Iron Co.	162
4 11 C	1119	Pierce Const. Co.	47
6 32 D	1042	Port Com. of Jacksonville (Florida)	170
6 30 D	459	Port Huron Southern	421
6 32 D	1060-1061	Public Belt R.R. Com. (New Orleans)	213
6 32 D	1063 to 1064	Public Belt R.R. Com. (New Orleans)	215
6 30 D	1614	Public Service Electric	35

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10	26½ D	143	Rapid City, Black Hills & Western	287
12	34½ D	52	Raritan River	403
10	30 D	655	Red River & Gulf	337
8	38 D	17-18	Republic Iron & Steel Co.	107
6	36 D	229-230	River Terminal	180
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10	30 D	658	Roscoe, Snyder & Pacific	339

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6	34 D	947	San Fran. Harbor Com. (Cal.)	142
10	30 D	654	San Joaquin & Eastern	248
8	22½ C	48	Sessions Foundry Co. Inc.	109
11	14 C	267-268	Shannon J. J. & Co.	2
8	20 C	43	Sheffield & Tionesta	252
10	38 C	138	Sierra Railway of California	291
12	34½ C	45	Silver Falls Timber Co.	23
6	36 D	284	St. Joseph Union Terminal	223
4	11 C	417	Standard Oil Co.	31
4	11 C	418	Standard Oil Co.	41
6	32 D	1045	Standard Steel Works Co.	82
10	28 D	1142-1143	Sugar Land Ry. Co.	335
6	10½ C	15	Surry Lumber Co.	8
10	22 D	86	Surry, Sussex & Southampton	372
10	40 C	176	Susquehanna & New York	397
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10	26½ D	141	Tavares & Gulf	327
10	20 D	656-657	Tenn., Alabama & Georgia	348
10	26½ D	146	Texas, Oklahoma, & Eastern	332
8	32 D	716	Texas State	330
8	30 C	618	Toledo-Detroit	329
12	36½ C	7	Tremont & Gulf	353
10	32 D	1165	Tuckerton R.R.	14
8	20 C	46	Tuscarora Valley	321
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4 10 C	37	U S Tube Refining Co.	67				
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4 4 C	30	Western Chemical Mfg. Co.	43	4 28 C	64-65	Youngstown Steel & Tube Co.	84
10 36 C	1247	West Virginia Northern	378	6 38 D	71 to 74	Youngstown Steel & Tube Co.	88
6 32 D	1048	Wheeling Steel & Iron Co.	101				
6 34 D	957	Whitaker-Glessner Co.	53				
8 18½ C	46	Wilwin Co., Ltd.	10				
4 22 C	212-213	Worth Bros Co.	42				
4 22 C	267-268	Worth Bros Co.	91				
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4 8	94 & 95	51 ✓									
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4 10 1/2	134	37	6 32 1/3	283	188	10 34 1/4	114	260 ✓			
4 11	417	39									
4 11	418	41 ✓									
4 11	419	27									
4 14	263	2	8 18 1/4	46	10						
4 14	264	2									
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4 16	148	102	8 20	43	252 ✓						
			8 20	46	321						
4 18	114	49 ✓									
4 20	54	31	8 22 1/4	48	109						
4 22	212 - 213	92 ✓	8 30	682	254						
4 22	214 to 216	56	8 30	698	325						
4 22	267 - 268	94	8 30	699	250 ✓						
4 26	146	33									
4 28	60 to 63	111 ✓									
4 28	64 - 65	84									
4 30	57	221 ✓	---								
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6 26	111	4	6 36	217	267			
6 26	112	4	6 36	228	228	8 26	196	313
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6 28	329	71	6 36	235	269	8 26	205	12
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6 30	459	421	6 36	239 - 240	183			
6 30	464	35	6 36	242 to 247	117	8 30	181	315
6 30	465	45	6 36	248 to 251	307	8 30	683 - 684	307
6 30	466 - 467	67	6 36	252 - 253	274	8 30	684	256
			6 36	254 – 255	123			
			6 36	281	186			
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			6 36	284	223	8 32	798	290
6 32	1057	200						
6 32	1060 – 1061	213						
6 32	1065 to 1069	217						
6 32	1074 - 1075	119						
6 32	1092	190						
6 32	1093 - 1094	262				8 34	544 - 545	235
6 32	1095	82						
6 32	1096	113						
6 32	1097	139				8 38	17 - 18	107
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6 32	1099 - 1100	115						
6 32	1110	242				8 40	6	159
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6 34	926	152	6 38	112	272
6 34	943	207	6 38	117	276
6 34	947	192	6 38	118	231
6 34	949	210	6 38	62 - 63	144
6 34	955 - 956	75	6 38	64	73
6 34	957	53	6 38	65 - 66	300
6 34	958	203	6 38	67	96
6 34	962	131	6 38	68 to 70	135
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10	18 1/4	34	16								
10	22	84	323 ✓								
10	22	86	372								
10	24 1/4	113	18 ✓	12	36 1/4	8-9	359				
10	26	332	375								
10	26 1/4	1111	327 ✓								
10	26 1/4	1148	287								
10	26 1/4	1116	332								
10	28	140-141	370 ✓								
10	28	142-143	335								
10	30	654	298 ✓								
10	30	655	337								
10	30	656-657	368								
10	30	658	339								
10	30 1/4	110	61								
10	30 1/4	111	29								
10	32	1110-1101 & 1144	313								
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8 36	43	361 ✓	10 30	138	291	12 30 1/4	111	20			
8 42	17	167	10 32	127	346	12 31 1/4	111	1105			
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			10 32	133	357	12 31 1/4	115	23			
8 44	1 to 3	172	10 31	2051	280						
8 44	11	176									
			10 36	1295	388	12 36 1/4	7	353			
			10 36	1296	283						
			10 36	1297	378						
			10 36	1348	341						
			10 40	174-175	382	12 38 1/4	118-119	211			
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			10 46	97 to 99	109						
			10 116	95	109						

THE BALDWIN LOCOMOTIVE WORKS AS SPECIFICATION S-12

Memorandum Spec'n 9833

SPECIFICATION FOR LOCOMOTIVES 4 14 C 263 to 268

263 SOLD TO F.C. DE LIMA A CHILCA - (PERU) 10-3-13.
264 SOLD TO JUNIATA WHITE SAND CO 1-8-14
265 SOLD TO CUBAN AMERICAN SUGAR CO. 2-3-14.
266 SOLD TO CUBAN AMERICAN SUGAR CO. 10-13-14
267, 268. SOLD TO J.J. SHANNON & Co. FOR EST OF CHAS MCDERMOTT. 1/9/14.

FOR STOCK 2/19/13

Gen. as Neg. 3190 and Print 15924

Engine Drawing No. 38 —

Gauge of Road 3' 0" Play ½"
Wheelbase, Rigid 5' 0" Driving 5' 0" Total 5' 0"
Total wheelbase, eng. and tend. { Actual ——— / Limited to ———

Curves ——— GRADES 6%

Limits, Height ——— Width ———
Weight (approximate) in working order, Total 36000
On F. tr'k ——— lbs. Drivers 36000 lbs., B. tr'k ——— lbs.

Tractive power 7740 lbs., Ratio of adhesion 3.9 Tank empty
Work'g St'm Pres. 165 lbs., Service Switching
Fuel Bituminious Coal

Boiler Steel Thick 3/8" Bill 5592
Boiler, Diam. 36" Plan Straight
Boiler st'm pres. 165 lbs., Tested to { 185 lbs. steam pres. / 220 lbs. water pres.
Longitud. seams Double riveted lap joint

Dome, diam 19" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 42-1/16" Width 30" Depth F. 38½" B. 38½"
Firebox, Tube ½" Crown 5/16" Sides 5/16" Back 5/16"
Firedoor opening 14" diam.
Water space, Front 2" & 2½" Sides 2" Back 2"
Water space, Frame Single Riveted
Water space stays 7/8" diam. with 3/16" hole 1½" deep from O S

Radial stays 1" diam. Sling stays front None
Button heads below crown on Two central rows
Crown bars None Placed ——— above crown ———
Crown bolts ———

Tubes # 12 W. G. Steel
Tube ends Swaged for copper rings fire box ends.
Tubes, No. 76 Diam. 2" Length 8' 4½"

Heating Surface, Tubes 333.3 Firebox 40 Total 373.3
Grate area 46 8.7 Ratio to heat'g surface, 1 : 42.8
Superheater ——— Feed-water heater ———
Reheater ——— Fire brick tubes ———

Fire Brick arch None

Grates Cast Iron Rocking Bars.
Ash Pan, Depth 14" Dampers Right and left.

Throttle Balance Pos. Dome.
Dry pipe Cast Iron

Superheater None

Smokebox extension Short Cleaning hole and cap None
Spark arrestor or hopper None
Cinder and deflect. plates With

Exhaust nozzles Single high

Stack Straight Diam. 9" Hole in S.B. 10"

(not spec)
Safety Valves Two Consolidated. 1½"
Safety valves None with relief lever, Set to 165 lbs.
Whistle B. L. W.

Steam Gauge One iron 6" Maker Ashcroft (not spec)
Steam gauge stand Iron **Clock** None
Water Gauge, One Ford & Kendig No. 3½ with ½" shank.
Cab lamps to burn Kerosene

Gauge Cocks Three back Surface valve None
Lowest gauge cock 3" above highest part of crown
Lubricator valve with dry pipe to dome.
Blower Valve B. L. W.

Blow off Cock One B. L. W. Pos. ~~Rear~~ FRONT 4/1/13.
Cleaning Plugs
Firebox Corners diagonal
Crown, One back
Waist, None
Front tube sheet, One Fusible Plug One.

Pump None Pos. ———
Top chamb. ——— Bottom chamb. ———
Feed cock ——— Feed pipes ———
Checks ——— Check pipes ———

(not spec)
Injectors Two Metropolitan Class "H" No. 4
Injectors, Pos. R and L Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. R. & L.

Steam Heat None

Cab Wood
No doors at side

Cab boards Wood Nosing None
Running boards Wood 6" wide Nosing None
Hand rail Iron Located on, Tank

Back Bumper Oak

Pilot None Pushing shoes None
Front Bumper Oak Bumper plate With
Steps Across front and back

Front Drawhead, Center above rail and back
Coupler Drawcasting front and back of heavy type design to avoid locking with car couplings on rough track.

Flag fixtures None

Headlight Two round case 10" Reflector, To burn Kerosene
Headlight, Nos. on sides None H'dl't step None
Lamp shelf None Nosing ———

Bell 28 pounds ahead of smoke stack
Sand Box Two Diam. 15" Body Iron ptd. Pipes Iron
Sander Hand with pipes as nearly vertical as possible

Dome casing Iron painted.

Boiler Jacket Soft steel ptd Bands Iron Style 9
Boiler Lagging Magnesia sectional

Frames Cast steel Braces Solid

Cylinders, Diam. 10" Stroke 16"
St'm ports, Length 7⅛" Width ¾" Bridges ¾"
Exh. ports, Length 7⅛" Width 1½" Valve lead 1/16"
Valve travel 3" O. S. lap 9/16" Ins. lap ———
Eccentric-crank throw 2⅛"
S. F. Lubr. Michigan double Bull's Eye See Ex 3-39-18 for ½ pt. Lubr. 158 iron pipes under rigging.
Cyl'r heads Cast iron
Cyl'r casings Iron ptd. Head covers Steel painted.
St'm chest casings Iron ptd. Covers Steel painted.
St'm chest valves Plain D.
pkg { PISTON ROD / VALVE STEMS } Hemp
Piston rods keyed to crossheads (J.J.S. 4/9/14)
Pistons Cast iron rings sprung into solid dished heads.
Guides Single bar steel, Yoke Cast Steel. Oil cups Needle
Crossheads Cast steel, bearings of cast iron babitted (J.J.S. 4/9/14)
Wrist Pins Steel Rod cups Plunger
Parallel rods to have solid ends.

Valve Motion Stephenson
{ Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.
Valve motion pin to work in bushed holes.

All threads on bolts (except staybolts) to be United States Standard
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 29" Cen. diam. 25" Cast iron centers.

Tires Steel Held by Shrinkage and shoulder.
Tires, Flanged, Pos. All Size 2" x 5"
Tires, Plain, Pos. ——— Size ———
Lateral play between driving boxes and wheel hubs = 1/16" total
Driving Boxes Cast iron
Journals, Diam. 5" Length 6"

Driving spring staples Wrot iron
Eq. Reams Cast Steel (J.J.S. 3/19/14)
Springs. Make B. L. W.

Front Engine Truck None
To swing ——— each side of cen. Cen. pin liners ———
Journals, Diam. ——— Length ——— Boxes ———
Wheels, Diam. ——— Tread ——— Kind ———
Tires ——— Cen. diam. ——— Size ———
Tires held by ———

Back Engine Truck None Wheeled ———
To swing ——— each side of cen. Cen. pin liners ———
Journals, Diam. ——— Length 0——— Boxes ———
Wheels, Diam. ——— Tread ——— Kind ———
Tires ——— Cen. diam. ——— Size ———
Tires held by ———

Brake, position On all, driving wheels
Operating { Engine, Sch. U-O B. L. W. steam
Parts { Eng. Tr'k, sch. ———
Foundation { Drivers, sch. U-O B. L. W.
Parts { Eng. tr'k, sch. ———
Air pump ——— Pos. ———
Train connections ———
Train signal, sch. ——— Separate lubr. for steam brake valve. Brake.- All parts to be kept above lower line of bumper
Shoes detachable from heads.

TENDER None.

TANK 700 gallons, Bill 2910

Tank, Saddle on top of boiler extending to front of smoke box extension.

Coal Box at left side 30" high extending full length of cab. Built of iron with scoop d or at bottom.

FRAME 3" wide with upper bar about 2½ deep. Frame with double rails extending to both front and back bumpers. Hangers and knees where possible cast integral with frame.

BUMPERS Front and back extending width of engine 22" deep about 6¾" thick and placed not over 6" above the rail.

Steps across engine near bottom of bumpers cross main rails about 10" above top of bumpers.

List of tools, sch. 26
Bolts, nuts and threads B. L. W.
Photo sch. None
Inspection B. L. W.
To be weighed No
Material spec'ns B. L. W.
Certificate of boiler test to conform to I. C. C. requirement
Inspectors plates and builders cards to be dated when engines are purchased.
Junior laws to 2/28/09.
Shipment on Car.

Brass shop finish, No. 1.
Machine shop finish D 165.

Patent Plates { Steam Dome 590,867 September 28, 1897. / Throttle 642,007 January 23, 1900.

Property Plates None.

PAINTING:- Engine, style 222, Black with yellow stripes.
Painting:- Tender, Style----------

TOM HEBLETHER :— TANK FINAL TO BE PLACED NEXT TO STACK AND SMOKE BOX. 1-3-13
TO BE LOCATED TO SUIT. AS REQUEST FROM MR. J. BANNEN TO MR. 2-5-13

4-14 C 263 SOLD TO F.C. DE LIMA A CHILCA - (PERU) WITH CHANGES AS FOLLOWS ORDERED THROUGH EXTRA WORK DEPT. ORDER NO 9180 DATED 10-3-13. SHIPMENT BEST FOREIGN STYLE - SOON AS POSSIBLE. SHARON M.C.B. AUTO FULL SIZE COUPLERS WITH SLOTTED KNUCKLE FOR LINK AND PIN CONNECTION 26" CENTRE ABOVE RAIL, SAME AS FOR 1022 & 26. OMIT ROAD NO. AND LETTERING. 10/9/13.

4-14 C 264 SOLD TO JUNIATA WHITE SAND CO. WITH CHANGES AS FOLLOWS ORDERED THROUG EXTRA WORK DEPT. ORDER NO. 307 DATED 1-8-14. TO BE SHIPPED IMMEDIATELY TWO POCKET DRAW CASTING F. & B., 15" FROM RAIL TO CENTRE OF LOWER POCKET. B.L.W. PROPERTY PLATES, FOR ENGINE. OMIT LETTERING AND NUMBERS 1/24/14

4-14 C 265 SOLD TO THE CUBAN AMERICAN SUGAR CO. FOR THE CHAPARRA SUGAR CO. CUBA. WITH CHANGES AS FOLLOWS ORDERED THROUGH EXTRA WORK DEPT. ORDER No. 1053 DATED 2/3/14 B.L.W. IRONCLAD WATER GLASS, AND NETTING AROUND ASH PAN.- TO BE APPLIED BEFORE LOCO. IS SHIPPED STRIPING IN ALUMINUM LEAF - OMIT LETTERING AND NUMBER - FRONT NUMBER A BLANK. HEADLIGHTS ADAMS & WESTLAKE 12" ROUND CASE TO BURN ACETYLENE. SIDE NOS. NOT REQUIRED. CAB LIGHTS TO BURN ACETYLENE. UNITED STATES MET. PACKING (NOT SPEC) FOR PISTON RODS & VALVE STEMS. ONE CROSSHEAD PUMP (OR 8695) FOR R.S. TO INCLUDE ALL PARTS NEC. FOR APPLICATION COUPLERS:- CLIMAX AUTO-THREE QUARTER SIZE WITH SLOTTED KNUCKLES, SAME HEIGHT AS FOR 8240 D 228, i.e. 25" CENTRE ABOVE RAIL — THESE PARTS ARE TO BE SHIPPED SEPARATELY WITH FULL PARTICULARS TO SHOW THEIR PROPER APPLICATIONS 2/3/14

4-14 C 267 & 268 SOLD TO J. JACOB SHANNON, FOR THE ESTATE OF CHAS. MCDERMOTT. CHANGES MADE AS FOLLOWS, THROUGH THE EXTRA WORK DEPT. ORDERS NOS 8512 & 8513. COUPLINGS:- MIDDLE POCKET 22" CENTRE ABOVE RAIL. J.J. SHANNON PROPERTY PLATES HEREWITH TO BE APPLIED ON EACH SIDE OF CAB. LOCOS TO BE PAINTED AS SPECD ROAD NOS 40 & 41 ON S. NO. PLATE NAME ON CAB SIDES, HERBERT FOR 267 AND MARIE FOR 268. MARK ON TANK SIDES, EST. CHAS MC. DERMOTT MAKING THE EST. RATHER SMALLER THAN THE REMAINDER OF THE LETTERING. J.J. SHANNON & CO'S KEYSTONE TRADE MARK TO BE APPLIED ON TANK SIDES. 1/9/14

4-14 C 266 SOLD TO THE CUBAN AMERICAN SUGAR CO. FOR CENTRAL MERCEDITA CUBA WITH CHANGES AS 8 15 D 181 CAST STEEL DRAWCASTINGS. SHIP. OR CAR. PAINTING: STYLE 222, OLIVE GREEN AND ALUMINUM - LETTERING SAME AS FOR 8-15 D 181. MARK ON TANK SIDES:- MERCEDITA SUGAR CO. ROAD No. 41 ON CAB SIDES. F.No. PLATE BLANK. — SEE INSPECTOR'S COPY No. 8-14-13

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-4056 on B.L.W. form herewith
Including supplement list of changes attached
Memorandum Spec'n 11173 Dup. 6 26 D 104 with same extras, except
where otherwise specified.

SPECIFICATION FOR LOCOMOTIVES 6 26 D 107 to 112 Ry. Co's Class

Gen. as PHOTO. 3247 } except with firebox placed over frames

Engine Drawing No. 30

FOR Dominga Steel Co., Inc. for 112 only.
John Marsch for 107 & 108 only.
F.C. del Norte de Cuba, Cuba for 109 & 110 only.
Cuba Cane Sugar Corporation, Cuba for 111 only. 10-13-16

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 9' 9" Driving 9' 9" Total 9' 9"
Total wheelbase, eng. and tend. { Actual 39' 1½" / Limited to ---

Curves and grades are sharp

35 **Limits,** Height ---- Width ---
Weight (approximate) in working order, Total 83,750 pounds
On F. tr'k --- lbs., Drivers 83,750 lbs., B. tr'k --- lbs.
Weight limited to 90,000 pounds
Tractive power 18,800 lbs., Ratio of adhesion 4.4
Work'g St'm Pres. 180 lbs., Service Switching
Fuel Soft coal
6-26-1109 no fire changed to Front Tube Sheet to be ½" thick dated 1919.

1 Front tube sheet to be ½" thick
31 **Boiler** Steel
Boiler, Diam. 48" Thick 9/16" Plan Straight top Bill 7954
2 Boiler st'm pres. 180 lbs., Tested to { 200 lbs. steam pres. / 270 lbs. water pres.
with factor of safety of 5.61
12 Longitud. seams Butt jointed, double covering strips, sextuple riveted (required by Mass. laws.) A.P.V. 4/13

11 **Dome,** diam. 25" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 53-11/16" Width 42⅜" Depth F. 51¾" B. 50⅞"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diam.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Double Riveted
Water space stays ⅞" diam.

15 16 Radial stays 1" diameter Sling stays front } Two rows of B. L. W. expansion stays
Button heads below crown on six central rows
Crown bars None Placed --- above crown
Crown bolts ---

16 17 Flues ---
Tubes #12 W.G. Charcoal iron or steel
Tube ends Swaged for copper ferrules, fire box ends
Number 135 Diam. 2" Length 13' 0"

Heating Surface Flues ---- Combus. Chamb. --- Total 983 ☐
Tubes 913 ☐ Fire Box 70 ☐ Fire Brick Tubes ---
Grate area 15.8☐ Ratio to Heating Surface 1 : 62.2
Superheater ----

Fire Brick Arch on studs

Grates Rocking bars (not finger type) with drop plate
22 **Ash Pan,** Dampers Front and back
Ash pan to conform to I. C. C. requirements

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Smokebox extension With Cleaning hole and cap L.S. only
Spark arrester as hopper With
32 Netting and deflect. plates With
Exhaust nozzles Double-high
Stack Cast iron Straight Dia. 15" Hole in S. B. dia. 18"

19 **Safety Valves** Two Ashton 2½", one open No. 28, one muffled No. 30
Safety valves Both with relief lever, Set to { 180 pounds muffled / 183 pounds open
Whistle B. L. W. plain

Steam Gauge One iron 7" MAKER: Crosby (spread)
Steam gauge stand Iron **Clock** None

38 **Water Gauge** One B.L.W. **Cab Lamps** to burn oil
Gauge Cocks Three back Surface valve None
Lowest gauge cock 3" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock Two Everlasting Pos: Front and L.S. near back
Cleaning Plugs
Firebox Corners diagonal
Crown, Two each side and two back
Waist, One under front
20 Front tube sheet, One Fusible plug One

Pump None Pos. ---
Top chamb. --- Bottom chamb. ---
Feed Cock --- Feed pipes ---
Checks --- Check pipes ---

(not spec) No. 7
Injectors Two Monitor Steam pipes Copper
41 Injectors, Pos. Right and left Overflow Iron
3 Pipes, Check Iron Feed Iron Pos. Right and left
21 Check B. L. W.

Steam Heat None

42 **Cab** Wood

Cab boards Wood Nosing Angle iron
Running boards Wood Nosing Angle iron
Hand rail Iron Located on Boiler

43 44 **Back Bumper** Bar steel Back drawbar height 29½"

Pilot None Pushing shoes Front
Front Bumper Oak Bumper plate With
34 **Steps** across front with hand rail
Steps, hand holds, etc., to conform to I. C. C. requirements
Front Drawhead, Center above rail 33½"
Coupler Sharon M. C. B. auto. with solid knuckle, 13" face

Signal fixtures None

Headlight Two Round Case 16" Reflector, To burn Kerosene
Headlight, Nos. on sides With H'd'l't step With
Lamp shelf None Nosing ---

Bell 85 pounds
Sand Box Two Diam. 23" Body Iron painted Pipes Iron
Sander (Nathan Auto) Leach Air trap "A-1" in each box, to sand front and rear

Dome casing Iron painted

23 **Boiler Jacket** 22 soft steel pto Bands Iron Style 9
Boiler Lagging Magnesia sectional

THE BALDWIN LOCOMOTIVE WORKS
A. J. Stratton Feb. 1917
SPECIFICATION FOR LOCOMOTIVES 6 26 D 107 to 112
FOR John Marsch (see previous page)

Frames Cast steel Braces Solid

Cylinders, Diam. 16" Stroke 24"
St'm ports, Length 15" Width 1¼" Bridges 1"
Exh. ports, Length 15" Width 2½" Valve lead 1/16"
Valve travel 5½" Steam lap ¾" Exhaust clearance ----
Eccentric-crank throw 4⅝" By-pass valve None
S. F. Lubr. Detroit Four Feed automatic Bulls Eye
Cyl'r heads Cast iron; Lubr. pipes of iron under jacket
Cyl'r casings Iron painted Head covers Steel painted
St'm chest casings Iron painted Covers Steel painted
St'm chest valves Richardson balanced, with vacuum valves
Met. pkg { Piston rods / Valve stems } United States, King type (not spec)

Pistons (see sup. 45)
Guides Laird type, steel Oil cups Needle
Crossheads Cast steel
Wrist Pins Steel Rod cups Grease cups for all rods
Parallel rods to have solid ends

Valve Motion Stephenson
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.
Driving wheels without hub liners
Drivers, O. S. Diam. 50" Cen. diam. 44", Centers Cast iron

Tires Steel Held by Shrinkage and shoulder
Tires, Flanged, Pos. Front and back Size 3" x 5½"
Tires, Plain, Pos. Middle Size 3" x 6½"
Lateral play between driving boxes and wheel hubs 1/16" total
Driving Boxes Cast iron
Journals, Diam. 7" Length 9"

Springs. Make B. L. W.

Front Engine Truck None Wheeled ---
To swing --- each side of cen., Cen. pin liners ---
Journals, Diam. --- Length --- Boxes ---
Wheels, Diam. --- Tread --- Kind ---
Tires --- Cen. diam. --- Size ---
Tires held by ---

Back Engine Truck None Wheeled ---
To swing --- each side of cen., Cen. pin liners ---
Journals, Diam. --- Length --- Boxes ---
Wheels, Diam. --- Tread --- Kind ---
Tires --- Cen. diam. --- Size ---
Tires held by ---

46 **Brake,** position On all driving and tender wheels
46 Operating { Engine, Sch. #6 ET West'g. combined auto and
56 Parts Eng. Tr'k. sch. --- straight air
Foundation Drivers, sch. WM-1 American D. S. equalized
Parts Eng. Tr'k, sch. ----
Air pump (Sup. 46) Pos. Located ahead of fire box
Train connections Front and back
Train signal, sch. None
Air reservoirs to have hydrostatic test of 210 lbs.

Tender Eight Wheeled, Drawing Nos. 777
Weight, with fuel and water, about 70,000 pounds
Tank to be of same design as for 6 26 D 90 to 100
Tank, 3500 Gallons, Bill 4359
Tank "U" shape, sloping back; Fuel capacity 4 tons
Syphon discharge 3" pipe conn. in left water leg of tank near cab
Tool Boxes Two of hard wood, Top
Water cock on tank near front for hose connections
Frame Steel 10" channels, with wooden end sills
42 Gang way between cab and tank to be 20" to 24"
Front Drawbar height 29"
Pilot None Pushing shoes With
Back drawhead, center above rail 33½"
Coupler Sharon M. C. B. auto. with solid knuckle, 13" face

37 Steps, hand holds, etc., to conform to I. C. C. requirements
Steps across rear with hand rial
Truck channel bar to be laid flat
Trucks Arch bar type with steel bolster

Springs Elliptic B. L. W. make
Journals, Diam. 4½" Length 8"
Wheels, Diam. 30" Tread 4½" Kind Chilled cast iron plate
Tires None Cen. diam. --- Size ---
Tires held by ---
Safety chains Single

48 **Brake** Position On all wheels
Brake sch. #6 ET West'g. auto. and straight air with 10" x 12" cylinder.

List of tools, sch. 26
Photo sch. #2 Inspection B. L. W., Except (see sup. 32)
To be weighed Yes Material spec'ns B. L. W.
Certificate of boiler test Three copies of B. L. W. form 1036 (see sup. 8)
Junior laws to 11-1-16 Shipment On own wheels

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. } Throttle, Patented Jan. 23, 1900 (Cast on)
Patents } Feed pipe strainer, Patented Sept. 1, 1903 (Cast on)

Property plates B. L. W. for engine and tender

Painting: Engine, style 291, Olive Green and Aluminum
Painting: Tender, style 291, Olive Green and Aluminum
Lettering to be Roman style, same as for previous locomotives

Marker Tank sides { John Marsch, Inc. / Railroad Contractors } For 107 & 108 only

Road Nos. Pos. Road Nos. Name: None
F. No. Plate 51 to 56 for 107
Dome and 52 for 108
Back of Tank

For instructions covering Painting, Marking, and parts ordered Extra, See back of this page.

6-26 D 109 & 110 SOLD TO FERROCARRILES DEL NORTE DE CUBA, CUBA
WITH CHANGES ORDERED THROUGH EXTRA WORK DEPT. ORDER No.5986
DATED 6-11-17 AS FOLLOWS:-
CAB LIGHTS AND TWO 18" ROUND CASE HEADLIGHTS TO BURN
ACETYLENE, SIDE NUMBERS - WITH.
PAINTING STYLE 291 OLIVE GREEN AND ALUMINUM.
LETTERING AND NUMBERS TO BE UNIFORM WITH 10-32 D 1161 TO 1164
MARK ON TANK SIDES, NORTE
ROAD NUMBERS 25 AND 26 IN BRASS ON FRONT NUMBER PLATE AND
PAINTED ON FRONT SAND BOX, CAB SIDES, AND BACK OF TANK.
ALL NECESSARY PARTS TO ENABLE RY CO. TO CHANGE LOCOS. AFTER
DELIVERY, TO BURN WOOD,-INCLUDING GRATES, STACK, CLEANING
PIPE, EXHAUST, AND FUEL RACK FOR TOP OF TANK.

6-26 D 111 SOLD TO CUBA CANE SUGAR CORPORATION, CUBA
WITH CHANGES ORDERED THROUGH EXTRA WORK DEPT. ORDER No.9451
DATED 9-14-17 AS FOLLOWS:-
HEADLIGHT EQUIPMENT PYLE NATIONAL ELECTRIC, TYPE "K" WITH
TWO 18" ROUND CASE HEADLIGHTS, AND CAB LIGHTS.
PAINTING STYLE 291 OLIVE GREEN AND ALUMINUM
MARK ON TANK SIDES, CUBA CANE SUGAR CORPORATION
ROAD NUMBER 100 IN BRASS ON FRONT NUMBER PLATE, AND PAINTED
ON FRONT SAND BOX, CAB SIDES AND BACK OF TANK.

6-26 D 112 SOLD TO DONNER STEEL CO., INC.
WITH CHANGES ORDERED THROUGH EXTRA WORK DEPT. ORDER No.9269
DATED 9-7-18, AS FOLLOWS:-
INJECTORS SELLERS CLASS "M" No.7½
PAINTING STYLE 291 OLIVE GREEN AND ALUMINUM
LETTERING SIMILAR TO 6-32 D 1088.
MARK ON TANK SIDES, DONNER STEEL CO., INC.
ROAD NUMBER 6 IN BRASS ON FRONT NUMBER PLATE, AND
PAINTED ON FRONT SAND BOX, CAB SIDES, AND BACK OF TANK.

SPECIFICATIONS FOR LOCOMOTIVES 6 26 D 107 to 112

FOR ~~John Marsh~~ (SEE PREVIOUS PAGE)

1 BOILERS FOR LOCOMOTIVES BUILT FOR USE IN BRITISH COLUMBIA ARE TO BE DESIGNED TO PASS BRITISH COLUMBIA INSPECTION, AND ARE TO CONFORM TO BRITISH COLUMBIA REQUIREMENTS. NOT NECESSARY TO HAVE DESIGN OF BOILER REGISTERED IN BRITISH COLUMBIA.

2 BOILER DESIGNED TO PASS BRITISH COLUMBIA INSPECTION FOR 180 POUNDS PRESSURE. SPECIAL CARE TO BE TAKEN IN CALKING.

3 BOILER MUST BE TESTED WITH COLD WATER TO 50 % ABOVE THE BOILER PRESSURE AND MUST BE TIGHT UNDER THIS TEST.

4 TO MEET REQUIREMENTS, IT WAS DETERMINED BY B.L.W. THAT THE BOILER SHOULD BE SUBJECTED TO THE FOLLOWING STEAM TEST BY FIRE:-
1ST TEST, 200 POUNDS LET DOWN TO 90, AFTER BOILER IS TIGHT
2ND TEST, 200 POUNDS LET DOWN TO 45 AFTER BOILER IS TIGHT
3RD TEST, 200 POUNDS
AT EACH AND EVERY TEST THE PRESSURE MUST BE HELD FOR ONE HALF HOUR WITHOUT BOILER SHOWING ANY INDICATION OF LEAKS OF ANY KIND. UNDER NO CINDITIONS IS THE PRESSURE TO BE LET DOWN BY BLOWING OFF, UNTIL ONE HALF HOUR HAS ELAPSED AFTER EACH AND EVRY TEST.
THE SAFETY VALVES AND STEAM GAUGES MUST BE APPLIED TO BOILER DURING THE ABOVE TESTS. BOILER PRESSURE IS 180 POUNDS.
THE FINAL HYDROSTATIC TEST IS TO BE MADE PRIOR TO SHIPMENT, AFTER WHICH, THE FIREBOX IS TO BE CLEANED AND PAINTED INSIDE.

5 BOILER SHELL TENSILE STRENGTH NOT LESS THAN 60,000 POUNDS. ALL BOILER AND FIREBOX PLATES TO HAVE ELASTIC LIMIT NOT LESS THAN 33,000 POUNDS WITH ELONGATION OF 20 % IN 8" SECTION, FOR BOILER PLATES, AND 25 % IN 8" SECTION FOR FIRE BOX PLATES.

6 EVERY PLATE IN BOILER AND FIREBOX MUST BE STAMPED WITH MAKER'S NAME AND TENSILE STRENGTH.
THIS STAMPING TO BE ENCIRCLED WITH A RING OF WHITE PAINT, TO MAKE IT EASILY DISCOVERABLE AND TO AVOID DELAY IN INSPECTION ON ARRIVAL.

7 EACH BOILER TO BE STAMPED LEGIBLY AND FULLY INTO THE BOILER PLATE ON RIGHT HAND SIDE OF FIRE-DOOR, CLEAR OF ATTACHMENTS IN FIGURES AT LEAST $\frac{1}{4}$" IN SIZE AS FOLLOWS:-
(1) THE BALDWIN LOCOMOTIVE WORKS (000)
(2) B. C. (000)
(3) 00000 S
(4) J D (000)
(5) 00. 0. 00
(1) BUILDER'S NAME AND CONSTRUCTION NUMBER OF LOCOMOTIVE.
(2) PROVINCIAL INITIAL LETTERS AND REGISTRATION NUMBER OF DESIGN. (IF THE BOILER HAS NOT BEEN BUILT TO A REGISTERED DESIGN, THIS SPACE IS TO BE LEFT BLANK)
(3) LOWEST TENSILE STRENGTH OF ANY PLATE IN THE CYLINDRICAL SHELL OF THE BOILER, WITH "S" FOR STEEL AND "I" FOR IRON
(4) THE INITIALS OF THE ENGINEER SURVEYOR WHO SUPERVISED THE CONSTRUCTION AND TESTS OF THE BOILER, WITH HIS SERIAL NUMBER. (WHEN THE BOILER IS BUILT AND TESTED AT THE B. L. W. WITHOUT THE SUPERVISION OF THE ENGINEER SURVEYOR, THIS SPACE IS TO BE LEFT BLANK)
(5) THE DATE CONSTRUCTION OF BOILER WAS COMPLETED, DAY OF MONTH, NUMERICAL ORDER OF THE MONTH, LAST TWO FIGURES OF THE YEAR.
THE ABOVE STAMPING IS IN ADDITION TO THE STAMPING REQUIRED ON EACH INDIVIDUAL PLATE, AND THE LOCATION IS TO BE INDICATED ON THE AFFIDAVIT FORM.

8 AFFIDAVITS ON FORM #1 TO BE MAILED AS SOON AS BOILER IS COMPLETED, TO ENABLE THE INSPECTOR TO CHECK MEASUREMENTS BEFORE LOCOMOTIVE ARRIVES. BE SURE THE FIGURES IN AFFIDAVIT ARE SAME AS FIGURES STAMPED ON THE PLATES.

11 DOME OF THE ONE PIECE TYPE.

12 BOILERS WHOSE LONGITUDINAL SEAMS ARE SEXTUPLE RIVETED BUTT STRAP CONSTRUCTION, RIVETED IN ACCORDANCE WITH BRITISH COLUMBIA LAW, B. L. W. DATA SHEET TRACING 27831, MAY BE APPROVED WITH A FACTOR OF 5.2 WHILE THOSE OF LAP SEAM CONSTRUCTION OR WITH QUADRUPLE RIVETED BUTT SEAMS ARE REQUIRED TO HAVE A FACTOR OF 6 OR 6.2.
THE FORMER ARE THEREFORE TO BE PREFERRED.

13 NOTE: ALL SHARP EDGES AND BURRS ARE TO BE REMOVED BY SLIGHT COUNTERSINKING AND BURR REAMING FROM RIVETS HOLES.

14 FIRE DOOR OPENINGS TO HAVE BOTH SHEETS FLANGED OUTWARDLY AS SKETCH IN JUNIOR LAW OF JAN. 21ST, 1914.

15 NO BOILER BRACES FROM BACK HEAD OR TUBE SHEET ARE TO BE FASTENED TO SHELL OF BOILER UNDER THE DOME.

16 TUBES, BOTH ENDS OF ALL TUBES TO BE BEADED OVER.

17 ALL OPENINGS IN BOILER OVER 1" PIPE TAP ARE TO BE REINFORDED WITH LINERS.

18 ALL STEAM OUTLETS ARE TO BE PROVIDED WITH STOP VALVES.

19 SAFETY VALVES ARE TO HAVE FLANGES BOLTED TO DOME CAP.
ALL SAFETY VALVES TO BE PROVIDED WITH LOCK NUTS IN ACCORDANCE WITH BRITISH COLUMBIA RULES.

20 FUSIBLE PLUG TO BE FILLED WITH BANCA TIN, AND PLUG LOCATED IN FRONT OF CROWN IN CENTER.

21 STOP COCK TO BE PROVIDED BETWEEN INJEDTOR CHECK AND BOILER. PROVIDE PIPE TO DELIVER BELOW THE WATER LINE OF BOILER WHEN CHECK OPENING IS ABOVE THE WATER LINE.

22 IN ACCORDANCE WITH ABSTRACT OF GENERAL ORDER NO. 107, DATED JULY 4, 1913, OF THE BOARD OF RAILWAY COMMISSIONERS FOR CANADA, LOCOMOTIVES FOR USE IN CANADA ARE REQUIRED TO CONFORM TO THE FOLLOWING:-
2 (A) ENGINES WITH EXTENDED SMOKEBOX, NETTING MESH SHALL NOT BE LARGER THAN 2½ x 2½ PER INCH #10 B. W. G.
2 (B) ENGINES WITH "DIAMOND" STACK (INCLUDING "RADLEY AND HUNTER" STACK) THE MESH SHALL NOT BE MORE THAN 3 x 3 PER INCH #10 B. W. G.
3 (C) THE OPENINGS IN LOCOMOTIVE ASH PANS TO BE COVERED WHEN PRACTICABLE WITH HEAVY SHEET IRON DAMPERS AND IF NOT PRACTICABLE WITH NETTING DAMPERS 2½ x 2½ MESH #10 B.W.G., SUCH DAMPERS TO BE FASTENED EITHER BY A HEAVY SPRING OR BY A SPLIT COTTER AND PINS, OR BY SUCH OTHER METHOD AS MAY BE APPROVED BY THE BOARD.
3 (D) OVERFLOW PIPES FROM INJECTORS OR FROM INJECTOR DELIVERY PIPES OR FROM BOILER, TO BE PUT INTO THE FRONT AND BACK OF THE ASH PANS AND USED FROM APRIL 1ST TO NOVEMBER 1ST, FOR WETTING ASH PANS.

23 LEAVE A HOLE IN THE LAGGING OPPOSITE EACH MANUFACTURER'S STAMP ON THE BOILER PLATE OF THE TENSILE STRENGTH, ETC., THIS HOLE TO BE COVERED BY A SEPARATE PIECE OF LAGGING NEATLY FASTENED TO THE MAIN SHEET.
PUT RING ON BOILER JACKET OVER TENSILE STAMPING ON BOILER PLATES SO THAT ALL LAGGING WILL NOT HAVE TO BE REMOVED.

31 LOCOMOTIVE MUST BE SUITABLE FOR OPERATION IN MASSACHUSETTS

32 BOILERS TO BE INSPECTED BY HARTFORD STEAM BOILER INSPECTION & INSURANCE COMPANY.

33 BOILER MUST BE STAMPED ON THE BACK HEAD, IN THE PRESENCE OF THE AUTHORIZED INSPECTOR THUS:- MASS. STD. 2 TO 7 INC. BALDWIN L. W.

34 ALL PARTS OF ENGINE AND TENDER TO CONFORM TO THE PRESENT I. C. C. RULES AND REGULATIONS.

35 CLEARANCE FROM TOP OF RAIL FOR ALL PARTS TO BE NOT LESS THAN 8"

36 WATER SPACE STAYS OF FALLS HOLLOW HOLLOW IRON.
WATER SPACE STAYBOLTS TO HAVE 3/16" TELLTALE HOLES IN ACCORDANCE WITH I. C. C. REQUIREMENTS.
WATER SPACE STAYS TO BE SPACED 4" CENTER TO CENTER.

37 COPPER FERRULES FOR TUBE ENDS TO PROJECT 1/32" AHEAD OF TUBE SHEET.

38 WATER GAUGE GLASS TO HAVE SARGENT IRON CLAD PROTECTOR.

39 BLOW-OFF COCKS TO BE OPERATED FROM RUNNING BOARD.

40 ANGLE 1¼" VALVE TO BE APPLIED IN TURRET FOR SYPHON, VALVE TO HAVE THREAD FOR 1½" PIPE.

41 TEE AND PLUG TO BE PROVIDED IN THE STRAIGHT PART OF THE INJECTOR CHECK PIPE, RIGHT AND LEFT, THE TEE BEING THE SAME SIZE AS THE PIPE.

42 GANG WAY BETWEEN CAB AND TANK TO BE 20" TO 24"

43 REAR DECK CASTING TO BE CAST STEEL.

44 CHAFING CASTING OF STEEL BETWEEN ENGINE AND TENDER AMPLE CLEARANCE TO BE PROVIDED FOR TENDER DRAWBAR.

45 PISTON HEADS OF CAST IRON WITH REMOVABLE FOLLOWERS, AND WITH SNAP RINGS FOR PACKING.
PISTON RODS TO BE KEYED TO CROSSHEADS.

46 ONE 9½" WEST'G. AIR PUMP ON RIGHT SIDE AND ONE 8½" CROSS COMPOUND PUMP ON LEFT SIDE.
CROSS COMPOUND AIR PUMP TO BE PROVIDED WITH 1¼" STEAM VALVE AND GOVERNOR.

47 PIPES BETWEEN AIR PUMP AND AIR RESERVOIR TO BE OF SUFFICIENT LENGTH TO SECURE PROPER COOLING OF AIR.

48 AIR RESERVOIRS TO BE WESTINGHOUSE ENAMELLED.
ONE EXTRA 22" RESERVOIR ON TENDER FOR WESTERN AIR DUMP CARS WITH VALVES AND CONNECTIONS FRONT OF ENGINE AND BACK OF TENDER USING 1" PIPE FOR CONNECTIONS.

49 BRAKE CYLINDERS TO BE PUSH DOWN TYPE.

50 CONNECTIONS FOR WESTERN AIR DUMP ARRANGEMENT OF PIPING ETC., TO BE SAME AS FOR 6 26 D 98 TO 100.
AIR PUMP AND DUMP CAR PIPING TO BE ARRANGED AS PER LETTER DATED JAN. 13, 1910 FROM THE WESTINGHOUSE AIR BRAKE CO., TO F. W. NAGLE (COPY ATTACHED) (SEE SUP.

51 AIR DUMP OPERATING VALVE (TO BE) LOCATED ALONG SIDE OF CAB DIRECTLY AHEAD OF STRAIGHT AIR VALVE WITHIN EASY REACH OF ENGINEER FROM SEAT.
THE VALVE (CAN BE) PRUCHASED FROM THE WESTERN WHEELED SCRAPER CO., AURORA, ILL.

52 AIR DUMP SYSTEM TO HAVE SEPARATE DUPLEX AIR GAUGE.

AIR PIPING ARRANGEMENT

COPY OF LETTER FROM THE WESTINGHOUSE AIR BRAKE CO. TO MR. F. W. NAGLE, DATED CHICAGO, 1-13-10.

"REPLYING TO YOUR LETTER OF THE 8TH INST., ON THE ABOVE SUBJECT, BEG TO STATE THAT THIS MATTER WAS TAKEN UP WITH MR. STRANG OF THE ABOVE COMPANY, WHO STATED THAT THE ENGINES ARE TO BE EQUIPPED WITH BOTH AN 8½" CROSS COMPOUND COMPRESSOR AND A 9½" COMPRESSOR. THE 8½" CROSS COMPOUND COMPRESSOR IS TO BE LOCATED ON THE LEFT HAND SIDE OF THE ENGINE AND IS TO BE USED FOR DUMPING CARS ONLY. THE 9½" COMPRESSOR IS TO BE LOCATED ON THE RIGHT HAND SIDE OF THE ENGINE, AND IS TO BE USED FOR OPERATING BRAKES. IT IS THEIR PRESENT PRACTICE WHERE THEY HAVE TWO COMPRESSORS INSTALLED, TO RUN A PIPE CONNECTING THE MAIN RESERVOIR LINE TO THE AUTOMATIC BRAKE VALVE WITH MAIN RESERVOIR LINE TO THE DUMPING VALVE. IN THIS LINE THEY PLACE A CUT OUT COCK. THE ENCLOSED SKETCH SHOWS THIS DIAGRAMATICALLY, AND IT IS TO BE NOTED THAT THE GAUGE CONNECTION TO THE MAIN RESERVOIR LINE TO THE DUMPING VALVE IS TAKEN FROM A POINT JUST BELOW THE CUT OUT COCK THAT SHOULD BE PLACED NEAR THE VALVE.

IN REGARD TO THE LOCATION OF THIS APPARATUS, THE AUTOMATIC BRAKE VALVE AND INDEPEENDENT BRAKE VALVE SHOULD BE PLACED WITHIN EASY REACH OF THE ENGINEER, AND THEY DESIRE THAT THE DUMPING VALVE WHICH IS PRACTICALLY A FOUR WAY COCK, AND IS FURNISHED BY THE WESTERN DUMP AIR [illegible], SHOULD BE PLACED IN FRONT OF THE ENGINEER BETWEEN THE SIDE OF THE CAB AND THE FIRE BOX. THE CUT OUT COCK JUST BELOW THIS VALVE MUST ALSO BE WITHIN EASY REACH OF THE ENGINEER, AS WHEN THEY DUMP THE CARS IT IS NECESSARY FOR THE ENGINEER TO OPEN THIS CUT-OUT COCK BEFORE OPERATING THE DUMPING VALVE.

THE CUT OUT COCK IN THE LINE CONNECTING THE MAIN RESERVOIR SUPPLY OF THE AUTOMATIC BRAKE VALVE TO THE MAIN RESERVOIR SUPPLY OF THE DUMPING VALVE SHOULD ALSO BE LOCATED IN THE CAB IN SUCH A POSITION THAT WHEN IT IS DESIRED TO USE BOTH PUMPS FOR DUMPING THE CARS IT MAY BE EASILY REACHED BY THE ENGINEER.

THE ABOVE COMPANY ARE ALSO PARTICULAR AS TO THE LOCATION OF THE CUT OUT COCKS IN THE DUMPING LINES, AND THESE SHOULD BE LOCATED AS FOLLOWS:-

FROM THE DUMPING VALVE ONE PIPE LEADS THROUGH THE FLOOR OF THE CAB INTO A TEE, AND FROM THIS TEE EXTENDS BOTH FORWARD AND BACK ON THE RIGHT HAND SIDE OF LOCOMOTIVE. TWO CUT OUT COCKS IN THIS LINE SHOULD BE PLACED ONE EACH SIDE OF THIS TEE. THE SAME LINE WHICH EXTENDS ON THE LEFT HAND SIDE OF THE LOCOMOTIVE SHOULD GO THROUGH THE FLOOR OF THE CAB ON THE RIGHT HAND SIDE INTO AN ELBOW, AND RUN FROM THERE FORWARD AND PASS UNDER THE BOILER JUST BACK OF THE SADDLE. THIS SHOULD LEAD INTO A TEE ON THE LEFT HAND SIDE AND THE LINE THEN EXTEND FORWARD AND BACK FROM THIS TEE. THE CUT OUT COCKS FOR THIS LINE ON THE LEFT HAND SIDE SHOULD BE LOCATED ONE ON EACH SIDE OF THIS TEE. THIS WILL BRING THE TWO CUT OUT COCKS FOR THE LINE ON THE RIGHT HAND SIDE JUST BELOW THE CAB ON THAT SIDE, AND THE TWO CUT OUT COCKS FOR THE LINE RUNNING ON THE LEFT HAND SIDE AT A POINT NEAR THE CYLINDER SADDLE ON THAT SIDE.

THE ABOVE COMPANY HAVE LEFT THE MATTER OF MAIN RESERVOIR CAPACITY UP TO THE BALDWIN LOCOMOTIVE COMPANY, BUT WOULD SUGGEST THAT YOU SEE THAT A RESERVOIR OF SUFFICIENT SIZE TO HANDLE A MAXIMUM OF TWENTY-FIVE CARS BE INSTALLED.

56 "THE ABOVE COMPANY HAVE ASKED US TO SEE THAT THE [illegible] IS EQUIPPED IN THE BEST POSSIBLE MANNER, AND WE WILL APPRECIATE IT VERY MUCH IF YOU WILL DO ALL IN YOUR POWER TO ACCOMPLISH THIS RESULT."

THE BALDWIN LOCOMOTIVE WORKS As Spec'n. C-1723 Dup. 6-10 1/3 C 61 except where otherwise specified.

Memorandum Spec'n 17051

SPECIFICATION FOR LOCOMOTIVES 6 10 1/3 C 75

FOR Surry Lumber Company

R.

Gen. as Photo. 2682 except with Straight Stack

Engine Drawing No. 5

3-12-17

Gauge of Road 3' 0" Play 3/8"

Wheelbase, Rigid 3' 9" Driving 3' 9" Total 9' 7"

Total wheelbase, eng. and tend. { Actual ——— / Limited to ———

Curves ———

Limits, Height ——— Width ———

Weight (approximate) in working order, Total 27,000 pounds

On F. tr'k ——— lbs., Drivers 20,500 lbs., B. tr'k 6,500 lbs.

Tractive power 3430 lbs., Ratio of adhesion 5.9

Work'g St'm Pres. 160 lbs., Service Switching

Fuel Soft Coal

Front tube sheet to be 3/8" thick

Boiler Steel Thick 5/16" Bill 8112

Boiler, Diam. 29¼" Plan Straight Top

Boiler st'm pres. 160 lbs. Tested to { 180 lbs. steam pres. / 214 lbs. water pres.

with factor of safety of 5.2

Longitud. seams Double riveted, lap joints

Dome, diam. 15½" Pos Central

Firebox Steel Combustion chamb. None

Firebox, length 28-13/16" Width 31⅜" Depth F. 31⅛" B. 31¼"

Firebox, Tube ⅜" Crown 5/16" Sides 5/16" Back 5/16"

Firedoor opening Rectangular 9" X 14"

Water space, Front 2" & 2½" Sides 2" Back 2"

Water space, Frame Single Riveted

Water space stays ⅞" diam. with 3/16" holes 1¼" deep from O.S.

Radial stays ⅞" diam. Sling stays front None

Button heads below crown on ——— central rows

Crown bars None Placed ——— above crown

Crown bolts ———

Flues ———

Tubes #13 W. G. Charcoal Iron or Steel

Tube ends Swaged for copper ferrules, fire box ends

Number 57 Diam. 1½" Length 6' 7⅞"

Heating Surface: Flues ——— Combus. Chamb. ———Total 175⁰

Tubes 150⁰ Fire Box 25⁰ Fire Brick Tubes ———

Grate area 6⁰ Ratio to Heating Surface 1 : 29

Superheater ———

Fire Brick Arch None

Grates Rocking bars

Ash Pan, Dampers Right and Left

Throttle Balance Pos. Dome

Dry pipe Steel

Superheater None

Smoke box front and door of cast iron

Smokebox extension With Cleaning hole and cap L. S. Only

Spark ejector or hopper With

Netting and deflect. plates With

Exhaust nozzles Single high

Stack Straight Dia. 8" Hole in S. B., dia. 10"

Safety Valves (Spec) Two Crosby 2"

Safety valves None with relief lever, Set to 160 pounds

Whistle B. L. W. plain

Steam Gauge One Iron 6" MAKER:-Ashcroft (not spec)

Steam gauge stand Iron **Clock** None

Water Gauge One B.L.W. (Ironclad) **Cab Lamps** to burn oil

Gauge Cocks Three Back Surface valve None

Lowest gauge cock 3" above highest part of crown

Lubricator steam valve without separate dry pipe to dome

Blower Valve B. L. W.

Blow off Cock One B.L.W. POS:--Left Side

Cleaning Plugs

Firebox Corners diagonal

Crown, One each side

Waist, One under front

Front tube sheet, One Fusible plug One

Pump None Pos. ———

Top chamb. ——— Bottom chamb. ———

Feed Cock ——— Feed pipes ———

Checks ——— Check pipes ———

② **Injectors** (not spec) Two Monitor No. 3

Injectors, Pos. Right and Left Steam pipes Copper

Pipes, Check Copper Feed Iron Overflow Iron

Check B. L. W. Pos. Right and Left

Feed Pipe Reservoir, With

Steam Heat None

Cab Wood

Cab floor to have plate of iron back of firebox

Cab boards Wood Nosing None

Running boards Wood Nosing None

Hand rail Iron Located on Tank

Back Bumper Steel plate

Pilot Wood Pushing shoes None

Front Bumper Steel Plate Bumper plate With

Steps None

F. & B. Drawhead, Center above rail 24"

Coupler Drawhead and springs as Co's sketch

Signal fixtures Iron on bumper

Headlight Two Round Case 10" Reflector, To burn Kerosene

Headlight, Nos. on sides None H'd'l't step None

Lamp shelf None Nosing ———

Bell 45 pounds

Sand Box One Diam. 15" Body Iron Painted Pipes Iron

Sander Hand

Dome casing Iron Painted

Boiler Jacket #22 Soft Steel Pt Bands Iron Style 8

Boiler Lagging Magnesia sectional

THE BALDWIN LOCOMOTIVE WORKS W. A. Bardsley June 1917

SPECIFICATION FOR LOCOMOTIVES 6 - 10 1/3 C 75

FOR Surry Lumber Company

R. W

③ **Frames** Cast Steel Braces Solid

Cylinders, Diam. 8" Stroke 12"

St'm ports, Length 7½" Width ⅜" Bridges ⅜"

Exh. ports, Length 7½" Width 1¼" Valve lead 1/16"

Valve travel 2½" Steam lap ½" Exhaust clearance ———

Eccentric crank throw 2" By-pass valve None { Lubr. Pipes of Iron under Jacket

S. F. Lubr. Detroit double #5 Bulls Eye (Spec)

Cyl'r heads Cast Iron, with guide lugs cast on

Cyl'r casings Iron Ptd. Head covers Steel Painted

St'm chest casings Iron Ptd. ~~Covers~~ Heads, Iron Painted

St'm chest valves Plain "D"

Met. plig { piston rods / valve stems } United States (not spec)

Pistons Cast Iron rings sprung into solid head

Guides Laird type, Steel Oil cups Needle

Crossheads Cast steel with shoes of brass

Wrist Pins Steel ④ Rod cups Needle

Valve Motion Stephenson

Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.

All finished movable nuts of steel or of iron case hardened.

⑪ **Wearing Bearings** B. L. W.

Driving Wheels without hub liners

Drivers, O. S. Diam. 30" Cen. diam. 26" Centers Cast Iron

Tires Steel Held by Shrinkage and Shoulder

Tires, Flanged, Pos. All Size 2" X 5"

Tires, Plain, Pos. None Size ———

Lateral play between driving boxes and wheel hubs - 1/32" total

Driving Boxes Cast Iron

Journals, Diam. 4" Length 6"

Springs. Make B. L. W.

Front Engine Truck None Wheeled ———

To swing ———each side of cen., Cen. pin liners ———

Journals, Diam. ——— Length ——— Boxes ———

Wheels, Diam. ——— Tread ——— Kind ———

Tires ——— Cen. diam. ———Size ———

Tires held by ———

Back Engine Truck Two Wheeled Swing Bolster, O.S. Bearing

To swing 6" each side of cen., Cen. pin liners None

Journals, Diam. 3" Length 5" Boxes Cast Iron

Wheels, Diam. 22" Tread 3⅜" Kind Chilled cast iron plate

Tires None Cen. diam. ——— Size ———

Tires held by ———

Back Engine truck wheels without hub liners

Engine truck link as Co's pencil sketch

Brake, position None.

Operating { Engine, Sch. ——— / Parts { Eng. Tr'k, sch. ———

Foundation { Drivers, sch. ——— / Parts { Eng. Tr'k, sch. ———

Air pump ——— Pos. ———

Train connections ———

Train signal, sch. ———

TENDER, None Wheeled, Drawing No. ———

WEIGHT, WITH FUEL AND WATER, ABOUT ———

TANK 400 Gallons, Bill 4548

Saddle tank located over top of boiler

① Fuel box located over back engine truck, back of Cab. Fuel rack not desired.

② Syphon to be XL Ejector equipped with Jenkins angle valve. All pipes to be of iron to following sizes:- Steam pipe to be 1½" diameter, Suction and discharge pipes to be 2½" diam., Syphon to be located on right side with 20' 0" Suction Hose.

③ Back end of frame to be 6" X 1¼" and to be braced as shown on Co's sketch.

④ Main and Connecting Rod Brasses (except front of main) to be secured by two ⅝" screws in straps instead of keys, similar to 10-22 D 86.

⑤ Extra set of Driving Tires ordered through Extra Work Dept., Order No. 2752 dated 4-11-17 to be shipped with locomotive. No charge.

FOR HEREAFTER:- Guides and crosshead to be Laird type, as required by specification.

Crosshead and guides with single bar were furnished by mistake for 6 10 1/3 C 75.

List of tools, Sch 26

Photo. Sch None Inspection, B. L. W.

To be weighed No Material Spec'ns. B. L. W.

Certificate of boiler test Three copies of B.L.W. form 1036

Junior laws to 5-1-17 Shipment On car (See ⑤ above)

Brass Shop Finish, No. 1

Machine Shop Finish D 165

B. L. W.

Patents None

Property Plates, None

PAINTING:- Engine, style — Black, without striping

PAINTING:- Tender, style ———

Lettering etc. to be in yellow

Mark on tank sides, S. S. & S.

Road Nos. Pos.	Road Nos.	Name, None
F. No. Plate	1	
Sand Box		
Cab Sides		
Back of fuel box		

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-1204

Memorandum Spec'n 11156

SPECIFICATION FOR LOCOMOTIVES 8 - 18 ½ C 46

FOR THE WILSON COMPANY, LTD.

Gen. Ar PHOTO. 5148

C-23-16 Engine Diagram No. 17

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 6' 0" Driving 6' 0" Total 19' 4"
Total wheelbase, eng. and tend. { Actual 38' 1" / Limited to ——

Curves 8 DEGREES Grades, 2%

Limits, Height —— Width ——
Weight (approximate) in working order, Total 55,400 LBS.
On F. t'k 9,000 lbs., Drivers 36,800 lbs., B. t'k 9,600 lbs.

Tractive power 8400 lbs., Ratio of adhesion 4.3
Work'g St'm Pres. 160 lbs., Service LOCOMO
Fuel SOFT COAL AND WOOD

Boiler STEEL Thick ½" Bill 7303
Boiler, Diam. 46" Plan STRAIGHT TOP
Boiler st'm pres. 160 lbs., Tested to { 180 lbs. steam pres. / 214 lbs. water pres.
WITH FACTOR OF SAFETY OF 4.78
Longitud. seams DOUBLE RIVETED LAP JOINTS

Dome, diam. 25" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE
Firebox, length 102-11/16" Width 34⅛" Depth F. 191" B. 48½"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" DIAM.
Water space, Front 3" Sides 2½" Back 2½"
Water space, Frame SINGLE Riveted
Water space stays ⅞" DIAM. WITH 3/16" HOLES 1½" DEEP FROM O. S.

Radial stays 1" DIAM. / Sling stays front { TWO ROWS OF B. L. W. EXPANSION STAYS
Button heads below crown on Sts central rows
Crown bars NONE Placed —— above crown
Crown bolts ——

Flues ——
Tubes #11 W. G. SPELLERIZED STEEL (FROM STOCK)
Tube ends SPACED FOR COPPER FERRULES FIREBOX ENDS
Number 94 Diam. 2" Length 9' 6"

Heating Surface	Flues ——	Combus. Chamb. ——	Total 509.3
	Tubes 463.3	Fire Box 46.0	Fire Brick Tubes ——
Grate area 10.2	Ratio to Heating Surface 1 : 50		
Superheater ——			

Fire Brick ARCH NONE

Grates ROCKING BARS AND DROP PLATE
Ash Pan, Dampers BACK ONLY

Throttle BALANCE Pos. DOME
Dry pipe STEEL

Superheater NONE

Smokebox extension WITH Cleaning hole and cap L.S. ONLY
Spark-arrester-or-hopper WITH
Netting and deflect. plates WITH

Exhaust nozzles DOUBLE HIGH

Stack CAST IRON, STRAIGHT Dia. 12" Hole in S. B., dia. 11½"

Safety Valves TWO CONSOLIDATED 3"
Safety valves, Hour with relief hours set at 180 POUNDS
Whistle B. L. W. PLAIN

Steam Gauge ONE FRONT 7" MARSH-ASHCROFT (STYLE)
Steam gauge stand IRON Clock NONE

Water Gauge ONE B.L.W. (TRONCLAD) Cab Lamps TO BURN KE
Gauge Cocks THREE BACK Bottom valve BOWL
Lowest gauge cock 3" above highest part of crown
Lubricator steam valve TO HAVE separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock ONE B. L. W. POS.—LEFT SIDE
Cleaning Plugs ONE FILLING PLUG IN TOP OF BOILER
Firebox, CORNERS, BACK ONES DIAGONAL AND RIGHT SIDE
Crown, ONE EACH SIDE AND TWO BACK
Waist, ONE UNDER FRONT
Front tube sheet, ONE Fusible plug ONE

Pumps NONE Pos. ——
Top chamb. —— Bottom chamb. ——
Feed Cock —— Feed pipes ——
Checks —— Check pipes ——

Injectors TWO MONITOR No. 5
Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER
Pipes, Check IRON Feed IRON Overflow IRON
Check B. L. W. Pos. RIGHT AND LEFT

Steam Heat NONE

Cab WOOD

Cab boards WOOD Nosing NONE
Running boards WOOD Nosing NONE
Hand rail IRON Located on BOILER

Back Bumper BAR STEEL Back drawbar height 30"

Pilot WOOD Pushing shoes NONE
Front Bumper OAK Bumper plate WITH
Steps, HAND HOLDS ETC. TO CONFORM TO I.C.C. REQUIREMENTS

Front Drawhead, Center above rail 33½"
Coupler M. C. B. AUTOMATIC

Signal fixtures IRON ON BUMPER.

Headlight TWO ROUND CASE 12" Reflector, To burn KEROSENE
Headlight, Nos. on sides WITH H'd'l't step NONE
Lamp shelf NONE Nosing ——

Bell 45 POUNDS
Sand Box TWO Diam. 18½" Body IRON PAINTED Pipes IRON
Sander HAND IN EACH BOX, TO SAND FRONT AND BACK

Dome casing IRON PAINTED

Boiler Jacket 22 SOFT STEEL PlcBands IRON Style 9
Boiler Lagging B. L. W. PLASTIC MAGNESIA (FROM STOCK)

THE BALDWIN LOCOMOTIVE WORKS
E.C. Gardiner Dec 1916 (10)
SPECIFICATION FOR LOCOMOTIVES 8 18½ C 46
FOR THE WILSON COMPANY, LTD.
R.

Frames CAST STEEL Braces SOLID

Cylinders, Diam. 12" Stroke 18"
St'm ports, Length 10" Width 1" Bridges ⅜"
Exh. ports, Length 10" Width 2" Valve lead 1/16"
Valve travel 1¼" Steam lap ⅞" Exhaust clearance ——
Eccentric-crank-throw 3½"
S. F. Lubr. MICHIGAN DOUBLE BULLS EYE, 2 PINTS CAPACITY
Cyl'r heads CAST IRON; LUBR. PIPES OF IRON UNDER JACKET
Cyl'r casings IRON PTD. Head covers STEEL PAINTED
St'm chest casings IRON PTD. Covers STEEL PAINTED
St'm chest valves RICHARDSON BALANCED, WITH VACUUM VALVES
Met. pkg { PISTON RODS / VALVE STEMS UNITED STATES (HEMP SPIRAL)

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD
Guides STEEL Oil cups NEEDLE
Crossheads CAST STEEL
Wrist Pins STEEL Rod cups PLUNGER, FORGED ON
PARALLEL RODS TO HAVE SOLID ENDS

Valve Motion STEPHENSON
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except stayBolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 42" Cen. diam. 36" CENTRES CAST IRON WHEELS WITHOUT HUB LINERS
Tires STEEL Held by SHRINKAGE AND SHOULDER
Tires, Flanged, Pos. ALL Size 3" K 5½"
Tires, Plain, Pos. —— Size ——
Lateral play between driving boxes and wheel hubs = 1/32" TOTAL
Driving Boxes CAST IRON
Journals, Diam. 5½" Length 7"

Springs, Make B. L. W.

Front Engine Truck TWO Wheeled SWING BOLSTER CENTRE BEARING
To swing 4" each side of cen., Cen. pin liners NONE
Journals, Diam. 3½" Length 6" Boxes CAST IRON
Wheels, Diam. 26" Tread 1¼" Kind CHILLED CAST IRON PLATE
Tires NONE Cen. diam. —— Size ——
Tires held by ——
FRONT AND BACK ENGINE TRUCK WHEELS WITHOUT HUB LINERS

Back Engine Truck TWO Wheeled SWING BOLSTER SIDE BEARING
To swing 4" each side of cen., Cen. pin liners NONE
Journals, Diam. 3½" Length 6" Boxes CAST IRON
Wheels, Diam. 26" Tread 1¼" Kind CHILLED CAST IRON PLATE
Tires NONE Cen. diam. —— Size ——
Tires held by ——

Brake, position ON ALL DRIVING AND TENDER WHEELS
Operating Parts { Engine, Sch. U-3 B. L. W. STEAM / Eng. Tr'k, sch. ——
Foundation Parts { Drivers, sch. U-3 B. L. W. / Eng. Tr'k, sch. ——
Air pump —— Pos. ——
Train connections ——
Train signal, sch. ——
SEPARATE LUBRICATOR FOR STEAM BRAKE VALVE.

Tender EIGHT Wheeled, Drawing No. 364
Weight, with fuel and water, about 41,000 LBS.

Tank 1800 Gallons. Bill 4344
TANK "U" SHAPE, STRAIGHT TOP. FUEL CAPACITY { 3 TONS OF COAL OR 2½ CORDS OF WOOD.
WOOD RACK AROUND TOP OF TANK.
Tool Boxes HARD WOOD, TOP

Frame OAK & YELLOW PINE

Front Drawbar height 26¾"
Pilot NONE Pushing shoes NONE
Back drawhead, center above rail 33½"
Coupler M. C. B. AUTOMATIC

STEPS, HAND HOLDS ETC. TO CONFORM TO I.C.C. REQUIREMENTS
Steps ACROSS REAR WITH HANDRAILS.

Trucks ARCH BAR TYPE WITH WOOD BOLSTERS

Springs ELLIPTIC. B. L. W.
Journals, Diam. 3½" Length 7"
Wheels, Diam. 26" Tread 1¼" Kind CHILLED CAST IRON PLATE
Tires —— Cen. diam. —— Size ——
Tires held by ——
Safety chains SINGLE

Brake Position ON ALL WHEELS
Brake sch. U-3 B. L. W. STEAM

List of tools, sch. 26 ONE PAIR WRECKING FROGS
Photo sch. NONE Inspection B. L. W.
To be weighed NO Material spec'ns B. L. W.
Certificate of boiler test THREE COPIES OF B.L.W. FROM 1036
Junior laws to 9-5-16 Shipment ON OWN WHEELS

Brass shop finish, No. 1
Machine shop finish D-165

Patents { B. L. W. THROTTLE, PATENTED JAN. 23, 1900 (CAST ON) / FEED PIPE STRAINER, PATENTED SEPT. 1, 1903 (CAST ON)

Property plates NONE

Painting:—Engine, style 291 OLIVE GREEN AND ALUMINUM
Painting:—Tender, style 291 OLIVE GREEN AND ALUMINUM

Mark on TANK SIDES. THE WILSON COMPANY, LTD.

Road Nos. Pos. Road Nos. Name None
F. No PLATE 100
F. SAND BOX
CAB SIDES
BACK OF TANK

THE BALDWIN LOCOMOTIVE WORKS As Spec'n. C-4094 As many parts as possible to be interchangeable with 8 24 D 230

Memorandum Spec'n 11160

SPECIFICATION FOR LOCOMOTIVES 8 26 D 205 Gen. as Photo. 2187

FOR Cherry River Boom and Lumber Co. Engine Drawing No. 44

M 9-28-16

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 19' 0"
Total wheelbase, eng. and tend. (Actual 44' 9" / Limited to ---

Curves --- Grades Heavy

Limits, Height --- Width ---
Weight (approximate) in working order, Total 93,000 pounds
On F. tr'k 13,000 lbs., Drivers 80,000 lbs., B. tr'k --- lbs.

Tractive power 18800 lbs., Ratio of adhesion 4.25
Work'g St'm Pres. 180 lbs., Service Switching
Fuel Soft coal

Front tube sheet ½" thick
Boiler Steel Thick 9/16" Bill 7933
Boiler, Diam. 50" Plan Extended Wagon Top
Boiler st'm pres. 180 lbs., Tested to { 200 lbs. steam pres. / 240 lbs. water pres.
Longitud. seams Butt jointed, double covering strips

Dome, diam. 29" Pos. Forward of firebox

Firebox Steel Combustion chamb. None
Firebox, length 71-1 1/16" Width 33⅜" Depth F. 60¼" B. 48½"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diam.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Single Riveted
Water space stays ⅝" diam. with 3/16" holes 1¼" deep from O.S.

Radial stays 1" diameter Sling stays front } Two rows of B. L. W. Expansion stays
Button heads below crown on Eight central rows
Crown bars None Placed ---- above crown
Crown bolts ----

Flues ----
Tubes #12 W.G. charcoal iron or steel
Tube ends Swaged for copper ferrules firebox ends
Number 180 Diam. 2" Length 10' 2"

Heating Surface	Flues ---	Combus. Chamb. ----	Total 1042 □	
	Tubes 950 □	Fire Box 92 □	Fire Brick Tubes ---	
Grate area 16.6 □	Ratio to Heating Surface 1 : 62.8			
Superheater ----				

Fire Brick Arch, None

Grates Rocking bars and drop plate
Ash Pan, Dampers Front and back

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Smokebox extension With Cleaning hole and cap Left side only
Spark ejector or hopper With
Netting and deflect. plates With

Exhaust nozzles Double, high

Stack Straight Dia. 15" Hole in S. B., dia. 9½"

Safety Valves Two Consolidated 2"
Safety valves None with relief lever, Set to 180 pounds
Whistle B. L. W. plain

Steam Gauge One Iron 7" MAKER: Ashcroft
Steam gauge stand Iron **Clock** None

Water Gauge One B.L.W. (Ironclad) **Cab Lamps** To burn oil
Gauge Cocks Three back Surface valve None
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One B. L. W. Pos: Front
Cleaning Plugs
Firebox Corners diagonal
Crown, Two each side and two back
Waist, One under front
Front tube sheet, One Fusible plug One

Pump None Pos. ---
Top chamb. --- Bottom chamb. ---
Feed Cock --- Feed pipes ---
Checks --- Check pipes ---

Injectors Two Sellers, Class "N" No. 7½
Injectors, Pos. Right and left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. Right and left

Steam Heat None

Cab Wood

Cab boards Wood Nosing None
Running boards Wood Nosing None
Hand rail Iron Located on boiler

Back Bumper Bar steel Back drawbar height 30¾"

Pilot Wood Pushing shoes at front
Front Bumper Oak Bumper plate With
Steps, hand holds, etc., to conform to I. C. C. requirements

Front Drawhead, Center above rail 33½"
Coupler M. C. B. auto.

Signal fixtures Iron on bumper

Headlight Two Round Cast 16" Reflector, To burn. Kerosene
Headlight, Nos. on sides With H'd'l't step With
Lamp shelf None Nosing ---

Bell 85 pounds
Sand Box Two Diam. 28" Body Iron painted Pipes Iron
Sander Leach Air Trap A-1 in each box

Dome casing Iron painted

Boiler Jacket #22 Soft steel ptd Bands Iron Style 9
Boiler Lagging Magnesia sectional

THE BALDWIN LOCOMOTIVE WORKS

SPECIFICATION FOR LOCOMOTIVES 8 26 D 205

FOR Cherry River Boom and Lumber Co.

Frames Cast steel Braces Solid

Cylinders, Diam. 16" Stroke 24"
St'm ports, Length 15" Width 1¼" Bridges 1"
Exh. ports, Length 15" Width 2½" Valve lead 1/16"
Valve travel 5" Allen Style Steam lap ⅞" Exhaust clearance ---
Eccentric-crank throw 4⅝" By-pass valve None
S. F. Lubr. Detroit Triple #22 Bulls Eye, (See * below)
Cyl'r heads Cast iron: Lubr. pipes of iron under jacket
Cyl'r casings Iron painted Head covers Steel painted
St'm chest casings Iron painted Covers Steel painted
St'm chest valves Richardson balanced with vacuum valves
Mot. pkg (Piston rods / Valve stems) U. S.

Pistons Cast iron rings sprung into solid head
Guides Steel Oil cups Needle
Crossheads Cast steel
Wrist Pins Steel. Rod cups Plunger
Parallel rods to have solid ends
Wrist pins, front and back to be larger than for 8 24 D 230
Valve Motion Stephenson
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.
* National Graphite Lubricator for cylinders, to be furnished free these works by Customer, and applied by the B. L. W.
Wearing Bearings B. L. W.

Drivers, O. S. Diam. 50" Cen. diam. 44" Centers cast iron

Tires Steel. Held by Shrinkage and shoulder
Tires, Flanged, Pos. Front and back Size 3" x 5½"
Tires, Plain, Pos. Middle Size 3" x 6½"
Lateral play between driving boxes and wheel hubs— 1/16" total.
Driving Boxes Cast iron
Journals, Diam. 7" Length 8"

Springs. Make B. L. W.

Front Engine Truck Two Wheeled Swing bolster center bearing
To swing 5½" each side of cen., Cen. pin liners None
Journals, Diam. 4½" Length 7½" Boxes Cast iron
Wheels, Diam. 26" Tread --- Kind Cast iron spoke center
Tires Steel Cen. diam. 21" Size 2½" x 5½"
Tires held by Shrinkage and shoulder

Back Engine Truck None Wheeled ---
To swing ---- each side of cen., Cen. pin liners ---
Journals, Diam. ---- Length ---- Boxes ---
Wheels, Diam. ---- Tread ---- Kind ----
Tires --- Cen. diam. ---- Size ---
Tires held by ----

Brake, position On all driving and tender wheels
Operating Parts: Engine, Sch. #6 ET West'g. Comb. auto. and straight air
Eng. Tr'k, sch. ----
Foundation Parts: Drivers, sch. Wi-I American O. S. equalized
Eng. Tr'k, sch. ----
Air pump One 9½" Pos. Left side
Train connections Front and back
Train signal, sch. None

Express companies have hydrostatic tests for grate

Tender Eight Wheeled, Drawing No. 356
Weight, with fuel and water, about 70,000 pounds

Tank 3500 Gallons, Bill 4347
Tank "U" shape, sloping back Fuel capacity 5 tons

Tool Boxes Hard wood, Top

Frame Oak and Yellow pine

Front Drawbar height 29⅜"
Pilot None Pushing shoes at rear
Back drawhead, center above rail 33½"
Coupler M. C. B. auto.

Steps, hand holds, etc., to conform to I. C. C. requirements.
Steps across rear with hand rails

Trucks Arch bar type with cast steel bolsters.

Springs Elliptic B. L. W.
Journals, Diam. 4½" Length 8"
Wheels, Diam. 30" Tread 4½" Kind Chilled cast iron plate
Tires None Cen. diam. --- Size ----
Tires held by ---
Safety chains Single

Brake Position On all wheels
Brake sch. #6 ET West'g. auto and straight air with 10" x 12" tender cylinder.

List of tools, sch. 25
Photo sch. #2 Inspection B. L. W.
To be weighed Yes Material spec'ns B. L. W.
Certificate of boiler test Three copies of B. L. W. form 1036
Junior laws to 11-1-16 Shipment On own wheels

Brass shop finish, No. 1
Machine shop finish D-165

Patents B. L. W. } Throttle, Patented Jan. 23, 1900 (Cast on)
Feed Pipe Strainer, Patented Sept. 1, 1903 (Cast on)

Property plates None

Painting—Engine, style 29I, Olive Green and Aluminum
Painting—Tender, style 29I, Olive Green and Aluminum

Mark on tank sides, Cherry River Boom & Lumber Co.

Road Nos. Pos. Road Nos. Name None
F. No. Plate 9
F. Sand box
Cab sides
Back of tank

THE BALDWIN LOCOMOTIVE WORKS As Spec'n. C-4094 As many parts as possible to be interchangeable with 8 24 D 230

Memorandum Spec'n 11160

SPECIFICATION FOR LOCOMOTIVES 8 26 D 205 Gen. as Photo. 2187

FOR Cherry River Boom and Lumber Co. **Engine Drawing No.** 44

M 9-28-16

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 19' 0"
Total wheelbase, eng. and tend. {Actual 44' 9" / Limited to ---

Curves --- Grades Heavy

Limits, Height --- Width ---
Weight (approximate) in working order, Total 93,000 pounds
On F. tr'k 13,000 lbs., Drivers 80,000 lbs., B. tr'k --- lbs.

Tractive power 18800 lbs.. Ratio of adhesion 4.25
Work'g St'm Pres. 180 lbs.. Service Switching
Fuel Soft coal

Front tube sheet ½" thick
Boiler Steel Thick 9/16" Bill 7933
Boiler, Diam. 50" Plan Extended Wagon Top
Boiler st'm pres. 180 lbs., Tested to { 200 lbs. steam pres. / 240 lbs. water pres.
Longitud. seams Butt jointed, double covering strips

Dome, diam. 29" Pos. Forward of firebox

Firebox Steel Combustion chamb. None
Firebox, length 71-1 1/16" Width 33⅜" Depth F. 60¼" B. 48½"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diam.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Single Riveted
Water space stays ⅝" diam. with 3/16" holes 1½" deep from O.S.

Radial stays 1" diameter Sling stays front {Two rows of B. L. W. Expansion stays
Button heads below crown on Eight central rows
Crown bars None Placed ---- above crown
Crown bolts ----

Flues ---
Tubes #12 W.G. charcoal iron or steel
Tube ends Swaged for copper ferrules firebox ends
Number 180 Diam. 2" Length 10' 2"

Heating Surface | Flues --- Combus. Chamb ---- Total 1042 □ | Tubes 950 □ Fire Box 92 □ Fire Brick Tubes ---
Grate area 16.6 □ Ratio to Heating Surface 1 : 62.8
Superheater ----

Fire Brick Arch, None

Grates Rocking bars and drop plate
Ash Pan, Dampers Front and back

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Smokebox extension With Cleaning hole and cap Left side only
Spark ejector or hopper With
Netting and deflect. plates With

Exhaust nozzles Double, high

Stack Straight Dia. 15" Hole in S. B., dia. 19½"

Safety Valves Two Consolidated 2"
Safety valves None with relief lever, Set to 180 pounds
Whistle B. L. W. plain

Steam Gauge One Iron 7" MAKER: Ashcroft
Steam gauge stand Iron **Clock** None

Water Gauge
Gauge Cocks
Lowest gauge coc
Lubricator steam
Blower Valve

Blow off Coc
Cleaning P
Firebox Coar
Crown, Two
Waist, One
Front tube she

Pump None
Top chamb. --
Feed Cock
Checks

Injectors To
Injectors, Pos.
Pipes, Check I
Check B. L.

Steam Heat

Cab Wood

Cab boards W
Running board
Hand rail Iro

Back Bump

Pilot Wood
Front Bum
Steps, hand

Front Drav
Coupler M.

Signal fixtures

Headlight
Headlight, No
Lamp shelf N

Bell 85 pounds
Sand Box Two Diam. 28" Body Iron painted Pipes Iron
Sander Leach Air Trap A-1 in each box.

Dome casing Iron painted

Boiler Jacket #22 Soft steel PTD Bands Iron Style 9
Boiler Lagging Magnesia sectional

NOTICE

THE PRECEDING PAGE HAS BEEN REPHOTOGRAPHED TO ASSURE THE BEST POSSIBLE LEGIBILITY. ITS IMAGE APPEARS IMMEDIATELY HEREAFTER.

SOUTHWEST MICROPUBLISHING, INC.

THE BALDWIN LOCOMOTIVE WORKS

SPECIFICATION FOR LOCOMOTIVES 8 26 D 205

FOR Cherry River Boom and Lumber Co.

Frames Cast steel Braces Solid

Cylinders, Diam. 16" Stroke 24" Bridges 1"
St'm ports, Length 15" Width 1¼" Bridges 1"
Exh. ports, Length 15" Width 2½" Valve lead 1/16"
Valve travel 5" Steam lap ⅞" Exhaust clearance ---
Eccentric-crank throw 4⅝" By-pass valve None
Bull's Eye, (See ¾ below)
Pipes of iron under jacket
covers Steel painted
Covers Steel painted
anged with vacuum valves

ng into solid head
Oil cups Needle

pe Plunger
ends
o be larger than for 8 24 D 230

nks and eccentric rod jaws to be
ened bushings.

) to be United States Standard.
of iron case hardened.
s for cylinders. To be furnished
, and applied by The B. L. W.

m, 4½" centers cast iron

nkage and shoulder
Size 3" x 5½"
Size 3" x 6½"
wheel hubs--- 1/16" total

Length 8"

Wheeled Swing bolster center bearing
en. pin liners None
Boxes Cast iron
Kind Cast iron spoke center
diam. 21" Size 2½" x 5½"
ouldER

Wheeled ---
n. pin liners ---
Boxes ---
Kind ---
diam. --- Size ---

ng and tender wheels
est's. Comb. Auto. and
straight air
American O. S. Equalized

Parts { Eng. Tr'k, sch. ---
Air pump One 9½" Pos. Left side
Train connections Front and back
Train signal, sch. None

Tender Eight Wheeled, Drawing No. 356
Weight, with fuel and water, about 70,000 pounds

Tank 3500 Gallons, Bill 4347
Tank "U" shape, sloping back Fuel capacity 5 tons

Tool Boxes Hard wood, Top

Frame Oak and yellow pine

Front Drawbar height 29⅜"
Pilot None Pushing shoes at rear
Back drawhead, center above rail 33½"
Coupler M. C. B. auto.

Steps, hand holds, etc., to conform to I. C. C. requirements.
Steps Across rear with hand rails

Trucks Arch bar type with cast steel bolsters.

Springs Elliptic B. L. W.
Journals, Diam. 4½" Length 8"
Wheels, Diam. 30" Tread 1¾" Kind Chilled cast iron plate
Tires None Cen. diam. --- Size---
Tires held by ---
Safety chains Single

Brake Position On all wheels
Brake sch. 6 ET West'g. Auto and straight air with 10" x 12" tender cylinder.

List of tools, sch. 25
Photo sch. 82 Inspection B. L. W.
To be weighed Yes Material spec'ns B. L. W.
Certificate of boiler test Three copies of B. L. W. form 1036
Junior lavs to 11-1-16 Shipment On own wheels

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. Patents { Throttle, Patented Jan. 23, 1900 (Cast on
Feed Pipe Strainer, Patented Sept. 1, 1903 (Cast on

Property plates None

Painting:—Engine, style 291, Olive Green and Aluminum
Painting:—Tender, style 291, Olive Green and Aluminum

Mark on tank sides, Cherry River Boom & Lumber Co.

Road Nos. Pas. --- Road Nos. --- Name None
F. No. Plate 9
F. Sand box
Cab sides
Back of tank

Expressions to have hydrostatic test of tanks

THE BALDWIN LOCOMOTIVE WORKS As Spec'n. C-4094 As many parts as possible to be interchangeable with 8 24 D 230

Memorandum Spec'n 11160

SPECIFICATION FOR LOCOMOTIVES 8 26 D 205 Gen. as Photo. 2187

Engine Drawing No. 44

FOR Cherry River Boom and Lumber Co. 9-28-16

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 19' 0"
Total wheelbase, eng. and tend. Actual 44' 9" Limited to ---

Curves --- Grades Heavy

Limits, Height --- Width ---
Weight approximate in working order, Total 93,000 pounds
On F. tr'k 13,000 lbs. Drivers 80,000 lbs. B. tr'k --- lbs.

Tractive power 18800 lbs. Ratio of adhesion 4.25
Work'g St'm Pres. 180 lbs. Service Switching
Fuel Soft coal

Front tube sheet ½" thick
Boiler Steel Thick 9/16" Bill 7933
Boiler, Diam. 50" Plan Extended wagon top
Boiler st'm pres. 180 lbs. Tested to 200 lbs. steam pres. / 240 lbs. water pres.
Longitud. seams Butt jointed, double covering strips

Dome, diam. 29" Pos. Forward of firebox

Firebox Steel Combustion chamb. None
Firebox, length 71-1 1/16" Width 33⅜" Depth F. 60¼" B. 48½"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diam.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Single Riveted
Water space stays ⅞" diam. with 3/16" holes 1¼" deep from O.S.
Radial stays 1" diameter Sling stays front Two rows of B. L. W. Expansion stays
Button heads to low crown on eight central rows
Crown bars None Placed --- above crown
Crown bolts ---

Flues ---
Tubes #12 W.G. charcoal iron or steel
Tube ends Swaged for copper ferrules firebox ends
Number 180 Diam. 2" Length 10' 2"

Heating Surface Flues --- Combus. Chamb --- Total 1042 □
Tubes 950 □ Fire Box 92 □ Fire Brick Tubes ---
Grate area 16.6 □ Ratio to Heating Surface 1 : 62.8
Superheater ---

Fire Brick Arch, None

Grates Rocking bars and drop plate
Ash Pan, Dampers Front and back

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Smokebox extension With Cleaning hole and cap Left side only
Spark ejector or hopper With
Netting and deflect. plates With

Exhaust nozzles Double, high

Stack Straight Dia. 15" Hole in S. B., dia. 19½"

Safety Valves Two Consolidated 2"
Safety valves None with relief lever, Set to 180 pounds
Whistle B. L. W. plain

Steam Gauge One Iron 7" MAKER: Ashcroft
Steam gauge stand Iron Clock None

Water Gauge One B.L.W.(Ironclad) **Cab Lamps** To burn oil
Gauge Cocks Three back Surface valve None
Lowest gauge cock 3¼" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One B. L. W. Pos: Front
Cleaning Plugs
Firebox Corners diagonal
Crown, Two each side and two back
Waist, One under front
Front tube sheet, One Fusible plug One

Pump None Pos. ---
Top chamb. --- Bottom chamb. ---
Feed Cock --- Feed pipes ---
Checks --- Check pipes ---

Injectors Two Sellers, Class "N" No. 7½
Injectors, Pos. Right and left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. Right and left

Steam Heat None

Cab Wood

Cab boards Wood Nosing None
Running boards Wood Nosing None
Hand rail Iron Located on boiler

Back Bumper Bar steel Back drawbar height 30¾"

Pilot Wood Pushing shoes at front
Front Bumper Oak Bumper plate With
Steps, hand holds, etc., to conform to I. C. C. requirements

Front Drawhead, Center above rail 33½"
Coupler M. C. B. auto.

Signal fixtures Iron on bumper

Headlight Two Round Cast 16" Reflector, To burn Kerosene
Headlight, Nos. on sides With H'dl't step With
Lamp shelf None Nosing ---

Bell 85 pounds
Sand Box Two Diam. 28" Body Iron painted Pipes Iron
Sander Leach Air Trap A-1 in each box

Dome casing Iron painted

Boiler Jacket #22 Soft steel ptd Bands Iron Style 9
Boiler Lagging Magnesia sectional

SPECIFICATION FOR LOCOMOTIVES 8 26 D 205

FOR Cherry River Boom and Lumber Co.

Frames Cast steel Braces Solid

Cylinders, Diam. 16" Stroke 24"
St'm ports, Length 15" Width 1¼" Bridges 1"
Exh. ports, Length 15" Width 2½" Valve lead 1/16"
Valve travel 5" Steam lap ¾" Exhaust clearance ---
Eccentric crank throw 4⅜" By-pass valve None
S. F. Lubr. Detroit triple #22 Bulls Eye, (See * below)
Cyl'r heads Cast iron: Lubr. pipes of iron under jacket
Cyl'r casings Iron painted Head covers Steel painted
St'm chest casings Iron painted Covers Steel painted
St'm chest valves Richardson balanced with vacuum valves
Met. pkg Piston rod / Valve stems U. S.

Pistons Cast iron rings sprung into solid head
Guides Steel Oil cups Needle
Crossheads Cast steel
Wrist Pins Steel. Rod cups Plunger
Parallel rods to have solid ends
Wrist pins, front and back to be larger than for 8 24 D 230
Valve Motion Stephenson
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.
* National Graphite Lubricator for cylinders, to be furnished free these Works by Customer, and applied by The B. L. W.
Wearing Bearings B. L. W.

Drivers, O. S. Diam. 50" Cen. diam. 44" Centers cast iron

Tires Steel Held by Shrinkage and shoulder
Tires, Flanged, Pos. Front and back Size 3" x 5½"
Tires, Plain, Pos. Middle Size 3" x 6½"
Lateral play between driving boxes and wheel hubs = 1/16" total
Driving Boxes Cast iron
Journals, Diam. 7" Length 8"

Springs. Make B. L. W.

Front Engine Truck Two Wheeled Swing bolster center bearing
To swing 5½" each side of cen., Cen. pin liners None
Journals, Diam. 4½" Length 7½" Boxes Cast iron
Wheels, Diam. 26" Tread --- Kind Cast iron spoke center
Tires Steel Cen. diam. 21" Size 2½" x 5½"
Tires held by Shrinkage and shoulder

Back Engine Truck None Wheeled ---
To swing --- each side of cen., Cen. pin liners ---
Journals, Diam. --- Length --- Boxes ---
Wheels, Diam. --- Tread --- Kind ---
Tires --- Cen. diam. --- Size ---
Tires held by ---

Brake, position On all driving and tender wheels
Operating Parts: Engine, Sch. #6 ET West'g. Comb. auto. and straight air
Eng. Tr'k, sch. ---
Foundation Parts: Drivers, sch. WM-1 American O. S. Equalized
Eng. Tr'k, sch. ---
Air pump One 9½" Pos. Left side
Train connections Front and back
Train signal, sch. None

As previously to have hydrostatic test of 210 lbs 1/31/16

Tender Eight Wheeled, Drawing No. 356
Weight, with fuel and water, about 70,000 pounds

Tank 3500 Gallons, Bill 4347
Tank "U" shape, sloping back Fuel capacity 5 tons

Tool Boxes Hard wood, Top

Frame Oak and Yellow pine

Front Drawbar height 29⅜"
Pilot None Pushing shoes at rear
Back drawhead, center above rail 33½"
Coupler M. C. B. auto.

Steps, hand holds, etc., to conform to I. C. C. requirements.
Steps across rear with hand rails

Trucks Arch bar type with cast steel bolsters.

Springs Elliptic B. L. W.
Journals, Diam. 4½" Length 8"
Wheels, Diam. 30" Tread 4½" Kind Chilled cast iron plate
Tires None Cen. diam. --- Size ---
Tires held by ---
Safety chains Single

Brake Position On all wheels
Brake sch. #6 ET West'g. auto and straight air with 10" x 12" tender cylinder.

List of tools, sch. 26
Photo sch. #2 Inspection B. L. W.
To be weighed Yes Material spec'ns B. L. W.
Certificate of boiler test Three copies of B. L. W. form 1036
Junior laws to 11-1-16 Shipment On own wheels

Brass shop finish, No. 1
Machine shop finish D-165

Front Engine Truck Two Wheeled Swing bolster center bearing
To swing 5½" each side of cen., Cen. pin liners None
Journals, Diam. 4½" Length 7½" Boxes Cast iron
Wheels, Diam. 26" Tread --- Kind Cast iron spoke center
Tires Steel Cen. diam. 21" Size 2½" x 5½"
Tires held by Shrinkage and shoulder

B. L. W. Patents: Throttle, Patented Jan. 23, 1900 (Cast on) / Feed Pipe Strainer, Patented Sept. 1, 1903 (Cast on)

Property plates None

Painting:—Engine, style 291, Olive Green and Aluminum
Painting:—Tender, style 291, Olive Green and Aluminum

Mark on tank sides, Cherry River Boom & Lumber Co.

Road Nos. Pos.	Road Nos.	Name None
F. No. plate	9	
F. Sand box		
Cab sides		
Back of tank		

THE BALDWIN LOCOMOTIVE WORKS Dup. 10 18 ¼ D 23, with same extras, except as otherwise specified

Memorandum Spec'n 11229

SPECIFICATION FOR LOCOMOTIVES 10 18 ¼ D 33

Gen. as Photo. 3651 } Except with straight top tender

Engine Drawing No. 10

FOR Lightsey Brothers, Inc.

M 1-24-16

Gauge of Road 4' 8½" Play ¾"

Wheelbase, Rigid 7' 10" Driving 7' 10" Total 20' 7"

Total wheelbase, engine and tend Actual 39' 8" Limited to ---

Rails 30, 35 and 40 pounds

Curves ----

Limits, Height --- Width ---

Weight approximate in working order, Total 55,000 pounds

On F. tr'k 7,000 lbs., Drivers 40,000 lbs., B. tr'k 8,000 lbs.

Tractive power 9180 lbs., Ratio of adhesion 4.3

Work'g St'm Pres. 170 lbs., Service Logging

Fuel Wood

Front tube sheet to be 7/16" thick

Boiler Steel Thick ⅜" Bill 7027

Boiler, Diam. 36" Plan Extended wagon top

Boiler st'm pres. 200 lbs., Tested to 220 lbs. steam pres. with factor of safety of 4.76 267 lbs. water pres.

Longitud. seams Butt jointed, sextuple riveted, 90 % seams

Dome, diam. 19" Pos. Forward of firebox

Firebox Steel Combustion chamb. None

Firebox, length 54" Width 37⅜" Depth F. 46" B. 39"

Firebox, Tube 7/16" Crown ⅜" Sides 5/16" Back 5/16"

Firedoor opening 14" diameter

Water space, Front 3½" Sides 2½" Back 2½"

Water space, Frame Single Riveted

Water space stays ⅝" diam. with 3/16" hole 1¼" deep from O.S.

Radial stays 1" diameter Sling stays front None

Button heads below crown on Four central rows

Crown bars None Placed --- above crown

Crown bolts ---

Flues ----

Tubes #12 N.G. iron or steel

Tube ends Swaged for copper ferrules, firebox ends

Number 83 Diam. 1⅝" Length 10' 1"

Heating Surface Flues ---- Combus. Chamb. ---- Total 436 □

Tubes 380 □ Fire Box 56 □ Fire Brick Tubes ---

Grate area 14 □ Ratio to Heating Surface 1 : 31.1

Superheater ---

Fire Brick Arch None

Grates Plain bars and dead plate

Ash Pan, Dampers Front and back

Throttle Balance Pos. Dome

Dry pipe Steel

Superheater None

Smokebox extension None Cleaning hole and cap None

Spark ejector or hopper None

Netting and deflect. plates None

Exhaust nozzles Double low

Cleaning pipe, with

Stack Radley & Hunter Dia. 12" Hole in S. B., dia. 13½"

Safety Valves Two Star 2" (not spec'd)

Safety valves None with relief lever, Set to 170 pounds

Whistle Chime

Steam Gauge One iron 6" Maker: Star (spec'd)

Steam gauge stand Iron **Clock** None

Water Gauge One B.L.W. (Ironclad) **Cab Lamps** to burn oil

Gauge Cocks Three back Surface valve None

Lowest gauge cock 3" above highest part of crown

Lubricator steam valve to have separate dry pipe to dome

Blower Valve B. L. W.

Blow off Cock One Johnstone Pos: Left side

Cleaning Plugs One filling plug in top of boiler

Firebox Corners

Crown, One right side, two left side and two back

Waist, One under front

Front tube sheet, One Fusible plug One

Pump None Pos. ---

Top chamb. --- Bottom chamb. ---

Feed Cock --- Feed pipes ---

Checks --- Check pipes ---

Apply #9 syphon under cab board on left side with 20 ft. of suction hose.

Injectors Two Sellers, Class "M" (not spec'd) No. 6½

Injectors, Pos. Right and left Steam pipes Copper

Pipes, Check Iron Feed Iron Overflow Iron

Check B. L. W. Pos. Right and left

Steam Heat None

Cab Wood Ventilator in cab roof

Cab boards Wood Nosing None

Running boards Wood Nosing None

Hand rail Iron Located on Boiler

Back Bumper Bar steel Back drawbar height 27⅞"

Pilot Wood Pushing shoes None

Front Bumper Oak Bumper plate With

Steps, hand holds, etc., to conform to I. C. C. requirements

Coupler: Two pocket draw casting, fitted with removable M.C.B. auto. coupler, with slotted knuckle, 33½" center above rail when in upper pocket and 25" center above rail when in lower pocket

Signal fixtures Iron on bumper

Headlight Two Round Case 12" Reflector, To burn Kerosene

Headlight, Nos. on sides With H'd'l't step None

Lamp shelf None Nosing ---

Bell 45 pounds

Sand Box, Two Diam. 19" Body Iron painted Pipes Iron

Sander (not spec'd) Leach air, trap A-1, in each box

Dome casing Iron painted

Boiler Jacket #22 soft steel pt'd Bands Iron Style 9

Boiler Lagging B. L. W. plastic magnesia (from stock)

THE BALDWIN LOCOMOTIVE WORKS (114)

H. B. Snyder April-1917

SPECIFICATION FOR LOCOMOTIVES 10 18 ¼ D 33

FOR Lightsey Brothers, Inc.

M

Frames Cast steel Braces Solid

Cylinders, Diam. 12" Stroke 16"

St'm ports, Length 10" Width 1" Bridges ⅞"

Exh. ports, Length 10" Width 2" Valve lead 1/16"

Valve travel 4" Steam lap ⅝" Exhaust clearance ----

Eccentric crank throw 3½" By-pass valve None

S. F. Lub. (not spec'd) Detroit triple No. 22 Bulls Eye

Cyl'r heads Cast iron: Lubr. pipes of iron under jacket

Cyl'r casings Iron painted Head covers Steel painted

St'm-chest casings Iron painted Covers Steel painted

St'm chest valves Balanced, with vacuum valves

Met. pkg Piston rods, valve stems United States, King type (not spec'd)

Pistons Cast iron rings sprung into solid head

Guides Steel Oil cups Needle

Crossheads "Alligator" type, cast steel

Wrist Pins Steel Rod cups Plunger, forged on

Parallel rods with solid ends

Valve Motion Stephenson

Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.

All finished movable nuts of steel or of iron case hardened.

Wearing Bearings Damascus bronze

Drivers, O. S. Diam. 36" Cen. diam. 31", centers cast iron

Tires Steel Held by Shrinkage and shoulder

Tires, Flanged, Pos. All Size 2½" x 5½"

Tires, Plain, Pos. None Size -----

Lateral play between driving boxes and wheel hubs = 1/32" total

Driving Boxes Steeled cast iron

Journals, Diam. 5" Length 6"

Springs. Make B. L. W.

Front Engine Truck Two Wheeled Swing bolster

To swing 3" each side of cen., Cen. pin liners None

Journals, Diam. 3½" Length 6" Boxes Cast iron

Wheels, Diam. 24" Tread 4½" Kind Chilled cast iron

Tires None Cen. diam. -- Size --

Tires held by --

Back Engine Truck Two Wheeled Swing bolster

To swing 3½" each side of cen., Cen. pin liners None

Journals, Diam. 3½" Length 6" Boxes Cast iron

Wheels, Diam. 24" Tread 4½" Kind Chilled cast iron

Tires None Cen. diam. --- Size --

Tires held by ---

Brake, position On all driving and tender wheels

Operating Parts: Engine, Sch. No. 6 ET West'g. combined auto and straight air

Eng. Tr'k, sch. ----

Foundation Parts: Drivers, sch. B. L. W.

Eng. Tr'k, sch. ----

Air pump One 8" Pos. Left side

Train connections Front and back

Train signal, sch. None

Air Reservoirs to have a Hydrostatic test of 210 pounds.

Tender Eight Wheeled, Drawing No. 730

Weight, with fuel and water, about 40,000 pounds

Tank 2000 Gallons. Bill 2705

Tank "U" shape, straight top. Fuel capacity 2 cords

Wood rack around top of tank

Tool Boxes Hard wood, Top

Provide for syphon connection to tank

Frame Steel 6" channels

Front Drawbar height 24⅝"

Pilot None Pushing shoes None

Coupler: Two pocket draw casting fitted with removable M.C.B. auto. coupler with slotted knuckle 33½" center above rail when in upper pocket and 25" center above rail when in lower pocket.

Steps, handholds, etc., to conform to I. C. C. requirements

Trucks Arch bar type with cast steel bolster

Springs Elliptic, B. L. W.

Journals, Diam. 3¼" Length 6"

Wheels, Diam. 24" Tread 4½" Kind Chilled cast iron plate

Tires None Cen. diam. --- Size ---

Tires held by ----

Safety chains Single

Brake Position On all wheels

Brake sch. No. 6 ET West'g. auto. and straight air with 8" x 12" brake cylinder

List of tools, sch. 27 One pair wrecking frogs.

Photo sch. None Inspection B. L. W.

To be weighed No Material specs B. L. W.

Certificate of boiler test Three copies of B. L. W. form 1036

Junior laws to 12-1-16 Shipped On own wheels

Brass shop finish, No 1

Machine shop finish D-165

B. L. W. Patents: Throttle, Patented Jan. 23, 1900 (Cast On)

Feed Pipe Strainer, Patented Sept. 1, 1903 (Cast On)

Property plates B. L. W. for engine and tender

Painting: -Engine, style 291, Olive Green and Aluminum

Painting: -Tender, style 291, Olive Green and Aluminum

Lettering, etc., to be same as for 10 18 ¼ D 23

Mark on tank sides, Lightsey Brothers

Road Nos. Pos.	Road Nos.	Name None
F. No. Plate	55	
F. Sand Box		
Cab Sides		
Back of Tank		

THE BALDWIN LOCOMOTIVE WORKS Dwg. 10 18 ¼ D 34, WITH BOOT EXTRAS,
Memorandum Spec'n 11232 EXCEPT AS OTHERWISE SPECIFIED
SPECIFICATION FOR LOCOMOTIVES 10 18 ¼ D 34 Gen. ar. Photo. W792, WITH RADLEY & HUNTER STACK
FOR Lyon Pine Company Engine Drawing No. 12
M 11-27-16.

Gauge of Road 4' 8½" Play 3/8"
Wheelbase, Rigid 8' 0" Driving 8' 0" Total 21' 4"
Total wheelbase, eng. and tend. { Actual 43' 0" / Limited to ---

Curves ----

Limits, Height ---- Width ----
Weight (approximate) in working order, Total 62,000 POUNDS
On F. tr'k 8500 lbs., Drivers 45,000 lbs., B. tr'k 8500 lbs.

Tractive power 11,020 lbs., Ratio of adhesion 4.
Work'g St'm Pres. 180 lbs., Service LOGGING
Fuel Wood

FRONT TUBE SHEET ½" THICK
Boiler STEEL Thick 7/16" Bill 7795
Boiler, Diam. 40" Plan EXTENDED WAGON TOP
Boiler st'm pres. 180 lbs., Tested to { 200 lbs. steam pres. / 240 lbs. water pres.
WITH FACTOR OF SAFETY OF 5.0
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS

Dome, diam. 22" Pos. FORWARD OF FIRE BOX

Firebox STEEL Combustion chamb. NONE
Firebox, length 55-15/16" Width 39½" Depth F. 48" B. 40½"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back 5/16"
Firedoor opening 16" DIAM.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame SINGLE Riveted
Water space stays ⅜" DIAM. WITH 3/16" HOLE 1½" DEEP FROM O.S.

Radial stays 1" DIAMETER Sling stays front NONE
Button heads below crown on FOUR central rows
Crown bars NONE Placed ---- above crown
Crown bolts ----

Flues NONE
Tubes #12 W.G. CHARCOAL IRON OR STEEL
Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS
Number 90 Diam. 2" Length 10' 6"

Heating Surface	Flues NONE	Combus. Chamb. NONE, Total 551 □'	
	Tubes 491 □'	Fire Box 60 □'	Fire Brick Tubes ---
Grate area 13.3 □'	Ratio to Heating Surface 1 : 41.4		
Superheater ---			

Fire Brick ARCH, NONE

Grates PLAIN BARS AND DEAD PLATES
Ash Pan, Dampers FRONT AND BACK

Throttle BALANCE Pos. DOME
Dry pipe STEEL

Superheater NONE

Smokebox extension NONE Cleaning hole and cap NONE
Spark ejector or hopper NONE
Nosing and deflect. plates NONE

Exhaust nozzles DOUBLE L&R
CLEANING PIPES WITH
Seats RADLEY AND HUNTER Dia. 12" Hole in S. B., dia. 13½"
SYPHON TO BE APPLIED UNDER CAB BOARD ON L.S. WITH 25' 0" OF SUCTION HOSE. SYPHON TO BE ARRANGED ALSO AS AN EJECTOR WITH 25'0" OF DELIVERY HOSE TO DISCHARGE WATER FROM TENDER TANK TO BRIDGER TANK, ALWAYS LEAVING A SUPPLY OF 8" OF WATER IN TENDER TANK.

Safety Valves TWO STAR 3" (Spec)
Safety valves NONE with relief lever, Set to 180 POUNDS
Whistle B. L. W. PLAIN

Steam Gauge ONE IRON 6" MAKER: STAR (Spec)
Steam gauge stand IRON Check NONE

Water Gauge ONE B.L.W. (IRONCLAD) **Cab Lamps** TO BURN OIL
Gauge Cocks THREE BASH Surface valve NONE
Lowest gauge cock 3" above highest part of crown
Lubricator steam valve TO HAVE separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock ONE B. L. W. Pos. FRONT
Cleaning Plugs ONE FILLING PLUG IN TOP OF BOILER
Firebox CORNERS
Crown, ONE RIGHT SIDE, TWO LEFT SIDE AND TWO BACK
Waist, ONE UNDER FRONT
Front tube sheet, ONE Fusible plug ONE

Pump NONE Pos. ----
Top chamb. ---- Bottom chamb. ----
Feed Cock ---- Feed pipes ----
Checks ---- Check pipes ----

Injectors (Spec) TWO SELLERS CLASS "N" No. 6½
Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER
Pipes, Check IRON Feed IRON Overflow IRON
Check SELLERS Pos. TOP OF BOILER

Steam Heat NONE

Cab STEEL

Cab boards WOOD Nosing NONE
Running boards WOOD Nosing NONE
Hand rail IRON Located on BOILER

Back Bumper BAR STEEL Back drawbar height 30"

Pilot WOOD Pushing shoes NONE
Front Bumper OAK Bumper plate WELD
Steps, HAND HOLDS, ETC., TO CONFORM TO I. C. C. REQUIREMENTS

COUPLER, TWO POCKET STEEL DRAWHEAD, TOP POCKET FITTED WITH REMOVABLE M.C.B. SPLIT KNUCKLE COUPLER, 33½" CEN. ABOVE TOP OF RAIL, AND LOWER POCKET FOR LINK AND PIN CONN., 25½" CEN. ABOVE TOP OF RAIL.

Signal fixtures IRON ON BUMPER

Headlight TWO ROUND CASE 12" Reflector, To burn KEROSENE
Headlight, Nos. on sides WITH H'dl't step NONE
Lamp shelf NONE Nosing ----

Bell 45 POUNDS
Sand Box TWO Diam. 19" Body IRON PAINTED Pipes IRON
Sander HAND IN EACH BOX TO SAND FRONT AND REAR.

Dome casing IRON PAINTED

Boiler Jacket #22 PLAIN STEEL Bands IRON Style 9
Boiler Lagging B. L. W. PLASTIC MAGNESIA (FROM STOCK)

Frames CAST STEEL Braces SOLID

Cylinders, Diam. 12" Stroke 18"
St'm ports, Length 10" Width 1" Bridges ⅞"
Exh. ports, Length 10" Width 2" Valve lead 1/16"
Valve travel 4" Steam lap ⅜" Exhaust clearance ----
Eccentric crank throw 3"
S. P. Lubr. (Spec) DETROIT DOUBLE NO. 12 BULLS EYE
Cyl'r heads CAST IRON: LUBR. PIPES OF IRON UNDER JACKET
Cyl'r casings IRON PAINTED Head covers STEEL PAINTED
St'm chest casings IRON PAINTED Covers STEEL PAINTED
St'm chest valves RICHARDSON BALANCED, WITH VACUUM VALVES
Met. pkg (PISTON ROD / VALVE STEMS) UNITED STATES (NOT Spec)

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD
Guides STEEL Oil cups NEEDLE
Crossheads CAST STEEL
Wrist Pins STEEL Rod cups PLUNGER, FORGED ON
PARALLEL RODS TO HAVE SOLID ENDS

Valve Motion STEPHENSON
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings DAMASCUS BRONZE

Drivers, O. S. Diam. 36" Cen. diam. 31" CENTERS CAST IRON

Tires STEEL Held by SHRINKAGE AND SHOULDER
Tires, Flanged, Pos. FRONT AND BACK Size 2½" x 5½"
Tires, Plain, Pos. MIDDLE Size 2½" x 6½"
Lateral play between driving boxes and wheel hubs = 1/32" TOTAL
Driving Boxes CAST IRON
Journals, Diam. 5½" Length 7"

Springs. Make B. L. W.

Front Engine Truck TWO Wheeled SWING BOLSTER, CENTER BEARING
To swing 3" each side of cen., Cen. pin liners NONE
Journals, Diam. 4½" Length 6½" Boxes CAST IRON
Wheels, Diam. 24" Tread 4½" Kind CHILLED CAST IRON SPOKE
Tires NONE Cen. diam. --- Size ---
Tires held by ---

Back Engine Truck TWO Wheeled SWING BOLSTER, SIDE BEARING
To swing 4" each side of cen., Cen. pin liners NONE
Journals, Diam. 4½" Length 6½" Boxes CAST IRON
Wheels, Diam. 24" Tread 4½" Kind CHILLED CAST IRON SPOKE
Tires NONE Cen. diam. --- Size ---
Tires held by ---

Brake, position ON ALL DRIVING AND TENDER WHEELS
Operating Parts: Engine, Sch. U-7 B. L. W. STEAM
Foundation Parts: Drivers, sch. U-7 B. L. W.
Eng. Tr'k, sch. ----
Eng. Tr'k, sch. ---
Air pump --- Pos. ---
Train connections ---
Train signal, sch. ---
SEPARATE LUBRICATOR FOR STEAM BRAKE VALVE

Tender EIGHT Wheeled, Drawing No. 406
Weight, with fuel and water, about 50,500 POUNDS

Tank 2500 Gallons. Bill 3739
TANK "U" SHAPE, STRAIGHT TOP FUEL CAPACITY 3 CORDS
WOOD RACK AROUND TOP OF TANK
Tool Boxes HARD WOOD, TOP

Frame STEEL 8" CHANNELS

Front Drawbar height 25¾"
Pilot NONE Pushing shoes NONE

COUPLER, TWO POCKET STEEL DRAWHEAD, TOP POCKET FITTED WITH REMOVABLE M.C.B. SPLIT KNUCKLE COUPLER, 33½" CEN. ABOVE TOP OF RAIL, LOWER POCKET FOR LINK AND PIN COUPLING, 25½" CEN. ABOVE TOP OF RAIL.
STEPS ACROSS REAR WITH HANDRAIL
STEPS, HAND HOLDS, ETC., TO CONFORM TO I. C. C. REQUIREMENTS

Trucks ARCH BAR TYPE WITH STEEL BOLSTERS

Springs ELLIPTIC B. L. W.
Journals, Diam. 3¾" Length 7"
Wheels, Diam. 24" Tread 4½" Kind CHILLED CAST IRON PLATE
Tires NONE Cen. diam. --- Size ---
Tires held by ----
Safety chains SINGLE

Brake Position ON ALL WHEELS
Brake sch. U-7 B. L. W. STEAM

List of tools, sch. 27 ONE PAIR WRECKING FROGS
Photo sch. NONE Inspection B. L. W.
To be weighed NO Material spec'ns B. L. W.
Certificate of boiler test THREE COPIES OF B. L. W. FORM 1036
Junior laws to 12-1-16 Shipment ON OWN WHEELS

Brass shop finish. No. 1
Machine shop finish D-165

B. L. W. Patents { THROTTLE, PATENTED JAN. 23, 1900 (CAST ON) / FEED PIPE STRAINER, PATENTED SEPT. 1, 1903 (CAST ON)

Property plates B. L. W. FOR ENGINE AND TENDER

Painting:—Engine, style 291, OLIVE GREEN AND ALUMINUM
Painting:—Tender, style 291, OLIVE GREEN AND ALUMINUM

Mark on TANK SIDES, LYON PINE COMPANY

Road Nos. Pos.	Road Nos.	Name NONE
F. No. PLATE	2	
F. SAND BOX		
CAB SIDES		
BACK OF TANK		

THE BALDWIN LOCOMOTIVE WORKS As 2nd's C4102

Memorandum Sheet No. 11141

SPECIFICATION FOR LOCOMOTIVES 10 24½ D 113

FOR Blount - Decker Lumber Co.

R.

Gen. as PHOTO. 5331 EIGHTY WITH STRAIGHT STACK.

8-24-16 Engine Drawing No. 28

Gauge of Road 4' 8½" Play 2"

Wheelbase, Rigid 9' 2" Driving 9' 2" Total 23' 9"

Total wheelbase, eng. and tend. { Actual 45' 5" / Limited to ——

Rails, 35 POUNDS PER YARD Grades 6%

Curves ——

Limits, Height —— Width ——

Weight (approximate) in working order, Total 94,000 LBS.

On F. tr'k 12,000 lbs., Drivers 70,200 lbs., B. tr'k 11,800 lbs.

Tractive power 18,700 lbs., Ratio of adhesion 3.8

Work'g St'm Pres. 180 lbs., Service LOGGING (see note ★)

Fuel SOFT COAL

Boiler STEEL Thick 9/16" Bill 7906-

Boiler, Diam. 52" Plan EXTENDED WAGON TOP

Boiler st'm pres. 200 lbs., Tested to { 220 lbs. steam pres. / 267 lbs. water pres.

Longitud. seams BUTT JOINTED DOUBLE COVERING STRIPS

Dome, diam. 28" Pos. FORWARD OF FIREBOX

Firebox STEEL Combustion chamb. NONE

Firebox, length 59-3/16" Width 34⅜" Depth F. 61½" B. 58"

Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"

Firedoor opening 16" DIAM.

Water space, Front 4" Sides 3" Back 3"

Water space, Frame STAYED Riveted

Water space stays 1" DIAM. WITH 3/16" HOLE 1½" BEST FROM O. S.

Radial stays 1" DIAM. Sling stays front { TWO ROWS OR B. L. W. EXPANSION STAYS

Button heads below crown on EIGHT central rows

Crown bars NONE Placed —— above crown

Crown bolts ——

Flues ——

Tubes 112 W. G. CHARCOAL IRON OR STEEL

Tube ends SWAGED FOR COPPER FERRULES FIREBOX ENDS

Number 160 Diam. 2" Length 11' 10½"

Heating Surface: Flues —— Combus. Chamb. —— Total 1074 sq. ft.

Tubes 988 sq. ft. Fire Box 86 sq. ft. Fire Brick Tubes ——

Grate area 14.1 sq. ft. Ratio to Heating Surface 1 : 76

Superheater ——

Fire Brick NONE

Ashpan ROCKING BARS AND DROP PLATE

Ash Pan, Dampers FRONT AND BACK

Throttle BALANCE Pos. DOME

Dry pipe STEEL

Superheater NONE

Smokebox extension WITH Cleaning hole and cap L.S. ONLY

Spark-arresting hopper WITH

Netting and deflect. plates WITH

Exhaust nozzles DOUBLE HIGH

Stack STRAIGHT Dia. 15" Hole in S. B., dia. 16"

★ HEADLIGHT EQUIPMENT TO BE SCHROEDER ELECTRIC No. 1414. HEADLIGHTS TO BE INCANDESCENT TYPE, AND TO BE EQUIPPED WITH 150 VOLT, 32 VOLT LAMPS ARRANGED TO BE OPERATED ONE AT A TIME BY MEANS OF A SWITCH IN CAB. HEADLIGHTS TO HAVE 12" GLASS MIRROR REFLECTORS.

Safety Valves (CROSBY) TWO CONSOLIDATED 2½"

Safety valves NONE with relief lever, Set to 180 POUNDS

Whistle B. L. W. PLAIN

Steam Gauge ONE 7" (MAKER'S-ASHCROFT) (Style-grade)

Steam gauge stand 1908 Clock NONE

Water Gauge ONE B.L.W. (1 BONGLAD) Cab Lamps ELECTRIC

Gauge Cocks THREE BACK Surface valve NONE

Lowest gauge cock 3½" above highest part of crown

Lubricator steam valve TO HAVE separate dry pipe to dome

Blower Valve B. L. W.

Blow off Cock ONE B. L. W. POS:-LEFT SIDE

Cleaning Plugs ONE FILLING PLUG IN TOP OF BOILER

Firebox CORNERS AND RIGHT SIDE

Crown, TWO EACH SIDE AND TWO BACK

Waist, ONE UNDER FRONT

Front tube sheet, ONE Fusible plug ONE

Pump NONE Pos. ——

Top chamb. —— Bottom chamb. ——

Feed Cock —— Feed pipes ——

Checks —— Check pipes ——

PROVIDE VALVE IN DOME FOR TWO SYPHONS ON TENDER

Injectors (NOT SHN) TWO MONITOR No. 7

Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER

Pipes, Check IRON Feed IRON Overflow IRON

Check B. L. W. Pos. RIGHT AND LEFT

Steam Heat NONE

Cab STEEL

Cab boards WOOD Nosing NONE

Running boards WOOD Nosing NONE

Hand rail IRON Located on BOILER

Back Bumper BAR STEEL Back drawbar height 33½"

BACK FOOT PLATE OF CAST STEEL

Pilot WOOD Pushing shoes NONE

Front Bumper OAK Bumper plate WITH

Steps, HAND HOLDS ETC. TO CONFORM TO I.C.C. REQUIREMENTS

Front Drawhead, Center above rail 33½", 28 AND 23"

Coupler DRAW CASTING TO HAVE THREE POCKETS WITH M.C.B. AUTO. COUPLER IN TOP POCKET. OPENINGS IN LOWER POCKETS TO BE AT LEAST 3½" WIDE FOR LINK AND PIN CONNECTION.

Signal fixtures IRON ON BUMPER

Headlight TWO ROUND CASE Reflector, (See note ★ below)

Headlight, Nos. on sides WITH H'd'l't step WITH

Lamp shelf NONE Nosing ——

Bell 85 POUNDS

Sand Box TWO Diam. 23" Body IRON PAINTED Pipes IRON

Sander HAND IN EACH BOX TO SAND FRONT AND REAR.

Dome casing IRON PAINTED

Boiler Jacket #22 SOFT STEEL PLATE Bands IRON Style 9

Boiler Lagging B. L. W. PLASTIC MAGNESIA (FROM STOCK)

THE BALDWIN LOCOMOTIVE WORKS

E.A.S. Hubbard Nov. 1916

SPECIFICATION FOR LOCOMOTIVES 10 24½ D 113

FOR Blount - Decker Lumber Co.

R.

Frames CAST STEEL Braces SOLID

Cylinders, Diam. 15" Stroke 24"

St'm ports, Length 13" Width 12" Bridges 1"

Exh. ports, Length 13" Width 2½" Valve lead 3/16"

Valve travel 4½" Steam lap ¾" Exhaust clearance ——

Eccentric crank throw 9-7/16" By-pass valve NONE

S. F. Lubr. MICHIGAN DOUBLE SIGHT FEED, 2 PINTS CAPACITY

Cyl'r heads CAST IRON; LUBR. PIPES OF IRON UNDER JACKET

Cyl'r casings IRON PTD. Head covers STEEL PAINTED

St'm chest casings IRON PTD. Covers STEEL PAINTED

St'm chest valves RICHARDSON BALANCED WITH VACUUM VALVES

Met. pkg (PATTON HOOD VALVE STEMS) UNITED STATES (Navigation)

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD.

Guides STEEL Oil cups NEEDLE

Crossheads CAST STEEL

Wrist Pins STEEL Rod cups PLUNGER

MAIN AND PARALLEL RODS TO HAVE STRAP ENDS.

Valve Motion WALSCHAERTS

Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard. All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 44" Cen. diam. 38" CENTRES CAST IRON

Tires STEEL Held by SHRINKAGE AND SHOULDER

Tires, Flanged, Pos. FRONT AND BACK Size 3" X 5½"

Tires, Plain, Pos. MIDDLE Size 3" X 6½"

Lateral play between driving boxes and wheel hubs—1/32" TOTAL

Driving Boxes CAST IRON

Journals, Diam. 6" Length 8"

★ Springs. Make B. L. W.

Front Engine Truck Two Wheeled SWING BOLSTER

To swing 4½" each side of cen., Cen. pin liners NONE

Journals, Diam. 4½" Length 7½" Boxes CAST IRON

Wheels, Diam. 24" Tread 4½" Kind CHILLED CAST IRON SPOKE

Tires NONE Cen. diam. —— Size ——

Tires held by ——

Back Engine Truck Two Wheeled SWING BOLSTER

To swing 3" each side of cen., Cen. pin liners NONE

Journals, Diam. 4½" Length 7½" Boxes CAST IRON

Wheels, Diam. 24" Tread 4½" Kind CHILLED CAST IRON SPOKE

Tires NONE Cen. diam. —— Size ——

Tires held by ——

Brake, position ON ALL DRIVING AND TENDER WHEELS

Operating Parts: Engine, Sch. U-8 B. L. W. STEAM; Eng. Tr'k, sch. ——

Foundation Parts: Drivers, sch. U-8 B. L. W.; Eng. Tr'k, sch. ——

Air pump —— Pos. ——

Train connections ——

Train signal, sch. ——

SEPARATE LUBRICATOR FOR STEAM BRAKE VALVE.

★ LOCO. WILL BE USED IN ROUGH MILL LOGGING SERVICE.- SPECIAL ATTENTION TO BE GIVEN TO DESIGN.

Tender EIGHT Wheeled, Drawing No. 921

Weight, with fuel and water, about 60,000 LBS.

TWO 3" SYPHONS ON TENDER, 20 FT. OF HOSE FOR EACH SYPHON

Tank 3,000 Gallons, Bill 3913

TANK "U" SHAPE STRAIGHT TOP. FUEL CAPACITY 6 TONS

Tool Boxes HARD WOOD, TOP.

Frame STEEL 6" AND 8" CHANNELS

Front Drawbar height 28¾"

Pilot NONE Pushing shoes NONE

Back drawhead, center above rail 33½", 28 AND 23"

Coupler DRAW CASTING TO HAVE THREE POCKETS WITH M.C.B. AUTO. COUPLER IN TOP POCKET. OPENINGS IN LOWER POCKETS TO BE AT LEAST 3½" WIDE FOR LINK AND PIN CONNECTIONS.

Steps, HAND HOLDS ETC. TO CONFORM TO I.C.C. REQUIREMENTS

Trucks ARCH BAR TYPE WITH CAST STEEL BOLSTERS

Springs ELLIPTIC. B. L. W.

Journals, Diam. 3½" Length 7"

Wheels, Diam. 30" Tread 4½" Kind CHILLED CAST IRON PLATE

Tires NONE Cen. diam. —— Size ——

Tires held by ——

Safety chains SINGLE

Brake Position ON ALL WHEELS

Brake sch. U-8 B. L. W. STEAM

List of tools, sch. 26 ONE PAIR WRECKING FROGS

Photo sch. 2 Inspection B. L. W.

To be weighed YES Material spec'ns B. L. W.

Certificate of boiler test THREE COPIES OF B. L. W. FORM 1036

Junior laws to 9-30-16 Shipment ON OWN WHEELS

Brass shop finish, No. 1

Machine shop finish D-165

B. L. W. Patents: THROTTLE, PATENTED JAN. 23, 1900 (CAST ON); FEED PIPE STRAINER, PATENTED SEPT. 1, 1903 (CAST ON)

Property plates B. L. W. FOR ENGINE AND TENDER

Painting: —Engine, style 291 OLIVE GREEN AND ALUMINUM

Painting —Tender, style 291 OLIVE GREEN AND ALUMINUM

LETTERING, ETC. TO BE SAME STYLE AS PHOTO. 5808 (8-24 D 236)

Mark on CAB SIDES, B. D. L. Co.

MARK ON TANK SIDES, BLOUNT - DECKER LUMBER COMPANY

Road Nos. Pos.	Road Nos.	Name NONE
F. No PLATE	3	
F. SAND BOX		
BACK OF TANK		

EXTRAS ORDERED THROUGH EXTRA WORK DEPT., ORDER No. 9248 DATED 10-17-16, AND No. 9532 DATED 10-18-16 TO BE SHIPPED WITH LOCO.

THE BALDWIN LOCOMOTIVE WORKS — As Spec'n C-3559 Dup. 12 30 ½ E 41 with same extras except where otherwise specified

Memorandum Spec'n 11187

SPECIFICATION FOR LOCOMOTIVES 12 30 ½ E 41½ — Gen. as Photo. 3810 — Engine Drawing No. 9

FOR East Oregon Lumber Company — 10-27-16

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 12' 1" Driving 12' 1" Total 27' 3"
Total wheelbase, eng. and tend. { Actual 49' 11½" / Limited to ---
Rails 56 pounds per yard
Curves 25 degrees Grades 6 %

Limits, Height --- Width ---
Weight (approximate) in working order, Total 139,000 pounds
On F. tr'k 15,000 lbs., Drivers 111,000 lbs., B. tr'k 13,000 lbs.

Tractive power 27,000 lbs., Ratio of adhesion 4.1
Work'g St'm Pres. 180 lbs., Service Logging
Fuel Wood

Front tube sheet to be ½" thick
Boiler Steel Thick 11/16" Bill 7684
Boiler, Diam. 70" Plan Straight top
Boiler st'm pres. 200 lbs., Tested to { 220 lbs. steam pres. / 267 lbs. water pres.
With factor of safety of 4½
Longitud. seams Butt jointed double covering strips, sextuple riveted
Dome, diam. 33" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 89-11/16" Width 41" Depth F. 67¾" B. 58¾"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back 5/16"
Firedoor opening 16" diam.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Single Riveted
Water space stays ⅞" diam. with 3/16" hole 1½" deep from O.S.
Flexible staybolts, Tate, about 350 in breaking zone
Radial stays 1" diameter Sling stays front { Three rows of B. L. W. expansion stays
Button heads below crown on Eight central rows
Crown bars None Placed --- above crown
Crown bolts ---

Flues None
Tubes #12 W.G. charcoal iron or steel
Tube ends Swaged for copper ferrules, firebox ends
Number 291 Diam. 2" Length 13' 0"
Tubes to be spaced ¼" apart and to be applied with Prosser expander

Heating Surface	Flues ---	Combus. Chamb. ---	Total 2108 □'
	Tubes 1968 □'	Fire Box 140 □'	Fire Brick Tubes ---
Grate area 25.5 □'	Ratio to Heating Surface 1 : 82		
Superheater ----			

Fire Brick Arch, None

Grates Plain bars and dead plates
Ash Pan, Dampers Front and back

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Smokebox extension With Cleaning hole and cap None
Spark ejector or hopper None
Netting and deflect. plates None

Exhaust nozzles Single, low
Cleaning pipe, with
Stack Radley & Hunter Dia. 18" Hole in S. B., dia. 19½"

(not spec) **Safety Valves** Two Consolidated 3"
Safety valves None with relief lever, Set to 180 pounds
Whistle Large chime

Steam Gauge One Iron 7" MAKER: Ashcroft (Spec)
Steam gauge stand Iron **Clock** None

Water Gauge One (See sup. 5) **Cab Lamps** Electric
Gauge Cocks Three back Surface valve None
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One B. L. W. Pos: Front
Cleaning Plugs
Firebox Corners diagonal, and sides
Crown, Two each side and two back
Waist, One under front
Front tube sheet, Two Fusible plug One

Pump None Pos. ---
Top chamb. --- Bottom chamb. ---
Feed Cock --- Feed pipes ---
Checks --- Check pipes ---

(Spec) **Injectors** Two Sellers No. 8½
Injectors, Pos. Right and left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. Right and left

Steam Heat None

Cab Steel, lined with wood Ventilator in cab roof

Cab boards Steel Nosing T-Iron
Running boards Steel Nosing - T-Iron
Hand rail Iron Located on Boiler

Back Bumper Bar steel Back drawbar height 35½"

Pilot Wood Pushing shoes None
Front Bumper Oak Bumper plate With
Steps, handholds, etc., to conform to I. C. C. requirements

Front Drawhead, Center above rail 33½"
Coupler M. C. B. auto. with slotted knuckle

Signal fixtures Iron or bumper

Headlight Two Round Case 18" Reflector,
Headlight, Nos. on sides With H'd'l't step None
Lamp shell None Nosing ---

Bell 92 pounds
Sand Box Two Diam. 31" Body Iron painted Pipes Iron
Sander (Not Spec) Leach Air, Trap A-1, to sand front and back

Dome casing Iron painted

Boiler Jacket #22 Plan. steel Bands Iron Style 9
Boiler Lagging Magnesia sectional

SPECIFICATION FOR LOCOMOTIVES 12 30 ½ E 41½

FOR East Oregon Lumber Company

Frames Cast steel, 4" wide Braces Solid

Cylinders, Diam. 18" Stroke 24"
St'm ports, Length 16" Width 1¼" Bridges 1"
Exh. ports, Length 16" Width 2½" Valve lead 1/16"
Valve travel 5½" Steam lap ¾" Exhaust clearance ---
Eccentric crank throw 4½" By-pass valve None
S. P. Lubr. Michigan Triple Bull's Eye (not spec)
Cyl'r heads Cast iron: Lubr. pipes of iron under jacket
Cyl'r casings Iron painted Head covers Steel painted
St'm chest casings Iron painted Covers Steel painted
St'm chest valves Richardson balanced, with vacuum valves
Met. pkg (Piston rods / Valve stems) U. S. (not spec)

Pistons Cast iron rings sprung into solid head
Guides Laird type, steel Oil cups Needle
Crossheads Cast steel with gibs of cast iron babbitted
Wrist Pins Steel Rod and cups (See sup. 13)

Valve Motion Stephenson
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.
All valve motion work to be bushed, same as for 12 30½ E 41

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.
Main driving wheels only to have hub liners of brass
Drivers, O. S. Diam. 44" Cen. diam. 38"
Wheel centers: main cast steel, others cast iron
11 **Tires** Standard steel Held by Shrinkage and shoulder
Tires, Flanged, Pos. Front and back Size 3" x 5½"
Tires, Plain, Pos. Intermediate Size 3" x 6½"
Lateral play between driving boxes and wheel hubs — 1/16" total
Driving Boxes Steeled cast iron
15 **Journals,** Diam. 7½" Length 8"

Springs, Make Standard Steel Works

Front Engine Truck Two Wheeled Swing bolster, center bearing
To swing 5" each side of cen., Cen. pin liners None
15 Journals, Diam. 4½" Length 7½" Boxes Cast iron
16 Wheels, Diam. 28" Tread --- Kind Cast iron spoke centers
Tires Standard steel Cen. diam. 23" Size 2½" x 5½"
Tires held by Bolted type fastening.

Back Engine Truck Two Wheeled Swing bolster, side bearing
To swing 5" each side of cen., Cen. pin liners None
15 Journals, Diam. 4½" Length 7½" Boxes Cast iron
16 Wheels, Diam. 28" Tread --- Kind Cast iron spoke centers
Tires Standard steel Cen. diam. 23" Size 2½" x 5½"
Tires held by Bolted type fastening

17 **Brake,** position On all driving and tender wheels
Operating Parts | Engine, Sch. No. 6 ET West'g. combined auto. and straight air / Eng. Tr'k, sch. ---
Foundation Parts | Drivers, sch. MN-1, American outside equalized / Eng. Tr'k, sch. ---
Air pump Two 9½" Pos. Both left side
Train connections Front and back
Train signal, sch. None
Air reservoirs to have hydrostatic test of 210 lbs.

25 **Tender** Eight Wheeled, Drawing No. 435
Weight, with fuel and water, about ~~80000~~ 86000 pounds
Tank ~~3500~~ 4000 gallons, Bill ~~4389~~ 4459 4/20 cords
Tank "U" shape, straight top: Fuel capacity
Height of tank increased 7" to provide for increased capacity
Tool Boxes of hard wood, Top

Frame Steel 10" channels

Front Drawbar height 32½"
Pilot None Pushing shoes None
Back drawhead, center above rail) 33½"
Coupler M. C. B. auto. with slotted knuckle

Steps (See sup. 28)

29 **Trucks** Square wrot iron equalized frames

30 Springs Elliptic, Standard Steel Works make
16 Journals, Diam. 4½" Length 8"
Wheels, Diam. 28" Tread --- Kind Cast iron plate centers
Tires Standard steel Cen. diam. 23" Size 2½" x 5½"
Tires held by Bolted type fastening
Safety chains Single

Brake Position On all wheels
Brake sch. No. 6 ET West'g. auto. and straight air with 10" x 12" cylinder

List of tools, sch. 30 One pair pressed steel frogs
Photo sch. #2 Inspection B. L. W.
To be weighed No Material spec'ns B. D. W.
Certificate of boiler test Three copies of B. L. W. form 1036
Junior laws to 10-14-16 Shipment On own wheels (See sup. 18)

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. Patents { Throttle, Patented Jan. 23, 1900 (Cast on) / Feed Pipe Strainer, Patented Sept. 1, 1903 (Cast on)

Property plates B. L. W. for engine and tender

Painting and striping to be same as for 12 30 ½ E 41, and to have special care to make it durable
Painting:—Engine, style 291, Olive Green and Aluminum
Painting:—Tender, style 291, Olive Green and Aluminum
All tires to be white leaded for photographing
Lettering, etc., to be same style as for 12 30 ½ E 41
Mark on tank sides, East Oregon Lumber Company
Mark on back of tank, 3500 gals.

Road Nos. Pos. Road Nos. Name None
F. No. Plate 3
Back Sand Box
Cab Sides
Back of Tank

For Marathon, Mark on back of tank to be changed to show 4000 gallons 5-18-17.

1 Locomotive is estimated to haul 100 tons (of 2000 pounds) up a 6 % grade or its equivilent, frictional resistance not exceeding 10 pounds per ton.

2 Locomotive to conform to all I. C. C. requirements.

3 Crown and side sheets of fire box in one piece, to provide for changing fuel to be oil.
Crown of firebox arranged for 6 % grade.

4 Whistle to screw into side of dome, same as for 12 30 ½ E 41.

5 Water gauge to be Klinger Reflex with reflector.

6 Suitable valves on blower pipe for round house connection.

7 Plug stop valve to be provided between injector check and boiler.

9 C. B. & Q. water deflector to be applied inside of boiler at injector checks.

10 One fire extinguisher Y, with stop valves, to be applied to injector check pipe, same as on 12 30 ½ E 24 and 41.

11 Cab boards to be covered with wood, in cab.
Drop seat for engineer on right side of cab, and tool box for fireman on left side.

12 Headlight equipment to be Pyle National Electric type "E" complete with generator, and with incandescent headlights, instead of arc.
Switch to be provided in cab for cutting out headlights.
Generators to be located in front of cab, if convenient, same as for 12 30 ½ E 24 and 41.

13 Main and side rods to have straps, keys and brasses.
Grease cups forged on straps.

14 Flange lubricators, O. R. & N. style, same as for 12 30 ½ E 24 and 41 to be applied to front of front drivers and back of rear drivers.

15 All axles from Standard Steel Works.

16 Wheels and axles of front and back engine trucks to be interchangeable.
Engine truck and tender wheels from Standard Steel Works.
Engine truck and tender wheel tires to be interchangeable.

17 Air reservoirs to be located same as for 12 30 ½ E 24 and 41.

18 Extras ordered through Extra Work Department, Order No. 11287, dated 11-7-16, to be shipped with locomotives.

TENDER

25 Fuel collar to be arranged for wood fuel with the man hole properly placed and of sufficient height to allow for the extension of the wood rack for additional fuel if desired.

26 Drain pipes 2" diameter on each side of tank funnel to carry waste water to track.

27 Distance between back of tank and rear of bumper to be about 18" to provide for carrying material.

28 Steps, hand holds, etc., to conform to I. C. C. requirements.
Step across rear of tender with hand rail.

29 Tender trucks, Northern Pacific style.

30 Axles from Standard Steel Works.

THE BALDWIN LOCOMOTIVE WORKS As Spec'n. C-1471 (see sup.) Details as far as practicable to be same as for 12-34¼ E 23

Memorandum Spec'n 17000

SPECIFICATION FOR LOCOMOTIVES 12 34¼ E 45 Gen. as Photo. 5371

FOR Silver Falls Timber Company **Engine Drawing No.** 13

R. 1-2-17

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 13' 1" Driving 13' 1" Total 27' 1"
Total wheelbase, eng. and tend. {Actual 54' 11" / Limited to -----
Grades, 6%. Rails, 60 lbs. per yard
Curves -----

Limits, Height ----- Width -----
Weight (approximate in working order, Total 179,050 pounds
On F. tr'k 15,700 lbs., Drivers 141,250 lbs., B. tr'k 22,100 lbs.

Tractive power 35,400 lbs., Ratio of adhesion 4
Work'g St'm Pres. 170 lbs., Service Logging
6 **Fuel** Oil

Front tube sheet to be ½" thick
Boiler Steel Thick ⅜" Bill 8080
Boiler, Diam. 74" Plan Straight Top

Boiler st'm pres. 200 lbs., Tested to {220 lbs. steam pres. / 267 lbs. water pres.
with factor of safety of 4.6
Longitud. seams Butt jointed, double covering strips

2 **Dome,** diam. 33" Pos. Central

3 5 **Firebox** Steel Combustion chamb. None
Firebox, length 90-3/16" Width 66" Depth F. 68¼" B. 62½"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back 5/16"
Firedoor opening 16" diam; Crown and sides in one piece
Water space, Front 4" Sides 3½" Back 3½"
Water space, Frame Single Riveted
4 Water space stays ⅞" diam. with 3/16" hole 1¼" deep from O. S.

Radial stays 1" diam. Sling stays front {Three rows of B. L. W. Expansion stays
Button heads below crown on Eight central rows
Crown bars None Placed ----- above crown
Crown bolts -----

Flues #9 W. G. Steel
Tubes #12 W. G. Charcoal Iron or Steel
Tube ends Swaged for copper ferrules fire box ends
Number 28 / 199 Diam. 5⅜" / 2" Length 16' 3"

Heating Surface Flues 637½ Combus. Chamb. ----- Total 2476
Tubes 1685 Fire Box 154 Fire Brick Tubes -----
Grate area 41.3 Ratio to Heating Surface 1 : 60
Superheater 537

Fire Brick pavement in pan
6 Fire Box lined with fire brick for oil burning

6 **Grates** None
Ash Pan, Dampers Front and Middle

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater (See sup. 7)

8 **Smokebox** extension With 8 Cleaning hole and cap None
Spark ejector or hopper None
Netting and deflect. plates None

Exhaust nozzles Single Lor
Cleaning Pipe, With
Stack Straight Dia. 18" Hole in S. B., dia. 21½"

(not spec) **Safety Valves** Two Consolidated 3½"
Safety valves None with relief lever, Set to 170 pounds
Whistle B. L. W. plain

Steam Gauge One Iron 7" Maker:-Ashcroft (Spec)
Steam gauge stand Iron **Clock** None

Water Gauge One Klinger Reflex **Cab Lamps** Electric
Gauge Cocks Three - Back Surface valve None
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One B. L. W. Pos:-Front
Cleaning Plugs One filling plug in top of boiler
Firebox Corners diagonal, sides and back
Crown, Two each side and four back
Waist, One under front
Front tube sheet, Two Fusible plug One

Pump None Pos. -----
Top chamb. ----- Bottom chamb. -----
Feed Cock ----- Feed pipes -----
Checks ----- Check pipes -----

(not spec) **Injectors** Two Monitor No. 9
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. Right and Left

Steam Heat None

Cab Steel

Cab boards to be covered with wood in cab
Cab boards Steel Nosing T-Iron
Running boards Steel Nosing T-Iron
Hand rail Iron Located on Boiler

Back Bumper Bar Steel Back drawbar height 31"

9 **Pilot** Wood Pushing shoes None
Front Bumper Oak Bumper plate With
Steps, hand holds, etc. to conform to I. C. C. requirements

Front Drawhead, Center above rail 33½"
Coupler M. C. B. Automatic with slotted knuckle

Signal fixtures Iron on bumper

10 Headlight Equipment to be Pyle National Electric, Arc type
Headlight Two Round Case 18" Reflector
Headlight, Nos. on sides With H'dl't step With
Lamp shelf Iron Nosing Iron

Bell 92 pounds
Sand Box Two Diam. 31" Body Iron Painted Pipes Iron
11 (not spec) Sander Leach Air, Trap A-1, in each box, to sand front and back

Dome casing Iron Painted

Boiler Jacket #22 Soft Steel Pt'd Bands Iron Style 9
Boiler Lagging Magnesia sectional

THE BALDWIN LOCOMOTIVE WORKS A. J. Stratton June 1917

SPECIFICATION FOR LOCOMOTIVES 12 34¼ E 45 (23)

FOR Silver Falls Timber Company Furnish three (3) framed photographs done up similar to Negative 3P15

R.

Frames Cast Steel Braces Solid

Cylinders, Diam. 20½" Stroke 28"
St'm ports, Length 27.9" Width 1⅞" Bridges 3⅜"
Exh. ports, Length ----- Width ----- Valve lead ¼"
Valve travel 5½" Steam lap ⅞" Exhaust clearance -----
Eccentric crank throw 14½" {Lubr. pipes of Iron
S. P. Lubr. (not spec) Michigan Five Feed Bulls Eye {under Jacket
Cyl'r heads Front, Cast Iron; Back, Cast Steel
Cyl'r casings Iron Pt'd. Head covers Steel Painted
St'm chest casings ----- Covers -----
St'm chest valves 12" diam. Piston type
Met. pkg {Piston rods / Valve stems} United States, King Type (not spec)

Pistons Cast Iron rings sprung into solid head
Guides Laird type, Steel Oil cups Needle
Crossheads Cast Steel, Gibs cast iron babbitted
Wrist Pins Steel Rod cups Grease cups, forged on
Parallel Rods to have strap ends

Valve Motion Walschaerts
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.
Main wheel centres only to have hub liners of brass
Drivers, O. S. Diam. 48" Cen. diam. 42"
12 Driving Wheel Centres, Main, cast steel, Other cast Iron
13 **Tires** Steel Held by Shrinkage and Shoulder
Tires, Flanged, Pos. Front and Back Size 3" X 5½"
Tires, Plain, Pos. Intermediate Size 3" X 6½"
Lateral play between driving boxes and wheel hubs = 1/16" total
Driving Boxes Steeled Cast Iron
13 **Journals,** Diam. {Main 9" / Others 8½" Length 10"

Springs. Make Standard Steel Works

Front Engine Truck Two Wheeled Swing Bolster Center bearing
To swing 2¾" each side of cen., Cen. pin liners None
13 Journals, Diam. 6" Length 10" Boxes Cast Iron
Wheels, Diam. 28" Tread ----- Kind Cast Iron spoke centre
13 Tires Steel Cen. diam. 23" Size 2½" X 5½"
Tires held by Bolted type fastening
Front Engine truck wheels without hub liners

Back Engine Truck Two Wheeled Rushton Inside Bearing
To swing 2½" each side of cen., Cen. pin liners None
13 Journals, Diam. 6" Length 10" Boxes Cast Steel
Wheels, Diam. 36" Tread ----- Kind Cast Iron Spoke Centre
13 Tires Steel Cen. diam. 31" Size 2½" X 5½"
Tires held by Bolted Type Fastening
Back engine truck wheels to have hub liners of Brass

Brake, position On all Driving and Tender Wheels
Operating Parts: Engine, Sch. No. 6 ET, West'g. Combined Auto. and Straight Air
Eng. Tr'k, sch. -----
Foundation Parts: Drivers, sch. WN-2, American Outside Equalized
Eng. Tr'k, sch. -----
Air pump Two 9½" Pos. Right and Left
Train connections Front and Back
Train signal, sch. None
Air Reservoir to have extra large capacity
Air reservoir to have hydrostatic test of 210 pounds
Certificates dated April 26th 1917 covering test of reservoir Nos. 11130 & 11131 inc. furnished by West'g. Air Brake Co., are filed in Main Office, File No. 6540

Tender Eight Wheeled, Drawing No. 435
Weight, with fuel and water, about 80,000 pounds

Tank {Oil 2000 / Water 4000} Gallons, Bill 3341 / 4523
Tank "U" shape, straight top

Tool Boxes Hard wood, top

Frame Steel 10" channels

Front Drawbar height 32½"
Pilot None Pushing shoes None
Back drawhead, center above rail 33½"
Coupler M. C. B. Automatic, with slotted knuckle

Steps, handholds, etc. to conform to I.C.C. requirements
Steps across rear with hand rail.

Trucks Arch bar type with steel bolsters

Springs Elliptic. Standard Steel Works make
13 Journals, Diam. 4¼" Length 8"
Wheels, Diam. 30" Tread Kind Cast Iron plate centres
13 Tires Steel Cen. diam. 25" Size 2½" X 5½"
Tires held by Bolted type fastening
Safety chains Single

Brake Position On all wheels
Brake sch. No. 6 - ET, West'g. Auto. and Straight Air with 10" X 12" tender brake cylinder

List of tools, sch. 31 Wrecking frogs same as for 12-34¼ E 23
Photo sch. None Inspection B. L. W.
To be weighed No Material spec'ns B. L. W.
Certificate of boiler test Three copies of B.L.W. form 1036
Junior laws to 3-1-17 Shipment On own wheels

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. Patents: Feed Pipe Strainer, Patented Sept. 1, 1903 (Cast On); Steam Pipe Cover, Patented July 18, 1911 (Cast On)

Property plates None

Painting:—Engine, style 291, Olive Green and Aluminum
Painting:—Tender, style 291, Olive Green and Aluminum
~~All tires to be white leaded for photograph~~ 6/14/17
Lettering to be same as for 12 - 34¼ E 23
Mark on Tank sides, SILVER FALLS TIMBER CO.
Mark on back of Tank, 4000 GALS.

Road Nos. Pos.	Road Nos.	Name None
F.No. Plate	102	
Dome and Cab Sides		

SPECIFICATION FOR LOCOMOTIVES 12 3¼ E 45

FOR SILVER FALLS TIMBER COMPANY

Specification for Type A Double Loop Superheater. SPECIFICATION O-7214 DATED MARCH 12, 1917.

BOILER TUBES	199 in number 2 o. d 16 ft 3 in. over tube sheets. Tubes located between and adjacent to boiler flues are to be beaded over at front end.
BOILER FLUES	28 in number 5½" o. d #9 BWG of cold drawn seamless steel. Flues to be straight, true to gauge and wall not to vary more than one gauge from specified thickness. Card 1906-G
BOILER FLUE SETTING	½ in. radius on both edges of flue holes in fire box tube sheet and on front edge of flue holes in front tube sheet as shown on drawings, except for copper sheets. Back end to be set with copper ferrule, rolled, beaded and prossered except for copper sheets. Front end to be rolled and beaded. Rollers to have at least 5 rolls. Card 1136. Prosser to have at least 12 sections. Card 5224
TUBE SHEET LAYOUT UNITS	28 units 1½" o. d #9 BWG of seamless steel. Pipes united by return bends. Each unit to be tested, before being placed in boiler, with water under pressure of 250 lb. per sq. in. for screwed return bends or 500 lb. per sq. in. for welded return bends.
UNIT PIPE SUPPORTS	Of steel fastened securely on superheater pipes so as not to slide. Card 10773
UNIT PIPE JOINT	To be made in best possible manner to insure absolutely tight joints in accordance with the notation on. Card 1043
UNIT CLAMP BOLT	To be in accordance with requirements of Locomotive Superheater Company Material Specification No. 12. Card 10695
HEADER	To be of close grain cylinder iron, steam tight in every respect. Joint ring for connection to dry pipe to have flat side against header flange. Casting should be moulded with the unit joint face down to secure the best quality of metal on surface where superheater unit joints are made. Each header to have a serial number cast on in such a location as not to be removed in finishing. No patch plugs or chaplets allowed in ball joint seats. Headers must not be treated with sal ammoniac. Header casting to be tight under water pressure of 250 lb. Test pressure to be applied separately to the saturated and to the superheated steam passages, so as to insure soundness of all partition walls. Card 1999-A
HEADER SUPPORTS	To be securely fastened to boiler shell with rivets or turned bolts fitted in reamed holes. To be properly located so as to support the header after header has been correctly located. Header should then be secured to supports. This to be done before superheater units are put in place. Card 1323
STEAM PIPE JOINT RINGS	Should be of cast iron.
DEFLECTING PLATE	To be constructed so as to permit easy inspection and removal of superheater units and joints. Design to be in accordance with. Card 10018
DAMPER CYLINDER	To be carefully and accurately made. Piston not to be more than 0.01 in. smaller than bore. Bearings for piston and extension to be in line. Piston to be ground and to operate freely under a pressure as low as 40 lb. per sq. in. Steam pipe to damper cylinder should be as short and free from bends as possible so as not to cause water to collect in cylinder. Pipe to be well protected against freezing. Card 1149
DAMPER SHAFT COUNTERWEIGHT	To be painted a light color to render it easily visible by the engineer. Card 1067
S. H. ARRANGEMENT	To be in accordance with. Card 4209
TEST (FINAL)	The superheater, after assembling in boiler and after steam pipes are fitted up, is to be thoroughly tested and to be tight under water pressure of at least 30% more than the working pressure of the boiler.

DAMPER	Card 1982-P	DAMPER SHAFT LINK	Card 1070
DAMPER CYL. ARM.	Card 1074	PATENT PLATE	Card 3159
DAMPER CYL. PIPE FITTING	Card 1069-A	S. H. UNIT BOLT WASHER	Card 1071
DAMPER CYL. PIPE UNION	Card 1287	S. H. UNIT CLAMP	Card 1073
DAMPER CYL. PIPING DIAGRAM	Card	S. H. UNIT CLAMP WASHER	Card 10305
DAMPER CYL. SUPPORT	Card	S. H. PIPE END	Card 1344
DAMPER SHAFT	Card 1068	S. H. PIPE BAND	Card 1988
DAMPER SHAFT ARM	Card 1065	RETURN BENDS	Card 10299
DAMPER SHAFT BEARING (O.S.)	Card 1148	DEFLECTING PLATE HANDLE	Card 1487
DAMPER SHAFT BEARING (I.S.)	Card 1275-G	LUBRICATOR CONNECTION	Card 3023
SPACING OF BANDS & SUPPORTS	Card 10792	DEFLECTING PLATE STUDS	Card 10809
TYPE OF RETURN BENDS	CAST STEEL	DEFLECTING PLATE CLAMP	Card 10809-A

SPECIFICATION FOR LOCOMOTIVES 12 3¼ E 45

FOR SILVER FALLS TIMBER COMPANY

R.

(25)

1 ALL PARTS POSSIBLE TO BE MADE INTERCHANGEABLE WITH ENGINE #101, CLASS - 12 3¼ E 23, BUT DO NOT CHANGE DESIGN.

2 AUXILIARY DOME FOR SAFETY VALVE AND WHISTLE

3 PARTICULAR PAINS TO BE TAKEN WITH THE FOUR INSIDE CORNERS OF THE FIREBOX, AS COMPANY HAVE HAD CONSIDERABLE TROUBLE WITH THEIR LOCOMOTIVE 101, CLASS 12-3¼ E 23, ESPECIALLY NEAR THE MUD RINGS.

4 FLEXIBLE STAYBOLTS TO BE TATE ABOUT 400 IN NUMBER, LOCATED IN BREAKING ZONE.

5 ON LOCOMOTIVE #101, CLASS 12-3¼ E 23, COMPANY CUT OUT THE DOOR SHEET OF THE FIREBOX FROM EVEN WITH THE DECK TO THE CROWN SHEET WITH AN ELECTRIC WELDER, AND SET IN A SHEET THIS SIZE, TO OVERCOME APPROXIMATELY 50 CRACKS WHICH DEVELOPED AROUND THE RIVET HOLES. COMPANY ALSO PUT 4 STAYS FROM THE TOP SEAM OF BACKHEAD OF THE BOILER TO THE TOP OF THE CROWN SHEETS AS SUPPORTS. LOWERED THE FIREPAN FROM ABOUT 10" ABOVE THE MUD RING TO THE LOWEST POSSIBLE POINT, AND IN ADDITION BRICKED UP THE ENTIRE BACK SHEET. COMPANY REQUEST THAT WE BEAR THESE THINGS IN MIND WITH THE NEW LOCOMOTIVE.

6 OIL BURNING ARRANGEMENT TO BE B. L. W. STANDARD WITH VON-BODEN INGLES OIL BURNER PLACED IN FRONT END OF FIRE BOX. OIL BURNING ARRANGEMENT TO BE SAME AS FOR 12-3¼ E 23. ROYALTY PAYABLE BY THE B. L. W.

7 SUPERHEATER AS LOCOMOTIVE SUPERHEATER CO'S SPECIFICATION No. O-7214 DATED MARCH 12, 1917 (COPY ATTACHED) SUPERHEATER, SCHMIDT TYPE, CONNECTING WITH TOP HEADER IN SMOKE BOX, AND WITH OUTSIDE STEAM PIPE CONNECTIONS TO VALVE CHAMBERS. ROYALTY ON SUPERHEATER PAYABLE BY THE B.L.W.

8 HAND HOLE AND CAP IN EACH SIDE OF SMOKE BOX FOR INSPECTION OF SUPERHEATER.

9 PILOT TO BE RY.CO'S STANDARD DESIGN

10 COMPANY CALL OUR ATTENTION ESPECIALLY TO THE LONG EXTENSION BEING PLACED ON THE HEADLIGHT CASINGS.

11 PARTICULAR CARE TO BE TAKEN WITH FRONT SANDERS AS SANDERS DO NOT WORK WELL ON 12-3¼ E 23 WHEN LOCOMOTIVE IS GOING UP HILL.

12 FLANGE LUBRICATORS, COLLINS, APPLIED TO FRONT AND BACK DRIVING WHEELS

13 TIRES AND AXLES FOR ENGINE AND TENDER FROM STANDARD STEEL WORKS.

THE BALDWIN LOCOMOTIVE WORKS As Spec'n. C-1608

Memorandum Spec'n 17017

SPECIFICATION FOR LOCOMOTIVES 4 11 C 419

FOR Pierce Coal Company

R.

Gen. as Photo. 5719

Engine Drawing No. 75

1-29-17

Gauge of Road 3' 0" Play 3/8"

Wheelbase, Rigid 4' 6" Driving 4' 6" Total 4' 6"

Total wheelbase, eng. and tend. { Actual ----- / Limited to -----

Curves -----

Limits, Height ----- Width -----

Weight (approximate) in working order, Total 27,000 pounds

On F. tr'k ----- lbs., Drivers 27,000 lbs., B. tr'k ----- lbs.

Tractive power 5500 lbs., Ratio of adhesion 5.

Work'g St'm Pres. 160 lbs., Service Switching

Fuel Soft Coal

Front tube sheet to be 3/8" thick

Boiler Steel Thick 5/16" Bill 8087

Boiler, Diam. 32" Plan Straight Top

Boiler st'm pres. 160 lbs., Tested to { 180 lbs. steam pres. / 214 lbs. water pres.

With factor of safety of 5.06

Longitud. seams Double riveted, lap joints

Dome, diam. 19" Pos. Central

Firebox Steel Combustion chamb. None

Firebox, length 30-13 3/16" Width 24 3/8" Depth F. 32 3/4" B. 31"

Firebox, Tube 7/16" Crown 5/16" Sides 5/16" Back 5/16"

Firedoor opening 14" diam.

Water space, Front 2" and 2 1/2" Sides 2" Back 2"

Water space, Frame Single Riveted

Water space stays 7/8" diam. with 3/16" holes 1 1/4" deep from O.S.

Radial stays 7/8" diam. Sling stays front None

Button heads below crown on ----- central rows

Crown bars None Placed ----- above crown

Crown bolts -----

Flues None

Tubes #13 W. G. Charcoal Iron or Steel

Tube ends Swaged for copper ferrules firebox ends

Number 74 Diam. 1 1/2" Length 7' 7 3/8"

Heating Surface	Flues -----	Combus. Chamb. -----	Total 245.7
	Tubes 218.9	Fire Box 26.8	Fire Brick Tubes -----
Grate area 5.1	Ratio to Heating Surface 1 : 48		
Superheater -----			

Fire Brick Arch, None

Grates Plain bars and drop plate

Ash Pan, Dampers Back

Throttle Balance Pos. Dome

Dry pipe Steel

Superheater None

Smokebox extension With Cleaning hole and cap Underneath

Spark ejector or hopper None

Netting and deflect. plates With

Exhaust nozzles Single high

Stack Straight Dia. 9" Hole in S. B., dia. 10"

* Front and Back bumpers and steps to be generally similar to 4-11 C 416, except dimensions to be as shown on Co's blue-print sketch.

Safety Valves (not spec) Two Consolidated 1 1/2"

Safety valves None with relief lever, Set to 160 pounds

Whistle B. L. W. plain

Steam Gauge One Iron 6" MAKER:-Ashcroft (not spec)

Steam gauge stand Iron **Clock** None

Water Gauge One B.L.W. Ironclad **Cab Lamps** to burn oil

Gauge Cocks Three Back Surface valve None

Lowest gauge cock 3" above highest part of crown

Lubricator steam valve to have separate dry pipe to dome

Blower Valve B. L. W.

Blow off Cock One B. L. W. POS:-Front

Cleaning Plugs

Firebox Corners

Crown, One each side and one back

Waist, One under front

Front tube sheet, One Fusible plug One

Pump None Pos. -----

Top chamb. ----- Bottom chamb.-----

Feed Cock ----- Feed pipes -----

Checks ----- Check pipes -----

Injectors (not spec) Two Metropolitan, Class "H" No. 3

Injectors, Pos. Right and Left Steam pipes Copper

Pipes, Check Iron Feed Iron Overflow Iron

Check B. L. W. Pos. Right and Left

Steam Heat None

Cab Wood

Coal box in left side of Cab.

Cab boards Wood Nosing None

Running boards None Nosing -----

Hand rail Iron Located on Cab

☼**Back Bumper** Oak

Pilot None Pushing shoes None

☼**Front Bumper** Oak Bumper plate None

Steps across front and back with handrails

F & B.Drawhead, Center above rail 16" to upper pocket

Coupler Drawcasting of cast iron with two pockets having pin 1 1/2" diam. front and back

Signal fixtures None

Headlight None Reflector, To burn -----

Headlight, Nos. on sides ----- H'dl't step -----

Lamp shelf None Nosing -----

Bell 28 pounds

Sand Box One Diam. 15" Body Iron Painted Pipes Iron

Sander Hand, to sand front and back

Dome casing Iron Painted

Boiler Jacket #22 Soft Steel Pt Bands Iron Style 9

Boiler Lagging Magnesia sectional

THE BALDWIN LOCOMOTIVE WORKS

A. J. Stratford Surveyor

SPECIFICATION FOR LOCOMOTIVES 4 11 C 419

FOR Pierce Coal Company

R.

(27)

Frames Cast Steel Braces Solid

Frames to be in one piece with double back rails.

Cylinders, Diam. 9" Stroke 14"

St'm ports, Length 2 1/2" Width 3/8" Bridges 3/8"

Exh. ports, Length 7/8" Width 1 1/4" Valve lead 1/16"

Valve travel 3" Steam lap 1/2" Exhaust clearance -----

Eccentric-crank throw 2 1/2" By-pass valve None

S. F. Lubr. (not spec) Michigan Double Bulls Eye, 1/8 pints capacity

Cyl'r heads Cast Iron; Lubr. pipes of Iron under Jacket

Cyl'r casings Iron Pto. Head covers Steel Painted

St'm chest casings Iron Pto. Covers Steel Painted

St'm chest valves Plain "D"

Mot. pkg { Piston rods Jerome (spec) / Valve stems Braided Packing.

Pistons Cast Iron rings sprung into solid head

Guides Steel Oil cups Needle

Crossheads Cast Iron

Wrist Pins Steel Rod cups Needle

Parallel Rods to have solid ends

Valve Motion Stephenson

Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.

All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Driving Wheels without hub liners

Drivers, O. S. Diam. 28" Cen. diam. 24" Centres Cast Iron

Tires Steel Held by Shrinkage and Shoulder

Tires, Flanged, Pos. All Size 2" X 5"

Tires, Plain, Pos. None Size -----

Lateral play between driving boxes and wheel hubs - 1/32" total

Driving Boxes Cast Iron

Journals, Diam. 4" Length 6"

Springs. Make B. L. W.

Front Engine Truck None Wheeled -----

To swing -----each side of cen., Cen. pin liners -----

Journals, Diam. ----- Length ----- Boxes -----

Wheels, Diam. ----- Tread ----- Kind -----

Tires ----- Cen. diam. ----- Size -----

Tires held by -----

Back Engine Truck None Wheeled -----

To swing -----each side of cen., Cen. pin liners -----

Journals, Diam. ----- Length ----- Boxes -----

Wheels, Diam. ----- Tread ----- Kind -----

Tires ----- Cen. diam. ----- Size -----

Tires held by -----

Brakes, position On all driving wheels (No tender)

Operating Parts { Engine, Sch. U-O B.L.W. Steam / Enp. Tr'k, sch. -----

Foundation Parts { Drivers, sch. U-O B.L.W. / Eng. Tr'k, sch. -----

Air pump ----- Pos. -----

Train connections -----

Train signal, sch. -----

Separate lubricator for steam brake valve.

Tender None Wheeled, Drawing No. -----

Weight, with fuel and water, about -----

Tank 500 Gallons, Bill 4528

Saddle Tank located over top of boiler and extending over Smoke Box.

Tool Boxes -----

Frame -----

Front Drawbar height -----

Pilot ----- Pushing shoes -----

Back drawhead, center above rail -----

Coupler -----

Steps -----

Trucks -----

Springs -----

Journals, Diam. ----- Length -----

Wheels, Diam. ----- Tread ----- Kind -----

Tires ----- Cen. diam. ----- Size -----

Tires held by -----

Safety chains -----

Brake Position -----

Brake sch. -----

List of tools, sch. 26

Photo sch. 2 Inspection B. L. W.

To be weighed Yes Material spec'ns B. L. W.

Certificate of boiler test Three copies of B.L.W. form 1036

Junior laws to 3-1-17 Shipment On Car (See ✳ below)

Brass shop finish, No. 1

Machine shop finish D-165

B. L. W. Patents } None

Property plates B. L. W. for Engine

Painting:—Engine, style 223 Olive Green and Aluminum

Painting:—Tender, style -----

Mark on tank sides, PIERCE COAL COMPANY

Road Nos. Pos. Road Nos. Name None

F. No. Plate 2

Sand Box

Cab Sides

✳ Extras ordered through Extra Work Department, Order No. 1385 dated 4-20-17 to be shipped with locomotive.

THE BALDWIN LOCOMOTIVE WORKS Dup. 10 30½ D 28, WITH SOME DETAILS EXCEPT AS OTHERWISE SPECIFIED.

Memorandum Spec'n 11178

SPECIFICATION FOR LOCOMOTIVES 10 30 ½ D 41

Gen. Al Photo. 2067

Engine Drawing No. 5

FOR WEST END COAL COMPANY

F. 10-18-16

Gauge of Road 4' 8½" Play ⅛"
Wheelbase, Rigid 10' 0" Driving 10' 0" Total 25' 3"
Total wheelbase, eng. and tend. {Actual ----- Limited to -----

Curves 20 DEGREES, GRADE 4%

Limits, Height ----- Width -----
Weight (approximate) in working order, Total 163500 LBS.
On F. tr'k 17,000 lbs., Drivers 115,000 lbs., B. tr'k 31,500 lbs.

Tractive power 25,860 lbs., Ratio of adhesion (4)
Work'g St'm Pres. 180 lbs., Service SWITCHING
Fuel ANTHRACITE COAL AS FINE AS NO. 1 BUCKWHEAT

FRONT TUBE SHEET TO BE ½" THICK
Boiler STEEL Thick 11/16" Bill 7950
Boiler, Diam. 62" Plan STRAIGHT TOP
Boiler st'm pres. 180 lbs., Tested to {200 lbs. steam pres. 240 lbs. water pres.
WITH FACTOR OF SAFETY OF 5.5
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS.

Dome, diam. 29" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE
Firebox, length 99" Width 72" Depth F. 58" B. 49"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening ONE OVAL 16" x 20"
Water space, Front 4" Sides 3" Back 3"
Water space, Frame SIDGLE Riveted
Water space stays ⅞" DIAM. WITH 3/16" HOLE 1½" DEEP FROM O.S.
Radial stays 1" DIAM. Sling stays front {TWO ROWS OF B.L.W. EXPANSION STAYS.
Button heads below crown on EIGHT central rows
Crown bars NONE Placed ---- above crown
Crown bolts ----

Flues ----
Tubes #12 W. G. IRON
Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.
Number 260 Diam. 2" Length 10' 3"

Heating Surface			
Flues ----	Combus. Chamb. ----	Total 1518⁰
Tubes 1384⁰	Fire Box 134⁰	Fire Brick Tubes ----
Grate area 49.5⁰	Ratio to Heating Surface 1 : 30.6	
Superheater ----		

Fire Brick ARCH, NONE

Grates ROCKING BARS AND DROP PLATE
Ash Pan, Dampers FRONT AND BACK

Throttle BALANCE Pos. DOME
Dry pipe WROT IRON

Superheater NONE

Smokebox extension WITH Cleaning hole and cap RIGHT AND LEFT
Spark ejector or hopper WITH
Netting and deflect. plates WITH

Exhaust nozzles DOUBLE HIGH

Stack STRAIGHT Dia. 18" Hole in S. B., dia. 22½"

(Spec.) **Safety Valves** TWO CROSBY 3"
Safety valves NONE with roller lever, Set to 180 LBS.
Whistle B. L. W. PLAIN

Steam Gauge ONE IRON 7" MAKER:- ASHCROFT (not spec.)
Steam gauge stand IRON **Clock** NONE

Water Gauge ONE B.L.W. (IRONCLAD) **Cab Lamps** TO BURN OIL
Gauge Cocks THREE BACK Surface valve NONE
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve TO HAVE separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock ONE B. L. W. POS:- FRONT
Cleaning Plugs
Firebox CORNERS DIAGONAL, AND SIDES AND BACK
Crown, TWO EACH SIDE AND FOUR BACK
Waist, ONE UNDER FRONT
Front tube sheet, TWO Fusible plug ONE

Pump NONE Pos. ----
Top chamb.---- Bottom chamb. ----
Feed Cock ---- Feed pipes ----
Checks----- Check pipes ----

(Spec.) **Injectors** TWO HANCOCK, TYPE A No. 8
Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER
Pipes, Check IRON Feed IRON Overflow IRON
Check B. L. W. Pos. RIGHT AND LEFT

Steam Heat NONE

Cab WOOD

Cab boards WOOD Nosing NONE
Running boards NONE Nosing -----
Hand rail IRON Located on CAB

Back Bumper OAK

Pilot NONE Pushing shoes FRONT AND BACK
Front Bumper OAK Bumper plate NONE
Steps ACROSS FRONT AND REAR WITH HAND RAIL
STEPS, HAND HOLDS ETC. TO CONFORM TO I.C.C. REQUIREMENTS
F & B Drawhead, Center above rail 33½"
Coupler M. C. B. AUTO.

Signal fixtures NONE

Headlight TWO, ROUND CASE 18" Reflector, To burn KEROSENE
Headlight, Nos. on sides WITH H'dr'l step WITH
Lamp shelf NONE Nosing -----

Bell 92 POUNDS
Sand Box TWO Diam. 28" Body IRON PTD. Pipes IRON
Sander LEACH AIR, TRAP A-1

Dome casing IRON PAINTED

Boiler Jacket #22 PLAN. STEEL Bands IRON Style 9
Boiler Lagging MAGNESIA SECTIONAL

THE BALDWIN LOCOMOTIVE WORKS
H. A. Beardsley Jan 1917

(29)

SPECIFICATION FOR LOCOMOTIVES 10 30 ½ D 41

FOR WEST END COAL COMPANY

F.

Frames CAST STEEL Braces SOLID

Cylinders, Diam. 18" Stroke 24"
St'm ports, Length 16" Width 1½" Bridges 1"
Exh. ports, Length 16" Width 2½" Valve lead 1/16"
Valve travel 5½" Steam lap 1" Exhaust clearance -----
Eccentric crank throw 5" By-pass valve NONE
S. F. Lubr. (MAKE) DETROIT TRIPLE NO. 22 BULLS EYE
Cyl'r heads CAST IRON; LUBR. PIPES OF IRON UNDER JACKET
Cyl'r casings IRON PTD. Head covers STEEL PAINTED
St'm chest casings IRON PTD. Covers STEEL PAINTED
St'm chest valves BALANCED, WITH VACUUM VALVES
Met. pkg (PISTON ROD VALVE STEM) U. S. (not spec.)

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD
Guides STEEL Oil cups NEEDLE
Crossheads CAST STEEL
Wrist Pins STEEL Rod cups PLUNGER
MAIN RODS CONNECTED TO REAR PAIR OF DRIVERS
PARALLEL RODS TO HAVE SOLID ENDS
Valve Motion STEPHENSON
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.
CO. COMPLAINS OF EXCESSIVE WEAR OF CROSSHEAD SHOES ON 10 30 ½ D 28.
All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.
DRIVING WHEELS WITHOUT HUB LINERS
Drivers, O. S. Diam. 46" Cen. diam. 40", CENTERS CAST IRON

(Spec. only the plan shows four. All only received at present.)

Tires STEEL Held by SHRINKAGE AND SHOULDER
Tires, Flanged, Pos. FRONT AND BACK Size 3" x 5½"
Tires, Plain, Pos. MIDDLE Size 3" x 6½"
Lateral play between driving boxes and wheel hubs— 1/16" TOTAL
Driving Boxes STEELED CAST IRON
Journals, Diam. 8" Length 10"

Springs, Make B. L. W.

Front Engine Truck TWO Wheeled SWING BOLSTER
To swing 2½" each side of cen., Cen. pin liners NONE
Journals, Diam. 5" Length 9" Boxes CAST IRON
Wheels, Diam. 28" Tread 1½" Kind CHILLED CAST IRON PLATE
Tires NONE Cen. diam. ---- Size ----
Tires held by -----
F. AND B. ENG. TRUCK WHEELS WITHOUT HUB LINERS.
Back Engine Truck TWO Wheeled RUSHTON, RADIAL TYPE
To swing 2½" each side of cen., Cen. pin liners NONE
Journals, Diam. 7" Length 10" Boxes CAST IRON
Wheels, Diam. 36" Tread 1½" Kind CHILLED CAST IRON DOUBLE PLATE.
Tires NONE Cen. diam. ---- Size ----
Tires held by -----

Brake, position ON ALL DRIVING WHEELS (NO TENDER)
Operating Parts | Engine, Sch. A-1 WEST'G AUTO. AIR; Eng. Tr'k, sch. -----
Foundation Parts | Drivers, sch. UM-2 AMERICAN O. S. EQUALIZED; Eng. Tr'k, sch. -----
Air pump ONE 9½" Pos. RIGHT SIDE
Train connections FRONT AND BACK
Train signal, sch. NONE
LE CHATELLIER BRAKE, VALVE ON LINE OF LOWER GAUGE COCK.
AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

Tender NONE Wheeled. Drawing No. -----
Weight, with fuel and water, about -----

Tank 1900 Gallons. Bill {4380 RIGHT SIDE 4381 LEFT SIDE
TANKS RECTANGULAR SHAPE, LOCATED AT SIDES OF BOILER
FUEL BOX AT REAR
Tool Boxes -----

Frame -----

Front Drawbar height -----
Pilot ----- Pushing shoes -----
Back drawhead, center above rail -----
Coupler ----

Steps -----

Trucks -----

Springs -----
Journals, Diam. ----- Length -----
Wheels, Diam. ----- Tread ----- Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----
Safety chains -----

Brake Position -----
Brake sch. -----

List of tools, sch. 29
Photo sch. NONE Inspection B. L. W.
To be weighed YES Material spec'ns B. L. W.
Certificate of boiler test THREE COPIES OF B.L.W. FORM 1036
Junior tanks to 10-24-16 Shipment ON OWN WHEELS

Brass shop finish, No. 1
Machine shop finish D-106

B. L. W. Patents | THROTTLE, PATENTED JAN. 23, 1900. (CAST ON)
FEED PIPE STRAINER, PATENTED SEPT. 1, 1903. (CAST ON)
REAR TRUCK 645834 MAR. 30, 1900. (BRASS PL.)

Property plates NONE

Painting:—Engine, style 291 OLIVE GREEN AND ALUMINUM
Painting:—Tender, style ----

Mark on TANK SIDES, M. & E.

Road Nos. Pos. Road Nos. 26 Name NONE
F. No. PLATE
DOME AND
BACK OF FUEL BOX

THE BALDWIN LOCOMOTIVE WORKS As Spec'n. C-4553

Memorandum Spec'n 17008

SPECIFICATION FOR LOCOMOTIVES 4 20 C 5½

FOR PHILADELPHIA SUBURBAN GAS & ELECTRIC CO.

Gen. as PHOTO. 5002

Engine Drawing No. 16

1-12-17

Gauge of Road 4' 8½" Play 3/4"
Wheelbase, Rigid 6' 0" Driving 6' 0" Total 6' 0"
Total wheelbase, eng. and tend. { Actual ----- / Limited to ----
RAILS, 65 AND 80 LBS.
Curves 135 FEET RADIUS GRADES, 2%

Limits, Height ——→ *and* ——→ Width *(see note ②)*
Weight (approximate) in working order, Total 61,000 LBS.
On F. tr'k ----- lbs., Drivers 61,000 lbs., B. tr'k ----- lbs.

Tractive power 11,850 lbs., Ratio of adhesion 5.1 *(see note ③)*
Work'g St'm Pres. 165 lbs., Service SWITCHING AROUND COKE OVENS
Fuel SOFT COAL

FRONT TUBE SHEET 7/16" THICK.
Boiler STEEL Thick 7/16" - Bill 8083
Boiler, Diam. 38" Plan STRAIGHT TOP

Boiler st'm pres. 165 lbs., Tested to { 185 lbs. steam pres. / 220 lbs. water pres.
WITH FACTOR OF SAFETY OF 5.
Longitud. seams DOUBLE RIVETED LAP JOINTS

Dome, diam. 22" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE
Firebox, length 43" Width 33⅜" Depth F. 40" B. 40"
Firebox, Tube 7/16" Crown 5/16" Sides 5/16" Back 5/16"
Firedoor opening 16" DIAM.
Water space, Front 3½" Sides 3" Back 3"
Water space, Frame SINGLE Riveted
Water space stays ⅞" DIAM. WITH 3/16" HOLES 1¼" DEEP FROM O. S.

Radial stays 1" DIAM. Sling stays front NONE
Button heads below crown on NONE · central rows
Crown bars NONE Placed ----- above crown
Crown bolts -----

Flues -----
Tubes #12 W. G. CHARCOAL IRON OR STEEL
Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS
Number 83 Diam. 1¾" Length 9' 1-9/16"

Heating Surface	Flues -----	Combus. Chamb. -----	Total 387⁰⁰
	Tubes 344⁰⁰	Fire Box 43⁰⁰	Fire Brick Tubes -----
Grate area 10⁰⁰	Ratio to Heating Surface 1 : 38.7		
Superheater -----			

Fire Brick ARCH NONE

Grates ROCKING BARS AND DROP PLATE
Ash Pan, Dampers FRONT AND BACK

Throttle BALANCE Pos. DOME
Dry pipe STEEL

Superheater NONE

Smokebox extension WITH Cleaning hole and cap NONE
Spark-ejector-of hopper WITH
Netting and deflect. plates WITH

Exhaust nozzles DOUBLE HIGH

Stack STRAIGHT Dia. 12" Hole in S. B., dia. 13½"

Safety Valves TWO CONSOLIDATED 1½" (NOT SPEC)
Safety valves NONE with relief lever, Set to 165 POUNDS
Whistle B. L. W.

Steam Gauge ONE IRON 7" MAKER:-ASHCROFT (NOT SPEC)
Steam gauge stand IRON **Clock** NONE

Water Gauge ONE B.L.W. (IRONCLAD) **Cab Lamps** TO BURN OIL
Gauge Cocks THREE BACK Surface valve NONE
Lowest gauge cock 3¼" above highest part of crown
Lubricator steam valve TO HAVE separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock ONE B. L. W. POS:-LEFT SIDE
Cleaning Plugs
Firebox CORNERS, DIAGONAL STAYS AND BACK
Crown, TWO BACK
Waist, ONE UNDER FRONT
Front tube sheet, ONE Fusible plug ONE

Pump NONE Pos. -----
Top chamb. ----- Bottom chamb. -----
Feed Cock ----- Feed pipes -----
Checks ----- Check pipes -----
INJECTORS TO BE ELEVATED RAILROAD PATTERN IN ORDER TO MATCH UP WITH CO'S OTHER EQUIPMENT
Injectors TWO MONITOR (NOT SPEC) No. 5
Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER
Pipes, Check IRON Feed IRON Overflow IRON
Check B. L. W. Pos. RIGHT AND LEFT

Steam Heat NONE

Cab STEEL *(see note ①)*

Cab boards STEEL Nosing T-IRON
Running boards STEEL Nosing T-IRON
Hand rail IRON Located on TANK

Back Bumper CAST IRON

Pilot NONE Pushing shoes CAST IN BUMPERS
Front Bumper CAST IRON Bumper plate NONE
Steps ACROSS FRONT AND BACK WITH HANDRAILS
STEPS, HAND HOLDS, ETC. TO CONFORM TO I. C. C. REQUIREMENTS
F. & B. Drawhead, Center above rail 33½"
Coupler M. C. B. AUTO.

Signal fixtures NONE

Headlight TWO ROUND CASE 12" Reflector, To burn KEROSENE
Headlight, Nos. on sides WITH H'd'l't step NONE
Lamp shelf NONE Nosing -----

Bell 45 POUNDS
Sand Box TWO Diam. 19" Body IRON PAINTED Pipes IRON
Sander HAND IN EACH BOX, TO SAND FRONT AND BACK

Dome casing IRON PAINTED

Boiler Jacket #22 SOFT STEEL PTD Bands IRON Style 9
Boiler Lagging MAGNESIA SECTIONAL

THE BALDWIN LOCOMOTIVE WORKS
E. N. Kalbach June 1917

(31)

SPECIFICATION FOR LOCOMOTIVES 4 20 C 5¼

FOR PHILADELPHIA SUBURBAN GAS & ELECTRIC CO.

Frames CAST STEEL Braces SOLID

Cylinders, Diam. 13" Stroke 18"
St'm ports, Length 12" Width 1" Bridges ⅞"
Exh. ports, Length 12" Width 2" Valve lead 1/16"
Valve travel 4¼" Steam lap 1" Exhaust clearance -----
Eccentric crank throw 3½" By-pass valve NONE
S. F. Lubr. (NOT SPEC) MICHIGAN DOUBLE BULLS EYE, 2 PINTS CAPACITY
Cyl'r heads CAST IRON; LUBR. PIPES OF IRON UNDER JACKET
Cyl'r casings IRON PTD. Head covers STEEL PAINTED
St'm chest casings IRON PTD. Covers STEEL PAINTED
St'm chest valves RICHARDSON BALANCED, WITH VACUUM VALVES
Met. pkg { PISTON ROD / VALVE STEMS } UNITED STATES (NOT SPEC)

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD
Guides STEEL Oil cups NEEDLE
Crossheads CAST STEEL
Wrist Pins STEEL Rod cups PLUNGER
PARALLEL RODS TO HAVE SOLID ENDS

Valve Motion STEPHENSON
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.
DRIVING WHEELS WITHOUT HUB LINERS
Drivers, O. S. Diam. 36" Cen. diam. 31", CENTRES CAST IRON

Tires STEEL Held by SHRINKAGE AND SHOULDER
Tires, Flanged, Pos. ALL Size 2½" X 5½"
Tires, Plain, Pos. NONE Size -----
Lateral play between driving boxes and wheel hubs = 1/32" TOTAL
Driving Boxes CAST IRON
Journals, Diam. 6½" Length 8"

Springs. Make B. L. W.

Front Engine Truck NONE Wheeled -----
To swing -----each side of cen., Cen. pin liners -----
Journals, Diam.----- Length ----- Boxes -----
Wheels, Diam.----- Tread ----- Kind -----
Tires ----- Cen. diam.----- Size -----
Tires held by -----

Back Engine Truck NONE Wheeled -----
To swing ----- each side of cen., Cen. pin liners -----
Journals, Diam.----- Length ----- Boxes -----
Wheels, Diam. ----- Tread----- Kind -----
Tires ----- Cen. diam.----- Size -----
Tires held by -----

Brake, position ON ALL DRIVING WHEELS (NO TENDER)
Operating Parts: Engine, Sch. U-1 B. L. W. STEAM / Eng. Tr'k, sch. -----
Foundation Parts: Drivers, sch. U-1 B. L. W. / Eng. Tr'k, sch. -----
Air pump ----- Pos. -----
Train connections -----
Train signal, sch. -----
SEPARATE LUBRICATOR FOR STEAM BRAKE VALVE

TENDER, NONE

TANK, 950 GALLONS, BILL 3812
SADDLE TANK LOCATED OVER TOP OF BOILER AND EXTENDING OVER SMOKE BOX.

① CAB TO BE SAME STYLE AS SHOWN ON PHOTO. 5002 (4-20 C DWG. 16) AND TO BE EQUIPPED WITH SIDE DOORS, WITH OPENING IN BACK, AND TO HAVE HANDLES ON EACH SIDE OF CAB AS SHOWN ON PHOTO. CENTRE LINE OF LOCO. TO OUTSIDE OF CAB TO BE 47" ON RIGHT SIDE AND 36½" ON LEFT SIDE. THE LEFT SIDE OF CAB TO BE FLUSH WITH TANK. OMIT FUEL BOX.

② CLEARANCE BETWEEN RETAINING WALL AND TRACK AT BACK OF OVENS, AS SHOWN ON CO'S PENCIL SKETCH DATED 12-23-16

③ HAULING CAPACITY OF LOCOMOTIVE TO BE 215 TONS (OF 2000 POUNDS) UP A STRAIGHT 2% GRADE, ESTIMATED ON THE BASIS OF 8 POUNDS FRICTIONAL RESISTANCE

LIST OF TOOLS, SCH. 26
PHOTO. SCH. NONE INSPECTION, B. L. W.
TO BE WEIGHED, NO. MATERIAL SPEC'NS. B. L. W.
CERTIFICATE OF BOILER TEST THREE COPIES OF B.L.W. FORM 1036.
JUNIOR LAWS TO 3-15-17 SHIPMENT, ON OWN WHEELS

BRASS SHOP FINISH, NO. 1
MACHINE SHOP FINISH, D-165

B. L. W. PATENTS } NONE

PROPERTY PLATES, NONE

PAINTING:- ENGINE, STYLE 223 OLIVE GREEN AND ALUMINUM
PAINTING:- TENDER, STYLE -----

MARK ON TANK SIDES, PHILADELPHIA SUBURBAN GAS & ELECTRIC CO.

ROAD NOS. POS. F.NO. PLATE, F. SAND BOX, CAB SIDES — ROAD NOS. 4 — NAME, NONE

THE BALDWIN LOCOMOTIVE WORKS DUPLICATE 4 26 C 143 WITH SAME EXTRAS, EXCEPT AS OTHERWISE SPECIFIED.

Memorandum Spec'n 11155

SPECIFICATION FOR LOCOMOTIVES 4 26 C 146 Gen. as PHOTO. 3515

FOR THE PHILADELPHIA ELECTRIC COMPANY (CHESTER WATERSIDE STATION) **Engine Drawing No.** 14

9-22-16

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 7' 0" Driving 7' 0" Total 7' 0"
Total wheelbase, eng. and tend. { Actual ---, Limited to ----

Curves AND GRADES (SEE ✳ NEXT PAGE)

Limits, Height ---- Width ----
Weight (approximate) in working order. Total 98,500 POUNDS
On F. tr'k ---- lbs., Drivers 98,500 lbs., B. tr'k --- lbs.

Tractive power 18,990 lbs., Ratio of adhesion 4.6, TANK EMPTY
Work'g St'm Pres. 160 lbs., Service SWITCHING
Fuel SOFT COAL

Boiler STEEL Thick ½" Bill 7810
Boiler, Diam. 52" Plan STRAIGHT TOP
Boiler st'm pres. 180 lbs., Tested to { 200 lbs. steam pres., 240 lbs. water pres.
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS, 90 % SEAMS

Dome, diam. 25" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE
Firebox, length 58-3/16" Width 34⅜" Depth F. 68½" B. 66½"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" DIAM.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame SINGLE Riveted
Water space stays ⅞" DIAM. WITH 3/16" HOLE 1½" DEEP FROM O.S.

Radial stays 1" DIAMETER Sling stays front { TWO ROWS OF B. L. W. EXPANSION STAYS
Button heads below crown on SIX central rows
Crown bars ---- Placed ---- above crown
Crown bolts ----

Flues ----
Tubes #12 W.G. IRON OR STEEL
Tube ends SWAGED FOR COPPER FERRULES FIRE BOX ENDS
Number 181 Diam. 2" Length 14' 2"

Heating Surface Flues --- Combus. Chamb. --- Total 1145.5 □'
Tubes 1050.3 □' Fire Box 95.2 □' Fire Brick Tubes ---
Grate area 13.8 □' Ratio to Heating Surface 1 : 83
Superheater ---

Fire Brick ARCH, ON STUDS

Grates ROCKING BARS AND DROP PLATE
Ash Pan, Dampers FRONT AND BACK

Throttle BALANCE Pos. DOME
Dry pipe STEEL

Superheater NONE

Smokebox extension WITH Cleaning hole and cap L.S. ONLY
Spark ~~ejector or~~ hopper WITH
Netting and deflect. plates WITH

Exhaust nozzles DOUBLE, HIGH

Stack STRAIGHT Dia. 16" Hole in S. B., dia. 23½"

(NOT SPEC) **Safety Valves** TWO COALE 2½"
Safety valves NONE with relief lever, Set to 160 POUNDS
Whistle B. L. W. PLAIN

Steam Gauge ONE IRON 7" MAKER: ASHCROFT (NOT SPEC)
Steam gauge stand IRON **Clock** NONE

Water Gauge ONE B.L.W. (IRONCLAD) **Cab Lamps** TO BURN OIL
Gauge Cocks THREE BACK Surface valve NONE
Lowest gauge cock 3¼" above highest part of crown
Lubricator steam valve TO HAVE separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock ONE B. L. W. POS: RIGHT SIDE
Cleaning Plugs
Firebox CORNERS, BACK ONES DIAGONAL AND SIDES
Crown, TWO EACH SIDE AND TWO BACK
Waist, ONE UNDER FRONT
Front tube sheet, TWO Fusible plug ONE

Pump NONE Pos. ---
Top chamb. --- Bottom chamb. ---
Feed Cock --- Feed pipes ---
Checks --- Check pipes ---

(NOT SPEC) **Injectors** TWO MONITOR No. 7
Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER
Pipes, Check IRON Feed IRON Overflow IRON
Check B. L. W. WITH STOP VALVE Pos. RIGHT AND LEFT

Steam Heat NONE

Cab WOOD, VENTILATOR IN CAB ROOF.
COAL BOX IN LEFT SIDE OF CAB.

Cab boards WOOD Nosing NONE
Running boards WOOD Nosing NONE
Hand rail IRON Located on TANK

Back Bumper OAK
BUMPERS (F.& B.) TO HAVE SHEET IRON COVERS ON FRONT AND AROUND ENDS
Pilot NONE Pushing shoes FRONT AND BACK
Front Bumper OAK Bumper plate NONE
Steps ACROSS FRONT AND BACK WITH HAND RAIL
STEPS, HAND HOLDS, ETC., TO CONFORM TO I. C. C. REQUIREMENTS
F.& B Drawhead, Center above rail 33½"
Coupler M. C. B. AUTOMATIC FRONT AND BACK

Signal fixtures NONE

Headlight TWO ROUNDS CASE 16" Reflector, To burn KEROSENE
Headlight, Nos. on sides WITH H'dl't step NONE
Lamp shelf NONE Nosing ---

Bell 85 POUNDS ON FRONT SAND BOX.
Sand Box TWO Diam. 28" Body IRON PAINTED Pipes IRON
Sander HAND, FRONT AND BACK

Dome casing IRON PAINTED

Boiler Jacket #22 SOFT STEEL PTD Bands IRON Style 9
Boiler Lagging B. L. W. PLASTIC MAGNESIA (FROM STOCK)

THE BALDWIN LOCOMOTIVE WORKS
J. E. Merrick Novice

SPECIFICATION FOR LOCOMOTIVES 4 26 C 146 (33)

FOR THE PHILADELPHIA ELECTRIC COMPANY (CHESTER WATERSIDE STATION)

Frames CAST STEEL Braces SOLID TENDER NONE

Cylinders, Diam. 16" Stroke 24"
St'm ports, Length 15" Width 1⅝" Bridges 1"
Exh. ports, Length 15" Width 2½" Valve lead 1/16"
Valve travel 5½" Steam lap ¾" Exhaust clearance ---
Eccentric crank throw 5" By-pass valve NONE
S. F. Lubr. (NOT SPEC) MICHIGAN DOUBLE BULLS EYE, 2 PINTS CAPACITY
Cyl'r heads CAST IRON: LUBR. PIPES OF IRON UNDER JACKET
Cyl'r casings IRON PAINTED Head covers STEEL PAINTED
St'm chest casings IRON PAINTED Covers STEEL PAINTED
St'm chest valves BALANCED WITH VACUUM VALVES
Met. pkg { PISTON RODS, VALVE STEMS U. S. (NOT SPEC)
PISTON RODS TO BE KEYED TO CROSSHEAD: GUIDE YOKE, STEEL PLATE
Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD
Guides TWO BAR, STEEL Oil cups NEEDLE
Crossheads ALLIGATOR, CAST STEEL
Wrist Pins STEEL Rod cups PLUNGER, FORGED ON RODS
PARALLEL RODS TO HAVE SOLID ENDS

Valve Motion STEPHENSON
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushing
ROCK SHAFT CAST STEEL

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 44" Cen. diam. 38" CENTERS CAST IRON

Tires STEEL Held by SHRINKAGE AND SHOULDER
Tires, Flanged, Pos. ALL Size 3" x 5½"
Tires, Plain, Pos. NONE Size ----
Lateral play between driving boxes and wheel hubs = 1/32" TOTAL
Driving Boxes STEELED CAST IRON
Journals, Diam. 8" Length 8½"

EQUAL BEAMS OF MILD STEEL
Springs. Make B. L. W.

Front Engine Truck NONE Wheeled ---
To swing --- each side of cen., Cen. pin liners ---
Journals, Diam. --- Length --- Boxes ---
Wheels, Diam. --- Tread --- Kind ---
Tires --- Cen. diam. --- Size ---
Tires held by ---

Back Engine Truck NONE Wheeled ---
To swing --- each side of cen., Cen. pin liners ---
Journals, Diam. --- Length --- Boxes ---
Wheels, Diam. --- Tread --- Kind ---
Tires --- Cen. diam. --- Size ---
Tires held by ---

Brake, position ON BOTH PAIRS OF WHEELS (NO TENDER)
Operating Parts { Engine, Sch. U-2, B. L. W. STEAM; Eng. Tr'k, sch. ----
Foundation Parts { Drivers, sch. U-2 B. L. W.; Eng. Tr'k, sch. ----
Air pump --- Pos. ---
Train connections ---
Train signal, sch. ---
SEPARATE LUBRICATOR FOR STEAM BRAKE VALVE

✳ LOCOMOTIVE OT OPERATE UNDER SAME CONDITIONS AS 4 26 C 143 ON GRADES AND CURVES AS FOLLOWS:-
GRADES 1.62 % COMBINED WITH CURVES 158' 0" RADIUS
GRADES 2½ % COMBINED WITH CURVES 167' 6" RADIUS
GRADES 4 % COMBINED WITH CURVES 176' 0" RADIUS

TANK 1250 GALLONS, BILL 4009
TANK SHAPE, SADDLE, OVER TOP OF BOILER

LIST OF TOOLS, SCH. 26
PHOTO. SCH., NONE INSPECTION B. L. W.
TO BE WEIGHED NO. MATERIAL SPEC'NS B. L. W.
CERTIFICATE OF BOILER TEST FOUR COPIES EACH B. L. W. FORMS 1036 AND 491
JUNIOR LAWS TO 10-1-16 SHIPMENT ON OWN WHEELS UNDER STEAM

BRASS SHOP FINISH, NO. 1
MACHINE SHOP FINISH D-165

PATENT PLATES { THROTTLE, PATENTED JAN. 23, 1900 (CASE ON)

PROPERTY PLATES NONE

PAINTING:-ENGINE, STYLE 223, OLIVE GREEN AND ALUMINUM
PAINTING: TENDER, STYLE ------

MARK ON TANK SIDES, BEACON LIGHT COMPANY

No. POS. ROAD NO. NAME NONE
F. NO. PLATE 1
CAB SIDES

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-3623

Memorandum Spec'n 17036

SPECIFICATION FOR LOCOMOTIVES 6 30 D 464

FOR Public Service Electric Company

Gen. as Photo. 3172

Engine Drawing No. 55

2-28-17

Gauge of Road 4'8½" Play ¾"

Wheelbase, Rigid 11'0" Driving 11'0" Total 11'0"

Total wheelbase, eng. and tend. { Actual ---- / Limited to ----

Curves 200 ft radius

Limits, Height ---- Width ----

Weight (approximate) in working order Total 120,000 pounds

On F. tr'k ---- lbs.. Drivers 120,000 lbs., B. tr'k ---- lbs.

Tractive power 25500 lbs.. Ratio of adhesion 4.7

Work'g St'm Pres. 170 lbs., Service Switching

Fuel Soft Coal

Front tube sheet to be ½" thick

Boiler Steel Thick 9/16" Bill 7716

Boiler, Diam. 54" Plan Straight Top.

Boiler st'm pres. 170 lbs. Tested to { 190 lbs. steam pres. / 227 lbs. water pres.
with factor of safety of 5.5

Longitud. seams Butt jointed, double covering strips

Dome, diam. 25" Pos. Central

Firebox Steel Combustion chamb. None

Firebox, length 69 7/16" Width 41¾" Depth F. 54¾" B. 53⅛"

Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"

Firedoor opening 16" diameter

Water space, Front 4" Sides 3" Back 3"

Water space, Frame Single Riveted

Water space stays ⅞" diam. with 3/16" holes 1¼" deep from O.S.

Radial stays 1" diam. Sling stays front { Two rows of B.L.W. Expansion Stays

Button heads below crown on Eight central rows

Crown bars None Placed --- above crown

Crown bolts ----

Flues ----

Tubes # 12 W. G. Charcoal Iron or Steel

Tube ends Swaged for copper ferrules, fire box ends.

Number 193" Diam. 2" Length 12'4"

Heating Surface { Flues ---- Combus. Chamb. ---- Total 1332.5" / Tubes 1238" Fire Box 94.5" Fire Brick Tubes ---- / Grate area 20.1" Ratio to Heating Surface 1 : 66.2 / Superheater ----

Fire Brick Arch on studs

Grates Rocking bars and drop plate

Ash Pan, Dampers Front and back

Throttle Balance Pos. Dome

Dry pipe Steel

Superheater None

Smokebox extension With Cleaning hole and cap L.S. only

Spark ejector hopper With

Netting and deflect. plates With

Exhaust nozzles Double high

Stack Straight Dia. 18" Hole in S. B., dia. 21½"

Safety Valves (NOT SPEC) Two Consolidated 2½"

Safety valves None with relief lever, Set to 170 pounds.

Whistle B. L. W. plain

Steam Gauge One Iron 7" Baker Ashcroft (NOT SPEC)

Steam gauge stand Iron **Clock** None

Water Gauge One B.L.W.(Ironclad) **Cab Lamps** to burn Oil

Gauge Cocks Three Back Surface valve None

Lowest gauge cock 3¼" above highest part of crown

Lubricator steam valve to have separate dry pipe to dome

Blower Valve B. L. W.

Blow off Cock One Crane 2" (to use stock) Pos.- Front

Cleaning Plugs

Firebox Corners, sides and back

Crown, Two each side and two back

Waist, One under front

Front tube sheet, One Fusible plug One

Pump None Pos. ----

Top chamb. ---- Bottom chamb. ----

Feed Cock ---- Feed pipes ----

Checks ---- Check pipes ----

Injectors (NOT SPEC) Two Monitor No. 8

Injectors, Pos. R. and L. Steam pipes Copper

Pipes, Check Iron Feed Iron Overflow Iron

Check B. L. W. Pos R. and L.

Steam Heat None

Cab Wood

Cab boards Wood Nosing None

Running boards Wood Nosing None

Hand rail Iron Located on tank

Back Bumper Oak

Pilot None Pushing shoes Front and Back

Front Bumper Oak Bumper plate None

Steps across front and back with hand rail

Steps hand holds etc. to conform to I.C.C. requirements.

F. & B. Drawhead, Center above rail 33½"

Coupler M. C. B. Auto

Signal fixtures None

Headlight Two Round Case 16" Reflector, To burn Kerosene

Headlight, Nos. on sides With H'd'l't step With

Lamp shelf None Nosing ----

Bell 92 pounds

Sand Box (NOT SPEC) Two Diam. 28" Body Iron ptd. Pipes Iron

Sander Leach Air trap A-1 in each box to sand front and back

Dome casing Iron Painted

Boiler Jacket #22 Soft Steel Ptd Bands Iron Style 9.

Boiler Lagging ~~B. L. W. Plastic Magnesia (from stock)~~ 7/26/17.
B.L.W. PLASTIC MAGNESIA (FROM STOCK)

THE BALDWIN LOCOMOTIVE WORKS

N. R. Grune Aug 9 1917

SPECIFICATION FOR LOCOMOTIVES 6 30 D 464

FOR Public Service Electric Company

35

Frames Cast Steel Braces Solid

Cylinders, Diam. 18" Stroke 24"

St'm ports, Length 16" Width 1¼" Bridges 1"

Exh. ports, Length 16" Width 2½" Valve lead 1/16"

Valve travel 5½" Steam lap ¾" Exhaust clearance ----

Eccentric crank throw 5½" By-pass valve None

S. F. Lubr. (NOT SPEC) Michigan Triple Bulls Eye.

Cyl'r heads Cast Iron; Lubr. pipes of Iron under jacket

Cyl'r casings Iron Ptd. Head covers Steel painted.

St'm chest casings Iron ptd. Covers Steel painted.

St'm chest valves Richardson Balanced, with vacuum valves

Met. pkg { PISTON ROD / VALVE STEMS } U. S. (NOT SPEC)

Pistons Cast Iron Rings sprung into solid head.

Guides Steel Oil cups Needle

Crossheads Cast Steel

Wrist Pins Steel Rod cups Plunger, forged on

Parallel Rods to have solid ends.

Valve Motion Stephenson

Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.

All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Driving wheels without hub liners

Drivers, O. S. Diam. 44" Cen. diam. 38" Centers Cast Iron

Tires Steel Held by Shrinkage and Shoulder.

Tires, Flanged. Pos. Front and Back Size 3" x 5½"

Tires, Plain. Pos. Middle Size 3" x 6½"

Lateral play between driving boxes and wheel hubs = 1/16" total.

Driving Boxes Steeled Cast Iron

Journals, Diam. 8" Length 8½"

Springs. Make B. L. W.

Front Engine Truck None Wheeled ----

To swing ---- each side of cen., Cen. pin liners ----

Journals, Diam. --- Length --- Boxes ----

Wheels, Diam. --- Tread --- Kind ----

Tires ---- Cen. diam. --- Size ----

Tires held by ----

Back Engine Truck None Wheeled ----

To swing --- each side of cen., Cen. pin liners ----

Journals, Diam. --- Length --- Boxes ----

Wheels, Diam. --- Tread --- Kind ----

Tires ---- Cen. diam. --- Size ----

Tires held by ----

Brake, position On all driving Wheel, (No tender)

Operating Parts { Engine, Sch. A-1 & SWA, West'g Auto and Straight Air / Eng. Tr'k, sch. ----

Foundation Parts { Drivers, sch. WE-2-American 0.5.Equalized. / Eng. Tr'k, sch. ----

Air pump One-9½" Pos. Left Side

Train connections Front and Back

Train signal, sch. None

Air reservoir to have hydrostatic test of 210 lbs.

Tender None Wheeled. Drawing No. ----

Weight, with fuel and water, about ----

Tank 1800 Gallons. Bill 4178

Saddle tank located over top of boiler

Fuel box located on rear extension of engine frame, back of cab. Fuel capacity 1½ tons.

Frame ----

Front Drawbar height ----

Pilot ---- Pushing shoes ----

Back drawhead, center above rail ----

Coupler ----

Steps ----

Trucks ----

Springs ----

Journals, Diam --- Length ----

Wheels, Diam. --- Tread --- Kind ----

Tires ---- Cen. diam. --- Size ----

Tires held by ----

Safety chains ----

Brake Position ----

Brake sch. ----

List of tools, sch. 29.

Photo sch. None Inspection B. L. W.

To be weighed No Material specifications B. L. W.

Certificate of boiler test Three copies of B. L. W. form 1036.

Junior laws to 4.20.17 Shipment On own wheels

Brass shop finish, No. 1

Machine shop finish D 165.

B. L. W. } NONE
Patents }

Property plates None

Painting: Engine, style 223 Olive Green and Aluminum

Painting: Tender, style ----

Mark on tank sides, PUBLIC SERVICE ELECTRIC COMPANY

Road Nos. Pos.	Road Nos.	Name None
F.No. Plate	2	
F. Sand Box		
Cab Sides		
Back of Fuel box		

THE BALDWIN LOCOMOTIVE WORKS As Spec'n. C-4704

Memorandum Spec'n 17055

SPECIFICATION FOR LOCOMOTIVES (4 10½ C) 134

FOR The Atlantic Refining Company

Gen. as Photo. 3838

Engine Drawing No. 35

B 3-14-17

Gauge of Road 4' 8½" Play ⅜"

Wheelbase, Rigid 4 ' 8" Driving 4 ' 8" Total 4' 8"

Total wheelbase, eng. and tend. { Actual ---- / Limited to ----

Curves ----- Grades 3%

Limits, Height ----- Width ------

Weight (approximate) in working order, Total 22,000 pounds

On F. tr'k ----- lbs., Drivers 22,000 lbs., B. tr'k ----- lbs.

Tractive power 4,000 lbs., Ratio of adhesion 5.5

Work'g St'm Pres. 160 lbs., Service Switching

Fuel Soft Coal

Front tube sheet to be fire box steel ⅜" thick

Boiler Steel Thick 5/16" Bill 8124

Boiler, Diam. 26" Plan Straight Top

Boiler st'm pres. 160 lbs., Tested to { 180 lbs. steam pres. / 214 lbs. water pres.

With factor of safety of 6.23

Longitud. seams butt jointed, double covering strips

Dome, diam. 15½" Pos. Central

Firebox Steel Combustion chamb. None

Firebox, length 29-13/16" Width 38⅜" Depth F. 30" B. 30"

Firebox, Tube ⅜" Crown 5/16" Sides 5/16" Back 5/16"

Firedoor opening 14" diam. Crown and sides in one piece

Water space, Front 2" and 2½". Sides 2" Back 2"

Water space, Frame: Single Riveted

Water space stays ⅜" diam. with 3/16" holes 1½" deep from O.S.

Radial stays ⅜" diam. Sling stays front None

Button heads below crown on None central rows

Crown bars None Placed ---- above crown

Crown bolts ------

Flues -----

Tubes #13 N.G. Charcoal Iron or Steel

Tube ends Swaged for copper ferrules, fire box ends.

Number 46 Diam. 1½" Length 7' 1⅛"

Heating Surface	Flues -----	Combus. Chamb. ----	Total	151.2
	Tubes 1205	Fire Box 24.7	Fire Brick Tubes	-----
	Grate area 7.9	Ratio to Heating Surface 1 :		19
	Superheater -------			

Fire Brick Arch None

Grates Plain Bars of cast iron

Ash Pan, Dampers R. and L.

Throttle Balance Pos. Dome

Dry pipe Steel

Superheater None

Smokebox extension Short Cleaning hole and cap None

Spark ejector or hopper None

Netting and deflect. plates With

Exhaust nozzles Single High

Stack Straight Dia. 9" Hole in S. B., dia. 10"

Safety Valves (Not Spec) Two Consolidated 1½"

Safety valves None with relief lever, Set to 160 pounds

Whistle B.L.W. Plain

Steam Gauge One Iron 6" Maker:- Ashcroft (Not Spec)

Steam gauge stand Iron **Clock** None

Water Gauge One B.L.W.(Ironclad) **Cab Lamps** to burn oil

Gauge Cocks Three Back Surface valve None

Lowest gauge cock 3" above highest part of crown

Lubricator steam valve to have separate dry pipe to dome

Blower Valve B.L.W.

Blow off Cock One B.L.W. Pos: Back

Cleaning Plugs

Firebox Corners

Crown, One each side and one back

Waist, One Under Front

Front tube sheet, None Fusible plug One

Pump ----- Pos. -------

Top chamb. ------ Bottom chamb. ------

Feed Cock------- Feed pipes-------

Checks ----- Check pipes -----

Injectors (Not Spec'd) Two Metropolitan, Class H. No. 3

Injectors, Pos. R. and L. Steam pipes Copper

Pipes, Check Iron Feed Iron Overflow Iron

Check B.L.W. Check and stop valve Pos. R. and L.

Steam Heat None

Cab Wood

Fuel box located in left side of cab.

Cab boards Wood Nosing None

Running boards None Nosing ----

Hand rail Iron Located on Cab

Back Bumper Oak

Pilot None Pushing shoes Front and Back

Front Bumper Cast Iron Bumper plate None

Steps across front and back with hand rails

F. & B. Drawhead, Center above rail 31"

Coupler Link Type

Signal fixtures None

Headlight Two round case 10" Reflector, To burn Kerosene

Headlight, Nos. on sides None H'd'l't step None

Lamp shelf None Nosing ------

Bell 28 pounds

Sand Box One Diam. 15" Body Iron painted Pipes Iron

Sander Hand.

Dome casing Iron painted

Boiler Jacket 22 Soft Steel Pte. **Bands** Iron Style 9

Boiler Lagging Magnesia Sectional

THE BALDWIN LOCOMOTIVE WORKS

H.R. Greene July 1917

SPECIFICATION FOR LOCOMOTIVES 4 10 ½ C 134

FOR The Atlantic Refining Company

37

Frames Cast Steel Braces Solid

Cylinders, Diam. 8" Stroke 12"

St'm ports, Length 7½" Width 2" Bridges 2"

Exh. ports, Length 7½" Width 1½" Valve lead 1/16"

Valve travel 2½" Steam lap ½" Exhaust clearance -----

Eccentric cranks throw 2" By-pass valve None

S. F. Lubr. (Not Spec) Michigan Double Bulls Eye, 1½" pint capacity

Cyl'r heads Cast Iron; Lubr. Pipes of Iron under jacket

Cyl'r casings Iron ptd. Head covers Steel painted

St'm chest casings Iron ptd. Covers Heads Steel ptd.

St'm chest valves Plain "D"

Mob. pkg { Piston rods / Valve stems } Braided Packing

Pistons Cast Iron rings sprung into solid head.

Guides Steel Oil cups Needle

Crossheads Cast Iron

Wrist Pins Steel Rod cups Needle

Parallel rods to have solid ends.

Valve Motion Stephenson

Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.

All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B.L.W.

Driving wheels without hub liners

Drivers, O. S. Diam. 26" Cen. diam. 22" Centres cast iron

Tires Steel Held by Shrinkage and Shoulder

Tires, Flanged, Pos. All Size 2" x 5½"

Tires, Plain, Pos. -------- Size ------

Lateral play between driving boxes and wheel hubs = 1/32" total

Driving Boxes Cast Iron

Journals, Diam. 4" Length 6"

Springs. Make B.L.W.

Front Engine Truck None Wheeled ------

To swing ---- each side of cen., Cen. pin liners -----

Journals, Diam. -----Length ----- Boxes -------

Wheels, Diam. ----- Tread -----Kind ------

Tires -------- Cen. diam. ---- Size -----

Tires held by --------

Back Engine Truck None Wheeled ------

To swing -----each side of cen., Cen. pin liners ------

Journals, Diam.------Length ----- Boxes ------

Wheels, Diam. ---- Tread ---- Kind -------

Tires ------ Cen. diam. ---- Size ----

Tires held by -------

Brake, position On all driving wheels (No Tender)

Operating Parts	Engine, Sch. U-O	B.L.W. Steam
	Eng. Tr'k, sch. -------	
Foundation Parts	Drivers, sch. U-O	B.L.W.
	Eng. Tr'k, sch. -----	
Air pump	---- Pos. -----	
Train connections	-------	
Train signal, sch.	--------	

Separate lubricator for steam brake valve.

Tender None Wheeled, Drawing No.-----

Weight, with fuel and water, about -----

Tank 200 Gallons, Bill 4549

Saddle Tank located over top of boiler

Tool Boxes ------

Frame ------

Front Drawbar height -----

Pilot ----- Pushing shoes -----

Back drawhead, center above rail -------

Coupler -------

Steps --------

Trucks ---------

Springs ---------

Journals, Diam. ---- Length -----

Wheels, Diam. ---- Tread --- Kind ------

Tires ------ Cen. diam. ---- Size

Tires held by ------

Safety chains -------

Brake Position ------

Brake sch. -----

List of tools, sch. 26

Photo sch. None Inspection B.L.W. Except See * below)

To be weighed No Material spec'ns B.L.W.

Certificate of boiler test Three copies of B.L.W. Form 1036

Junior laws to 5-25-17 Shipment ~~On Own Wheels~~ On Car 7/8/17

Brass shop finish, No. 1

Machine shop finish D-165

B. L. W. Patents } None

Property plates None

Painting:—Engine, style 223 Olive Green and Aluminum

Painting:—Tender, style --------

Mark on Tank sides, The Atlantic Refining Company

Road Nos. Pos. Road Nos. Name None

F. No. Plate 1

Cab sides

* Boiler to conform to the Pennsylvania State Boiler Laws, and to meet the requirements of the Philadelphia Boiler Inspectors.

Boiler must be stamped on the back head { Penna Std / 3 / Baldwin

In the presence of the authorized inspector; Thus:—

Boiler to be inspected by the Hartford Steam Boiler Inspection and Insurance Co.

THE BALDWIN LOCOMOTIVE WORKS As Specfn C-417
Memorandum Specn. 11150 Dup. 4-11 C 414 BOTH BASIC EXTRAS, EXCEPT AS OTHERWISE SPECIFIED.

SPECIFICATION FOR LOCOMOTIVES 4 11 C 417

FOR Standard Oil Company (N.J.) Bay Way Refinery. 9-14-16 Gen'l Photo. 4199

R. **Engine Drawing No.** 72

Gauge of Road 3' 0" Play ⅜"
Wheelbase, Rigid 3' 9" Driving 3' 9" Total 3' 9"
Total wheelbase, eng. and tend. {Actual ----- / Limited to -----

Curves 16° 0" RADIUS
Length of locomotive overall 14' 9"
Limits, Height 8' 0" (Actual Height 8'4⅜" R.S.M.C.) Width 6' 6"
Weight (approximate) in working order, Total 28,250 LBS.
On F. tr'k ----- lbs., Drivers 28,250 lbs., B. tr'k ----- lbs.

Tractive power 5930 lbs., Ratio of adhesion 4.8
Work'g St'm Pres. 160 lbs., Service SWITCHING
Fuel HARD COAL

Boiler STEEL Thick ⅜" Bill 7744
Boiler, Diam. 36" Plan STRAIGHT TOP
Boiler st'm pres. 160 lbs., Tested to 180 lbs. steam pres. / 214 lbs. water pres.
Longitud. seams DOUBLE RIVETED, LAP JOINTS

Dome, diam. 19" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE
Firebox, length 28-1/16" Width 48" Depth F. 36½" B. 36½"
Firebox, Tube ⅜" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 14" DIAMETER
Water space, Front 2½" Sides 2" Back 2"
Water space, Frame SINGLE Riveted
Water space stays ⅞" DIAM. WITH 3/16" HOLES 1¼" DEEP FROM O. S.

Radial stays 1" DIAM. Sling stays front NONE
Button heads below crown on ----- central rows
Crown bars NONE Placed ----- above crown
Crown bolts -----

Flues -----
Tubes #13 W. G. IRON
Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS
Number 100 Diam. 1½" Length 7' 0"

Heating Surface Flues ----- Combus. Chamb. ----- Total 308 sq
Tubes 272 sq Fire Box 36 sq Fire Brick Tubes -----
Grate area 9.3 sq Ratio to Heating Surface 1 : 33.1
Superheater

Fire Brick ARCH NONE

Grates ROCKING TABLE DUMP GRATES
Ash Pan, Dampers RIGHT AND LEFT
ASH PAN TO HAVE CLEAN OUT DOOR

Throttle BALANCE Pos. DOME
Dry pipe WROT IRON

Superheater NONE

Smokebox extension SHORT Cleaning hole and cap UNDERNEATH
Spark ejector or hopper NONE
Netting and deflect. plates WITH

Exhaust nozzles SINGLE HIGH

Stack STRAIGHT Dia. 9" Hole in S. B., dia. 10"

Safety Valves TWO CONSOLIDATED 1½"
Safety valves NONE with relief lever, Set to 160 POUNDS
Whistle B. L. W. PLAIN

Steam Gauge ONE IRON 6" MAKER:-ASHCROFT
Steam gauge stand IRON **Clock** NONE

Water Gauge ONE B.L.W. (IRONCLAD) **Cab Lamps** TO BURN OIL.
Gauge Cocks THREE BACK Surface valve NONE
Lowest gauge cock 3" above highest part of crown
Lubricator steam valve TO HAVE separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock ONE B.L.W. POS:-BACK
Cleaning Plugs
Firebox CORNERS, FRONT ONES DIAGONAL AND FRONT
Crown, ONE EACH SIDE
Waist, ONE UNDER FRONT
Front tube sheet, ONE Fusible plug ONE

Pump NONE Pos. -----
Top chamb. ----- Bottom chamb. -----
Feed Cock ----- Feed pipes -----
Checks ----- Check pipes -----

Injectors TWO METROPOLITAN, CLASS "H" No. 4
Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER
Pipes, Check IRON Feed IRON Overflow IRON
Check B. L. W. Pos. RIGHT AND LEFT

Steam Heat NONE

Cab WOOD
FUEL BOX LOCATED IN LEFT SIDE OF CAB

Cab boards WOOD Nosing NONE
Running boards WOOD Nosing NONE
Hand rail IRON Located on TANK

Back Bumper OAK

Pilot NONE Pushing shoes NONE
Front Bumper OAK Bumper plate NONE
Steps ACROSS FRONT AND BACK WITH HAND RAILS

F.& B Drawhead, Center above rail 14" TO CENTRE POCKET
Coupler THREE POCKET DRAWHEAD FOR LINK AND PIN COUPLING

Signal fixtures NONE

Headlight TWO ROUND CASE 10" Reflector, To burn KEROSENE
Headlight, Nos. on sides ~~WITH~~ None Name H'dl't step NONE
Lamp shelf NONE Nosing -----

Bell 28 POUNDS
Sand Box ONE Diam. 15" Body IRON PAINTED Pipes IRON
Sander HARD

Dome casing IRON PAINTED

Boiler Jacket #22 SOFT STEEL Pt Bands IRON Style 9
Boiler Lagging MAGNESIA SECTIONAL

THE BALDWIN LOCOMOTIVE WORKS

SPECIFICATION FOR LOCOMOTIVES 4 11 C 417

FOR Standard Oil Co. (N. J.) Bay Way Refinery
R.

Frames CAST STEEL Braces SOLID

Cylinders, Diam. 9" Stroke 14"
St'm ports, Length 7½" Width ⅜" Bridges ⅜"
Exh. ports, Length 7½" Width 1¼" Valve lead 1/16"
Valve travel 3" Steam lap ½" Exhaust clearance -----
Eccentric-~~crank~~ throw 2¼" By-pass valve NONE
S. F. Lubr. MICHIGAN DOUBLE BULLS EYE, 1½ PINT CAPACITY
Cyl'r heads CAST IRON; LUBR. PIPES OF IRON UNDER JACKET
Cyl'r casings IRON PTD. Head covers STEEL PAINTED
St'm chest casings IRON PTD. Covers STEEL PAINTED
St'm chest valves PLAIN "D"
~~Met.~~ pkg (PISTON ROD / VALVE STEMS) BRAIDED PACKING

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD
Guides STEEL Oil cups NEEDLE
Crossheads CAST IRON
Wrist Pins, STEEL Rod cups NEEDLE

Valve Motion STEPHENSON
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 26" Cen. diam. 22" CENTRES CAST IRON

Tires STEEL Held by SHRINKAGE AND SHOULDER
Tires, Flanged, Pos. ALL Size 2" X 5"
Tires, Plain, Pos. NONE Size -----
Lateral play between driving boxes and wheel hubs = 1/32" TOTAL
Driving Boxes CAST IRON
Journals, Diam. 4" Length 6"

Springs. Make B. L. W.

Front Engine Truck NONE Wheeled -----
To swing ----- each side of cen., Cen. pin liners -----
Journals, Diam ---- Length ----- Boxes -----
Wheels, Diam. ----- Tread ----- Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----

Back Engine Truck NONE Wheeled -----
To swing ----- each side of cen., Cen. pin liners -----
Journals, Diam. ----- Length ----- Boxes -----
Wheels, Diam. ----- Tread ----- Kind -----
Tires ----- Cen. diam. ---- Size -----
Tires held by -----

Brake, position ON ALL DRIVING WHEELS (NO TENDER)
Operating Parts: Engine, Sch. U0 B. L. W. STEAM / Eng. Tr'k. sch. -----
Foundation Parts: Drivers, sch. U-0 B. L. W. / Eng. Tr'k, sch. -----
Air pump ----- Pos. -----
Train connections -----
Train signal, sch. -----
SEPARATE LUBRICATOR FOR STEAM BRAKE VALVE

Tender NONE Wheeled, Drawing No. -----
Weight, with fuel and water, about -----

Tank 400 Gallons, Bill 4215
SADDLE TANK LOCATED OVER TOP OF BOILER

Tool Boxes -----

Frame -----

Front Drawbar height -----
Pilot ----- Pushing shoes -----
Back drawhead, center above rail -----
Coupler -----

Steps -----

Trucks -----

Springs -----
Journals, Diam. ----- Length -----
Wheels, Diam. ----- Tread ----- Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----
Safety chains -----

Brake Position -----
Brake sch. -----

List of tools, sch. 26
Photo sch. NONE Inspection B. L. W.
To be weighed NO Material specns B. L. W.
Certificate of boiler test THREE COPIES OF B.L.W. FORM 1036.
Junior laws to 3-29-16 Shipment ON CAR

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. Patents: THROTTLE, PATENTED JANUARY 23, 1900 (CAST ON)

Property plates NONE

Painting:- Engine, style 222 BLACK AND YELLOW
Painting: Tender, style -----

PAINTING, LETTERING ETC. TO BE SAME AS FOR 4-11 C 414
Mark on TANK SIDES, BAYWAY REFINERY

Road Nos. Pos.	Road Nos.	Name NONE
F. No PLATE	6	
SAND BOX		
CAB SIDES		

THE BALDWIN LOCOMOTIVE WORKS As Specification 6 - 4244

Memorandum Spec'n 11188

SPECIFICATION FOR LOCOMOTIVES 4 11 C 418

FOR Standard Oil Company (N.J.) Baltimore Division

Gen. as Photo 4199

Engine Drawing No. 74

F. 10-30-16

Gauge of Road 2' 6" Play 1/2"
Wheelbase, Rigid 3' 9" Driving 3' 9" Total 3' 9"
Total wheelbase, eng. and tend. { Actual ----, Limited to ----
Rails 25 pounds, A.S.C.E. section Grades 3%.
Curves 16' 0" radius
Loco. guaranteed to traverse curves of 16' 0" radius
Limits, Height 2' 3" Width ---
Weight (approximate) in working order, Total 27,500 pounds
On F. tr'k ---- lbs., Drivers 27,500 lbs., B. tr'k ---- lbs.

Tractive power 5930 lbs., Ratio of adhesion 4.6
Work'g St'm Pres. 160 lbs., Service Industrial
Fuel Soft Coal

Front tube sheet to be 1/2" thick.
Boiler Steel Thick 7/16" Bill 7744
Boiler, Diam. 36" Plan Straight Top

Boiler st'm pres. 160 lbs., Tested to { 180 lbs. steam pres., 214 lbs. water pres.
With factor of safety of 5-5
Longitud. seams Double riveted lap joints

Dome, diam. 19" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 28-1/16" Width 48" Depth F. 36 1/4" B. 36 1/4"
Firebox, Tube 3/8" Crown 3/8" Sides 5/16" Back 5/16"
Firedoor opening 14" diameter
Water space, Front 2 1/2" Sides 2" Back 2"
Water space, Frame Single Riveted
Water space stays 7/8" diam. with 3/16" holes 1 1/4" deep from O.S.

Radial stays 1" diam. Sling stays front None
Button heads below crown on ---- central rows
Crown bars None Placed ---- above crown
Crown bolts ----

Flues ----
Tubes #13 W.G. Charcoal Iron or Steel
Tube ends Swaged for copper ferrules, firebox ends.
Number 100 Diam. 1 1/2" Length 7' 0"

Heating Surface Flues ---- Combus. Chamb. ---- Total 308 sq.
Tubes 272 sq. Fire Box 36 sq. Fire Brick Tubes ----
Grate area 9.3 sq. Ratio to Heating Surface 1 : 33.1
Superheater ----

Fire Brick Arch, None

Grates Rocking bars without drop plate
Ash Pan, Dampers Right and Left
Ash pan to have clean out door and to have netting under dampers
Throttle Balance Pos. Dome
Dry pipe Wrot Iron

Superheater None

Smokebox extension Short Cleaning hole and cap Underneath
Spark ejector or hopper None
Netting and deflect. plates With

Exhaust nozzles Single high

Stack Straight Dia. 9" Hole in S. B., dia. 10"

Safety Valves (Not Spec.) Two Consolidated 1 1/2"
Safety valves None with relief lever, Set to 160 pounds
Whistle B. L. W. Plain

Steam Gauge One Iron 6" MAKER:- Ashcroft (Spec.)
Steam gauge stand Iron
Clock None

Water Gauge One B.L.W. (Ironclad) **Cab Lamps** to burn oil
Gauge Cocks Three Back Surface valve None
Lowest gauge cock 3" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One B. L. W. POS:- Back
Cleaning Plugs
Firebox Corners, front ones diagonal and front
Crown, One each side
Waist, One under front
Front tube sheet, One Fusible plug One

Pump None Pos. ----
Top chamb. ---- Bottom chamb. ----
Feed Cock ---- Feed pipes ----
Checks ---- Check pipes ----

Injectors (Not Spec.) Two Metropolitan, Class "H" No. 4
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. Right and Left

Steam Heat None

Cab Wood
Fuel box located on left side of Cab

Cab boards Wood. Nosing None
Running boards Wood Nosing None
Hand rail Iron Located on Tank

Back Bumper Oak

Pilot None Pushing shoes None
Front Bumper Oak Bumper plate None
Steps Hanging step boards and hand holds front and back.

F. & B Drawhead, Center above rail 14" to middle pocket
Coupler Cast Iron, as per Co's print 58-19

Signal fixtures None

Headlight One Round Case 10" Reflector, To burn Kerobene
Headlight, Nos. on sides None H'dl't step None
Lamp shelf None Nosing ----

Bell 28 pounds
Sand Box One Diam. 15" Body Iron Painted Pipes Iron
Sander Hand

Dome casing Iron Painted

Boiler Jacket #22 Soft Steel Ptd. Bands Iron Style 9
Boiler Lagging Magnesia Sectional

THE BALDWIN LOCOMOTIVE WORKS As Specification 6 - 4244
Memorandum Spec'n 11188
SPECIFICATION FOR LOCOMOTIVES 4 11 C 418
FOR Standard Oil Company (N.J.) Baltimore Division
E. 10-30-16
Gen. as Photo 4199
Engine Drawing No. 74

Gauge of Road 2' 6" Play 1/2"
Wheelbase, Rigid 3' 9" Driving 3' 9" Total 3' 9"
Total wheelbase, eng. and tend. | Actual ----
| Limited to ----
Rails 25 pounds, A.S.C.E. section Grades 3%.
Curves 16' 0" radius
Loco. guaranteed to traverse curves of 16' 0" radius
Limits, Height 8' 3" Width ---
Weight (approximate) in working order, Total 27,500 pounds
On F tr'k ---- lbs., Drivers 27,500 lbs., B. tr'k ---- lbs.

Tractive power 5930 lbs., Ratio of adhesion 4.6
Work'g St'm Pres. 160 lbs., Service Industrial
Fuel Soft Coal

Front tube sheet to be 1/2" thick.
Boiler Steel Thick 7/16" Bill 7744
Boiler, Diam. 36" Plan Straight Top
Boiler st'm pres. 160 lbs., Tested to | 180 lbs. steam pres.
With factor of safety of 5.5 | 214 lbs. water pres.
Longitud. seams Double riveted lap joints

Dome, diam. 19" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 28-1/16" Width 48" Depth F. 36 1/4" B. 36 1/4"
Firebox, Tube 3/8" Crown 3/8" Sides 5/16" Back 5/16"
Firedoor opening 14" diameter
Water space, Front 2 1/2" Sides 2" Back 2"
Water space, Frame Single Riveted
Water space stays 3/8" diam. with 3 1/16" holes 1 1/4" deep from O.S.

Radial stays 1" diam. Sling stays front None
Button heads below crown on ---- central rows
Crown bars None Placed ---- above crown
Crown bolts ----

Flues ----
Tubes #13 W.G. Charcoal Iron or Steel
Tube ends Swaged for copper ferrules, firebox ends.
Number 100 Diam. 1 1/2" Length 7' 0"

Heating Surface	Flues ----	Combus. Chamb. ----	Total	308.0
	Tubes 272.0	Fire Box 36.0	Fire Brick Tubes	----
Grate area 9.3		Ratio to Heating Surface 1		33.1
Superheater ----				

Fire Brick Arch, None

Grates Rocking bars without drop plate
Ash Pan, Dampers Right and Left
Ash pan to have clean out door and to have netting under dampers
Throttle Balance Pos. Dome
Dry pipe Wrot Iron

Superheater None

Smokebox extension Short Cleaning hole and cap Underneath
Spark ejector or hopper None
Netting and deflect. plates With

Exhaust nozzles Single high

Stack Straight Dia. 9" Hole in S. B., dia. 10"

Safety Valves (Not Spec.) Two Consolidated 1 1/2"
Safety valves None with relief lever, Set to 160 pounds
Whistle B. L. W. Plain

Steam Gauge One Iron 6" MAKER:- Ashcroft (Spec.)
Steam gauge stand Iron **Clock** None

Water Gau
Gauge Cock
Lowest gauge
Lubricator stea
Blower Valv

Blow off Co
Cleaning
Firebox Co
Crown, One
Waist, One
Front tube sh

Pump None
Top chamb. --
Feed Cock ---
Checks ----

(Not Spec.)
Injectors Tw
Injectors, Pos.
Pipes, Check
Check B. L.

Steam Heat

Cab Wood
Fuel box loca

Cab boards Wo
Running boards
Hand rail Iron

Back Bumpe

Pilot None
Front Bumpe
Steps Hangin

F.& B Drawh
Coupler Cast

Signal fixtures

Headlight One
Headlight, Nos. o
Lamp shelf None

Bell 28 pounds
Sand Box One Diam. 15" Body Iron Painted Pipes Iron
Sander Hand

Dome casing Iron Painted

Boiler Jacket #22 Soft Steel Ptd. Bands Iron Style 9
Boiler Lagging Magnesia Sectional

NOTICE

THE PRECEDING PAGE HAS BEEN REPHOTOGRAPHED TO ASSURE THE BEST POSSIBLE LEGIBILITY. ITS IMAGE APPEARS IMMEDIATELY HEREAFTER.

SOUTHWEST MICROPUBLISHING, INC.

THE BALDWIN LOCOMOTIVE WORKS As Specification C - 4244
Memorandum Spec'n 11188
SPECIFICATION FOR LOCOMOTIVES 4 11 C 418
FOR Standard Oil Company (N.J.) Baltimore Division
F. 10-30-16

Gen. 85 Photo 4139
Engine Drawing No. 74

Gauge of Road 2' 6" Play ½"
Wheelbase, Rigid 3' 9" Driving 3' 3" Total 3' 9"
Total wheelbase, eng. and tend (Actual ----, Limited to ----)
Rails 25 pounds, A.S.C.E. section Grades 3%.
Curves 16° 0" radius
Loco. guaranteed to traverse curves of 16° 0" radius
Limits, Height 9' 3" Width ---
Weight (approximate working order) Total 21,500 pounds
On F. truck ---- lbs. On Drivers 27,500 lbs. On B. truck ---- lbs.

Tractive power 5930 lbs., Ratio of adhesion 4.6
Work'g St'm Pres. 160 lbs., Service Industrial
Fuel Soft Coal

Front tube sheet to be ½" thick.
Boiler Steel Thick ⅞" Bill 7744
Boiler, Diam. 36" Plan Straight Top
Boiler st'm pres. 160 lbs. Tested to 180 lbs. steam pres.
With factor of safety of 5.5 214 lbs. water pres.
Longitud'l seams Double riveted lap joints

Dome, diam. 19" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 95-4/16" Width 48" Depth F. 36¼" B. 36¼"
Firebox, Tube ⅜" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 14" diameter
Water space, Front 6½" Sides 2" Back 2"
Water space, Frame Single Bevelled
Water space stays ⅝" diam. with 3½" holes 1¼" deep from O.S.

Radial stays 1" diam. Sling stays front None
Button heads outside of sheet ---- vertical rows
Crown bars None Pitch ---- above crown
Crown bolts ----

Flues ----
Tubes 413 2¼" O.D. charcoal iron or steel
Tube ends Spaced for copper ferrules, firebox ends.
Number 190 Diam. 1½" Length 7' 0"

Heating Flues ---- Combus. Chamb. ---- Total 3080
Surface Tubes 2720 Fire Box 360 Fire Brick Tubes ----
Grate area 42.5 Ratio to Heating Surface 1 33.1
Superheater ----

Fire Brick Arch, None

Grates Rocking bars without drop plate
Ash Pan, Dampers Right and Left
Ash pan to have clean out door and to have netting under dampers
Throttle Balance Pos. Dome
Dry pipe Wrot Iron

Superheater None

Smokebox extension Short Cleaning hole and cap Underneath
Spark ejector or hopper None
Netting and deflect plates With

Exhaust nozzles Single high

Stack Straight Dia. 9" Hole in S. B., dia. 10"

Safety Valves (Not Spec) Two Consolidated 1½"
Safety valves None with relief lever, Set to 160 pounds
Whistle B. L. W. Plain

Steam Gauge One Iron 6" MAKER:- Ashcroft (Spec)
Steam gauge stand Iron **Clock** None

Water Gauge One B.L.W. (Ironclad) **Cab Lamps** to burn oil
Gauge Cocks Three Back Surface valve None
Lowest gauge cock 3" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One B. L. W. POS:- Back
Cleaning Plugs
Firebox Corners, front ones diagonal and front
Crown, One each side
Waist, One under front
Front tube sheet, One Fusible plug One

Pump None Pos. ----
Top chamb ---- Bottom chamb. ----
Feed Cock ---- Feed pipes ----
Checks ---- Check pipes ----

(Not Spec.)
Injectors Two Metropolitan, Class "H" No. 4
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos Right and Left

Steam Heat None

Cab Wood
Fuel box located on left side of cab

Cab boards Wood. Nosing None
Running boards Wood Nosing None
Hand rail Iron Located on Tank

Back Bumper Oak

Pilot None Pushing shoes None
Front Bumper Oak Bumper plate None
Steps Hanging step boards and hand holds front and back.

F.& B Drawhead, Center above rail 11½" to middle pocket
Coupler Cast Iron, as per Co's print 58-19

Signal fixtures None

Headlight One Round Case 10" Reflector. To burn Kerosene
Headlight, Nos. on sides None H'd'l't step None
Lamp shelf None Nosing ----

Bell 25 pounds
Sand Box One Diam. 15" Body Iron Painted Pipes Iron
Sander Hand

Dome casing Iron Painted

Boiler Jacket 22 Soft Steel Ptd. Bands Iron Style 9
Boiler Lagging Magnesia Sectional

THE BALDWIN LOCOMOTIVE WORKS
6 N. Fresh January
SPECIFICATION FOR LOCOMOTIVES 4 11 C 418
FOR Standard Oil Company (N.J.) Baltimore Division
F.

40

Frames Cast Steel Braces Solid

Cylinders, Diam. 9" Stroke 14"
St'm ports, Length 7⅛" Width ⅝" Bridges ⅝"
Exh. ports, Length 7⅛" Width 1½" Valve lead 1/16"
Valve travel 3" Steam lap ½" Exhaust clearance ----
Eccentric-crank throw 2½" By-pass valve None
S. F. Lubr. Michigan Double Bulls Eye, 1½ pints cap.
Cyl'r heads Cast Iron; Lubr. pipes of Iron under jacket
Cyl'r casings Iron Painted Head covers Steel Painted
St'm chest casings Iron Painted Covers Steel Painted
St'm chest valves Plain "D"
Valve pkg [illegible] Braided Packing

Pistons Cast Iron rings sprung into solid head.
Guides Steel Oil cups Needle
Crossheads Cast Steel
Wrist Pins Steel Rod cups Needle

Valve Motion Stephenson
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 25" Cen. diam. 22" Centres Cast Iron
Driving wheels without hub liners
Tires Steel Held by Shrinkage and shoulder
Tires, Flanged, Pos. All Size 2" x 5"
Tires, Plain, Pos. ---- Size ----
Lateral play between driving boxes and wheel hubs - 1/32" total
Driving Boxes Cast Iron
Journals, Diam. 4" Length 6"

Springs Make B. L. W.

Front Engine Truck None Wheeled ----
To swing ---- each side of cen., Cen. pin liners
Journals, Diam. ---- Length ---- Boxes ----
Wheels, Diam. ---- Tread ---- Kind ----
Tires ---- Cen. diam. ---- Size ----
Tires held by ----

Back Engine Truck None Wheeled
To swing ---- each side of cen., Cen. pin liners
Journals, Diam. ---- Length ---- Boxes ----
Wheels, Diam. ---- Tread ---- Kind ----
Tires ---- Cen. diam. ---- Size ----
Tires held by ----

Brakes, position On all wheels (No tender)
Operating { Engine, Sch. U - O B.L.W. Steam
Parts { Eng. Tr'k, sch.
Foundation { Drivers, sch. U - O B.L.W.
Parts { Eng. Tr'k, sch. ----
Air pump ---- Pos. ----
Train connections ----
Train signal, sch. ----
Separate lubricator for steam brake valve

Tender None Wheeled, Drawing No. ----
Weight, with fuel and water, about ----

Tank 400 Gallons, Bill 4215
Saddle tank located over top of boiler, and extending over smoke box.
Tool Boxes ----

Frame ----

Front Drawbar height ----
Pilot ---- Pushing shoes ----
Back drawhead, center above rail ----
Coupler ----

Steps ----

Trucks ----

Springs ----
Journals, Diam. ---- Length ----
Wheels, Diam. ---- Tread ---- Kind ----
Tires ---- Cen. diam. ---- Size ----
Tires held by ----
Safety chains ----

Brake Position ----
Brake sch. ----

List of tools, sch. 26
Photo sch. 2 Inspection B. L. W.
To be weighed Yes Material spec'ns B. L. W.
Certificate of boiler test Three copies of B.L.W. form 1036
Junior lawns to 12.1.16 Shipment On car

Brass shop finish, No. 1
Machine shop finish D-165 -

B. L. W. Patents } Throttle, Patented Jan. 23, 1900 (cast on)

Property plates None

Painting:—Engine, style 222 Black and Yellow
Painting:—Tender, style ----

Lettering to same as for 4 6 C 11 - 12
Mark on tank sides, Canton Refinery

Road Nos. Pos. Road Nos. Name None
F. No. Plate 3
Sand Box
Cab sides

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C - 4918.

Memorandum Spec'n 17072.

SPECIFICATION FOR LOCOMOTIVES 4 4 C 30.

FOR Western Chemical Manufacturing Company.

Gen. as Photo. 8226.

Engine Drawing No. 8

4-24-17.

Gauge of Road 3' 0" Play 1/8"

Wheelbase, Rigid 3' 4" Driving 3' 4" Total 3' 4"

Total wheelbase, eng. and tend. { Actual ----- / Limited to ---

Rails 16 pounds.

Curves 35 Ft. radius

Limits, Height --- Width ----

Weight (approximate) in working order, Total 12,000 pounds.

On F. tr'k ------ lbs., Drivers 12000 lbs., B. tr'k ------ lbs.

Tractive power 1320 lbs., Ratio of adhesion 9

Work'g St'm Pres. 150 lbs., Service Switching.

Fuel Soft Coal.

Front tube sheet to be 3/8" thick.

Boiler Steel. Thick 5/16" Bill 8147

Boiler, Diam. 22" Plan Straight Top.

Boiler st'm pres. 150 lbs., Tested to { 170 lbs. steam pres. / 200 lbs. water pres.

With factor of safety of 8.08

Longitud. seams Double riveted, lap joints.

Dome, diam. 12" Pos. Central.

Firebox Steel. Combustion chamb. None.

Firebox, length 20 13/16" Width 21 1/8" Depth F. 24 1/4" B. 24 1/4"

Firebox, Tube 3/8" Crown 5/16" Sides 5/16" Back 5/16"

Firedoor opening 7 1/2" x 14"

Water space, Front 2" Sides 2" Back 2"

Water space, Frame Single Riveted

Water space stays 7/8" diam. with 3/16" holes 1 1/2" deep from O.S.

Radial stays 7/8" diam. Sling stays front None.

Button heads below crown on ---- central rows

Crown bars None. Placed ---- above crown

Crown bolts ----

Flues ----

Tubes #13 W.G. Charcoal Iron or Steel.

Tube ends Swaged for copper ferrules fire box ends.

Number 32 Diam. 1 1/2" Length 6'0"

Heating Surface: Flues ---- Combus. Chamb. ---- Total 88.5 sq

Tubes 74.3 sq Fire Box 14.2 sq Fire Brick Tubes ---

Grate area 3.12 sq Ratio to Heating Surface 1 : 28.4

Superheater ----

Fire Brick Arch. None.

Grate Bars to be Sheffield or Herring bone type.

Grate bars as B. L. W. print 5747 approved.

Grates Cast Iron, Plain Bars, with 5/16" slots.

Ash Pan, Dampers Front and back.

Throttle Balance Pos. Dome

Dry pipe Steel.

Superheater None

Smokebox extension short Cleaning hole and cap None

Spark ejector or hopper None

Netting and deflect. plates With.

Exhaust nozzles Single, HIGH

Stack Straight Dia. 4 1/2" Hole in S. B., dia. 4 1/2"

(NOT SPEC.) Safety Valves Two Consolidated 1 1/2"

Safety valves None with relief lever, Set to 150 pounds.

Whistle B. L. W. plain.

Steam Gauge One Iron 4" MAKER:- Ashcroft (not spec)

Steam gauge stand Iron. Clock None.

Water Gauge One B.L.W.(Ironclad) Cab Lamps To burn oil.

Gauge Cocks Three Back. Surface valve None

Lowest gauge cock 3" above highest part of crown

Lubricator steam valves have separate dry pipe to dome

Blower Valve B.L.W.

Blow off Cock One B.L.W. pos. Front.

Cleaning Plugs

Firebox Corners,

Crown, One back.

Waist, One under front.

Front tube sheet, One Fusible plug One

Pump None. Pos. ---

Top chamb. --- Bottom chamb. ---

Feed Cock --- Feed pipes ---

Checks --- Check pipes ---

(NOT SPEC.) Injectors Two Metropolitan, Class H. No. 3

Injectors, Pos. R. & L. Steam pipes Copper.

Pipes, Check Iron Feed Iron. Overflow Iron

Check B. L. W. Pos. R. & L.

Steam Heat None.

Cab Wood.

Coal Box located in left side of Cab.

Cab boards Wood. Nosing None.

Running boards None. Nosing ---

Hand rail Iron Located on Cab.

Back Bumper Oak.

Pilot None. Pushing shoes None

Front Bumper Oak. Bumper plate None.

Steps Front and back, with hand rail for switchman.

F. & B. Drawhead, Center above rail 6 1/2" to 13"

Coupler Cast Iron Drawhead for link and pin connection.

Signal fixtures None.

Headlights to be Adams & Westlake No. 1453.

Headlight Two Round Case 6" Reflector, To burn Kerosene.

Headlight, Nos. on sides None. H'dl't step None.

Lamp shelf None. Nosing ----

Bell 16 pounds.

Sand Box One Diam. 15" Body Iron painted. Pipes Iron.

Sander Hand to sand front and back.

Dome casing Iron painted.

Boiler Jacket #22 Soft steel pt'd Bands Iron. Style 9.

Boiler Lagging B.L.W. Plastic Magnesia (from stock.)

THE BALDWIN LOCOMOTIVE WORKS

B. N. Bailey July 1917

SPECIFICATION FOR LOCOMOTIVES 4 4 C 30.

FOR Western Chemical Manufacturing Company.

Frames Cast Steel. Braces Solid

Cylinders, Diam. 5" Stroke 10"

St'm ports, Length 4 1/2" Width 1" Bridges 1"

Exh. ports, Length 4 1/2" Width 1 1/2" Valve lead 1/32"

Valve travel 3" Steam lap 1" Exhaust clearance ---

Eccentric crank throw 2" By-pass valve None.

S. F. Lubr. (not spec) Michigan double bull's eye, 1/2 pints. capacity.

Cyl'r heads Cast Iron, Lubr. pipes of Iron under jacket.

Cyl'r casings Iron ptd. Head covers Planished steel.

St'm chest casings Iron ptd. Covers None.

St'm chest valves Plain "D"

Met. pkg { PISTON RODS / VALVE STEMS } Braided packing.

Pistons Cast iron rings spring into solid head.

Guides Steel. Oil cups B.L.W. Orda

Crossheads Cast Iron.

Wrist Pins Steel. Rod cups Needle.

Par. Rods to have solid ends.

Valve Motion Stephenson.

Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.

All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B.L.W.

Driving wheels without hub liners.

Drivers, O. S. Diam. 24" Cen. diam. 20" Centers Cast Iron.

Tires Steel. Held by Shrinkage and shoulder.

Tires, Flanged, Pos. All. Size 2" x 5"

Tires, Plain, Pos. None. Size -----

Lateral play between driving boxes and wheel hubs = 1/32" total.

Driving Boxes Cast Iron.

Journals, Diam. 3 1/2" Length 6"

Springs. Make B. L. W.

Front Engine Truck None. Wheeled ---

To swing --- each side of cen., Cen. pin liners ---

Journals, Diam. --- Length --- Boxes ---

Wheels, Diam. --- Tread --- Kind ---

Tires --- Cen. diam. --- Size ---

Tires held by ---

Back Engine Truck None. Wheeled ---

To swing --- each side of cen., Cen. pin liners ---

Journals, Diam. --- Length --- Boxes ---

Wheels, Diam. --- Tread --- Kind ---

Tires --- Cen. diam. --- Size ---

Tires held by ---

Brake, position On both pairs of wheels.

Operating { Engine, Sch. --- B. L. W. Hand. / Parts { Eng. Tr'k, sch. --- }

Foundation { Drivers, sch. --- B. L. W. / Parts { Eng. Tr'k, sch. --- }

Air pump Pos. ---

Train connections ---

Train signal, sch. ---

Tender None Wheeled, Drawing No. ---

Weight, with fuel and water, about ---

Tank 100 Gallons, Bill 4535

Saddle tank located over top of boiler and extending over the smoke box.

Tool Boxes

Frame ---

Front Drawbar height ---

Pilot Pushing shoes ---

Back drawhead, center above rail ---

Coupler ---

Steps ---

Trucks ---

Springs ---

Journals. Diam. --- Length ---

Wheels. Diam. --- Tread --- Kind ---

Tires --- Cen. diam. --- Size ---

Tires held by ---

Safety chains ---

Brake Position ---

Brake sch. ---

List of tools, sch. 26.

Photo sch. None. Inspection B. L. W.

To be weighed Yes. Material spec'ns B. L. W.

Certificate of boiler test Three copies of B. L. W. form 1036

Junior laws to 5/1/17. Shipment On Car.

Brass shop finish, No. 1

Machine shop finish D 165.

B. L. W.

Patents None.

Property plates None.

Painting: Engine, style 223 Olive Green and Alluminum.

Painting: Tender, style ------

Mark on tank sides, WESTERN CHEMICAL MFG. CO.

Road Nos. Pos. Road Nos. Name None.

F. No. Plate. 1.

Cab Sides.

THE BALDWIN LOCOMOTIVE WORKS Dup. 6-30 D 408 WITH SAME EXTRAS EXCEPT AS OTHERWISE SPECIFIED AND TO INTERCHANGE WITH 6-30 D 457

Memorandum Spec'n 17050

SPECIFICATION FOR LOCOMOTIVES 6 30 D 465

FOR NEWPORT CHEMICAL WORKS, INCORPORATED

Gen. as PHOTO. 3048

Engine Drawing No. 49

3-9-17.

Gauge of Road 4' 8½" Play ¾"

Wheelbase, Rigid 9' 6" Driving 9' 6" Total 9' 6"

Total wheelbase, eng. and tend. { Actual 38' 5½" / Limited to -----

Curves 110 FEET RADIUS. GRADE, 4%

Limits, Height 14' 6" Width -----

Weight approximate in working order, Total 100,000 POUNDS

On F. tr'k ---- lbs., Drivers 100,000 lbs., B. tr'k ----- lbs.

Tractive power 24,780 lbs. Ratio of adhesion 4

Work'g St'm Pres. 180 lbs. Service SWITCHING

Fuel SOFT COAL

FRONT TUBE SHEET TO BE ½" THICK

Boiler STEEL Thick ⅝" Bill 7701

Boiler, Diam. 56" Plan STRAIGHT TOP

Boiler st'm pres. 180 lbs. Tested to { 200 lbs. steam pres. / 240 lbs. water pres.

WITH FACTOR OF SAFETY OF

Longitud. seams BUTT JOINTED, DOUBDE COVERING STRIPS.

Dome, diam 29" Pos CENTRAL

Firebox STEEL Combustion chamb. NONE

Firebox, length 66-11/16" Width 34⅜" Depth F. 66" B. 63⅜"

Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"

Firedoor opening 16" DIAM.

Water space, Front 4" Sides 3" Back 3"

Water space, Frame SINGLE Riveted

Water space stays 7" DIAM WITH 3/16" HOLES 1½" DEEP DROW O.S.

Radial stays 1" DIAM. Sling stays front { TWO ROWS OF B.L.W. EXPANSION STAYS.

Button heads below crown on EIGHT central rows

Crown bars NONE Placed ---- above crown

Crown bolts -----

Flues ----

Tubes #12 W.G. IRON OR STEEL

Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.

Number 202 Diam. 2" Length 12' 5"

Heating Flues NONE Combus. Chamb. ---- Total 1410 sq. ft.

Surface Tubes 1305 sq. ft. Fire Box 105 sq. ft. Fire Brick Tubes ---

Grate area 15.9 sq. ft. Ratio to Heating Surface 1 : 88

Superheater NONE

Fire Brick ARCH ON STUDS.

Grates CAST IRON, ROCKING BARS AND DROP PLATE.

Ash Pan, Dampers FRONT AND BACK

Throttle BALANCE Pos. DOME

Dry pipe STEEL

Superheater NONE

Smokebox extension WITH Cleaning hole and cap L.S. ONLY

Spark ~~ejector~~ hopper WITH

Netting and deflect. plates WITH

Exhaust nozzles DOUBLE HIGH

Stack STRAIGHT Dia. 16" Hole in S. B., dia. 17½"

(NOT Spec) **Safety Valves** TWO CONSOLIDATED 2½"

Safety valves NONE with relief lever, Set to 180 POUNDS

Whistle B. L. W. PLAIN.

Steam Gauge ONE IRON 7" (NOT Spec) MAKER:- ASHCROFT

Steam gauge stand IRON **Clock** NONE

Water Gauge ONE B.L.W. (IRONCLAD) **Cab Lamps** TO BURN OIL.

Gauge Cocks THREE BACK Surface valve NONE

Lowest gauge cock 3½" above highest part of crown

Lubricator steam valve TO HAVE separate dry pipe to dome

Blower Valve B.L.W.

Blow off Cock ONE B.L.W. POS:-RIGHT SIDE

Cleaning Plugs

Firebox CORNERS, BACK ONES DIAGONAL, LEFT SIDE AND BACK

Crown, TWO EACH SIDE AND THREE BACK

Waist, ONE UNDER FRONT

Front tube sheet, TWO Fusible plug ONE

Pump NONE Pos. ----

Top chamb. ---- Bottom chamb. ----

Feed Cock ---- Feed pipes -----

Checks ----- Check pipes ---

(NOT Spec) **Injectors** TWO HANCOCK, TYPE "A" No. 8

Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER

Pipes, Check IRON Feed IRON Overflow IRON

Check B.L.W. Pos. RIGHT AND LEFT.

Steam Heat NONE

Cab WOOD

Cab boards WOOD Nosing NONE

Running boards WOOD Nosing NONE

Hand rail IRON Located on BOILER

Back Bumper BAR STEEL Back drawbar height 34"

Pilot NONE Pushing shoes FRONT

Front Bumper OAK Bumper plate NONE

Steps ACROSS FRONT WITH HAND RAIL,

STEPS, HAND HOLDS, ETC. TO CONFORM TO I.C.C. REQUIREMENTS.

Front Drawhead, Center above rail 33½"

Coupler SHARON M.C.B. AUTO.

Signal fixtures NONE

Headlight TWO ROUND CASE 16" Reflector, To burn KEROSENE

Headlight, Nos. on sides WITH H'd'l't step WITH

Lamp shelf NONE Nosing ----

Bell 92 POUNDS

Sand Box TWO Diam. 28" Body IRON PAINTED Pipes IRON

Sander (NOT Spec) LEACH AIR, TRAP "A-1"

Dome casing IRON PAINTED

Boiler Jacket #22 SOFT STEEL PTD. this IRON Style 9

Boiler Lagging MAGNESIA SECTIONAL

THE BALDWIN LOCOMOTIVE WORKS

B. O. Brick Aug 1917

SPECIFICATION FOR LOCOMOTIVES 6 30 D 465

FOR NEWPORT CHEMICAL WORKS INCORPORATED

45

Frames CAST STEEL Braces SOLID

FRAMES TO BE SECURELY BRACED.

Cylinders, Diam. 18" Stroke 24"

St'm ports, Length 16" Width 1¼" Bridges 1"

Exh. ports, Length 16" Width 2½" Valve lead 1/16"

Valve travel 5" Steam lap ¾" Exhaust clearance -----

Eccentric crank throw 5" By-pass valve NONE

(NOT Spec) S. F. Lubr. DETROIT TRIPLE #22 BULLS EYE.

Cyl'r heads CAST IRON; LUBR. PIPES OF IRON UNDER JACKET

Cyl'r casings IRON PTD. Head covers STEEL PAINTED

St'm chest casings IRON PTD. Covers STEEL PAINTED

St'm chest valves BALANCED, WITH VACUUM VALVES.

Met. pkg { PISTON RODS / VALVE STEMS U.S. (NOT Spec)

PISTON RODS TO BE KEYED TO CROSSHEAD

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD.

Guides STEEL Oil cups NEEDLE

Crossheads CAST STEEL WITH GIBS OF CAST STEEL TINNED.

Wrist Pins STEEL Rod cups PLUNGER, FORGED ON.

PARALLEL RODS TO HAVE STRAP ENDS.

Valve Motion STEPHENSON

{ Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.

All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B.L.W.

DRIVING WHEELS WITHOUT RUB LINERS.

Drivers, O. S. Diam. 48" Cen. diam. 42" CENTRES CAST IRON.

Tires STEEL Held by SHRINKAGE AND SHOULDER

Tires, Flanged, Pos. FRONT AND BACK Size 3" x 5½"

Tires, Plain, Pos. MIDDLE Size 3" x 6½"

Lateral play between driving boxes and wheel hubs 1/16" TOTAL

Driving Boxes STEELED CAST IRON

Journals, Diam. 8" Length 8½"

Springs. Make STANDARD STEEL WORKS

Front Engine Truck NONE Wheeled ----

To swing ---- each side of cen., Cen. pin liners -----

Journals, Diam. --- Length ---- Boxes ----

Wheels, Diam. ---- Tread ---- Kind -----

Tires ------ Cen. diam. --- Size -----

Tires held by -------

Back Engine Truck NONE Wheeled -----

To swing --- each side of cen., Cen. pin liners ----

Journals, Diam. --- Length ---- Boxes -----

Wheels, Diam. ---- Tread --- Kind -----

Tires ------ Cen. diam. --- Size ---

Tires held by --------

Brake, position ON ALL DRIVING AND TENDER WHEELS.

Operating Parts { Engine, Sch. A-1, WEST'G. AUTO. AIR. / Eng. Tr'k, sch ----

Foundation Parts { Drivers, sch. WM 1, AMERICAN O.S. EQUALIZED. / Eng. Tr'k, sch. ----

Air pump ONE 9½" Pos. LEFT SIDE

Train connections FRONT AND BACK

Train signal, sch. NONE

AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 LBS.

CERTIFICATES DATED MAY 11TH 1917, COVERING TEST OF RESERVOIR NOS. 11844-11845 INC. FURNISHED BY WEST'G. AIR BRAKE CO., ARE FILED IN MAIN OFFICE, FILE No. 11296

Tender EIGHT Wheeled, Drawing No. 356

Weight, with fuel and water. about 60,000 LBS.

Tank 3,000 Gallons. Bill 4521

TANK "U" SHAPE, SLOPING BACK. FUEL CAPACITY, 6 TONS.

Tool Boxes OF HARD WOOD, TOP.

Frame OAK AND YELLOW PINE

TENDER WEDGE BLOCK TO BE 9½" THICK WITH LONG RADIAL BEARING FAC

Front Drawbar height 30½"

Pilot NONE Pushing shoes AT REAR

Back drawhead, center above rail 33½"

Coupler SHARON M.C.B. AUTOMATIC

STEPS ACROSS BACK WITH HAND RAIL.

Steps, HAND HOLDS, ETC, TO CONFORM TO I.C.C. REQUIREMENTS

Trucks ARCH BAR TYPE WITH WOOD BOLSTER.

Springs ELLIPTIC. STANDARD STEEL WORKS.

Journals, Diam. 3¾" Length 7" NATIONAL JOURNAL BOXES.

Wheels, Diam. 30" Tread 4¼" Kind CHILLED CAST IRON PLATE

Tires NONE Cen. diam. --- Size -----

Tires held by -------

Safety chains SINGLE

Brake Position ON ALL WHEELS

Brake sch. FL-1012, WEST'G. AUTO. AIR.

List of tools, sch. 29

Photo sch. NONE Inspection B.L.W.

To be weighed No Material spec'ns B.L.W.

Certificate of boiler test THREE COPIES OF B.L.W. FORM 1036

Junior laws to 4-11-17. Shipment ON OWN WHEELS

Brass shop finish, No. 1

Machine shop finish D-165

B. L. W. Patents { FEED PIPE RESERVOIR PATENTED SEPT. 1, 1903 (CAST ON)

Property plates NONE

Painting:-Engine, style 291 OLIVE GREEN AND GOLD

Painting:-Tender, style 291 OLIVE GREEN AND GOLD

LETTERING TO BE SAME STYLE AS FOR 6 30 D 408

Mark on CAB SIDES N. C. W. I.

MARK ON TANK SIDES NEWPORT CHEMICAL WORKS, INC.

Road Nos. Pos.	Road Nos.	Name NONE
F. NO. PLATE	201	
DOME AND		
BACK OF TANK		

As Spec'n C - 4729

THE BALDWIN LOCOMOTIVE WORKS Dup. 6 32 D 1087 with same Extras except as otherwise specified

Memorandum Spec'n 17059

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1111 Gen. as Photo. 4926 {Except slightly smaller in size

FOR Michigan Alkali Company **Engine Drawing No.** 36

3-21-17.

Gauge of Road 4'8½" Play ⅜"
Wheelbase, Rigid 11'0" Driving 11'0" Total 11'0"
Total wheelbase, eng. and tend. {Actual 40'4½" Limited to ------

Curves 30 degrees

Limits, Height ------ Width -----
Weight (approximate) in working order, Total 115,000 pounds
On F. tr'k ----- lbs., Drivers 115,000 lbs., B. tr'k ----- lbs.

Tractive power 27980 lbs., Ratio of adhesion 4.1
Work'g St'm Pres. 190 lbs., Service Switching
Fuel Soft Coal
Locomotive to conform to all the I.C.C. requirements
Front tube sheet to be ½" thick
Boiler Steel Thick ⅜" Bill 8121
Boiler, Diam. 60" Plan Straight Top
{Boiler st'm pres. 190 lbs., Tested to {210 lbs. steam pres. / 254 lbs. water pres.
{With factor of safety of 4.94
Longitud. seams butt jointed, double covering strips.

Dome, diam. 29" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 95-7/16" Width 33⅜" Depth F. 64⅜" B. 62½"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diam.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Double Riveted
Water space stays 1" diam. with 3/16" hole 1⅛" deep from O.S.
Radial stays 1⅛" diam. Sling stays front {Two rows of B.L.W. Expansion Stays
Button heads below crown on Six central rows
Crown bars None Placed ---- above crown
Crown bolts ------

Flues None
Tubes #12 W.G. Charcoal Iron
Tube ends Swaged for copper ferrules, fire end.
Number 217 Diam. 2" Length 11'0"
Bottom row of tubes to be omitted (One tube)

Heating Surface | Flues None Combus. Chamb. None Total 1372.9 sq. ft.
Tubes 1239.3 sq. ft. Fire Box 133.6 sq. ft. Fire Brick Tubes ----
Grate area 22.1 sq. ft. Ratio to Heating Surface 1 : 62.1
Superheater ----

Fire Brick Arch on Studs

Grates Rocking bars and drop plate
Ash Pan, Dampers Front and back
Ash Pan to be self dumping type

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Smokebox extension With Cleaning hole and cap L.S.Only
Spark ejector or Hopper With
Netting and deflect. plates With

Exhaust nozzles Double High

Stack Straight Dia. 16" Hole in Base, dia. 21½"

Safety Valves (Spec) Two Crosby 3"
Safety valves None with relief lever, Set to 190 pounds
Whistle B.L.W. Plain, operated by lever

Steam Gauge One Iron 7" Maker:- Ashcroft (Not spec)
Steam gauge stand Iron **Clock** None

Water Gauge One B.L.W. (Ironclad) **Cab Lamps** to Burn Oil
Gauge Cocks Three Back Surface valve None
Lowest gauge cock ¾" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B.L.W.

Blow off Cock One B.L.W. Pos:- Front
Cleaning Plugs One plug above fire door
Firebox Corners, diagonal, sides, and back
Crown, One each side and three back
Waist, One under Front
Front tube sheet, One Fusible plug One
Plugs at front and back to be placed close to mud ring.

Pump None Pos. -----
Top chamb. ----- Bottom chamb. -----
Feed Cock ----- Feed pipes -----
Checks ------ Check pipes ------

Injectors (Spec) Two Hancock No. 8
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B.L.W. Pos. Right and Left

Steam Heat None

Cab Steel, with ventilator and saddle
Ample clearance to be provided between cab and tender when working on curves.
Cab boards Wood Nosing None
Running boards Wood Nosing None
Hand rail Iron Located on Boiler

Back Bumper Bar Steel Back drawbar height 35"

Pilot None Pushing shoes Front
Front Bumper Oak Bumper plate None
Steps across front with hand rail
Steps, hand holds, etc. to conform to I.C.C. requirements.
Front Drawhead, Center above rail 33½"
Coupler Tower M.C.B. Auto.

Signal fixtures None

Headlight Two round case 18" Reflector, To burn Kerosene
Headlight, Nos. on sides With H'd'l't step With
Lamp shelf None Nosing ------

Bell 85 pounds Golmar Air Bell Ringer.
Sand Box (Not spec) Two Diam. 28" Body Iron painted Pipes Iron
Sander Leach Air. Trap A-1 to each box to sand front and back

Dome casing Iron Painted

Boiler Jacket #22 Plain. Steel Bands Iron Style 9
Boiler Lagging 'Manesia Sectional

THE BALDWIN LOCOMOTIVE WORKS

A. J. Brandt Sept 1917

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1111

FOR Michigan Alkali Company

47

Frames Cast Steel Braces Solid

Cylinders, Diam. 19" Stroke 24"
St'm ports, Length 16 Width 1¼" Bridges 1"
Exh. ports, Length 16" Width 2½" Valve lead 1/16"
Valve travel 5½" Steam lap ⅜" Exhaust clearance -----
Eccentric crank throw 5" By-pass valve None
S. P. Lubr. (Spec) Detroit Triple #22 Bulls Eye
Cyl'r heads Cast Iron; Lubr. pipes of copper under jacket
Cyl'r casings Iron Ptd. Head covers Steel Painted
St'm chest casings Iron Ptd. Covers Steel Painted
St'm chest valves Richardson Balanced, with vacuum vlaves
Met. pkg {Piston rods / Valve stems} United States (Not spec)
Piston rods to be keyed to crossheads
Pistons Cast Iron rings sprung into solid head
Guides Steel Oil cups Needle
Crossheads Cast Steel
Wrist Pins Steel. Rod cups Grease cups forged on rods
Parallel rods to have solid ends

Valve Motion Stephenson
{Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B.L.W.
Driving wheels without hub liners
Drivers, O. S. Diam. 50" Cen. diam. 44" Centres cast Iron

Tires Steel Held by Shrinkage and Shoulder
Tires, Flanged, Pos. Front and Back Size 3" x 5½"
Tires, Plain, Pos. Middle Size 3" x 6½"
Lateral play between driving boxes and wheel hubs—½" Total.
Driving Boxes Steeled Cast Iron
Journals, Diam. 8" Length 8½

Springs. Make B.L.W.

Front Engine Truck None Wheeled ------
To swing ----each side of cen., Cen. pin liners ----
Journals, Diam. ---- Length ---- Boxes ------
Wheels, Diam. ----- Tread ----- Kind ------
Tires -------- Cen. diam. ---Size
Tires held by ---------

Back Engine Truck None Wheeled -----
To swing ---- each side of cen., Cen. pin liners -----
Journals, Diam. ---- Length ----- Boxes ------
Wheels, Diam. ----- Tread ---- Kind ------
Tires ------ Cen. diam. --- Size -----
Tires held by ---------

Brake, position On all driving and tender wheels
Operating Parts {Engine, Sch. A-1 and SWA West'g. Auto. and Eng. Tr'k, sch. ----- Straight air
Foundation Parts {Drivers, sch. WM-2 American O.S. Equalized Eng. Tr'k, sch. ------
Air pump One 9½" Pos. Left Side
Train connections Front and Back
Train signal, sch. None
Air Reservoir to have hydrostatic test of 210 lbs.
Certificates dated June 6th 1917 covering test of reservoir Nos. 12594 and 12693 furnished by West'g. Air Brake Co., are filed in Main Office, File No. 3967

Tender Eight Wheeled, Drawing No. 435
Weight, with fuel and water, about 70,000 pounds

Tank 3500 Gallons, Bill 3743
Tank "U" shape, sloping back with collar. Fuel cap. 6 tons.

Tool Boxes Hard Wood, Top

Frame Steel 10" channels

Front Drawbar height 29¾"
Pilot None Pushing shoes at rear
Back drawhead, center above rail 33½"
Coupler Tower M.C.B. Auto.
Steps, hand holds, etc. to conform to I.C.C. requirements.
Steps across back, with hand rail
Steps and hand rail on sloping back of tank.

Trucks Arch Bar Type with cast steel bolsters.

Springs Elliptic. B.L.W.
Journals, Diam. 4½" Length 8"
Wheels, Diam. 30" Tread 4½" Kind {Standard Steel Works / Solid Forged Rolled Steel.
Tires None Cen. diam.---- Size -----
Tires held by ------- Wheel Rims 2½" thick
Safety chains Single

Brake Position On all wheels
Brake sch. FL-1012 and SWA West'g. Auto. and Straight Air.
Ample clearance to be provided between cab and tender when working on curve.

List of tools, sch. 26
Photo sch. None Inspection B.L.W.
To be weighed No Material spec'ns B.L.W.
Certificate of boiler test Three Copies B.L.W. Form 1036
Junior laws to 5-7-17 Shipment On Own Wheels

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. Patents } Feed Pipe Strainer, Patented Sept. 1, 1903 (Cast On)

Property plates None

Painting: —Engine, style — Black No Striping
Painting:—Tender, style —— Black No Striping
Lettering in white same as for 6 32 D 1087
Mark on Cab sides under windows, N. T. R. R.
Mark on Tank Sides, Wyandotte Terminal Railroad Co.

Front Number Plate of cast iron
Road Nos. Pos. Road Nos. Name None.
F. No. Plate 7
Dome
Side Collar of tank
Back Of tank

THE BALDWIN LOCOMOTIVE WORKS As Spec. C-4282
Memorandum Spec'n 11192 — Minor details to be same as for 4-11 C 376 except where otherwise spec'd.

SPECIFICATION FOR LOCOMOTIVES 4 18 C 114 — Gen. as Photo. 5543 | Except with oil instead of electric headlight

FOR General Refractories Company — 10-30-16 — **Engine Drawing No.** 36

R.

Gauge of Road 3' 3" Play 5/8"
Wheelbase, Rigid 5' 0" Driving 5' 0" Total 5' 0"
Total wheelbase, eng. and tend. | Actual ----- | Limited to -----

Rails, 40 lbs.
Curves 150 ft. radius Grades, 3 1/2%

Limits, Height ------ Width -----
Weight approximate in working order, Total 46000 lbs.
On F. tr'k ----- lbs., Drivers 46000 lbs., B. tr'k ----- lbs.

Tractive power 9800 lbs., Ratio of adhesion 4.7
Work'g St'm Pres. 165 lbs., Service Switching
Fuel Soft Coal

Front tube sheet to be 1/2" thick
Boiler Steel Thick 7/16" Bill 7965
Boiler, Diam. 40" Plan Straight Top

Boiler st'm pres. 165 lbs., Tested to { 185 lbs. steam pres. / 220 lbs. water pres.
with factor of safety of 5.27
Longitud. seams Double riveted, lap joints.

Dome, diam. 22" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 36-7/16" Width 35 1/4" Depth F. 40" B. 39"
Firebox, Tube 7/16" Crown 3/8" Sides 5/16" Back 5/16"
Firedoor opening 16" diam.
Water space, Front 2" & 2 1/2" Sides 2" Back 2"
Water space, Frame Single Riveted
Water space stays 7/8" diam. with 3/16" holes 1 1/4" deep from O.S.

Radial stays 1" diam. Sling stays front None
Button heads below crown on None central rows
Crown bars None Placed ----- above crown
Crown bolts -----

Flues -----
Tubes #12 W. G. Charcoal Iron or Steel
Tube ends Swaged for copper ferrules firebox ends.
Number 104 Diam. 1 3/4" Length 8' 1 5/8"

Heating Flues ----- Combus. Chamb. ----- Total 422.0
Surface Tubes 384.0 Fire Box 38.0 Fire Brick Tubes ——
Grate area 8.90 Ratio to Heating Surface 1 : 47.4
Superheater -----

Fire Brick Arch None

Grates Rocking Bars and Drop plate
Ash Pan, Dampers Front and Back

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Smokebox extension With Cleaning hole and cap Underneath
Spark ejector or hopper None
Netting and deflect. plates With

Exhaust nozzles Double, high

Stack Straight Dia. 12" Hole in S. B., dia. 13 1/2"

(Not spec.) **Safety Valves** Two Coale 2"
Safety valves None with relief lever, Set to 165 pounds
Whistle Low, not shrill

Steam Gauge One Iron 6" MAKER:-Ashcroft (Not spec.)
Steam gauge stand Iron **Clock** None

Water Gauge One B.L.W. (Ironclad) **Cab Lamps** to burn oil.
Gauge Cocks Three Back Surface valve None
Lowest gauge cock 3" above highest part of crown
Lubricator steam valve without separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One B.L.W. POS:-Front
Cleaning Plugs
Firebox Corners, diagonal
Crown, One each side and one back
Waist, One under front
Front tube sheet, One Fusible plug One

Pump None Pos. -----
Top chamb. ----- Bottom chamb. -----
Feed Cock ----- Feed pipes -----
Checks ----- Check pipes -----

(Spec.) **Injectors** Two Sellers, Class "N" No. 4-3/10
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. Right and Left

Steam Heat None

Cab Wood
Coal box, left side of cab, with capacity for 1000 pounds or more if possible.
Cab boards Wood Nosing None
Running boards Wood Nosing None
Hand rail Iron Located on tank

Back Bumper Oak

Pilot None Pushing shoes Front and Back
Front Bumper Oak Bumper plate None
Steps Across front and back with handrails

F. & B. Drawhead, Center above rail 20" and 24"
Coupler Cast Iron Drawheads with two pockets for link and pin connection, front and back.

Signal fixtures None

Headlight Two Round Case 10" (account of time) Reflector, To burn Kerosene
Headlight, Nos. on sides None H'd'l't step None
Lamp shelf None Nosing -----

Bell 45 pounds
Sand Box Two Diam. 19" Body Iron Painted Pipes Iron
Sander Hand in each box to sand front and back

Dome casing Iron Painted

Boiler Jacket #22 Soft Steel Plate Bands Iron Style 9
Boiler Lagging Magnesia sectional

THE BALDWIN LOCOMOTIVE WORKS
W. A. Barclay — Jan 1917

SPECIFICATION FOR LOCOMOTIVES 4 18 C 114

FOR General Refractories Company

R.

49

Frames Cast Steel Braces Solid

Cylinders, Diam. 12" Stroke 16"
St'm ports, Length 10" Width 1" Bridges 7/8"
Exh. ports, Length 10" Width 2" Valve lead 1/16"
Valve travel 4 1/8" Steam lap 7/8" Exhaust clearance -----
Eccentric crank throw 3 1/2" By-pass valve None
S. F. Lubr. (Spec.) Detroit double No. 5 Bull's-Eye
Cyl'r heads Cast Iron; Lubr. pipes of Iron under jacket
Cyl'r casings Iron Ptd. Head covers Steel Painted
St'm chest casings Iron Ptd. Covers Steel Painted
St'm chest valves Richardson balanced, with vacuum valves
Met. pkg {Piston rods / Valve stems} United States (Not spec.)

Pistons Cast Iron ring sprung into solid head
Guides Steel Oil cups Needle
Crossheads Cast Steel with Bearings of Brass
Wrist Pins Steel Rod cups Plunger
Parallel Rods to have solid ends

Valve Motion Stephenson
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 33" Cen. diam. 28" Centres Cast Iron
Driving Wheels without hub liners
Tires Steel Held by Shrinkage and Shoulder
Tires, Flanged, Pos. All Size 2 1/2" X 5"
Tires, Plain, Pos. ----- Size -----
Lateral play between driving boxes and wheel hubs = 1/32" total
Driving Boxes Cast Iron
Journals, Diam. 5 1/2" Length 6"

Springs. Make B. L. W.

Front Engine Truck None Wheeled -----
To swing -----each side of cen., Cen. pin liners -----
Journals, Diam. -----Length ----- Boxes -----
Wheels, Diam. ----- Tread----- Kind -----
Tires ----- Cen. diam.----- Size -----
Tires held by -----

Back Engine Truck None Wheeled -----
To swing -----each side of cen., Cen. pin liners -----
Journals, Diam. -----Length ----- Boxes -----
Wheels, Diam. ----- Tread -----Kind -----
Tires ----- Cen. diam.----- Size -----
Tires held by -----

Brake, position Both pairs of Driving Wheels (No Tender)
Operating Parts | Engine, Sch. U-1 B.L.W. Steam / Eng. Tr'k, sch. -----
Foundation Parts | Drivers, sch. U-1 B.L.W. / Eng. Tr'k, sch. -----
Air pump ----- Pos. -----
Train connections -----
Train signal, sch. -----
Separate lubricator for steam brake valve

Tender None Wheeled, Drawing No. -----
Weight, with fuel and water, about -----

Tank 800 Gallons, Bill 4386
Saddle tank, located over top of boiler, and extending over smoke box
Tool Boxes -----

Frame -----

Front Drawbar height -----
Pilot ----- Pushing shoes -----
Back drawhead, center above rail -----
Coupler -----

Steps -----

Trucks -----

Springs -----
Journals, Diam. -----Length -----
Wheels, Diam. ----- Tread -----Kind -----
Tires ----- Cen. diam. -----Size -----
Tires held by -----
Safety chains -----

Brake Position -----
Brake sch. -----

List of tools, sch. 26
Photo sch. #2 Inspection B. L. W.
To be weighed Yes Material specfns B. L. W.
Certificate of boiler test Three copies of B.L.W. form 1036
Junior laws to 31-2-16 Shipment On Car

Brass shop finish, No. 1
Machine shop finish D-165
General appearance of loco. to be same as 4 18 C 106

B. L. W.
Patents Throttle, Patented Jan. 23, 1900 (Cast on)

Property plates None

Painting: Engine, style 222 Olive Green and Aluminum
Painting:—Tender, style -----

Lettering, etc. to be same general style as photo. 5549 (4-18C 106
Mark on tank sides, General Refractories Co.

Road Nos. Pos. F. No Plate F. Sand Box Cab Sides — Road Nos. 5 — Name None

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-4354

Memorandum Spec'n 11242

SPECIFICATION FOR LOCOMOTIVES 4 8 C 94 & 95

FOR J. W. Paxson Co.

R. 12-8-16

Gen. as Photo. 5423

Engine Drawing No. 19

Gauge of Road 3' 0" Play $\frac{3}{8}$"
Wheelbase, Rigid 3' 10" Driving 3' 10" Total 3' 10"
Total wheelbase, eng. and tend. Actual ----- Limited to -----
Rails, 20 pounds. Ties spaced about 3'0" apart
Curves ----- Grades, 5.6%

Limits, Height ----- Width -----
Weight (approximate) in working order, Total 17,200 Lbs.
On F. tr'k ----- lbs., Drivers 17,200 lbs., B. tr'k ----- lbs.

* Tractive power 3480 lbs., Ratio of adhesion 4.9, tank empty 4.2
Work'g St'm Pres. 160 lbs., Service Switching
Fuel Soft Coal

Front tube sheet to be $\frac{7}{16}$" thick
Boiler Steel Thick $\frac{5}{16}$" Bill 8030
Boiler, Diam. 24" Plan Straight Top
Boiler st'm pres. 160 lbs., Tested to 180 lbs. steam pres.
with factor of safety of 6.9 214 lbs. water pres.
Longitud. seams Double riveted, lap joint

Dome, diam. $15\frac{1}{8}$" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 26-$13\frac{1}{16}$" Width $19\frac{7}{8}$" Depth F. 27" B. 27"
Firebox, Tube $\frac{3}{8}$" Crown $\frac{5}{16}$" Sides $\frac{5}{16}$" Back $\frac{5}{16}$"
Firedoor opening 12" diam.
Water space, Front 2" and $2\frac{1}{2}$" Sides 2" Back 2"
Water space, Frame Single Riveted
Water space stays $\frac{7}{8}$" diam. with $\frac{3}{16}$" holes $1\frac{1}{4}$" deep from O.S.

Radial stays $\frac{7}{8}$" diam. Sling stays front None
Button heads below crown on None central rows
Crown bars None Placed ----- above crown

* Locomotive to haul four cars weighing $3\frac{1}{2}$ tons each, up a 5.6% grade.

Tubes #13 W. G. Charcoal Iron or Steel
Tube ends Swaged for copper ferrules, fire box ends
Number 43 Diam. $1\frac{1}{2}$" Length 6' 4"

Heating Surface Flues ----- Combus. Chamb. ----- Total 122[0]
Tubes 106[0] Fire Box 16[0] Fire Brick Tubes -----
Grate area 3.7[0] Ratio to Heating Surface 1 : 33
Superheater -----

Fire Brick Arch, None

Grates Rocking Bars and drop plate
Ash Pan, Dampers Back only

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Smoke box extension to be short.
Smokebox extension With Cleaning hole and cap Underneath
Spark ejector or hopper None
Netting and deflect. plates None

Exhaust nozzles Single Low
Cleaning Pipe:- With
Stack Radley & Hunter Dia. 7" Hole in S. B., dia. 9"
Stack to be arranged to prevent throwing of sparks Sept. 3/27/17

(Not Space)
Safety Valves Two Consolidated $1\frac{1}{2}$"
Safety valves None with relief lever, Set to 160 pounds
Whistle B. L. W. plain

Steam Gauge One Iron 6" MAKER:-Ashcroft (Not Space)
Steam gauge stand Tron **Clock** None

Water Gauge One B.L.W. (Cronclad) **Cab Lamps** to burn oil
Gauge Cocks Three Back Surface valve None
Lowest gauge cock 3" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome See Lo. 10606-24
Blower Valve B. L. W.

Blow off Cock One B. L. W. POS:-Back
Cleaning Plugs
Firebox Corners
Crown, None
Waist, One under front
Front tube sheet, None Fusible plug One

Pump None Pos. -----
Top chamb. ----- Bottom chamb. -----
Feed Cock ----- Feed pipes -----
Checks ----- Check pipes -----

(Not Space)
Injectors Two Metropolitan, Class "H" No. 2
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B.L.W. with stop valves Pos. Right and Left

Steam Heat None

Cab Wood
Fuel box in left side of cab, capacity 800 pounds

Cab boards Wood Nosing None
Running boards None Nosing None
Hand rail Iron Located on Cab

Back Bumper Oak

Pilot None Pushing shoes None
Front Bumper Oak Bumper plate None
Steps Across front

F. & B. Drawhead, Center above rail 17"
Coupler Cast Iron Drawhead, (to suit service)

Signal fixtures None

Headlights to be Adams & Westlake No. 1453
Headlight Two Round Case 6" Reflector, To burn Kerosene
Headlight, Nos. on sides None H'dl't step None
Lamp shelf None Nosing -----

Bell 28 pounds
Sand Box One Diam. 15" Body Iron Painted Pipes Iron
Sander Hand to sand front and back

Dome casing Iron Painted

Boiler Jacket #22 Soft Steel Pt. Bands Iron Style 9
Boiler Lagging Magnesia sectional

THE BALDWIN LOCOMOTIVE WORKS
6 No. Greeh April 1917
SPECIFICATION FOR LOCOMOTIVES 4 - 8 C 94 & 95
FOR J. W. Paxson Co.
R.

Frames Cast Steel Braces Solid

Cylinders, Diam. 7" Stroke 12"
St'm ports, Length $4\frac{1}{2}$" Width $\frac{5}{8}$" Bridges $\frac{3}{8}$"
Exh. ports, Length $4\frac{1}{2}$" Width $1\frac{1}{4}$" Valve lead $\frac{1}{16}$"
Valve travel 3" Steam lap $\frac{1}{2}$" Exhaust clearance -----
Eccentric-cranks throw $2\frac{1}{4}$" By-pass valve None
S. F. Lubr. (Cyl.) Michigan Double Bulls Eye, $1\frac{1}{2}$ pints capacity
Cyl'r heads Cast Iron: Lubr. pipes of Iron under jacket
Cyl'r casings Iron Ptd. Head covers Steel Painted
St'm chest casings Iron Ptd. Covers Steel Painted
St'm chest valves Plain "D"
~~Main~~ pkg (Piston rods / Valve stems) Braided Packing

Pistons Cast Iron rings sprung into solid head
Guides Steel Oil cups Needle
Crossheads Cast Iron
Wrist Pins Steel Rod cups Needle, forged on
Parallel rods to have solid ends.

Valve Motion Stephenson
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.
Driving wheels without hub liners
Drivers, O. S. Diam. 23" Cen. diam. 19", Centres Cast Iron

Tires Steel Held by Shrinkage and Shoulder
Tires, Flanged, Pos. All Size 2" X 5"
Tires, Plain, Pos. None Size -----
Lateral play between driving boxes and wheel hubs = 1/32" total
Driving Boxes Cast Iron
Journals, Diam. $3\frac{1}{2}$" Length 6"

Springs. Make B. L. W.

Front Engine Truck None Wheeled -----
To swing -----each side of cen., Cen. pin liners -----
Journals, Diam. -----Length ----- Boxes -----
Wheels, Diam----- Tread -----Kind -----
Tires ----- Cen. diam----- Size -----
Tires held by -----

Back Engine Truck None Wheeled -----
To swing----- each side of cen., Cen. pin liners -----
Journals, Diam. -----Length ----- Boxes -----
Wheels, Diam----- Tread -----Kind -----
Tires ----- Cen. diam----- Size -----
Tires held by -----

Brake, position On all driving wheels (no tender)
Operating Parts: Engine, Sch. ----- B. L. W. Hand; Eng. Tr'k, sch. -----
Foundation Parts: Drivers, sch. ----- B. L. W.; Eng. Tr'k, sch. -----
Air pump ----- Pos. -----
Train connections -----
Train signal, sch. -----

Tender None Wheeled, Drawing No. -----
Weight, with fuel and water, about -----

Tank 300 Gallons, Bill 4441
Saddle tank extending over smoke box.
Equalizing pipe to be applied between both sides of tank
Tool Boxes -----

Frame -----

Front Drawbar height -----
Pilot ----- Pushing shoes -----
Back drawhead, center above rail -----
Coupler -----

Steps -----

Trucks -----

Springs -----
Journals, Diam. -----Length -----
Wheels, Diam. ----- Tread ----- Kind -----
Tires ----- Cen. diam----- Size -----
Tires held by -----
Safety chains -----

Brake Position -----
Brake sch. -----

List of tools, sch. 26
Photo sch. None Inspection B. L. W. except * below
To be weighed, No Material spec'ns B. L. W.
Certificate of boiler test Three copies of B.L.W. form 1036
Junior laws to 2-20-17 Shipment On car

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. Patents: None

Property plates None

Painting: Engine, style 223 Olive Green and Aluminum
Painting: Tender, style ----------

Mark on tank sides, L. S. Co.

Road Nos. Pos.	Road Nos.	Name None
F. No Plate	2	
Cab Sides	3	

* Loco. while under steam just prior to shipment, is to be inspected by Company's representative. Advise Company when representative should be here for this purpose, giving one days notice.

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-4363

Memorandum Spec'n 11240

SPECIFICATION FOR LOCOMOTIVES 6 3¼ D 957

FOR Whitaker – Glessner Company

R. (Portsmouth Works) 12-6-16

Gen. as Photo. 3305

Engine Drawing No. 75

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 10' 10" Driving 10' 10" Total 10' 10"
Total wheelbase, eng. and tend. {Actual ——— / Limited to ———

Curves 400 feet radius. Grades, 2% (see note Ⓑ)
Rails, 80 pounds
Limits, Height ——— Width ———
Weight (approximate) in working order, Total 150,000 pounds
On F. tr'k ——— lbs., Drivers 150000 lbs., B. tr'k ——— lbs.

Tractive power 31860 lbs., Ratio of adhesion 4.7 (see note Ⓐ)
Work'g St'm Pres. 180 lbs., Service Switching
Fuel Soft Coal
Boiler to be built to meet Ohio Industrial Laws (see note Ⓒ and sups 1 to 9)
Front tube sheet to be ½" thick
Boiler Steel Thick ⅜" Bill 8033
Boiler, Diam. 60" Plan Straight Top

Boiler st'm pres. 180 lbs. Tested to { 200 lbs. steam pres. / 240 lbs. water pres.
with factor of safety of 5.2
Longitud. seams Butt jointed, double covering strips

Dome, diam. 29" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 88-3/16" Width 41¼" Depth F. 59¾" B. 57½"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back 5/16"
Firedoor opening 16" diam. Crown and sides in one piece
Water space, Front 4" Sides 3½" Back 3½"
Water space, Frame Single Riveted
Water space stays 1" diam. with 3/16" holes 1¼" deep from O.S.

Radial stays 1" diam. Sling stays front {Two rows of B. L. W. Expansion Stays / Eight central rows
Button heads below crown on
Crown bars None Placed ——— above crown
Crown bolts ———

Flues ———
Tubes #12 W. G. Charcoal Iron or Steel
Tube ends Swaged for copper ferrules firebox ends
Number 198 Diam. 2" Length 10' 9"

Heating Surface Flues ——— Combus. Chamb. ——— Total 1227⁰
Tubes 1106⁰ Fire Box 121⁰ Fire Brick Tubes ———
Grate area 25.3 Ratio to Heating Surface 1 : 48.5
Superheater ———

Fire Brick Arch on Studs

Grates Rocking bars and drop plate
Ash Pan, Dampers Front and back

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Smokebox extension With Cleaning hole and cap L. S. Only
Spark ejector or hopper With
Netting and deflect. plates With

Exhaust nozzles Double high

Stack Cast Iron, Straight Dia. 18" Hole in S. B., dia. 22"

(not spec) **Safety Valves** Two Consolidated 2½"
Safety valves None with relief lever, Set to 180 pounds
Whistle B. L. W. plain

Steam Gauge One Iron 7" Maker:–Ashcroft (not spec)
Steam gauge stand Iron **Clock** None

Water Gauge One B.L.W. (Ironclad) **Cab Lamps** to burn oil
Gauge Cocks Three Back Surface valve None
Lowest gauge cock 3¼" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One B. L. W. Pos:–Front
Cleaning Plugs One plug above fire door
Firebox Corners diagonal, sides and back
Crown, One each side and three back
Waist, One under front
Front tube sheet, One Fusible plug One

Pump None Pos. ———
Top chamb. ——— Bottom chamb. ———
Feed Cock ——— Feed pipes ———
Checks ——— Check pipes ———

(not spec) **Injectors** Two Monitor No. 7
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. Right and Left

Steam Heat None

Cab Wood
Coal box with a capacity of 3500 lbs. located on rear extension of engine frame, back of cab.
Cab boards Wood Nosing None
Running boards Wood Nosing None
Hand rail Iron Located on tank

Back Bumper Oak

Pilot None Pushing shoes Front and back
Front Bumper Oak Bumper plate None
Steps across front and back with hand rails.
Steps, hand holds, etc. to conform to I.C.C. requirements
F. & B. Drawhead, Center above rail 33½"
Coupler M. C. B. Auto.

Signal fixtures None

Headlight Two Round Case 16" Reflector, To burn Kerosene
Headlight, Nos. on sides With H'd'l't step With
Lamp shelf None Nosing ———

Bell 92 pounds
Sand Box Two Diam. 31" Body Iron Painted Pipes Iron
Sander (not spec) Leach Air Trap A-1, in each box, to sand front and back.

Dome casing Iron Painted

Boiler Jacket #22 Soft Steel Pt Bands Iron Style 9 and 14
Boiler Lagging B. L. W. Plastic Magnesia (from stock)
Backhead of boiler to be lagged and jacketed

THE BALDWIN LOCOMOTIVE WORKS
L. L. Neele May 1917

SPECIFICATION FOR LOCOMOTIVES 6 3¼ D 957 53

FOR Whitaker – Glessner Company

R.

Frames Cast Steel Braces Solid

Cylinders, Diam. 20" Stroke 26"
St'm ports, Length 16" Width 1½" Bridges ⅝"
Exh. ports, Length 16" Width 2½" Valve lead 1/16"
Valve travel 5½" Steam lap ⅞" Exhaust clearance ———
Eccentric-crank throw 5" By-pass valve None
S. P. Lubr. (not spec) Michigan Triple Bulls Eye
Cyl'r heads Cast Iron; Lubr. pipes of Iron under Jacket
Cyl'r casings Iron Ptd. Head covers Steel Painted
St'm chest casings Iron Ptd. Covers Steel Painted
St'm chest valves Richardson Balanced with vacuum valves
Met. pkg {Piston Rods / Valve Stems} United States (not spec)

Pistons Cast Iron rings sprung into solid head
Guides Steel Oil cups Needle
Crossheads Cast Steel
Wrist Pins Steel Rod cups Plunger, forged on
Parallel Rods to have solid ends

Valve Motion Stephenson
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.
Driving Wheels without hub liners
Drivers, O. S. Diam. 50" Cen. diam. 44" Centres Cast Iron

Tires Steel Held by Shrinkage and Shoulder
Tires, Flanged, Pos. All Size 3" X 5½"
Tires, Plain, Pos. None Size ———
Lateral play between driving boxes and wheel hubs = 1/16" total
Driving Boxes Steeled Cast Iron
Journals, Diam. 9" Length 12"

Springs. Make B. L. W.

Front Engine Truck None Wheeled ———
To swing ——— each side of cen., Cen. pin liners ———
Journals, Diam. ——— Length ——— Boxes ———
Wheels, Diam. ——— Tread ——— Kind ———
Tires ——— Cen. diam. ——— Size ———
Tires held by ———

Back Engine Truck None Wheeled ———
To swing ——— each side of cen., Cen. pin liners ———
Journals, Diam. ——— Length ——— Boxes ———
Wheels, Diam. ——— Tread ——— Kind ———
Tires ——— Cen. diam. ——— Size ———
Tires held by ———

Brake, position On all driving wheels (no tender)
Operating Parts {Engine, Sch. A-1, SWA West'g. Auto. and Straight Air / Eng. Tr'k, sch. ———
Foundation Parts {Drivers, sch. WM-2 American O.S. Equalized / Eng. Tr'k, sch. ———
Air pump One 9½" Pos. L.S. on smoke box
Train connections Front and Back
Train signal, sch. None
Air reservoir to have hydrostatic test of 210 lbs. 5/14/17
Certificates dated Mar. 21st 1917 covering test of reservoir Nos. 9608–9609 inc. furnished by West'g. Air Brake Co., are filed in Main Office, File No. 3235-W.

TENDER, None

Tank 2500 Gallons, Bill 4350
Saddle Tank located over top of boiler, but not to extend over smoke box.

Ⓐ Locomotive to haul about 550 tons (of 2240 lbs. each) of cars and lading up a 2% straight grade.

Ⓑ No curve on grades but one level curve 400 feet radius at top of grade.

Ⓒ Locomotive to conform to the requirements of the Industrail Commission of Ohio, and must be stamped on the back head of boiler, in the presence of the authorized inspector, thus { OHIO STD / 14 / BALDWIN

Ⓓ Boiler to be inspected by the Hartford Steam Boiler Inspection & Insurance Co.

List of tools, sch. 29
Photo. sch. None Inspection B.L.W. except (see Ⓓ above)
To be weighed, No Material spec'ns. B. L. W.
Certificate of boiler test Three copies of B.L.W. form 1036
Junior laws to 2-1-17; Shipment, On own wheels

Brass shop finish, No. 1
Machine shop finish, D-165

B. L. W. PATENTS } Steam Pipe Cover, Patented July 18, 1911 (Cast On)

Property Plates, None

PAINTING:– Engine, style 220 Olive Green and Aluminum
PAINTING:– Tender, style ———

Mark on tank sides, WHITAKER-GLESSNER CO.

Front Number plate to be 18" diameter with a centre circle 12" diam. painted red having large figure in the middle, the 3" band on outside to be painted white with SAFETY FIRST painted in black letters as shown on sketch herewith.

Road Nos. Pos.	Road Nos.	Name, None
F. No. Plate	8	
F. Sand Box		
Cab sides		

A Boilers built to meet the requirements of the Industrial Commission of Ohio must be designed strictly in accordance with the "Rules formulated by the Industrial Commission of Ohio," and be inspected during construction and upon completion by an authorized Ohio Inspector, such Inspector not to be interested either directly or indirectly with the manufacturer.

B DESIGN:- The minimum factor of safety shall be five.

B Longitudinal lap seams shall not be used.

C Welded Boiler braces shall not be subjected to a fibre stress in excess of 6000 lbs. per sq. in.

D Stress in staybolts shall not exceed 6500 lbs. per sq. in.,(therefore use 1" staybolts for 180 lbs. and over)

E The maximum allowable stress per square inch net cross sectional area of stud bolts or tap bolts having a diameter of ¾" or larger shall not exceed 6000 lbs.

F The minimum thickness of butt straps shall be as follows:-

THICKNESS OF SHELL PLATES	MINIMUM THICKNESS OF BUTT STRAPS
¼" & 5/16"	¼"
⅜"	5/16"
7/16"	⅜"
½" & 9/16"	7/16"
⅝", 11/16" & ¾"	½"
13/16"	9/16"
⅞"	⅝"
15/16"	11/16"
1" & 1⅛"	¾"

G The minimum thickness of tube sheets shall be as follows:-

OUTSIDE DIA. OF TUBE SHEET	MINIMUM THICKNESS
42" or less	⅜"
Over 42" to 54" inclusive	7/16"
" 54" to 72" "	½"
" 72"	9/16"

When a tube sheet is not circular in form (i.e., fire box tube sheet) the least dimension of such sheet shall determine its thickness.

H No boiler shall have a continuous longitudinal seam over 12 feet in length.

I There shall be not less than six brass washout plugs not smaller than 1½" pipe tap located as follows:
One in front tube sheet below the tubes.
One in back head at or about the line of the crown sheet.
Four in the lower part of the water leg.

J An opening in the boiler for a threaded pipe connection 1" in diameter or over shall have not less than the minimum number of threads in such opening as shown in the following table:-

SIZE OF PIPE CONNECTION.	1" & 1¼"	1½" & 2"	2½" to 4"
NO. OF THDS. PER INCH.	11½	11½	8
MINIMUM NO. OF THDS. REQUIRED IN OPENING.	4	5	7
MINIMUM THICKNESS OF MATERIAL REQUIRED TO GIVE ABOVE NO. OF THREADS.	⅜"	7/16"	⅞"

If the thickness of the boiler material is not sufficient to give the above number of threads, a liner or flange must be applied.

K Each boiler must be provided with a connection ¼ pipe size for attaching inspector's test gauge.

L A fusible plug must be applied which projects through the crown at least 1". The plug must be filled with pure tin and the least diameter of the fusible metal must be not less than ⅜" (Fusible Plug B. L. W. Card #4516).

M Feed water shall not discharge into a boiler in close proximity to riveted joints in shell or furnace sheets. Each boiler shall have a feed pipe fitted with a check valve, and also a stop valve or stop cock between the check valve and the boiler, the feed water to discharge below the lowest safe water line.

N MATERIALS:- Shell,(including top and sides) dome and butt straps (including dome liner), shall be open hearth steel of FIRE BOX quality and shall conform to the specification of the American Society of Mechanical Engineers.
Front tube sheet, back head, and throat sheet may be open hearth FLANGE steel and shall conform to the requirements of the American Society of Mechanical Engineers.

O Smoke Box steel to conform to B. L. W. Spec'n.

P Rivets shall be open hearth extra soft steel as specified in paragraphs 15, 17 and 19, Part III. Section 2, of the Boiler inspection law of Ohio.

Q All boiler plates except the fire box and smoke box plates must be marked by the manufacturer with the heat number, name of manufacturer, brand and lowest tensile strength in the manner and location shown on The B. L. W. Marking Card #6807.
This marking card should be ordered on the card sheet and on the store room sheet for boiler steel and one piece domes.

R SHOP PRACTICE:- Rivet holes except for attaching stay feet and T-iron to heads shall be drilled full size with plates, butt straps, and heads bolted up in place; or they may be punched out not to exceed ¼" less than full size for plates over 5/16" in thickness, and ⅛" less than full size for plates 5/16" and under, and then drilled or reamed to full size with plates, butt straps and heads bolted up in position.
The Tube holes may be drilled full size, or they may be punched not to exceed ½" less than full size and then drilled, reamed or finished full size with rotating cutter.

S Upon completion each boiler shall be stamped with the words

OHIO STANDARD
(serial no. as specified)
BALDWIN

This stamping must be done by the authorized Ohio inspector.
The height of the letters and figures shall be 5/16".
The location of the stamping shall be on the back head above plug hole. It must not be covered by lagging or fittings.

C Extract from letter of the Hartford Steam Boiler Inspection and Insurance Co. dated Jan. 7th, 1916:- "In order for our inspectors to comply with Ohio requirements in making inspections of steam boilers, it is necessary that they make at least three visits to the shop during the work of construction. First, to look over the plates to see that they are sound and properly stamped, and if it is the practise of the shop, to first punch the rivet holes, the punching should have been done at this time.
The second trip would be to see the work after it is fitted up and rivet holes reamed or drilled full size preparatory to driving the rivets.
The next trip would be after the boiler is completed for the purpose of examining the completed work and applying the hydrostatic test."

T When the boiler is tested by hydrostatic pressure, the maximum pressure applied shall not exceed one and one-half times the maximum allowable working pressure.

U A Data report, on forms furnished by the Boiler Inspection Department of the Ohio Industrial Commission, shall be forwarded by the builder to the chief inspector of such department for each boiler stamped OHIO STD. before the boiler is shipped from the boiler shop.

THE BALDWIN LOCOMOTIVE WORKS As Ry. Co's spec'n. No. 3, Revised Chicago, Sept. 29th, and Oct. 3rd, 1916

Memorandum Spec'n 11165

SPECIFICATION FOR LOCOMOTIVES 4 22 C 214 to 216 Gen. as Photo. 3862

FOR Mark Manufacturing Company Engine Drawing No. 38

10-4-16

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 7' 0" Driving 7' 0" Total 7' 0"
Total wheelbase, eng. and tend. { Actual ---, Limited to ---

Curves 70 ft. radius

Limits, Height 10' 6" Width 8' 6½"
Weight (approximate) In working order, Total 81,000 pounds
On F. tr'k ---- lbs., Drivers 81,000 lbs., R. tr'k ---- lbs.

Tractive power 17,300 lbs., Ratio of adhesion 4.68
Work'g St'm Pres. 180 lbs., Service Switching (See note ①)
Fuel Soft coal

Front tube sheet to be ½" thick
Boiler Steel Thick 7/16" Bill 7947
Boiler, Diam. 42" Plan Straight Top
Boiler st'm pres. 180 lbs., Tested to { 215 lbs. steam pres., 225 lbs. water pres.
with factor of safety of 5.25
Longitud. seams Butt jointed, double covering strips

Dome, diam. 22" Pos. Central
Auxiliary dome for safety valves and whistle
Firebox Steel Combustion chamb. None
Firebox, length 46-3/16" Width 42½" Depth F. 41½" B. 43"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back 5/16"
Firedoor opening 16" diam. Crown and sides in one sheet
Water space, Front 3½" Sides 3" Back 3"
Water space, Frame Single Riveted
Water space stays ⅞" diam. with 3/16" holes 14" deep from O.S.

Radial stays 1" diameter Sling stays front None
Button heads below crown on 5/8 central rows
Crown bars None Placed --- above crown
Crown bolts ---

Flues ---
Tubes #12 W.G. seamless steel or charcoal iron
Tube ends Shaged for copper ferrules, Pierson ends
Number 100 Diam. 2" Length 10' 9"

Heating Surface				
Flues ---	Combus. Chamb. ---	Total 612 sq. ft.
Tubes 559 sq. ft.	Fire Box 53 sq. ft.	Fire Brick Tubes ---
Grate area 13.5 sq. ft.	Ratio to Heating Surface 1 : 45.4	
Superheater ---		

Fire Brick Arch, None

Grates Cast iron, rocking bar type, with drop plate
Ash Pan, Dampers Front and back

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Superheater extension With Cleaning hole and cap L. S. only
Front diaphragm plate With
Netting and detector plates With

Exhaust nozzles Double nozzle

Stack, Straight Dia. 14" Hole in S. B., dia. 21½"

(Spare) **Safety Valves** Two Crosby 1½", High efficiency
Safety valves None with relief lever, Set to 180 pounds
Whistle B. L. W. 4"

Steam Gauge One iron case 5" MAKER: Ashcroft (not spare)
Steam gauge stand Iron **Clock** None

Water Gauge One B.L.W. (Ironclad) **Cab Lamps** To burn oil
Gauge Cocks Three back Surface valve None
Lowest gauge cock 3" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One B. L. W. (approved design) Pos: Front
Cleaning Plugs
Firebox Corners diagonal
Crown, One each side and two back
Waist, One under front
Front tube sheet, One Fusible plug One

Pump None Pos. ---
Top chamb. --- Bottom chamb. ---
Feed Cock --- Feed pipes ---
Checks --- Check pipes ---

(not spare) **Injectors** Two Monitor No. 8
Injectors, Pos. Right and left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. Right and left

Steam Heat None

③ **Cab** Steel, sheathed with wood and lined with asbestos
Coal bin in left side of cab, capacity 1600 pounds
Cab boards and running boards to be securely fastened
Cab boards Steel Nosing Tee iron
Running boards Steel Nosing Tee iron
Hand rail Iron Located on tank

Back Bumper Cast steel
Combined weight of front and back bumpers to be 2000 pounds

Pilot None Pushing shoes Front and back
Front Bumper Cast steel. Bumper plate None
Steps across front and back, with handrails
Steps, hand holds, etc., to conform to I. C. C. requirements
F. & B Drawhead, Center above rail (See note ④)
Coupler (See note ④)

Signal fixtures None

Headlight Two Round Case 12" Reflector, To burn Kerosene
Headlight, Nos. on sides With H'd'l't step None
Lamp shelf None Nosing ---

Bell 65 pounds
Sand Box Four (see below) Body Iron painted Pipes - see Sander
Sander, Leach Ash Trap B-S. in each box to sand front and back
Sand boxes to be placed under tank.
Dome casing Iron, painted

Boiler Jacket 22 soft steel plates Iron Style 9
Boiler Lagging Magnesia sectional

THE BALDWIN LOCOMOTIVE WORKS O Standish Jan 1917

SPECIFICATION FOR LOCOMOTIVES 4 22 C 214 to 216

FOR Mark Manufacturing Company

Frames Cast steel Braces Solid

⑤ **Cylinders,** Diam. 14" Stroke 22"
St'm ports, Length 13" Width 1½" Bridges 1"
Exh. ports, Length 13" Width 2½" Valve lead 1/16"
Valve travel 5" Steam lap 1 3/16" Exhaust clearance ---
Eccentric-crank throw 4" By-pass valve None
S. P. Lubr. Michigan Triple Bull's Eye
Cyl'r heads Cast iron; Lubr. pipes of iron under jackets
Cyl'r casings Iron painted Head covers Steel painted
St'm chest castings Iron painted Covers Steel painted
St'm chest valves Richardson Balanced, with vacuum valves
Met. pkg. (Piston rods, valve stems) United States (not spare)

Pistons Cast iron rings sprung into solid head
Guides Steel Oil cups Needle
Crossheads Cast steel
Wrist Pins Steel Rod cups Plunger
Parallel rods to have solid ends

Valve Motion Stephenson
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.
Driving wheels without hub liners
Drivers, O. S. Diam. 38" Cen. diam. 33", centers Cast iron

Tires Steel Held by Shrinkage and shoulder
Tires, Flanged, Pos. All Size 2½" x 5½"
Tires, Plain, Pos. --- Size ---
Lateral play between driving boxes and wheel hubs — 1/32" total
Driving Boxes Cast iron
Journals, Diam. 7" Length 8"

Springs. Make B. L. W.

Front Engine Truck None Wheeled ---
To swing --- each side of cen., Cen. pin liners ---
Journals, Diam. --- Length --- Boxes ---
Wheels, Diam. --- Tread --- Kind ---
Tires --- Cen. diam. --- Size ---
Tires held by ---

Back Engine Truck None Wheeled ---
To swing --- each side of cen., Cen. pin liners ---
Journals, Diam. --- Length --- Boxes ---
Wheels, Diam. --- Tread --- Kind ---
Tires --- Cen. diam. --- Size ---
Tires held by ---

② **Brakes,** position On both pairs of wheels (no tender)
Operating Parts | Engine, Sch. A-1-SNA Westg. Quick Action Auto. and Straight Air
Eng. Tr'k, sch. ---
Foundation Parts | Drivers, sch. B. L. W.
Eng. Tr'k, sch. ---
Air pump One 9½" Pos. Left side, on smoke box
Train connections Front and back
Train signal, sch. None

Tender, None

Tank 1300 Gallons, Bill 4379
Saddle tank located over top of boiler, and extending over smoke box. Top of saddle tank to be flush with top of cab and no part of locomotive to project above tank except the stack which will project 1" above the tank.

① Locomotive to be used for switching ingot cars and also standard freight cars.

② Unions to be Mark cold drawn steel.

③ Cab to have rear entrance; sliding windows.
Doors and window sash to be of steel with wire inserted glass.
Cab to have tool box and seat for engineer.

④ Couplers, front and back, to be Sharon M. C. B. auto. fitted in National Malleable Castings Co's extended floor pocket at standard height (33½") center above rail, - and Sharon small special couplers 16" center above rail. The small special couplers to have radial attachment, for use with ingot and charging cars as shown on Co's drawing 69-008 (herewith).

⑤ Cylinders to be extra heavy and to have no projecting cylinder flanges for bolting on heads.
Cylinders to be lagged with Magnesia sectional.

⑥ Tool equipment to include:- One poker, one hoe, one rake, two jack screws, one scoop shovel, one one-quart long spout oil can, one hammer, one 12" monkey wrench, and all other necessary tools for this type of locomotive.

List of tools, sch. 26 (see note ⑥)
Photo. sch. #2 Inspection B. L. W.
To be weighed Yes Material spec'ns B. L. W.
Certificate of boiler test Three copies of B. L. W. form 1036
Junior laws to 10-16-16 Shipment On own wheels

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. Throttle, Patented Jan. 23, 1900 (Cast on)
Patents

Property plates, None

Painting:-Engine, style 37A, Olive Green and Aluminum
Painting:-Tender, style ------

Lettering, etc., to be generally as photo. 3862 (4 28 C 52)
Mark on tank sides, Mark Manufacturing Co.

Road Nos. Pos.	Road Nos.	Name, None
F. No. Plate	1	
Cab sides	3	
	4	

THE BALDWIN LOCOMOTIVE WORKS As Ry. Co's. Spec'n #4.
Memorandum Spec'n 11164 REVISED CHICAGO, 9-29-16
SPECIFICATION FOR LOCOMOTIVES 6 36 D 236 AND 241
FOR MARK MANUFACTURING CO.
M 10-4-16 **Engine Drawing No. 35**

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 11' 0" Driving 11' 0" . Total 11' 0"
Total wheelbase, eng. and tend. { Actual 43' 11½" / Limited to ----

Curves 175 FEET RADIUS

Limits, Height [illegible] Width 10' 3"
Weight (approximate) In working order, Total 158,000 POUNDS
On F. tr'k [illegible] lbs., Drivers 158,000 lbs., B. tr'k --- lbs.

Tractive power 35,080 lbs., Ratio of adhesion 4.4
Work'g St'm Pres. 180 lbs., Service SWITCHING
Fuel SOFT COAL

FRONT TUBE SHEET TO BE ½" THICK
Boiler STEEL Thick 13/16" Bill 7948
Boiler, Diam. 74" Plan STRAIGHT TOP
Boiler st'm pres. 200 lbs., Tested to { 220 lbs. steam pres. / 267 lbs. water pres.
WITH FACTOR OF SAFETY OF 4.85
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS
AUXILIARY DOME FOR SAFETY VALVES AND WHISTLE
Dome, diam. 33" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE
Firebox, length 114⅛" Width 41⅛" Depth F. 72¼" B. 69½"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back ⅜"
Firedoor opening 16" DIAM.
Water space, Front 4" Sides 3½" Back 3½"
Water space, Frame DOUBLE Riveted
2 Water space stays ⅞" DIAM. WITH 3/16" HOLES 1½" DEEP FROM O.S.

Radial stays 1" DIAMETER Sling stays from front { THREE ROWS OF B. L. W. EXPANSION STAYS
Button heads below crown on EIGHT central rows
Crown bars NONE Placed --- above crown
Crown bolts ---

Flues # 9 W.G. CHARCOAL IRON OR SEAMLESS STEEL
Tubes #12 W.G. CHARCOAL IRON OR SEAMLESS STEEL
Tube ends SPACED FOR COPPER FERRULES FIREBOX ENDS
Number 26 / 185 Diam. 5½" / 2" Length 10' 9"

Heating Surface	Flues 399 □	Combus. Chamb. ---	Total 1633.6 □
	Tubes 1033 □	Fire Box 186 □	Fire Brick Tubes 15.6□
Grate area 32.7 □	Ratio to Heating Surface 1 : 50		
Superheater 333 □			

Fire Brick ARCH, AMERICAN SECURITY ON TWO TUBES 3" O.D. OF .18" THICK SEAMLESS STEEL

Grates ROCKING BARS AND DROP PLATE
Ash Pan, Dampers FRONT AND BACK

Throttle BALANCE Pos. DOME
Dry pipe STEEL

Superheater SCHMIDT

Smokebox extension With 6 Cleaning hole and cap L.S. ONLY
Smoke-arch-tube hopper With
Spreading and deflector plates With

Exhaust nozzles SINGLE, HIGH

Blast STRAIGHT Dia. 18" Hole in S. B., dia. 22"

Safety Valves TWO COALE (SPEC) 2½"
Safety valves NONE with relief lever, Set to 180 POUNDS
Whistle B. L. W. PLAIN

Steam Gauge ONE IRON 7" MAKER: ASHCROFT (NOT SPEC)
Steam gauge stand IRON **Clock** NONE

Water Gauge ONE B.L.W.(IRONCLAD) **Cab Lamps** TO BURN OIL
Gauge Cocks THREE BACK Surface valve NONE
Lowest gauge cock 3¼" above highest part of crown
Lubricator steam valve TO HAVE separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock ONE B. L. W. Pos: FRONT
Cleaning Plugs ONE PLUG ABOVE FIRE DOOR
Firebox CORNERS DIAGONAL, SIDES AND BACK
Crown, TWO EACH SIDE AND THREE BACK
Waist, ONE UNDER FRONT
Front tube sheet, ONE Fusible plug ONE

Pump NONE Pos. ---
Top chamb. --- Bottom chamb. ---
Feed Cock --- Feed pipes ---
Checks --- Check pipes ---

Injectors (NOT SPEC) TWO MONITOR No. 9
Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER
Pipes, Check IRON Feed IRON Overflow IRON
Check B. L. W. Pos. RIGHT AND LEFT

Steam Heat NONE

Cab STEEL, LINED WITH WOOD

Cab boards STEEL Nosing T-IRON
Running boards STEEL Nosing T-IRON
Hand rail IRON Located on BOILER

7 8 **Back Bumper** BAR STEEL Back drawbar height 32¾"

Pilot NONE Pushing shoes CAST IN BUMPER
Front Bumper CAST STEEL Bumper plate NONE
Steps ACROSS FRONT WITH HANDRAIL
STEPS, HAND HOLDS, ETC., TO CONFORM TO I. C. C. REQUIREMENTS
Front Drawhead, Center above rail (SEE SUP. 9)
Coupler (SEE SUP. 9)

Signal fixtures NONE

Headlight TWO ROUND CASE 16" Reflector, To burn KEROSENE
Headlight, Nos. on sides WITH H'dl't step WITH
Lamp shelf NONE Nosing ---

Bell 92 POUNDS. GOLLMAR AIR BELL RINGER
Sand Box Two (SPEC) Diam. 28" Body IRON PAINTED Pipes IRON
Sander LEACH AIR TRAP A-1, IN EACH BOX TO SAND FRONT AND BACK

Dome casing IRON PAINTED

Boiler Jacket 22 SOFT STEEL PIDBands IRON Style 9
Boiler Lagging MAGNESIA SECTIONAL

Frames CAST STEEL Braces SOLID

Cylinders, Diam. 21". Stroke 26"
St'm ports, Length 23½" Width 1-11/16" Bridges ---
Exh. ports, Length --- Width --- Valve lead 3/16"
Valve travel 5½" Steam lap 1 3/16" Exhaust clearance ---
Eccentric crank throw 11 51/64" (SPEC)
S. F. Lubr. MICHIGAN FIVE FEED BULLS EYE
Cyl'r heads CAST IRON: LUBR. PIPES OF IRON UNDER JACKET
Cyl'r casings IRON PAINTED Head covers STEEL PAINTED
St'm chest casings --- Covers ---
St'm chest valves 10" DIAMETER, PISTON TYPE
Met. pkg { PISTON RODS / VALVE STEMS } UNITED STATES (SPEC)

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD
10 **Guides** STEEL Oil cups NEEDLE
Crossheads CAST STEEL
Wrist Pins STEEL Rod cups PLUNGER
PARALLEL RODS TO HAVE SOLID ENDS

Valve Motion WALSCHAERTS
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.
DRIVING WHEELS TO HAVE HUB LINERS OF BRONZE
Drivers, O. S. Diam. 50" Cen. diam. 44", CENTERS CAST STEEL

Tires STANDARD STEEL Held by SHRINKAGE AND SHOULDER
Tires, Flanged, Pos. FRONT AND BACK Size 3" x 5½"
Tires, Plain, Pos. MIDDLE Size 3" x 6½"
Lateral play between driving boxes and wheel hubs = ⅛" TOTAL
Driving Boxes CAST STEEL
Journals, Diam. 9" Length 12"

11 **Springs.** Make STANDARD STEEL WORKS

Front Engine Truck NONE Wheeled ---
To swing --- each side of cen., Cen. pin liners ---
Journals, Diam. --- Length --- Boxes ---
Wheels, Diam. --- Tread --- Kind ---
Tires --- Cen. diam. --- Size ---
Tires held by ---

Back Engine Truck NONE Wheeled ---
To swing --- each side of cen., Cen. pin liners ---
Journals, Diam. --- Length --- Boxes ---
Wheels, Diam. --- Tread --- Kind ---
Tires --- Cen. diam. --- Size ---
Tires held by ---

1 **Brake,** position ON ALL DRIVING AND TENDER WHEELS
Operating Parts: Engine, Sch. #6 ET WESTINGHOUSE COMBINED AUTO. AND STRAIGHT AIR; Eng. Tr'k, sch. ---
Foundation Parts: Drivers, sch. WM-3 AMERICAN OUTSIDE EQUALIZED.; Eng. Tr'k, sch. ---
Air pump ONE 9½" Pos. LEFT SIDE
Train connections FRONT AND BACK
Train signal, sch. NONE
AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS

31 **Tender** EIGHT Wheeled, Drawing No. 435
Weight, with fuel and water, about 100,000 POUNDS

Tank 5000 Gallons, Bill 3655
TANK "U" SHAPE SLOPING BACK. FUEL CAPACITY 8 TONS

Tool Boxes HARD WOOD, TOP

32 **Frame** STEEL 10" CHANNELS

33 Front Drawbar height 32½"
Pilot NONE Pushing shoes CAST IN END SILLS
Back drawhead, center above rail (SEE SUP. 35)
Coupler (SEE SUP. 35)
STEPS, HAND HOLDS, ETC., TO CONFORM TO I. C. C. REQUIREMENTS
STEP ACROSS REAR WITH HANDRAIL
Steps ON SLOPING BACK OF TANK WITH HAND RAIL

Trucks ARCH BAR TYPE WITH STEEL BOLSTER

Springs ELLIPTIC, STANDARD STEEL WORKS
3 Journals, Diam. 5" Length 9"
Wheels, Diam. 30" Tread 4⅝" Kind CHILLED CAST IRON PLATE
Tires NONE Cen. diam. --- Size ---
Tires held by ---
Safety chains SINGLE

Brake Position ON ALL WHEELS
Brake sch. #6 ET WEST'G. AUTO. AND STRAIGHT AIR WITH 12" x 12" TENDER CYLINDER

12 List of tools, sch. 29
Photo sch. #2 Inspection B. L. W.
To be weighed YES Material spec'ns B. L. W.
Certificate of boiler test THREE COPIES OF B. L. W. FORM 1036
Junior laws to 10-16-16 Shipment ON OWN WHEELS

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. Patents: THROTTLE, PATENTED JAN. 23, 1900 (CAST ON); FEED PIPE STRAINER, PATENTED SEPT. 1, 1903 (CAST ON); STEAM PIPE COVER, PATENTED JULY 18, 1911 (CAST ON)

Property plates NONE

Painting: Engine, style 291, OLIVE GREEN AND ALUMINUM
Painting: Tender, style 291, OLIVE GREEN AND ALUMINUM

Mark on TANK SIDES, MARK MANUFACTURING CO.

Road Nos. Pos.	Road Nos.	Name NONE
F. No. PLATE	2	
F. SAND BOX	5	
CAB SIDES		
BACK OF TANK		

1 UNIONS TO BE MARK COLD DRAWN STEEL.

2 FLEXIBLE STAYBOLTS, TATE, 350 IN BREAKING ZONE.

3 THROTTLE TO BE PROVIDED WITH AUXILIARY DRIFTING VALVE.

4 STEAM PIPES TO HAVE OUTSIDE CONNECTION TO STEAM CHEST.

5 SUPERHEATER AS LOCOMOTIVE SUPERHEATER CO'S SPECIFICATION No. M 25-060-C DATED 11-13-16 (COPY ATTACHED). ROYALTY ON SUPERHEATER PAYABLE BY B. L. W.

6 HAND HOLE AND CAP TO BE PROVIDED RIGHT AND LEFT IN SMOKE BOX FOR INSPECTION OF SUPERHEATER.

7 FOOT PLATE TO BE CAST STEEL.

8 CHAFING PLATES OF CAST STEEL, WITH SPRING BUFFER TO BE PROVIDED BETWEEN ENGINE AND TENDER.

9 COUPLERS AT FRONT TO BE SHARON M. C. B. AUTO. FITTED IN NATIONAL MALLEABLE CASTINGS CO'S EXTENDED FLOOR POCKET AT STANDARD HEIGHT ($33\frac{1}{2}$") CENTER ABOVE RAIL,- AND SHARON SMALL SPECIAL COUPLERS 16" CENTER ABOVE RAIL. THE SMALL SPECIAL COUPLERS TO HAVE RADIAL ATTACHMENT, FOR USE WITH INGOT AND CHARGING CARS AS SHOWN ON CO'S DRAWING 69-008

10 GUIDE YOKE OF MILD WROT STEEL OR CAST STEEL.

11 SPRINGS AND HANGERS TO BE EXTRA HEAVY FOR ROUGH WORK. SPRING SADDLES OVER DRIVING BOXES TO BE EXTRA STRONG. EQUAL BEAMS OF WROT STEEL OR CAST STEEL.

12 LOCOMOTIVE TO BE FURNISHED WITH ALL NECESSARY WRENCHES, FIRING TOOLS, HAMMER, CHISELS, PACKING TOOLS, TWO JACK SCREWS, ONE SCOOP SHOVEL, OIL CANS AND TORCH.

T E N D E R

31 TENDER COAL GATES OF STEEL.

32 TENDER BUMPERS FRONT AND BACK OF CAST STEEL.

33 CHAFING PLATES OF CAST STEEL, WITH SPRING BUFFER BETWEEN ENG ENGINE AND TENDER.

34 BACK BUMPER AS B. L. W. TRACING 33151 APPROVED BY COMPANY.

35 COUPLER AT BACK TO BE SHARON M. C. B. AUTO. FITTED IN NATIONAL MALLEABLE CASTINGS CO'S EXTENDED FLOOR POCKET AT STANDARD HEAGHT ($33\frac{1}{2}$") CENTER ABOVE RAIL,- AND SHARON SMALL SPECIAL COUPLERS 16" CENTER ABOVE RAIL. THE SMALL SPECIAL COUPLERS TO HAVE RADIAL ATTACHMENT, FOR USE WITH INGOT AND CHARGING CARS AS SHOWN ON CO'S DRAWING 69-008

36 TENDER JOURNAL BOXES TO BE NATIONAL MALLEABLE CASTINGS CO'S FOR COIL SPRINGS.

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-3976 (see note 1)
Memorandum Spec'n 11140
SPECIFICATION FOR LOCOMOTIVES 10 30 ½ D 40 Gen. as Photo. 2544
FOR Green THE BABCOCK & WILCOX CO., BAYONNE WORKS. (12/5/16) Engine Drawing No. 12
M 8-22-16

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 9' 0" Driving 9' 0" Total 24' 0"
Total wheelbase, eng. and tend. {Actual ---, Limited to ---

Curves 135 FT. RADIUS: GRADES 4 %

Limits, Height --- Width ---
Weight (approximate) in working order, Total 147,500 POUNDS
On F. tr'k 14,800 lbs., Drivers 117,700 lbs., B. tr'k 15,000 lbs.

Tractive power 27,040 lbs., Ratio of adhesion 4.3 (see note 2)
Work'g St'm Pres. 180 lbs., Service SWITCHING
Fuel SOFT COAL

Boiler STEEL Thick ⅝" Bill 7900
Boiler, Diam. 62" Plan STRAIGHT TOP
Boiler st'm pres. 180 lbs., Tested to {200 lbs. steam pres., 240 lbs. water pres.
Longitud. seams BUTT JOINTED DOUBLE COVERING STRIPS
BOILER TO HAVE A FACTOR OF SAFETY OF 5
Dome, diam. 29" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE
Firebox, length 76⅝" Width 41⅜" Depth F. 62⅜" B. 59⅜"
Firebox, Tube 9/16" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" DIAM.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame SINGLE Riveted
Water space stays ⅞" DIAMETER WITH 3/16" HOLES 1½" DEEP FROM O.S.

Radial stays 1" DIAMETER Sling stays front {TWO ROWS OF B. L. W. EXPANSION STAYS
Button heads below crown on SIX central rows
Crown bars NONE Placed --- above crown
Crown bolts ---

Flues ---
Tubes #8 W.G. COLD DRAWN SEAMLESS STEEL (see note 3)
Tube ends SWAGED FOR COPPER FERRULES, FIREBOX ENDS
Number 244 Diam. 2" Length 10' 8"

Heating Surface	Flues ---	Combus. Chamb. ---	Total 1467 □'
	Tubes 1352 □'	Fire Box 115 □'	Fire Brick Tubes ---
Grate area 22 □'	Ratio to Heating Surface 1 : 66.7		
Superheater ---			

Fire Brick ARCH, ON STUDS, APPLIED AS B. L. W. TRACING 3519

Grates ROCKING BARS AND DROP PLATE
Ash Pan, Dampers BACK ONLY

Throttle BALANCE Pos. DOME
Dry pipe STEEL

Superheater NONE

Smokebox extension WITH Cleaning hole and cap L.S. ONLY
Spark arrester or hopper WITH
Netting and deflect. plates WITH

Exhaust nozzles DOUBLE, HIGH

Stack STRAIGHT Dia. 18" Hole in S. B., dia. 22"

Safety Valves (NOT SPEC) TWO CONSOLIDATED 2½"
Safety valves NONE with relief lever, Set to 180 POUNDS
Whistle B. L. W. PLAIN

Steam Gauge ONE IRON 7" MAKERS ASHCROFT (NOT SPEC)
Steam gauge stand IRON **Clock** NONE

Water Gauge ONE B.L.W.(IRONCLAD) **Cab Lamps** TO BURN OIL
Gauge Cocks THREE BACK Surface valve NONE
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve TO HAVE separate dry pipe to dome
Blower Valve B. L. W. (see note 4)

Blow off Cock ONE B. L. W. POS: FRONT
Cleaning Plugs
Firebox CORNERS DIAGONAL, SIDES AND BACK
Crown, ONE EACH SIDE AND TWO BACK
Waist, ONE UNDER FRONT
Front tube sheet, ONE Fusible plug ONE

Pump NONE Pos. ---
Top chamb. --- Bottom chamb. ---
Feed Cock --- Feed pipes ---
Checks --- Check pipes ---

Injectors (NOT SPEC) TWO MONITOR No. 8
Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER
Pipes, Check IRON Feed IRON Overflow IRON
Check B. L. W. Pos. RIGHT AND LEFT

Steam Heat NONE

Cab STEEL (see note 6 and 7)

Cab boards WOOD Nosing NONE
Running boards WOOD Nosing NONE
Hand rail IRON Located on TANK

Back Bumper CAST STEEL

Pilot NONE Pushing shoes CAST IN BUMPERS
Front Bumper CAST STEEL Bumper plate WITH
Steps ACROSS FRONT AND BACK WITH HANDRAILS

F. & B Drawhead, Center above rail 33½"
Coupler M. C. B. AUTOMATIC

Signal fixtures NONE

HEADLIGHT CABINET TO BE MADE OF #10 SHEET STEEL
Headlight TWO ROUND CASE 18" Reflector, To burn KEROSENE
Headlight, Nos. on sides WITH H'd'l't step WITH
Lamp shell NONE Nosing ---

Bell 92 POUNDS
Sand Box TWO Diam. 28" Body IRON PAINTED Pipes IRON
Sander (NOT SPEC) TEACH AIR TRAP A-1 IN EACH BOX TO SAND FRONT AND BACK

Dome casing IRON PAINTED

Boiler Jacket #22 SOFT STEEL PLAIN Bands IRON Style 9
Boiler Lagging MAGNESIA SECTIONAL

THE BALDWIN LOCOMOTIVE WORKS
J.A. Griffin May 19/16
SPECIFICATION FOR LOCOMOTIVES 10 30 ½ D 40
FOR Green THE BABCOCK & WILCOX CO.
M

61

Frames CAST STEEL Braces SOLID

Cylinders, Diam. 18" Stroke 24"
St'm ports, Length 16" Width 1½" Bridges 1"
Exh. ports, Length 16" Width 2½" Valve lead 1/16"
Valve travel 5½" Steam lap 1" Exhaust clearance ---
Eccentric-crank throw 4½" By-pass valve NONE
S.P. Lubr. MICHIGAN TRIPLE BULLS EYE
Cyl'r heads CAST IRON; LUBR. PIPES OF IRON UNDER JACKET
Cyl'r casings IRON PAINTED Head covers STEEL PAINTED
St'm chest casings IRON PAINTED Covers STEEL PAINTED
St'm chest valves RICHARDSON BALANCED, WITH VACUUM VALVES
Met. pkg {PISTON RODS, VALVE STEMS UNITED STATES (NOT SPEC)

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD
Guides STEEL Oil cups NEEDLE
Crossheads CAST STEEL
Wrist Pins STEEL Rod cups (see note 5)
PARALLEL RODS TO HAVE SOLID ENDS

Valve Motion STEPHENSON
{Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O.S. Diam. 44" Cen. diam. 38" CENTERS CAST STEEL

Tires STEEL Held by SHRINKAGE AND SHOULDER
Tires, Flanged, Pos. FRONT AND BACK Size 3" x 5½"
Tires, Plain, Pos. MIDDLE Size 3" x 6½"
Lateral play between driving boxes and wheel hubs – 1/16" TOTAL
Driving Boxes CAST STEEL
Journals, Diam. {MAIN 8½" Length 10", OTHERS 8" " 10"

Springs. Make B. L. W.

Front Engine Truck TWO Wheeled SWING BOLSTER
To swing 5½" each side of cen., Cen. pin liners NONE
Journals, Diam. 5" Length 9" Boxes CAST IRON
Wheels, Diam. 28" Tread --- Kind CAST IRON SPOKE CENTER
Tires STEEL Cen. diam. 23" Size 2½" x 5½"
Tires held by SHRINKAGE AND SHOULDER

Back Engine Truck TWO Wheeled SWING BOLSTER
To swing 5½" each side of cen., Cen. pin liners NONE
Journals, Diam. 5" Length 9" Boxes ~~NONE~~ CAST IRON.
Wheels, Diam. 28" Tread --- Kind CAST IRON SPOKE CENTER
Tires STEEL Cen. diam. 23" Size 2½" x 5½"
Tires held by SHRINKAGE AND SHOULDER

Brake, position ON ALL DRIVING WHEELS (NO TENDER)
Operating {Engine, Sch. A-1 AND SMI WEST'S. AUTO. AND STRAIGHT AIR
Parts {Eng. Tr'k, sch. ---
Foundation {Drivers, sch. HM-2 AMERICAN OUTSIDE EQUALIZED
Parts {Eng. Tr'k, sch. ---
Air pump One 9½" Pos. LEFT SIDE
Train connections FRONT AND BACK
Train signal, sch. NONE

TENDER NONE

TANK 2500 GALLONS, BILL 4235
TANK SADDLE LOCATED OVER TOP OF BOILER.

(1) THE DESIGN, MATERIAL AND WORKMANSHIP TO BE SUCH THAT WILL GIVE LONG LIFE AND LONG WEAR TO THE LOCOMOTIVE.

(2) LOCOMOTIVE TO HAUL 220 TONS (2000 POUNDS PER TON) UP STRAIGHT GRADE OF 4 %, PROVIDED THE FRICTIONAL RESISTANCE OF THE CARS DOES NOT EXCEED 8½ POUNDS PER TON.

(3) BOILER TUBES FROM THE Babcock & Wilcox Co., Bayonne, N. J.
TUBE ARRANGEMENT TO BE SUCH THAT WHEN THE THROTTLE WORK IS TAKEN OUT OF DOME A MAN CAN GO INSIDE AND CONVENIENTLY INSPECT THE TUBES.

(4) AIR BLOWER TO BE PROVIDED FOR USE IN STARTING FIRE WHEN COLD.

(5) ALL WINDOWS AND DOORS TO BE MADE SO THAT THEY CAN BE ENTIRELY REMOVED IN THE SUMMER.
WIRE SCREENS TO BE PROVIDED FOR BACK WINDOWS.

(6) GREASE CUPS TO BE PROVIDED THAT ARE STRONG AND POSITIVE.

(7) COAL BOX TO BE LOCATED ON REAR EXTENSION OF ENGINE FRAME BACK OF CAB, CAPACITY 3 TONS.
BOX OF HEAVY STEEL, DURABLE MATERIAL, TO WITHSTAND RUST AS MUCH AS POSSIBLE.

LIST OF TOOLS, SCH. 29
PHOTO SCH. NONE Inspection B.L.W. EXCEPT (see notes 6 & 7)
To be weighed YES Material spec'ns B. L. W.
Certificate of boiler test THREE COPIES OF B. L. W. FORM 1036
Junior laws to 10-15-16 Shipment On own wheels UNDER STEAM. 12/15/16

BRASS SHOP FINISH, No. 1
MACHINE SHOP FINISH D-165

(8) ~~WHEN MACHINE WORK HAS BEEN ADVANCED TO A POINT WHERE WHEN THE CONSTRUCTION OF THE LOCOMOTIVE HAS REACHED A POINT WHERE RIVETING WILL BEGIN ON THE BOILER, COMPANY IS TO BE GIVEN SUFFICIENT ADVANCE NOTICE TO ENABLE THEM TO HAVE THIER REPRESENTATIVE AT THESE WORKS BY THAT TIME; AND WHEN MACHINE WORK HAS BEEN ADVANCED TO A POINT WHERE WHAT IS BEING DONE CAN BE SEEN, THE SAME ADVANCE NOTICE IS TO BE GIVEN TO THEM~~ BOILER CONSTRUCTION TO BE INSPECTED BY THE HARTFORD STEAM BOILER INSPECTION & INSURANCE CO. 11/10/16.

(9) Notify J. W. Haslam, Purchasing Agent, The Babcock & Wilcox Co. Bayonne, N. J., AT THE TIME THE ERECTION OF THE LOCOMOTIVE BEGINS, SO HE CAN HAVE HIS REPRESENTATIVE COME HERE TO MAKE A GENERAL INSPECTION OF THE PROGRESS OF THE WORK.

ROYALTIES, IF ANY, PAYABLE BY THE B. L. W.

PATENT PLATES {THROTTLE, PATENTED JAN. 23, 1900 (CAST ON)
REAR TRUCK SUSPENSION 1095929, MAY 5, 1914 (BRASS PLATE)

PROPERTY PLATES NONE

PAINTING: ENGINE STYLE 291, OLIVE GREEN AND ALUMINUM
PAINTING: TENDER STYLE ------

MARK ON TANK SIDES, B. & W. CO.

ROAD NOS. POS.	ROAD NOS.	NAME NONE
F. No. PLATE	3	
F. SAND BOX		
CAB SIDES		
BACK OF TANK		

THE BALDWIN LOCOMOTIVE WORKS As Spec'n. C-4087

Memorandum Spec'n. 11135

SPECIFICATION FOR LOCOMOTIVES 8 32 1/3 D 3 AND 4 Gen. as B. L. W. tracing 32442

FOR NEVADA CONSOLIDATED COPPER Co. Engine Drawing No. 2

8-11-16

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 19' 10"
Total wheelbase, eng. and tend. { Actual ---, Limited to ---
GRADES 5 %
Curves 45 DEGREES RADIUS: RAILS 75 POUNDS

Limits, Height ---- Width ----
Weight (approximate) in working order, Total 162,000 POUNDS
On F. tr'k --- lbs., Drivers 146,000 lbs., B. tr'k 16,000 lbs.

Tractive power 31,200 lbs., Ratio of adhesion 4.68
Work'g St'm Pres. 180 lbs., Service SWITCHING
Fuel SOFT COAL

FRONT TUBE SHEET ½" THICK
Boiler STEEL Thick ⅞" Bill 7925
Boiler, Diam. 64¼" Plan STRAIGHT TOP
Boiler st'm pres. 200 lbs., Tested to { 240 lbs. steam pres., 250 lbs. water pres.
Longitud. seams (SEE SUPPLEMENT 1)

Dome, diam. 29" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE
Firebox, length 96-1/16" Width 41⅞" Depth F. 64½" B. 57¼"
Firebox, Tube 9/16" Crown 7/16" Sides 7/16" Back ⅜"
Firedoor opening 16" DIAM.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame DOUBLE Riveted
2 Water space stays 1" DIAM. WITH 3/16" HOLE 14" DEEP FROM O.S.

Radial stays (SEP. 3) Sling stays front THREE ROWS OF B.L.W. EXPANSION STAYS
Button heads below crown on SIX central rows
Crown bars NONE Placed --- above crown
Crown bolts ---

Flues # 9 W.G. STEEL
Tubes #12 W.G. CHARCOAL IRON
Tube ends SWAGED FOR COPPER FERRULES FIREBOX ENDS
Number 21 / 135 Diam. 5½" / 2" Length 12' 0"

Heating Surface	Flues 360	Combus. Chamb. ---	Total 1336
	Tubes 842	Fire Box 134	Fire Brick Tubes ---
	Grate area 28	Ratio to Heating Surface 1 : 47.7	
	Superheater 282		

Fire Brick ARCH, NONE

Grates ROCKING BARS WITH DROP PLATE
4 **Ash Pan,** Dampers RIGHT AND LEFT AND BACK

Throttle BALANCE Pos. DOME
Dry pipe STEEL

Superheater SCHMIDT (SEE SUPPLEMENT 6)

6 **Smokebox** extension WITH Cleaning hole and can LEFT SIDE ONLY
7 Spark-arrester hopper WITH
Netting and deflect. plates WITH

Exhaust nozzles SINGLE HIGH

8 **Stack** CAST IRON, STRAIGHT Dia. 16" Hole in S. B., dia. 19"

Safety Valves (NIDT SPEC) TWO CONSOLIDATED 2½"
Safety valves NONE with relief lever, Set to 180 POUNDS
Whistle CHIME, OF BRASS

Steam Gauge ONE IRON 7" MAKER: ASHCROFT (NIDT SPEC)
Steam gauge stand IRON Clock NONE

10 **Water Gauge** ONE B.L.W. (IRONCLAD) **Cab Lamps** ELECTRIC
Gauge Cocks THREE BACK Surface valve NONE
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve WITHOUT separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock ONE B. L. W. Pos. FRONT
Cleaning Plugs ONE PLUG ABOVE FIRE DOOR
Firebox CORNERS DIAGONAL, ONE EACH SIDE AND BACK
11 Crown, ONE LEFT SIDE AND THREE BACK
Waist, ONE UNDER FRONT
Front tube sheet, NONE Fusible plug ONE

Pump NONE Pos. ----
Top chamb. ---- Bottom chamb. ----
Feed Cock ---- Feed pipes ----
Checks ---- Check pipes ----

12 **Injectors** (SPEC) TWO NATHAN MONITOR No. 8
Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER
Pipes, Check IRON Feed IRON Overflow IRON
Check B. L. W. Pos. RIGHT AND LEFT

Steam Heat NONE

13 **Cab** STEEL

Cab boards STEEL Nosing T-IRON
Running boards STEEL Nosing T-IRON
Hand rail IRON OR STEEL Located on TANK

Back Bumper CAST STEEL

Pilot NONE Pushing shoes CAST IN BUMPERS
Front Bumper CAST STEEL Bumper plate NONE
Steps OF WOOD, FRONT AND BACK WITH HAND RAIL

14 **F. & B Drawhead,** Center above rail 33½"
Coupler TOWER RADIAL M. C. B. AUTO., FRONT AND BACK

Signal fixtures NONE

15 **Headlight** TWO ROUND CASE 12" Reflector,
Headlight, Nos. on sides WITH H'd'l't step WITH
Lamp shelf NONE Nosing ----

Bell 85 POUNDS
16 **Sand Box** TWO Diam. 28" Body IRON PAINTED Pipes IRON
Sander (SPEC) LEACH AIR, SINGLE TRAP A-1, IN EACH BOX TO SAND FRONT AND BACK
Dome casing IRON PAINTED

Boiler Jacket 22 SHEET STEEL PTD Bands IRON Style 9
Boiler Lagging MAGNESIA SECTIONAL

THE BALDWIN LOCOMOTIVE WORKS

N. Schuch Dec 1916

SPECIFICATION FOR LOCOMOTIVES 8 32 1/3 D 3 AND 4

FOR NEVADA CONSOLIDATED COPPER Co.

15/17 **Frames** CAST STEEL Braces SOLID

Cylinders, Diam. 19" Stroke 26"
St'm ports, Length 20⅜" Width 1⅜" Bridges ----
Exh. ports, Length ---- Width --- Valve lead 1/16"
Valve travel 5" Steam lap ¾" Exhaust clearance ---
Eccentric crank throw 4" By-pass valve NONE
S. P. Lubr. NATHAN FIVE FEED BULL'S EYE
Cyl'r heads CAST IRON: LUBR. PIPES OF IRON UNDER JACKET
Cyl'r casings IRON PAINTED Head covers STEEL PAINTED
St'm chest casings ---- Covers ----
St'm chest valves 9" DIAM. PISTON TYPE, INSIDE ADMISSION
Met. pkg { PISTON RODS / VALVE STEMS UNITED STATES (NOT SPEC)

Pistons CAST IRON RINGS SPRING INTO SOLID HEAD
20 **Guides** TWO BAR, STEEL Oil cups NEEDLE
Crossheads ALLIGATOR, CAST STEEL
26 **Wrist Pins** STEEL Rod cups FOR HARD GREASE
PARALLEL RODS TO HAVE SOLID ENDS

Valve Motion STEPHENSON
27 Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except stayboits) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

28 **Drivers,** O. S. Diam. 46" Cen. diam. 40" CENTERS OF CAST STEEL

Tires STEEL Held by SHRINKAGE AND SHOULDER
Tires, Flanged, Pos. FRONT AND BACK Size 3" x 5½"
Tires, Plain, Pos. MIDDLE Size 3" x 7"
Lateral play between driving boxes and wheel hubs — 1/16" TOTAL
29 **Driving Boxes** CAST STEEL
Journals, Diam. 8½" Length 10"

Springs. Make B. L. W.

Front Engine Truck NONE Wheeled ---
To swing --- each side of cen., Cen. pin liners ---
Journals, Diam. --- Length --- Boxes ---
Wheels, Diam. --- Tread --- Kind ---
Tires --- Cen. diam. --- Size ---
Tires held by ---

30 **Back Engine Truck** TWO Wheeled SWING BOLSTER
To swing 8½" each side of cen., Cen. pin liners NONE
Journals, Diam. 5" Length 9" Boxes CAST IRON
Wheels, Diam. 28" Tread --- Kind CAST IRON SPOKE CENTER
Tires STEEL Cen. diam. 23" Size 2½" x 5½"
Tires held by SHRINKAGE AND SHOULDER

32 **Brake,** position ON ALL DRIVING WHEELS (NO TENDER)
31 Operating Parts { Engine, Sch. No. 6 ET WEST'G. COMBINED AUTO. AND STRAIGHT AIR; Eng. Tr'k, sch. ---
Foundation Parts { Drivers, sch. MA-2 AMERICAN O. S. EQUALIZED; Eng. Tr'k, sch. ---
Air pump ONE 8½" CROSS COMPOUND (SEE SUPPLEMENT 33)
Train connections FRONT AND BACK
Train signal, sch. NONE

Air reservoirs to have hydrostatic test of 200 lbs 11/3/16

Certificates dated 10-10-16 & 10-11-16 covering test of reservoirs Nos 4745 to 4765, furnished by Westg. Air Brake Co are filed in Mech. Office file, K Bell 11/4/16

Tender NONE Wheeled, Drawing No. ---
Weight, with fuel and water, about ---

36 **Tank** 2200 Gallons, Bill 4360
37 TANK SADDLE TYPE, LOCATED OVER TOP OF BOILER

Tool Boxes ----

Frame ---

Front Drawbar height ---
Pilot --- Pushing shoes ---
Back drawhead, center above rail ---
Coupler ---

Steps ---

Trucks ---

Springs ---
Journals, Diam. --- Length ---
Wheels, Diam. --- Tread --- Kind ---
Tires --- Cen. diam. --- Size ---
Tires held by ---
Safety chains ---

Brake Position ---
Brake sch. ---

List of tools, sch. 29
Photo sch. 2 Inspection B. L. W.
To be weighed YES Material spec'ns B. L. W.
Certificate of boiler test THREE COPIES OF B. L. W. FORM 1036
Junior laws to 10-10-16 Shipment ON OWN WHEELS

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. Patents { THROTTLE, PATENTED JAN. 23, 1900 (CAST ON); STEAM PIPE COVER, PATENTED JULY 18, 1911 (CAST ON)

Property plates NONE

Painting: — Engine, style 220, OLIVE GREEN AND ALUMINUM
Painting:— Tender, style -----

Mark on TANK SIDES, NEVADA CONSOLIDATED COPPER CO.

Road Nos. Pos.	Road Nos.	Name NONE
F. No. PLATE	500	
DOME AND BACK OF FUEL BOX	501	

SPECIFICATION FOR LOCOMOTIVES 8 32 1/3 D 3 AND 4
FOR NEVADA CONSOLIDATED COPPER CO.

1 LONGITUDINAL SEAMS TO BE BUTT JOINTED DOUBLE COVERING STRIPS SEXTUPLE RIVETED

2 STAYBOLTS TO BE OF WROUGHT IRON SPACED NOT OVER 4" CENTER TO CENTER AND TO BE PNEUMATICALLY DRIVEN.

3 RADIAL STAYS TO BE OF WROUGHT IRON WITH BODY 15/16" DIAMETER, WITH ENLARGED ENDS, 1⅛" DIAMETER.

4 ASH PAN TO BE OF THE SELF DUMPING TYPE, MADE OF STEEL PLATE.

5 SUPERHEATER SCHMIDT TYPE CONNECTING WITH TOP HEADER IN SMOKE-BOX AND WITH OUTSIDE STEAM PIPE CONNECTIONS TO VALVE CHAMBERS.
ROYALTY ON SUPERHEATER PAYABLE BY THE B. L. W.
SUPERHEATER AS LOCOMOTIVE SUPERHEATER CO'S SPECIFICATION NO. P-1195-A DATED 9-27-16 (COPY ATTACHED).

6 PLUG 3" DIAMETER TO BE APPLIED RIGHT AND LEFT IN SMOKE BOX FOR INSPECTION OF SUPERHEATER.

7 SMOKE BOX FRONT AND DOOR TO BE OF PRESSED STEEL, CAREFULLY FITTED.

8 STACK TO BE DESIGNED TO GIVE MAXIMUM DRAFT.

10 WATER GAUGE TO BE OF THE SAFETY TYPE.

11 CLEANING PLUGS TO BE LOCATED AT CORNERS, SIDES AND ENDS OF FIREBOX, ABOVE THE FIRE DOOR AND CROWN SHEET AND FOR WASHING SHELL OF BOILER.

12 INJECTORS TO HAVE AMPLE CAPACITY.

13 CAB OF THE SIDE ENTRANCE TYPE, THOROUGHLY BRACED AND SECURELY FASTENED TO BOILER AND RUNNING BOARDS.
CAB TO HAVE SUITABLE SLIDING WINDOWS, CONVENIENT TOOL BOXES, SEATS, CUSHIONS AND ARM RESTS FOR ENGINEER AND FIREMAN.

14 COUPLERS TO BE ARRANGED FOR 45 DEGREE CURVES.

15 HEADLIGHTS AND EQUIPMENT TO BE SCHROEDER ELECTRIC.
GENERATOR TO BE PLACED ON SIDE OF SMOKEBOX AHEAD OF TANK.
BACK HEADLIGHT TO BE PLACED ON ROOF OF CAB.

16 SAND BOX TO BE LOCATED IN THE FRONT OR FORWARD POSITION AND THE TANK MAN HOLE TO BE LOCATED IN THE POSITION WHERE SAND BOX IS NOW SHOWN.

18 ENGINE FRAMES TO BE THOROUGHLY ANNEALED.
FRAME TO HAVE DOUBLE FORWARD SECTION PROVIDED WITH LUGS FOR HOLDING CYLINDERS.
FRAMES TO BE THOROUGHLY BRACED TOGETHER AND TO BOILER BY SUITABLE CASTINGS, BRACES, EXPANSION PLATES AND PADS.

19 PEDESTALS PROTECTED FROM WEAR BY CAST IRON SHOES AND ADJUSTABLE WEDGES.
PEDESTALS TO BE SECURELY FASTENED TOGETHER AT BOTTOM BY CAPS LUGGED AND BOLTED TO BOTTOM OF PEDESTAL.

20 CLEARANCE BETWEEN GUIDES AND FRONT CRANK PINS TO BE NOT LESS THAN ¾" AND THERE MUST BE ROOM ENOUGH BETWEEN THE FRONT DRIVING WHEEL AND CYLINDER HEAD TO PERMIT APPLYING AND REMOVING BRAKE SHOES FREELY.

24 CRANK PINS OF HAMMERED OPEN HEARTH STEEL AND TO HAVE AMPLE BEARING SURFACE. (see sup. 20)

27 ECCENTRICS AND ECCENTRIC STRAPS TO BE OF CAST IRON.

28 ALL DRIVING WHEELS TO HAVE BRASS HUB LINERS.

29 DRIVING BOXES TO HAVE DEEP FLANGES AND LARGE OIL CELLARS.

30 BACK ENGINE TRUCK TO BE OF THE UNEQUALIZED CENTER BEARING TYPE.

32 LOCOMOTIVE TO HAVE STRAIGHT AND AUTOMATIC AIR-BRAKE VALVES.

33 AIR PUMP TO BE PLACED ON LEFT SIDE OF SMOKE BOX AHEAD OF TANK.

34 MAIN RESERVOIRS TO BE WESTINGHOUSE ENAMELLED WITH A TOTAL CAPACITY OF BETWEEN 38,000 AND 42,000 CUBIC INCHES (42,000 CUBIC INCHES PREFERRED)
RESERVOIRS TO BE PLACED UNDER RUNNING BOARDS AND NOT UNDER ENGINE.

36 TANK OF STEEL PLATE STRONGLY RIVETED TOGETHER, THOROUGHLY BRACED AND STAYED AND WELL SECURED TO BOILER.
TANK FUNNEL TO BE AT LEAST 12" x 18".

37 COAL BOX WITH A CAPACITY OF THREE TONS, TO BE MADE OF STEEL PLATE, LOCATED ON REAR EXTENSION OF ENGINE FRAME BACK OF CAB.

FOR HEREAFTER:- DRIVING WHEELS TO BE REVISED TO PROVIDE MORE VOLUME FOR LEAD IN COUNTERBALANCE. SEE NOTE DATED 12-16-16 FROM H. V. WILLE, FILE No. 2611. R.S.McC. 12/19/16

For Hereafter:- Strengthen back engine truck to a carrying capacity of 32000 pounds and raise question about use of flanged tires on middle drivers. See letter dated 11.20.17 File No. R.S.McC. N.22.17.

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THE BALDWIN LOCOMOTIVE WORKS

SUPERHEATER SPECIFICATION FOR LOCOMOTIVES 8 32 1/3 D 3 AND 4
FOR NEVADA CONSOLIDATED COPPER CO.

Locomotive Superheater Company's Specification No. P-1195-A dated SEPTEMBER 27TH, 1916.
Specification for Superheater with Top Header, Double Loop Arrangement.

BOILER TUBES 135 in number 2" O. D. 12 ft. 0 ins. over tube sheets. Tubes located between and adjacent to Boiler flues are to be beaded over at front end.

BOILER FLUES 21 in number 5½" O.D. #9 B.W.G. thick of cold drawn seamless steel. Flues to be straight, true to gauge and wall not to vary more than one gauge from specified thickness, as shown on Card 10308-C

BOILER FLUE SETTING Radius 1/16 inch on both edges of flue holes in firebox tube sheet and on front edge of flue holes in front flue sheet as shown on drawings, except for copper sheets. Back end to be set with copper ferrules, rolled, beaded and pressered except for copper sheets. Front end to be rolled and beaded. Rollers to have at least 5 rolls. Prosser to have at least 12 sections Card 1137 Card 5835

TUBE SHEET LAYOUT S. H. UNITS to be in accordance with
21 units 1½" O. D. #9 B.W.G. thick of seamless steel. Pipes united by ~~cast-steel~~ return bends
Each unit to be tested, before being placed in boiler, with water under pressure of 500 pounds.

S. H. PIPE SUPPORTS Of steel fastened securely on superheater pipes so as not to slide as shown on Card 10773

S. H. PIPE JOINT To be made in best possible manner to insure absolutely tight joints in accordance with the notation on Card 1043

S. H. UNIT CLAMP BOLT ~~To be of steel having a tensile strength between 60,000 lbs. and 70,000 lbs. per sq. inch and to be as shown on~~ To be in accordance with Loco. Super. Co's material Specy. #12 Card 10695

S. H. HEADER To be of close grain cylinder iron, steam tight in every respect. Joint ring for connection to dry pipe to have flat side against header flange. Casting should be moulded with the face having the superheater joints placed downward in the mould to secure the best quality of metal on surface where superheater joints are made. Each header to have a serial number cast on in such a location as not to be removed in finishing. No patch plugs allowed on ball joint seats. Headers must not be treated ~~excessively~~ with sal ammoniac. Header casting to be tight under water pressure of 250 lbs. Test pressure to be applied separately to the saturated and to the superheated steam passages, so as to insure soundness of all partition walls. Card 10893

S. H. HEADER SUPPORTS To be securely ~~bolted or riveted~~ fastened to boiler shell with ~~rivets~~ or turned bolts fitted in reamed holes. To be properly located so as to support the header after header has been correctly located. Header should then be ~~bolted~~ secured to supports. This to be done before superheater units are put in place. Card 1323

ST. PIPE JOINT RINGS DEFLECTING PLATE Should be of cast iron.

DAMPER CYLINDER To be constructed so as to permit easy inspection and removal of superheater units and joints. Design to be in accordance with Card SEE ARRGT.
To be carefully and accurately made. Piston not to be more than 0.01 inch smaller than bore. Bearings for Piston and extension to be in line. Piston to be ground and to operate freely under a pressure as low as 40 lbs. per sq. in. Steam Pipe to damper cylinder should be as short and free from bends as possible so as not to cause water to collect in cylinder. Pipe to be protected against freezing. Card 1149

DAMPER SHAFT COUNTERWEIGHT To be painted a light color to render it easily visible by the engineer Card 1067

S. H. ARRANGEMENT To be in accordance with Card 4867

TEST (FINAL) The Superheater, after assembling in boiler and after steam pipes are fitted up, is to be thoroughly tested and to be tight under water pressure of ~~250 lbs.~~ at least 30 % more than the working pressure of the boiler

Name	Card	Name	Card
Damper	10832	Damper Shaft Link	1070
Damper Cylinder Arm	1074	Patent Plate	3158
Damper Cylinder Pipe Fitting		S. H. Unit Bolt Washer	1071
Damper Cylinder Pipe Union	1287	S. H. Unit Clamp	1073
Damper Cylinder Piping Diagram	1503	S. H. Unit Clamp Washer	10305
Damper Cylinder Support		S. H. Pipe End	1344
Damper Shaft	1235-J	S. H. Pipe Band	1988
Damper Shaft Arm	1234 AND 1246	Return Bends	10094
Damper Shaft Bearing (O. S.)	1148 AND 1223	Deflecting Plate Handle	1487
Damper Shaft Bearing (I. S.)	1275-D	Lubricator Connection	3023
SPACING OF BANDS AND SUPPORTS	10759	DEFLECTING PLATE STUDS	10809
		DEFLECTING PLATE CLAMP	10809-A

SUPERHEATER UNITS TO HAVE WELDED RETURN BENDS.

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-1822

Memorandum Spec'n 17071

SPECIFICATION FOR LOCOMOTIVES 6 30 D 466 & 467. Gen. A^d Photo. 3172 Actual-Photo-6349

FOR R. {ILLINOIS ZINC COMPANY FOR 466 ~~UNITED STATES GOVERNMENT STORES~~ MIDDLETOWN CAR COMPANY FOR 467 Engine Drawing No. 55

4-21-17

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"
Total wheelbase, eng. and tend. {Actual ----- Limited to -----

Curves -----

Limits, Height ----- Width -----
Weight (approximate in working order, Total 120,000 POUNDS
On F. tr'k ----- lbs., Drivers 120,000 lbs., B. tr'k ----- lbs.

Tractive power 25,500 lbs., Ratio of adhesion 4.7
Work'g St'm Pres. 170 lbs., Service SWITCHING
Fuel SOFT COAL

FRONT TUBE SHEET TO BE ½" THICK
Boiler STEEL Thick 9/16" Bill 7716
Boiler, Diam. 54" Plan STRAIGHT TOP
Boiler st'm pres. 170 lbs., Tested to {190 lbs. steam pres. 227 lbs. water pres.
WITH FACTOR OF SAFETY OF 5.5
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS

Dome, diam. 25" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE
Firebox, length 69-7/16" Width 41 3/4" Depth F. 54 3/4" B. 53 1/4"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" DIAM.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame SINGLE Riveted
Water space stays ⅝" DIAM. WITH 3/16" HOLES 1¼" DEEP FROM O.S.

Radial stays 1" DIAM. Sling stays front {TWO ROWS OF B. L. W. EXPANSION STAYS
Button heads below crown on EIGHT central rows
Crown bars NONE Placed ----- above crown
Crown bolts -----

Flues -----
Tubes #12 W. G. CHARCOAL IRON OR STEEL
Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS
Number 193 Diam. 2" Length 12' 4"

Heating Surface: Flues ----- Combus. Chamb. ----- Total 1332.5
Tubes 1238 Fire Box 94.5 Fire Brick Tubes -----
Grate area 20.1 Ratio to Heating Surface 1 : 66.2
Superheater -----

Fire Brick ARCH ON STUDS

Grates ROCKING BARS AND DROP PLATE
Ash Pan, Dampers FRONT AND BACK

Throttle BALANCE Pos. DOME
Dry pipe STEEL

Superheater NONE

Smokebox extension WITH Cleaning hole and cap L. S. ONLY
Spark ~~ejector or~~ hopper WITH
Netting and deflect. plates WITH

Exhaust nozzles DOUBLE HIGH

Stack STRAIGHT Dia. 18" Hole in S. B., dia. 21¼"

Safety Valves (NOT SPEC.) TWO CONSOLIDATED 2½"
Safety valves NONE with relief lever, Set to 170 POUNDS
Whistle B. L. W. PLAIN

Steam Gauge ONE IRON 7" MAKER:-ASHCROFT (NOT SPEC.)
Steam gauge stand IRON **Clock** NONE

Water Gauge ONE B.L.W. (IRONCLAD) **Cab Lamps** TO BURN OIL
Gauge Cocks THREE BACK Surface valve NONE
Lowest gauge cock ¾" above highest part of crown
Lubricator steam valve TO HAVE separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock ONE CRANE 2" (TO USE STOCK) POS:-FRONT
Cleaning Plugs
Firebox CORNERS, SIDES AND BACK
Crown, TWO EACH SIDE AND TWO BACK
Waist, ONE UNDER FRONT
Front tube sheet, ONE Fusible plug ONE

Pump NONE Pos. -----
Top chamb. ----- Bottom chamb. -----
Feed Cock ----- Feed pipes -----
Checks ----- Check pipes -----

Injectors (NOT SPEC.) TWO MONITOR No. 8
Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER
Pipes, Check IRON Feed IRON Overflow IRON
Check B. L. W. Pos. RIGHT AND LEFT

Steam Heat NONE.

Cab WOOD

Cab boards WOOD Nosing NONE
Running boards WOOD Nosing NONE
Hand rail IRON Located on TANK

Back Bumper OAK

Pilot NONE Pushing shoes FRONT AND BACK
Front Bumper OAK Bumper plate NONE
Steps ACROSS FRONT AND BACK, WITH HAND RAILS
STEPS, HAND HOLDS, ETC. TO CONFORM TO I.C.C. REQUIREMENTS
F.&B. Drawhead, Center above rail 33½"
Coupler M. C. B. AUTOMATIC

Signal fixtures NONE

Headlight TWO ROUND CASE 16" Reflector, To burn KEROSENE
Headlight, Nos. on sides WITH H'd'l't step WITH
Lamp shelf NONE Nosing -----

Bell 92 POUNDS
Sand Box TWO Diam. 28" Body IRON PAINTED Pipes IRON
Sander (NOT SPEC.) LEACH AIR, TRAP A-1, IN EACH BOX, TO SAND FRONT AND BACK
Dome casing IRON PAINTED

Boiler Jacket #22 SOFT STEEL PtdBands IRON Style 9
Boiler Lagging MAGNESIA SECTIONAL

THE BALDWIN LOCOMOTIVE WORKS

H. R. Fowler. Aug 1917

SPECIFICATION FOR LOCOMOTIVES 6 30 D 466 & 467. 67

FOR R. {ILLINOIS ZINC COMPANY FOR 466 MIDDLETOWN CAR COMPANY FOR 467

Frames CAST STEEL Braces SOLID

Cylinders, Diam. 18" Stroke 24"
St'm ports, Length 16" Width 1½" Bridges 1"
Exh. ports, Length 16" Width 2½" Valve lead 1/16"
Valve travel 5¼" Steam lap ⅜" Exhaust clearance -----
Eccentric crank throw 5½" By-pass valve NONE
S. P. Lubr. (NOT SPEC.) MICHIGAN TRIPLE BULLS EYE
Cyl'r heads CAST IRON; LUBR. PIPES OF IRON UNDER JACKET
Cyl'r casings IRON PTD. Head covers STEEL PAINTED
St'm chest casings IRON PTD. Covers STEEL PAINTED
St'm chest valves RICHARDSON BALANCED, WITH VACUUM VALVES
Met. pkg {PISTON RODS VALVE STEMS UNITED STATES (NOT SPEC.)

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD
Guides STEEL Oil cups NEEDLE
Crossheads CastelSteel
Wrist Pins STEEL Rod cups PLUNGER, FORGED ON.
PARALLEL RODS TO HAVE SOLID ENDS

Valve Motion STEPHENSON
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.
DRIVING WHEELS WITHOUT HUB LINERS
Drivers, O. S. Diam. 44" Cen. diam. 38" CENTRES CAST IRON

Tires STEEL Held by SHRINKAGE AND SHOULDER
Tires, Flanged, Pos. FRONT AND BACK Size 3" X 5½"
Tires, Plain, Pos. MIDDLE Size 3" X 6½"
Lateral play between driving boxes and wheel hubs — 1/16" TOTAL
Driving Boxes STEELED CAST IRON
Journals, Diam. 8" Length 8½"

Springs. Make B. L. W.

Front Engine Truck NONE Wheeled -----
To swing -----each side of cen., Cen. pin liners -----
Journals, Diam.----- Length ----- Boxes -----
Wheels, Diam. ----- Tread----- Kind -----
Tires ----- Cen. diam. -----Size -----
Tires held by -----

Back Engine Truck NONE Wheeled -----
To swing -----each side of cen., Cen. pin liners -----
Journals, Diam.----- Length ----- Boxes -----
Wheels, Diam.----- Tread----- Kind -----
Tires ----- Cen. diam.----- Size -----
Tires held by -----

Brake, position ON ALL DRIVING WHEELS (NO TENDER)
Operating Parts {Engine, Sch. A-1, WEST'G. AUTO. AIR — SWA Sent Ex. Cond. 2843-1918 on HC7 Eng. Tr'k, sch. -----
Foundation Parts {Drivers, sch. WA-2 AMERICAN O.S. EQUALIZED Eng. Tr'k, sch. -----
Air pump ONE 9½" Pos. LEFT SIDE
Train connections FRONT AND BACK.
Train signal, sch. NONE
AIR RESERVOIR TO HAVE HYDROSTATIC TEST OF 210 POUNDS

Tender Name Wheeled, Drawing No. ---
Weight, with fuel and water, about ---

Tank 1800 Gallons, Bill 4178
TANK SHAPE, SADDLE OVER TOP OF BOILER
FUEL BOX ON REAR EXTENSION OF ENGINE FRAME, BACK OF CAB
Tool Boxes -----

Frame -----

Front Drawbar height -----
Pilot ----- Pushing shoes -----
Back drawhead, center above rail -----
Coupler -----

Steps -----

Trucks -----

Springs -----
Journals, Diam. ----- Length -----
Wheels, Diam. ----- Tread ----- Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----
Safety chains -----

Brake Position -----
Brake sch. -----

List of tools, sch. 29
Photo sch. #2 Inspection B. L. W.
To be weighed YES Material spec'ns B. L. W.
Certificate of boiler test THREE COPIES OF B.L.W. FORM 1036
Junior laws to 4-20-17 Shipment ON OWN WHEELS

Brass shop finish, No.
Machine shop finish D-165

B. L. W. Patents } NONE

Property plates NONE

Painting: Engine, style 223 OLIVE GREEN AND ALUMINUM
Painting:—Tender, style -----

Mark on (SEE OTHER SIDE OF THIS PAGE)

Road Nos. Pos. Road Nos. Name NONE
SEE OTHER SIDE

6 - 30 D 466 sold to Illinois Zinc Company with changes ordered through Extra Work Dept., Order No.7516 dated 7-17-17 as follows:-
Painting Style 223, Olive Green and Aluminum
Mark on tank sides, PERU LASALLE & DEER PARK R. R.
Road Number 2 in Brass on Front Number Plate and painted on sides of cab and back of fuel box.
Rails 75 to 85 pounds per yard.
Curves 45 degrees, Grades about 2%.
Co. has no limitations as to height.

7-17-17

6 - 30 D 467 sold to Middletown Car Company with changes ordered through Extra Work Dept., Order No.8029 dated 8-1-17 as follows:-
Painting Style 223, Olive Green and Aluminum
Mark on tank sides, MIDDLETOWN CAR CO.
Road Number 2 in Brass on Front Number Plate and Painted on sides of cab and back of fuel box.

8/1/17

THE BALDWIN LOCOMOTIVE WORKS Dup. of 4 10 C 34 with same extras except as otherwise specified.

Memorandum Spec'n 17014

SPECIFICATION FOR LOCOMOTIVES 4 10 C 37

FOR United States Metals Refining Co. Chrome Plant **Engine Drawing No.** 11

1-22-17

Gauge of Road 3' 0" Play ½"
Wheelbase, Rigid 3' 9" Driving 3' 9" Total 3' 9"
Total wheelbase, eng. and tend. { Actual ---- / Limited to ----
Rails, 20 and 30 pounds per yard.
Curves 25 ft. radius

★ **Limits,** Height 7' 6" Width 4' 6"
Weight (approximate) in working order, Total 20,500 lbs.
On F. tr'k ---- lbs., Drivers 20,500 lbs., B. tr'k ----- lbs.

Tractive power 4080 lbs., Ratio of adhesion 4.5 tank empty
Work'g St'm Pres. 150 lbs., Service Switching
Fuel Pea Coal
Boiler to be inspected by Hartford Steam Boiler Inspection and Insurance Co. for account of the purchasers.
Boiler Steel Thick ⅜" Bill 6094
Boiler, Diam. 30" Plan Straight Top
Front tube sheet ½" thick
Boiler st'm pres. 150 lbs., Tested to { 170 lbs. steam pres. / 200 lbs. water pres.
with factor of safety of 6.4
Longitud. seams Double riveted lap joints

Dome, diam. 15⅛" Pos. Forward of firebox

Firebox Steel Combustion chamb. None
Firebox, length 25½" Width 39¾" Depth F.29½" B. 29½"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back ⅜"
Firedoor opening 14" diameter
Water space, Front 2" and 2½" Sides 2" Back 2"
Water space, Frame Single Riveted
Water space stays ⅞" dia. with 3/16" hole 1½" deep from O. S.

Radial stays ⅞" diam. Sling stays front None
Button heads below crown on ---- central rows
Crown bars None Placed ---- above crown
Crown bolts ----

Flues None
Tubes #13 W. G. Charcoal Iron or Steel
Tube ends Swaged for copper ferrules firebox ends
Number 66 Diam. 1⅝" Length 6' 7"

Heating Flues None Combus. Chamb. None Total 192⁰
Surface Tubes 168⁰ Fire Box 24⁰ Fire Brick Tubes ----
Grate area 70 Ratio to Heating Surface 1 : 27
Superheater ----

Fire Brick Arch None

Grates Plain bars
Ash Pan, Dampers Right and Left

Throttle Balance Pos. Dome
Dry pipe Wrot iron or steel

Superheater None

Smokebox extension None Cleaning hole and cap None
Spark ejector or hopper None
Netting and deflect. plates ~~None~~ None (8/16/22 FNP.)

Exhaust nozzles Single

Stack Straight Dia. 8" Hole in S. B., dia. 8¾"

Safety Valves (NOT Spec'd) Two Consolidated 1½"
Safety valves None with relief lever, Set to 150 lbs.
Whistle B. L. W. Plain

Steam Gauge One Iron 6" MAKER:- Ashcroft (NOT Spec'd)
Steam gauge stand Iron **Clock** None

Water Gauge { One Ford & Kendig #3½ with B.L.W. guard **Cab Lamps** to burn oil
Gauge Cocks Three back Surface valve None
Lowest gauge cock 3" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One B. L. W. POS:- Front
Cleaning Plugs
Firebox Corners, front ones diagonal, and back
Crown, One back
Waist, One under front
Front tube sheet, One Fusible plug One

Pump None Pos. ----
Top chamb. ---- Bottom chamb. ----
Feed Cock ---- Feed pipes ----
Checks ---- Check pipes ----

Injectors (NOT Spec'd) Two Penberthy Automatic, No. "CC"
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. Right and Left
Intermediate check to be applied in check pipes.
Steam Heat None

Cab of steel with 12" bunkboards each side with glass panel in top of sliding doors at back. One drop seat 12" wide, 14" long and about 26" high.
Coal box located in left side of cab.

Cab boards Iron Nosing Angle Iron
Running boards None Nosing ----
Hand rail None Located on ----

Back Bumper Steel plate

Pilot None Pushing shoes None
Front Bumper Steel plate Bumper plate with, at front
Steps None

F. & B Drawhead, Center above rail 15"
Coupler Radial drawbars at front and back to be furnished free and applied by Ry. Co. after delivery of loco.

Signal fixtures None

Headlight Two Round Case 10" Reflector, To burn Kerosene
Headlight, Nos. on sides None H'dl't step None
Lamp shell None Nosing None

Bell 28 pounds
Sand Box One Diam. 15" Body Iron painted Pipes Iron
Sander Hand

Dome casing Iron painted

Boiler Jacket #22 Soft Steel pt. Bands Iron Style 9
Boiler Lagging Magnesia sectional

THE BALDWIN LOCOMOTIVE WORKS
W. Conklin June 1917
SPECIFICATION FOR LOCOMOTIVES 4 10 C 37
FOR United States Metals Refining Co.

69

Frames Cast Steel Braces Solid

Cylinders, Diam. 8" Stroke 12"
St'm ports, Length 7½" Width ⅜" Bridges ⅝"
Exh. ports, Length 7½" Width 1¼" Valve lead 1/32"
Valve travel 1⅛" 2 5/16" Steam lap ½" Exhaust clearance ----
Eccentric throw 2" By-pass valve None
S. F. Lubr. (NOT Spec'd) Detroit Double #7 Bulls Eye
Cyl'r heads Cast Iron; Lubr. pipes of iron under jacket
Cyl'r casings Iron painted Head covers Steel Painted
St'm ch.st casings Iron Painted Covers Steel Painted
St'm chest valves Plain "D"
Met. pkg ~~PISTON ROD~~ France Metallic (spec) Valve Stems Braided Packing

Pistons Cast iron rings sprung into solid head
Guides Steel Oil cups Needle
Crossheads Cast Iron
Wrist Pins Steel Rod cups Needle
Parallel Rods to have strap ends.

Valve Motion Stephenson
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 24" Cen. diam. 20" Centres Cast Steel

Tires Steel Held by Shrinkage and Shoulder
Tires, Flanged, Pos. All Size 2" x 4½"
Tires, Plain, Pos. ---- Size ----
Lateral play between driving boxes and wheel hubs - 1/32" total
Driving Boxes Cast Iron
Journals, Diam. 4" Length 6"

Springs. Make B. L. W.

Front Engine Truck None Wheeled ----
To swing --- each side of cen., Cen. pin liners ----
Journals, Diam. ---- Length ---- Boxes ----
Wheels, Diam. ---- Tread ---- Kind ----
Tires ---- Cen. diam. ---- Size ----
Tires held by ----

Back Engine Truck None Wheeled ----
To swing ---- each side of cen., Cen. pin liners ----
Journals, Diam. ---- Length ---- Boxes ----
Wheels, Diam. ---- Tread ---- Kind ----
Tires ---- Cen. diam. ---- Size ----
Tires held by ----

Brake, position On all driving wheels (No Tender)
Operating Engine, Sch. UO- B. L. W. Steam
Parts Eng. Tr'k, sch. ----
Foundation Drivers, sch. UO - B.L.W.
Parts Eng. Tr'k, sch. ----
Air pump ---- Pos. ----
Train connections -----
Train signal, sch. ----
Separate lubricator for steam brake valve
★ Tracks on 5 feet centers in some places, clearance to be arranged to suit. Centre of boiler above top of rail will be about 3' 7". Length of engine to be as shown by print from tracing 18805. Width of cab at eaves will be about 4' 4", and at cab boards 4' 6" and over cylinders 4' 6".

Tender None Wheeled, Drawing No. ----
Weight, with fuel and water, about ----

Tank 250 Gallons Bill 4169
Tank shape saddle, located over top of boiler and extending out to end of smoke box.
Tool Boxes ----

Frame ----

Front Drawbar height ----
Pilot ---- Pushing shoes ----
Back drawhead, center above rail ----
Coupler ----

Steps ----

Trucks ----

Springs ----
Journals, Diam. ---- Length ----
Wheels, Diam. ---- Tread ---- Kind ----
Tires ---- Cen. diam. ---- Size ----
Tires held by ----
Safety chains ----

Brake Position ----
Brake sch. ----

List of tools, sch. 26
Photo sch. None Inspection B. L. W. (Except see boiler)
To be weighed Yes Material specs B.L.W.
Certificate of boiler test Three copies of B.L.W. form 1036
Junior laws to 3-4-16 Shipment On Car

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W.
Patents None

Property plates None

Painting: Engine, style 223, Olive Green and Aluminum
Painting: Tender, style ----

Mark on tank sides U. S. M. R. Co.

Road Nos. Pos. Road Nos. Name None
F. No. Plate 11
Cab Sides

THE BALDWIN LOCOMOTIVE WORKS Dup. 6-28 D 249 with same extras except as otherwise specified

Memorandum Spec'n 11249

SPECIFICATION FOR LOCOMOTIVES 6 28 D 329 Gen. as Photo. 2528

FOR Cornwall Ore Bank Company **Engine Drawing No.** 37

R. 12-14-16

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 10' 6" Driving 10' 6" Total 10' 6"
Total wheelbase, eng. and tend. { Actual 28' 9" / Limited to -----

Curves -----

Limits, Height ----- Width -----
Weight (approximate) in working order, Total 89,000 pounds
On F. tr'k ----- lbs.. Drivers 89,000 lbs., B. tr'k ----- lbs.

Tractive power 21400 lbs.. Ratio of adhesion 4.16
Work'g St'm Pres. 160 lbs., Service Switching
Fuel Soft Coal

Front tube sheet to be ½" thick
Boiler Steel Thick 7/16" Bill 8025
Boiler, Diam. 48" Plan Straight Top
Boiler st'm pres. 160 lbs. Tested to { 180 lbs. steam pres. / 214 lbs. water pres.
with factor of safety of 5.15
Longitud. seams Double riveted, butt jointed

Dome, diam. 25" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 75-15/16" Width 33⅜" Depth F. 53½" B. 52⅛"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diam.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Single Riveted
Water space stays ⅞" diam. with 3/16" holes 1½" deep from O. S.
Flexible staybolts, 300 American 15/16" diam.
Radial stays 1" diameter Sling stays front { Two rows of B.L.W. Expansion stays
Button heads below crown on Six central rows
Crown bars None Placed ----- above crown
Crown bolts None

Flues -----
Tubes 312 W. G. Charcoal Iron
Tube ends Swaged for copper ferrules firebox ends
Number 140 Diam. 2" Length 10' 8½"

Heating Surface Flues ----- Combus. Chamb. ----- Total 872 sq ft
Tubes 779 sq ft Fire Box 93 sq ft Fire Brick Tubes -----
Grate area 17.6 sq ft Ratio to Heating Surface 1 : 51
Superheater -----

Fire Brick Arch on Studs

Grates Rocking Bars and drop plate
Ash Pan, Dampers Front and Back

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Smokebox extension With Cleaning hole and cap Right and Left
Spark ejector or hopper With
Netting and deflect. plates With

Exhaust nozzles Double high

Stack Straight Dia. 16" Hole in S. B., dia. 19½"

Safety Valves Two Consolidated 2" (not spec)
Safety valves None with relief lever, Set to { 160 pounds / 165 pounds
Whistle B. L. W. plain

Steam Gauge One Iron 7" MAKER - Ashcroft (not spec)
Steam gauge stand Iron **Clock** None

Water Gauge One B.L.W.(Ironclad) **Cab Lamps** to burn oil
Gauge Cocks Three back Surface valve None
Lowest gauge cock 3¼" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One B. L. W. POS:-Front
Cleaning Plugs
Firebox Corners and back
Crown, Two back
Waist, One under front
Front tube sheet, One Fusible plug One

Pump None Pos. -----
Top chamb. ----- Bottom chamb. -----
Feed Cock ----- Feed pipes -----
Checks ----- Check pipes -----

(spec)
Injectors Two Sellers Improved No. 6½
Injectors, Pos. Right end Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. Right end Left

Steam Heat None

Cab Wood
Cab to be provided with sliding doors in back to enclose space of about 4 feet
Cab boards Wood Nosing Angle Iron
Running boards Wood Nosing Angle Iron
Hand rail Iron Located on Boiler

Back Bumper Bar steel Back drawbar height 26"

Pilot None Pushing shoes at front
Front Bumper Oak Bumper plate None
Steps across front with hand rail
Steps, hand holds, etc. to conform to I. C. C. requirements
Front Drawhead, Center above rail 33½"
Coupler M. C. B. Automatic

Signal fixtures None

Headlight One Round Case 16" Reflector. To burn Kerosene
Headlight, Nos. on sides With H'dl't step With
Lamp shelf None Nosing -----

Bell 85 pounds
Sand Box Two Diam. 28" Body Iron Painted Pipes Iron
Sander Leach Air Trap A-1 in each box

Dome casing Iron painted

Boiler Jacket #22 Soft Steel Pt Bands Iron Style 9
Boiler Lagging Magnesia sectional

THE BALDWIN LOCOMOTIVE WORKS J. A. Jeffries June 1917

SPECIFICATION FOR LOCOMOTIVES 6 28 D 329

FOR Cornwall Ore Bank Company

R.

Frames Cast Steel Braces Solid

Cylinders, Diam. 17" Stroke 24"
St'm ports, Length 16" Width 1½" Bridges 1"
Exh. ports, Length 16" Width 2⅜" Valve lead 1/16"
Valve travel 5½" Steam lap ¾" Exhaust clearance -----
Eccentric crank throw 4½" By-pass valve None
S. F. Lubr. (not spec) Michigan Triple Bulls Eye
Cyl'r heads Cast Iron; Lubr. pipes of Copper under jacket
Cyl'r casings Iron Ptd. Head covers Steel Painted
St'm chest casings Iron Ptd. Covers Steel Painted
St'm chest valves Richardson Balanced, with vacuum valves
Met. pkg { PISTON RODS / VALVE STEMS UNITED STATES (not spec)

Pistons Cast Iron rings sprung into solid head
Guides Laird type, steel Oil cups Needle
Crossheads Cast steel with brass bearings
Wrist Pins Steel Rod cups Plunger
Parallel rods to have solid ends

Valve Motion Stephenson
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.
Driving wheels without hub liners
Drivers, O. S. Diam. 44" Cen. diam. 38" Centers cast iron

Tires Steel Held by Shrinkage and Shoulder
Tires, Flanged, Pos. Front and Back Size 3" X 5½"
Tires, Plain, Pos. Middle Size 3" X 6⅛"
Lateral play between driving boxes and wheel hubs = 1/16" total
Driving Boxes Steeled cast iron
Journals, Diam. 7" Length 8"

Springs. Make B. L. W.

Front Engine Truck None Wheeled -----
To swing -----each side of cen., Cen. pin liners -----
Journals, Diam. ----Length ----- Boxes -----
Wheels, Diam. ----- Tread -----Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----

Back Engine Truck None Wheeled -----
To swing ----- each side of cen., Cen. pin liners-----
Journals, Diam. -----Length ----- Boxes -----
Wheels, Diam. ------Tread----- Kind -----
Tires ----- Cen. diam.----- Size -----
Tires held by -----

Brake, position On all drivers only (none on tender)
Operating Parts { Engine, Sch. No.6 ET West'g. Combined Auto. and Straight Air / Eng. Tr'k, sch. -----
Foundation Parts { Drivers, sch. WM-1 American O. S. Equalized / Eng. Tr'k, sch. -----
Air pump One 8½" Cross Compound POS:-Left Side
Train connections Front and back
Train signal, sch. None
Air Reservoirs to have large capacity
All air reservoirs to have hydrostatic test of 210 pounds
Jacob & Kilburn air dumping arrangement operated from Cab
CERTIFICATES DATED MAY 29TH 1917 COVERING TEST OF RESERVOIR NOS. 10099 FURNISHED BY WEST'G. AIR BRAKE CO., ARE FILED IN MAIN OFFICE, FILE NO. 2084

Fuel Car ~~Tender~~ Four Wheeled, Drawing No. 232
Weight, with fuel and water, about 3500 pounds

Tank 1500 Gallons. Bill 45531 ~~44665~~ 5/4/17
Tank saddle, over top of boiler

Tool Boxes 18" wide X 2' 6" deep. Full width of car in length

Frame Oak and Yellow pine

Front Drawbar height 26⅜"
Pilot None Pushing shoes at rear
Back drawhead, center above rail 33½"
Coupler M. C. B. Auto.

Steps, hand holds, etc. to conform to I. C. C. requirements
Steps across rear, with hand rail

Trucks None Wheels to work in pedestals
Car to be cross equalized
Springs Semi-elliptic. B. L. W. make
Journals, Diam. 3½" Length 6⅝"
Wheels, Diam. 30" Tread 4½" Kind Chilled cast iron plate
Tires None Cen. diam. -----Size -----
Tires held by -----
Safety chains None

Brake Position On all wheels
Brake sch. B. L. W. hand only
~~Fuel Car~~ Tender to be piped for air brake on train
FUEL CAR TO BE PIPED FOR JACOB & KILBURN AIR DUMPING ARRANGEMENT, OPERATED FROM CAB.

List of tools, sch. 29
Photo sch. None Inspection B. L. W.
To be weighed Yes Material specns B. L. W.
Certificate of boiler test Three copies of B. L. W. form 1036
Junior laws to 2-1-17 Shipment On own wheels, under steam

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. Patents None

Property plates None

Painting: Engine, style 126, Black and Gold
Painting: Tender, style Card 53, for fuel car, Black and Gold

Lettering, etc. to be same as for 6-28 D 249
Mark on Tank Sides, CORNWALL ORE BANK COMPANY
Mark on fuel car sides, CORNWALL ORE BANK COMPANY

Road Nos. Pos.	Road Nos.	Name None
F.No. Plate	4	
Dome		
Cab panel		
Back of fuel car		

THE BALDWIN LOCOMOTIVE WORKS As Specification C-4046

Memorandum Spec'n 11139

SPECIFICATION FOR LOCOMOTIVES 6 38 D 64

FOR Cornwall Ore Bank Company

M

Gen. as Photo 2107 (Except with sloping back tender)

Engine Drawing No. 12

8-10-16

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"
Total wheelbase, eng. and tend. { Actual 42' 10½" / Limited to -----
Grades 3-1/3 %, about ½ miles long
Curves 250 ft. radius Rails 60 pounds

Limits, Height ---- Width ----
Weight (approximate) in working order, Total 150,000 pounds
On F. tr'k ---- lbs., Drivers 150,000 lbs., B. tr'k --- lbs.

Tractive power 38,510 lbs., Ratio of adhesion 3.9
Work'g St'm Pres. 180 lbs., Service Switching
Fuel Soft Coal

Boiler Steel Thick ¾" Bill 7901
Boiler, Diam. 74" Plan Straight Top
Boiler st'm pres. 200 lbs., Tested to { 220 lbs. steam pres. / 267 lbs. water pres.
Longitud. seams Butt jointed, double covering strips

Dome, diam. 33" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 120⅛" Width 42" Depth F. 68-13/16" B. 66-13/16"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diam.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Double Riveted
Water space stays ⅞" diam. with 3/16" holes 1½" deep from O.S.
American Flexible Staybolts of Ewald Iron (400) in breaking zone.
Radial stays 1" diameter Sling stays front { Three rows of B.L.W. Expansion Stays
Button heads below crown on Ten central rows
Crown bars None Placed ---- above crown
Crown bolts -----

Flues ------
Tubes #12 WG Charcoal Iron
Tube ends Swaged for copper ferrules, firebox ends
Number 335 Diam. 2" Length 10' 6"

Heating Surface	Flues ----	Combus. Chamb. ----	Total 2012 sq
	Tubes 1827 sq	Fire Box 185 sq	Fire Brick Tubes ---
Grate area 35 sq	Ratio to Heating Surface 1 : 57.5		
Superheater -----			

Fire Brick Arch, None

Grates Rocking bars and drop plate
Ash Pan, Dampers Front and back

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Smokebox extension With Cleaning hole and cap L. S. only
Spark-ejector on hopper With
Netting and deflect. plates With

Exhaust nozzles Double, high

Stack Straight Dia. 16" Hole in S. B. dia. 18"

Safety Valves Two Consolidated 3" (not spec)
Safety valves None with relief lever, Set to 180 pounds
Whistle B. L. W. plain

Steam Gauge One Iron 7" Maker—Ashcroft (not spec)
Steam gauge stand Iron Clock None

Water Gauge One B.L.W.(Ironclad) Cab Lamps to burn Oil
Gauge Cocks Three Brass Surface valve None
Lowest gauge cock 3" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock Two B.L.W. Pos: One front and one in left side
Cleaning Plugs One plug above fire door
Firebox Corners diagonal and sides
Crown, Three each side and three back
Waist, One under front
Front tube sheet, One Fusible plug One

Pump None Pos. ---
Top chamb. --- Bottom chamb. ---
Feed Cock --- Feed pipes ---
Checks --- Check pipes ---

Injectors (spec) Two Sellers, Class "N" No. 84
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. Right and Left

Steam Heat None

Cab Steel

Cab boards Steel Nosing T-iron
Running boards Steel Nosing T-iron
Hand rail Iron Located on Boiler

Back Bumper Bar Steel Back drawbar height 29½"

Front bumper to have heavy plate in front and back
Pilot None Pushing shoes at front
Front Bumper Oak Bumper plate None
Steps across front with hand rails
Steps, hand holds, etc., to conform to I. C. C. requirements
Front Drawhead, Center above rail 33½"
Coupler M. C. B. Automatic

Signal fixtures None

Headlight Two Round Case 18" Reflector, To burn Kerosene
Headlight, Nos. on sides With H'dl't step With
Lamp shelf None Nosing -----

Bell 92 pounds
Sand Box Two Diam. 28" Body Iron, painted Pipes Iron
Sander (spec) Leach Air, Type A-1, in each box to sand front and rear.

Dome casing Iron, painted

Boiler Jacket #22 Soft Steel Pl. Bands Iron Style B and M
Boiler Lagging Magnesia Sectional
Back head of boiler to be lagged and jacketed

THE BALDWIN LOCOMOTIVE WORKS
J. F. Brennah. Nov. 1916

SPECIFICATION FOR LOCOMOTIVES 6 38 D 64

73

FOR Cornwall Ore Bank Company

M

Frames Cast Steel Braces Solid

Cylinders, Diam. 22" Stroke 26"
Sl'm ports, Length 16" Width 1⅜" Bridges 1⅛"
Exh. ports, Length 16" Width 2½" Valve lead 1/16"
Valve travel 5½" Steam lap ⅞" Exhaust clearance ----
Eccentric crank throw 4⅜" By-pass valve None
S. F. Lubr. (spec) Detroit Four Feed No. 32 Bulls Eye
Cyl'r heads Cast Iron; Lubr. pipes of iron under jacket
Cyl'r casings Iron, painted Head covers Steel painted
Sl'm chest casings Iron, painted Covers Steel painted
Sl'm chest valves Richardson, Balanced, with vacuum valves
Met. pkg (piston rods / valve stems) U. S. (not spec)

Pistons Cast iron rings sprung into solid head
Guides Steel Oil cups Needle
Crossheads Cast Steel
Wrist Pins Steel Rod cups Plunger
Parallel rods to have solid ends

Valve Motion Stephenson
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 50" Cen. diam. 44", Centres Cast Steel
Driving wheels to have bronze hub liners
Tires Steel Held by Shrinkage and shoulder
Tires, Flanged, Pos. Front end back Size 3" x 5½"
Tires, Plain, Pos. Middle Size 3" x 6½"
Lateral play between driving boxes and wheel hubs = 1/16" total
Driving Boxes Cast steel
Journals, Diam. 9" Length 12"
Springs to be B. L. W., except Driving Springs from Union Spring & Mfg. Co., because B.L.W. Cannot furnish in time.

Front Engine Truck None Wheeled ---
To swing --- each side of cen., Cen. pin liners ---
Journals, Diam. --- Length --- Boxes ---
Wheels, Diam. --- Tread --- Kind ---
Tires --- Cen. diam. --- Size ---
Tires held by ---

Back Engine Truck None Wheeled ---
To swing --- each side of cen., Cen. pin liners ---
Journals, Diam. --- Length --- Boxes ---
Wheels, Diam. --- Tread --- Kind ---
Tires --- Cen. diam. --- Size ---
Tires held by ---

Brakes, position On all driving and tender wheels
Operating Parts { Engine, Sch. 6-ET West'g Combined Auto and straight air / Eng. Trk, sch. ---- }
Foundation Parts { Drivers, sch. ET-2 American O.S. Equalized / Eng. Trk, sch. ---- }
Air pump { One 9½" / One 8½" Cross Compound } Pos:—L.S. ahead of firebox
Train connections Front and back
Train signal, sch. None
Large air reservoir capacity
Hancock Inspirator Co's arrangement for operating air dump cars. ANGLE COCKS FOR K.S.I. 20-YARD DUMP CARS ARE LOCATED 21" ABOVE RAIL AND 20" APART IE. 10" EACH SIDE OF CENTRE. H.S.16.

Tender Eight Wheeled, Drawing No. 918
Weight, with fuel and water, about 90,000 pounds

Tank 4500 Gallons, Bill 4319
Tank "U" shape, sloping back Fuel capacity 6 tons

Tool Boxes of hard wood, top

Frame Steel 8" and 10" channels
Bumpers to have heavy plate in front and back
Front Drawbar height 29½"
Pilot None Pushing shoes at rear
Back drawhead, center above rail 33½"
Coupler M. C. B. Automatic
Steps across rear with hand rails
Steps and hand rails on sloping back of tank
Steps, hand holds, etc., to conform to I. C. C. requirements

Trucks Arch Bar type with cast steel bolsters

Springs Elliptic B. L. W.
Journals, Diam. 5" Length 9"
Wheels, Diam. 33" Tread 4½" Kind Chilled Cast iron plate
Tires --- Cen. diam. --- Size ---
Tires held by ---
Safety chains Single

Brake Position On all wheels
Brake sch. #6-ET West'g Auto and straight air, with 10" x 12" cylinder.

List of tools, sch. 29
Photo sch. None Inspection B. L. W.
To be weighed No Material spec'ns B. L. W.
Certificate of boiler test Three copies of B. L. W. form 1036
Junior laws to 9-20-16 Shipment On own wheels

Brass shop finish, No. 1
Machine shop finish D-155

B. L. W. Patents { Throttle, Patented Jan. 23, 1900 (Cast on) / Feed Pipe Strainer, Patented Sept. 1, 1903 (Cast on)

Property plates None

Painting:—Engine, style 291, Black and Gold
Painting:—Tender, style 291, Black and Gold

Mark on tank sides, CORNWALL ORE BANK CO.

Road Nos. Pos.	Road Nos.	Name None
F. No. Plate	6	
F. Sand Box		
Cab sides		
Back of tank		

Hereafter - Sand box 31" dia. will be arranged so that pipes will clear the gasket.
9-11-16

THE BALDWIN LOCOMOTIVE WORKS Dup. 6 34 D 927 WITH SAME EXTRAS, EXCEPT AS OTHERWISE SPECIFIED

Memorandum Spec'n 11217

SPECIFICATION FOR LOCOMOTIVES 6 34 D 955 AND 956 — Builder's Photo. 3305

FOR NATIONAL SLAG COMPANY — **Engine Drawing No.** 75

11-17-16

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 10' 10" Driving 10' 10" Total 10' 10"
Total wheelbase eng and tend. (Actual ---, Limited to ---)
RAILS 80 AND 100 POUNDS
Curves 30 DEGREES GRADES 2½ PER CENT
LOCOMOTIVE TO BE DESIGNED TO WITHSTAND ROUGH SERVICE.
Limits, Height NONE Width ---
Weight approximate in working order, Total 137,000 POUNDS
On F. trk ---- lbs., Drivers 137,000 lbs. B. trk ---

Tractive power 31,820 lbs., Ratio of adhesion 4.9
Work'g St'm Pres. 180 lbs., Service SWITCHING
Fuel SOFT COAL

FRONT TUBE SHEET TO BE ½" THICK
Boiler STEEL Thick ⅜" Bill 7980
Boiler, Diam. 60" Plan STRAIGHT TOP
Boiler st'm pres. 180 lbs., Tested to 200 lbs steam pres. / 240 lbs water pres. WITH FACTOR OF SAFETY OF 5.1
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS
DOME TO BE OF THE BUILT UP TYPE
Dome, diam. 34½" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE
Firebox, length 89⅛" Width 41 1/16" Depth F. 59¾" B. 57½"
Firebox, Tube ½" Crown ⅜" Sides ⅝" Back ⅜"
Firedoor opening OVAL 13½" x 12"
Water space, Frnt. 4" Sides 3½" Back 3½"
Water space, Fram. SINGLE Riveted
Water space stays 1" DIAM. WITH 3/16" HOLE 1¼" DEEP FROM O.S.

Radial stays 1⅛" DIAMETER Sling stays front { TWO ROWS OF B.L.W. EXPANSION STAYS
Button heads below crown on EIGHT central rows
Crown bars NONE Placed --- above crown
Crown bolts ----

Flues ----
Tubes #12 W. G. CHARCOAL IRON OR STEEL
Tube ends SWAGED FOR COPPER FERRULES FIREBOX ENDS
Number 192 Diam. 2" Length 10' 9"

Heating Flues ------ Combus. Chamb. --- Total 1227 sq ft
Surface Tubes 1106 sq ft Fire Box 121 sq ft Fire Brick Tubes ---
Grate area 25.3 sq ft Ratio to Heating Surface 1 : 48.5
Superheater ----

Fire Brick ARCH, ON STUDS
GRATES TO HAVE TABLE BARS INSTEAD OF FINGER BARS
GRATE SIDE FRAMES TO BE EXACTLY SAME AS FOR 6 34 D 927
Grates ROCKING BARS AND DROP PLATE
Ash Pan, Dampers FRONT AND BACK

THROTTLE TO BE OPERATED THROUGH SIDE OF DOME
Throttle BALANCE Pos. DOME
Dry pipe ~~CAST IRON OR STEEL~~

Superheater NONE

Smokebox extension WITH Cleaning hole and cap LEFT SIDE
Spark arrester or hopper WITH
Netting and deflect. plates WITH

Exhaust nozzles DOUBLE, HIGH.

Stack STRAIGHT Dia. 18" Hole in S. B., dia. 22"

Safety Valves (NOT SPEC) TWO COALE 3" Set to 180 POUNDS
Safety valves NONE with relief lever
Whistle CHIME

Steam Gauge ONE IRON 7" MAKER: ASHCROFT (NOT SPEC)
Steam gauge stand IRON **Clock** NONE
GAUGE COCKS TO BE LYNON AND EVANS
Water Gauge ONE JERGUSON **Cab Lamps** TO BURN OIL
Gauge Cocks THREE BACK Surface valve NONE
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve TO HAVE separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock ONE EVERLASTING Pos: FRONT
Cleaning Plugs
Firebox CORNERS DIAGONAL, SIDES AND BACK
Crown, ONE EACH SIDE AND THREE BACK
Waist, ONE UNDER FRONT
Front tube sheet, ONE Fusible plug ONE

Pump NONE Pos. ---
Top chamb. --- Bottom chamb. ---
Feed Cock --- Feed pipes ---
Checks --- Check pipes ---

Injectors (spec) TWO SELLERS, CLASS "N" LEVER TYPE No. 7½
Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER
Pipes, Check IRON Feed IRON Overflow IRON
Check SELLERS, WITH STOP VALVE Pos. RIGHT AND LEFT

Steam Heat NONE
APPLY A STEAM TURRET IN CAB WITH SMALL VALVES LEADING FROM IT

Cab STEEL

Cab boards WOOD Nosing NONE
Running boards WOOD Nosing NONE
Hand rail IRON Located on TANK AND SMOKEBOX

Back Bumper CAST STEEL

STEPS ON BACK OF FRONT BUMPER
Pilot NONE Pushing shoes CAST IN BUMPER
Front Bumper CAST STEEL Bumper plate WITH
Steps, HANDHOLDS, ETC., TO CONFORM TO I. C. C. REQUIREMENTS
STEPS ACROSS FRONT AND REAR WITH HANDRAILS AND GRABIRONS
F. & B Drawhead, Center above rail 33½"
Coupler M. C. B. AUTO.

Signal fixtures NONE

HEADLIGHT LAMPS TO GO IN FROM SIDE OF HEADLIGHTS
Headlight TWO ROUND CASE 16" Reflector, To burn KEROSENE
Headlight, Nos. on sides WITH H'dl't step WITH
Lamp shelf NONE Nosing ---

Bell 92 POUNDS
Sand Box (Narrow) TWO Diam. 31" Body IRON PAINTED Pipes IRON
Sander LEACH AIR, TRAP A-1 IN EACH BOX, TO SAND FRONT AND REAR

Dome casing IRON PAINTED

Boiler Jacket #22 SOFT STEEL PTD Bands IRON Style 9
Boiler Lagging MAGNESIA SECTIONAL

THE BALDWIN LOCOMOTIVE WORKS
Chas. Powell — April 1917

SPECIFICATION FOR LOCOMOTIVES 6 34 D 955 AND 956

FOR NATIONAL SLAG COMPANY — T5

Frames CAST STEEL Braces SOLID

Cylinders, Diam. 20" Stroke 26"
St'm ports, Length 16" Width 1¼" Bridges 1"
Exh. ports, Length 16" Width 2½" Valve lead 3/32"
Valve travel 5½" Steam lap ¾" Exhaust clearance ---
Eccentric crank throw 5" By-pass valve NONE
S. P. Lubr. (SPEC) DETROIT TRIPLE #22 BULLS EYE
Cyl'r heads CAST IRON: LUBR. PIPES OF IRON UNDER JACKET
Cyl'r casings IRON PAINTED Head covers STEEL PAINTED
St'm chest casings IRON PAINTED Covers STEEL PAINTED
St'm chest valves RICHARDSON BALANCED, WITH VACUUM VALVES
Met. pkg (NOT SPEC) (PISTON RODS / VALVE STEMS) UNITED STATES, DUPLICATE PACKING CASINGS

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD
Guides STEEL Oil cups NEEDLE
Crossheads CAST STEEL
Wrist Pins STEEL Rod cups GREASE CUPS, FORGED SOLID
PARALLEL RODS TO HAVE SOLID ENDS
STUB BOLTS TO BE DRIVEN UP FROM THE BOTTOM
Valve Motion STEPHENSON
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.
DRIVING WHEELS, MAIN ONLY WITH HUB LINERS OF BRONZE
Drivers, O. S. Diam. 50" Cen. diam. 42"
CENTERS, MAIN CAST STEEL, OTHERS CAST IRON
Tires STEEL Held by SHRINKAGE AND SHOULDER
Tires, Flanged, Pos. FRONT AND BACK Size 4" x 5½"
Tires, Plain, Pos. MIDDLE Size 4" x 6½"
Lateral play between driving boxes and wheel hubs = 1/16" TOTAL
Driving Boxes STEELED CAST IRON
Journals, Diam. 9" Length 12"

Springs. Make B. L. W.

Front Engine Truck NONE Wheeled ---
To swing --- each side of cen., Cen. pin liners ---
Journals, Diam. --- Length --- Boxes ---
Wheels, Diam. --- Tread --- Kind ---
Tires --- Cen. diam. --- Size ---
Tires held by ---

Back Engine Truck NONE Wheeled ---
To swing --- each side of cen., Cen. pin liners ---
Journals, Diam. --- Length --- Boxes ---
Wheels, Diam. --- Tread --- Kind ---
Tires --- Cen. diam. --- Size ---
Tires held by ---

Brake, position ON ALL DRIVING WHEELS (NO TENDER)
Operating Parts: Engine, Sch. No. 6 ET WEST'G. COMB. AUTO. AND STRAIGHT AIR; Eng. Tr'k, sch. ---
Foundation Parts: Drivers, sch. VM-3, AMERICAN OUTSIDE EQUALIZED; Eng. Tr'k, sch. ---
Air pump ONE 9½" Pos. LEFT SIDE, ON SMOKEBOX
Train connections FRONT AND BACK
Train signal, sch. ----
AIR PUMP EXHAUST TO BE PIPED INTO CYLINDER SADDLE
AIR PUMP INTAKE CONNECTION TO BE PROTECTED FROM STEAM FROM STEAM CHEST RELIEF VALVES
DRIVING BRAKE SHOES OF CAST STEEL.
Air Reservoirs to have a hydrostatic test of 210 pounds.

TENDER, NONE

TANK 2500 GALLONS, BILL 4350
TANK, SADDLE OVER TOP OF BOILER
TANK VALVE TO BE ARRANGED TO ALLOW CLEANING WITHOUT DRAINING TANK.

COAL BOX WITH A CAPACITY OF 3000 POUNDS, LOCATED ON REAR EXTENSION OF ENGINE FRAME BACK OF CAB. CENTER OF COAL BOX TO BE CUT OUT FOR CONVENIENCE IN CLEANING FIRE.
APPLY SAFETY BARS ACROSS REAR OF SPACE OF COAL BOX.

LIST OF TOOLS, SCH. 29
PHOTO SCH. NONE INSPECTION B. L. W. (EXCEPT SEE ★ BELOW)
TO BE WEIGHED YES MATERIAL SPECINS B. L. W.
CERTIFICATE OF BOILER TEST THREE COPIES OF B.L.W. FORM 1036.
JUNIOR LAWS TO 12-11-16 SHIPMENT ON OWN WHEELS UNDER STEAM

BRASS SHOP FINISH, No. 1
MACHINE SHOP FINISH D-1/5

PATENT PLATES: THROTTLE, PATENTED JAN. 23, 1900 (CAST ON); FEED PIPE STRAINER, PATENTED SEPT. 1, 1903 (CAST ON)

PROPERTY PLATES, NONE

PAINTING:- ENGINE, STYLE 220, OLIVE GREEN AND ALUMINUM
PAINTING:- TENDER, STYLE -----

MARK ON FRONT AND BACK OF FRONT AND BACK BUMPERS, NEAR EACH END: SAFETY FIRST
MARK ON TANK SIDES, NATIONAL SLAG COMPANY

No. Pos.	ROAD NO.	NAME, ~~NONE~~ ON CAB SIDES.
F. No. PLATE	# 3	~~BRITAIN FERRY FOR 955~~ 5/4/17
F. SAND BOX	# 5	AMERICA FOR 955
~~CAB SIDES~~	3	BRITAIN FERRY FOR 956.

NOTIFY JOHN M. BUCKLAND, #28 N. 16TH ST., ALLENTOWN, PA.,
★ TWO DAYS BEFORE ENGINE IS READY TO LEAVE SO HE CAN HAVE INSPECTOR HERE.

THE BALDWIN LOCOMOTIVE WORKS Dup. 4 30 C 54, with same extras, except as otherwise specified.

Memorandum Spec'n 17007

SPECIFICATION FOR LOCOMOTIVES 4 30 C 58

FOR * ~~The Baldwin Locomotive Works, Eddystone Plant~~

Gen. as Photo. 1665

Engine Drawing No. 4

1-11-17

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 7' 6" Driving 7' 6" Total 7' 6"
Total wheelbase, eng. and tend. { Actual ---- / Limited to ----

Curves ----

Limits, Height ---- Width ----
Weight approximate on working order. Total 103,000 pounds
On F. tr'k ---- lbs. Drivers 103,000 lbs. B. tr'k ---- lbs.

Tractive power 25800 lbs. Ratio of adhesion 4
Work'g St'm Pres. 180 lbs. Service Switching
Fuel Soft Coal

Front tube sheet ½" thick
Boiler Steel Thick ⅝" Bill 7648
Boiler, Diam. 56" Plan Straight Top.
Boiler st'm pres. 180 lbs. Tested to { 200 lbs. steam pres. / 240 lbs. water pres.
with factor of safety of 4.5
Longitud. seams Butt jointed, double covering strips.

Dome, diam. 29" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 55-15 1/16" Width 42⅛" Depth F. 56⅜" B. 53⅜"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diam.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Single Riveted
Water space stays 1" diam. with 3/16" hole 1¼" deep from O.S.

Radial stays 1⅛" Sling stays front { Two rows of B.L.W. Expansion stays.
Button heads below crown on six central rows
Crown bars None Placed ---- above crown
Crown bolts ----

Flues None
Tubes #12 W. G. Charcoal Iron or Steel
Tube ends Swaged for copper ferrules, fire box ends.
Number 200 Diam. 2" Length 11' 0"

Heating Flues None Combus. Chamb. None Total 1224.3 sq. ft.
Surface Tubes 1143.1 sq. ft. Fire Box 81.2 sq. ft. Fire Brick Tubes ----
Grate area 16.3 sq. ft. Ratio to Heating Surface 1 : 75
Superheater ----

Fire Brick on studs

Grates Rocking bars and drop plate
Ash Pan, Dampers Front and back

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Smokebox extension With Cleaning hole and cap L.S. only
Spark ~~ejector or~~ hopper With
Netting and deflect. plates With

Exhaust nozzles Double high.

Stack Straight Dia. 15" Hole in S. B. dia. 16"

Safety Valves Two Consolidated 2½" (not spec)
Safety valves None with relief lever, Set to 180 pounds
Whistle B. L. W. plain

Steam Gauge One Iron 7" MAKER:- Ashcroft (not spec)
Steam gauge stand Iron **Clock** None

Water Gauge One B.L.W. (Ironclad) **Cab Lamps** to burn oil
Gauge Cocks Three Back Surface valve None
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve, to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One B.L.W. POS:- Front
Cleaning Plugs
Firebox Corners, sides and back
Crown, Three back
Waist, One under front
Front tube sheet, One Fusible plug One

Pump None Pos. ----
Top chamb. ---- Bottom chamb. ----
Feed Cock ---- Feed pipes ----
Checks ---- Check pipes ----
The injector on back head to be on R.S. 20" from cen. of boiler to cen. of feed pipe and 2½" from cen. of Inj. to top of boiler
Injectors Two Sellers (not spec) No. 8½
Injectors, Pos. on back head and on L.S. Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B.L.W. - with line checks Pos. Right and Left

Steam Heat None

CAB Wood
Coal box located on rear extension of engine frame back of cab, on right side only. Hole 12" diam. in back of fuel box on line with centre of fire door, so flues can be cleaned.

Cab boards Wood Nosing None
Running boards Wood Nosing None
Hand rail Iron Located on tank

Back Bumper Oak
Steps at front and back to be in two pieces with opening in centre to clear pilot of other locos. when coupled together.
Pilot None Pushing shoes Front and Back
3/27/17 ~~FRONT~~ **Bumper** Oak Bumper plate None
Steps across front and rear with hand rails
Steps, handholds etc. to conform to I.C.C. requirements.
F & C
~~Front~~ **Drawhead,** Center above rail 33½"
Coupler M.C.B. Automatic, pocket type.

Signal fixtures None

Headlight Two (to use stock) Round Case 16" Reflector, To burn Kerosene
Headlight, Nos. on sides With H'dl't step With
Lamp shelf None Nosing ----

Bell 85 pounds
Sand Box Two Diam. 23" Body Iron pinted Pipes Iron
Sander (not spec) Leach Air, Trap A-1 in each box to sand front and rear.

Dome casing Iron painted

Boiler Jacket #22 Soft Steel Ptd Bands Iron Style 9
Boiler Lagging B.L.W. plastic magnesia (From Stock)

THE BALDWIN LOCOMOTIVE WORKS
J. E. Kernick
SPECIFICATION FOR LOCOMOTIVES 4 30 C 58
FOR * ~~The Baldwin Locomotive Works, Eddystone Plant~~

77

Frames Cast Steel Braces Solid

Cylinders, Diam. 18" Stroke 24"
St'm ports, Length 16" Width 1½" Bridges 1"
Exh. ports, Length 16" Width 2½" Valve lead 3/32"
Valve travel 5½" Steam lap ¾" Exhaust clearance ----
Eccentric ~~crank~~ throw 5" By-pass valve None
S. P. Lubr. (not spec) Michigan Triple Bulls Eye, Three pint capacity.
Cyl'r heads Cast Iron. Lubr. pipes of iron under jacket.
Cyl'r casings Iron painted Head covers Steel painted
St'm chest casings Iron painted Covers Steel pianted
St'm chest valves Richardson Balanced, with vacuum valves.
Met. pkg { PISTON RODS / VALVE STEMS } U. S. (not spec)

Pistons Cast Iron rings sprung into solid head.
Guides Steel Oil cups Needle
Crossheads Cast Steel
Wrist Pins Steel Rod cups Plunger
Parallel rods to have solid ends.

Valve Motion Stephenson
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 46" Cen. diam. 40", Centres Cast Iron

Tires Steel Held by Shrinkage and Shoulder
Tires, Flanged, Pos. All Size 3" x 5½"
Tires, Plain, Pos. ---- Size ----
Lateral play between driving boxes and wheel hubs = 1/16" total
Driving Boxes Steeled Cast Iron
Journals, Diam. 8½" Length 10"

Springs. Make B. L. W.

Front Engine Truck None Wheeled ----
To swing --- each side of cen., Cen. pin liners ----
Journals, Diam. --- Length --- Boxes ---
Wheels, Diam. ---- Tread --- Kind ----
Tires ---- Cen. diam: ---- Size
Tires held by ----

Back Engine Truck None Wheeled ----
To swing ---- each side of cen., Cen. pin liners ----
Journals, Diam. --- Length ---- Boxes ----
Wheels, Diam. ---- Tread ----Kind ----
Tires ---- Cen. diam. ---- Size ----
Tires held by ----

Brake, position On all driving wheels. (No Tender)
Operating Parts { Engine, Sch. #6 ET West'g Combined Auto. and Straight air. / Eng. Tr'k, sch. ----
Foundation Parts { Drivers, sch. WY-2 American O.S. Equalized / Eng. Tr'k, sch. ----
Air pump One 9½" Pos. Left Side on smoke box
Train connections Front and Back
Train signal, sch. None
Air reservoirs to have hydrostatic test of 210 lbs.

Tender None Wheeled. Drawing No. ----
Weight, with fuel and water. about ----

Tank 1500 Gallons, Bill 4125
Saddle tank located over top of boiler

Tool Boxes ----

Frame ----

Front Drawbar height ----
Pilot ---- Pushing shoes ----
Back drawhead, center above rail ----
Coupler ----

Steps ----

Trucks ----

Springs ----
Journals, Diam. ---- Length ----
Wheels, Diam. ---- Tread ---- Kind ----
Tires ---- Cen. diam. ---- Size
Tires held by ----
Safety chains ----

Brake Position ----
Brake sch. ----

* { Loco. sold to The United Gas Improvement Co. Repainted and Re-Lettered. - Road No. 8 - See Extra Order No. 27-1929.

List of tools, sch. 29
Photo sch. None Inspection B. L. W.
To be weighed No Material specs B. L. W.
Certificate of boiler test Three copies of B.L.W. form 1036
Junior laws to 1-12-17 Shipment On own wheels

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. Patents None

Property plates None

Painting: -Engine, style 220 Olive Green and Aluminum
Painting: -Tender, style -------

* Mark on tank sides, ~~THE BALDWIN LOCOMOTIVE WORKS~~

Road Nos. Pos. F. No. Plate Dome and Back of fuel box, * Road Nos. 11 Name None

THE BALDWIN LOCOMOTIVE WORKS Dup. 6-38 D 67 WITH SAME EXTRAS EXCEPT WHERE OTHERWISE SPECIFIED. (see sup 20) Class

Memorandum Spec'n 17054

SPECIFICATION FOR LOCOMOTIVES 6 38 D 77 & 78 Gen. as PHOTO 4352

FOR THE BALDWIN LOCOMOTIVE WORKS (EDDYSTONE PLANT) **Engine Drawing No.** 19

B. 3-14-17

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"
Total wheelbase, eng. and tend. (Actual 43' 7" (Limited to ——

Curves 200 FEET RADIUS

Limits, Height 14' 2" Width -----
Weight (approximate) in working order, Total 160,000 POUNDS
On F. tr'k ----- lbs.. Drivers 160,000 lbs., B. tr'k ----- lbs.

Tractive power 37,750 lbs., Ratio of adhesion 4.25
Work'g St'm Pres. 180 lbs., Service SWITCHING
Fuel BITUMINOUS COAL

FRONT TUBE SHEET ½" THICK

Boiler STEEL Thick 13/16" Bill ~~9240~~ 8050
Boiler, Diam. 74" Plan STRAIGHT TOP
Boiler st'm pres. 180 lbs., Tested to (200 lbs. steam pres. (240 lbs. water pres.
WITH FACTOR OF SAFETY OF 1.7
Long'tud. seams BUTT JOINTED, DOUBLE COVERING STRIPS

Dome, diam. 33" Pos. CENTRAL
DOME TO BE LARGE FOR INSPECTION PURPOSES.

Firebox STEEL Combustion chamb. NONE
Firebox, length 96½" Width 39" Depth F. 71 ¾" B. 69¼"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back ⅜"
Firedoor opening 16" DIAM.
Water space, Front 4" Sides 4" Back 4"
Water space, Frame DOUBLE Riveted
Water space stays ⅞" DIAM. WITH 3 15/16" HOLE 1¼" DEEP FROM O.S.

Radial stays 1" DIAM. Sling stays front (THREE ROWS OF B.L.W. EXPANSION STAYS.
Button heads below crown on SIX central rows
Crown bars NONE Placed ---- above crown
Crown bolts ----

Flues NONE
Tubes #12 W.G. CHARCOAL IRON
Tube ends SWAGED FOR COPPER FERRULES, FIREBOX ENDS
Number 330 Diam. 2" Length 11'0"
TUBES TO HAVE ¾" SPACES

Heating Surface Flues NONE Combus. Chamb. NONE Total 2046 sq ft
Tubes 1986 sq ft Fire Box 160 sq ft Fire Brick Tubes ----
Grate area 25 sq ft Ratio to Heating Surface 1 : 78.7
Superheater --------

Fire Brick ARCH NONE

Grates ROCKING BARS WITH DROP PLATE
Ash Pan, Dampers NONE

Throttle BALANCE Pos. DOME
Dry pipe STEEL

Superheater NONE

Smokebox extension WITH Cleaning hole and cap NONE
Spark ejector or hopper NONE
Netting and deflect. plates WITH

Exhaust nozzles DOUBLE HIGH

Stack STRAIGHT Dia. 15" Hole in S. B., dia. 18"

Safety Valves THREE CONSOLIDATED 3" ONE MUFFLED. (NOT SPEC)
Safety valves NONE with relief lever, Set to (180 LBS. MUFFLED (183 LBS. OPEN
Whistle B.L.W. CHIME

Steam Gauge ONE IRON 7" BAKER ASHCROFT (NOT SPEC)
Steam gauge stand IRON **Clock** NONE

Water Gauge ONE B.L.W. (IRONCLAD) **Cab Lamps** TO BURN OIL
Gauge Cocks THREE BACK Surface valve NONE
Lowest gauge cock 4" above highest part of crown
Lubricator steam valve TO HAVE separate dry pipe to dome
Blower Valve B.L.W.

Blow off Cock ONE CRANE 2" (TO USE STOCK) POS: FRONT.
Cleaning Plugs
Firebox CORNERS DIAGONAL, AND SIDES.
Crown, TWO EACH SIDE AND ONE BACK.
Waist, TWO UNDER: ONE FRONT AND ONE BACK.
Front tube sheet, NONE Fusible plug ONE

Pump NONE Pos. -----
Top chamb. ---- Bottom chamb. ----
Feed Cock ---- Feed pipes -----
Checks ----- Check pipes -----

Injectors (NOT SPEC) TWO SELLERS, CLASS "N" No. 9½
Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER
Pipes, Check COPPER Feed IRON Overflow IRON
Check SELLERS Pos. RIGHT AND LEFT

Steam Heat NONE

Cab STEEL (SEE SUP. 6) VENTILATOR IN CAB ROOF.

Cab boards STEEL PLATE Nosing T-IRON
Running boards STEEL PLATE Nosing T-IRON
Hand rail IRON Located on BOILER

Back Bumper BAR STEEL Back drawbar height 37"

Pilot NONE Pushing shoes CAST IN BUMPER
Front Bumper CAST STEEL Bumper plate NONE
Steps, HAND HOLDS, ETC. TO CONFORM TO I.C.C. REQUIREMENTS.

Front Drawhead, Center above rail 34½"
Coupler SHARON M.C.B. AUTOMATIC

Signal fixtures NONE

Headlight TWO ROUND CASE 16" Reflector, To burn KEROSENE
Headlight, Nos. on sides WITH H'dl't step WITH
Lamp shelf NONE Nosing ----

Bell 92 POUNDS GOLLMAR BELL RINGER
Sand Box TWO Diam. 28" Body IRON PTD. Pipes IRON
Sander (NOT SPEC) LEACH AIR TRAP A-1 IN EACH BOX TO SAND FRONT AND BACK

Dome casing IRON PTD.

Boiler Jacket STEEL PTD. Bands IRON Style 9 AND 14
Boiler Lagging (NOT SPEC) MAGNESIA SECTIONAL
BACK HEAD OF BOILER TO BE LAGGED AND JACKETED

THE BALDWIN LOCOMOTIVE WORKS
E.N. Kalbach

SPECIFICATION FOR LOCOMOTIVES 6 38 D 77 & 78

FOR THE BALDWIN LOCOMOTIVE WORKS (EDDYSTONE PLANT)

Frames CAST STEEL Braces SOLID

Cylinders, Diam. 22" Stroke 26"
St'm ports, Length 19" Width 1 3/8" Bridges 1⅛"
Exh. ports, Length 19" Width 2 3/8" Valve lead ¼"
Valve travel 5¼" Steam lap ¾" Exhaust clearance -----
Eccentric crank throw 12-7/32" By-pass valve NONE
S.F. Lubr. (per spec) DETROIT TRIPLE #22 BULLS EYE
Cyl'r heads CAST IRON; LUBR. PIPES OF COPPER UNDER JACKET
Cyl'r casings IRON PTD. Head covers STEEL PAINTED
St'm chest casings IRON PTD. Covers STEEL PAINTED
St'm chest valves RICHARDSON BALANCED, WITH VACUUM VALVES.
Met. pkg (PISTON RODS / VALVE STEMS) U.S. KING TYPE (NOT SPEC)

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD
Guides TWO BAR TYPE, STEEL Oil cups NEEDLE
Crossheads ALLIGATOR TYPE, CAST STEEL
Wrist Pins STEEL Rod cups PLUNGER, FOR ALL RODS.
PARALLEL RODS TO HAVE SOLID ENDS.

Valve Motion WALSCHAERTS
Links, sliding blocks, pins, lifting links and eccentric rods [illegible] to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings (SEE SUP 16-19-20)

Drivers, O. S. Diam. 51" Cen. diam. 44" CENTRED CAST STEEL

Tires STEEL Held by SHRINKAGE AND SHOULDER
Tires, Flanged, Pos. FRONT AND BACK Size 3½" X 5½"
Tires, Plain, Pos. MIDDLE Size 3½" X 6½"
Lateral play between driving boxes and wheel hubs = 1/16" TOTAL
Driving Boxes CAST STEEL
Journals, Diam. 9" Length 12"

Springs. Make STANDARD STEEL WORKS

Front Engine Truck NONE Wheeled -----
To swing ---- each side of cen., Cen. pin liners ----
Journals, Diam. --- Length ---- Boxes ----
Wheels, Diam. ----- Tread ----Kind ----
Tires ------ Cen. diam. ---- Size ---
Tires held by ------

Back Engine Truck NONE Wheeled ----
To swing ----each side of cen., Cen. pin liners ----
Journals, Diam. ---- Length --- Boxes ----
Wheels, Diam. ---- Tread --- Kind -----
Tires ------ Cen. diam. --- Size ----
Tires held by ------

Brake, position ON ALL DRIVING AND TENDER WHEELS
Operating Parts: Engine, Sch. AI & SMA WEST'G. AUTO. AND STRAIGHT AIR.
Eng. Tr'k, sch. ----
Foundation Parts: Drivers, sch. WM-3 AND BC, AMERICAN D.S. EQUALIZED
Eng. Tr'k, sch. ------
Air pump TWO 9½" RIGHT AND LEFT POS:- BOTH LEFT SIDE.
Train connections FRONT AND BACK
Train signal, sch. NONE
AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS

Tender EIGHT Wheeled. Drawing No. 435
Weight, with fuel and water, about 90,000 LBS.

Tank 4500 Gallons, Bill 4385
TANK "U" SHAPE, SLOPING BACK.
COAL GATES OF STEEL. FUEL CAPACITY 6 TONS.
Tool Boxes OF STEEL BUILT INTO LEGS OF TANK.

Frame STEEL 10" CHANNELS
FRONT AND BACK BUMPERS TO HAVE ¾" PLATE IN BACK OF SAME
Front Drawbar height 33"
Pilot NONE Pushing shoes AT REAR.
Back drawhead, center above rail 34½"
Coupler SHARON M.C.B. AUTO. WITH 12¼ HEAD AND WITH WESTINGHOUSE FRICTION DRAFT GEAR.

Steps, HAND HOLDS, ETC. TO CONFORM TO I.C.C. REQUIREMENTS.

Trucks ARCH BAR TYPE WITH CAST STEEL BOLSTER.
TRUCK SPRINGS PLANK TO BE OF CHANNEL IRON.
Springs ELLIPTIC. B.L.W. MAKE.
Journals, Diam. 5" Length 9" JOURNAL BEARINGS, B.L.W.
Wheels, Diam. 33" Tread 4¼" Kind STANDARD ROLLED STEEL
Tires NONE Cen. diam. ---- Size ----
Tires held by ------ WHEEL RIMS 2½" THICK
Safety chains SINGLE

Brake Position ON ALL WHEELS
Brake sch. FL-1212 & SNB WEST'G. AUTO AND STRAIGHT AIR.

List of tools, sch. 29
Photo sch. NONE Inspection B.L.W.
To be weighed NO Material specifns B.L.W.
Certificate of boiler test THREE COPIES OF B.L.W. FORM 1036.
Junior laws to 3-17-17 Shipment ON OWN WHEELS

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W.
Patents FEED PIPE STRAINER, PATENTED SEPT. 1, 1903 (CAST ON)

Property plates NONE

Painting: Engine, style 291 OLIVE GREEN AND ALUMINUM
Painting:—Tender, style 291 OLIVE GREEN AND ALUMINUM
LETTERING, ETC. TO BE SIMILAR TO 4 30 C 58
Mark on TANK SIDES THE BALDWIN LOCOMOTIVE WORKS

Road Nos. Pos.	Road Nos.	Name NONE
F. NO. PLATE	12	
CAB SIDES	13	
BACK OF TANK		

SPECIFICATION FOR LOCOMOTIVES 6 38 D 77 & 78
FOR THE BALDWIN LOCOMOTIVE WORKS (EDDYSTONE PLANT)

1 FLEXIBLE STAYBOLTS TO BE AMERICAN OF EWALD IRON 15/16" DIAM. ABOUT 400 IN BREAKING ZONE.
BOTTOM ROW OF STAYBOLTS IN WATER LEG AND RIVETS FOR MUD RING TO COME ABOVE FRAME AND BE ARRANGED SO THAT BOILER MAY BE PATCHED READILY AT THIS POINT.

2 ASH PAN TO BE DUMPING TYPE WITH CLEANING DOORS IN BOTTOM OF PAN. DOORS TO BE OPERATED FROM THE SIDE OF LOCOMOTIVES.

3 FRONT END ARRANGEMENT TO BE M.M. Standard SELF CLEANING TYPE.

4 ONE PLUG EACH SIDE IN WAIST, BACK OF SAND BOX AND JUST ABOVE THE LONGITUDINAL SEAMS; AND ONE PLUG EACH SIDE OF FIRE DOOR ABOUT 5" ABOVE RUNNING BOARD.

5 INJECTOR TO BE SELF ACTING TYPE FOR HOT WATER AND TO BE LOCATED AS LOW AS POSSIBLE.

6 CAB TOOL BOXES AND CAB SEAT BOXES TO BE MADE OF STEEL.

7 RUNNING BOARDS TO EXTEND UP TO STEAM CHESTS.
BRACKET SUPPORT FOR RUNNING BOARD ON FIRE BOX, AND NOT TO BE ATTACHED TO BOILER WITH FOOT TURNED UP.

8 STEP TO BE PROVIDED IN FRONT OF ENGINE WITH BRACKETS OF STEEL, SUPPORTING A STEEL PLATE ON WHICH IS BOLTED AN OAK PLANK.
ADDITIONAL STEPS ON BACK OF FRONT BUMPER BEAM.

9 ONE STEP ON RIGHT AND TWO STEPS ON LEFT SIDE OF SMOKE BOX.

10 ECONOMY DEVICES CORPORATION CAST STEEL (DOUBLE SPRING) RADIAL BUFFER TO BE APPLIED BETWEEN ENGINE AND TENDER.

11 TOP AND SIDES OF FIREBOX INSIDE OF CAB TO BE LAGGED AND JACKETED.

12 FRAMES TO BE THOROUGHLY ANNEALED AND TO HAVE DOUBLE FORWARD SECTION. FRAMES TO HAVE GOOD CROSS BRACES.

13 PEDESTAL WEDGES AND GIBS OF CAST IRON.

14 CYLINDERS TO BE BUSHED.

15 CROSSHEADS TO HAVE SIDE PLATES.
CROSSHEAD GIBS OF WROT IRON, BABBITTED.

16 MAIN ROD BRASSES AND SIDE ROD BUSHINGS TO BE DAMASCUS NICKLE BRONZE.

17 WRIST PINS TO BE RIVETED OVER.

18 THE BLIND TIRES ON MIDDLE WHEELS TO BE AS WIDE AS PRACTICABLE.

19 DRIVING WHEELS TO HAVE HUB LINERS OF DAMASCUS NICKLE BRONZE.

20 DRIVING BOXES TO HAVE HEAVY DAMASCUS BRONZE BEARINGS WITH SUITABLE OIL GROOVES.

21 MAIN RESERVOIRS TO HAVE DRAIN COCKS.

22 AIR PUMP EXHAUST TO BE PIPED INTO CYLINDER SADDLE.

23 DRIVING BRAKE CYLINDERS TO BE 14" x 10".

26 USE AS MANY PARTS AS POSSIBLE CONFORMING TO THOSE ON OTHER B.L.W. SHIFTING LOCOS., SO AS TO MINIMIZE THE AMOUNT OF STOCK TO BE CARRIED.

TENDER.

40 STEPS TO BE PROVIDED AT REAR OF TENDER WITH BRACKETS OF STEEL, SUPPORTING A STEEL PLATE ON WHICH IS BOLTED AN OAK PLANK.
SIDE STEPS TO BE PROVIDED AT REAR OF TENDER.
HAND RAIL ON TANK, ONLY 26" HIGH.

THE BALDWIN LOCOMOTIVE WORKS Dup. 6 32 D 778, with same extras except as otherwise specified.
Memorandum Spec'n 11167
SPECIFICATION FOR LOCOMOTIVES 6 32 D 1095
FOR Standard Steel Works Company
M

10-7-16

Engine Drawing No. 16

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 10' 8" Driving 10' 8" Total 10' 8"
Total wheelbase, eng. and tend. Actual 39' 4½" Limited to 48' 0"

Curves 91 ft. radius. **Grade** 5 %

Limits, Height --- Width ---
Weight (approximate in working order. Total 109,125 pounds
On F. tr'k --- lbs., Drivers 109,125 lbs., B. tr'k --- lbs.

Tractive power 23,520 lbs., Ratio of adhesion 4.65
Work'g St'm Pres. 160 lbs. Service Switching
Fuel Soft Coal

Boiler Steel Thick 9/16" Bill 4113
Boiler, Diam. 58" Plan Straight top
Boiler st'm pres. 160 lbs. Tested to 180 lbs. steam pres. / 214 lbs. water pres.
Longitud. seams Butt jointed, double covering strips.

Dome, diam. 31½" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 74-7/16" Width 34⅜" Depth F. 67" B. 63½"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diameter
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Single Riveted
Water space stays ⅞" diam. with 3/16" hole 1¼" deep from O. S.

Radial stays None Sling stays front None
Button heads below crown on --- central rows
Crown bars ⊥ 6" x 5/16" Placed 3" above crown
Crown bolts 1" diam. with taper fit through crown sheet

Flues ----
Tubes #12 W.G. Iron
Tube ends Swaged for copper ferrules firebox ends
Number 201 Diam. 2" Length 14' 5½"

Heating Surface Flues --- Combus. Chamb. --- Total 1630.6 ☐
Tubes 1513 ☐ Fire Box 117.6 ☐ Fire Brick Tubes ---
Grate area 17.6 ☐ Ratio to Heating Surface 1 : 92.2
Superheater ----

Fire Brick Arch on studs

Grates Rocking bars and drop plate.
Ash Pan, Dampers Front and back

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Smokebox extension With Cleaning hole and cap R. and L.
Spark-ejector hopper With
Netting and deflect. plates With

Exhaust nozzles Double high

Stack Straight Dia. 16" Hole in S. B., dia. 20½"

Safety Valves (not spec) Two Consolidated 3"
Safety valves None with relief lever, Set to 160 and 165 pounds
Whistle B. L. W. Plain

Steam Gauge One Iron 7" Maker: Ashcroft (not spec)
Steam gauge stand Iron **Clock** None

Water Gauge None One B.L.W. (Ironclad) 9/32 ref. **Cab Lamps** to burn oil
Gauge Cocks Three back Surface valve None
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One Crane 2" (From Stock) Pos: Left side
Cleaning Plugs
Firebox Corners, sides, front and back
Crown, Two each side and two back
Waist, One under front
Front tube sheet, Two Fusible plug One

Pump None Pos. ---
Top chamb. --- Bottom chamb. ---
Feed Cock --- Feed pipes ---
Checks --- Check pipes ---

Injectors (not spec) Two Monitor No. 8
Injectors, Pos. Right and left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. Right and left

Steam Heat None
Steam Turret, With

Cab Cypress, with ventilator in roof

Cab boards Wood Nosing Angle iron
Running boards Wood Nosing Angle iron
Hand rail Iron Located on boiler

Back Bumper Bar steel Back drawbar height 35¼"

Pilot None Pushing shoes Front
Front Bumper Oak Bumper plate None
Steps Front
Steps, hand holds etc. to conform to I.C.C requirements. P.S.M.C. 9/24/16
Front Drawhead, Center above rail 33½"
Coupler M. C. B. Auto.

Signal fixtures None

Headlight Two Round Case 18" Reflector, To burn Kerosene
Headlight, Nos. on sides With H'dl't step With
Lamp shelf None Nosing ----

Bell 92 pounds
Sand Box Two Diam. 28" Body Iron painted Pipes Iron
Sander Hand

Dome casing Iron painted

Boiler Jacket #22 Plan. Steel Bands Iron Style 9
Boiler Lagging Magnesia Sectional

THE BALDWIN LOCOMOTIVE WORKS
M Conklin Dec 1916
SPECIFICATION FOR LOCOMOTIVES 6 32 D 1095
FOR Standard Steel Works Company
M

82

Frames Cast steel Braces Solid

Cylinders, Diam. 19" Stroke 24"
St'm ports, Length 16" Width 1¼" Bridges 1"
Exh. ports, Length 16" Width 2½" Valve lead 1/16"
Valve travel 5½" Steam lap ¾" Exhaust clearance ---
Eccentric crank-throw 5½" By-pass valve None
S. F. Lubr. Detroit Tripple 3-C (From stock) (not spec)
Cyl'r heads Cast iron: Lubr. pipes of copper under jacket
Cyl'r casings Iron painted Head covers Steel painted
St'm chest casings Iron painted Covers Steel painted
St'm chest valves Balanced, with vacuum valves
Met. pkg (Piston rods / Valve stems) Holmes (spec)

Pistons Cast iron rings sprung into solid head
Guides Steel Oil cups Needle
Crossheads Cast steel
Wrist Pins Steel Rod cups Needle
Parallel rods to have solid ends

Valve Motion Stephenson
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 50" Cen. diam. 44" Centers cast iron
Driving wheels without hub liners
Tires Standard steel Held by Shrinkage and shoulder
Tires, Flanged, Pos. Front and back Size 3" x 5½"
Tires, Plain, Pos. Middle Size 3" x 7"
Lateral play between driving boxes and wheel hubs = 1/32" total
Driving Boxes Steeled Cast iron
Journals, Diam. 8" Length 9"

Springs. Make Standard Steel Works

Front Engine Truck None Wheeled ---
To swing --- each side of cen., Cen. pin liners ---
Journals, Diam. --- Length --- Boxes ---.
Wheels, Diam. --- Tread --- Kind ---
Tires --- Cen. diam. --- Size ---
Tires held by ---

Back Engine Truck None Wheeled ---
To swing --- each side of cen., Cen. pin liners ---
Journals, Diam. --- Length --- Boxes ---
Wheels, Diam. --- Tread --- Kind ---
Tires --- Cen. diam. --- Size ---
Tires held by ---

Brake, position On all driving and tender wheels
Operating Parts: Engine, Sch. S American Steam; Eng. Tr'k, sch. ---
Foundation Parts: Drivers, sch. UM-2 American O. S. Equalized; Eng. Tr'k, sch. ---
Air pump and Pos. (See * below)
Train connections None
Train signal, sch. None
* Furnish one 9½" air pump on left side with 1" pump governor and one air drum under cab board on left side with air gauge and a 1" cut-out cock located in cab to enable engineer to furnish air pressure to dump cars from engine.

Tender Eight Wheeled, Drawing No. 406
Weight, with fuel and water, about 62,000 pounds

Tank 3,000 Gallons, Bill 4355
Tank "U" shape, sloping back with collar

Tool Boxes Hard wood, Top
Lamp shelf back
Frame Steel 8" channels, with oak bumpers

Front Drawbar height 31½"
Pilot None Pushing shoes at rear
Back drawhead, center above rail 33½"
Coupler M. C. B. Auto.

Steps, back and on sloping back. Handrails back
Steps, hand holds etc. to conform to I.C.C requirements P.S.M.C. 9/24/16
Trucks Wood bolster, Channel bar laid flat.

Springs Elliptic. Standard Steel Works
Journals, Diam. 4½" Length 8" M. C. B. Axle Box, etc.
Wheels, Diam. 33" Tread 2½" Kind ~~Chilled Iron~~ Rolled Steel ~~Cast Iron Plate Centers~~
Tires ~~Steel~~ Cen. diam. ~~28"~~ 29" Size ~~2½" x 5½"~~ 2½" x 5½" 14 7/16
Tires held by ~~Shrinkage and bolts~~ (See ★ below) Wheel Rims 2½" thick.
Safety chains Single

Brake Position On all wheels
Brake sch. T American Steam
Provide for application of air pressure to dump cars.
★ Tender wheels to be Standard Steel Works ~~No. 2~~ wheel.
Wheels and axles to be made to Standard dimensions advocated by the manufacturers of the wheels.
List of tools, sch. 29
Photo sch. None Inspection B. L. W.
To be weighed... Yes Material spec'ns B. L. W.
Certificate of boiler test Three copies of B. L. W. form 1036
Junior laws to 10-6-09 Shipment On own wheels

Brass shop finish, No. 1
Machine shop finish D-106

B. L. W. Patents: Throttle, Patented Jan. 23, 1900 (Cast on); Feed Pipe Strainer, Patented Sep. 1, 1903 (Cast on

Property plates None

Painting:—Engine, style 291, Olive Green and Aluminum
Painting:—Tender, style 291, Olive Green and Aluminum

Mark on tank sides, STANDARD STEEL WORKS COMPANY

Road Nos. Pos. / Road Nos. / Name None
F. No. Plate 9
F. Sand Box
Cab Sides
Back of Tank

11-266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS Dup. of 4 28 C 58-59 WITH SAME EXTRAS EXCEPT AS OTHERWISE SPECIFIED.

Memorandum Spec'n 11201

SPECIFICATION FOR LOCOMOTIVES 4 28 C 64 - 65 Gen. as Neg. print from tracing 20461

FOR THE YOUNGSTOWN SHEET & TUBE CO. Engine Drawing No. 17-

11-7-16

Gauge of Road 3' 0" Play 5" 15

Wheelbase, Rigid 6' 0" Driving 6' 0" Total 6' 0"

Total wheelbase, eng. and tend. { Actual ----- Limited to -----

Curves 60 FT. RADIUS. GRADES 2½ MAXIMUM

Limits, Height 11' 0" Width 7' 4"

Weight (approximate) in working order, Total 109,000 POUNDS

On F. tr'k ----- lbs., Drivers 109,000 lbs., B. tr'k ----- lbs.

Tractive power 21600 lbs., Ratio of adhesion 4.35, TANK EMPTY

Work'g St'm Pres. 185 lbs., Service SWITCHING

Fuel SOFT COAL

1-c FRONT TUBE SHEET ½" THICK

17-a Boiler STEEL Thick ⅝" Bill 7977

Boiler, Diam. 54" Plan STRAIGHT TOP.

Boiler st'm pres. 185 lbs., Tested to { 205 lbs. steam pres. 247 lbs. water pres.

2-f WITH FACTOR OF SAFETY OF 5.6

Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS.

Dome, diam. 29" Pos. FORWARD OF FIRE BOX

Firebox STEEL Combustion chamb. NONE

Firebox, length 46-3/16" Width 49⅜" Depth F. 64⅛" B. 63⅜"

Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"

Firedoor opening 16" DIAMETER

Water space, Front 3½" Sides 3" Back 3"

Water space, Frame SINGLE Riveted

Water space stays 1" DIAMETER (SEE SUP. 21)

Radial stays 1⅛" DIAM. Sling stays front { TWO ROWS OF B.L.W. EXPANSION STAYS.

Button heads below crown on SIX central rows

Crown bars NONE Placed ----- above crown

Crown bolts ----

Tubes 242 W. G. CHARCOAL IRON

Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.

Number 180 Diam. 2" Length 11' 6"

Heating Surface	Flues —	Combus. Chamb. ——	Total 1161 sq
	Tubes 1076 sq	Fire Box 85 sq	Fire Brick Tubes ----

Grate area 15.9 sq Ratio to Heating Surface 1 : 73

Superheater ----

Fire Brick ARCH, NONE

22 Grates ROCKING BARS AND DROP PLATE

Ash Pan, Dampers NONE

Throttle BALANCE Pos. DOME

Dry pipe WROT IRON OR STEEL

Superheater NONE

Smokebox extension WITH Cleaning hole and cap L. S. ONLY

Spark-arrester hopper WITH

Netting and screens plates WITH

Exhaust nozzles DOUBLE - HIGH

Stack STRAIGHT Dia. 16" Hole in S. B., dia. 17½"

(cast iron) Safety Valves TWO CONSOLIDATED 2½"

Safety valves NONE with relief lever, Set to 185 POUNDS

Whistle B. L. W. PLAIN

Steam Gauge ONE IRON 7" MAKER:- ASHCROFT

23 Steam gauge stand IRON Clock NONE

24 Water Gauge ONE B. L. W. 26 Cab Lamps TO BURN OIL

Gauge Cocks THREE - BACK Surface valve NONE

Lowest gauge cock 3½" above highest part of crown

Lubricator steam valve TO HAVE separate dry pipe to dome

Blower Valve B. L. W.

Blow off Cock ONE B. L. W. POS:- LEFT SIDE

Cleaning Plugs ONE PLUG ABOVE FIRE DOOR

Firebox CORNERS DIAGONAL

Crown, ONE EACH SIDE AND TWO BACK

Waist, ONE UNDER FRONT

Front tube sheet, ONE Fusible plug ONE

Pump NONE Pos. -----

Top chamb. ----- Bottom chamb. -----

Feed Cock ----- Feed pipes -----

Checks ----- Check pipes -----

(Gac) Injectors TWO SELLERS, HOT WATER TYPE No. 7½

Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER

Pipes, Check COPPER Feed COPPER Overflow IRON

Check SELLERS, STYLE AS { WITH STOP VALVE Pos. RIGHT AND LEFT

Steam Heat NONE

24 Cab STEEL, LINED WITH WOOD

COAL BOX IN LEFT SIDE OF CAB. FUEL CAPACITY, 700 POUNDS

Cab boards WOOD Nosing ANGLE IRON

27 Running boards CAST IRON Nosing -----

Hand rail IRON Located on CAB

Back Bumper CAST IRON SOLID

Pilot NONE Pushing shoes CAST IN BUMPERS

Front Bumper CAST STEEL Bumper plate NONE

30 Steps ACROSS FRONT AND BACK WITH HAND RAILS

36 F. & B Drawhead, Center above rail 18"

Coupler AS RY. CO'S PRINT, SKETCH OH-35

Signal fixtures NONE

Headlight (SEE SUP. 37) Reflector, To burn KEROSENE

Headlight, Nos. on sides WITH H'd'l't step NONE

Lamp shelf IRON Nosing -----

35 Bell 85 POUNDS COLLMAR STEAM BELL RINGER

39 Sand Box FOUR (See sup. 40) Body SHEET IRON Pipes IRON

40 Sander HAND, TO SAND FRONT AND REAR

Dome casing IRON PAINTED

Boiler Jacket { 22 SOFT STEEL Pto. Bands IRON Style 9 AND 14

Boiler Lagging MAGNESIA SECTIONAL

BACK HEAD OF BOILER TO BE LAGGED AND JACKETED.

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THE BALDWIN LOCOMOTIVE WORKS

H. C. Bair Baldwin Wm. Schlegel

SPECIFICATION FOR LOCOMOTIVES 4 28 C 64 - 65

FOR THE YOUNGSTOWN SHEET & TUBE CO.

Frames CAST STEEL Braces SOLID

Cylinders, Diam. 17" Stroke 20"

Stm ports, Length 16" Width 1¼" Bridges 1"

Exh. ports, Length 16" Width 2½" Valve lead 1/16"

Valve travel 5¼" Steam lap 1" Exhaust clearance -----

Eccentric crank throw 5" By-pass valve -----

L. & P. Cocks DETROIT THREE FEED #22 BULLS EYE. (SEE SUP. 41)

Pstn heads CAST IRON

Cyl. castings IRON PTD. Head covers STEEL PAINTED

Stm chest castings IRON PTD. Covers STEEL PAINTED

Steam chest valves RICHARDSON BALANCED WITH VACUUM VALVES PISTON TYPE

Main pins { PISTON RODS UNITED STATES A (Spec.) 14-1

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD

Cylinder STEEL Oil cups NEEDLE

Crossheads CAST STEEL

Wrist Pins STEEL Rod cups GREASE CUPS

PARALLEL RODS TO HAVE SOLID ENDS

Valve Motion STEPHENSON

Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.

All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

12 Drivers, O. S. Diam. 42" Cen. diam. 36". CENTERS CAST STEEL

DRIVING WHEELS WITHOUT HUB LINERS (SEE SUP. 42)

Tires STEEL Held by SHRINKAGE AND SHOULDER

Tires, Flanged, Pos. ALL Size 3" x 5½"

Tires, Plain, Pos. NONE Size -----

Lateral play between driving boxes and wheel hubs 1/32" TOTAL

Driving Boxes CAST STEEL WITH BRONZE BEARINGS

Journals, Diam. 9" Length 9"

Springs Make B.L.W., STANDARD STEEL WORKS, OR OTHER MAKE

Front Engine Truck NONE Wheeled -----

To swing ----- each side of cen. Cen. pin liners -----

Journals, Diam. ----- Length ----- Boxes -----

Wheels, Diam. ----- Tread ----- Kind -----

Tires ----- Cen. diam. ----- Size -----

Tires held by -----

Back Engine Truck ----- Wheeled -----

To swing ----- each side of cen. Cen. pin liners -----

Journals, Diam. ----- Length ----- Boxes -----

Wheels, Diam. ----- Tread ----- Kind -----

Tires ----- Cen. diam. ----- Size -----

Tires held by -----

Brakes, system, ON ALL DRIVING WHEELS (NO TENDER)

Operating { Engine, sch. 8 AMERICAN STEAM

Parts { Eng. Trk, sch. -----

Foundation { Drivers, sch. WY-2 AMERICAN O.S. EQUALIZED

Parts { Eng. Trk, sch. -----

Train connections ---

Train signal, sch. ----- (Too LATE TO CHANGE)

Brake Shoes CAST IRON WITH STEEL INSERTS.

Tender NONE Wheeled, Drawing No. -----

Weight, with fuel and water, about -----

4-d Tank 1800 Gallons, Bill 4389

SADDLE TANK LOCATED OVER TOP OF BOILER, EXTENDING OVER SMOKE BOX

Tool Boxes -----

Frame -----

Front Drawbar height -----

Pilot Pushing shoes

Back drawhead, center above rail -----

Coupler ----

Steps -----

Trucks -----

Springs -----

Journals, Diam. ----- Length -----

Wheels, Diam. ----- Tread ----- Kind -----

Tires ----- Cen. diam. ----- Size -----

Tires held by -----

Safety chains -----

Brake Position -----

Brake sch. -----

List of tools, sch. 29

Photo sch. NONE Inspection (SEE SUP. 1 to 9-17

To be weighed No Material spec'ns B. L. W.

Certificate of boiler test THREE COPIES OF B. L. W. FORM 1036

Junior laws to 11.7.16 Shipment ON CAR

Brass shop finish, No. 1

Machine shop finish D-165

B. L. W. Patents { THROTTLE, PATENTED JAN. 23, 1900 (CAST ON) FEED PIPE STRAINER, PATENTED SEPT. 1, 1903 (CAST ON)

Property plates NONE

PANEL ON CAB TO HAVE ROUND CORNERS INSTEAD OF SQUARE CORNERS.

Painting:- Engine, style 367 BLACK AND COLOR

Painting:- Tender, style -----

LETTERING, NUMBERING AND STRIPING IN YELLOW PAINT AS CO'S PRINT, SKETCH OH-34 REVISED 11.7.16 (HEREWITH)

Mark on TANK SIDES, THE Y. S. & T. CO.

FRONT NUMBER PLATE WITH 6" FIGURES AS SHOWN ON CO'S PRINT OH-34 I.E., B. L. W. NUMBER PLATE CARD 546

Road Nos. Pos.	Road Nos.	Name NONE
F. Nos. PLATE	55	
CAB SIDES	56	

SPECIFICATION FOR LOCOMOTIVES 4 28 C 64 and 65

FOR The Youngstown Sheet & Tube Co.

1 Boilers built to meet the requirments of the Industrial Commission of Ohio must be designed strictly in accordance with the "Rules formulated by the Industrial Commission of Ohio," and be inspected during construction and upon completion by an authorized Ohio Inspector, such Inspector not to be interested either directly or indirectly with the manufacturer.

2 DESIGN:- The minimum factor of safety shall be five.

3 Longitudinal lap seams shall not be used.

4 Welded Boiler braces shall not be subjected to a fibre stress in excess of 6000 lbs. per sq. in.

5 Stress in staybolts shall not exceed 6500 lbs. per sq. in..(therefore use 1" staybolts for 180 lbs. and over)

6 The maximum allowable stress per square inch net cross sectional area of stud bolts or tap bolts having a diameter of ¾" or larger shall not exceed 6000 lbs.

7 The minimum thickness of butt straps shall be as follows:-

THICKNESS OF SHELL PLATES	MINIMUM THICKNESS OF BUTT STRAPS
½" & 5/16"	½"
⅜"	5/16"
7/16"	⅜"
½" & 9/16"	7/16"
⅝", 11/16" & ¾"	½"
13/16"	9/16"
⅞"	⅝"
15/16"	11/16"
1" & 1⅛"	¾"

The minimum thickness of tube sheets shall be as follows:-

OUTSIDE DIA. OF TUBE SHEET	MINIMUM THICKNESS
42" or less	½"
Over 42" to 54" inclusive	7/16"
" 54" to 72" "	½"
" 72"	9/16"

When a tube sheet is not circular in form (i.e., fire box tube sheet) the least dimension of such sheet shall determine its thickness.

No boiler shall have a continuous longitudinal seam over 12 feet in length.

There shall be not less than six brass washout plugs not smaller than 1½" pipe tap located as follows:

One in front tube sheet below the tubes.

One in back head at or about the line of the crown sheet.

Four in the lower part of the water leg.

An opening in the boiler for a threaded pipe connection 1" in diameter or over shall have not less than the minimum number of threads in such opening as shown in the following table:-

SIZE OF PIPE CONNECTION.	1" & 1½"	1¾" & 2"	2½" to 4"
NO. OF THDS. PER INCH	11½	11½	8
MINIMUM NO. OF THDS. REQUIRED IN OPENING.	4	5	7
MINIMUM THICKNESS OF MATERIAL REQUIRED TO GIVE ABOVE NO. OF THREADS.	⅜"	7/16"	⅝"

If the thickness of the boiler material is not sufficient to give the above number of threads, a liner or flange must be applied.

Each boiler must be provided with a connection ¼ pipe size for attaching inspector's test gauge.

A fusible plug must be applied which projects through the crown at least 1". The plug must be filled with pure tin and the least diameter of the fusible metal must be not less than ½" (Fusible Plug B. L. W. Card #4516).

Feed water shall not discharge into a boiler in close proximity to riveted joints in shell or furnace sheets. Each boiler shall have a feed pipe fitted with a check valve, and also a stop valve or stop cock between the check valve and the boiler, the feed water to discharge below the lowest safe water line.

5 MATERIALS:- Shell,(including top and sides) dome and butt straps (including dome liner), shall be open hearth steel of FIRE BOX quality and shall conform to the specification of the American Society of Mechanical Engineers.

Front tube sheet, back head, and throat sheet may be open hearth FLANGE steel and shall conform to the requirements of the American Society of Mechanical Engineers.

8 Smoke Box steel to conform to B. L. W. Spec'n.

9 Rivets shall be open hearth extra soft steel as specified in paragraphs 15, 17 and 19, Part III, Section 2, of the Boiler Inspection law of Ohio.

10 All boiler plates except the fire box and smoke box plates must be marked by the manufacturer with the heat number, name of manufacturer, brand and lowest tensile strength in the manner and location shown on The B. L. W. Marking Card #6807.
This marking card should be ordered on the card sheet and on the store room sheet for boiler steel and one piece dome.

11 SHOP PRACTICE:- Rivet holes except for attaching stay feet and T-iron to heads shall be drilled full size with plates, butt straps, and heads bolted up in place; or they may be punched out not to exceed ¼" less than full size for plates over 5/16" in thickness, and ⅛" less than full size for plates 5/16" and under, and then drilled or reamed to full size with plates butt straps and heads bolted up in position.
The Tube holes may be drilled full size, or they may be punched not to exceed ⅛" less than full size and then drilled, reamed or finished full size with rotating cutter.

12 Upon completion each boiler shall be stamped with the words

OHIO STANDARD
(serial no. as specified)
BALDWIN

This stamping must be done by the authorized Ohio inspector. The height of the letters and figures shall be 5/16".
The location of the stamping shall be on the back head above plug hole. It must not be covered by lagging or fittings.

13 Extract from letter of the Hartford Steam Boiler Inspection and Insurance Co. dated Jan. 7th, 1916:- "In order for our inspectors to comply with Ohio requirements in making inspections of steam boilers, it is necessary that they make at least three visits to the shop during the work of construction First, to look over the plates to see that they are sound and properly stamped, and if it is the practice of the shop, to first punch the rivet holes, the punching should have been done at this time.
The second trip would be to see the work after it is fitted up and rivet holes reamed or drilled full size preparatory to driving the rivets.
The next trip would be after the boiler is completed for the purpose of examining the completed work and applying the hydrostatic test."

14 When the boiler is tested by hydrostatic pressure, the maximum pressure applied shall not exceed one and one-half times the maximum allowable working pressure.

15 A Data report, on forms furnished by the Boiler Inspection Department of the Ohio Industrial Commission, shall be forwarded by the builder to the chief inspector of such department for each boiler stamped OHIO STD. before the boiler is shipped from the boiler shop.

11-266-67 Photo copied see box

SPECIFICATION FOR LOCOMOTIVES 4 28 C 64 - 65

FOR THE YOUNGSTOWN SHEET & TUBE CO.

15 LENGTH OF LOCOMOTIVE OVER BUMPERS TO BE 24' 0"

16 ALL PARTS LIABLE TO RENEWAL TO BE ACCURATELY MACHINED TO STANDARD TEMPLATES AND GAUGES AND TO BE INTERCHANGEABLE.

17 BOILER TO BE INSPECTED BY AN OUTSIDE INSPECTION CO. AND OHIO CERTIFICATES FURNISHED IN TRIPLICATE. (see Sup. 1 to 9)
INSPECTION BY R. W. HUNT & CO. WHO WILL TEST AND INSPECT AT THE POINT OF MANUFACTURE, BOILER AND FIRE BOX PLATES, TUBES, AXLES, WHEELS ANS SPRINGS.
SEND TO THEM TWO COPIES OF OUR ORDERS ON THE MANUFACTURERS FOR THE MATERIALS MENTIONED.

18 BOILER TO CONFORM TO THE REQUIREMENTS OF THE INDUSTRIAL COMMISSION OF OHIO; AND MUST BE STAMPED ON THE BACK HEAD IN THE PRESENCE OF THE AUTHORIZED INSPECTOR, - THUS
OHIO STD
11 AND 12
BALDWIN

19 CAPACITY OF BOILER WITH WATER AT WORKING LEVEL TO BE 600 GALLONS.

20 CONNECTIONS AT FRONT AND REAR OF FIRE BOX TO CROSS PIECES BETWEEN FRAMES TO BE STRONG. STUD CONNECTIONS ON PREVIOUS LOCOS. WERE NOT SATISFACTORY.

21 STAY BOLTS OF FALLS HOLLOW HOLLOW STAYBOLT IRON, EXCEPT THREE TOP HORIZONTAL ROWS OB STAYBOLTS ON SIDES OF FIRE BOX AND TWO VERTICAL ROWS BOTH ENDS ON SIDES OF FIRE BOX TO BE TATE FLEXIBLE STAYBOLTS.
THREE TOP CROSS ROWS AND TWO VERTICAL ROWS ON EACH SIDE OF BACK BOILER HEAD TO BE TATE FLEXIBLE STAYBOLTS.
ALL STAYBOLTS ABOVE FOURTH ROW FROM LOWEST PART OF SHELL ON THROAT SHEET TO BE TATE FLEXIBLE STAYBOLTS.
TOTAL NUMBER OF TATE FLEXIBLE STAYBOLTS ABOUT 250.
TELL TALE HOLES IN RIGID STAY BOLTS TO BE COUNTERSUNK ON OUTSIDE.

22 SHAKER GRATE LEVER BRACKET TO BE FASTENED TO SOME OTHER PLACE BESIDE BACK OF FIRE BOX;

23 STEAM GAUGE TO BE PLACED ON BACK HEAD OF BOILER

24 WATER GAUGE COCKS AND WATER GLASS COCKS TO BE BONNET TYPE.
WATER GLASS TO HAVE BABCOCK SAFETY WATER GLASS SHIELD.

25 STEAM GAUGE AND WATER GLASS LAMPS, ADAMS & WESTLAKE, REFERENCE #37 AND 38.

26 VENTILATOR TO BE PROVIDED IN TOP OF CAB SAME AS FOR LOCO. 32767, CLASS 6 3¼ D 705.

27 CAB TO BE PROVIDED WITH REAR ENTRANCE (INSTEAD OF SIDE) AS SHOWN ON Co's PRINT, SKETCH OH-35.
ARM REST AND CUSHION SEAT TO BE PROVIDED FOR ENGINEER.

28 ENGINEER'S SEAT TO BE A BOX SEAT 18" LONG AND 17" WIDE AND LID TO BE HINGED AND CUSHIONED FULL LENGTH.

29 RUNNING BOARDS LOCATED UNDERNEATH LEGS OF TANK.

30 STEPS, COUPLERS, HANDHOLDS, ETC. TO CONFORM TO I.C.C. REQUIREMENTS.

36 COUPLINGS:- THE REAR DRAWBAR TO BE CARRIED WELL BACK UNDER THE CAB AND BE SECURELY FASTENED TO THE FRAME, WHEN THE DRAWBARS SWING OVER A STEP OR RUNNING BOARD, THE SPACE COVERED BY THEIR SWING IS TO BE BOXED UP FLUSH WITH EDGE OF THE RUNNING BOARDS TO PROTECT A MAN STANDING THEREON.

37 HEADLIGHTS TO BE 14" ALL STEEL ROUND CASE WITH CLASS "K" INTERIOR, FOR FRONT END, MADE BY THE UNITED STATES HEADLIGHT Co.
DIETZ CHAMPION ALL STEEL LAMP FOR REAR END.

38 OIL CUPS TO BE PROVIDED ON BELL RINGER PIPE INSIDE OF CAB.

39 BELL ROPE GUIDE PULLEYS TO BE PLACED ON TOP OF TANK IN LINE WITH BELL.

40 SAND BOXES TO BE SQUARE, TWO ON EACH SIDE OF ENGINE, ONE FRONT AND ONE BACK OF WHEELS. SAND LEVERS TO BE UPRIGHT AND CONVENIENTLY PLACED FOR USE OF ENGINEER.

41 LUBRICATOR TO HAVE TWO FEEDS PIPED TO THE CYLINDERS AND ONE FEED PIPED TO THE STEAM BRAKE.
LUBRICATOR PIPES OF IRON UNDER JACKET.
LUBRICATOR TO BE ERECTED SO BULLS EYE FACES WINDOW INSTEAD OF BOILER HEAD.

42 DRIVING WHEEL FLANGES TO BE 1" HIGH.

43 DRIVING BOXES TO BE BABBITTED ON HUB FACE.
DRIVING BOX CELLARS ON FRONT DRIVERS TO BE MADE SO AS TO SPONGE SAME WITHOUT REMOVING THEM FROM THE BOX.

44 MATERIAL IN WATER TANK TO BE BRACED.
TANK RIVETS ⅜" DIAMETER, 1,2" PITCH.

45 TANK TO BE PROVIDED WITH MAN HOLE LARGE ENOUGH FOR MAN TO GET IN AND OUT.

46 STEAM CONNECTION TO BE PROVIDED AT EACH END FOR SUPPLYING STEAM FOR LIFTING CYLINDER ON CINDER CAR.

THE BALDWIN LOCOMOTIVE WORKS Dup of 6-38 D 44-45 same extras except where otherwise specified.

Memorandum Spec'n 17034

SPECIFICATION FOR LOCOMOTIVES 6 38 D 71 to 74 Gen. as Photo. 5707

FOR The Youngstown Sheet and Tube Company. **Engine Drawing No.** 12

2-27-17.

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"
Total wheelbase, eng. and tend. { Actual 44' 0" / Limited to -----

Curves -----

Limits, Height ----- Width ----
Weight (approximate) in working order, Total 151000 pounds.
On F. tr'k ------ lbs.. Drivers 151,000 lbs., B. tr'k ----- lbs.

Tractive power 38,510 lbs., Ratio of adhesion 3.9
Work'g St'm Pres. 180 lbs., Service Switching
Fuel Soft Coal

Front tube sheet to be 9/16" thick

1 **Boiler** Steel Thick ¾" Bill 8090
6 Boiler, Diam. 74" Plan Straight Top
7 Boiler st'm pres. 200 lbs., Tested to { 220 lbs. steam pres. / 267 lbs. water pres.
With factor of safety of 5.01
Longitud. seams Butt jointed, double covering strips.

10 **Dome,** diam. 31½" Pos. Central

11 **Firebox** Steel Combustion chamb. None
Firebox, length 120⅛" Width 42" Depth F. 68 13/16 B. 66 13/16
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diam.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Double Riveted
2 3 Water space stays 1" diam. with 3/16" hole 1¼" deep from O.S.

Radial stays 1" diam. Sling stays front { Three rows of B.L.W. Expansion Stays.
Button heads below crown on Ten central rows
Crown bars None Placed --- above crown
Crown bolts ------
#11 for 74 only A/C time.

Flues
Tubes #12 Y.G. Charcoal Iron
Tube ends Swaged for copper ferrules, fire box ends.
Number 335 Diam. 2" Length 10' 6"

Heating Surface Flues ——— Combus. Chamb. —— Total 2012⁰
Tubes 1827⁰ Fire Box 185⁰ Fire Brick Tubes ----
Grate area 35⁰ Ratio to Heating Surface 1 : 57.5
Superheater ---

Fire Brick Arch none

Grates Rocking Bar and Drop plate (See sup. 24)
Ash Pan, Dampers Front and Back (See sup. 25)

Throttle Balance (Sup. 26) Pos. Dome
Dry pipe ~~Inside Iron or~~ Steel

Superheater None

Smokebox extension With Cleaning hole and cap L. S. only
Spark ~~ejector or~~ hopper With
Netting and deflect. plates With

Exhaust nozzles Double high

Stack Straight Dia. 16" Hole in S. B., dia. 17"
Stack to have steel base

Safety Valves Two Consolidated 3" (Spec)
Safety valves None with relief lever, Set to 180 pounds.
Whistle B.L.W. plain

Steam Gauge Two Iron 7" Maker:- Crosby (Spec)
Steam gauge stand Iron **Clock** None

Water Gauge One (See sup. 28) **Cab Lamps** to burn oil
18 **Gauge Cocks** Three - Back Surface valve with on line with second gauge cock
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B.L.W.

Blow off Cock One B.L.W. Pos: Left side of firebox.
Cleaning Plugs One plug above fire door.
29 Firebox Corners diagonal, (See sup. 29)
Crown. Three each side and three back
Waist, Two under, one near front and one at throat.
Front tube sheet, One Fusible plug One

Pump None Pos. -----
Top chamb. ------ Bottom chamb. ----
Feed Cock ----- Feed pipes -----
Checks ----- Check pipes ----

Injectors to be hot water type.
Injectors Two Sellers Class "K" (Spec) No. 10½
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Copper Feed Iron Overflow Iron
Check Sellers combined Main, check and stop valve Pos: R & L.
Checks to have flange connection to boiler.
Steam Heat None

18 30 **Cab** Steel, lined with wood. Ventilator in cab roof

Cab boards Iron (See sup. 46) Nosing T-Iron
Running boards Iron Nosing T-Iron
Hand rail Iron Located on Boiler

31 **Back Bumper** Bar Steel Back drawbar height 29¾"

Pilot None Pushing shoes At front
32 **Front Bumper** Cast Iron Bumper plate None
Steps Across front with hand rail (See sup. 15-32)
Steps, hand holds, etc. to conform to I.C.C. requirements.
Front Drawhead, Center above rail 33⅝"
Coupler Sharon M.C.B. Auto. (See sup. 33)

Signal fixtures Iron on bumper

36 **Headlight** Two round case 18" Reflector, To burn Kerosene
Headlight, Nos. on sides (See sup. 48) H'dl't step None
Lamp shelf None Nosing ----

Bell 92 pounds Gollmar Air Bell Ringer.
Sand Box Two Diam. 28" Body Iron ptd. Pipes Iron
Sander (1917 Spec) Leach Air, Trap A-1, in each box to sand front and back

Dome casing Iron painted

Boiler Jacket #22 plan steel Bands Iron Style 9 and 14
Boiler Lagging Magnesia sectional
Back head of boiler to be lagged and jacketed.

11 Apr. 26-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS
C. H. Frech June 1917
SPECIFICATION FOR LOCOMOTIVES 6 38 D 71 to 74
FOR The Youngstown Sheet and Tube Company

Frames Cast Steel (See sup. 37) Braces Solid

Cylinders, Diam. 22" Stroke 26"
St'm ports, Length 16" Width 1⅜" Bridges 1⅛"
Exh. ports, Length 16" Width 2⅜" Valve lead 1/16"
Valve travel 5½" Steam lap ⅞" Exhaust clearance ----
Eccentric crank throw 4⅜" By-pass valve None
S. F. Lubr. (Spec) Detroit Triple #22 Bulls Eye, (See sup. 38)
Cyl'r heads Cast Iron
Cyl'r casings Iron ptd Head covers Steel painted
St'm chest casings Iron ptd. Covers Steel painted
St'm chest valves Richardson Balanced, with vacuum valves
Met. pkg { Piston rods / Valve stems } United States King Type (Spec)

Pistons Cast iron rings sprung into solid head (Sup. 39)
Guides Laird Type, Steel Oil cups Adjustable Needle
Crossheads Cast Steel
Wrist Pins Steel Rod and cups (See sup. 40)

Valve Motion Stephenson
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

27 All threads on bolts (except staybolts) to be United States Standard.
42 All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B.L.W.

43 **Drivers,** O. S. Diam. 50" Cen. diam. 44" Centres cast steel

Tires Steel Held by Shrinkage and Shoulder
Tires, Flanged, Pos. Front and Back Size 3" x 5½"
Tires, Plain, Pos. Middle Size 3" x 6½"
Lateral play between driving boxes and wheel hubs = 1/16"
Driving Boxes Cast Steel (See sup. 44)
Journals, Diam. 9" Length 12"

46 **Springs.** Make B.L.W., Standard Steel Works or other make

Front Engine Truck None Wheeled ----
To swing ----each side of cen., Cen. pin liners ----
Journals, Diam. --- Length --- Boxes ----
Wheels, Diam. ---- Tread ---- Kind -----
Tires ---- Cen. diam. -- Size ---
Tires held by -----

Back Engine Truck None Wheeled ---
To swing ---each side of cen., Cen. pin liners ----
Journals, Diam. --- Length ---- Boxes ----
Wheels, Diam. ---- Tread --- Kind ----
Tires ------ Cen. diam. --- Size
Tires held by -------

47 **Brake,** position On all driving and tender wheels.
Operating Parts { Engine, Sch. A-1, SVA. West'g. Auto. and Straight Air / Eng. Tr'k, sch. ----
Foundation Parts { Drivers, sch. UA-2 American O.S. Equalized / Eng. Tr'k, sch. -----
Air pump Two - 9½" Pos. Right and Left (See sup. 46)
Train connections Front and Back
Train signal, sch. None
Air Reservoir to have hydrostatic test of 210 lbs.
Certificates dated May 5th 1917, covering test of reservoir Nos. U1426 to U1433 inc. furnished by West'g. Air Brake Co., are filed in Main Office, File No. 1080

49 **Tender** Eight Wheeled, Drawing No. 435
Weight, with fuel and water, about 90,000 lbs.

49 **Tank** 4500 Gallons, Bill 4060
Tank "U" shape straight top. Fuel Cap. 12,000 lbs.

Tool Boxes None

Frame Steel 10" Channels (See sup. 51)
Tender Body bolster to be of cast steel
31 Front Drawbar height 31¾"
Pilot None Pushing shoes At rear
Back drawhead, center above rail 33½"
Coupler Sharon M.C.B. Auto. (See sup. 52)

45 Steps, hand holds, etc. to conform to I.C.C. requirements.

53 **Trucks** Andrews Cast Steel side frames with steel bolsters

Springs Elliptic. B.L.W. Standard Steel Works or other make
Journals, Diam. 5" Length 9"
54 Wheels, Diam. 33" Tread 1¼" Kind M.C.B. Rolled Steel
Tires None Cen. diam. --- Size ----
Tires held by ---- Wheels rims 2½" thick
Safety chains Single

Brake Position On All Wheels
Brake sch. FL-1212 and SNB West'g. Auto. and Straight Air

List of tools, sch. 29
Photo sch. None Inspection B.L.W. (except sup . 17)
To be weighed No Material spec'ns B.L.W.
Certificate of boiler test Three copies of B.L.W. form 1036 (Sups. 1 to 9)
Junior laws to 4-15-17 Shipment On on wheels

Brass shop finish. No. 1
Machine shop finish D-165

B. L. W. Patents } Feed Pipe Strainer, Patented Sep. 1, 1903. (Cast on)

Property plates None

Painting:—Engine, style 368 Black and yellow
Painting:—Tender, style 368 Black and yellow (See sup. 48)

Lettering etc. to be same as for 6 38 D 44 etc.
Mark on Tank sides, The Youngstown Sheet & Tube Co.

Road Nos. Pos. Road Nos. Name None
F. No. Plate 303 to 306
Cab sides

SPECIFICATION FOR LOCOMOTIVES 6 38 D 71 to 74

FOR The Youngstown Sheeet and Tube Company.

A Boilers built to meet the requirements of the Industrial Commission of Ohio must be designed strictly in accordance with the "Rules formulated by the Industrial Commission of Ohio," and be inspected during construction and upon completion by an authorized Ohio Inspector, such Inspector not to be interested either directly or indirectly with the manufacturer.

B FACTOR:- The minimum factor of safety shall be five.

B Longitudinal lap seams shall not be used.

C Welded Boiler braces shall not be subjected to a fibre stress in excess of 6000 lbs. per sq. in.

D Stress in staybolts shall not exceed 6500 lbs. per sq. in.,(therefore use 1" staybolts for 180 lbs. and over)

E The maximum allowable stress per square inch net cross sectional area of stud bolts or tap bolts having a diameter of ¾" or larger shall not exceed 6000 lbs.

F The minimum thickness of butt straps shall be as follows:-

THICKNESS OF SHELL PLATES	MINIMUM THICKNESS OF BUTT STRAPS
½" & 5/16"	½"
⅜"	5/16"
7/16"	⅜"
½" & 9/16"	7/16"
⅝", 11/16" & ¾"	½"
13/16"	9/16"
⅞"	⅝"
15/16"	11/16"
1" & 1⅛"	¾"

G The minimum thickness of tube sheets shall be as follows:-

OUTSIDE DIA. OF TUBE SHEET	MINIMUM THICKNESS
42" or less	⅜"
Over 42" to 54" inclusive	7/16"
" 54" to 72" "	½"
" 72"	9/16"

When a tube sheet is not circular in form (i.e., fire box tube sheet) the least dimension of such sheet shall determine its thickness.

H No boiler shall have a continuous longitudinal seam over 12 feet in length.

I There shall be not less than six brass washout plugs not smaller than 1½" pipe tap located as follows:
One in front tube sheet below the tubes.
One in back head at or about the line of the crown sheet.
Four in the lower part of the water leg.

J An opening in the boiler for a threaded pipe connection 1" in diameter or over shall have not less than the minimum number of threads in such opening as shown in the following table:-

SIZE OF PIPE CONNECTION.	1" & 1½"	1½" & 2"	2½" to 4"
NO. OF THDS. PER INCH.	11½	11½	8
MINIMUM NO. OF THDS. REQUIRED IN OPENING.	4	5	7
MINIMUM THICKNESS OF MATERIAL REQUIRED TO GIVE ABOVE NO. OF THREADS.	⅜"	7/16"	½"

If the thickness of the boiler material is not sufficient to give the above number of threads, a liner or flange must be applied.

K Each boiler must be provided with a connection ¼ pipe size for attaching inspector's test gauge.

L A fusible plug must be applied which projects through the crown at least 1". The plug must be filled with pure tin and the least diameter of the fusible metal must be not less than ⅜" (Fusible Plug B. L. W. Card #4516).

M Feed water shall not discharge into a boiler in close proximity to riveted joints in shell or furnace sheets. Each boiler shall have a feed pipe fitted with a check valve, and also a stop valve or stop cock between the check valve and the boiler, the feed water to discharge below the lowest safe water line.

N MATERIALS:- Shell,(including top and sides) dome and butt straps (including dome liner), shall be open hearth steel of FIRE BOX quality and shall conform to the specification of the American Society of Mechanical Engineers.
Front tube sheet, back head, and throat sheet may be open hearth FLANGE steel and shall conform to the requirments of the American Society of Mechanical Engineers.

O Smoke Box steel to conform to B. L. W. Spec'n.

P Rivets shall be open hearth extra soft steel as specified in paragraphs 15, 17 and 19, Part III, Section 2, of the Boiler inspection Law of Ohio.

Q All boiler plates except the fire box and smoke box plates must be marked by the manufacturer with the heat number, name of manufacturer, brand and lowest tensile strength in the manner and location shown on The B. L. W. Marking Card #6807.
This marking card should be ordered on the card sheet and on the store room sheet for boiler steel and one piece dome.

R SHOP PRACTICE:- Rivet holes except for attaching stay feet and T-iron to heads shall be drilled full size with plates, butt straps, and heads bolted up in place: or they may be punched out not to exceed ¼" less than full size for plates over 5/16" in thickness, and ⅛" less than full size for plates 5/16" and under, and then drilled or reamed to full size with plates, butt straps and heads bolted up in position.
The Tube holes may be drilled full size, or they may be punched not to exceed ⅛" less than full size and then drilled, reamed or finished full size with rotating cutter.

S Upon completion each boiler shall be stamped with the words

OHIO STANDARD
(serial no. as specified)
BALDWIN

This stamping must be done by the authorized Ohio inspector.
The height of the letters and figures shall be 5/16".
The location of the stamping shall be on the back head above plug hole. It must not be covered by lagging or fittings.

T Extract from letter of the Hartford Steam Boiler Inspection and Insurance Co. dated Jan. 7th, 1916:- "In order for our inspectors to comply with Ohio requirements in making inspections of steam boilers, it is necessary that they make at least three visits to the shop during the work of construction. First, to look over the plates to see that they are sound and properly stamped, and if it is the practise of the shop, to first punch the rivet holes, the punching should have been done at this time.
The second trip would be to see the work after it is fitted up and rivet holes reamed or drilled full size preparatory to driving the rivets.
The next trip would be after the boiler is completed for the purpose of examining the completed work and applying the hydrostatic test."

U When the boiler is tested by hydrostatic pressure, the maximum pressure applied shall not exceed one and one-half times the maximum allowable working pressure.

V A Data report, on forms furnished by the Boiler Inspection Department of the Ohio Industrial Commission, shall be forwarded by the builder to the chief inspector of such department for each boiler stamped OHIO STD. before the boiler is shipped from the boiler shop.

Lever 6 38 D 72-73-74 were stamped as shown Ormond Serial Nos 129-130 and 131, and 6 D 71 Serial Nos 125-126 and 134 as covered on Baldwin Order No. 6739-1929

11p. 266-67 Photo copied see box

SPECIFICATION FOR LOCOMOTIVES 6 38 D 71 to 74

FOR The Youngstown Sheeet and Tube Company

90

15 Engine and tender to be equipped with all grab irons, steps, walks, guards, rails, markings and other safety appliances required by Federal and Ohio State Laws.(Sup.1 to 9)

16 Boiler to conform to the requirements of the Industrial Commission of Ohio, and to be stamped on the back head in the presence of the authorized inspector,- Thus
OHIO STD
15 to 18
BLADWIN

17 Boiler to be inspected by Hartford Steam Boiler Inspection and Insurance Co. (See sups. 1 to 9)

18 Boiler to be located to provide a three quarter deck.(Sup.30)

19 Back boiler head to have a plate giving the following data: Shell, thickness plate; longitudinal seams (lap or butt) diameter and pitch of rivets, number of rows of rivets. Boiler braces, head to head or diagonal, size and pitch of rivets.
Dome, seams (lap or butt) size and pitch of rivets.
Pressure, test, and working.

20 Dome of O.H. Steel, built up with separate top, base and body sections.

21 All flanged plates in fire box to be thoroughly annealed after flanging.

22 Tell-tale hole in rigid stay bolts to be countersunk on O. S.

23 Tate Flexible staybolts to be of Ewald Iron about 340 in number, to be used in the following locations:-
Three top horizontal rows and two end vertical rows on sides.
The top cross rows and two side vertical rows down as far as fire door on back boiler head.
Close to radius in throat sheet.
Ten additional Tate Flexible staybolts in lower corners of throat sheet.

24 Grates with two drop plates, one front and one back.

25 Ash pan of steel plates, with cast iron hoppers and slides and to comply with the Ohio State Law, and the I.C.C. requirements.

26 Throttle lever stem to extend out through back boiler head.

27 All boiler threads 12 per inch.

28 Water gauge and gauge cocks to have bonnet to prevent removal of stem.
Water gauge to be Tubular, with Babcock shield.

29 Cleaning holes to be located as follows:-
Two in back boiler head about 12" above mud ring.
Two in throat sheet, over middle driver and half way between mud ring and shell of boiler (on each side)
One plug on right side opposite Blow-off cock.
Two at each side of fire box half between running board and mud ring.

30 Cab to be located so there will be about 42" between back head of boiler and back of cab. (See sup. 18)

31 Buffer between engine and tender as Co's., print 12304, received with letter dated August 8th., 1915. (File 1080)

32 Front bumper and step to be standard as shown by B.L.W. photo. 3816, 6 38 D 18.

33 Couplers:- Engine and tender to be fitted with extended floor coupler pocket, as illustrated in the National Malleable Castings Co's., catalogue No. 2, page 70, with shim washers as shown on page 67, one set of washers #1505 and one set #1510 to be furnished.

36 Headlight at front to be located on top of smoke box.

37 Frame Pedestals to be integral with main frames and to be protected from wear of boxes by cast iron gibs and wedges

38 Lubricator pipes of copper under jacket.

39 Piston rods to be ground and keyed to crosshead.

40 Parallel rods to have solid ends.
Grease cups forged integral with all connecting and parallel rods.

41 Provide for lubrication of all bearings, and attach oil cups where required.

42 All finished movable nuts to be made of steel or iron case hardened.

43 All driving wheels to have hub liners of Bronze.

44 Driving box oil cellars to be so designed that they may be packed from the side without removing them.

45 Equalizing beams of wrot steel.

46 Air pumps to be located as low as possible, and air drums under cab boards, in order to keep running boards in line with cab floor and give engineer and fireman and unobstructed view of man on front bumper step.

47 Driving brake shoes to be Perfecto, all to be interchangeable

48 Lettering, etc. in yellow paint, same as photo. No. 150
Striping ½" wide on both sides of tank 6" from edge and on both cab panels, the panels to have round corners.
Road numbers in 3" figures on front number plate, 6" figures on cab panel and in 4" illuminated figures on both sides of both headlights. Marking on sides of tank to be 7" high.

TENDER.

49 Tank material to be the following thickness:- Top and bottom plates ¼" inside plates ¼", outside plates 3/16" and riveted with ⅝" rivets, 1¼" pitch.
Tank to have flush top and to be as low as consistant with good design.
Tank coal collar arranged similar to but not as high as shown by photo. 5084, 6 38 D 41.

50 Tank man hole to be 36" long.

51 Back bumper and step to be standard as shown by B.L.W. photo. 3816, 6 38 D 18.

52 Couplers:- Engine and tender to be fitted with extended floor coupler pocket, as illustrated in the National Malleable Castings Co's., catalogue No. 2, page 70, with shim washers as shown on page 67, one set of washers #1505 and one set #1510 to be furnished.

53 B.L.W. built up tender truck bolsters interchangeable with Simplex bolsters, may be used provided B.L.W. will guarantee equivalent service.

54 Tender wheels to weigh 730 pounds.

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-4127 Dup. 4-22 C 187 to 189, except where otherwise specified.

Memorandum Spec'n L1158

SPECIFICATION FOR LOCOMOTIVES 4 22 C 212 - 213 Gen. as Photo. 5723

FOR North Brothers Company 9-25-16 **Engine Drawing No.** 36

R. 6

Gauge of Road 2' 6" Play ½"
Wheelbase, Rigid 5' 6" Driving 5' 6" Total 5' 6"
Total wheelbase, eng. and tend { Actual ----- Limited to -----

Curves 56 feet radius
Loco. to be built to same overall dimensions as 4-22 C 187 to 189
Limits, Height ---- Width ----
Weight approximate in working order, Total 58,000 lbs.
On F. tr'k ----- lbs., Drivers 58,000 lbs., B. tr'k ----- lbs.

Tractive power 13,300 lbs., Ratio of adhesion 4.3
Work'g St'm Pres. 165 lbs., Service Switching
Fuel Coal

Front tube sheet to be ½" thick
Boiler Worth Bros. Steel Thick 7/16" Bill 7610
Boiler, Diam. 44" Plan Straight Top
Boiler st'm pres. 165 lbs., Tested to { 185 lbs. steam pres. / 220 lbs. water pres. with factor of safety of 5.46.
Longitud. seams Butt jointed, double covering strips

Dome, diam 22" Pos. Central

Firebox Worth Bros. Steel Combustion chamb. None
Firebox, length 43-11/16" Width 33⅜" Depth F. 47⅞" B. 42⅝"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diam.
Water space, Front 3" Sides 2½" Back 2½"
Water space, Frame Single Riveted
Water space stays ⅞" diam. with 3/16" holes 1½" deep from O.S.

Radial stays 1" diam. Sling stays front None
Button heads below crown on Six central rows
Crown bars None Placed ----- above crown
Crown bolts -----

Flues -----
Tubes #12 W. G. Worth Bros. Charcoal Iron
Tube ends Swaged for copper ferrules, fire box ends.
Number 110 Diam. 2" Length 9' 3"

Heating Surface Flues ----- Combus. Chamb. ----- Total 578 sq.
Tubes 528 Fire Box 50 Fire Brick Tubes -----
Grate area 10.1 sq. Ratio to Heating Surface 1 : 57.2
Superheater -----

Fire Brick Arch None

Grates Rocking Bars and Drop plate
Ash Pan, Dampers Front and back
Ash Pan dampers to be operated from cab.

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Smokebox extension With Cleaning hole and cap None
Spark ejector or hopper None
Netting and deflect plates With
Smoke box arrangement to be self cleaning type.
Exhaust nozzles Double, high
Extra exhaust nozzles to be furnished.
Stack Straight Dia. 12¾" Hole in S. B., dia. 16½"

Safety Valves (Spec.) Two Coale 1½"
Safety valves None with relief lever, Set to 165 pounds
Whistle B. L. W. Plain

Steam Gauge One Iron 7" MAKER:-Ashcroft (Not Spec.)
Steam gauge stand Iron **Clock** None

Water Gauge One B.L.W. (Ironclad) **Cab Lamps** to burn oil.
Gauge Cocks Three Back Surface valve None
Lowest gauge cock 3" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One Homestead POS:-Left Side
Cleaning Plugs
Firebox Corners, diagonal
Crown, One each side and two back
Waist, One under front
Front tube sheet, One Fusible plug One

Pump None Pos. -----
Top chamb. ----- Bottom chamb. -----
Feed Cock ----- Feed pipes -----
Checks ----- Check pipes -----

Injectors (Spec.) Two Sellers, Class "N" No. 7½
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. Right and Left

Steam Heat None

Cab Sheet Steel (see note (1) and (2))
Coal bunker in left side of cab, capacity, about 700 lbs. of coal.
Cab boards Steel Nosing Angle Iron
Running boards None Nosing -----
Hand rail Iron Pipe. Located on Cab

Back Bumper Cast Steel (see note (4))

Pilot None Pushing shoes None
Front Bumper Cast Steel (see note (4)) Bumper plate None
(3) **Steps** Hanging foot boards, with hand holds, front and back.

F. & B Drawhead, Center above rail 15⅝"
Coupler Link type as shown on B.L.W. tracing 32873 for front and 32874 for back (approved by customer)

Signal fixtures None (see note (2))

Headlight Two Round Case 12" Reflector, To burn Kerosene
Headlight, Nos. on sides With H'dl't step None
Lamp shelf None Nosing -----
Bell to have continuous ringer, i.e. (Gollmar Steam)
Bell 45 pounds, on right side of Bumper
Sand Box Four (see note (5)) Body Iron Painted Pipes Iron
Sander Hand, in each box to sand front and back.

Dome casing Iron Painted

Boiler Jacket #22 Soft Steel Ptd Bands Iron Style 9 and 14
Boiler Lagging Magnesia sectional (see note (6))
Back head of boiler to be lagged and jacketed.

No. 266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS 92

H. Conkling Nov. 1916

SPECIFICATION FOR LOCOMOTIVES 4 22 C 212 - 213

FOR North Brothers Company

R.

Frames Cast Steel, cross braced Braces Solid
Cylinder cocks to be worked from cab.
Cylinders, Diam. 14" Stroke 16"
St'm ports, Length 12" Width 1" Bridges ⅞"
Exh. ports, Length 12" Width 2" Valve lead 1/16"
Valve travel 1⅝" Steam lap ⅞" Exhaust clearance -----
Eccentric-crank throw 3¾" By-pass valve None
S. F. Lubr. Detroit Double #12 Bulls Eye (see note (1))
Cyl'r heads Cast Iron Lubr. pipes of copper under jacket
Cyl'r casings Iron Ptd. Head covers Steel Painted
(6) St'm chest casings Iron Ptd. Covers Steel Painted
St'm chest valves Balanced, with vacuum valves
Met. pkg {Piston Rods / Valve Stems} United States (not spec.)

Pistons Cast Iron rings sprung into solid head
Guides Steel Oil cups Needle
Crossheads Cast Steel
Wrist Pins Steel Rod cups Plunger
Parallel Rods to have solid ends

Valve Motion Stephenson
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 33" Cen. diam. 28" Centres Cast Steel
Driving wheels to have bronze hub liners
Tires Steel Held by Shrinkage and Shoulder
Tires, Flanged/Pos. All Size 2½" x 4½"
Tires, Plain, Pos. ----- Size -----
Lateral play between driving boxes and wheel hubs = 1/32" total
Driving Boxes Cast Steel
Journals, Diam. 7" Length 8"
Driving springs to be made heavier. Spring links and saddles to be heavier than for previous locomotives
Springs Make B. L. W.
Make sure that springs are strong enough
Front Engine Truck None Wheeled -----
To swing ----- each side of cen., Cen. pin liners -----
Journals, Diam. ----- Length ----- Boxes -----
Wheels, Diam. ----- Tread ----- Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----

Back Engine Truck None Wheeled -----
To swing ----- each side of cen., Cen. pin liners -----
Journals, Diam. ----- Length ----- Boxes -----
Wheels, Diam. ----- Tread ----- Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----

Brake, position On all driving wheels. (No tender)
Operating parts { Engine, Sch. ----- American Steam / Eng. Tr'k, sch. -----
Foundation { Drivers, sch. ----- B. L. W.
Parts { Eng. Tr'k, sch. -----
Air pump ----- Pos. -----
Train connections -----
Train signal, sch. None
Brake to have B.L.W. foundation parts with American Brake Co's operating fixtures for steam brake.
Brake Shoes, Ross - McHan

Tender - None

Tank 800 Gallons, Bill 4093
Tanks rectangular shape, located at sides of boiler.
Tank moved forward 12" to improve weight distribution.

(1) Cab to be well secured to the boiler and the floor, with rear entrance. Side, front and rear windows with glass and sash. Side windows arranged to slide.
Cab to have sliding ventilator in roof.
Tool boxes, cushions and arm rests to be furnished.
Lubricator to be placed to the left of water gauge so water gauge can be seen by Engineer.

(2) Marker Lamp on back of cab, left side, high up, in addition to headlight on right side.

(3) Grab irons to be applied at sides of opening in back of cab. Grab iron across back opening to be omitted.

(4) Bumpers to be well ribbed and braced, with radial draw bars, with clevis on outside end. Drawbars to have big swing.
All to be designed to suit the curves.
Wood bumper blocks to be applied on face of bumper 41" wide by 8" high by 10" deep, with iron plate face ¾" thick.
Bottom of bumpers to be 4" above rail.

(5) Sand Boxes Rectangular located below tank. Rear sand boxes to be larger.
Change location of feed pipe reservoir and tank bearer to make room for larger sand boxes.
Lids of sand boxes to be made so the sand will go into the boxes and not on to the ground when filling.
Sander rigging to be simpler and to work easier.

(6) Cylinders to be lagged with wood.

(7) Tool equipment to include two jack screws and levers, tallow can, three oil cans, one set of steel wrenches fitting all nuts and bolts on the engine, two monkey wrenches, one hard -one- and one soft hammer, two chisels, valve gauge, pinch bar, poker, scraper and Engineer's torch. Tool Sch. No. 26

(8) Locomotive to be subject at all times to the inspection and approval of Worth Bros. Co's representative.
Copies of orders for plates and tubes to be sent to Mr. H. L. Murphey, P.A.

Photo. Sch. #2 Inspection (see note (8))
To be Weighed Yes Material Spec'ns. B. L. W.
Certificate of boiler test Three copies of B.L.W. form 1036.
Junior Laws to 9-28-16 Shipment on Car

Brass shop finish, No 1
Machine shop finish D-165

B. L. W. Patents } Throttle, Patented Jan. 23, 1900 (Cast On)

Property plates None
Painting:- Engine style 222 Olive Green and Aluminum
Painting:- Tender, style -----
Lettering, etc. to be similar to 4 - 22 C 187 etc.
Mark on tank sides W. B. Co. 11
Road No. on tank to be on same line with mark.
Road Nos. Pos. Road Nos. Name None
F. No Plate 11
Cab sides 12
Sides of tank

11-266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-4127
Dup. 4-22 C 187 to 189, except where otherwise specified.
Memorandum Spec'n L1158
SPECIFICATION FOR LOCOMOTIVES 4 22 C 212 - 213 Gen. as Photo. 5723
FOR North Brothers Company 9-25-16 **Engine Drawing No.** 36
R.

Gauge of Road 2' 6" Play 1/2"
Wheelbase, Rigid 5' 6" Driving 5' 6" Total 5' 6"
Total wheelbase, eng. and tend { Actual ----- / Limited to -----

Curves 56 feet radius
Loco. to be built to same overall dimensions as 4-22 C 187 to 189
Limits, Height ---- Width ----
Weight (approximate in working order) Total 58,000 lbs.
On F. tr'k ----- lbs., Drivers 58,000 lbs., B. tr'k ----- lbs.

Tractive power 13,300 lbs., Ratio of adhesion 4.3
Work'g St'm Pres. 165 lbs., Service Switching
Fuel Coal

Front tube sheet to be 1/2" thick
Boiler Worth Bros. Steel Thick 7/16" Bill 7610
Boiler, Diam. 44" Plan Straight Top
Boiler st'm pres. 165 lbs., Tested to { 185 lbs. steam pres. / 220 lbs. water pres. } with factor of safety of 5.46.
Longitud. seams Butt jointed, double covering strips

Dome, diam 22" Pos. Central

Firebox Worth Bros. Steel Combustion chamb. None
Firebox, length 43-11/16" Width 33 3/8" Depth F. 47 3/4" B. 42 1/2"
Firebox, Tube 1/2" Crown 1/2" Sides 5/16" Back 5/16"
Firedoor opening 16" diam.
Water space, Front 3" Sides 2 1/2" Back 2 1/2"
Water space, Frame Single Riveted
Water space stays 7/8" diam. with 3/16" holes 1 1/4" deep from O.S.

Radial stays 1" diam. Sling stays front None
Button heads below crown on Six central rows
Crown bars None Placed ----- above crown
Crown bolts -----

Flues -----
Tubes #12 W. G. Worth Bros. Charcoal Iron
Tube ends Swaged for copper ferrules, fire box ends.
Number 110 Diam. 2" Length 9' 3"

Heating Surface | Flues ----- | Combus. Chamb. ----- | Total 578 sq.
Tubes 528 sq. | Fire Box 50 sq. | Fire Brick Tubes -----
Grate area 10.1 sq. Ratio to Heating Surface 1 : 57.2
Superheater -----

Fire Brick Arch None

Grates Rocking Bars and Drop Plate
Ash Pan, Dampers Front and Back
Ash Pan dampers to be operated from cab.

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Smokebox extension With Cleaning hole and cap None
Spark ejector or hopper None
Netting and deflect plates With
Smoke box arrangement to be self cleaning type.
Exhaust nozzles Double, high
Extra exhaust nozzles to be furnished.
Stack Straight Dia. 12 3/4" Hole in S. B., dia. 16 1/2"

Safety Valves (Spec.) Two Coale 1 1/2"
Safety valves None with relief lever, Set to 165 pounds
Whistle B. L. W. Plain

Steam Gauge One Iron 7" MAKER:-Ashcroft (Not Spec.)
Steam gauge stand Iron **Clock** None
Water Gauge One B.L.W. (Ironclad) **Cab Lamps** to burn oil.
Gauge Cocks Three
Lowest gauge cock 3"
Lubricator steam valve TC
Blower Valve B. L.

Blow off Cock One H
Cleaning Plugs
Firebox Corners, dia
Crown, One each sid
Waist, One under fr
Front tube sheet, One

Pump None
Top chamb. -----
Feed Cock -----
Checks -----

Injectors (Spec.) Two Sellers
Injectors, Pos. Right and
Pipes, Check Iron F
Check B. L. W.

Steam Heat None

Cab Sheet Steel (see
Coal bunker in left s
coal.
Cab boards Steel
Running boards None
Hand rail Iron Pipe.

Back Bumper Cast

Pilot None
Front Bumper Cast S
③ **Steps** Hanging foot B

F. & B Drawhead, Cont
Coupler Link type as
and 32874 for back (a

Signal fixtures None (see

Headlight Two Round C
Headlight, Nos. on sides
Lamp shelf None
Bell to have continuo
Bell 45 pounds, on Ri
Sand Box Four (see note ⑤) Body Iron Painted Pipes Iron
Sander Hand, in each box to sand front and back.

Dome casing Iron Painted

Boiler Jacket 22 Soft Steel Pto Bands Iron Style 9 and 14
Boiler Lagging Magnesia sectional (see note ⑥)
Back head of boiler to be lagged and jacketed.

NOTICE

THE PRECEDING PAGE HAS BEEN REPHOTOGRAPHED TO ASSURE THE BEST POSSIBLE LEGIBILITY. ITS IMAGE APPEARS IMMEDIATELY HEREAFTER.

SOUTHWEST MICROPUBLISHING, INC.

THE BALDWIN LOCOMOTIVE WORKS Nov. 1916 92
N. Conkling
SPECIFICATION FOR LOCOMOTIVES 4 22 C 212 - 213
FOR North Brothers Company
R.

Frames Cast Steel, gross braced Braces Solid
Cylinder cocks to be worked from cab.
Cylinders, Diam. 14" Stroke 16"
St'm ports, Length 12" Width 1" Bridges 7/8"
Exh. ports, Length 12" Width 2" Valve lead 1/16"
Valve travel 4 1/8" Steam lap 1" Exhaust clearance -----

...nder jacket
...inted
...inted

...ead
Needle

...od jaws to be

...es Standard.
...ed.

...ast Steel

...lder
... x 40"

Total

...links and
...motives

...tender)

Arts Eng. Tr'k, sch.
Foundation: Drivers, sch. ----- B. L. W.
Parts Eng. Tr'k, sch. -----
Air pump ----- Pos. -----
Train connections -----
Train signal, sch. None
Brake to have B.L.W. foundation parts with American
Brake Co's operating fixtures for steam brake.
Brake Shoes, Ross - Median

Tender - None

Tank 800 Gallons, Bill 4093
Tanks rectangular shape, located at sides of boiler.
Tank moved forward 12" to improve weight distribution.

① Cab to be well secured to the boiler and the floor, with rear entrance. Side, front and rear windows with glass and sash. Side windows arranged to slide.
Cab to have sliding ventilator in roof.
Tool boxes, cushions and arm rests to be furnished.
Lubricator to be placed to the left of water gauge so water gauge can be seen by Engineer.

② Marker Lamp on back of cab, left side, high up, in addition to headlight on right side.

③ Grab irons to be applied at sides of opening in back of cab.
Grab iron across back opening to be omitted.

④ Bumpers to be well ribbed and braced, with radial draw bars, with clevis on outside end. Drawbars to have big swing.
All to be designed to suit the curves.
Wood bumper blocks to be applied on face of bumper 41" wide by 8" high by 10" deep, with iron plate face 3/4" thick.
Bottom of bumpers to be 4" above rail.

⑤ Sand Boxes Rectangular located below tank. Rear sand boxes to be larger.
Change location of feed pipe reservoir and tank bearer to make room for larger sand boxes.
Lids of sand boxes to be made so the sand will go into the boxes and not on to the ground when filling.
Sander rigging to be simpler and to work easier.

⑥ Cylinders to be lagged with wood.

⑦ Tool equipment to include two jack screws and levers, tallow can, three oil cans, one set of steel wrenches fitting all nuts and bolts on the engine, two monkey wrenches, one hard and one soft hammer, two chisels, valve gauge, pinch bar, poker, scraper and Engineer's torch. Tool Sch. No. 26

⑧ Locomotive to be subject at all times to the inspection and approval of Worth Bros. Co's representative.
Copies of orders for plates and tubes to be sent to Mr. H. L. Murphey, P.A.

Photo. Sch. #2 Inspection (see note ⑧)
To be Weighed Yes Material Spec'ns. B. L. W.
Certificate of boiler test Three copies of B.L.W. form 1036.
Junior Labs to 9-28-16 Shipment on Car

Brass shop finish, No 1
Machine shop finish D-165

Patents B. L. W. } Throttle, Patented Jan. 23, 1900 (Cast On)
Property plates None
Painting:- Engine style 222 Olive Green and Aluminum
Painting:- Tender, style -----
Lettering, etc. to be similar to 4 - 22 C 187 etc.
Mark on tank sides W. B. Co. 11
Road No. on tank to be on same line with mark.

Road Nos. Pos.	Road Nos.	Name None
F. No Plate	11	
Cab sides	12	
Sides of tank		

11-268-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-4127 Dup. 4-22 C 187 to 189, except where otherwise specified.

Memorandum Spec'n L1158

SPECIFICATION FOR LOCOMOTIVES 4 22 C 212 - 213 Gen. as Photo. 5723

FOR North Brothers Company 9-25-16 **Engine Drawing No.** 36

R.

Gauge of Road 2' 6" Play ½"
Wheelbase, Rigid 5' 6" Driving 5' 6" Total 5' 6"
Total wheelbase, engine and tender Actual ----- Limited to -----

Curves 56 feet radius
Loco. to be built to same overall dimensions as 4-22 C 187 to 189
Limits, Height ↗ Width ↗
Weight (approximate on working order) Total 58,000 lbs.
On F. truck ----- lbs. Drivers 38,000 lbs. B truck ----- lbs.

Tractive power 13,300 lbs. Ratio of adhesion 4.3
Work'g St'm Pres. 165 lbs. Service Switching
Fuel Coal

Front tube sheet to be ½" thick
Boiler North Bros. Steel Thick 7/16" Bill 7610
Boiler, Diam. 44" Plan Straight Top

Boiler st'm pres. 165 lbs. Tested to { 185 lbs. steam pres. / 220 lbs. water pres.
with factor of safety of 5.45.
Longitud. seams Butt jointed, double covering strips

Dome, Diam. 22" Pos. Central

Firebox North Bros. Steel Combustion chamb. None
Firebox, length 43-11/16" Width 33⅞" Depth F. 47⅞" B. 42½"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diam.
Water space, Front 3" Sides 2½" Back 2½"
Water space, Frame Single Riveted
Water space stays 6" diam. with 3/16" holes 1¼" deep from O.S.

Radial stays 1" diam. Sling stays front None
Button heads below crown on Six central rows
Crown bars None Plates ----- above crown
Crown bolts -----

Flues -----
Tubes #12 W. G. North Bros. Charcoal Iron
Tube ends Swaged for copper ferrules, fire box ends.
Number 110 Diam 2" Length 9' 3"

Heating Surface Flues ----- Combus. Chamb. ----- Total 578 sq. ft.
Tubes 528 sq. ft. Fire Box 50 sq. ft. Fire Brick Tubes -----
Grate area 10.1 sq. ft. Ratio to Heating Surface 1 : 57.2
Superheater -----

Fire Brick Arch None

Grates Rocking Bars and Drop plate
Ash Pan, Dampers Front and back
Ash Pan dampers to be operated from cab.

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Smokebox extension With Cleaning hole and cap None
Spark ejector or hopper None
Netting and deflect. plates With
Smoke box arrangement to be self cleaning type.
Exhaust nozzles Double, high
Extra exhaust nozzles to be furnished.
Stack Straight Dia 12¾" Hole in S. B., dia. 16½"

Safety Valves (Spec.) Two Coale 1½"
Safety valves None with relief lever, Set to 165 pounds
Whistle B. L. W. Plain

Steam Gauge One Iron 7" MAKER:-Ashcroft (Not Spec.)
Steam gauge stand Iron **Clock** None
Water Gauge One B.L.W. (Ironclad) **Cab Lamps** to burn oil.
Gauge Cocks Three Back Surface valve None
Lowest gauge cock 3" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One Homestead POS:-Left Side
Cleaning Plugs
Firebox Corners, diagonal
Crown, One each side and two back
Waist, One under front
Front tube sheet, One **Fusible plug** One

Pump None Pos. -----
Top chamb. ----- Bottom chamb. -----
Feed Cock ----- Feed pipes -----
Checks ----- Check pipes -----

Injectors (Spec.) Two Sellers, Class "N" No. 7½
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. Right and Left

Steam Heat None

Cab Sheet Steel (see note ① and ②)
Coal bunker in left side of cab, capacity, about 700 lbs. of coal.
Cab boards Steel Nosing Angle Iron
Running boards None Nosing -----
Hand rail Iron Pipe. Located on Cab

Back Bumper Cast Steel (see note ④)

Pilot None Pushing shoes None
Front Bumper Cast Steel (see note ④) Bumper plate None
③ **Steps** Hanging foot boards, with hand holds, front and back.

F. & B. Drawhead, Center above rail 15⅝"
Coupler Link type as shown on B.L.W. tracing 32873 for front and 32874 for back (approved by customer)

Signal fixtures None (see note ②)

Headlight Two Round Case 12" Reflector, To burn Kerosene
Headlight, Nos. on sides With H'dl't step None
Lamp shelf None Nosing -----
Bell to have continuous ringer, i.e. (Gollmar Steam)
Bell 40 pounds, on right side of Bumper
Sand Box Four (see note ⑤) Body Iron Painted Pipes Iron
Sander Hand, in each box to sand front and back.

Dome casing Iron Painted

Boiler Jacket #22 Soft Steel Ptd. Bands Iron Style 9 and 14
Boiler Lagging Magnesia sectional (see note ⑥)
Back head of boiler to be lagged and jacketed.

THE BALDWIN LOCOMOTIVE WORKS Nov. 1916

N. Conklin

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SPECIFICATION FOR LOCOMOTIVES 4 22 C 212 → 213

FOR North Brothers Company

R.

Frames Cast Steel, cross braced Braces Solid
Cylinder cocks to be worked from cab.
Cylinders, Diam. 14" Stroke 16"
St'm ports, Length 12" Width 1" Bridges ⅞"
Exh. ports, Length 12" Width 2" Valve lead 1/16"
Valve travel 4½" Steam lap ⅞" Exhaust clearance -----
Eccentric crank throw 3¾" By-pass valve None
S. F. Lubr. (Spec.) Detroit Double #12 Bulls Eye (see note ①)
Cyl'r heads Cast Iron; Lubr. pipes of copper under jacket
Cyl'r casings Iron Ptd. Head covers Steel Painted
⑥ St'm chest casings Iron Ptd. Covers Steel Painted
St'm chest valves Balanced, with vacuum valves
Met. pkg {Piston rods / Valve stems} United States (not spec.)

Pistons Cast Iron rings sprung into solid head
Guides Steel Oil cups Needle
Crossheads Cast Steel
Wrist Pins Steel Rod cups Plunger
Parallel rods to have solid ends

Valve Motion Stephenson
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 33" Cen. diam. 28" Centres Cast Steel
Driving wheels to have bronze hub liners
Tires Steel Held by Shrinkage and Shoulder
Tires, Flanged, Pos. All Size 2½" X 4½"
Tires, Plain, Pos. ----- Size -----
Lateral play between driving boxes and wheel hubs = 1/32" total
Driving Boxes Cast Steel
Journals, Diam. 7" Length 8"
Driving springs to be made heavier. Spring links and saddles to be heavier than for previous locomotives
Springs, Make B. L. W.
Make sure that springs are strong enough
Front Engine Truck None Wheeled -----
To swing ----- each side of cen., Cen. pin liners -----
Journals, Diam. ----- Length ----- Boxes -----
Wheels, Diam. ----- Tread ----- Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----

Back Engine Truck None Wheeled -----
To swing ----- each side of cen., Cen. pin liners -----
Journals, Diam. ----- Length ----- Boxes -----
Wheels, Diam. ----- Tread ----- Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----

Brake, position On all driving wheels, (No tender)
Operating parts: Engine, Sch. ----- American Steam; Eng. Tr'k, sch. -----
Foundation parts: Drivers, sch. ----- B. L. W.; Eng. Tr'k, sch. -----
Air pump ----- Pos. -----
Train connections -----
Train signal, sch. None
Brake to have B.L.W. foundation parts with American
Brake Co's operating fixtures for steam brake.
Brake Shoes, Ross - Meehan

Tender - None

Tank 800 Gallons, Bill 4093
Tanks rectangular shape, located at sides of boiler.
Tank moved forward 12" to improve weight distribution.

① Cab to be well secured to the boiler and the floor, with rear entrance. Side, front and rear windows with glass and sash. Side windows arranged to slide.
Cab to have sliding ventilator in roof.
Tool boxes, cushions and arm rests to be furnished.
Lubricator to be placed to the left of water gauge so water gauge can be seen by Engineer.

② Marker Lamp on back of cab, left side, high up, in addition to headlight on right side.

③ Grab irons to be applied at sides of opening in back of cab. Grab iron across back opening to be omitted.

④ Bumpers to be well ribbed and braced, with radial draw bars, with clevis on outside end. Drawbars to have big swing.
All to be designed to suit the curves.
Wood bumper blocks to be applied on face of bumper 41" wide by 8" high by 10" deep, with iron plate face ⅜" thick.
Bottom of bumpers to be 4" above rail.

⑤ Sand Boxes Rectangular located below tank. Rear sand boxes to be larger.
Change location of feed pipe reservoir and tank bearer to make room for larger sand boxes.
Lids of sand boxes to be made so the sand will go into the boxes and not on to the ground when filling.
Sander rigging to be simpler and to work easier.

⑥ Cylinders to be lagged with wood.

⑦ Tool equipment to include two jack screws and levers, tallow can, three oil cans, one set of steel wrenches fitting all nuts and bolts on the engine, two monkey wrenches, one hard one and one soft hammer, two chisels, valve gauge, pinch bar, poker, scraper and Engineer's torch. Tool Sch. No. 26

⑧ Locomotive to be subject at all times to the inspection and approval of Worth Bros. Co's representative.
Copies of orders for plates and tubes to be sent to Mr. E. L. Murphey, P.A.

Photo. Sch. #2 Inspection (see note ⑧)
To be Weighed Yes Material Spec'ns. B. L. W.
Certificate of boiler test Three copies of B.L.W. form 1036.
Junior Laws to 9-28-16 Shipment on Car

Brass shop finish, No 1
Machine shop finish D-165

B. L. W. Patents } Throttle, Patented Jan. 23, 1900 (Cast On)

Property plates None

Painting:- Engine style 272 Olive Green and Aluminum
Painting:- Tender, style -----

Lettering, etc. to be similar to 4 - 22 C 187 etc.
Mark on tank sides W. B. Co. 11
Road No. on tank to be on same line with mark.

Road Nos. Pos.	Road Nos.	Name None
F. No Plate	11	
Cab sides	12	
Sides of tank		

THE BALDWIN LOCOMOTIVE WORKS As Spec'n. C-4444 Dup. 4-22 C 212-213 except where otherwise specified

Memorandum Spec'n 17028

SPECIFICATION FOR LOCOMOTIVES 4 22 C 267 - 268 Gen. as Photo. 6132

FOR Worth Brothers Company **Engine Drawing No.** 36

R. 2-10-17

Gauge of Road 2' 6" Play ½"
Wheelbase, Rigid 5' 6" Driving 5' 6" Total 5' 6"
Total wheelbase, eng. and tend. (Actual ----- (Limited to -----

Curves 56' 0" radius

Limits, Height and width same as for 4-22 C 212 etc.
Weight approximate) in working order, Total 62,000 lbs.
On F. tr'k ----- lbs., Drivers 62,000 lbs., B. tr'k ----- lbs.

Tractive power 13,300 lbs., Ratio of adhesion 4.66
Work'g St'm Pres. 165 lbs., Service Switching
Fuel Soft Coal

Front tube sheet to be ½" thick
Boiler Worth Bros. Steel Thick 7/16" Bill 7610
Boiler, Diam. 44" Plan Straight Top

Boiler st'm pres. 165 lbs., Tested to (185 lbs. steam pres.
with factor of safety of 5.46 (220 lbs. water pres.
Longitud. seams Butt jointed, double covering strips

Dome, diam. 22" Pos. Central

Firebox Worth Bros. Steel Combustion chamb. None
Firebox, length 43-11/16" Width 33⅜" Depth F. 47¾" S. 42½"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diam.
Water space, Front 3" Sides 2½" Back 2½"
Water space, Frame Single Riveted
Water space stays ⅞" diam. with 3/16" holes 1¼" deep from O.S.

Radial stays 1" diam. Sling stays front None
Button heads below crown on Six central rows
Crown bars None Placed ----- above crown
Crown bolts -----

Flues -----
Tubes #12 W. G. Worth Bros. Charcoal Iron
Tube ends Swaged for copper ferrules, fire box ends
Number 110 Diam. 2" Length 9' 3"

Heating Flues ----- Combus. Chamb. ----- Total 578.0
Surface Tubes 528.0 Fire Box 50.0 Fire Brick Tubes -----
Grate area 10.1 Ratio to Heating Surface 1 : 57.2
Superheater -----

Fire Brick Arch, None

Grates Rocking bars and drop plate
Ash Pan, Dampers Front and Back
Ash pan dampers to be operated from cab

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Smokebox extension With Cleaning hole and cap None
Spark ejector or hopper None
Netting and deflect. plates With
Front end arrangement to be self-cleaning type
Exhaust nozzles Double high

Stack Straight Dia. 12¾" Hole in S. B., dia. 16½"

Safety Valves (Spec) Two Coale 1½"
Safety valves None with relief lever, Set to 165 pounds
Whistle B. L. W. Plain

Steam Gauge One Iron 7" MAKER:-Ashcroft (not spec)
Steam gauge stand Iron **Clock** None
Cylinder lubricator to be placed to left of water gauge
Water Gauge One B.L.W. (Ironclad) **Cab Lamps** to burn oil
Gauge Cocks Three Back Surface valve None
Lowest gauge cock 3" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One Homestead POS:-Left Side
Cleaning Plugs
Firebox Corners diagonal
Crown, One each side and two back
Waist, One under front
Front tube sheet, One Fusible plug One

Pump None Pos. -----
Top chamb. ----- Bottom chamb. -----
Feed Cock ----- Feed pipes -----
Checks ----- Check pipes -----

Injectors (Spec) Two Sellers, Class "N" No. 7½
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. Right and Left

Steam Heat None

Engineer's seats to be fastened on seat box
Cab Sheet steel. Sliding ventilator in cab roof
Cab to have rear entrance, with grab irons at sides of opening. Omit coal bunker from cab.
Cab boards Steel Nosing Angle Iron
Running boards None Nosing -----
Hand rail Iron Pipe Located on Cab

* **Back Bumper** Cast Steel
Bumpers to have long radius
Bumpers to have wooden blocks applied to face
Pilot None Pushing shoes None
* **Front Bumper** Cast steel Bumper plate None
Steps Hanging foot boards with hand holds, front and back

F.& B Drawhead, Center above rail 15⅝"
Coupler Swinging Link type

Signal fixtures None
Marker lamp on back of cab, left side, high up, in addition to headlight on right side.
Headlight Two Round Case 12" Reflector, To burn Kerosene
Headlight, Nos. on sides With H'd'l't step None
Lamp shelf None Nosing -----

Bell 45 pounds on bumper, Gollmar Steam Bell Ringer
Sand Box Four Diam. ----- Body Iron Painted. Pipes Iron
Sander Hand, in each box, to sand front and back

Dome casing Iron Painted
Back head of boiler to be lagged and jacketed.
Boiler Jacket #22 Soft Steel Pt'd Bands Iron Style 9 and 14
Boiler Lagging Magnesia sectional

* Front Bumper as B.L.W. Card 10029, foot plate as B.L.W. card 2943, back bumper as B.L.W. tracing 33803, approved by Co. Pivot brackets for back drawbar are to be made separate from bumper beams, similar to construction of front ones and same should be made heavier.

11-266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS
N. Conklin

SPECIFICATION FOR LOCOMOTIVES 4 22 C 267 - 268 94

FOR Worth Brothers Company
R.

Frames Cast steel, cross braced Braces Solid
Cylinder cocks to be worked from Cab.
Cylinders, Diam. 14" Stroke 16"
St'm ports, Length 12" Width 1" Bridges ⅞"
Exh. ports, Length 12" Width 2" Valve lead 1/16"
Valve travel 4½" Steam lap ⅞" Exhaust clearance -----
Eccentric-crank-throw 3⅜" By-pass valve None
S. F. Lubr. (Spec) Detroit double #12 Bulls Eye
Cyl'r heads Cast Iron; Lubr. pipes of copper under jacket
Cyl'r casings Iron Pt'd. Head covers Steel Painted
St'm chest casings Iron Pt'd. Covers Steel Painted
St'm chest valves Balanced with vacuum valves
Met. pkg (Piston rods / Valve stems) United States (not spec)
Cylinder to be lagged with wood
Pistons Cast iron rings sprung into solid head
Guides Steel Oil cups Needle
Crossheads Cast Steel
Wrist Pins Steel Rod cups Plunger
Parallel rods to have solid ends

Valve Motion Stephenson
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.
Driving wheels to have hub liners of bronze
Drivers, O. S. Diam. 33" Cen. diam. 28" Centers Cast Steel

Tires Steel Held by Shrinkage and Shoulder
Tires, Flanged, Pos. All Size 2½" X 4¾"
Tires, Plain, Pos. None Size -----
Lateral play between driving boxes and wheel hubs = 1/32" total
Driving Boxes Cast steel, with babbitt on hub face
Journals, Diam. 7" Length 8"

Springs and links to be heavy
Springs. Make B. L. W.

Front Engine Truck None Wheeled -----
To swing -----each side of cen., Cen. pin liners -----
Journals, Diam. ----- Length ----- Boxes -----
Wheels, Diam. ----- Tread ----- Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----

Back Engine Truck None Wheeled -----
To swing -----each side of cen., Cen. pin liners -----
Journals, Diam. -----Length ----- Boxes-----
Wheels, Diam. ----- Tread ----- Kind -----
Tires ----- Cen. diam. -----Size -----
Tires held by -----

Brake, position On all driving wheels (no tender)
Operating Parts: Engine, Sch. ----- American Steam; Eng. Tr'k, sch.
Foundation Parts: Drivers, sch. ----- B. L. W.; Eng. Tr'k, sch.
Air pump ----- Pos. -----
Train connections -----
Train signal, sch. -----
Brake shoes to be Ross-Meehan

Tender None Wheeled, Drawing No. -----
Weight, with fuel and water, about -----

Tank 800 Gallons. Bill 4093
Tanks rectangular shaped, located at sides of boiler

Tool Boxes -----

Frame -----

Front Drawbar height -----
Pilot ----- Pushing shoes -----
Back drawhead, center above rail -----
Coupler -----

Steps -----

Trucks -----

Springs -----
Journals, Diam. ----- Length -----
Wheels, Diam. ----- Tread -----Kind -----
Tires ----- Cen. diam. -----Size -----
Tires held by -----
Safety chains -----

Brake Position -----
Brake sch. -----
★ Logos. to be subject at all times to the inspection and approval of Worth Bros. Co's representative.

List of tools, sch. 26
Photo sch. None Inspection B. L. W. except see ★ above
To be weighed Yes Material spec'ns B. L. W.
Certificate of boiler test Three copies of B.L.W. form 1036
Junior laws to 9-28-16 Shipment On car

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. } None
Patents }

Property plates None

Painting:—Engine, style 222 Olive Green and Aluminum
Painting:—Tender, style -------

Lettering, etc. to be same as for 4-22 C 212 & 213
Mark on tank sides, W. B. Co.- 13

Road No. on tank to be on same line with mark
Road Nos. Pos. Road Nos. Name None
F.No. Plate 13
Cab Sides 14
Sides of tank

Pp. 266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-4128 Dup. 6 38 D 50 & 51 except where otherwise specified.

Memorandum Spec'n 11200

SPECIFICATION FOR LOCOMOTIVES 6 38 D 67

Gen. as Photo. 5084 except to have Walschaerts valve motion.

FOR Worth Brothers Company 11-3-16

R. **Engine Drawing No.** 19

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"
Total wheelbase, eng. and tend. (Actual 43' 7" / Limited to ------

Curves 200 feet radius

Limits, Height 14' 2" Width ------
Weight (approximate) in working order, Total 160,000 lbs.
On F. tr'k ----- lbs., Drivers 160,000 lbs., B. tr'k ----- lbs.

Tractive power 37,750 lbs., Ratio of adhesion 4.25
Work'g St'm Pres. 180 lbs., Service Switching
Fuel Bituminous Coal

Front tube sheet ½" thick
Boiler Steel Thick 13/16" Bill 72-3
Boiler, Diam. 74" Plan Straight Top

Boiler st'm pres. 180 lbs., Tested to (200 lbs. steam pres. / 240 lbs. water pres.
with factor of safety of 4.7
Longitud. seams Butt jointed, double covering strips

Dome, diam. 33" Pos. Central
Dome to be large for inspection purposes.
Firebox Steel Combustion chamb. None
Firebox, length 96⅛" Width 39" Depth F. 71¾" B. 69¼"
Firebox, Tube ½" Crown ½" Sides ⅜" Back ⅜"
Firedoor opening 16" diam.
Water space, Front 4" Sides 4" Back 4"
2 Water space, Frame Double Riveted
2 Water space stays ⅞" diam. with 3⅛6" hole 1¼" deep from O.S.
Flexible staybolts, 15⅛6" diam. American about 400 in breaking zone.
Radial stays 1" diam. Sling stays front (Three rows of B. L. W. Expansion Stays.
Button heads below crown on Six central rows
Crown bars None Placed ----- above crown
Crown bolts -----

Flues None
Tubes #12 W. G. Charcoal Iron
Tube ends Swaged for copper ferrules, firebox ends
Number 330 Diam. 2" Length 11' 0"
Tubes to have ¾" spaces.

Heating Surface Flues None Combus. Chamb. None Total 2046⁰
Tubes 1896⁰ Fire Box 160⁰ Fire Brick Tubes -----
Grate area 26⁰ Ratio to Heating Surface 1 : 78.7
Superheater -----

Fire Brick Arch None

Grates Dumping Table type, without drop grate.
3 **Ash Pan,** Dampers None

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

4 **Smokebox** extension With Cleaning hole and cap None
Spark ejector or hopper None
Netting and deflect. plates With

Exhaust nozzles Double high

Stack Straight Dia. 16" Hole in S. B., dia. 18"

Safety Valves (not spec) Three Consolidated 3" One muffled
Safety valves None with relief lever, Set to (180 lbs. muffled / 183 lbs. Open
Whistle (See sup. 5-6)

Steam Gauge One (See sup. 5-7)
Steam gauge stand Iron **Clock** None

Water Gauge One (See sup. 9) **Cab Lamps** to burn oil
5 **Gauge Cocks** Three Back Surface valve None
Lowest gauge cock 4" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One Crane 2" (to use stock) POS:-Front
Cleaning Plugs (See sup. 10)
Firebox Corners diagonal, sides
Crown, Two each side and one back
Waist, Two under: one front and one back
Front tube sheet, None Fusible plug One

Pump None Pos. -----
Top chamb. ----- Bottom chamb. -----
Feed Cock ----- Feed pipes -----
Checks ----- Check pipes -----

11 **Injectors** (spec) Two Sellers, Class "N" No. 9½
Injectors, Pos. Right and Left (Sup 11) Steam pipes Copper
Pipes, Check Copper Feed Iron Overflow Iron
Check Sellers Pos. Right and Left

Steam Heat None

Cab Steel (See sup. 12-13) Ventilator in cab roof

Cab boards Steel Plate Nosing T-Iron
14 Running boards Steel Plate Nosing T-Iron
Hand rail Iron Located on Boiler

17 **Back Bumper** Bar Steel Back drawbar height 32"
18

Pilot None Pushing shoes Cast in bumper
Front Bumper Cast Steel Bumper plate None
15 **Steps,** Hand holds, etc. to conform to I.C.C. requirements.
16

Front Drawhead, Center above rail 34½"
Coupler Sharon M. C. B. Automatic

Signal fixtures None

19 **Headlight** Two Round Case 16" Reflector, To burn Kerosene
Headlight, Nos. on sides With H'd'l't step With
Lamp shelf None Nosing -----

Bell 92 pounds. Gollmar Air Bell Ringer.
20 **Sand Box** Two Diam. 28" Body Iron Painted Pipes Iron
Sander (See sup. 21)

Dome casing Iron Painted

22 **Boiler Jacket** #18 Steel Ptd. Bands Iron Style 9 and 14
Boiler Lagging Magnesia sectional
Back head of boiler to be lagged and jacketed

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THE BALDWIN LOCOMOTIVE WORKS
E. H. Kalbach Feb. 1917
SPECIFICATION FOR LOCOMOTIVES 6 38 D 67

FOR Worth Brothers Company
R.

23 26 **Frames** Cast Steel Braces Solid

27 **Cylinders,** Diam. 22" Stroke 26" (See sup. 27)
St'm ports, Length 19" Width 1⅞" Bridges 1⅛"
Exh. ports, Length 19" Width 2¼" Valve lead ¼"
Valve travel 5¼" Steam lap ¾" Exhaust clearance -----
Eccentric crank throw 12-7/32" By-pass valve None
S. F. Lubr. (Spec) Detroit Triple #22 Bulls Eye
Cyl'r heads Cast Iron; Lubr. pipes of copper under jacket
28 Cyl'r casings Iron Ptd. Head covers Steel Painted
St'm chest casings Iron Ptd. Covers Steel Painted
St'm chest valves Richardson Balanced, with vacuum relves
Met. pkg (Spec) Piston rods / valve stems Hayden Single Ring Pkg. Co., Columbus, Ohio.

Pistons Cast Iron rings sprung into solid head
Guides Two Bar Type, Steel Oil cups Needle
29 **Crossheads** Alligator Type, Cast Steel
31 **Wrist Pins** Steel Rod cups Plunger, for all rods
30 Parallel Rods to have solid ends.

Valve Motion Walschaerts
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings (See sup. 30-33-34)

32 **Drivers,** O. S. Diam. 51" Cen. diam. 44", Centres Cast Steel

Tires Steel Held by Shrinkage and Shoulder
Tires, Flanged, Pos. Front and Back Size 3½" X 5½"
32 Tires, Plain, Pos. Middle Size 3½" X 6½"
Lateral play between driving boxes and wheel hubs = 1/16" total
34 **Driving Boxes** Cast Steel
Journals, Diam. 9" Length 12"

Driving springs, of Vanadium Steel
Springs. Make Standard Steel Works

Front Engine Truck None Wheeled -----
To swing ----- each side of cen., Cen. pin liners -----
Journals, Diam. ----- Length ----- Boxes -----
Wheels, Diam. ----- Tread ----- Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----

Back Engine Truck None Wheeled -----
To swing ----- each side of cen., Cen. pin liners -----
Journals, Diam. ----- Length ----- Boxes -----
Wheels, Diam. ----- Tread ----- Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----

5 35 **Brake,** position On all driving and tender wheels
Operating Parts: Engine, Sch. Al & SWA West'g. Auto. and Straight Air / Eng. Tr'k, sch. -----
Foundation Parts: Drivers, sch. WM-3 and BC, American O.S. Equalized / Eng. Tr'k, sch. -----
Air pump Two 9½" Right and Left POS:-Both, Left side
Train connections Front and Back
Train signal, sch. None
Air Reservoirs to have a hydrostatic test of 230 pounds.

Tender Eight Wheeled, Drawing No. 435
Weight, with fuel and water, about 90,000 lbs.
Tender to be same design as shown on Photo. 5084 (6 38 D 41)
Tank 4500 Gallons. Bill 4385
Tank "U" shape, sloping back.
Coal Gates of steel. Fuel capacity 6 tons.
Tool Boxes of steel built into legs of tank.
Coal boards to be same as shown on Photo. 5084 (6 38 D 41)
Frame Steel 10" Channels
Front and back bumpers to have ¾" plate in back of same
17 Front Drawbar height 33"
18 Pilot None Pushing shoes at rear.
Back drawhead, center above rail 34½"
Coupler Sharon M.C.B. Auto. with 12¼" head and with Westinghouse Friction draft gear.

15 16 Steps, hand holds, etc. to conform to I.C.C. requirements.

Trucks Arch Bar type with cast steel bolster.
Truck spring plank to be of Channel Iron
Springs Elliptic. B. L. W. make.
Journals, Diam. 5" Length 9" Journal Bearings, B. L. W.
Wheels, Diam. 33" Tread 4¼" Kind Midvale Rolled Steel
Tires None Cen. diam. ----- Size -----
Tires held by ----- Wheel Rims 2½" thick
Safety chains Single

Brake Position On all wheels
Brake sch. FL-1212 & SAB West'g. Auto. and Straight Air.

List of tools, sch. 29
Photo sch. #2 Inspection B.L.W. except (See sup. 1)
To be weighed Yes Material specifns B. L. W.
Certificate of boiler test Three copies of B.L.W. form 1036.
Junior laws to 12-20-16 Shipment On own wheels, under steam.

Brass shop finish. No. 1
Machine shop finish D-165

B. L. W. Patents: Throttle Patented Jan. 23, 1900 (Cast On)
Feed Pipe Strainer, Patented Sept. 1, 1903 (Cast On)

Property plates None

Painting: Engine, style 291 Olive Green and Gold
Painting: Tender, style 291 Olive Green and Gold

Lettering, etc. to be similar to 6 38 D 50 - 51
Mark on Tank Sides, W. B. Co. 106

Front number plate to be 14½" diameter
Road Nos. Pos. Road Nos. Name None
F.No Plate 106
Cab Sides

11-266-67 Photo copied see box

SPECIFICATION FOR LOCOMOTIVES 6 38 D 67

FOR NORTH BROTHERS COMPANY.

R.

1 LOCOMOTIVES TO BE SUBJECT AT ALL TIMES TO THE INSPECTION AND APPROVAL OF NORTH BROTHERS CO'S REPRESENTATIVE.

2 BOTTOM ROW OF STAYBOLTS IN WATER LEG AND RIVETS FOR MUD RING TO COME ABOVE FRAME AND BE ARRANGED SO THAT THE BOILER MAY BE PATCHED READILY AT THIS POINT.

3 ASH PAN TO BE DUMPING TYPE WITH CLEANING DOORS IN BOTTOM OF PAN. DOORS TO BE OPERATED FROM THE SIDE OF LOCOMOTIVES

4 FRONT END ARRANGEMENT TO BE M.M. STANDARD SELF CLEANING TYPE.

5 STEAM AND AIR GAUGES, GAUGE COCKS AND WHISTLE TO BE MANUFACTURED BY THE STAR BRASS MFG. CO. (SPEC)

6 WHISTLE TO BE No.3 STANDARD 5" CHIME, 200 LBS. (SUP. 5)

7 STEAM GAUGES TO BE 6½" IRON CASE WITH DOUBLE SPRING, "BDN" STANDARD LOCOMOTIVE TYPE WITH BLACK DIAL (SEE SUP. 5)

9 WATER GAUGE TO BE LATEST IMPROVED SAFETY TYPE.

10 CLEANING HOLES TO HAVE PLUGS INSTEAD OF HAND HOLES. ONE PLUG EACH SIDE IN WAIST, BACK OF SAND BOX AND JUST ABOVE THE LONGITUDINAL SEAM; AND ONE PLUG EACH SIDE OF FIRE DOOR ABOUT 5" ABOVE RUNNING BOARD.

11 INJECTORS TO BE SELF ACTING TYPE FOR HOT WATER AND TO BE LOCATED AS LOW AS POSSIBLE. INJECTOR TO BE LOCATED LOWER THAN FOR 6 38 D 50 - 51

12 CAB TO BE BUILT IN ACCORDANCE WITH CO'S PRINT G-675, DATED JAN. 1, 1916.

13 CAB TOOL BOXES AND CAB SEAT BOXES TO BE MADE OF STEEL.

14 RUNNING BOARDS TO EXTEND UP TO STEAM CHESTS.
BRACKET SUPPORT FOR RUNNING BOARD ON FIRE BOX, AND NOT TO BE ATTACHED TO BOILER, WITH FOOT TURNED UP.

15 STEP TO BE PROVIDED IN FRONT OF ENGINE WITH BRACKETS OF STEEL, SUPPORTING A STEEL PLATE ON WHICH IS BOLTED AN OAK PLANK.
ADDITIONAL STEPS ON BACK OF FRONT BUMPER BEAM.

16 ONE STEP ON RIGHT SIDE AND TWO STEPS ON LEFT SIDE OF SMOKE BOX.

17 ECONOMY DEVICES CORPORATION CAST STEEL (DOUBLE SPRING) RADIAL BUFFER TO BE APPLIED BETWEEN ENGINE AND TENDER.

18 ADDITION CLEARANCE OF 2" TO BE PROVIDED BETWEEN ENGINE AND TENDER ON ACCOUNT OF CURVES.

19 HEADLIGHTS FROM STAR HEADLIGHT CO.-CASE TO BE 30½" HIGH, 16" FACE, BASE ON BOTTOM OF RESERVOIR TO BE 9¾" WIDE.

20 SAND BOXES AND DOME TO HAVE TWO BRASS BANDS ⅝" WIDE.

21 SANDER TO BE SAME AS FOR 6 38 D 50 - 51, i.e., (COPY) LEACH AIR TRAP D SINGLE IN EACH BOX TO SAND FRONT AND REAR. (OMIT HAND SANDER) BOTTOM SAND PIPES TO BE 2" INSIDE DIAM.

22 TOP AND SIDES OF FIREBOX INSIDE OF CAB TO BE LAGGED AND JACKETED.

23 FRAMES TO BE THOROUGHLY ANNEALED AND TO HAVE DOUBLE FORWARD SECTION. FRAMES TO HAVE GOOD CROSS BRACES.

26 PEDESTAL WEDGES AND GIBS OF CAST IRON.

27 CYLINDERS TO BE BUSHED.

28 CYLINDERS TO HAVE MAGNESIA SECTIONAL LAGGING.

29 CROSSHEADS TO HAVE SIDE PLATES.
CROSSHEAD GIBS OF WROT IRON, BABBITTED.

30 MAIN ROD BRASSES AND SIDE ROD BUSHINGS TO BE DAMASCUS NICKEL BRONZE.

31 WRIST PINS TO BE RIVETED OVER.

32 THE BLIND TIRES ON MIDDLE WHEELS TO BE AS WIDE AS PRACTICABLE.

33 DRIVING WHEELS TO HAVE HUB LINERS OF DAMASCUS NICKLE BRONZE.

34 DRIVING BOXES TO HAVE HEAVY DAMASCUS NICKEL BRONZE BEARINGS WITH SUITABLE OIL GROOVES.

35 MAIN RESERVOIRS TO HAVE DRAIN COCKS.

36 AIR PUMP EXHAUST TO BE PIPED INTO CYLINDER SADDLE.

37 DRIVING BRAKE CYLINDERS TO BE 14" X 10".

T E N D E R.

165 STEPS TO BE PROVIDED AT REAR OF TENDER WITH BRACKETS OF STEEL, SUPPORTING A STEEL PLATE ON WHICH IS BOLTED AN OAK PLANK.
SIDE STEPS TO BE PROVIDED AT REAR OF TENDER.
HAND RAIL ON TANK, ONLY 26" HIGH.

11-266-67 Photo copied see box

Dup. 6 38 D 67 with same extras except where otherwise specified.

THE BALDWIN LOCOMOTIVE WORKS

Memorandum Spec'n 17122.

SPECIFICATION FOR LOCOMOTIVES 6 38 D 80.

FOR Worth Brothers Company.

L.

9-11-17.

Gen. as Photo. 6352

Engine Drawing No. 19.

Gauge of Road 4' 8½" Play ¾"

Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"

Total wheelbase, eng. and tend. { Actual 43' 7" / Limited to - - -

17 **Curves** 200 feet radius.

Limits, Height 14' 2" Width - - -

Weight (approximate in working order, Total 160,000 pounds

On F. tr'k - - - lbs. Drivers 160,080 lbs., B. tr'k - - - lbs.

Tractive power 37,750 lbs., Ratio of adhesion 4.25

Work'g St'm Pres. 180 lbs., Service Switching

Fuel Bituminous Coal

Front tube sheet ½" thick.

Boiler Steel Thick 13/16" Bill 8050

Boiler, Diam. 74" Plan Straight Top

{Boiler st'm pres. 180 lbs., Tested to { 200 lbs. steam pres. / 240 lbs. water pres.
{With factor of safety of 4.7

Longitud. seams Butt jointed, double covering strips

Dome, diam. 33" Pos. Central

Dome to be large for inspection purposes.

Firebox Steel Combustion chamb. None

Firebox, length 96⅛" Width 39" Depth F. 71¾" B. 69¼"

Firebox, Tube ½" Crown ½" Sides ⅜" Back ⅜"

Firedoor opening 16" diam.

Water space, Front 4" Sides 4" Back 4"

Water space, Frame Double Riveted

2, Water space stays ⅞" diam. with 3/16" hole, 1¼" deep from O.S.

Flexible staybolts, 15/16" diam. American about 400 in breaking zone.

Radial stays 1" diam. Sling stays front { Three rows of B. L. W. Expansion Stays.

Button heads below crown on Six central rows

Crown bars None Placed - - - above crown

Crown bolts - - - -

Flues None

Tubes #12 W. G. Charcoal Iron

Tube ends Swaged for copper ferrules, firebox ends

Number 330 Diam. 2" Length 11' 0"

Tubes to have ¾" spaces.

Heating Surface { Flues None Combus. Chamb. None Total 2046□" / Tubes 1886□" Fire Box 160□" Fire Brick Tubes - - - / Grate area 26□" Ratio to Heating Surface 1 : 78.7 / Superheater - - -

Fire Brick Arch None

Grates Dumping Table type, without drop grate.

3 **Ash Pan,** Dampers None

Throttle Balance Pos. Dome

Dry pipe Steel

Superheater None

Smokebox extension With Cleaning hole and cap None

Spark ejector or hopper None

14 Netting and deflect. plates With

Exhaust nozzles Double, high

Stack Straight - Dia. 16" Hole in S. B., dia. 18"

(not spec) **Safety Valves** Three Consolidated 3" One muffled

Safety valves None with relief lever, Set to { 180 lbs. muffled / 183 lbs. open.

Whistle (see sup. 5-6)

140 **Steam Gauge** One (see sup. 5-7)

Steam gauge stand Iron **Clock** None

Water Gauge One (see sup. 8) **Cab Lamps** to burn oil

5 **Gauge Cocks** Three Back Surface valve None

Lowest gauge cock 4" above highest part of crown

Lubricator steam valve to have separate dry pipe to dome

Blower Valve B. L. W.

Blow off Cock One Crane 2" (to use stock) Pos:- Front

Cleaning Plugs (See sup 9.)

Firebox Corners diagonal, sides

Crown, Two each side and one back

Waist, Two under; one front and one back

Front tube sheet, None Fusible plug One

Pump None Pos. - - -

Top chamb. - - - Bottom chamb. - - -

Feed Cock - - - Feed pipes - - -

Checks - - - Check pipes - - - -

(spec) **Injectors** Two Sellers, Class "K" No. 9½

10 Injectors, Pos. Right and Left Steam pipes Copper

Pipes, Check Copper Feed Iron Overflow Iron

Check Sellers Pos. Right and Left

Steam Heat None.

Cab Steel (see sup 11-a.) Ventilator in cab roof

Cab boards Steel Plate Nosing T-Iron

13 Running boards Steel Plate Nosing T-Iron

Hand rail Iron Located on Sup. 38 Boiler

16 **Back Bumper** Bar Steel Back drawbar height 32"

Pilot None Pushing shoes Cast in Bumper

140 **Front Bumper** Cast Steel Bumper plate None

141 **Steps** Hand holds, etc. to conform to I.C.C. requirements.

140 **Front Drawhead,** Center above rail 34½"

Coupler Sharon M. C. B. Automatic.

Signal fixtures None

18 **Headlight** Two Round Case 16" Reflector, To burn Kerosene

Headlight, Nos. on sides With H'dl't step With

Lamp shelf None Nosing - - - -

Bell 92 pounds. Gollmar Air Bell Ringer.

Sand Box Two Diam. 28" Body Iron Painted Pipes Iron

Sander (see sup. 19-a.)

Dome casing Iron painted.

Boiler Jacket #18 Steel Ptd. Bands Iron Style 9 and 14.

21 **Boiler Lagging** Magnesia sectional.

Back-head of boiler to be lagged and jacketed.

THE BALDWIN LOCOMOTIVE WORKS

E H C Kalbach Nov. 1917

99

SPECIFICATION FOR LOCOMOTIVES 6 38 D 80

FOR Worth Brothers Company.

L.

Frames Cast Steel (see sup. 22-24) Braces Solid

Cylinders, Diam. 22" Stroke 26" (see sup. 27-a.)

St'm ports, Length 19" Width 1⅞" Bridges 1⅛"

Exh. ports, Length 19" Width 2⅝" Valve lead ¼"

Valve travel 5¼" Steam lap ¾" Exhaust clearance - - -

Eccentric crank throw 12-7/32" By-pass valve None

S. F. Cylr. (spec) Detroit Triple #22 Bulls Eye

Cyl'r heads Cast Iron., Lubr. pipes of copper under jacket.

Cyl'r casings Iron Ptd. Head covers Steel Painted

St'm chest casings Iron Ptd. Covers Steel Painted

St'm chest valves Richardson Balanced, with vacuum valves

Met. pkg. (spec) Piston rods Valve stems Hayden Single Ring Pkg. Co., Columbus, Ohio

Pistons Cast Iron rings sprung into solid head.

Guides Two bar type, Steel Oil cups Needle

19 **Crossheads** Alligator type, Cast Steel

21 **Wrist Pins** Steel Rod cups Plunger, for all rods

Parallel Rods to have solid ends.

Valve Motion Walschaerts.

{ Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.

All finished movable nuts of steel or of iron case hardened.

Wearing Bearings (see sup. 30. 33. 34)

23 **Drivers,** O. S. Diam. 51" Cen. diam. 44"., Centres Cast Steel.

Tires Steel Held by Shrinkage and Shoulder.

Tires, Flanged, Pos. Front and Back Size 3½" x 5½"

32 Tires, Plain, Pos. Middle Size 3½" x 6½"

Lateral play between driving boxes and wheel hubs = 1/16" total

31 **Driving Boxes** Cast Steel

Journals, Diam. 9" Length 12"

Driving springs, of Vanadium Steel.

Springs. Make Standard Steel Works.

Front Engine Truck None Wheeled - - -

To swing - - - each side of cen., Cen. pin liners - - -

Journals, Diam. - - - Length - - - Boxes - - -

Wheels, Diam. - - - Tread - - - Kind - - -

Tires - - - Cen. diam. - - - Size - - -

Tires held by - - - -

Back Engine Truck None Wheeled - - -

To swing - - - each side of cen., Cen. pin liners - - -

Journals, Diam. - - - Length - - - Boxes - - -

Wheels, Diam. - - - Tread - - - Kind - - -

Tires - - - Cen. diam. - - - Size - - -

Tires held by - - -

Brake, position On all driving and tender wheels.

5 Operating Parts { Engine, Sch. AI & SWA West'g. Auto. and Straight Air / Eng. Tr'k, sch. - - -

31 Foundation Parts { Drivers, sch. WM-3 and BC, American O.S. Equalized / Eng. Tr'k, sch. - - - -

36 Air pump Two 9½" R&L Pos. Both, Left side.

Train connections Front and back.

Train signal, sch. None

35 Air Reservoirs to have Hydrostatic test of 210 pounds.

Tender Eight Wheeled, Drawing No. 435

Weight, with fuel and water, about 90,000 lbs.

Tender to be same design as shown on Photo. 5084 (6 38 D 41.)

Tank 4500 Gallons. Bill 4551

Tank "U" shape; sloping back.

Coal gates of steel. Fuel capacity 6 tons.

Tool Boxes of steel, built into legs of tanks.

Coal boards to be same as shown on Photo. 5084 (6 38 D 41)

Frame Steel, 10" channels

16-a Front and back bumpers to have ¾" plate in back of same.

140 Front Drawbar height 33"

Pilot None Pushing shoes at rear

140 Back drawhead, center above rail 34½"

51 **Coupler** Sharon M.C.B. Auto. with 12½" head and with West'g. Friction Draft Gear.

51 Steps Hand holds, etc., to conform to I.C.C. requirements.

Trucks Arch bar type with cast steel bolster

Truck spring plank to be of Channel Iron.

Springs Elliptic, B.L.W. make

Journals, Diam. 5" Length 9" Journal Bearings, B.L.W.

Wheels, Diam. 33" Tread 4½" Kind Midvale Rolled Steel.

Tires None Cen. diam. - - - Size - - -

Tires held by - - - Wheel Rims 2½" thick.

Safety chains Single

Brake Position On all wheels

Brake sch. FL-1212 & SNB West'g. Auto. and Straight Air.

11 List of tools, sch. 29

Photo sch. None Inspection B.L.W. except (see sup. 1)

To be weighed No. Material specs'ns B.L.W.

Certificate of boiler test Three copies of B.L.W. form 1036

Junior laws to 12-20-16 Shipment On own wheels, under steam.

Brass shop finish, No. 1.

Machine shop finish D-165.

B. L. W. Patents } Feed Pipe Strainer, Patented Sept. 1, 1903 (Cast on)

Property plates None

Painting:—Engine, style 291 Olive Green and ~~Gold~~ Aluminum

Painting:—Tender, style 291 Olive Green and ~~Gold~~ Aluminum. 12/29/17.

Lettering, etc. to be similar to 6 38 D 67

Mark on Tank Sides, W. B. Co. 107

Front number plate to be 14½" diameter.

Road Nos. Pos. Road Nos. Name None

F. No. Plate 107

Cab Sides.

11 p. 266-67 Photo copied see box

SPECIFICATION FOR LOCOMOTIVES 6 38 D 80. 100

FOR WORTH BROTHERS COMPANY.

L.

1 LOCOMOTIVES TO BE SUBJECT AT ALL TIMES TO THE INSPECTION AND APPROVAL OF WORTH BROTHERS Co'S REPRESENTATIVE.

2 BOTTOM ROW OF STAYBOLTS IN WATER LEG AND RIVETS FOR MUD RING TO COME ABOVE FRAME AND BE ARRANGED SO THAT THE BOILER MAY BE PATCHED READILY AT THIS POINT.

3 ASH PAN TO BE DUMPING TYPE WITH CLEANING DOORS IN BOTTOM OF PAN. DOORS TO BE OPERATED FROM THE SIDE OF LOCOMOTIVES.

4 FRONT END ARRANGEMENT TO BE M. M. STANDARD SELF CLEANING TYPE.

5 STEAM AND AIR GAUGES, GAUGE COCKS AND WHISTLE TO BE MANUFACTURED BY THE STAR BRASS MFG. Co. (spec) Ewiff straight32 air gauges to be taken off (RECEIVED BY MISTAKE) 10/19/17.

6 WHISTLE TO BE No. 3 STANDARD 5" CHIME, 200 LBS. (SEE SUP 5)

7 STEAM GAUGES TO BE 6½" IRON CASE WITH DOUBLE SPRING, "BDN" STANDARD LOCOMOTIVE TYPE WITH BLACK DIAL. (SEE SUP. 5)

8 WATER GAUGE TO BE LATEST IMPROVED SAFETY TYPE.

9 CLEANING HOLES TO HAVE PLUGS INSTEAD OF HAND HOLES. ONE PLUG EACH SIDE IN WAIST, BACK OF SAND BOX AND JUST ABOVE THE LONGITUDINAL SEAM., AND ONE PLUG EACH SIDE OF FIRE DOOR ABOUT 5" ABOVE RUNNING BOARD.

10 INJECTORS TO BE SELF ACTING TYPE FOR HOT WATER AND TO BE LOCATED AS LOW AS POSSIBLE. INJECTOR TO BE LOCATED LOWER THAN FOR 6 38 D 50 - 51.

11 CAB TO BE BUILT IN ACCORDANCE WITH Co'S PRINT G-675, DATED JANUARY 1, 1916.

12 CAB TOOL BOXES AND CAB SEAT BOXES TO BE MADE OF STEEL.

13 RUNNING BOARDS TO EXTEND UP TO STEAM CHESTS.
BRACKET SUPPORT FOR RUNNING BOARD ON FIREBOX, AND NOT TO BE ATTACHED TO BOILER, WITH FOOT TURNED UP.

14 STEP TO BE PROVIDED IN FRONT OF ENGINE WITH BRACKETS OF STEEL, SUPPORTING A STEEL PLATE ON WHICH IS BOLTED AN OAK PLANK.
ADDITIONAL STEPS ON BACK OF FRONT BUMPER BEAM.

15 ONE STEP ON RIGHT SIDE AND TWO STEPS ON LEFT SIDE OF SMOKE BOX.

16 ECONOMY DEVICES CORPORATION CAST STEEL (DOUBLE SPRING) RADIAL BUFFER TO BE APPLIED BETWEEN ENGINE AND TENDER.

17 ADDITION CLEARANCE OF 2" TO BE PROVIDED BETWEEN ENGINE AND TENDER ON ACCOUNT OF CURVES.

18 HEADLIGHTS FROM STAR HEADLIGHT Co:- CASE TO BE 30½" HIGH 16" FACE, BASE ON BOTTOM OF RESERVOIR TO BE 9½" WIDE.

19 SAND BOXES AND DOME TO HAVE TWO BRASS BANDS 5" WIDE.

20 SANDER TO BE SAME AS FOR 6 38 D 50 - 51, i.e. (spec) LEACH MFG TRAP D SINGLE IN EACH BOX TO SAND FRONT AND REAR. (OMIT HAND SANDER) BOTTOM SAND PIPES TO BE 2" INSIDE DIAM.

21 TOP AND SIDES OF FIREBOX INSIDE OF CAB TO BE LAGGED AND JACKETED.

22 FRAMES TO BE THOROUGHLY ANNEALED AND TO HAVE DOUBLE FORWARD SECTION. FRAMES TO HAVE GOOD CROSS BRACES.

26 PEDESTAL WEDGES AND GIBS OF CAST IRON.

27 CYLINDERS TO BE BUSHED.

28 CYLINDERS TO HAVE MAGNESIA SECTIONAL LAGGING.

29 CROSSHEADS TO HAVE SIDE PLATES.
CROSSHEAD GIBS OF WROT IRON, BABBITTED.

30 MAIN ROD BRASSES AND SIDE ROD BUSHINGS TO BE DAMASCUS NICKEL BRONZE.

31 WRIST PINS TO BE RIVETED OVER.

32 THE BLIND TIRES ON MIDDLE WHEELS TO BE AS WIDE AS PRACTICABLE.

33 DRIVING WHEELS TO HAVE HUB LINERS OF DAMASCUS NICKEL BRONZE.

34 DRIVING BOXES TO HAVE HEAVY DAMASCUS NICKEL BRONZE BEARINGS, WITH SUITABLE OIL GROOVES.

35 MAIN RESERVOIRS TO HAVE DRAIN COCKS.

36 AIR PUMP EXHAUST TO BE PIPED INTO CYLINDER SADDLE.

37 DRIVING BRAKE CYLINDERS TO BE 14" x 10".

38 2band Rail around dome and sand boxes/ 2band Railing along outside of running boards, both sides of loco, with step at end of running boards down to Steam chests. 10-8-17.

40 ALL THE NECESSARY SAFETY APPLIANCES AS REQUIRED BY THE LAWS OF THE STATE OF PENNSYLVANIA, TO BE PROVIDED. (SUP.

TENDER.

51 STEPS TO BE PROVIDED AT REAR OF TENDER WITH BRACKETS OF STEEL, SUPPORTING A STEEL PLATE ON WHICH IS BOLTED AN OAK PLANK.
SIDE STEPS TO BE PROVIDED AT REAR OF TENDER.
HAND RAIL ON TANK, ONLY 26" HIGH.

THE BALDWIN LOCOMOTIVE WORKS As Spec'n. C-1648

Memorandum Spec'n 17023

SPECIFICATION FOR LOCOMOTIVES 4 16 C 148

FOR The Phoenix Iron Company

R.

Gen. #8 Photo. 3190 {Except built to a limited height

Engine Drawing No. 25

2-2-17

Gauge of Road 2' 11" Play 3/8"

Wheelbase, Rigid 5' 0" Driving 5' 0" Total 5' 0"

Total wheelbase, eng. and tend. {Actual ----- / Limited to -----

Curves -----

(1) **Limits,** Height ~~7' 10"~~ Rigid Width {6' 4" over Cab / 6' 8" over Bumpers

Weight (approximate) in working order. Total 42,000 pounds

On F. tr'k ----- lbs., Drivers 42,000 lbs., B. tr'k ----- lbs.

Tractive power 9050 lbs., Ratio of adhesion 4.6

Work'g St'm Pres. 165 lbs., Service Switching

Fuel Soft Coal

Front Tube sheet to be 1/2" thick

(2) **Boiler** Steel Thick 7/16" Bill 8086

(3) Boiler, Diam. 36" Plan Straight Top

(4) Boiler st'm pres. 165 lbs., Tested to {185 lbs. steam pres. / 248 lbs. water pres.

with factor of safety of 5.75

Longitud. seams Double riveted butt joints

Dome, diam. 19" Pos. Central

Firebox Steel Combustion chamb. None

Firebox, length 42-1/16" Width 30" Depth F. 38 1/2" B. 36 3/4"

Firebox, Tube 1/2" Crown 5/16" Sides 5/16" Back 5/16"

Firedoor opening 14" diam.

Water space, Front 2" and 2 1/2" Sides 2" Back 2"

Water space, Frame Single Riveted

Water space stays 7/8" diam. with 3/16" holes 1 1/4" deep from O. S.

Water space stays to be spaced not over 4" x 4"

Radial stays 7/8" diam. Sling stays front None

Button heads below crown on None central rows

Crown bars None Placed ----- above crown

Crown bolts -----

Flues ----- / **Tubes** 2" #11 (house stock) W. G. Seamless Steel

Tube ends Swaged for copper ferrules, fire box ends

Number 76 Diam. 2" Length 8' 4 1/2"

(If seamless steel tubes will delay shipment, use Charcoal Iron)

Heating Surface Flues ----- Combus. Chamb. -----Total 370[sq]

Tubes 330[sq] Fire Box 40[sq] Fire Brick Tubes -----

Grate area 9.7[sq] Ratio to Heating Surface 1 : 42.5

Superheater -----

Fire Brick Arch, None

Grates Rocking Bars and cast iron

Ash Pan, Dampers Right and Left

Throttle Balance Pos. Dome

Dry pipe Steel

Superheater None

Smokebox extension Short Cleaning hole and cap Underneath

Spark ejector or hopper None

Netting and deflect. plates With

Exhaust nozzles Single high

Stack Straight Dia. 9" Hole in S. B., dia. 10"

Safety Valves (not spec) Two Consolidated 1 1/2"

Safety valves None with relief lever, Set to 165 pounds

Whistle B. L. W. plain

Steam Gauge One Iron 6" MAKER:-Ashcroft (not spec)

Steam gauge stand Iron **Clock** None

Water Gauge One B.L.W. (Ironclad) **Cab Lamps** to burn oil

Gauge Cocks Three - Back Surface valve None

Lowest gauge cock 3" above highest part of crown

Lubricator steam valve to have separate dry pipe to dome

Blower Valve B. L. W.

Blow off Cock One B. L. W. POS:-Front

Cleaning Plugs

Firebox Corners

Crown, One Back

Waist, None

Front tube sheet, One Fusible plug One

Pump None Pos. -----

Top chamb. ----- Bottom chamb. -----

Feed Cock ----- Feed pipes -----

Checks ----- Check pipes -----

Injectors (not spec) Two Monitor No. 5

Injectors, Pos. Right and Left Steam pipes Copper

Pipes, Check Iron Feed Iron Overflow Iron

Check B.L.W. Combined Check and Stop Pos. Right and Left

Steam Heat None

Cab floor lowered to give as much head room in cab as possible.

Cab Steel, Cab open at rear

Coal box in left side of Cab. Fuel capacity, 1/2 ton

Cab boards Steel Nosing None

Running boards None Nosing -----

Hand rail Iron Located on Cab

Back Bumper Cast Steel

Back bumper to extend beyond back of cab

Pilot None Pushing shoes None

Front Bumper Cast Steel Bumper plate None

Steps across front and back with hand rails

F. & B. Drawhead, Center above rail 19"

Coupler One pocket coupling of cast steel as per Co's sketch

Signal fixtures None

Headlight Two Round Case 10" Reflector, To burn Kerosene

Headlight, Nos. on sides None H'd'l't step None

Lamp shelf None Nosing -----

Bell 28 pounds, ahead of smoke stack

Sand Box ~~Four~~ Two Diam. ~~24"~~ 19" Body Iron Painted Pipes Iron

Sander Hand in each box to sand front and back.

~~K-Sand boxes mounted under sheet tank~~ H.R.C. 6-18-17.

Dome casing Iron Painted

Boiler Jacket 22 Soft Steel Ptd Bands Iron Style 9

Boiler Lagging Magnesia sectional

THE BALDWIN LOCOMOTIVE WORKS

N.R. Greene May 1917

102

SPECIFICATION FOR LOCOMOTIVES 4 16 C 148

FOR The Phoenix Iron Company

R.

Frames Cast Steel Braces Solid

Cylinders, Diam. 11" Stroke 16"

St'm ports, Length 7 1/2" Width 3" Bridges 3/4"

Exh. ports, Length 7 1/2" Width 1 1/2" Valve lead 1/16"

Valve travel 3 1/4" Steam lap 9/16" Exhaust clearance -----

Eccentric crank throw 2 1/2" By-pass valve None

S. F. Lubr. Michigan, Double Bulls Eye, 1 1/8 pints capacity (not spec)

Cyl'r heads Cast Iron; Lubr. pipes of Iron under Jacket

Cyl'r casings Iron Ptd. Head covers Steel Painted

St'm chest casings Iron Ptd. Covers Steel Painted

St'm chest valves Plain "D"

Pkg {Piston Rods / Valve Stems} Braided Packing

Pistons Cast Iron rings sprung into solid head

Guides Steel Oil cups Needle

Crossheads Cast Steel

Wrist Pins Steel Rod cups Needle

Parallel Rods to have straps, keys and brasses

Valve Motion Stephenson

Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.

All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Driving Wheels without hub liners

Drivers, O. S. Diam. 30" Cen. diam. 25" Centers Cast Iron

Tires Steel Held by Shrinkage and Shoulder

Tires, Flanged, Pos. All Size 2 1/2" x 5"

Tires, Plain, Pos. ----- Size -----

Lateral play between driving boxes and wheel hubs-- 1/32" total

Driving Boxes Cast Iron

Journals, Diam. 5" Length 6"

(5) **Springs.** Make B. L. W.

Front Engine Truck None Wheeled -----

To swing ----- each side of cen., Cen. pin liners -----

Journals, Diam. ----- Length ----- Boxes -----

Wheels, Diam. ----- Tread ----- Kind -----

Tires ----- Cen. diam. ----- Size -----

Tires held by -----

Back Engine Truck None Wheeled -----

To swing ----- each side of cen., Cen. pin liners -----

Journals, Diam. ----- Length ----- Boxes -----

Wheels, Diam. ----- Tread ----- Kind -----

Tires ----- Cen. diam. ----- Size -----

Tires held by -----

Brake, position On all driving wheels (no tender)

Operating Parts {Engine, Sch. U-O, B. L. W. Steam / Eng. Tr'k, sch. -----

Foundation Parts {Drivers, sch. U-O, B. L. W. / Eng. Tr'k, sch. -----

Air pump ----- Pos. -----

Train connections -----

Train signal, sch. -----

Separate lubricator for steam brake valve

TENDER, None

TANK, 800 Gallons, Bill 4510

Saddle tank over top of boiler, and extending over smoke box.

(1) Limit height ~~7' 10"~~ at a distance of 20" from centre line of Cab. Arrangement and allowable heights of Bell, Stack, Sand Boxes, Dome, and Cab Roof as shown on pencil tracing of Loco.

(2) Boiler and fittings to conform to Penna. State Boiler Law. Boiler and fire box material to conform to the American Society for Testing Materials Spec'n. A-30-14 and to be stamped by manufacturers in accordance with B. L. W. marking card 6815. Stress in stay rods must not exceed 6000 pounds per square inch

(3) Boiler must be stamped on the back head above the plug hole, with the ~~symbol, thus~~ ~~immediately below or to one side of this~~ {PA. STD / PENNA. / BALDWIN} ~~mark must be placed~~ the stamp of the Pennsylvania Industrial Board, thus: The height of the letters and figures used in the above stamping must be not less than 1/4". These stamps must be plainly visible when the boiler is completed.

(4) Boiler to be inspected by The Hartford Steam Boiler Inspection & Insurance Company.

(5) Driving springs not to have negative cambre but to be generally as shown on photo. 4974, class 4 - 14 C 271.

List of Tools, Sch. 26

Photo. Sch. #2 Inspection, B.L.W. except (4) above

To be weighed, Yes Material spec'ns. B. L. W. (except see (2))

Certificate of boiler test, Three copies of B.L.W. form 1036

Junior laws to 4-13-17 Shipment, On Car

Brass Shop Finish, No. 1

Machine Shop Finish, D-165

B. L. W. Patents None

Property Plates, None

PAINTING:- Engine, style 222 Olive Green and Yellow

PAINTING:- Tender, style -----

Mark on tank sides, PHOENIX IRON CO.

Road Nos. Pos. Road Nos. Name, None

F. No. Plate 9

Cab Sides

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-4326

Memorandum Spec'n 11214

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1098

FOR Wheeling Steel & Iron Company

R. 11-14-16

Gen. as Photo. 2213 Except with larger tank

Engine Drawing No. 52

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"
Total wheelbase, eng. and tend. {Actual ----- / Limited to -----

Curves -----

Limits, Height ----- Width -----
Weight approximate in working order, Total 131,000 lbs.
On F. tr'k ----- lbs.. Drivers 131,000 lbs.. B tr'k ----- lbs.

Tractive power 29920 lbs.. Ratio of adhesion 4.5
Work'g St'm Pres. 180 lbs.. Service Switching
Fuel Soft Coal

★ Front tube sheet to be ½" thick
Boiler Steel Thick 9/16" Bill 8022
Boiler, Diam. 56" Plan Straight Top
Boiler st'm pres. 180 lbs.. Tested to {200 lbs. steam pres / 240 lbs. water pres.
With factor of safety of 5.0
Longitud. seams Butt jointed, , double covering strips

Dome, diam. 22" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 69-7/16" Width 42⅛" Depth F 55⅜" B. 54¼"
Firebox, Tube ½ Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diam.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Single Riveted
Water space stays 1" diam. with 3/16" hole 1¼" deep from O.S.
Tate Flexible staybolts 280 in breaking zone
Radial stays 1" diam. Sling stays front {Two rows of B. L. W. Expansion Stays
Button heads below crown on Eight central rows
Crown bars None Placed ----- above crown
Crown bolts -----

Flues -----
Tubes #12 W. G. Charcoal Iron or Steel
Tube ends Swaged for copper ferrules firebox ends
Number 198 Diam. 2" Length 12' 4"

Heating Flues ----- Combus. Chamb. ----- Total 1362
Surface Tubes 1270 Fire Box 92 Fire Brick Tubes -----
Grate area 20.3 Ratio to Heating Surface 1 : 67
Superheater -----

Fire Brick Arch on Studs

Grates Rocking bars and drop plate
Ash Pan, Dampers Front and Back

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Smokebox extension With Cleaning hole and cap L.S. Only
Spark ~~ejector or~~ hopper With
Netting and deflect. plates With

Exhaust nozzles Double High

Stack Straight Dia 16" Hole in S. B. dia. 20½"

Safety Valves (not spec) Two Consolidated 2½"
Safety valves None with relief lever, Set to 180 pounds
Whistle B. L. W. plain

Steam Gauge One Iron 7" MAKER:-Ashcroft (not spec)
Steam gauge stand Iron **Clock** None

Water Gauge One B.L.W. (Ironclad) **Cab Lamps** to burn oil
Gauge Cocks Three Back Surface valve None
Lowest gauge cock 3¼" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One Crane 2" (to use stock) POS:-Left Side
Cleaning Plugs
Firebox Corners diagonal, Right Side, Front and Back
Crown, Two each side and two back
Waist, One under front
Front tube sheet, One Fusible plug One

Pump None Pos. -----
Top chamb. ----- Bottom chamb. -----
Feed Cock ----- Feed pipes -----
Checks ----- Check pipes -----

Injectors (not spec) Two Monitor No. 8
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. Right and Left

Steam Heat None

Cab Wood
Coal box on rear extension of engine frame, back of cab, capacity 2 tons
Cab boards Wood Nosing None
Running boards Wood Nosing None
Hand rail Iron Located on tank

Back Bumper Oak

Pilot None Pushing shoes Front and Back
Front Bumper Oak Bumper plate None
Steps across front and back with handrails.
Steps, hand holds etc. to conform to I.C.C. requirements
F. & B Drawhead, Center above rail 33½"
Coupler M. C. B. Automatic

Signal fixtures None

Headlight Two Round Case 16" Reflector. To burn Kerosene
Headlight, Nos. on sides With H'dl't step With
Lamp shelf None Nosing -----

Bell 92 pounds
Sand Box Two Diam. 28" Body Iron Painted Pipes Iron
Sander Hand in each box, to sand front and back

Dome casing Iron Painted

Boiler Jacket #22 Soft Steel Pt Bands Iron Style 9
Boiler Lagging Magnesia sectional

11-266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS

N. Hamrick April 1917

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1098

FOR Wheeling Steel & Iron Company

R.

104

✓ Furnish to Co. one set of prints of grate bars, brake shoes and other wearing parts. 3.27.17.

Frames Cast Steel Braces Solid
Cylinder cocks to be placed on sides of cylinders
Cylinders, Diam. 19" Stroke 24"
St'm ports, Length 16" Width 1½" Bridges 1"
Exh. ports, Length 16" Width 2½" Valve lead 1/16"
Valve travel 5¼" Steam lap ¾" Exhaust clearance -----
Eccentric ~~crank~~ throw 5¼" By-pass valve None
S. F. Lubr. (Spec) Detroit Triple No. 22 Bulls Eye
Cyl'r heads Cast Iron; Lubr. pipes of Iron under jacket
Cyl'r casings Iron Ptd. Head covers Steel painted
St'm chest casings Iron Ptd. Covers Steel painted
St'm chest valves Richardson Balanced, with vacuum valves
Met. pkg (Piston rods / Valve stems) United States (not spec)

Pistons Cast Iron rings sprung into solid head
Guides Steel Oil cups Needle
Crossheads Cast Steel
Wrist Pins Steel Rod cups Plunger, forged on
Parallel rods to have solid ends

Valve Motion Stephenson
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 46" Cen. diam. 40" Centres Cast Iron
Driving wheels without hub liners
Tires Steel Held by Shrinkage and Shoulder
Tires, Flanged, Pos Front and Back Size 3" X 5½"
Tires, Plain, Pos. Middle Size 3" X 6½"
Lateral play between driving boxes and wheel hubs = 1/16" total
Driving Boxes Steeled Cast Iron
Journals, Diam. 8½" Length 9"

Springs. Make B. L. W.

Front Engine Truck None Wheeled -----
To swing -----each side of cen., Cen. pin liners -----
Journals, Diam. ----- Length ----- Boxes -----
Wheels, Diam. ----- Tread -----Kind -----
Tires ----- Cen. diam----- Size -----
Tires held by -----

Back Engine Truck None Wheeled -----
To swing -----each side of cen., Cen. pin liners -----
Journals, Diam. ----- Length ----- Boxes -----
Wheels, Diam. ----- Tread -----Kind - -----
Tires ----- Cen. diam. -----Size -----
Tires held by -----

Brake, position On all driving wheels (no tender)
Operating Parts {Engine, Sch. S American Steam / Eng. Tr'k, sch. -----
Foundation Parts {Drivers. sch. WM-2 American O.S. Equalized / Eng. Tr'k, sch. -----
Air pump ----- Pos. -----
Train connections None
Train signal, sch. None
One feed from main lubricator to be piped to lubricate steam brake.

Tender, None Wheeled, Drawing No. -----
Weight, with fuel and water, about -----

Tank, 2250 Gallons, Bill 4471
Saddle tank located over top of boiler.

★ Loco. to conform to the requirements of the Industrial Commission of Ohio, and must be stamped {Ohio Std. / 13 / Baldwin} on the backhead of boiler in the presence of the authorized inspector, thus, (See sup. 1 to 9 inc.)

✳ Boiler to be inspected by the Hartford Steam Boiler Inspection & Insurance Company.

List of tools, sch. 29
Photo. sch. #2 Inspection, B. L. W. except see ✳ above
To be weighed, Yes Material spec'ns. B. L. W.
Certificate of boiler test, Three copies of B.L.W. form 1036
Junior laws to 2-1-17 Shipment, On own wheels

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. Plates } None

Property Plates – None

PAINTING:- Engine, style 220 Olive Green and Aluminum
Painting:- Tender, style ----------

Mark on tank sides, W. C. & I. Co.

Road Nos. Pos. Road Nos. Name, None
F. No. Plate 21
Cab Sides
Back of fuel box

pp. 266-67 Photo copied see box

A Boilers built to meet the requirements of the Industrial Commission of Ohio must be designed strictly in accordance with the "Rules formulated by the Industrial Commission of Ohio," and be inspected during construction and upon completion by an authorized Ohio Inspector, such Inspector not to be interested either directly or indirectly with the manufacturer.

2 DESIGN:- The minimum factor of safety shall be five.

B Longitudinal lap seams shall not be used.

C Welded Boiler braces shall not be subjected to a fibre stress in excess of 6000 lbs. per sq. in.

D Stress in staybolts shall not exceed 6500 lbs. per sq. in.,(therefore use 1" staybolts for 180 lbs. and over)

E The maximum allowable stress per square inch net cross sectional area of stud bolts or tap bolts having a diameter of ¾" or larger shall not exceed 6000 lbs.

F The minimum thickness of butt straps shall be as follows:-

THICKNESS OF SHELL PLATES	MINIMUM THICKNESS OF BUTT STRAPS
¼" & 5/16"	¼"
⅜"	5/16"
7/16"	⅜"
½" & 9/16"	7/16"
⅝", 11/16" & ¾"	½"
13/16"	9/16"
⅞"	⅝"
15/16"	11/16"
1" & 1⅛"	¾"

G The minimum thickness of tube sheets shall be as follows:-

OUTSIDE DIA. OF TUBE SHEET	MINIMUM THICKNESS
42" or less	⅜"
Over 42" to 54" inclusive	7/16"
" 54" to 72" "	½"
" 72"	9/16"

When a tube sheet is not circular in form (i.e., fire box tube sheet) the least dimension of such sheet shall determine its thickness.

H No boiler shall have a continuous longitudinal seam over 12 feet in length.

I There shall be not less than six brass washout plugs not smaller than 1½" pipe tap located as follows:
One in front tube sheet below the tubes.
One in back head at or about the line of the crown sheet.
Four in the lower part of the water leg.

J An opening in the boiler for a threaded pipe connection 1" in diameter or over shall have not less than the minimum number of threads in such opening as shown in the following table:-

SIZE OF PIPE CONNECTION.	1" & 1½"	1½" & 2"	2½" to 4"
NO. OF THDS. PER INCH.	11½	11½	8
MINIMUM NO. OF THDS. REQUIRED IN OPENING.	4	5	7
MINIMUM THICKNESS OF MATERIAL REQUIRED TO GIVE ABOVE NO. OF THREADS.	⅜"	7/16"	⅝"

If the thickness of the boiler material is not sufficient to give the above number of threads, a liner or flange must be applied.

K Each boiler must be provided with a connection ¼ pipe size for attaching inspector's test gauge.

L A fusible plug must be applied which projects through the crown at least 1". The plug must be filled with pure tin and the least diameter of the fusible metal must be not less than ⅜" (Fusible Plug B. L. W. Card #4516).

M Feed water shall not discharge into a boiler in close proximity to riveted joints in shell or furnace sheets. Each boiler shall have a feed pipe fitted with a check valve, and also a stop valve or stop cock between the check valve and the boiler, the feed water to discharge below the lowest safe water line.

5 MATERIALS:- Shell,(including top and sides) dome and butt straps (including dome liner), shall be open hearth steel of FIRE BOX quality and shall conform to the specification of the American Society of Mechanical Engineers.
Front tube sheet, back head, and throat sheet may be open hearth FLANGE steel and shall conform to the requirements of the American Society of Mechanical Engineers.

B Smoke Box steel to conform to B. L. W. Spec'n.

C Rivets shall be open hearth extra soft steel as specified in paragraphs 15, 17 and 19, Part III, Section 2, of the Boiler inspection law of Ohio.

D All boiler plates except the fire box and smoke box plates must be marked by the manufacturer with the heat number, name of manufacturer, brand and lowest tensile strength in the manner and location shown on The B. L. W. Marking Card #6807.
This marking card should be ordered on the card sheet and on the store room sheet for boiler steel and one piece dome.

7 SHOP PRACTICE:- Rivet holes except for attaching stay feet and T-iron to heads shall be drilled full size with plates, butt straps, and heads bolted up in place: or they may be punched out not to exceed ¼" less than full size for plates over 5/16" in thickness, and ⅛" less than full size for plates 5/16" and under, and then drilled or reamed to full size with plates, butt straps and heads bolted up in position.
The Tube holes may be drilled full size, or they may be punched not to exceed ½" less than full size and then drilled, reamed or finished full size with rotating cutter.

B Upon completion each boiler shall be stamped with the words

OHIO STANDARD
(serial no. as specified)
BALDWIN

This stamping must be done by the authorized Ohio inspector.
The height of the letters and figures shall be 5/16".
The location of the stamping shall be on the back head above plug hole. It must not be covered by lagging or fittings.

C Extract from letter of the Hartford Steam Boiler Inspection and Insurance Co. dated Jan. 7th, 1916:- "In order for our inspectors to comply with Ohio requirements in making inspections of steam boilers, it is necessary that they make at least three visits to the shop during the work of construction.
First, to look over the plates to see that they are sound and properly stamped, and if it is the practise of the shop, to first punch the rivet holes, the punching should have been done at this time.
The second trip would be to see the work after it is fitted up and rivet holes reamed or drilled full size preparetory to driving the rivets.
The next trip would be after the boiler is completed for the purpose of examining the completed work and applying the hydrostatic test."

8 When the boiler is tested by hydrostatic pressure, the maximum pressure applied shall not exceed one and one-half times the maximum allowable working pressure.

9 A Data report, on forms furnished by the Boiler Inspection Department of the Ohio Industrial Commission, shall be forwarded by the builder to the chief inspector of such department for each boiler stamped OHIO STD. before the boiler is shipped from the boiler shop.

11-266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS Dup. of 8-38 D 15 - 16 Same extras except where otherwise specified.

Memorandum Spec'n 17045

SPECIFICATION FOR LOCOMOTIVES 8 38 D 17 & 18

FOR Republic Iron and Steel Company.

Gen. as Photo. 5891

Engine Drawing No. 3

3-6-17

Gauge of Road 4' 8½" Play ¾"

Wheelbase, Rigid 13' 6" Driving 13' 6" Total 22' 0"

Total wheelbase, eng. and tend. { Actual 52' 1" / Limited to -----

Grades, 3%, Rails, 85 lbs., Frogs #6.

Curves 338 Ft. radius

Limits, Height ----- Width -----

Weight (approximate) in working order, Total 175,000 lbs.

On F. tr'k 20,000 lbs., Drivers 155,000 lbs., B. tr'k ----- lbs.

Tractive power 38,500 lbs., Ratio of adhesion 4.1

Work'g St'm Pres. 180 lbs., Service Freight.

Fuel Soft coal.

Boiler to conform to the requirements of the Ohio State Railroad Commission, i.e. to conform to I.C.C. requirements (approved 6-26-17)

Boiler Steel Thick ⅝" Bill 7705

Boiler, Diam 78" Plan Straight Top.

Boiler st'm pres. 180 lbs., Tested to { 200 lbs steam pres. / 240 lbs water pres.

With factor of safety of 5.5

Longitud. seams Butt jointed, double covering strips.

Front tube sheet to be ½" thick.

Dome, diam. 33" Pos. Central.

Firebox Steel Combustion chamb. None

Firebox, length 120-3/16" Width 42⅛" Depth F. 73⅜" B. 71⅜"

Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"

Firedoor opening 16" diam.

Water space, Front 4" Sides 3" Back 3"

Water space, Frame Double Riveted

Water space stays ⅞" diam. with 3/16" hole 1¼" deep from O. S.

Flexible Stay bolts, American, of Ewald Iron, about 450 in breaking zone.

Radial stays 1" diam. Sling stays front { A three rows of B.L.W. Expansion stays.

Button heads below crown on Eight central rows

Two combustion tubes to be applied in each side of fire box with a steam jet to inject air into fire box, same to be controlled by a globe valve in the turret.

Tubes #11 W.G. Charcoal Iron or Steel.

Tube ends Swaged for copper ferrules in fire box ends.

Number 346 Diam. 2" Length 12' 6"

Heating Surface { Flues None Combus. Chamb. None Total 2450 sq. ft. / Tubes 2249 sq. ft. Fire Box 201 sq. ft. Fire Brick Tubes ----

Grate area 35.1 sq. ft. Ratio to Heating Surface 1 69.8

Superheater ------

Fire Brick Arch on Studs.

Grate support to be arranged as shown on Ry. Co's. pencil sketch

Grate frame to be ¾" from sides of fire box.

Grates Rocking bars to dump. No dead grates.

Ash Pan, Dampers Front and Back.

Throttle Balance Pos. Dome

Dry pipe Steel

Superheater None

Smokebox and firebrick arrangement is to be such as to prevent show of smoke.

Smokebox extension With Cleaning hole and cap L.S. only.

Spark ejector or hopper With

Netting and deflect. plates With

Exhaust nozzles Doble high.

Stack Straight Dia. 18" Hole in S. B., dia. 21¼"

Safety Valves (not spec) Two Consolidated 3"

Safety valves None with relief lever, Set to 180 pounds.

Whistle B.L.W. plain.

Steam Gauge One Iron 7" Maker:-Ashcroft (spec)

Steam gauge stand Iron **Clock** None

Water Gauge One Reflex **Cab Lamps** to burn oil.

Gauge Cocks Three back Surface valve None

Lowest gauge cock 3½" above highest part of crown

Lubricator steam valve to have separate dry pipe to dome

Blower Valve B.L.W.

Blow off Cock One Everlasting 1½" Pos:-Front.

Cleaning Plugs

Firebox Corners diagonal, sides and back.

Crown, Three each side and two back.

Waist, One under, as near front tube sheet as possible.

Front tube sheet, One Fusible plug One

Pump None Pos. -----

Top chamb. ----- Bottom chamb. -----

Feed Cock ---- Feed pipes ----

Checks ---- Check pipes ----

(Not spec)

Injectors Two Monitor No. 10

Injectors, Pos. Right and Left Steam pipes Copper

Pipes, Check Iron Feed Iron Overflow Iron

Check B.L.W. Pos. Right and Left

Steam Heat None

Cab Steel

Cab boards Wood Nosing None

Running boards Wood Nosing None

Hand rail Iron Located on Boiler

Safety chain to be applied between engine and tender.

Back Bumper Bar Steel Back drawbar height 30½"

Front bumper details as Ry. Co's. pencil sketch except bumper to be of cast iron to improve distribution of weight.

Pilot None Pushing shoes Cast in bumper

Front Bumper Cast Iron Bumper plate With

Steps across front with hand rail.

Steps, hand holds, etc. to conform to I.C.C. requirements.

Front Drawhead, Center above rail 33½"

Coupler M.C.B. automatic.

Signal fixtures Iron on bumper

Headlight to be Dressel Ry. Lamp Works #110.

Headlight Two round case 14" Reflector, To burn Kerosene.

Headlight, Nos. on sides With H'd'l't step With

Lamp shelf None Nosing -----

Bell 92 pounds. Collmar Air Bell Ringer.

Sand Box Two Diam. 28" Body Iron painted Pipes Iron.

Sander (not spec) Leach Air Trap A-1, in each box to sand front and back.

Dome casing Iron painted.

Boiler Jacket #22 Plain Steel Bands Iron Style 9 and 14

Boiler Lagging Magnesia sectional.

Backhead of boiler to be lagged and jacketed

THE BALDWIN LOCOMOTIVE WORKS

C. W. Finch. July 1917

SPECIFICATION FOR LOCOMOTIVES 8 38 D 17 & 18

FOR Republic Iron and Steel Company.

107

Furnish to Company two sets of prints of such parts as are different from 8 38 D 15 & 16

Frames Cast Steel Braces Solid.

Cylinders, Diam. 22" Stroke 26"

St'm ports, Length 19" Width 1⅝" Bridges 1⅜"

Exh. ports, Length 19" Width 3" Valve lead 3/32"

Valve travel 5½" Steam lap ⅞" Exhaust clearance -----

Eccentric crank throw 5" By-pass valve None

S. F. Lubr. (not spec) Michigan Triple Bulls Eye.

Cyl'r heads Cast Iron; Lubr. pipes of iron under jacket.

Cyl'r casings Iron P.T.D. Head covers Steel Painted.

St'm chest casings Iron P.T.D. Covers Steel Painted.

St'm chest valves Richardson Balanced with vacuum valves.

Met. pkg { (Piston rods / Valve stems) Jerome Elliott (not spec)

Pistons Cast Iron rings sprung into solid head.

Guides Steel Oil cups Needle

Crossheads Cast Steel

Wrist Pins Steel Rod cups Plunger, forged on.

Parallel rods to have solid ends.

Valve Motion Stephenson.

Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts except staybolts to be United States Standard.

All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B.L.W.

Driving wheels, Main only to have hub liners of Bronze.

Drivers, O.S. Diam. 50" Cen. diam. 44"

Centres, Main cast steel, others, cast iron.

Tires Steel Held by Shrinkage and Shoulder.

Tires, Flanged, Pos. Front and Back Size 3" x 5½"

Tires, Plain, Pos. Middle Size 3" x 6½"

Lateral play between driving boxes and wheel hubs - 1/16" total.

Driving Boxes Main Cast Steel, others steeled cast iron.

Journals, Diam. 9" Length 12"

Springs. Make B.L.W.

Front Engine Truck Two Wheeled Swing Bolster.

To swing 3½" each side of cen., Cen. pin liners None

Journals, Diam. 5½" Length 10" Boxes Cast Iron.

Wheels, Diam. 28" Tread ---- Kind Cast Iron plate center.

Tires Steel Cen. diam. 23" Size 2½" x 5½"

Tires held by Shrinkage and Shoulder.

Eng truck wheels without hub liners.

Back Engine Truck None Wheeled ----

To swing --- each side of cen., Cen. pin liners ----

Journals, Diam. ---- Length ---- Boxes ----

Wheels, Diam. --- Tread --- Kind ----

Tires ----- Cen. diam. --- Size ---

Tires held by ------

Brake, position On all driving and tender wheels.

Operating Parts { Engine, Sch. A-1 and SWA West'g. Auto. and Straight Air. / Eng. Tr'k, sch. ----

Foundation Parts { Drivers, sch. WM-3 American O. S. Equalized. / Eng. Tr'k, sch. ----

Air pump One 9½" Pos. Left side, ahead of firebox.

Train connections Front and Back.

Train signal, sch. None

Brake Equipment to include:- Pump Governor SF-4, Auto. Air Cylinder oil cup equipment, Engineer's brake valve G-6 with feed valve G-6, and Straight Air valve S-3-⅜"

Air Reservoir to have hydrostatic test of 210 pounds

Tender Eight Wheeled, Drawing No. 435

Weight, with fuel and water, about 100,000 lbs.

Tank 5,000 Gallons, Bill 3959

Tank "U" shape, sloping back. Fuel capacity 8 tons.

Tool Boxes Hard wood, Top.

Headlight support on tank as Ry. Co's pencil sketch

Frame Steel 10" Channels.

Front Drawbar height 30½"

Pilot None Pushing shoes At rear.

Back drawhead, center above rail 33½"

Coupler M.C.B. Automatic Coupler pocket of Steel

Back bumper details as Ry. Co's. pencil sketch.

Steps, hand holds, etc. to conform to I. C. C. requirements.

Steps across rear with hand rail.

Trucks Arch bar type with cast steel bolster.

Springs Elliptic. B.L.W. make

Journals, Diam. 5" Length 9"

Wheels, Diam. 30" Tread 4¼" Kind Chilled Cast Iron plate.

Tires None Cen. diam. --- Size ----

Tires held by ----

Safety chains Single

Brake Position On all wheels

Brake sch. FL-1212 and SWB West'g. Auto. and Straight Air.

List of tools, sch. 29

Photo sch. None Inspection B.L.W.

To be weighed No. Material specs B.L.W.

Certificate of boiler test Three copies of B.L.W. from 1036.

Junior laws to 4-15-17 Shipment On own wheels.

Brass shop finish, No. 1

Machine shop finish D-165

B. L. W. Patents { Feed Pipe Strainer, Patented Sept. 1. 1903 (Cast On)

Property plates None

Painting:—Engine, style 291 Olive Green and Aluminum.

Painting:—Tender, style 291 Olive Green and Aluminum.

Lettering, etc. to be same as for 8-38 D 15 & 16.

Mark on tank sides, R. I. & S. Co.

Road Nos. Pos.	Road Nos.	Name None
F No. Plate	14	
Dome.	15	
Cab Sides.		
Back of tank.		

THE BALDWIN LOCOMOTIVE WORKS As Spec'n. C-1027

Memorandum Spec'n 11123

SPECIFICATION FOR LOCOMOTIVES 8 22 ½ C 48

FOR THE SESSIONS FOUNDRY COMPANY, INC.

Gen. as B. L. W. Tracing 32191

Engine Drawing No. 16

7-27-16

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 7' 0" Driving 7' 0" Total 21' 5"
Total wheelbase, eng. and tend. { Actual ---, Limited to ---

LIMITS AS RY. CO'S LAYOUT DATED MARCH 11, 1895, RECEIVED JUNE 16, 1916 (HEREWITH) SOME RECENT CHANGES IN CO'S TRACKS HAS MADE GRADES A LITTLE EASIER.

Weight (approximate) in working order, Total 86,500 POUNDS
On F. tr'k 11,000 lbs., Drivers 62,500 lbs., B. tr'k 13,000 lbs.

* Tractive power 15,000 lbs., Ratio of adhesion 4.16
Work'g St'm Pres. 180 lbs., Service SWITCHING
Fuel SOFT COAL

* LOCOMOTIVE TO HANDLE TWO BIG STANDARD CARS, TOTAL WEIGHT OF CARS AND LADING 160 TO 170 TONS

Boiler STEEL Thick ½" Bill 7916
Boiler, Diam. 48" Plan STRAIGHT TOP
Boiler st'm pres. 180 lbs., Tested to { 200 lbs. steam pres., 240 lbs. water pres.
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS

Dome, diam. 25" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE
Firebox, length 48-3/16" Width 42⅜" Depth F. 39" B. 43⅜"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" DIAM.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame SINGLE Riveted
Water space stays ⅞" DIAM. WITH 3/16" HOLES 1½" DEEP FROM O.S.

Radial stays 1" DIAMETER Sling stays front TWO ROWS OF B. L. W. EXPANSION STAYS.
Button heads below crown on SIX central rows
Crown bars NONE Placed ---- above crown
Crown bolts -----

Flues ----
Tubes #12 W.G. TYLER CHARCOAL IRON
Tube ends SWAGED FOR COPPER FERRULES, FIREBOX ENDS
Number 145 Diam. 2" Length 11' 0"

Heating Surface	Flues ----	Combus. Chamb. ---	Total 889 □'
	Tubes 829 □'	Fire Box 60 □'	Fire Brick Tubes ---
Grate area 14.2 □'	Ratio to Heating Surface 1 : 62.6		
Superheater ----			

Fire Brick ARCH, NONE

Grates, ROCKING BARS AND DROP PLATE
Ash Pan, Dampers FRONT AND BACK
ASH PAN SLIDES IN BOTTOM OF PAN

Throttle BALANCE Pos. DOME
Dry pipe STEEL

Superheater NONE

Smokebox extension WITH Cleaning hole and cap L.S. ONLY
Spark ejector or hopper WITH
Netting and deflect. plates WITH

Exhaust nozzles DOUBLE, HIGH

Stack STRAIGHT Dia. 14" Hole in S. B. dia. 21"

Safety Valves TWO CONSOLIDATED 2"
Safety valves NONE with relief lever, Set to 180 POUNDS
Whistle B. L. W. PLAIN

Steam Gauge ONE IRON 7" MAKER:- ASHCROFT
Steam gauge stand IRON **Clock** NONE

Water Gauge ONE B.L.W. (IRONCLAD) **Cab Lamps** TO BURN OIL
Gauge Cocks THREE BACK Surface valve NONE
Lowest gauge cock 3" above highest part of crown
Lubricator steam valve TO HAVE separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock ONE HANCOCK Pos: FRONT
Cleaning Plugs
Firebox CORNERS DIAGONAL AND BACK
Crown, ONE EACH SIDE AND TWO BACK
Waist, ONE UNDER FRONT
Front tube sheet, ONE Fusible plug ONE

Pump NONE Pos. ---
Top chamb. --- Bottom chamb. ---
Feed Cock --- Feed pipes ---
Checks --- Check pipes ---

Injectors TWO HANCOCK, TYPE A No. 6
Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER
Pipes, Check IRON Feed IRON Overflow IRON
Check B. L. W. Pos. RIGHT AND LEFT

Steam Heat NONE

Cab WOOD CAB TO BE SAME WIDTH AS BOX CARS
COAL BOX ON REAR EXTENSION OF ENGINE FRAME, BACK OF CAB
How much? 2 Mos
Cab boards WOOD Nosing NONE
Running boards WOOD Nosing NONE
Hand rail IRON Located on TANK

Back Bumper CAST STEEL

Pilot NONE Pushing shoes CAST IN BUMPERS
Front Bumper CAST STEEL Bumper plate WITH
Steps ACROSS FRONT AND REAR WITH SUITABLE HANDRAILS

F.& B. Drawhead, Center above rail 33½"
Coupler TOWER M. C. B. AUTOMATIC

Signal fixtures NONE

Headlight NONE Reflector, To burn ---
Headlight, Nos. on sides --- H'd'l't step NONE
Lamp shelf NONE Nosing ---

Bell 85 POUNDS
Sand Box TWO Diam. 23" Body IRON, PAINTED Pipes IRON
Sander LEACH AIR TRAP A-1 IN EACH BOX, TO SAND FRONT AND BACK

Dome casing IRON, PAINTED

Boiler Jacket #22 SOFT STEEL, PLAIN Iron Style 9
Boiler Lagging MAGNESIA SECTIONAL

Pat. Dec. 26-67 Blank copied see box

THE BALDWIN LOCOMOTIVE WORKS

109

SPECIFICATION FOR LOCOMOTIVES 8 22 ½ C 48

FOR THE SESSIONS FOUNDRY COMPANY, INC.

Frames CAST STEEL Braces SOLID

Cylinders, Diam. 14" Stroke 22"
St'm ports, Length 13" Width 1½" Bridges 1"
Exh. ports, Length 13" Width 2½" Valve lead 1/16"
Valve travel 5" Steam lap ¾" Exhaust clearance ----
Eccentric crank throw 4½" By-pass valve NONE
S. F. Lubr. MICHIGAN TRIPLE BULLS EYE
Cyl'r heads CAST IRON: LUBR. PIPES OF IRON UNDER JACKET
Cyl'r casings IRON, PAINTED Head covers STEEL, PAINTED
St'm chest casings IRON, PAINTED Covers STEEL, PAINTED
St'm chest valves RICHARDSON BALANCED, WITH VACUUM VALVES
Met. pkg { PISTON RODS, VALVE STEMS U. S.

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD
Guides STEEL Oil cups NEEDLE
Crossheads CAST STEEL
Wrist Pins STEEL Rod cups PLUNGER
PARALLEL RODS TO HAVE SOLID ENDS

Valve Motion STEPHENSON
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 44" Cen. diam. 38", CENTERS CAST IRON

Tires STEEL Held by SHRINKAGE AND SHOULDER
Tires, Flanged, Pos. ALL Size 3" x 5½"
Tires, Plain, Pos. --- Size ---
Lateral play between driving boxes and wheel hubs = 1/32" TOTAL
Driving Boxes CAST IRON
Journals, Diam. 7" Length 8"

Springs. Make B. L. W.

Front Engine Truck TWO Wheeled SWING BOLSTER, CENTER BEARING
To swing 3¾" each side of cen., Cen. pin liners NONE
Journals, Diam. 4½" Length 7½" Boxes CAST IRON
Wheels, Diam. 26" Tread 4½" Kind CHILLED CAST IRON PLATE
Tires NONE Cen. diam. — Size ---
Tires held by ----
Use after wear on tires increased

Back Engine Truck TWO Wheeled SWING BOLSTER, SIDE BEARING
To swing 4½" each side of cen., Cen. pin liners NONE
Journals, Diam. 4½" Length 7½" Boxes CAST IRON
Wheels, Diam. 26" Tread 4½" Kind CHILLED CAST IRON PLATE
Tires NONE Cen. diam. --- Size ---
Tires held by ----

Brake, position ON BOTH PAIRS OF DRIVING WHEELS (NO TENDER)
Operating Parts { Engine, Sch. A-1 WESTINGHOUSE AUTOMATIC AIR; Eng. Tr'k, sch. ----
Foundation Parts { Drivers, sch. WY-1 AMERICAN O. S. EQUALIZED; Eng. Tr'k, sch. -----
Air pump ONE 5½" Pos. LEFT SIDE
Train connections FRONT AND BACK
Train signal, sch. NONE
BRAKE HEADS TO BE M. C. B. STYLE

Tender NONE Wheeled, Drawing No. ---
Weight, with fuel and water, about ---

Tank 1,000 Gallons. Bill 4331
SADDLE TANK LOCATED OVER TOP OF BOILER

Tool Boxes ---

Frame ---

Front Drawbar height ---
Pilot --- Pushing shoes ---
Back drawhead, center above rail ---
Coupler ---

Steps ---

Trucks ---

Springs ---
Journals, Diam. --- Length ---
Wheels, Diam. --- Tread --- Kind ---
Tires --- Cen. diam. --- Size ---
Tires held by ---
Safety chains ---

Brake Position -----
Brake sch. ---

List of tools, sch. 26
Photo sch. 2 Inspection B. L. W.
To be weighed YES Material specs'ns B. L. W.
Certificate of boiler test THREE COPIES OF B. L. W. FORM 1036
Junior laws to 10-17-16 Shipment ON OWN WHEELS

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. Patents { THROTTLE, PATENTED, JAN. 23, 1900 (CAST ON); REAR EQUALIZING BEAM SUSPENSION } 1095929, MAY 5, 1914 (BRASS PLATE)

Property plates B. L. W. FOR ENGINE

Painting: Engine, style 222, OLIVE GREEN AND ALUMINUM
Painting:—Tender, style -----

Mark on TANK SIDES, THE SESSIONS FOUNDRY COMPANY

Road Nos. Pos.	Road Nos.	Name NONE
F. No. PLATE	3	
F. SAND BOX		
CAB SIDES		

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-4106

Memorandum Spec'n 11147

SPECIFICATION FOR LOCOMOTIVES 4-28-2 C 60 to 63 Gen. as Photo 2584

FOR Bethlehem Steel Company (Lehigh Plant) **Engine Drawing No.** 21

9-9-16

Gauge of Road 3' 0" Play ⅝"
Wheelbase, Rigid 5' 9" Driving 5' 9" Total 5' 9"
Total wheelbase, eng. and tend. { Actual --- / Limited to ----
Grades 2½% and 4%.
Curves 37½ feet radius
Length over bumpers 24' 1"
Limits, Height 10' 6" Width 7' 9½"
Weight (approximate) in working order, Total 92,390 pounds
On F. tr'k --- lbs., Drivers 92,390 lbs., B. tr'k --- lbs.

Tractive power 21,060 lbs., Ratio of adhesion 4.3
Work'g St'm Pres. 180 lbs., Service Switching
Fuel Soft Coal

Boiler Steel Thick 9/16" Bill 7918
Boiler, Diam. 52" Plan Straight Top
Boiler st'm pres. 180 lbs., Tested to { 200 lbs. steam pres. / 240 lbs. water pres.
Longitud. seams Butt jointed double covering strips

Dome, diam. 25" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 46⅛" Width 49⅜" Depth F. 57⅜" B. 56⅛"
Firebox, Tube, ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diam.
Water space, Front 2½" Sides 3" Back 3"
Water space, Frame Single Riveted
Water space stays ⅞" diam. with 3/16" holes 1½" deep from O.S.

Radial stays 1" diameter Sling stays front Two rows of B. L. W. Expansion Stays
Button heads below crown on Six central rows
Crown bars None Placed -- above crown
Crown bolts ----

Flues ----
Tubes #12 W.G. Charcoal iron or steel
Tube ends Swaged for copper ferrules, fire box ends
Number 158 Diam. 2" Length 10' 10"

Heating Surface	Flues ---	Combus. Chamb. ---	Total 965 sq
	Tubes 889 sq	Fire Box 76 sq	Fire Brick Tubes ---
Grate area 16 sq	Ratio to Heating Surface 1 : 60.3		
Superheater -----			

Fire Brick Arch, None

Grates Rocking bars and drop plate
Ash Pan, Dampers Right and left

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Smokebox extension With Cleaning hole and cap None
Spark-arrester hopper With
Netting and deflect. plates With

Exhaust nozzles Double, High

Stack Cast iron, straight Dia. 16" Hole in S. B. dia. 19½"

(Not Spec) **Safety Valves** Two Consolidated 2"
Safety valves None with relief lever, Set to 180 pounds
Whistle B. L. W. plain

Steam Gauge One 4½ 7" WAKER:- Ashcroft (Not Spec)
Steam gauge stand Iron **Clock** None

Water Gauge One B.L.W.(Ironclad) **Cab Lamps** to burn oil
Gauge Cocks Three Back Surface valve None
Lowest gauge cock 2½" above highest part of crown
Lubricator steam valve without separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One B. L. W. Pos:- Front
Cleaning Plugs
Firebox Corners diagonal
Crown, One each side and three back
Waist, One under front
Front tube sheet, One Fusible plug One

Pump None Pos. ---
Top chamb. --- Bottom chamb. ---
Feed Cock ---- Feed pipes ---
Checks --- Check pipes ---

(Spec) **Injectors** Two Sellers Class N No. 7½
Injectors, Pos. Right and left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. Right and left

Steam Heat None

Cab Steel
Omit cab side doors and provide sliding doors in back of cab;
Omit coal box from cab.
Cab boards Steel Nosing T-iron
Running boards None Nosing ---
Hand rail Iron Located on Cab

* **Back Bumper** Cast iron
Steps and hand rail to be provided at front of tank so that tank funnel can be reached
Pilot None Pushing shoes Cast in bumpers
* **Front Bumper** Cast iron Bumper plate None
Steps Across front and back

* **Coupler** Front bumper and two pocket drawhead 24" and 31" center above rail as shown on B. L. W. tracing 32796.
Back bumper and radial drawbar with link and pin coupling 22" center above rail as B. L. W. tracing 32797.
Signal fixtures None

Headlight Two Round Case 14" Reflector, To burn Kerosene
Headlight, Nos. on sides With H'd'l't step None
Lamp shelf None Nosing ----

Bell 85 pounds
Sand Box Four 10½"x 10" Body Iron, painted Pipes Iron
Sander Hand in each box

Dome casing Iron, painted

Boiler Jacket #22 sch. steel pl. Bands Iron Style 9 and 14
Boiler Lagging Magnesia Sectional
Back head of boiler to be lagged and jacketed

11-266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS
R. E. McFalls Nov 1916 III
SPECIFICATION FOR LOCOMOTIVES 4-28-2 C 60 to 63
FOR Bethlehem Steel Company (Lehigh Plant)

Frames Cast Steel Braces Solid

Cylinders, Diam. 17" Stroke 20"
St'm ports, Length 16" Width 1½" Bridges 1"
Exh. ports, Length 16" Width 2½" Valve lead 1/16"
Valve travel 5½" Steam lap ¾" Exhaust clearance ----
Eccentric crank throw 5" By-pass valve none
(Spec) Nathan Triple Bulls Eye
Cyl'r heads Cast Iron: Lubr. pipes of iron under jacket
Cyl'r casings Iron painted Head covers Steel painted
St'm chest casings Iron painted Covers Steel painted
St'm chest valves Richardson Balanced, with vacuum valves
Mat'l pkg Piston rods Steel U. S. (Not Spec)

Pistons Cast iron rings spring into solid head
Guides Laird type, steel Guide ups Needle
Crossheads Cast steel
Wrist Pins Steel Rod cups Plunger
Parallel rods to have solid ends

Valve Motion Stephenson
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except stayboits to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 42" Cen. diam. 36", Centers Cast iron
Wheel centers without hub liners
Tires Steel Held by Shrinkage and shoulder
Tires, Flanged, Pos. All Size 3" x 5"
Tires, Plain, Pos. ---- Size ----
Lateral play between driving boxes and wheel hubs 1/16" total
Driving Boxes Steeled cast iron
Journals, Diam. 8½" Length 9"

Springs. Make B. L. W.

Front Engine Truck None Wheeled ----
To swing --- each side of cen. Cen. pin liners ---
Journals, Diam. --- Length --- Boxes ---
Wheels, Diam. --- Tread --- Kind ---
Tires ---- Cen. diam. --- Size ---
Tires held by ---

Back Engine Truck None Wheeled ---
To swing --- each side of cen. Cen. pin liners ---
Journals, Diam. --- Length --- Boxes ---
Wheels, Diam. --- Tread --- Kind ---
Tires --- Cen. diam. --- Size ---
Tires held by ---

Brake, position On all drivers (No tender)
Operating Parts { Engine, Sch. U-2 B. L. W. Steam / Eng. Tr'k, sch. ----
Foundation Parts { Drivers, sch. U-2 B. L. W. / Eng. Tr'k, sch. ----
Air pump ---- Pos. ---
Train connections ----
Train signal, sch. ----
Main Lubricator to be piped to steam brake valve

Tender None Standard Drawing No. ---
Weight, with tank and water about ---

Tank 1500 Gallons Sch. 4327
Saddle tank over top of boiler, extending over smoke box

Fuel Bunker ---

Frame --

Front Drawbar height ---
Pilot ---- Pilot wheels ---
Back drawhead center above rail ---
Coupler ----

Steps ---

Trucks ---

Springs ---
Journals, Diam. --- Length ---
Wheels, Diam. --- Tread --- Kind ---
Tires --- Cen. diam. --- Size ---
Tires held by ---
Safety chains ---

Brake Position ---
Brake sch. ---

List of tools, sch. 29
Photo sch. None Inspection B. L. W.
To be weighed Yes Material specifications B. L. W.
Certificate of boiler test Three copies of B. L. W. form 1036
Junior laws to 9-10-16 Shipment On cars

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. Patents Throttle, Patented January 23, 1900 (Cast on)

Property plates None

Painting: Engine, style 220 OLIVE GREEN AND ALUMINUM (Yellow Stripe) 11/8/16.
Painting: Tender, style ---------

LETTERING, ETC. TO BE APPLIED IN YELLOW
Mark on TANK SIDES, BETHLEHEM STEEL COMPANY

Road Nos. Pos	Road Nos.	Name NONE
F.NO PLATE	18 TO 21	
DOME		
CAB SIDES		

11-266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-4106

Memorandum Spec'n 11147

SPECIFICATION FOR LOCOMOTIVES 4-28-0 60 to 63

FOR Bethlehem Steel Company (Lehigh Plant)

Gen. as Photo 2584

Engine Drawing No. 21

9-9-16

Gauge of Road 3' 0" Play ⅝"
Wheelbase, Rigid 5' 9" Driving 5' 9" Total 5' 9"
Total wheelbase, eng. and tend. Actual ---, Limited to ----
Grades 2½% and 4%.
Curves 3½° radius
Length over bumpers 24' 1"
Limits, Height 10' 6" Width 7' 9½"
Weight (approximate) in working order, Total 92,390 pounds
On F. tr'k --- lbs., Drivers 92,390 lbs., B. tr'k --- lbs.

Tractive power 21,060 lbs., Ratio of adhesion 4.3
Work'g St'm Pres. 180 lbs., Service Switching
Fuel Soft Coal

Boiler Steel Thick 9/16" Bill 7918
Boiler, Diam. 52" Plan Straight Top
Boiler st'm pres. 180 lbs., Tested to 200 lbs. steam pres. / 240 lbs. water pres.
Longitud. seams Butt jointed double covering strips

Dome, diam. 25" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 46⅛" Width 49¾" Depth F. 57⅞" B. 56⅝"
Firebox, Tube, ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diam.
Water space, Front 2½" Sides 3" Back 3"
Water space, Frame Single Riveted
Water space stays ⅞" diam. with 3/16" holes 1½" deep from O.S.

Radial stays 1" diameter Sling stays front Two rows of B. L. W. Expansion Stays
Button heads below crown on Six central rows
Crown bars None Placed -- above crown
Crown bolts ----

Flues ----
Tubes #12 W.G. Charcoal iron or steel
Tube ends Swaged for copper ferrules, fire box ends
Number 158 Diam. 2" Leng. 20' 10"

Heating Surface	Flues ----	Combus. Chamb. ----	Total 965[d]
	Tubes 889[d]	Fire Box 76[d]	Fire Brick Tubes ---
Grate area 16[d]	Ratio to Heating Surface 1 : 60.3		
Superheater -----			

Fire Brick Arch, None

Grates Rocking bars and drop plate
Ash Pan, Dampers Right and left

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Smokebox extension With Cleaning hole and cap None
Spark-arrester hopper With
Netting and deflect. plates With

Exhaust nozzles Double, High

Stack Cast iron, straight Dia. 18" Hole in S. B. dia. 19½"

(Not spec) **Safety Valves** Two Consolidated 2"
Safety valves None with relief lever, Set to 180 pounds
Whistle B. L. W. plain

Steam Gauge One 1 on 7" BAKER-Ashcroft (not spec)
Steam gauge stand Iron **Clock** None

Water Gauge One B. L. W. (Tramelet) Cab Lower
Gauge Cocks Three
Lowest gauge cock 2½"
Lubricator steam valve
Blower Valve B. L.

Blow off Cock One
Cleaning Plugs
Firebox Corners dia
Crown, One each side
Waist, One under fr
Front tube sheet, One

Pump None
Top chamb. ---
Feed Cock ----
Checks ---

(Spec) **Injectors** Two Sellers
Injectors, Pos. Right and
Pipes, Check Iron F
Check B. L. W.

Steam Heat None

Cab Steel
Omit cab side doors and
Omit coal box from cab
Cab boards Steel
Running boards Iron
Hand rail Iron

*Back Bumper Cast Ir
Steps and hand rail to
tank funnel can be rem
Pilot None
*Front Bumper Cast Ir
Steps Across front and

*Coupler Front bumper
above rail as shown on
Back bumper and radial
center above rail as B.
Signal fixtures None

Headlight Two Round Cas
Headlight, Nos. on sides With
Lamp shelf None

Bell 85 pounds
Sand Box Four 10½" x 10
Sander Head in each box

Dome casing Iron, painted

Boiler Jacket #22 soft steel pt Bands Iron Style 9 and 14
Boiler Lagging Magnesia Sectional
Back head of boiler to be lagged and jacketed

NOTICE

THE PRECEDING PAGE HAS BEEN REPHOTOGRAPHED TO ASSURE THE BEST POSSIBLE LEGIBILITY. ITS IMAGE APPEARS IMMEDIATELY HEREAFTER.

SOUTHWEST MICROPUBLISHING, INC.

THE BALDWIN LOCOMOTIVE WORKS

R. E. McFalls Nov 1916

111

SPECIFICATION FOR LOCOMOTIVES 4-28-0 60 to 63

FOR Bethlehem Steel Company (Lehigh Plant)

Frames Cast Steel Bolts Solid

Cylinders, Diam. 17" Stroke 20"
St'm ports, Length 16" Width 1½" Bridges 1"
Exh. ports, Length 16" Width 2½" Valve lead 1/16"
Valve travel 5½" Steam lap ¾" Exhaust clearance ----
[illegible] none

iron under jacket
Steel painted
Steel painted
with vacuum valves
)

solid head
ups Needle

ger

centre rod jaws to be
hings.

ited States Standard.
e hardened

", Centers Cast iron

) and shoulder
Size 3" x 5"
Size ----
s = 1/16" total

Size - -

Size---

Eng. Tr'k, sch. ----
Foundation Drivers, sch. U-2 B. L. W.
Parts Eng. Tr'k, sch. ----
Air pump ---- Pos. ---
Train connections ----
Train signal, sch. ----
Main Lubricator to be piped to steam brake valve

Tender None Standard Drawing No ---
Weight, with tank and water about ---

Tank 1500 Gallons Sch 4327
Saddle tank over top of boiler, extending over smoke box

Coal Bunker ---

Frame --

Front Drawing Height ---
Pilot ---- Pilot Beam ---
Back Deadwood (other above rail ---
Coupler ----

Steps ---

Trucks ---

Springs ---
Journals, Diam. --- Length ---
Wheels, Diam. --- Tread --- Kind ---
Tires --- Cen. diam. --- Size ---
Tires held by ---
Safety chains ---

Brake Position ---
Brake sch. ---

List of tools, sch. 29
Photo sch. None Inspection B. L. W.
To be weighed Yes Material specs B. L. W.
Certificate of boiler test Three copies of B. L. W. form 1036
Junior laws to 9-10-16 Shipment On cars

Brass shop finish, No 1
Machine shop finish D-165

B. L. W.
Patents Throttle, Patented January 23, 1900 (Cast on)

Property plates None

Painting: Engine, style 220 OLIVE GREEN AND ALUMINUM YELLOW 11/8/16.
Painting: Tender, style ---------

LETTERING, ETC. TO BE APPLIED IN YELLOW
Mark on TANK SIDES, BETHLEHEM STEEL COMPANY

Road Nos. Pos	Road Nos.	Name NONE
F. NO PLATE	18 TO 21	
DOME		
CAB SIDES		

THE BALDWIN LOCOMOTIVE WORKS As Spec'd C-4102

Memorandum Spec'n 11147

SPECIFICATION FOR LOCOMOTIVES 4 28 C 60 to 63 Gen as Photo 2584

FOR Bethlehem Steel Company (Lehigh Plant) **Engine Drawing No.** 21

M 9-9-16

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 5' 9" Driving 5' 9" Total 5' 9"
Total wheelbase, eng. and tend. { Actual ---, Limited to ----
Grades 3½% and 4%.
Curves 37½ feet radius
Length over bumpers 24' 1"
Limits, Height 10' 6" Width 7' 9½"
Weight (approximate) In working order, Total 92,390 pounds
On F. tr'k --- lbs. Drivers 92,390 lbs. B. tr'k --- lbs.

Tractive power 21,060 lbs. Ratio of adhesion 4.3
Work'g St'm Pres. 180 lbs. Service Switching
Fuel Soft Coal

Boiler Steel Thick 9/16" Bill 7918
Boiler, Diam. 52" Plan Straight Top
Boiler st'm pres. 180 lbs. Tested to { 200 lbs. steam pres. / 240 lbs. water pres.
Longitud. seams Butt jointed double covering strips

Dome, diam. 25" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 46½" Width 42½" Depth F. 57⅝" B. 56⅝"
Firebox, Tube, ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diam.
Water space, Front 4½" Sides 3" Back 3"
Water space, Frame Single Riveted
Water space stays ⅞" diam. with 7/16" holes 1½" deep from O.S.

Radial stays 1" diameter Sling stays front 3 rows of B. L. W. Expansion Stays
Button heads below crown on 6 1 central rows
Crown bars None Placed --- above crown
Crown bolts ----

Flues ----
Tubes 312 2" O.D. Charcoal iron or steel
Tube ends Swaged for copper ferrules, fire box ends
Number 156 Diam. 2" Length 10' 10"

Heating Surface	Flues ----	Combus. Chamb. ----	Total 889 sq. ft.
	Tubes 889 sq. ft.	Fire Box 76 sq. ft.	Fire Brick Tubes ---
Grate area 16 sq. ft.	Ratio to Heating Surface 1 : 60.3		
Superheater -----			

Fire Brick Arch, None

Grates Rocking bars and drop plate
Ash Pan Dampers Right and left

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Smokebox extension With Cleaning hole and cap None
Spark arrester hopper With
Netting and deflect. plates With ---

Exhaust nozzles Double, High

Stack Cast iron, straight Dia. 16" Hole in S. B. dia. 15½"

Safety Valves Two Consolidated 2" (Not spec)
Safety valves None with relief lever, Set to 180 pounds
Whistle B.-L. W. plain

Steam Gauge One 4½" 7" BAKER - Ashcroft (Not spec)
Steam gauge stand Iron **Clock** None

Water Gauge One B.L.W.(Ironclad) **Cab Lamps** to burn oil
Gauge Cocks Three Back Surface valve None
Lowest gauge cock 2½" above highest part of crown
Lubricator steam valve without separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One B. L. W. Pos.- Front
Cleaning Plugs
Firebox Corners diagonal
Crown, One each side and three back
Waist, One under front
Front tube sheet, One Fusible plug One

Pump None Pos. ---
Top chamb. --- Bottom chamb. ---
Feed Cock ---- Feed pipes ---
Checks --- Check pipes ---

Injectors Two Sellers Class N (Spec) No. 7½
Injectors, Pos. Right and left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos Right and left

Steam Heat None

Cab Steel
Omit cab side doors and provide sliding doors in back of cab;
Omit coal box from cab.
Cab boards Steel Nosing T-iron
Running boards None Nosing ---
Hand rail Iron Located on Cab

***Back Bumper** Cast iron
Steps and hand rail to be provided at front of tank so that tank funnel can be reached
Pilot None Pushing shoes Cast in bumpers
***Front Bumper** Cast iron Bumper plate None
Steps Across front and back

***Coupler** Front bumper and two pocket thimbles 34" and 32" center above rail as shown on B. L. W. tracing 32795.
Back bumper and radial drawbar with link and pin coupling 22" center above rail as B. L. W. tracing 32797.
Signal fixtures None

Headlight Tee Round Case 14" Reflector, To burn Kerosene
Headlight, Pos. on sides With H'd'l't step None
Lamp shelf None Nosing ----

Bell 65 pounds
Sand Box Four 10½" x 30" Body Iron, painted Pipes Iron
Sander Hand in each box

Dome casing Iron, painted

Boiler Jacket #22 soft steel plBarrel Iron Style S and M
Boiler Lagging Magnesia Sectional
each head of boiler to be lagged and jacketed

11-266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS
R.E. McFalls Nov. 1916 111
SPECIFICATION FOR LOCOMOTIVES 4 28 C 60 to 63
FOR Bethlehem Steel Company (Lehigh Plant)
M

Frames Cast Steel Braces Solid

Cylinders, Diam. 17" Stroke 20"
St'm ports, Length 16" Width 1½" Bridges 1"
Exh. ports, Length 16" Width 2½" Valve lead 1/16"
Valve travel 5½" Steam lap ¾" Exhaust clearance ----
Eccentric crank throw 5" By-pass valve none
S. P. Lubr. (Spec) Nathan Triple Bulls Eye
Cyl'r heads Cast Iron; Lubr. pipes of iron under jacket
Cyl'r casings Iron painted Head covers Steel painted
St'm chest casings Iron painted Covers Steel painted
St'm chest valves Richardson Balanced, with vacuum valves
Met. pkg { PISTON ROD / VALVE STEMS } U. S. (Not spec)

Pistons Cast iron rings sprung into solid head
Guides, Laird type, steel Oil cups Needle
Crossheads Cast steel
Wrist Pins Steel Rod cups Plunger
Parallel rods to have solid ends

Valve Motion Stephenson
{ Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except stayholts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 42" Cen. diam. 36", Centers Cast iron
Wheel centers without hub liners
Tires Steel Held by Shrinkage and shoulder
Tires, Flanged, Pos. All Size 3" x 5"
Tires, Plain, Pos. ---- Size ----
Lateral play between driving boxes and wheel hubs = 1/16" total
Driving Boxes Steeled cast iron
Journals, Diam. 8½" Length 9"

Springs. Make B. L. W.

Front Engine Truck None Wheeled ----
To swing --- each side of cen., Cen. pin liners ----
Journals, Diam. --- Length --- Boxes ----
Wheels, Diam. --- Tread --- Kind ---
Tires ---- Cen. diam. --- Size ---
Tires held by ---

Back Engine Truck None Wheeled ---
To swing --- each side of cen., Cen. pin liners ---
Journals, Diam. --- Length --- Boxes----
Wheels, Diam. --- Tread --- Kind ---
Tires --- Cen. diam. --- Size---
Tires held by ---

Brake, position On all drivers (No tender)
Operating { Engine, Sch. U-2 B. L. W. Steam
Parts { Eng. Tr'k, sch. ----
Foundation Drivers, sch. U-2 B. L. W.
Parts Eng. Tr'k, sch. ----
Air pump ---- Pos. ---
Train connections ----
Train signal, sch. ----
Main Lubricator to be piped to steam brake valve

Tender None Wheeled, Drawing No. ---
Weight, with fuel and water, about ---

Tank 1500 Gallons Bill 4327
Saddle tank over top of boiler, extending over smoke box

Tool Boxes ---

Frame ---

Front Drawbar height ---
Pilot ---- Pushing shoes ---
Back drawhead, center above rail ---
Coupler ---

Steps ---

Trucks ---

Springs ---
Journals, Diam. --- Length ---
Wheels, Diam. --- Tread --- Kind ---
Tires --- Cen. diam. --- Size ---
Tires held by ---
Safety chains ---

Brake Position ---
Brake sch. ---

List of tools, sch. 29
Photo sch. None Inspection B. L. W.
To be weighed Yes Material specifications B. L. W.
Certificate of boiler test Three copies of B. L. W. form 1036
Junior laws to 9-10-16 Shipment On cars

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. Patents { Throttle, Patented January 23, 1900 (Cast on)

Property plates None

Painting: —Engine, style 220 OLIVE GREEN AND ALUMINUM (YELLOW) 11/28/16.
Painting: —Tender, style ---------

LETTERING, ETC. TO BE APPLIED IN YELLOW
Mark on TANK SIDES, BETHLEHEM STEEL COMPANY

Road Nos. Pos.	Road Nos.	Name NONE
F. & NO PLATE	18 to 21	
DOME		
CAB SIDES		

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-1637
Memorandum Spec'n 11175
SPECIFICATION FOR LOCOMOTIVES 6 32 D 1096
FOR BETHLEHEM STEEL CO.
LEBANON PLANT

Gen. as PHOTO. 3802
Engine Drawing No. 48
10-16-16

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"
Total wheelbase, eng. and tend. {Actual 140' 3¾" / Limited to ---

Curves ---

Limits, Height --- Width ---
Weight (approximate) in working order, Total 122,000 POUNDS
On F. tr'k --- lbs.. Drivers 122,000 lbs., B. tr'k --- lbs.

Tractive power 28,720 lbs., Ratio of adhesion 4.3
Work'g St'm Pres. 180 lbs., Service SWITCHING
Fuel SOFT COAL

FRONT TUBE SHEET TO BE ½" THICK
Boiler STEEL Thick ⅜" Bill 6295
Boiler, Diam. 62" Plan STRAIGHT TOP
Boiler st'm pres. 200 lbs., Tested to {220 lbs. steam pres. / 267 lbs. water pres.
Longitud. seams BUTT JOINTED DOUBLE COVERING STRIPS

Dome, diam. 29" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE
Firebox, length 88-1/16" Width 41" Depth F. 60½" B. 57½"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" DIAM.
Water space, Front 4" Sides 3½" Back 3½"
Water space, Frame SINGLE Riveted
Water space stays ⅜" DIAM. WITH 3/16" HOLES 1¼" DEEP FROM O.S.

Radial stays 1" DIAMETER Sling stays front {TWO ROWS OF B. L. W. EXPANSION STAYS
Button heads below crown on EIGHT central rows
Crown bars NONE Placed --- above crown
Crown bolts ---

Flues ---
Tubes #12 W.G. CHARCOAL IRON OR STEEL
Tube ends SWAGED FOR COPPER FERRULES FIREBOX ENDS
Number 246 Diam. 2" Length 11' 0⅛"

Heating Surface: Flues --- Combus. Chamb. --- Total 1530 ☐
Tubes 1407 ☐ Fire Box 123 ☐ Fire Brick Tubes ---
Grate area 25 ☐ Ratio to Heating Surface 1 : 61.2
Superheater ---

Fire Brick ARCH NONE

Grates ROCKING BARS AND DROP PLATE
Ash Pan, Dampers FRONT AND BACK

Throttle BALANCE Pos. DOME
Dry pipe STEEL

Superheater NONE

Smokebox extension WITH Cleaning hole and cap L. S. ONLY
Spark ejector or hopper WITH
Netting and deflect. plates WITH

Exhaust nozzles DOUBLE, HIGH

Stack STRAIGHT Dia. 16" Hole in S. B., dia. 21"

Safety Valves (Spec.) TWO COALE 2½" MUFFLED
Safety valves NONE with relief lever, Set to 180 POUNDS
Whistle B. L. W. PLAIN

Steam Gauge ONE IRON 7" MAKER: ASHCROFT (NOT SPEC)
Steam gauge stand IRON **Clock** NONE

Water Gauge ONE B.L.W. (IRONCLAD) **Cab Lamps** TO BURN OIL
Gauge Cocks THREE BACK Surface valve NONE
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve TO HAVE separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock B. L. W. Pos. RIGHT AND LEFT
Cleaning Plugs ONE PLUG ABOVE EIRE
Firebox CORNERS DIAGONAL AND FRONT
Crown, TWO EACH SIDE AND TWO BACK
Waist, ONE UNDER FRONT
Front tube sheet, ONE Fusible plug ONE
ONE PLUG EACH SIDE IN WAIST ABOUT 14" BACK OF FRONT TUBE SHEET ABOUT ON LINE WITH TOP ROW OF FLUES.

Pump NONE Pos.
Top chamb. --- Bottom chamb. ---
Feed Cock --- Feed pipes ---
Checks --- Check pipes ---

Injectors (Spec.) TWO HANCOCK TYPE "A" No. 9
Injectors, Pos. RIGHT AND LEFT Steam pipes Concealed
Pipes, Check IRON Feed IRON Overflow IRON
Check B. L. W. Pos. RIGHT AND LEFT

Steam Heat NONE

Cab WOOD SEAT BOX TO BE APPLIED ON RIGHT SIDE

Cab boards WOOD Nosing NONE
Running boards WOOD Nosing NONE
Hand rail IRON Located on BOILER

Back Bumper BAR STEEL Back drawbar height 2'-4"

Pilot NONE Pushing shoes AT FRONT
Front Bumper OAK Bumper plate WITH
Steps ACROSS FRONT WITH HAND RAIL
STEPS, HAND HOLDS, ETC., TO CONFORM TO I. C. C. REQUIREMENTS
Front Drawhead, Center above rail 33½"
Coupler M. C. B. AUTOMATIC

Signal fixtures NONE

Headlight TWO ROUND CASE 16" Reflector, To burn KEROSENE
Headlight, Nos. on sides WITH H'dl't stop WITH
Lamp shelf NONE Nosing ---

Bell 92 POUNDS
Sand Box TWO Diam. 28" Body IRON PAINTED Pipes IRON
Sander (NOT SPEC) LEACH AIR TRAP A-1 IN EACH BOX TO SAND FRONT AND BACK

Dome casing IRON PAINTED

Boiler Jacket #22 SOFT STEEL PTBands IRON Style 9
Boiler Lagging MAGNESIA SECTIONAL

11-266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS
N. Eastlick Jan. 1917
SPECIFICATION FOR LOCOMOTIVES 6 32 D 1096
FOR BETHLEHEM STEEL CO.

113

Frames CAST STEEL Braces SOLID

Cylinders, Diam. 19" Stroke 26"
St'm ports, Length 16" Width 1¼" Bridges 1"
Exh. ports, Length 16" Width 2½" Valve lead 1/16"
Valve travel 5⅝" Steam lap ¾" Exhaust clearance ---
Eccentric crank throw 5" By-pass valve NONE
S. F. Lubr. (Spec.) DETROIT TRIPPLE #22 BULLS EYE
Cyl'r heads CAST IRON: LUBR. PIPES OF IRON UNDER JACKET
Cyl'r casings IRON PAINTED Head covers STEEL PAINTED
St'm chest casings IRON PAINTED Covers STEEL PAINTED
St'm chest valves RICHARDSON BALANCED WITH VACUUM VALVES
Met. pkg {PISTON RODS / VALVE STEMS} UNITED STATES (NOT SPEC)
PISTON RODS TO BE KEYED TO CROSSHEADS
Pistons CAST IRON RINGS, SPRUNG INTO SOLID HEADS
Guides STEEL Oil cups NEEDLE
Crossheads CAST STEEL
Wrist Pins STEEL Rod cups PLUNGER
PARALLEL RODS TO HAVE SOLID ENDS

Valve Motion STEPHENSON
{Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.
MAIN DRIVING WHEELS ONLY TO HAVE BRASS HUB LINERS
Drivers, O. S. Diam. 50" Cen. diam. 44"
WHEEL CENTERS, MAIN CAST STEEL, OTHERS CAST IRON
Tires STEEL Held by SHRINKAGE AND SHOULDER
Tires, Flanged, Pos. FRONT AND BACK Size 3" x 5½"
Tires, Plain, Pos. MIDDLE Size 3" x 6½"
Lateral play between driving boxes and wheel hubs = 1/16" TOTAL
Driving Boxes CAST STEEL
Journals, Diam. 8½" Length 8½"

Springs. Make B. L. W.

Front Engine Truck NONE Wheeled ---
To swing --- each side of cen., Cen. pin liners ---
Journals, Diam. --- Length --- Boxes ---
Wheels, Diam. --- Tread --- Kind ---
Tires --- Cen. diam. --- Size ---
Tires held by ---

Back Engine Truck NONE Wheeled ---
To swing --- each side of cen., Cen. pin liners ---
Journals, Diam. --- Length --- Boxes ---
Wheels, Diam. --- Tread --- Kind ---
Tires --- Cen. diam. --- Size ---
Tires held by ---

Brake, position ON ALL DRIVING AND TENDER WHEELS
Operating Parts {Engine, Sch. A-1 AND SWA WESTINGHOUSE AUTOMATIC AND STRAIGHT AIR / Eng. Tr'k, sch. ---}
Foundation Parts {Drivers, sch. WM-2 AMERICAN OUTSIDE EQUALIZED / Eng. Tr'k, sch. ---}
Air pump ONE 9½" Pos. LEFT SIDE
Train connections, FRONT AND BACK
Train signal, sch. NONE
Air reservoirs to have hydrostatic test of 210 lbs per sq. in.

Tender EIGHT Wheeled, Drawing No. 435
Weight, with fuel and water, about 80,000 POUNDS

Tank 4000 Gallons, Bill 4171
TANK "U" SHAPE, SLOPING BACK FUEL CAPACITY 7 TONS

Tool Boxes HARD WOOD, TOP

Frame STEEL 10" CHANNELS

Front Drawbar height 28¼"
Pilot NONE Pushing shoes AT REAR
Back drawhead, center above rail 33½"
Coupler M. C. B. AUTOMATIC
STEPS, HAND HOLDS, ETC., TO CONFORM TO I. C. C. REQUIREMENTS
STEPS ACROSS BACK WITH HANDRAIL
Steps AND HANDRAIL ON SLOPING BACK OF TANK

Trucks ARCH BAR TYPE WITH CAST STEEL BOLSTER

Springs ELLIPTIC B. L. W.
Journals, Diam. 4½" Length 8"
Wheels, Diam. 33" Tread 4½" Kind CHILLED CAST IRON PLATE
Tires NONE Cen. diam. --- Size ---
Tires held by ---
Safety chains SINGLE

Brake Position ON ALL WHEELS.
Brake sch. FL-1212 AND SWA WESTINGHOUSE AUTOMATIC AND STRAIGHT AIR

List of tools, sch. 29
Photo sch. NONE Inspection B. L. W.
To be weighed NO Material spec'ns B. L. W.
Certificate of boiler test THREE COPIES OF B. L. W. FORM 1036
Junior laws to 4-6-16 Shipment ON OWN WHEELS, UNDER STEAM. 1-2-17

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. Patents {THROTTLE, PATENTED JAN. 23, 1900 (CAST ON) / FEED PIPE STRAINER, PATENTED SEP. 1, 1903 (CAST ON)}

Property plates NONE

Painting: -Engine, style 291, OLIVE GREEN AND ALUMINUM
Painting: - Tender, style 291, OLIVE GREEN AND ALUMINUM

Mark on TANK SIDES, BETHLEHEM STEEL COMPANY

Road Nos. Pos.	Road Nos.	Name
F. No. PLATE	8	NONE
F. SAND BOX		
CAB SIDES		
BACK OF TANK		

THE BALDWIN LOCOMOTIVE WORKS As Spec'n. C-4323
Memorandum Spec'n 11250 Dup. 6-32 D 1089 and 1090 except where otherwise specified.

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1099-1100 Gen. as Photo. 3802 {Except with Laird type guides

FOR Bethlehem Steel Company – Steelton Plant **Engine Drawing No.** 48

R. 12-15-16

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"
Total wheelbase engine and tender Actual 40' 3⅜" Limited to -----

Curves -----

Limits, Height ----- Width -----
Weight (proposed) (Actual) Total 123,500 pounds
On F. truck ----- lbs. On Drivers 123,500 lbs. On B. truck ----- lbs.

Tractive power 26720 lbs. Ratio of adhesion 4.3
Work'g St'm Pres. 190 lbs. Service SWITCHING
Fuel Soft Coal

Front tube sheet to be ½" thick.
Boiler Steel Taper ⅝" Built 1895
Boiler, Diam. 62" Plate Straight Top
Boiler st'm pres 200 lbs. Tensile strength 52000 lbs. Strength of weakest ring 200 lbs. WITH FACTOR OF SAFETY OF 4.94 Strength of weakest part of water leg 202 lbs.
Longitud. seams Butt welded, double riveted, sextuple straps

Dome, diam. 28" Plate Sectional

Firebox Steel Combustion chamber None
Firebox, length 96-1 5/8" Width 41" Depth F. 69½" B. 57½"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diav.
Water space, Front 4" Sides 3½" Back 3½"
Water space, Frame Single Rivited
Water space stays ⅝" diam. with 2.1" holes 1¼" pitch horiz. & V.

Radial stays 1" diam. Sling stays from {Two rows of B. L. W. Expansion stays
Button heads to be flush on Eight central rows
Crown bars Sling Plate ----- above crown
Crown bolts -----

Flues -----
Tubes #12 W. G. Charcoal Iron or Steel
Tube ends Swaged for copper ferrules, fire box ends
Number 246 Diam. 2" Length 11' 0⅛"

Heating Flues ---- Combus. Chamb. ---- Total 1530 sq. ft.
Surface Tubes 1407 sq. ft. Fire Box 123 sq. ft. Fire Brick Tubes ----
Grate area 25 sq. ft. Ratio to Heating Surface 1 to 61.2
Superheater ----

Fire Brick Arch None
No studs for arch brick desired in fire box

Grates Rocking bars, with drop plate front and back
Ash Pan, Dampers Front and back

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Smokebox extension With Cleaning hole and cap L. S. Only
Spark ejector or hopper With
Netting and deflect. plates With

Exhaust nozzles Double high

Stack Straight Dia. 16" Hole in S. B. dia. 21"

Safety Valves (Spare) Two Coale 2½" muffled
Safety valves None with relief lever, Set to 190 pounds
Whistle B. L. W. Plain

Steam Gauge One Iron 7" MAKER:-Ashcroft (not Spare)
Steam gauge stand Iron **Clock** None

Water Gauge One B.L.W. (Ironclad) **Cab Lamps** to burn oil
Gauge Cocks Three Back Surface None
Lowest gauge cock ¾" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One B. L. W. POS:-Front
Cleaning Plugs One plug above fire door
Firebox Corners diagonal and sides
Crown, Two each side and two back
Waist, (See * below)
Front tube sheet, One Fusible plug One
One plug each side in waist about 14" back of front flue sheet about on line with top row of flues.
Plugs in side sheets where blow-off cocks are now located

* Washout plate on under side of boiler 30" back of front tube sheet. Casting to be riveted to boiler should have 5" washout hole as Co's print 29-6-162.

PUMP, None (Spare)

Injectors Two Hancock, type "A" No. 9
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. Right and Left
Overflow from left injector to be piped into front ash pan and from right injector into rear ash pan, to wash ashes off inclined part of pan to prevent the warping of pan.
STEAM HEAT, None

Cab Wood. Seat box to be applied in right side of cab. Opening between running boards and jacket to be closed, to protect machinery from dirt and grit.
Cab boards Wood Nosing None
Running boards Wood Nosing None
Hand rail Iron Located on Boiler

Back Bumper Bar Steel Back drawbar height 25¼"
Steel buffer castings between engine and tender as Co's pt. No. 28300
Pilot None Pushing shoes Cast in Bumper
Front Bumper Cast steel Bumper plate With
Steps across front with hand rails
Steps, hand holds, etc. to conform to I. C. C. requirements
Front Drawhead, Center above rail 33½"
Coupler M. C. B. Auto.

Signal fixtures None

Headlight Two Round Case 16" Reflector, To burn Kerosene
Headlight, Nos. on sides With H'dl't step With
Lamp shell None Nosing -----

Bell 92 pounds
Sand Box Two Diam. 28" Body Iron Painted Pipes Iron
Sander (Spare) Leach Air Trap A-1 in each box to sand front and back
Sand pipes to be 3" diam. leading from sand boxes to rail.
Dome casing Iron Painted

Boiler Jacket #22 Soft Steel Pt. Bands Iron Style 9
Boiler Lagging Magnesia sectional

Ord. 266-67 Phot. copies see box

THE BALDWIN LOCOMOTIVE WORKS
N. Harwick June 1917 115

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1099-1100

FOR – Bethlehem Steel Company

R.

Two complete sets of detail blue-prints of all parts of Locos. to be furnished.

Frames Cast Steel Braces Solid

Cylinders, Diam. 19" Stroke 26"
St'm ports, Length 16" Width 1¼" Bridges 1"
Exh. ports, Length 16" Width 2½" Valve lead 1/16"
Valve travel 5½" Steam lap ¾" Exhaust clearance -----
Eccentric crank throw 5" By-pass valve None
S. F. Lubr. Detroit Triple #22 Bulls Eye (Spare)
Cyl'r heads Cast Iron; Lubr. pipes of Iron under jacket
Cyl'r casings Iron Ptd. Head covers Steel Painted
St'm chest casings Iron Ptd. Covers Steel Painted
St'm chest valves Richardson Balanced, with vacuum valves
Met. pkg (Piston rods Valve stem) United States (not Spare)
Piston rods to be keyed to crosshead
Pistons Cast iron rings sprung into solid head
Guides Laird type, Steel Oil cups Needle
Crossheads Cast steel
Wrist Pins Steel Rod cups Plunger
Main rods to be connected to middle pair of driving wheels.
Parallel rods to have solid ends.
Valve Motion Stephenson
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.
Driving wheels to have hub liners of Brass
Drivers, O. S. Diam. 50" Cen. diam. 44"
Wheel Centers:- Main cast Steel, Others cast Iron
Tires Steel Held by Shrinkage and Shoulder
Tires, Flanged, Pos. Front and Back Size 3" X 5½"
Tires, Plain, Pos. Middle Size 3" X 6½"
Lateral play between driving boxes and wheel hubs – 1/16" total
Driving Boxes Cast steel
Journals, Diam. 8½" Length 9½"

Springs. Make B. L. W.

Front Engine Truck None Wheeled -----
To swing ----- each side of cen., Cen. pin liners -----
Journals, Diam. ----- Length ----- Boxes -----
Wheels, Diam. ----- Tread -----Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----

Back Engine Truck None Wheeled -----
To swing ----- each side of cen., Cen. pin liners -----
Journals, Diam. ---- Length ----- Boxes -----
Wheels, Diam. ----- Tread -----Kind -----
Tires ----- Cen. diam.----- Size -----
Tires held by -----

Brake, position On all driving and tender wheels
Operating Parts } Engine, Sch. A-1 & S.W.A. West'g. Auto. and Eng. Tr'k, sch. ----- Straight Air
Foundation Parts } Drivers, sch. W-2 American Outside Equalized Eng. Tr'k, sch. -----
Air pump One 9½" Pos. Left Side
Train connections Front and Back
Train signal, sch. None
Air Reservoir to have hydrostatic test of 210 pounds
Certificates dated April 13th 1917 covering test of reservoir Nos. 10710 to 10713 furnished by West'g. Air Brake Co. are filed in Main Office, File No. 191

Tender Eight Wheeled, Drawing No. 435
Weight, with fuel and water about 80,000 pounds

Tank 4,000 Gallons Bill 4422
Tank "U" shape, sloping back. Fuel capacity 7 tons.

Two Bozes of hard wood, Top.

Frame Steel 10" Channels
Steel buffer castings between E. & T. as Co's pt. No. 28300
Front Drawbar ---- 28½"
Pilot None Pushing shoes at rear
Back drawbar height (center above rail) 33½"
Coupler M. C. B. Automatic.
Steps, hand holds etc. to conform to I.C.C. requirements.
Steps across rear with hand rails.
Shoes and hand rails on sloping back of tank.

Trucks Arch bar type with cast steel bolsters

Springs Elliptic. B. L. W. make
Journals, Diam. 4½" Length 8"
Wheels, Diam. 33" Tread 1½" Kind Chilled Cast Iron Plate
Tires None Cen. diam. ----- Size -----
Tires held by -----
Safety chains Single

Brake Position On all wheels
Brake sch. PL-1212 & S.M.E. West'g. Auto. and Straight Air

List of tools, sch 29
Photo sch. None Inspection B. L. W.
To be weighed Yes Material specifications B. L. W.
Certificate of boiler test Three copies of B.L.W. form 1036
Junior tanks to 5-1-17 Shipment On own wheels, under steam

Brass shop finish, No 1
Machine shop finish D-165

B. L. W. Patents Feed Pipe Strainer, Patented Sept. 1, 1903 (Cast On)

Property plates None

Painting: Engine, style 291 Olive Green and Aluminum
Painting Tender, style 291 Olive Green and Aluminum

Mark on Tank sides, STEELTON AND HIGHSPIRE R.R.CO.

Road Nos. Pos.	Road Nos.	Name None
F. No. Plate	23	
F. Sand Box	24	
Cab Sides		
Back of Tank		

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-4330.
Memorandum Spec'n. 11230 Dup. 6-36 D 233-234, except where otherwise specified.
SPECIFICATION FOR LOCOMOTIVES 6 36 D 242 to 247 Gen. as Photo. 6081
FOR Bethlehem Steel Company. 11-24-16 Engine Drawing No. 37
R. (Maryland Plant)

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"
Total wheelbase, eng. and tend. (Actual 42' 2" (Limited to -----
RAILS, 90 pounds
Curves 200 feet radius

Limits, Height 15' 0" Width 10' 3"
Weight (approximate in working order, Total 150,000 pounds.
On F. tr'k ----- lbs., Drivers 150,000 lbs., B. tr'k ——— lbs.

Tractive power 34,400 lbs. Ratio of adhesion 4.3
Work'g St'm Pres. 180 lbs., Service Switching
Fuel Soft Coal

FRONT TUBE SHEET ½" THICK
Boiler Steel Thick ¾" Bill 7850
Boiler, Diam. 72" Plan Straight Top

Boiler st'm pres. 180 lbs., Tested to (200 lbs. steam pres.
WITH FACTOR OF SAFETY OF 5.1 (240 lbs. water pres.
Longitud. seams Butt jointed, double covering strips

Dome, diam. 33" Pos. Central

Firebox Steel Con bustion chamb None
Firebox, length 108-3/16" Width 42⅛" Depth F. 71½" B. 66½"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diameter
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Double Riveted
Water space stays ⅜" diam. with 3½" holes 1¼" deep from O.S.
Water space stays of Bethlehem Iron
Radial stays 1" diam. Sling front } Three rows of B. L. W. Expansion Stays
Button heads below crown on: Eight central rows
Crown bars None Placed ----- above crown
Crown bolts -----
Flues -----
LATE FLEXIBLE STAYBOLTS OF BETHLEHEM IRON, ABOUT 400 IN NUMBER, 1" DIAM. LOCATED IN BREAKING ZONE.

Tubes #12 m. g. Charcoal Iron
Tube ends Swaged for copper ferrules, fire box ends
Number 330 Diam. 2" Length 10' 5"

Heating Flues ----- Combus. Chamb. -----Total 1959.0
Surface Tubes 1726.0 Fire Box 173.0 Fire Brick Tubes -----
Grate area 31.6.0 Ratio to Heating Surface 1 : 62
Superheater -----

Fire Brick Arch on studs

Two drop grates, one front and one rear
Grates Rocking bars and drop plates
Ash Pan, Dampers Front and back
Ash pan to be self cleaning type

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Smokebox extension With Cleaning hole and cap L. S. Only
Spark ejector or hopper With
Netting and deflect. plates With

Exhaust nozzles Double high

Stack Straight Dia. 18" Hole in S. B., dia. 21¼"

Safety Valves Two Coale 3" Muffled
Safety valves None with relief lever, Set to 180 pounds
Whistle Chime, located on right side of dome

Steam Gauge One Iron 7" MAKER:-Ashcroft
Steam gauge stand Iron **Clock** None

Water Gauge One Klinger **Cab Lamps** to burn oil
Gauge Cocks Three Back Surface valve None
Lowest gauge cock 3¼" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.
Blow off cock handle to clear air pump
Blow off Cock One Spheero POS:-Front
Cleaning Plugs
Firebox Corners diagonal, and sides
Crown, Three each side and three back
Waist, One under front
Front tube sheet. Two Fusible plug One

Pump None Pos. -----
Top chamb. ----- Bottom chamb. -----
Feed Cock ----- Feed pipes -----
Checks ----- Check pipes -----

Injectors, to be located on sides of fire box
Injectors Two Sellers, Class "P" No. 10½
Injectors. Pos. Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. Right and Left
Injector checks in same location as for 6-36 D 233-234
Steam Heat None

✱ **Cab** Steel

Cab boards Steel Nosing T-Iron
Running boards Steel Nosing T-Iron
Hand rail Iron Located on Boiler

★ **Back Bumper** Bar Steel Back drawbar height 31"

Pilot None Pushing shoes Cast in bumper
Front Bumper Cast Steel Bumper plate None
Steps across front with hand rail
Steps, hand holds etc. to conform to I.C.C. requirements
Front Drawhead, Center above rail 33½"
Coupler M. C. B. Auto. Co's Standard

Signal fixtures Iron on Bumper
Signal lamp brackets to be applied
Headlight Equipment, Dressel #175-A with #100 Burner.
Headlight Two Round Case 16" Reflector. To burn Kerosene
Headlight, Nos. on sides With H'dl't step With
Lamp shelf None Nosing -----

Bell 92 pounds
Sand Box Two Diam. 28" Body Iron Painted Pipes Iron
Sander Hand in each box to sand front and rear

Dome casing Iron Painted
Back head of boiler to be lagged and jacketed
Boiler Jacket #22 Soft Steel Pt'd Bands Iron Style 9 and 14
Boiler Lagging Magnesia Sectional

A 1¼" steam line to run from left side of manifold in cab to front end of locomotive, projecting 2" beyond and resting on bumper, 25" from center line of couplers. Two disc valves to be placed on this line located in cab, end of pipe to be capped.

11-266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS 117
SPECIFICATION FOR LOCOMOTIVES 6 36 D 242 to 247
FOR Bethlehem Steel Company (Maryland Plant)
R.

Frames Cast Steel Braces Solid
Front end of two frames connected by spreader, back of bumper.
Cylinders, Diam. 21" Stroke 26"
St'm ports, Length 19" Width 1⅞" Bridges 1¼"
Exh. ports, Length 19" Width 3½" Valve lead ¼"
Valve travel 5½" Steam lap ⅞" Exhaust clearance -----
Eccentric crank throw 10⅜" By-pass valve None
S. F. Lubr. Detroit Triple #22 Bulls Eye
Cyl'r heads Cast Iron; Lubr. pipes of Iron under jacket
Cyl'r casings Iron Pt'd. Head covers Steel Painted
St'm chest casings Iron Pt'd. Covers Steel Painted
St'm chest valves Richardson Balanced, with vacuum valves
Met. pkg (piston rods / valve stems) U. S., with Gibbs vibrating cups
Steam chest pressure plate to be adjustable
Pistons Cast Iron rings sprung into solid head
Guides Laird Type, Steel Oil cups Needle
Crossheads Cast Steel
Wrist Pins Steel Rod cups Plunger, forged on
Parallel rods, to have solid ends

Valve Motion Walschaerts
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.
Drivers, O. S. Diam. 51" Cen. diam. 44" Centers Cast Steel

Tires Steel Held by Shrinkage and Shoulder
Tires, Flanged, Pos. Front and Back Size 3½" X 5½"
Tires, Plain, Pos. Middle Size 3½" X 6½"
Lateral play between driving boxes and wheel hubs—1/16" total
Driving Boxes Cast Steel
Journals, Diam. 9" Length 12"
Bottoms to be cut out as the dead eyes where spring hangers connect to frames back of spring hangers may be changed without raising engine off the wheels sufficient for pins to clear drivers. 2.19.17.
Springs. Make B. L. W.

Front Engine Truck None Wheeled -----
To swing ----- each side of cen., Cen. pin liners -----
Journals, Diam. ----- Length----- Boxes -----
Wheels, Diam. ----- Tread -----Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----

Back Engine Truck None Wheeled -----
To swing ----- each side of cen., Cen. pin liners-----
Journals, Diam. ---- Length ----- Boxes -----
Wheels, Diam. ----- Tread -----Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----

Brake, position On all driving and tender wheels
Operating Parts: Engine, Sch. A-1 & SMA West'g. Auto. and Straight Air; Eng. Tr'k, sch. -----
Foundation Parts: Drivers, sch. WM-2 American O. S. Equalized; Eng. Tr'k, sch. -----
Air pump One - 9½" Pos. Left Side
Train connections Front and Back
Train signal, sch. None
Straight air brake valve location to be changed to top of automatic brake valve.
Air reservoirs to have hydrostatic test of 210 pounds
Driving brake shoes, Perfecto.

Tender Eight Wheeled, Drawing No. 659
Weight, with fuel and water, about 102,000 lbs.

Tank 5,000 Gallons, Bill 3887
Tank, "U" shape, sloping back. Fuel capacity 8 tons

Tool Boxes of Hard Wood, Top
Signal lamp brackets at rear
Frame Steel 13" Channels, with cast steel bumpers, front and back.
★ Front Drawbar height 30"
Pilot None Pushing shoes Cast in Bumper
Back drawhead, center above rail 33½"
Coupler M. C. B. Auto., Co's Standard

Steps, hand holds, etc. to conform to I.C.C. requirements
Steps and hand rails on sloping back of tank.
Steps across rear with hand rail.
Trucks Arch bar type, with cast steel bolsters

Springs Elliptic. B. L. W.
Journals, Diam. 5" Length 9"
Wheels, Diam. 33" Tread 4½" Kind Chilled Cast Iron Plate
Tires None Cen. diam. ----- Size -----
Tires held by -----
Safety chains Single

Brake Position On all wheels
Brake sch. FL-1212 & SMB West'g. Auto. and Straight Air

List of tools, sch. 29
Photo sch. None Inspection B. L. W.
To be weighed Yes Material spec'ns B. L. W.
Certificate of boiler test Three copies of B.L.W. form 1036
Junior laws to 1-20-17 Shipment On own wheels, under steam

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. Throttle, , Patented Jan. 23, 1900 (Cast On)
Patents: Feed Pipe Strainer, Patented Sept. 1, 1903 (Cast On)

Property plates None

Painting:—Engine, style 291 Olive Green and Aluminum
Painting:—Tender, style. 291 Olive Green and Aluminum

Lettering, etc. to be same as for 6-36 D 231 to 234
Mark on tank sides, Bethlehem Steel Company

Road Nos. Pos. Road Nos. Name None
F. No Plate 25 and 26 for 242 & 243
Dome and Back of Tank 5 to 8 for 244 to 247

★ Wedge casting of cast steel with large radius and deep face, bolted to draw casting of cast steel at rear of engine, with friction wedge between draw casting and friction casting to take up slack in draw bar.

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-3207
Where not otherwise specified, loco. to be duplicate of 6 32 D 103C

Memorandum Spec'n 10803

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1074 - 1075 Gen. as 4410

FOR Maryland Steel Company **Engine Drawing No.** 43

12-9-15

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, B... 10' 6" Driving 10' 6" Total 10' 6"
Total Wheelbase engine and tend... Actual 41' 3½"
Limited to ——

Curves ----

Limits, Height ---- Width ----
Weight approximate: Total 165,000 lbs.
On F'ck ---- lbs. Drivers 165,000 lbs. B'k ---- lbs.

Tractive power 26510 lbs. Ratio of adhesion 4
Work'g St'm Pres. 180 lbs. Service Switching
Fuel Soft Coal

Boiler Steel Thick ⅞" Rivet Bill 7612
Boiler Diam. 58" Plan Straight Top
Boiler St'm pres. 180 lbs. Test 200 lbs. steam pres.
240 lbs. water pres.
Longitud'l seams Butt jointed, double covering stripe.

Dome, Diam. 29" Pos. Central

Firebox Steel Cor. Position chamb. None
Firebox Length 71-11/16" Width 34⅛" Depth F 72½" B. 71½"
Firebox, Tube ½" Crown 8" Sides 5/16" Back 5/16"
Firedoor opening 16" diam.
Water space Front 4" Sides 3" Back 3"
Water space Front Double Bottom
* Water space Sides ⅝" Diam. with 3/16" hole 1¼" deep from C. S.
Water space stayboltsof Ewald Iron } Two Rows of B. L. W. Expansion stays
Radial stays 1" diam. Sling stays front
Button heads to be used on Eight central rows
Crown bars None Placed ---- above crown
Crown bolts ----
* Tate flexible stay bolts, about 370, located in breaking zone
Flues None
Tubes #12 B. G. Charcoal Iron
Tube ends Swaged for copper ferrules, firebox ends.
Number 213 Diam. 2" Length 14' 0"

Heating Flues None Combus. Chamb None Total 1669 sq.ft.
Surface Tubes 1552 sq.ft. Fire Box 117 sq.ft. Fire Brick Tubes ----
Grate area 17.1 sq.ft. Ratio to Heating Surface 1 : 97
Superheater ----

Fire Brick On studs

Grates Rocking bars and drop plate
Ash Pan, Dampers Front and back
Ash Pan to be self cleaning

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Smokebox extension With Cleaning hole and cap L. S. only
Spark ejector or hopper With
Netting and deflect. plates With

Exhaust nozzles Double high

Stack Cast Iron, Straight Dia. 16" Hole in S. B., dia. 19"

Safety Valves (spec) Two Coale 3" muffled
Safety valves None with relief lever, Set to 180 pounds
Whistle Crane

Steam Gauge One Iron 7" MAKER:- Ashcroft (spec).
Steam gauge stand Iron **Clock** None

Water Gauge One Klinger **Cab Lamps** to burn oil
Gauge Cocks Three Back Surface valve None
Lowest gauge cock 3" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One Sphero POS:- Back
Cleaning Plugs
Firebox Corners diagonal
Crown, Two each side and two back
Waist, One under front
Front tube sheet, One Fusible plug One

Pump None
Top chamb.---- Pos. ----
Feed Cock ---- Bottom chamb. ----
Checks ---- Feed pipes ----
Check pipes ----

Injectors (spec) Two Sellers Class "N" No. 8
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. Right and Left

Steam Heat None

Cab Wood

Cab boards Wood Nosing None
Running boards Wood Nosing None
Hand rail Iron Located on Boiler

Back Bumper Bar Steel Back drawbar height 34½"
Wedge casting of cast steel with large radius and deep face, to be bolted to draw casting of cast steel on tack of engine.

Pilot None Pushing shoes at front
Front Bumper Oak Bumper plate None
Steps across front with hand rail
Steps, hand holds, etc. to conform to I.C.C. requirements.
Front Drawhead, Center above rail 33½"
Coupler M. C. B. Auto.
Front drawhead to conform to Ry. Co's standard

Signal fixtures Iron on bumper. Signal lamp brackets to be applied.

Headlight Two Round Case 16" Reflector, To burn Kerosene
Headlight, Nos. on sides With Headlight step With
Lamp shelf None Nosing ----

Bell 85 pounds
Sand Box Two Diam. 28" Body Iron Ptd. Pipes Iron
Sander Hand, in each box to sand front and rear.

Dome casing Iron Painted
Boiler Jacket #22 Soft Steel Ptd. Bands Iron Style 9
Boiler Lagging Magnesia sectional

A 1¼" steam line to connects to left side of the manifold in the cab, and to extend to the front end of the engine, projecting 2" beyond and lying on the bumper 25" from the centre line of the coupler. Line to be provided with two 1½" disc valves in cab and the front end of the pipe to be capped.

11-266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS
W. E. Rudolph Feb. 1916 119

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1074 - 1075

FOR Maryland Steel Company

Frames Cast Steel Braces Solid

Cylinders, Diam. 19" Stroke 24"
St'm ports, Length 16" Width 1½" Bridges 1"
Exh. ports, Length 16" Width 2½" Valve lead 1/16"
Valve travel 5⅞" Steam lap ¾" Exhaust clearance ----
Eccentric crank throw 5" By-pass valve None
S. F. Lubr. (spec) Detroit Triple #22 Bulls Eye } Iron pipes under jacket
Cyl'r heads Cast Iron
Cyl'r casings Iron Ptd. Head covers Steel painted
St'm chest casings Iron Ptd. Covers Steel painted
St'm chest valves Balanced with vacuum valves
Met. pkg PISTON ROD / VALVE STEMS Gibbs (spec) United States with Gibbs Vibrating Cup
Steam chest pressure plate to be adjustable.
Pistons Cast Iron rings sprung into solid head.
Guides Laird Type, Steel Oil cups Needle
Crossheads Laird Type, Cast Steel.
Wrist Pins Steel Rod cups Plunger
Parallel rods to have solid ends.

Valve Motion Stephenson.
Links, sliding blocks, pins, lifting links and eccentric rod laws to be well case hardened or to have hardened bushings.
Coil spring to be substituted on link lifting shaft in place of leaf spring.
All threads on bolts except stayholts to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 50" Cen. diam. 44", Centres Cast Steel

Tires Steel Held by Shrinkage and Shoulder.
Tires, Flanged, Pos. Front and Back Size 3" x 5½"
Tires, Plain, Pos. Middle Size 3" x 6½"
Lateral play between driving boxes and wheel hubs = 1/32" total
Driving Boxes Cast Steel
Journals, Diam. 8"- Length 8½"

Springs. Make B. L. W.

Front Engine Truck None Wheeled ----
To swing ---- each side of cen., Cen. pin liners ----
Journals, Diam. --- Length --- Boxes ---
Wheels, Diam. --- Tread --- Kind ----
Tires --- Cen. diam. ---- Size ----
Tires held by ----

Back Engine Truck None Wheeled ---
To swing --- each side of cen., Cen. pin liners ---
Journals, Diam. ---- Length --- Boxes ----
Wheels, Diam. --- Tread --- Kind ----
Tires --- Cen. diam. --- Size ---
Tires held by ----

Brake, position On all driving and tender wheels.
Operating Parts: Engine, Sch. A-1 and SWA West'g Auto. and Straight Air
Eng. Tr'k, sch. ----
Foundation Parts: Drivers, sch. WM-2 American C. S. Equalized
Eng. Tr'k, sch. ----
Air pump One - 9½" Pos. Left Side
Train connections Front and Rear.
Train signal, sch. None
Brake clogs on drivers to be cast steel 1/6
Driver Brake Shoes to be Perfecto.

Tender Eight Wheeled, Drawing No. 921
Weight, with fuel and water, about 70,000 lbs.

Tank 3500 Gallons, Bill 3743
Tank "U" shape, sloping back. Fuel Cap. 6 Tons.
Tool Boxes Hard Wood, Top

Frame Steel 6" and 8" channels.
Special attention to be paid to tender rear bumper.
Front Drawbar height 31½"
Pilot None Pushing shoes at rear.
Back drawhead, center above rail 33½"
Coupler M. C. B. Auto.
Draw casting back of tender to conform to Co's Standard
Steps, hand holds, etc. to conform to I. C. C. requirements
Steps across rear with hand rail.

Trucks Arch Bar Type with Cast Steel Bolsters

Springs Elliptic. B. L. W. make.
Journals, Diam. 4½" Length 8"
Wheels, Diam. 33" Tread 4½" Kind Chilled Cast Iron Plate
Tires None Cen. diam. ---- Size ----
Tires held by ----
Safety chains Single

Brake Position On all wheels.
Brake sch. FL-1012 and Swb West'g Auto. and Straight Air.
Buffer casting between engine and tender to have a large radius and a deep face.

List of tools, sch. 29
Photo sch. None Inspection B. L. W.
To be weighed No Material specs. B. L. W.
Certificate of boiler test Three copies of B.L.W. form 1C36
Junior laws to 12-24-15 Shipment On own wheels, under steam

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. Patents: Throttle, Patented Jan. 23, 1900, (Cast on)
Feed Pipe Strainer, Patented Sept. 1, 1903, (Cast on)

Property plates None

Painting: Engine, style 291, Olive Green and Aluminum
Painting Tender, style 291 Olive Green and Aluminum

Lettering, etc. to be similar to 6 32 D 103C
Mark on tank sides, MARYLAND STEEL CO.

Road Nos. Pos. Road Nos. Name None
F. No. Plate 23
Dome 24
Back of tank

11-266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS — As spec'n C-3789 Minor details to be same as for 6 32 D 1074 - 1075

Memorandum Spec'n 10986

SPECIFICATION FOR LOCOMOTIVES — 6 36 D 231-232,233,234 8-23-16.

FOR MARYLAND STEEL COMPANY — Gen. as PHOTO 4385, WITH WALSCHAERTS VALVE MOTION — Engine Drawing No. 33

5-24-16

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"
Total wheelbase, eng. and tend. { Actual 42' 2" / Limited to ----

Curves 200 FT. RADIUS RAILS 90 LBS.

Limits, Height SEE A BELOW Width ----
Weight (approximate) in working order, Total 150,000 LBS.
On F. tr'k ---- lbs., Drivers 150,000 lbs., B. tr'k --- lbs.

Tractive power 34,400 lbs., Ratio of adhesion 4.3
Work'g St'm Pres. 180 lbs., Service SWITCHING
Fuel SOFT COAL
A LOAD CLEARANCE AT LOWEST POINT ON MAIN TRACK IS 16' 8" AND ON ONE SIDING IS 15' 8"
Boiler STEEL Thick ¾" Bill 7850
Boiler, Diam. 72" Plan STRAIGHT TOP
Boiler st'm pres. 180 lbs.. Tested to { 200 lbs. steam pres. / 240 lbs. water pres.
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS

Dome, diam. 33" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE
Firebox, length 108 3/16" Width 42⅛" Depth F. 71½" B. 66½"
Firebox, Tubes ⅝" 2" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" DIAMETER
Water space, Front 4" Sides 3" Back 3"
Water space, Frame DOUBLE Riveted
* Water space stays ⅞" DIAM. WITH 3/16" HOLES 1¼" DEEP FROM O.S., EXCEPT ABOUT 400 TATE FLEXIBLE STAYS 1" DIAM IN BREAKING ZONE
Radial stays 1" DIAMETER Sling stays front { THREE ROWS OF EXPANSION STAYS
Button heads outside crown on EIGHT central rows
Crown bars NONE Placed ----- above row
Crown bolts ----
* WATER SPACE STAYS INCLUDING TATE FLEXIBLE TO BE MADE OF Ewald Iron
Flues -----
Tubes #12 W. G. CHARCOAL IRON
Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS
Number 330 Diam. 2" Length 10' 5"

Heating Flues --- Combus. Chamb. -- Total 1959
Surface Tubes 1786 Fire Box 173 Fire Brick Tubes ---
Grate area 31.6 Ratio to Heating Surface 1 : 62
Superheater -----

Fire Brick ARCH, ON STUDS

DROP GRATE TO BE APPLIED AT FRONT AND AT BACK OF FIRE BOX
Grates ROCKING BARS AND DROP PLATES
Ash Pan, Dampers FRONT AND BACK
ASH PAN SELF CLEANING TYPE

Throttle BALANCE Pos. DOME
Dry pipe STEEL

Superheater NONE

Smokebox extension WITH Cleaning hole and cap LEFT SIDE ONLY
Spark-stops or hopper WITH
Netting and deflect. plates WITH

Exhaust nozzles DOUBLE HIGH

Stack STRAIGHT Dia. 18" Hole in S. B. dia. 21½"
A 1½" STEAM LINE TO RUN FROM LEFT SIDE OF MANIFOLD IN THE CAB TO THE FRONT END OF THE ENGINE, PROJECTING 2" BEYOND AND RESTING ON THE BUMPER, 25" FROM THE CENTER LINE OF THE COUPLER. TWO DISC VALVES TO BE ON THIS LINE LOCATED IN CAB AND THE END OF THE PIPE TO BE CAPPED.

Safety Valves (not spec.) TWO COALE 3" MUFFLED
Safety valves NONE with relief lever, Set to 180 POUNDS
Whistle CHIME, IN RIGHT HAND SIDE OF DOME (INSTEAD OF TOP)

Steam Gauge ONE IRON 7" MAKER:- ASHCROFT (spec.)
Steam gauge stand IRON **Clock** NONE

Water Gauge ONE MAUGER, TYPE C **Cab Lamps** TO BURN OIL
Gauge Cocks THREE BACK Surface valve NONE
Lowest gauge cock 3¼" above highest part of crown
Lubricator steam valve TO HAVE separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock ONE SEHERO Pos:- FRONT
Cleaning Plugs
Firebox CORNERS DIAGONAL, AND SIDES
Crown, THREE EACH SIDE AND THREE BACK
Waist, ONE UNDER FRONT
Front tube sheet, TWO Fusible plug ONE

Pump NONE
Top chamb. --- Pos. ---
Feed Cock --- Bottom chamb. ---
Checks --- Feed pipes ---
Check pipes ---

INJECTORS TO BE LOCATED ON SIDES OF FIRE BOX
Injectors (not spec.) TWO SELLERS, CLASS "P" No. 10½
Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER
Pipes, Check IRON Feed IRON Overflow IRON
Check B. L. W. Pos. RIGHT AND LEFT

Steam Heat NONE

★ **Cab** STEEL

Cab boards STEEL Nosing T-IRON
Running boards STEEL Nosing T-IRON
Hand rail IRON Located on BOILER
HEAVY PLATE AT FRONT AND BACK OF FRONT BUMPER
◎ **Back Bumper** BAR STEEL Back drawbar height 31"

Pilot NONE Pushing shoes AT FRONT
Front Bumper OAK Bumper plate NONE
Steps ACROSS FRONT WITH HAND RAIL
STEPS, HAND HOLDS, ETC., TO CONFORM TO I.C.C. REQUIREMENTS
Front Drawhead, Center above rail 33½"
Coupler M. C. B. AUTO. RY. CO'S STANDARD

SIGNAL LAMP BRACKETS TO BE APPLIED
Signal fixtures IRON ON BUMPER

Headlight TWO ROUND CASE 16" Reflector. To burn KEROSENE
Headlight, Nos. on sides WITH Hi'l't step WITH
Lamp shelf NONE Nosing ---

Bell 92 POUNDS
Sand Box TWO Diam. 28" Body IRON, PAINTED Pipes IRON
Sander HAND IN EACH BOX TO SAND FRONT AND REAR

Dome casing IRON, PAINTED

Boiler Jacket #22 SOFT STEEL PTD Bands IRON Style 9
Boiler Lagging MAGNESIA SECTIONAL

THE BALDWIN LOCOMOTIVE WORKS — L. L. Meeks — Sept. 1916 Dec. 1916. — 121

SPECIFICATION FOR LOCOMOTIVES — 6 36 D 231 232. 233. 234

FOR MARYLAND STEEL COMPANY

One complete set of blue prints to be furnished to R.P.Co. 9-14-16

Frames CAST STEEL Braces SOLID
SPREADER TO CONNECT FRONT END OF TWO FRAMES BACK OF BUMPER
Cylinders, Diam. 21" Stroke 26"
St'm ports, Length 19" Width 1⅞" Bridges 1¼"
Exh. ports, Length 19" Width 3¼" Valve lead ¼"
Valve travel 5¼" Steam lap 1" Exhaust clearance ----
Eccentric crank throw 10" By-pass valve NONE
S. F. Lubr. DETROIT TRIPLE #22 BULLS EYE (MODEL)
Cyl'r heads CAST IRON. LUBR. PIPES OF IRON UNDER JACKET
Cyl'r casings IRON, PAINTED Head covers STEEL, PAINTED
St'm chest casings IRON, PAINTED Covers STEEL PAINTED
St'm chest valves RICHARDSON BALANCED, WITH VACUUM VALVES
Met. pkg { PISTON RODS / VALVE STEMS U. S. WITH GIBBS VIBRATING CUPS (NOT spec.)
STEAM CHEST PRESSURE PLATE TO BE ADJUSTABLE
Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD
Guides LAIRD TYPE, STEEL Oil cups NEEDLE
Crossheads CAST STEEL
Wrist Pins STEEL Rod cups PLUNGER, FORGED ON
PARALLEL RODS TO HAVE SOLID ENDS

Valve Motion WALSCHAERTS
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 51" Cen. diam. 44", CENTERS CAST STEEL

Tires STEEL Held by SHRINKAGE AND SHOULDER
Tires, Flanged, Pos. FRONT AND BACK Size 3½" x 5½"
Tires, Plain, Pos. MIDDLE Size 3½" x 6½"
Lateral play between driving boxes and wheel hubs = 1/16" TOTAL
Driving Boxes CAST STEEL
Journals, Diam. 9" Length 12"

Springs. Make B. L. W.

Front Engine Truck NONE Wheeled ---
To swing --- each side of cen., Cen. pin liners ---
Journals, Diam. --- Length --- Boxes ---
Wheels, Diam. --- Tread --- Kind ---
Tires ---- Cen. diam. --- Size ---
Tires held by ----

Back Engine Truck NONE Wheeled ---
To swing --- each side of cen., Cen. pin liners ---
Journals, Diam. --- Length --- Boxes ---
Wheels, Diam. --- Tread --- Kind ---
Tires ---- Cen. diam. --- Size ---
Tires held by ----

Brake, position ON ALL DRIVING AND TENDER WHEELS
Operating Parts { Engine, Sch. A-1 AND SWB WEST'G. AUTO. AND STRAIGHT AIR / Eng. Tr'k, sch. ----
Foundation Parts { Drivers, sch. WM-2 AMERICAN O. S. EQUALIZED / Eng. Tr'k, sch. ----
Air pump ONE 9½" Pos. LEFT SIDE
Train connections FRONT AND BACK
Train signal, sch. NONE
DRIVING BRAKE SHOES TO BE PERFECTO

Tender EIGHT Wheeled, Drawing No. 659
Weight, with fuel and water, about 100,000 LBS.

Tank 5,000 Gallons, Bill 3887
TANK "U" SHAPE SLOPING BACK FUEL CAPACITY 8 TONS

Tool Boxes OF HARD WOOD, TOP

Frame STEEL 13" CHANNELS
WOOD BUMPERS AT FRONT AND REAR
◎ Front Drawbar height 31"
Pilot NONE Pushing shoes AT REAR
Back drawhead, center above rail 33½"
Coupler M. C. B. AUTO., RY. CO'S STANDARD

STEPS, HAND HOLDS, ETC., TO CONFORM TO I. C. C. REQUIREMENTS
Steps ACROSS REAR WITH HAND RAIL
STEPS AND HAND RAILS ON SLOPING BACK OF TANK
Trucks ARCH BAR TYPE WITH CAST STEEL BOLSTERS

Springs ELLIPTIC - B. L. W.
Journals, Diam. 5" Length 9"
Wheels, Diam. 33" Tread 4¼" Kind CHILLED CAST IRON PLATE
Tires NONE Cen. diam. --- Size ---
Tires held by ---
Safety chains SINGLE

Brake Position ON ALL WHEELS
Brake sch. FL. 1212 AND SWB WEST'G. AUTO AND STRAIGHT AIR

List of tools, sch. 29
Photo sch. 2 Inspection B. L. W.
To be weighed YES Material spec'ns B. L. W.
Certificate of boiler test THREE COPIES OF B. L. W. FORM 1036
Junior laws to 8-1-16 { Shipment ON OWN WHEELS / SHIP UNDER STEAM: G 36 D 233.234. 10-13-16.
Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. Patents { THROTTLE PATENTED JAN. 23, 1900 (CAST ON) / FEED PIPE STRAINER, PATENTED SEP. 1, 1903 (CAST ON)

Property plates NONE

Painting: Engine, style 291 OLIVE GREEN AND ALUMINUM
Painting:—Tender, style 291 OLIVE GREEN AND ALUMINUM

LETTERING, ETC., TO BE SIMILAR TO 6 32 D 1074, ETC.
Mark on TANK SIDES BETHLEHEM STEEL COMPANY

Road Nos.-Pos. Road Nos. Name NONE
F. No. PLATE 1 & 2
DOME 3 & 4
BACK OF TANK

◎ WEDGE CASTING OF CAST STEEL WITH LARGE RADIUS AND DEEP FACE, BOLTED TO DRAW CASTING OF CAST STEEL AT REAR OF ENGINE, WITH FRICTION WEDGE BETWEEN DRAW CASTING AND FRICTION CASTING TO TAKE UP SLACK IN DRAW BAR.

pp. 266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS Dup. 6 36 D 199 & 200 with extras except as otherwise specified.

Manufacturer's Spec'n 17003

SPECIFICATION FOR LOCOMOTIVES 6 36 D 254-255

Gen'l Photo. 3701

FOR Cambria Steel Company

Engine Drawing No. 1

1-4-17

Gauge of Road 4' 8½". **Play** ½" **Wheelbase**, Rigid 11' 0" **Driving** 11' 0" **Total** 11' 0"

Total wheelbase, eng. and tend. { Actual 41' 10½" / Limited to ----

Curves ----

Limits, Height ~~15'-0"~~ 15' 6" Width ----

Weight (approximate) in working order, Total 135,000 pounds

On F. tr'k ---- lbs., Drivers 135,000 lbs., B. tr'k ---- lbs.

Tractive power 35,080 lbs., Ratio of adhesion 3.85

Work'g St'm Pres. 180 lbs., Service Switching

Fuel Semi-Bituminous Coal

Front tube sheet ½" thick

Boiler Steel Thick 11/16" Bill 8052

Boiler, Diam. 68" Plan Straight Top

Boiler st'm pres. 180 lbs., Tested to { 200 lbs. steam pres. / 240 lbs. water pres.

With factor of safety of 5.0

Longitud. seams Butt jointed, double covering stripe.

Dome, diam. 29" Pos. Central

Firebox Steel Combustion chamb. None

Firebox, length 108⅛" Width 42" Depth F. 65¾" B. 62¾"

Firebox, Tube ½" Crown ½" Sides ⅜" Back ⅜"

Firedoor opening 16" diam.

Water space, Front 4" Sides 3" Back 3"

Water space, Frame Single Riveted

Water space stays 1" diam. with 3/16" hole 1½" deep from O. S.

Radial stays 1⅛" diam. Sling stays, front {Two rows of B.L.W. Expansion Stays.

Button heads below crown on Eight central rows

Crown bars None Placed ---- above crown

Crown bolts ----

Flues None

Tubes #12 W. G. Iron

Tube ends Swaged for copper ferrules, firebox ends.

Number 317 Diam. 2" Length 10' 5"

Heating Surface: Flues None Combus. Chamb. None Total 1896.0

Tubes 1715.5 Fire Box 180.7 Fire Brick Tubes ----

Grate area 31.5 Ratio to Heating Surface 1 : 60

Superheater ----

Fire Brick None

Grates Rocking bars with drop plate and back

Ash Pan, Dampers Front and Back

Throttle Balance Pos. Dome

Dry pipe Steel

Superheater None

Smokebox extension With Cleaning hole and cap Right and Left

Spark ejector or hopper With, with straight drop

Netting and deflect. plates With

Exhaust nozzles Double high

Petticoat pipe, With

Stack Straight Dia. 18" Hole in S. B., dia. 18¾"

Stack to have copper ferrule at top.

(Spec.) **Safety Valves** Two Consolidated 3" muffled

Safety valves None with vertical lever, Set to 180 pounds

Whistle B. L. W. Plain

Steam Gauge One Iron 7" MAKER:- Crosby (Spec.)

Steam gauge stand Iron **Clock** None

Water Gauge (See sup. 3) **Cab Lamps** to burn oil

Gauge Cocks Four Back Surface valve None

Lowest gauge cock 3½" above highest part of crown

Lubricator steam valve to have separate dry pipe to dome

Blower Valve B. L. W.

Blow off Cock One B. L. W. Pos:- Front

Cleaning Plugs

Firebox Corners, front ones diagonal, sides and back

Crown, Two each side and four back

Waist, One under front

Front tube sheet, One Fusible plug One

Pump None Pos. ----

Top chamb. ---- Bottom chamb. ----

Feed Cock ---- Feed pipes ----

Checks ---- Check pipes ----

(Spec.) **Injectors** Two Sellers "1887" Class L No. 10½

Injectors, Pos. Right and Left Steam pipes Copper

Pipes, Check Copper Feed Iron Overflow Iron (Sup. 4)

Check Sellers with set valves Pos. Right and Left

Steam Heat None

Cab Steel (See sup. 5)

Cab boards Wood Nosing None

Running boards Light Steel Nosing T-Iron

Hand rail Iron Located on Boiler

6 **Back Bumper** Bar Steel Back drawbar height 33"

Pilot None Pushing shoes at front

Front Bumper Oak Bumper plate None (Sup. 7)

Steps across front with convenient hand rail

Steps, hand holds, etc. to conform to I. C. C. requirements

Front Drawhead, Center above rail 33½"

Coupler Tower M. C. B. Auto. with slotted knuckle

Signal fixtures None

38 **Headlight** to be Star

Headlight Two Round Case 16" Reflector, To burn Kerosene

Headlight Nos. on sides With H'dl't stop With

Lamp shell None Nosing ----

Bell 65 pounds

Sand Box Two Diam. 28" Body Iron Painted Pipes Iron

Sander Hand in each box, to sand front and rear

Dome casing Iron Painted

Boiler Jacket #22 Plan. Steel Bands T-Iron Style 9

Boiler Lagging Magnesia sectional

THE BALDWIN LOCOMOTIVE WORKS

Geo. O. Buck Inspector

SPECIFICATION FOR LOCOMOTIVES 6 36 D 254 - 255

FOR Cambria Steel Company

123

Frames Cast Steel Braces Solid

8 **Cylinders**, Diam. 21" Stroke 26"

St'm ports, Length 19" Width 1⅞" Bridges 1⅜"

Exh. ports, Length 19" Width 3" Valve lead 1/16"

Valve travel 5½" Steam lap 1" Exhaust clearance ----

Eccentric-crank throw 5"

S. F. Lubr. (Spec.) Detroit Triple #22 Bulls Eye

Cyl'r heads Cast Iron; Lubr. pipes of copper under jacket

Cyl'r casings Iron Ptd. Head covers Steel Painted

St'm chest casings Iron Ptd. Covers Steel Painted

St'm chest valves Balanced, Smit vacuum valves

Met. pkg {PISTON RODS / VALVE STEMS} U. S. (Spec.)

Pistons (See sup. 9)

10 **Guides** Laird Type, Steel Oil cups Needle

Crossheads Cast Steel

Wrist Pins (Sup. 11) Rod cups Plunger (See sup. 12-13)

Valve Motion Stephenson

Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

Eccentrics to be in halves with key as large as possible.

All threads on bolts (except staybolts) to be United States Standard.

All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

14 Driving wheels to have bab liners of brass

Drivers, O. S. Diam. 50" Cen. diam. 44" Centres Cast Steel

Tires Rolled Steel Held by Shrinkage and Shoulder

Tires, Flanged, Pos. Front and Back Size 3" x 5½"

Tires, Plain, Pos. Middle Size 3" x 6½"

Lateral play between driving boxes and wheel hubs — 1/16" total

Driving Boxes Cast Steel

15/16 **Journals**, Diam. 9" Length 18"

17 **Springs**. Make B. L. W.

Front Engine Truck None Wheeled ----

To swing ---- each side of cen. Cen. pin liners

Journals, Diam. ---- Length ---- Boxes ----

Wheels, Diam. ---- Tread ---- Kind ----

Tires ---- Cen. diam. ---- Size ----

Tires held by ----

Back Engine Truck None Wheeled ----

To swing ---- each side of cen. Cen. pin liners

Journals, Diam. ---- Length ---- Boxes ----

Wheels, Diam. ---- Tread ---- Kind ----

Tires ---- Cen. diam. ---- Size ----

Tires held by ----

21 **Brake**, position On all driving and tender wheels.

Operation { Engine, Sch. #6-ET West'g Combined auto. and / Eng. Tr'k, sch. ---- Straight Air

Parts { Foundation Drivers, sch. UA-2 American C.S. Equalized / Eng. Tr'k, sch. ----

Air pump One - 9½" Pos. L. S. ahead of fire box

Train connections Front and Back. Air pump to be N. P. L. Hand.

Train signal, sch. None

Air reservoirs to have hydrostatic test of 210 pounds.

CERTIFICATES DATED Jan. 18TH 1917, COVERING TEST OF RESERVOIRS Nos. 1 TO 7026 INCL. FURNISHED BY WEST'G. AIR BRAKE CO. ARE FILED IN MAIN OFFICE, FILE No. 37.

31 **Tender** Eight Wheeled, Drawing No. 659

Weight, with fuel and water, about 100,000 pounds

Tank 5,000 Gallons, Bills 4112

Tank "U" Shape, square top. Fuel capacity 8 tons.

Tool Boxes Steel, on tap of each water leg

Tool boxes to have sloping lids to drain water

32 **Frame**, Structural 13" steel

Front Drawbar height 32½"

Pilot None Pushing shoes (See sup. 33)

34 Back drawhead, center above rail 33½"

Coupler Tower M. C. B. Auto. with West'g. Friction draft gear

Coupler to have slotted knuckle

35 Steps, hand holds, etc. to conform to I. C. C. requirements

Trucks Arch Bar Type

Springs Coil (See sup. 37)

Journals, Diam. 5½" Length 10" Chilled cast iron

Wheels, Diam. 33" Tread 4½" Kind ~~Solid forged rolled steel~~ Ramec 6-13-17

Tires None Cen. diam. ---- Size ----

Tires held by ----

Safety chains None

Brake Position On all wheels

Brake sch. #6-ET West'g. Auto. and Straight Air with 12" x 12" tender cylinder.

List of tools, sch. ~~38~~ 39

Photo sch. None Inspection B. L. W. except (See sup. 1)

To be weighed No Material specs B. L. W.

Certificate of boiler test Three copies of B. L. W. form 1036

Junior laws to 1-20-17 Shipment On own wheels

Brass shop finish, No. 1

Machine shop finish D-165

B. L. W. Patents { Feed Pipe Strainer, patented Sept. 1, 1903 (Cast on) / Cab Ventilator 722,539 Mar. 10, 1903 Brass Plate

Property plates None

Painting: Engine, style 291 Olive Green and color

Painting Tender, style 291 Olive Green and color

Lettering etc. to be same as for 6 36 D 199 - 200

Mark on sides of dome, C. S. Co.

Mark on tank sides, CAMBRIA (in large letters)

Road Nos. Pos.	Road Nos.	Name Name
F. No. Plate	38	
Cab sides	39	

11. 266-67 Photo copied see box

FOR HEREAFTER:-
Locate Air Gauges so that they can be more easily seen by Engineer.
Raise question as to placing them on a separate stand in the front of the cab.
Move steam gauge stand back and to provide more room for throttle lever and lengthen throttle lever link about 1".
Run hand rail over top of smoke box ahead of stack and change location of columns on smoke box front so that the bolts will clear the smoke box ring.
Apply a headlight step to left side of center of smoke box instead of directly below the headlight. R.S.McC. 5.11.17.

SPECIFICATION FOR LOCOMOTIVES 6 36 D 254 - 255

FOR Cambria Steel Company

1 Contractor's Shops are to be open to the Inspector of the Cambria Steel Co. for inspection of material and workmanship entering into the construction of these locomotives, and an inspector is to be present to witness the boiler test. Mr. E. W. Clarke, Chief Engineer, Johnstown, Pa., is to be notified when the boiler is ready for inspection so he can send his representative to witness tests.

2 Ash pan, self cleaning type to be operated from the side of the engine. The ash pan is to be as large as possible.

3 Water Gauge glass, Mauger, of ample length for full variation of water levers.

4 Overflow pipes and injectors are to empty into the front and back ash pans.

5 Cab to have rounded eaves and Rushton Vehtilator. Windows are to be arranged with three sashes so that when all are pushed forward there will be about two thirds open space. One of the sashes to be arranged so it can be brought all the way back, leaving an open space centrally between either sash, for use in winter. A drop seat to be furnished for the Engineer about the middle of the cab. A shallow clothes box is to be arranged behind the seat, taking up a minimum of space, in order to provide the greatest convenience.

6 Tender wedge to be made of cast steel. (See sup.34)
Spring buffer between engine and tender, placed on tender.

7 A heavy steel plate to be provided across the front and back of front bumper.

8 Cylinders to be cast in one piece with half saddle.

9 Piston and rods to be same as for previous engines.
Pistons are to have cast iron snap rings and are to be fitted with bull rings and follower.
Piston rods of steel and to be keyed to crossheads.

10 Guides to be same as previous engines.

11 Wrist pins of Coffin Process Steel. (See sup.16)

12 The connecting rods to have forked ends with split brasses and large key bolt covering practically the entire width of the brass; split brasses.
Main rods to be same as for previous engines.
Parallel rods to have strap ends.

13 Main and side rod brasses to be same as for previous engines. Brass on rods to be same as on 6 36 D 88-89. All rods to have jumper oil cups.

14 Driving hub liners to be $\frac{3}{8}$" thick and as large as hubs will permit.

15 Driving axles of Coffin Process hammered steel. (See sup.16)

16 All axles and wrist pins to be purchased from the Cambria Steel Co. Send copy of our order for driving and tender axles and wrist pins direct to E. W. Clarke, Chief Engineer, Johnstown, Pa. Mark across face of order for driving and tender axles and wrist pins the words "FOR CAMBRIA LOCOMOTIVE."

17 Driving springs to have one more plate than for previous locomotives.
Equalising beams of forged steel.

21 Air pump to have Detroit air cylinder lubricators.

22 Two Westinghouse enameled reservoirs 18½" x 96"

23 The high speed brake attachment to be omitted, and brake work kept as high as possible above track to obtain maximum clearance.

24 Company's purchase order number and date to be carried on small brass Plate secured to side of cab near bottom. ORDER No.D-4656 JANUARY 3, 1917

TENDER

31 The back portion of the tank is to have a square top and to have a 4" railing all around.
Tank collar and side sheets to be made in separate pieces.
Tank collar to be straight.
Tank funnel, tank collar and hand rail to be arranged as shown on American Loco. Co's sketch 88-B-6.
Man hole to be located half way netween the end of the coal space and the rear of the tank, and is to be oblong across the top of the tank (See sup.36)

32 Tender frame longitudinal channels to be 13" deep.
Tender frame channels to be purchased from any place where we can get them.

33 Push pole pockets are to be provided about 4" from the ends of the tender bumper.

34 Spring buffer between engine and tender, placed on tender.
Buffer to be of cast steel with double spring (See sup. 6)

35 Step across rear of tender with convenient hand rail.

36 Straight side board along each side of tank, back to the end of the coal hole, and then across the top of tank (See sup.31)

37 A ladder is to be arranged on the rear end of the tender.

38 Tender headlight is to be located in the center of the tender.

39 Tender trucks are to be Pennsylvania R. R. Standard 100,000 lbs. capacity, as Cambria Steel Co's print C-7260.
Tender truck complete including wheels, axles, brake work, etc. to be purchased from the Cambria Steel Co. (See sup.16)
Send copy of our order for tender truck direct to E. W. Clarke Chief Engineer, Johnstown, Pa.
Mark across face of order the words "FOR CAMBRIA LOCOMOTIVE".

1917-66-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS Dup. 6 36 D 254 255 with same extras except as otherwise spec'd.

Memorandum Spec'n 17CC3

SPECIFICATION FOR LOCOMOTIVES 6 36 D 282-283 Gen. as Photo. 5761

FOR Cambria Steel Company Engine Drawing No. 1

3-16-17

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"
Total wheelbase, eng. and tend. Actual 41' 10½" Limited to ----

Curves ----

Limits, Height 13' 6" Width ----
Weight (approximate) in working order, Total 135,000 pounds
On F. tr'k ---- lbs., Drivers 135,000 lbs., B. tr'k ---- lbs.

Tractive power 35,080 lbs., Ratio of adhesion 3.85
Work'g St'm Pres. 180 lbs., Service Switching
Fuel Semi-Bituminous Coal

Front tube sheet ½" thick
Boiler Steel Thick 11/16" Bill 8C52
Boiler, Diam. 68" Plan Straight Top
Boiler st'm pres. 180 lbs., Tested to 200 lbs. steam pres. / 240 lbs. water pres
With factor of safety of 5.0
Longitud. seams Butt jointed, double covering strips.

Dome, diam. 29" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 108⅛" Width 42" Depth F. 65½" B. 62½"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back ⅜"
Firedoor opening 16" diam.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Single Riveted
Water space stays 1" diam. with 3/16" hole 1½" deep from C. S.

Radial stays 1⅛" diam. Sling stays front Two rows of B.I.W. Expansion Stays.
Button heads below crown on Eight central rows
Crown bars None Placed ---- above crown
Crown bolts ----

Flues None
Tubes #12 W. G. Iron
Tube ends Swaged for copper ferrules, firebox ends.
Number 317 Diam. 2" Length 10' 5"

Heating Surface: Flues None Combus. Chamb. None Total 1896.0
Tubes 1715.3 Fire Box 180.7 Fire Brick Tubes ----
Grate area 31.5 Ratio to Heating Surface 1 : 60
Superheater ----

Fire Brick None

Grates Rocking bars with drop plate and back
Ash Pan, Dampers Front and Back

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Smokebox extension With Cleaning hole and cap Right and Left
Spark ejector or hopper With, with straight drop
Netting and deflect. plates With

Exhaust nozzles Double high
Petticoat pipe, With
Stack Straight Dia. 18" Hole in S. B., dia. 18¾"
Stack to have copper ferrule at top.

Safety Valves (Spec) Two Consolidated 3" muffled
Safety valves None with relief lever, Set to 180 pounds
Whistle B. L. W. Plain

Steam Gauge One Iron 7" MAKER:- Crosby (Spec)
Steam gauge stand Iron **Clock** None

Water Gauge (See sup. 3) **Cab Lamps** to burn oil
Gauge Cocks Four Back Surface valve None
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One B. L. W. PCS:- Front
Cleaning Plugs
Firebox Corners, front ones diagonal, sides and back
Crown, Two each side and four back
Waist, One under front
Front tube sheet, One Fusible plug One

Pump None Pos. ----
Top chamb. ---- Bottom chamb. ----
Feed Cock ---- Feed pipes ----
Checks ---- Check pipes ----

Injectors (Spec) Two Sellers "1887" Class L No. 10
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Copper Feed Iron Overflow Iron (Sup. 4)
Check Sellers with set valves Pos. Right and Left

Steam Heat None

Cab Steel (See sup. 5)

Cab boards Wood Nosing None
Running boards Light Steel Nosing T-Iron
Hand rail Iron Located on Boiler

Back Bumper Bar Steel Back drawbar height 33"

Pilot None Pushing shoes at front
Front Bumper Oak Bumper plate None (Sup. 7)
Steps across front with convenient hand rail
Steps, hand holds, etc. to conform to I. C. C. requirements
Front Drawhead, Center above rail 33½"
Coupler Tower M. C. B. Auto. with slotted knuckle

Signal fixtures None

Headlights to be Star
Headlight Two Round Case 16" Reflector, To burn Kerosene
Headlight, Nos. on sides With H'dl't step With
Lamp shelf None Nosing ----

Bell 85 pounds
Sand Box Two Diam. 28" Body Iron Painted Pipes Iron
Sander Hand in each box, to sand front and rear

Dome casing Iron Painted

Boiler Jacket #22 Plan. Steel Bands Iron Style 9
Boiler Lagging Magnesia sectional

THE BALDWIN LOCOMOTIVE WORKS
B O Blanch 5/9/1917

SPECIFICATION FOR LOCOMOTIVES 6 36 D 282 - 283 126

FOR Cambria Steel Company

Frames Cast Steel Braces Solid

Cylinders, Diam. 21" Stroke 26"
St'm ports, Length 19" Width 1⅞" Bridges 1⅜"
Exh. ports, Length 19" Width 3" Valve lead 1/16"
Valve travel 5½" Steam lap ¾" Exhaust clearance ----
Eccentric crank throw 5"
S. P. Lubr. (Spec) Detroit Triple #22 Bulls Eye
Cyl'r heads Cast Iron; Lubr. pipes of copper under jacket
Cyl'r casings Iron Ptd. Head covers Steel Painted
St'm chest casings Iron Ptd. Covers Steel Painted
St'm chest valves Balanced, Cmit vacuum valves
Mot. pkg (Piston rods Valve stems) U. S. (Spec)

Pistons (See sup. 9)
Guides Laird Type, Steel Oil cups Needle
Crossheads Cast Steel
Wrist Pins (Sup. 11) Rod cups Plunger (See sup. 12-13)

Valve Motion Stephenson
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.
Eccentrics to be in halves with key as large as possible.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.
Driving wheels to have hub liners of brass
Drivers, O. S. Diam. 50" Cen. diam. 44" Centres Cast Steel

Tires Rolled Steel Held by Shrinkage and Shoulder
Tires, Flanged, Pos. Front and Back Size 3" x 5½"
Tires, Plain, Pos. Middle Size 3" x 6½"
Lateral play between driving boxes and wheel hubs - 1/16" total
Driving Boxes Cast Steel
Journals, Diam. 9" Length 12"

Springs. Make B. L. W.

Front Engine Truck None Wheeled ----
To swing ---- each side of cen., Cen. pin liners
Journals, Diam. ---- Length ---- Boxes ----
Wheels, Diam. --- Tread ---- Kind ----
Tires ---- Cen. diam. ---- Size ----
Tires held by ----

Back Engine Truck None Wheeled ----
To swing ---- each side of cen., Cen. pin liners
Journals, Diam. ---- Length ---- Boxes ----
Wheels, Diam. ---- Tread ---- Kind ----
Tires ---- Cen. diam. ---- Size ----
Tires held by ----

Brake, position On all driving and tender wheels.
Operating Parts: Engine, Sch. #6-ET West'g Combined Auto. and Straight Air; Eng. Tr'k, sch. ----
Foundation Parts: Drivers, sch. WI-2 American O.S. Equalized; Eng. Tr'k, sch. ----
Air pump One - 9½" Pos. L. S. ahead of fire box
Train connections Front and Back. Air pump to be R. & L. Hand.
Train signal, sch. None
Air reservoirs to have hydrostatic test of 210 pounds.

Tender Eight Wheeled, Drawing No. 659
Weight, with fuel and water, about 100,000 pounds

Tank 5,000 Gallons, Bill 4112
Tank "U" Shape, square top. Fuel capacity 8 tons.

Tool Boxes Steel on top of each water leg
Tool boxes to have sloping lids to drain water
Frame Structural 13" steel

Front Drawbar height 29½"
Pilot None Pushing shoes (See sup. 33)
Back drawhead, center above rail 33½"
Coupler Tower M. C. B. Auto. with West'g. Friction draft gear
Coupler to have slotted knuckle

Steps, hand holds, etc. to conform to I. C. C. requirements

Trucks Arch Bar Type

Springs Coil (See sup. 39)
Journals, Diam. 5½" Length 10"
Wheels, Diam. 33" Tread 4½" Kind Chilled Cast Iron ~~Solid forged rolled steel~~ (S.M.C. 6-18-17)
Tires None Cen. diam. ---- Size ----
Tires held by ----
Safety chains None

Brake Position On all wheels
Brake sch. #6-ET West'g. Auto. and Straight Air with 12" x 12" tender cylinder.

List of tools, sch. 29
Photo sch. None Inspection B. L. W. except (See sup. 1)
To be weighed No Material spec'ns B. L. W.
Certificate of boiler test Three copies of B. L. W. form 1036
Junior laws to 1-20-17 Shipment On own wheels

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. Patents: Feed Pipe Strainer, patented Sept. 1, 1903 (Cast on); Cab Ventilator 722,539 Mar. 10, 1903 (Brass Plate)

Property plates None

Painting: Engine, style 291 Olive Green and color
Painting:—Tender, style 291 Olive Green and color

Lettering etc. to be same as for 6 36 D 254 - 255
Mark on sides of dome, C. S. Co.
Mark on tank sides, CAMBRIA (in large letters)

Road Nos. Pos. Road Nos. Name NONE.
B. No. Plate 40 4/29/17
Cab sides 41

11-266-67 Photo copied see box

SPECIFICATION FOR LOCOMOTIVES 6 36 D 282 - 285

FOR Cambria Steel Company

127

1 Contractor's Shops are to be open to the Inspector of the Cambria Steel Co. for inspection of material and workmanship entering into the construction of these locomotives, and an inspector is to be present to witness the boiler test.
Mr. E. W. Clarke, Chief Engineer, Johnstown, Pa., is to be notified when the boiler is ready for inspection so he can send his representative to witness tests.

2 Ash pan, self cleaning type to be operated from the side of the engine. The ash pan is to be as large as possible.

3 Water Gauge glass, Mauger, of ample length for full variation of water levels.

4 Overflow pipes and injectors are to empty into the front and back ash pans.

5 Cab to have rounded eaves and Rushton Ventilator. Windows are to be arranged with three sashes so that when all are pushed forward there will be about two thirds open space. One of the sashes to be arranged so it can be brought all the way back, leaving an open space centrally between either sash, for use in winter. A drop seat to be furnished for the Engineer about the middle of the cab. A shallow clothes box is to be arranged behind the seat, taking up a minimum of space, in order to provide the greatest convenience.

6 Tender wedge to be made of cast steel. (See sup. 34)
Spring buffer between engine and tender, placed on tender.

7 A heavy steel plate to be provided across the front and back of front bumper.

8 Cylinders to be cast in one piece with half saddle.

9 Piston and rods to be same as for previous engines.
Pistons are to have cast iron snap rings and are to be fitted with bull rings and follower.
Piston rods of steel and to be keyed to crossheads.

10 Guides to be same as previous engines.

11 Wrist pins of Coffin Process Steel. (See sup. 16)

12 The connecting rods to have forked ends with split brasses and large key bolt covering practically the entire width of the brass; split brasses.
Main rods to be same as for previous engines.
Parallel rods to have strap ends.

13 Main and side rod brasses to be same as for previous engines. Brass on rods to be same as on 6 36 D 88-89. All rods to have jumper oil cups.

14 Driving hub liners to be ⅜" thick and as large as hubs will permit.

15 Driving axles of Coffin Process hammered steel. (See sup. 16)

16 All axles and wrist pins to be purchased from the Cambria Steel Co. Send copy of our orders for driving and tender axles and wrist pins direct to F. H. Moyer, Chief Engineer, Johnstown, Pa. Mark across face of order for driving and tender axles and wrist pins the words "FOR CAMBRIA LOCOMOTIVE."

17 Driving springs to have one more plate than for previous locomotives.
Equalizing beams of forged steel.

21 Air pump to have Detroit air cylinder lubricators.

22 Two Westinghouse enameled reservoirs 18½" x 96"

23 The high speed brake attachment to be omitted, and brake work kept as high as possible above track to obtain maximum clearance.

24 Company's purchase order number and date to be carried on small brass Plate secured to side of cab near bottom.
ORDER No. D-4956
MARCH 16, 1917
5/15/17.

TENDER

31 The back portion of the tank is to have a square top and to have a 4" railing all around.
Tank collar and side sheets to be made in separate pieces.
Tank collar to be straight.
Tank funnel, tank collar and hand rail to be arranged as shown on American Loco. Co's sketch 88-B-6.
Man hole to be located half way between the end of the coal space and the rear of the tank, and is to be oblong across the top of the tank (See sup. 36)

32 Tender frame longitudinal channels to be 13" deep.
Tender frame channels to be purchased from any place where we can get them.

33 Push pole pockets are to be provided about 4" from the ends of the tender bumper.

34 Spring buffer between engine and tender, placed on tender.
Buffer to be of cast steel with double spring (See sup. 6)

35 Step across rear of tender with convenient hand rail.

36 Straight side board along each side of tank, back to the end of the coal hole, and then across the top of tank (See sup. 31)

37 A ladder is to be arranged on the rear end of the tender.

38 Tender headlight is to be located in the center of the tender.

39 Tender trucks are to be Pennsylvania R. R. Standard 100,000 lbs. capacity, as Cambria Steel Co's print C-7260.
Tender truck complete including wheels, axles, brake work, etc. to be purchased from the Cambria Steel Co. (See sup. 16)
Send copy of our order for tender truck direct to E. W. Clarke Chief Engineer, Johnstown, Pa.
Mark across face of order the words "FOR CAMBRIA LOCOMOTIVE".

FOR HEREAFTER:- AIR GAUGES TO BE LOCATED SO THEY CAN BE MORE EASILY SEEN BY ENGINEER. RAISE QUESTION AS TO PLACING THEM ON A SEPARATE STAND IN THE FRONT OF THE CAB. STEAM GAUGE STAND TO BE MOVED BACK TO PROVIDE MORE ROOM FOR THROTTLE LEVER AND THROTTLE LEVER LINK TO BE LENGTHENED ABOUT 1".

R.S.M.C. 5/16/17

#1. 266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS As Spec'n 6-31-37
Dup. 6 36 D 91, EXCEPT AS OTHERWISE SPECIFIED

Memorandum Spec'n 11176

SPECIFICATION FOR LOCOMOTIVES 6 36 D 237 AND 238 Gen. as Photo. 3796

Engine Drawing No. 11

FOR THE AMERICAN ROLLING MILL CO.

10-18-16

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"
Total wheelbase, eng. and tend. { Actual 41'4" (est)
Limited to ---

Curves SAME AS FOR 6 36 D 91

Limits, Height 13' 8" Width { 10' 1" ACROSS FOOT BOARDS / 9' 9" ACROSS CYLINDERS
Weight (approximate) in working order, Total 140,000 POUNDS
On F. tr'k --- lbs., Drivers 140,000 lbs., B. tr'k --- lbs.

Tractive power 35,080 lbs., Ratio of adhesion 4.
Work'g St'm Pres. 180 lbs., Service SWITCHING
Fuel SOFT COAL

FRONT TUBE SHEET TO BE ½" THICK
Boiler STEEL Thick 1 1/16" Bill 7952
Boiler, Diam. 68" Plan STRAIGHT TOP
Boiler st'm pres. 180 lbs., Tested to { 200 lbs. steam pres. / 240 lbs. water pres.
WITH A FACTOR OF SAFETY OF 5.0
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS

Dome, diam. 29" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE
Firebox, length 108-3/16" Width 66½" Depth F. 65⅝" B. 62½"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" DIAM.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame SINGLE Riveted
Water space stays 1" DIAM. WITH 3/16" HOLES 1½" DEEP FROM O.S.

Radial stays 1" DIAMETER Sling stays front { TWO ROWS OF B. L. W. EXPANSION STAYS
Button heads below crown on EIGHT central rows
Crown bars NONE Placed ---- above crown
Crown bolts ----

Flues ----
Tubes #11 W.G. ARMCO IRON { FURNISHED FREE THESE NUMBER BY AMERICAN ROLLING MILL CO.
Tube ends SWAGED FOR COPPER FERRULES, FIREBOX ENDS
Number 322 Diam. 2" Length 10' 5"

Heating Surface { Flues ---- Combus. Chamb. ---- Total 1903.5 sq ft
Tubes 1742.5 sq ft Fire Box 161.0 sq ft Fire Brick Tubes ----
Grate area 31.5 sq ft Ratio to Heating Surface 1 to 60
Superheater ----

Fire Brick ARCH ON STUDS

Grates CAST IRON, ROCKING BARS AND DEAD PLATE
Ash Pan, Dampers FRONT AND BACK

Throttle BALANCED Pos. DOME
Dry pipe STEEL

Superheater NONE

Safety Valves TWO CONSOLIDATED 3"
Safety valves NONE with relief lever, Set to 180 POUNDS
Whistle CHIME, IN SIDE OF DOME

Steam Gauge ONE FROM 7" MAKER: ASHCROFT
Steam gauge stand IRON Clock NONE

Water Gauge ONE REFLEX Cab Lamps TO BURN OIL
Gauge Cocks THREE BACK Surface valve NONE
Lowest gauge cock 3" above highest part of crown
Lubricator steam valve TO HAVE separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock ONE HOMESTEAD Pos. FRONT
Cleaning Plugs
Firebox CORNERS DIAGONAL, SIDES AND BACK
Crown, THREE EACH SIDE AND TWO BACK
Waist, ONE UNDER FRONT
Front tube sheet, ONE Fusible plug ONE

Pump NONE Pos. ---
Top chamb. ---- Bottom chamb. ----
Feed Cock ---- Feed pipes ----
Checks ---- Check pipes ----

Injectors TWO SIMPLEX No. 10
Injectors, Pos. RIGHT AND LEFT Steam pipes SAME AS
Pipes, Check FROM Feed FROM Overflow FROM
Check B. L. W. Pos. RIGHT AND LEFT

Steam Heat NONE

Cab Steel

FRONT SECTION OF RUNNING BOARDS BEVELED TO SUIT AIR DRUMS
Cab boards Wood Nearest NONE
Running boards WOOD Nearest NONE
Hand rail IRON Located on BOILER

Back Manhead Bar STEEL Back drawhead sheet 7/16"

Pilot NONE Pushing shoes CAST ON BUMPER
Front Bumper CAST STEEL Bumper plate WOOD
Steps ACROSS FRONT WITH HAND RAIL
Steps, HAND HOLDS, ETC., TO CONFORM TO I. C. C. REQUIREMENTS
Front Drawhead, Center above rail 33½"
Coupler TOWER M. C. B. AUTO.

Signal fixtures IRON ON BUMPER

Headlight TWO NUMBER CASE 16" Reflector, To burn KEROSENE
Headlight, Wire on sides WITH Trimmed WITH
Lamp shell NONE Mounting ----

Bell 92 POUNDS, COLLINAR AIR BELL HANGER
Sand Box Two Diam. 23" Body { PAINTED / PAINTED
Sander LEACH AIR VALVE ON EACH END

Boiler casing IRON PAINTED

Boiler Jacket { #22 ARMCO / FINISHED IRON Sandw. Iron Wash. 0
Boiler Lagging MAGNESIA SECTIONAL

Condensation collection WITH Cleaning hole and cap L. B. ONLY
Water spaces as lagged WITH
Heating and defect. plates WITH
Stayed surface (Radial, Diag'l, Vert.)
Staybolt Steel/Iron Dia. 1" Pos. in S. B. dia. 3½"

THE BALDWIN LOCOMOTIVE WORKS
H. Conklin Jan 19 17

SPECIFICATION FOR LOCOMOTIVES 6 36 D 237 AND 238

FOR THE AMERICAN ROLLING MILL Co.

129

ONE SET OF BLUE PRINTS ON LINEN TO BE FURNISHED TO CUSTOMER.

Frames CAST STEEL Braces SOLID

Cylinders, Diam. 21" Stroke 26"
Sl'm ports, Length 19" Width 1⅝" Bridges 1⅝"
Exh. ports, Length 19" Width 3" Valve lead 1/16"
Valve travel 5½" Steam lap 1" Exhaust clearance ---
Eccentric crank throw 5" By-pass valve NONE
8 P. Lub. DETROIT TRIPLE No. 238 (FROM STOCK) 24 SPARE EYE FOR HEREAFTER
Cyl'r heads CAST IRON, LARGE PIECE OF IRON UNDER JACKET
Cyl'r casings IRON PAINTED Head covers STEEL PAINTED
Sl'm chest covers IRON PAINTED Covers STEEL PAINTED
Sl'm chest valves RICHARDSON BALANCED, WITH YAGUMA VALVES
Mot. pkg (packing) U. S.
DETROIT No. 24, BULLS EYE LUBR. PISTON RODS No. 11.
PACKED No. 20 IN RODS, No. 21 IN VALVES
Pistons CAST IRON RINGS SPRING INTO SOLID HEAD
Cr'sh'ds LAIRD TYPE, STEEL Oil cups NATIONAL
Crossheads CAST STEEL, WITH TENDER BARS
Main Pins STEEL Rod cups PLUMMER, FORGED ON
Parallel rods TO HAVE SOLID ENDS

Valve Motion STEPHENSON
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.
MAIN WHEELS ONLY TO HAVE RUB LINERS OF BRASS
Driving, O. S. Diam. 50" Cen. diam. 44"
WHEEL CENTERS: - MAIN CAST STEEL, OTHERS CAST IRON
Tires, STEEL Held by SHRINKAGE AND SHOULDER
Tires, Flanged, Pos. FRONT AND BACK Size 3" x 5½"
Tires, Plain, Pos. MIDDLE Size 3" x 6½"
Lateral play between driving boxes and wheel hubs - 1/16" TOTAL
Driving Boxes STEELED CAST IRON
Journals, Diam. 9" Length 12"

Springs. Make B. L. W.

Front Engine Truck NONE Wheels ----
To swing ---- each side of cen., Cen. pin liners ----
Journals, Diam. ---- Length ---- Boxes ----
Wheels, Diam. ---- Tread ---- Kind ----
Tires ---- Cen. diam. ---- Size ----
Tires held by ----

Back Engine Truck NONE Wheels ----
To swing ---- each side of cen., Cen. pin liners ----
Journals, Diam. ---- Length ---- Boxes ----
Wheels, Diam. ---- Tread ---- Kind ----
Tires ---- Cen. diam. ---- Size ----
Tires held by ----

Brake, position On ALL DRIVING AND TENDER WHEELS
Operating Parts { Engine, Sch. No. 6 ET WEST'G. COMBINED AUTO. AND STRAIGHT AIR / Eng. Tr'k, sch. ----
Foundation Parts { Drivers, sch. 28-2 AMERICAN D. S. EQUALIZED / Eng. Tr'k, sch. ----
Air pump ONE 9½" Pos. LEFT SIDE
Train connections FRONT AND BACK
Train signal, sch. NONE
AIR PUMP TO BE PLACED LOWER THAN FOR 6 36 D 91
AIR DRUMS TO BE LOCATED UNDER FRONT SECTION OF RUNNING BOARDS, AND TO BE SECURELY FASTENED TO BOILER WITH CAST STEEL BRACKETS.
AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

Tender EIGHT Wheeled, Drawing No. 365
Weight, with fuel and water, about 80,000 POUNDS

Tank NOOD Gallons, Bill #4714 cap. 11.2.17.
TANK "U" SHAPE, SLOPING BACK FUEL CAPACITY 6 TONS

Tool Boxes HARD WOOD, TOP

Frame OAK AND YELLOW PINE

Front Drawbar height 34⅜"
Pilot NONE Pushing shoes AT REAR
Back drawhead, center above rail 33½"
Coupler TOWER M. C. B. AUTO.

STEPS, HAND HOLDS, ETC., TO CONFORM TO I. C. C. REQUIREMENTS
Steps ACROSS REAR WITH HAND RAIL
HAND RAIL ON SLOPING BACK OF TANK
Trucks ARCH BAR TYPE WITH STEEL BOLSTERS

Springs ELLIPTIC B. L. W.
Journals, Diam. 4½" Length 8"
Wheels, Diam. 30" Tread 1½" Kind CHILLED CAST IRON, PLATE
Tires NONE Cen. diam. --- Size ---
Tires held by ---
Safety chains SINGLE

Brake Position ON ALL WHEELS
Brake sch. No. 6 ET WEST'G. AUTO. AND STRAIGHT AIR WITH 10" x 12" TENDER CYLINDER

List of tools, sch. 29
Photo sch. 2 Inspection B. L. W., EXCEPT SEE ★ BELOW
To be weighed YES Material spec'ns B. L. W.
Certificate of boiler test THREE COPIES OF B. L. W. FORM 1035
Junior laws to 11-1-16 Shipment ON OWN WHEELS

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. Patents { THROTTLE. PATENTED JAN. 23, 1900 (CAST ON)
FEED PIPE STRAINER, PATENTED SEPT. 1, 1903 (CAST ON)

Property plates NONE

Painting:--Engine, style 291, OLIVE GREEN AND ALUMINUM
Painting:--Tender, style 291, OLIVE GREEN AND ALUMINUM
LETTERING, ETC., TO BE SAME AS FOR 6 36 D 91
Mark on TANK SIDES. { THE AMERICAN ROLLING MILL COMPANY

	Road Nos. Pos.	Road Nos.	Name Plate
F. No. PLATE		7002	
CAB SIDES		7003	
BACK OF TANK			

★ LOCOMOTIVE TO CONFORM TO THE REQUIREMENTS OF THE INDUSTRIAL COMMISSION OF OHIO, AND MUST BE STAMPED ON THE BACK HEAD OF BOILER IN THE PRESENCE OF THE AUTHORIZED INSPECTOR, THUS: { OHIO STD. 9 & 10 BALDWIN
BOILER TO BE INSPECTED BY THE HARTFORD STEAM BOILER INSPECTION & INSURANCE Co.

11-266-67 Photo copied see box

1895.

...boilers built to meet the requirements of the Industrial Commission of Ohio must be designed strictly in accordance with the "Rules formulated by the Industrial Commission of Ohio," and be inspected during construction and upon completion by an authorized Ohio Inspector, such Inspector not to be interested either directly or indirectly with the manufacturer.

2 FACTOR OF SAFETY. The minimum factor of safety shall be five.

3 LONGITUDINAL SEAMS. Lap seams shall not be used.

4 BUTT STRAPS. Butt straps shall not be subjected to a fibre stress in excess of 6000 lbs. per sq. in.

5 STRESS IN STAYBOLTS. Stresses in staybolts shall not exceed 6000 lbs. per sq. in., (therefore use 1/4 allowable for 100 lbs. and over)

6 STRESS IN SHELL. The maximum allowable stress per square inch net cross section-al area of shell plate or the boiler having a diameter of 36" or larger shall not exceed 6000 lbs.

7 THICKNESS OF PLATES. The thickness of butt straps shall be as follows:-

THICKNESS OF SHELL PLATES	MINIMUM THICKNESS OF BUTT STRAPS

The thickness of flanged heads shall be as follows:-

OUTSIDE DIA. OF TUBE PLATE	MINIMUM THICKNESS

...shall be not less than [illegible] inches.

...shall be not greater than [illegible] inches.

...shall be not greater than [illegible] inches.

...shall be not greater

THE BALDWIN LOCOMOTIVE WORKS As Spec'n. C-4110

Memorandum Spec'n 17032

SPECIFICATION FOR LOCOMOTIVES 6 - 3¼ D 962

FOR Carnegie Steel Company (Schoen Steel Wheel Works)

R.

Gen. as photo. 5084 {Except somewhat smaller and with Baker valve motion

Engine Drawing No. 83

3-5-17

Gauge of Road 4' 8½" Play ⅜"

Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"

Total wheelbase, eng. and tend. {Actual 45' 8¾" {Limited to ——

Curves 150 feet radius

Limits, Height 14' 2" Width {10' 0" except over cylinders may be 10' 1½"

Weight (approximate) in working order, Total 132,000 pounds

On F. tr'k —— lbs., Drivers 132,000 lbs., B. tr'k —— lbs.

Tractive power 31824 lbs., Ratio of adhesion 4.1

Work'g St'm Pres. 180 lbs., Service Switching

Fuel Soft Coal

Front tube sheet to be ½" thick

Boiler Steel (Sup. 26) Thick ⅞" Bill 8096 (8254 for Horaffes and extras. U.S. mks.)

Boiler, Diam. 64" Plan Straight Top

Boiler st'm pres. 180 lbs. Tested to {200 lbs. steam pres. {240 lbs. water pres. {with factor of safety of 5.1

Longitud. seams (See sup. 27)

Dome, diam. 29" Pos. Central

Firebox Steel (Sup. 29) Combustion chamb. None

Firebox, length 96-1/16" Width 39" Depth F. 64" B. 61"

Firebox, Tube ½" Crown ⅜" Sides ⅜" Back 5/16"

Firedoor opening One oval 15" x 18"

Water space, Front 4" Sides 3" Back 3"

Water space, Frame Double Riveted

Water space stays 1" diam. with 3/16" hole 1¼" deep from O. S.

Radial stays 1⅛" diam. Sling stays front (See sup. 37)

Button heads below crown on Ten central rows

Crown bars None Placed —— above crown

Crown bolts ——

Flues None

Tubes #11 W. G. Lap Welded Spellerized Steel

Tube ends Swaged for copper ferrules, firebox ends

Number 261 Diam. 2" Length 11' 0"

Heating Surface	Flues ——	Combus. Chamb. ——	Total	1631 sq. ft.
	Tubes 1492 sq. ft.	Fire Box 139 sq. ft.	Fire Brick Tubes	——
Grate area 26 sq. ft.	Ratio to Heating Surface 1 : 62.8			
Superheater ——				

Fire Brick Arch, None

Grates Rocking Bars (See sup. 40)

Ash Pan, Dampers Front and back

Throttle Balance Pos. Dome

Dry pipe Steel Steam Pipes (See sup. 44)

Superheater None

Smokebox extension With Cleaning hole and cap None

Spark ejector or hopper None

Netting and deflect. plates With

Exhaust nozzles Single - high

Stack Straight Dia. 16" Hole in S. B., dia. 23¾"

Safety Valves (spec) Two Coale 3" muffled

Safety valves None with relief lever, Set to 180 pounds

Whistle Brass 6½" Chime, type 963-A-1030 from Nathan Mfg. Co.

Steam Gauge One Brass Case 7" MAKERS-Ashton (spec'd)

Steam gauge stand Iron **Clock** None

Water Gauge One (See sup. 59) **Cab Lamps** To burn oil

Gauge Cocks Three - Back Surface valve None

Lowest gauge cock 3½" above highest part of crown

Lubricator steam valve without separate dry pipe to dome

Blower Valve B. L. W.

Blow off Cock One Homestead 1½" (See sup. 61)

Cleaning Plugs One plug above fire door

Firebox Corners diagonal, back and one each side

Crown, Four each side and three back

Waist, One under front

Front tube sheet, None Fusible plug One

Pump None Pos. ——

Top chamb. —— Bottom chamb. ——

Feed Cock —— Feed pipes ——

Checks —— Check pipes ——

Injectors Two Sellers, Class "K" (spec'd) No. 9½

Injectors, Pos. Right and Left Steam pipes Copper

Pipes, Check Steel Feed Steel Overflow Steel

Check (See sup. 63) Pos. Right and Left

Steam Heat None

Cab Steel (See sup. 65) Ventilator in cab roof

Cab boards Steel (See sup. Nosing None

Running boards Steel (See sup. 76) Nosing Angle Iron (Sup. 76)

Hand rail Iron (See sup. 76) Located on Boiler

Back Bumper Bar Steel Back drawbar height 32½"

Pilot None Pushing shoes Cast in bumper

Front Bumper Cast Steel (Sup. 81) Bumper plate With

Steps (See sup. 7-77 etc.)

Front Drawhead, Center above rail 33½"

Coupler Sharon Radial M. C. B. Auto. of steel

Signal fixtures None

Headlight Two Round Case 23" Reflector, To burn Kerosene

Headlight, Nos. on sides With H'd'l't step With

Lamp shelf None Nosing ——

Bell of Brass, 92 pounds. Bell Ringer (See sup. 84)

Sand Box Two Diam. 28" Body Iron Painted Pipes Iron

(Sarver) Leach Air, Trap A-1 in each box

Dome casing Iron Painted

Boiler Jacket (See sup. 86) Bands Iron Style 15 and 14

Boiler Lagging Johns-Manville 85% Magnesia sectional

11-266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS

H. J. Smith Assistant to Chief Engineer

SPECIFICATION FOR LOCOMOTIVES 6 - 3¼ D 962

FOR Carnegie Steel Company (Schoen Steel Wheel Works)

R.

Furnish prints (See sup. 2)

131

Frames Cast Steel 5" wide (Sup. 76) Braces Solid

Cylinders, Diam. 20" Stroke 26"

St'm ports, Length 16" Width 1⅞" Bridges 1⅜"

Exh. ports, Length 16" Width 3" Valve lead ⅛"

Valve travel 5½" Steam lap ¾" Exhaust clearance ——

Eccentric crank throw 11½" By-pass valve None

S. F. Lubr. and pipes (See sup. 100)

Cyl'r heads Cast Iron (See sup. 101)

Cyl'r casings (Sup. 102) Head covers Pressed Steel Painted

St'm chest casings (Sup. 103) Covers Steel Painted (Sup. 103)

St'm chest valves American Balanced, D type

Met. pkg {Piston rods {Valve stems Heyden type (spec'd)

Pistons (See sup. 111)

Guides Two Bar type, steel Oil cups Needle

Crossheads "Alligator" type, Cast Steel (See sup. 114)

Wrist Pins Steel Rod cups (See sup. 116 etc. 119-121)

Valve Motion Baker, Royalty payable by The B. L. W.

Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.

All finished movable nuts of steel or of iron case hardened.

Wearing Bearings (See sup. 118-121-128-158)

Drivers, O. S. Diam. 50" Cen. diam. 44" Centres cast steel

Tires Steel Held by Shrinkage and Shoulder

Tires, Flanged, Pos. All Size 3" x 6"

Tires, Plain, Pos. None Size ——

Lateral play between driving boxes and wheel hubs = ⅛" total

Driving Boxes Cast Steel (See sup. 128)

Journals, Diam. 9" Length 12"

Springs. Make B. L. W. (See sup. 129)

Front Engine Truck None Wheeled ——

To swing ——each side of cen., Cen. pin liners ——

Journals, Diam. ——Length —— Boxes ——

Wheels, Diam. —— Tread —— Kind ——

Tires —— Cen. diam. ——Size ——

Tires held by ——

Back Engine Truck None Wheeled ——

To swing ——each side of cen., Cen. pin liners ——

Journals, Diam. ——Length —— Boxes ——

Wheels, Diam. —— Tread —— Kind ——

Tires —— Cen. diam. —— Size ——

Tires held by ——

Brake, position On all driving and tender wheels

Operating Parts {Engine, Sch. No. 6 ET West'g. Combined Auto. and Straight Air {Eng. Tr'k, sch. ——

Foundation Parts {Drivers, sch. WM-2-BC American O. S. Equalized {Eng. Tr'k, sch. ——

Air pump One 9½" Pos. Left Side

Train connections Front and Back

Train signal, sch. None

Certificates dated June 9th and July 11th covering test of reservoir Nos. 13305 and 13813 furnished by West'g. Air Brake Co. are filed in Main Office, File No. 82

Tender Eight Wheeled, Drawing No. 435

Weight, with fuel and water, about 90,000 pounds

Tank 4500 Gallons, Bill 4551

Tank "U" shape, sloping back. Fuel capacity 4½ tons.

Tool Boxes (See sup. 144)

Frame Steel 10" channels

Front Drawbar height 31¼"

Pilot None Pushing shoes None

Back drawhead, center above rail 33½"

Coupler Sharon M. C. B. Auto. with 5" x 7" shank slotted for Farlow Draft Gear, and equipped with Westinghouse-Farlow draft gear.

Steps (See sup. 7-152 etc. 156)

Trucks Diamond Arch bar type, with heavy cast steel bolster

Springs Elliptic. B. L. W. make

Journals, Diam. 5" Length 9"

Wheels, Diam. 33" Tread —— Kind Carnegie Steel Co's Schoen No. 5-1131

Tires None Cen. diam. —— Size ——

Tires held by —— Wheel Rims 2½" thick

Safety chains Single

Brake Position On all wheels

Brake sch. No. 6 ET West'g. Auto. and Straight air with 10" x 12" cylinder

List of tools, sch. 29 (See sup. 12)

Photo sch. #2 Inspection (See sup. 3 etc.)

To be weighed Yes Material spec'ns B. L. W. except as spec'd. (Sup.

Certificate of boiler test Three copies of B. L. W. form 1036

Junior laws to 7-4-17 Shipment On own wheels, under steam

Brass shop finish, No. 1

Machine shop finish D-165

B. L. W. Patents } None

Property plates None

Painting: —Engine, style 291 Black and Gold Bronze

Painting: —Tender, style 291 Black and Gold Bronze

Mark on Cab Panels {Carnegie Steel Co.

Mark on tank sides, Schoen Steel Wheel Works

Mark on back of tank in small letters {Coal 4½ tons {Water 4500 gallons

Road Nos. Pos. Road Nos. Name None

F. No. Plate 43

Dome and

Cab sides

SPECIFICATION FOR LOCOMOTIVES 6 - 34 D 962

FOR CARNEGIE STEEL COMPANY (SCHOEN STEEL WHEEL WORKS)

R.

1 ANY MATERIALS ENTERING INTO THE CONSTRUCTION OF LOCOMOTIVE WHICH MAY BE MANUFACTURED BY THE SUBSIDIARY COMPANIES OF THE UNITED STATES STEEL CORPORATION, MUST BE PURCHASED FROM SUCH COMPIES.

2 THE B. L. W. TO FURNISH ONE COMPLETE SET OF VAN DYKE PRINTS AND ONE COMPLETE SET OF BLUE PRINTS COVERING EVERY DETAIL OF ENGINE AND TENDER, WITH CARD RECORD AND MATERIAL RECORD OF SAME.
FURNISH TO MR. RALSTON, ONE COPY OF DWG. ROOM SPEC'N.

3 THE RY. CO. RESERVES THE RIGHT TO HAVE INSPECTORS AT THE B. L. W. AND SUB-CONTRACTOR'S WORKS TO THOROUGHLY INSPECT ALL MATERIAL AND WORKMANSHIP FOR THE ENTIRE LOCOMOTIVE. MR. C.F.W. RYS, METALLURGICAL ENGINEER, CARNEGIE STEEL CO., PITTSBURH, PA., WILL INSPECT AT THE RESPECTIVE MANUFACTURERS, BOILER AND FIREBOX SHEETS, FRAMES, ALL AXLES, TENDER WHEELS, JOURNAL BOX BEARINGS, BUSHINGS, STAYBOLT MATERIAL AND SPRINGS SEND HIM COPIES OF ALL ORDERS FOR MATERIALS ENTERING INTO THE CONSTRUCTION OF THESE LOCOS., AND WHEN WE START TO LAY OUT BOILERS AND BEGIN MACHINE WORK IN OUR SHOPS WE ARE TO NOTIFY HIM SO THAT HE CAN ARRANGE TO HAVE INSPECTORS ON HAND AT THAT TIME. (SEE SUP. 4 TO 6)

4 BOILER TESTS, STEAM PIPE TESTS, DRY PIPE TESTS AND CYLINDER TESTS TO BE MADE AND LOCO. TO BE TESTED AND WEIGHED ~~DURING CAR WORKING HOURS~~ IN THE PRESENCE OF THE RY. CO'S INSPECTOR. MR. 1148
ALL BOLTS IN FRAMES AND CYLINDERS MUST BE FITTED AND PASSED ON BY RY.CO'S INSPECTOR BEFORE BEING DRIVEN.

5 ENGINE AND TENDER TO BE WEIGHED LIGHT AND IN WORKING ORDER IN THE PRESENCE OF RY.CO'S INSPECTOR.

6 LOCATION OF ALL PIPES AND CAB FIXTURES TO BE APPROVED BY THE RY.CO'S INSPECTOR. RUNNING TEST OF LOCO. IS NOT TO BE MADE UNTIL ALL PIPES ARE APPLIED, TANK FILLED WITH WATER AND LUBRICATORS FILLED WITH OIL.. WORKING PRESSURE TO BE MAINTAINED UNTIL RUNNING TEST IS FINISHED. CERTIFICATE OF APPROVAL MUST BE OBTAINED FROM THE R. R. CO'S INSPECTOR BEFORE LOCO. LEAVES THE BALDWIN LOCOMOTIVE WORKS.

7 ENGINE AND TENDER TO BE EQUIPPED WITH ALL THE I.C.C. SAFETY APPLIANCE STANDARD REQUIREMENTS.

8 ALL BOLTS AND NUTS TO HAVE U.S. STANDARD THREAD EXCEPT WHERE FINER THREADS ARE NECESSARY. STEEL ENGINE BOLTS AND COLD PRESSED NUTS TO BE USED.
NUMBER OF THREADS PER INCH TO BE SUITABLE FOR THE WORK.
ALL BOLTS MUST BE THROUGH BOLTS WHEREVER PRACTICABLE.
ALL FINISHED REMOVABLE NUTS TO BE CASE HARDENED.

9 SPLIT AND COTTER KEYS MUST NOT BE APPLIED THROUGH NUTS ON ANY PART OF LOCO. BUT PLACED ON OUTSIDE OF NUT OR USED WITH CASTLE NUT

10 ALL CASTINGS WHICH ARE SUBJECT TO STRAIN ARE TO BE SPOT FACED FOR HEADS OF BOLTS AND NUTS

11 ALL PIPES MUST CLEAR JACKET BY AT LEAST 1"
FINS TO BE REMOVED AND ALL PIPES BLOWN OUT BEFORE ERECTION
AVOID UNNECESSARY JOINTS AND CLAMP ALL PIPES SO THEY CANNOT VIBRATE. CLAMPS FOR 1" PIPE AND OVER TO BE $\frac{3}{8}$" X 2" WITH JAMB NUTS. ALL PIPE CLAMP BOLTS MUST HAVE DOUBLE NUTS.

12 LOCOMOTIVE TO BE PROVIDED WITH COMPLETE SET OF WRENCHES TO FIT ALL NUTS AND BOLTS, INCLUDING TWO MONKEY WRENCHES, ONE POKER, ONE SCRAPER, ONE MACHINIST'S HAMMER, ONE SOFT HAMMER, THREE COLD CHISELS (TWO FLAT AND ONE CAPE), PACKING TOOLS, ONE PINCH BAR, ONE SCOOP SHOVEL, ONE LONG SPOUT QUART OIL CAN, ONE TALLOW POT, ONE TORCH, TWO JACK SCREWS AND ONE WATER PAIL. ONE TWO GALLON OIL CAN.

16 NUMBER PLATES TO BE MADE OF BRASS AND PLACED ON EACH SIDE OF STEAM DOME

17 CAB AND TANK TO BE PAINTED BLACK AND VARNISHED AS PER STANDARD LOCOMOTIVE PRACTICE.
CAB AND TANK MUST BE THOROUGHLY CLEANED BY SAND BLAST BEFORE PAINTING.
OUTSIDE OF CAB SASH TO BE PAINTED BLACK
JACKET TO BE PAINTED BEST GRADE OF JACKET PAINT; COLOR TO BE RUSSIAN IRON
LETTERS AND STRIPES TO BE MADE WITH GOLD BRONZE TO HARMONIZE WITH ALL THE OTHER LOCOS. IN USE AT CO'S PLANT
PANEL OF CAB AND TANK TO HAVE 1" STRIP AROUND OUTSIDE ABOUT 4" FROM CENTER LINE OF RIVETS
MARK TO BE APPLIED ON CAB PANELS AND ON SIDES OF TANK AT CENTRE LINE SIMILAR TO RY. CO'S SKETCH (HEREWITH)

Photograph on a plate 8"x10" to show close up view of the Baker valve motion, including the back steam chest cover and eccentric crank. Also furnish diagonal views looking from front and from back at this motion work. 11. 2 19

11-266-67 Photo copied see box

SPECIFICATION FOR LOCOMOTIVES 6 - 34 D 962

FOR CARNEGIE STEEL COMPANY (SCHOEN STEEL WHEEL WORKS)

R.

26 BOILER TO BE CARNEGIE STEEL CO'S BOILER STEEL IN ACCORDANCE WITH AMERICAN SOCIETY FOR TESTING MATERIALS SPEC'N. A-30-14
BOILER TO BE WELL DESIGNED, THOROUGHLY BRACED AND STAYED AND TO CONFORM TO THE I. C. C. REQUIREMENTS
BOILER TO BE BUILT TO A FACTOR OF SAFETY OF FIVE AT THE WORKING PRESSURE OF 180 POUNDS.
BOILER TO BE TESTED IN ACCORDANCE WITH THE I. C. C. REQUIREMENTS.

27 ALL PLATES IN BOILER TO BE CAREFULLY FLANGED AND ALL HAND FLANGED PLATES TO BE CAREFULLY ANNEALED AFTER FLANGING.
ALL PLATES TO BE PLANED AT EDGES AND CAULKED INSIDE AND OUTSIDE WITH ROUND NOSED TOOL.
THROAT SHEET TO BE OF SUFFICIENT THICKNESS TO MAINTAIN REQUIRED SECTION AFTER FLANGING.
BOILER TO BE THOROUGHLY REINFORCED AT DOME OPENINGS.
HORIZONTAL SEAMS TO BE BUTT JOINTED, SEXTUPLE RIVETED, WITH WELT STRIPS INSIDE AND OUTSIDE. LONGITUDINAL SEAMS ON EACH COURSE MAY BE WELDED 9" FRONT AND BACK
BOILER SEAM NOT TO BE ON THE TOP CENTER LINE OF BOILER BUT TO BE OFF AT AN ANGLE OF ABOUT 45 DEGREES, EXCEPT FOR DOME COURSE, WHICH MAY HAVE SEAM ON TOP OF BOILER PROVIDED A PROPER FACTOR OF SAFETY CAN BE OBTAINED WITHOUT FIGURING ANY ALLOWANCE FOR THE WELD.
CIRCUMFERENTIAL SEAMS TO BE DOUBLE RIVETED.
WRAPPER SHEET TO BE MADE IN ONE PIECE.
RIVET HOLES TO BE REAMED AFTER PLATES ARE ASSEMBLED TO INSURE UNIFORM HOLES, AND TO BE SLIGHTLY COUNTERSUNK INSIDE AND OUTSIDE UNDER HEADS OF RIVETS. RIVETS ARE TO BE DRIVEN BY HYDRAULIC OR PNEUMATIC PRESSURE WHEREVER POSSIBLE.
ALL RIVETS IN ENTIRE BOILER TO BE MADE OF STEEL AND TO BE MACHINE DRIVEN WHEREVER POSSIBLE.
ALL RIVETS INSIDE OF WATER LEG IN WRAPPER SHEET SIDE TO BE HALF COUNTERSUNK 10" UP FROM MUD RING.

28 DOME TO BE OF ONE PIECE TYPE, REINFORCED WITH CIRCULAR LINER OF APPROVED THICKNESS AND EDGES OF HOLE IN SHELL TO BE CHIPPED SMOOTH.

29 FIRE BOX TO BE MADE OF CARNEGIE STEEL CO'S FIRE BOX STEEL IN ACCORDANCE WITH AMERICAN SOCIETY FOR TESTING MATERIALS SPEC'N. A-30-14.
FIRE BOX PLATES TO BE CAREFULLY FLANGED AND ALL HAND FLANGED PLATES TO BE CAREFULLY ANNEALED AFTER FLANGING.
FIRE BOX CROWN AND SIDES TO BE MADE IN ONE PIECE.
EDGES OF FIRE BOX FLUE SHEET FLANGE AND DOOR SHEET FLANGE TO BE BEVELED ABOUT 36" UP FROM MUD RING.
ALL RIVET HEADS INSIDE OF FIRE BOX TO BE COUNTERSUNK.
ALL MUD RING RIVETS INSIDE OF FIRE BOX TO BE HALF COUNTERSUNK, AND TO BE DRIVEN WITH HEADS 5/16" HIGH.

30 FIRE DOOR TO BE SWING TYPE WITH CHAIN.

31 MUD RING TO BE MADE OF CAST STEEL WITH LUGS FRONT AND BACK FOR SECURING BOILER TO FRAMES.
MUD RING TO HAVE LUGS ON BOTTOM FOR HOLDING THE GRATE FRAME AND ASH PAN.
MUD RING CORNERS BOTH INSIDE AND OUTSIDE TO BE ELECTRIC WELDED 9" EACH WAY FROM CORNER.

32 FIRE BOX TO BE PLACED ON TOP OF FRAMES.
FIRE BOX TO BE SUPPORTED BY PLATES BOLTED TO LUGS ON MUD RING AND TO A CAST STEEL CROSSTIE AT THE FRONT END AND THE DECK PLATE AT THE BACK END.
NO SIDE EXPANSION PADS TO BE USED.

36 ALL WATER SPACE AND RADIAL STAY BOLTS TO BE MADE OF CARTER SPECIAL STAY BOLT IRON.
ALL RIGID STAY BOLTS TO HAVE TELL-TALE HOLES AS REQUIRED BY THE I. C. C. LAWS.
FLEXIBLE STAYS, TATE ABOUT 300 IN BREAKING ZONE.

37 THE TWO FRONT ROWS OF RADIAL STAYS TO BE EXPANSION STAYS OF THE TURNBUCKLE TYPE AS SHOWN ON B.L.W. BOILER CARDS 11407 & 11408, AS FURNISHED ON EXTRA ORDER NO. 7577 - 1915.
THESE STAYS TO BE MADE OF CARTER SPECIAL STAYBOLT IRON.

38 THROAT STAYS TO BE RY. CO'S STANDARD TYPE.
BOILER BRACES TO BE MADE OF CARNEGIE STEEL CO'S WELDING STEEL.
FRONT TUBE SHEET AND BACK HEAD BRACES TO BE OF THE WELDED JAW TYPE AND TO CARRY NOT OVER 9000 POUNDS PER SQUARE INCH WHEN SUPPORTING AN AREA 3" FROM INSIDE OF ROOF, 2" FROM OUTSIDE OF TUBES, AND 2" FROM CENTRE OF STAYBOLTS WITH NOTHING DEDUCTED FOR DRY PIPE OPENING. ALL BACK HEAD BRACES TO BE ATTACHED TO SHELL BEHIND DOME.

39 TUBES FROM NATIONAL TUBE CO.
TUBE HOLES TO BE ACCURATELY REAMED AND SHARP CORNERS TO BE ROUNDED OFF TO AVOID CUTTING TUBES AND FERRULES.
TUBE HOLES IN FIREBOX TUBE SHEET TO BE 2" OFF BOTTOM OF BOILER AND TO BE 2" OFF OUTSIDE OF TUBE SHEET AT TOP AND 1½" AT SIDES.
TUBES TO BE PROSSERED AT FIRE BOX END.
TEN PER CENT. OF THE TUBES TO BE BEADED AT FRONT END.

40 GRATES OF CAST IRON SAME AS FOR 6-34 D 960 ETC.
NO DROP PLATE NOR DEAD GRATE TO BE USED.
GRATES TO BE ROCKING DUMP TYPE OPERATED IN TWO SECTIONS, OPERATED FROM CAB WITH HANDLE HINGED TO SHAFT ON BACK HEAD OF BOILER.

41 ASH PAN TO BE MADE OF STEEL PLATES OF THE HOPPER TYPE WITH AMPLE AIR OPENING.
ASH PAN SLIDE WORK AS B. L. W. CARD 7143 APPROVED

42 THROTTLE, DRY PIPE AND DOUBLE CONE TO BE SAME AS FOR 6-34 D 45
STEAM PIPES SAME AS FOR 6-34 D 45.

43 DRY PIPE FLANGE ON FLUE SHEET TO BE APPLIED BY MEANS OF THREADED STAY BOLT IRON 1" DIAM. RIVETED OVER INSIDE AND OUTSIDE. DRY PIPE SUPPORT TO BE 3" X ½"

44 STEAM PIPES OF CAST IRON IN SMOKE BOX

45 SMOKE BOX FRONT AND DOOR OF PRESSED STEEL, CAREFULLY FITTED
SMOKE BOX FRONT TO BE ½" THICK WITH DOOR ⅜" THICK.
SMOKE BOX LINER OF AMPLE THICKNESS TO TAKE IN ALL BOLTS IN CYLINDER SADDLE.

46 SMOKE BOX NETTING TO HAVE 2½ MESH PER INCH #12 WIRE.
ARRANGEMENT TO BE DOUBLE NUTTED AND ANGLE RIVETS TO BE FLUSH ON OUTSIDE.

47 EXHAUST PIPE TO BE ATTACHED TO CYLINDER SADDLE WITH STUDS

48 SMOKE STACK AND BASE OF CAST IRON IN ONE PIECE SAME AS FOR 6 - 34 D 941 ETC.

11-266-67 Photo copied see box

56 ALL OPENINGS IN BOILER 2½" DIAM. AND LARGER, ARE TO BE PROPERLY REINFORCED

57 SAFETY VALVE ELBOW TO BE SIMILAR TO THE TYPE SHOWN BY HOMESTEAD STEEL WORKS PRINT G-530, PATT. 5-G-126

58 WHISTLE TO BE PLACED IN ELBOW CASTING IN SIDE OF STEAM DOME.

59 WATER GAUGE TO BE BABCOCK IMPROVED WATER BOTTLE.

60 GAUGE COCKS TO BE TYPE 272-A-1001, MADE BY NATHAN MFG.CO.

61 BLOW OFF COCK, TO BE LOCATED IN THROAT AND TO HAVE EXTENSION HANDLE.

62 BOILER AS B.L.W. CARD 12369 APPROVED EXCEPT WITH THE ADDITION OF THE FOLLOWING PLUGS.
ONE CLEANING PLUG IN BARREL OF BOILER ON THE RIGHT SIDE ABOVE TUBES IN BACK OF FRONT TUBE SHEET.
ONE CLEANING PLUG IN BARREL OF BOILER RIGHT SIDE ABOVE TUBES, FRONT OF BACK TUBE SHEET.
ONE CLEANING PLUG RIGHT AND LEFT BACK CORNERS OF FIREBOX DIAGONAL, OPPOSITE CENTER OF FIRE DOOR.
WASHOUT PLUGS TO HAVE SQUARE ENDS, TO BE 2" DIAM. WITH 12 THREADS, AND WITH TAPER OF ½" IN 12".

63 INJECTORS TO BE PLACED ON SIDES OF BOILER INSIDE OF CAB.
INJECTOR CHECK TO BE SELLERS COMBINED MAIN CHECK AND STOP VALVE, SIDE INLET STYLE E & F SCREW SHANK, PLACED IN FRONT COURSE OF BOILER.
ALL INJECTOR CONNECTIONS TO HAVE 10 THREADS PER INCH; THIS REFERS ONLY TO THE SCREW SHANKS - ALL OTHER THREADS ARE TO BE MANUFACTURERS STANDARD.
INJECTOR FEED PIPE HOSE STRAINER TO BE SELLERS.
INJECTOR FEED PIPE CLAMPS TO BE 2½" X ⅜"
ALL BOLTS IN THE INJECTOR CHECK PIPE CLAMPS TO HAVE DOUBLE NUTS.

64 FUEL SPRINKLER TO BE SELLERS

65 CAB TO BE MADE OF ¼" PLATE AND TO HAVE COPPER GUTTERS ON SIDES OVER WINDOWS. CAB TO BE LINED THROUGHOUT WITH POPLAR, TONGUED AND GROOVED, AND WELL FINISHED AND VARNISHED.
SIDES AND BACK OF CAB TO EXTEND BELOW CAB BOARD.
CAB TO BE SECURED TO BOILER BY 4" ANGLE AND TO HAVE 40 BOLTS, ⅝" DIAM. IN DOUBLE ROW OF 20 ON EACH SIDE.
CAB SHEET TO HAVE CLEARANCE OF NOT LESS THAN ¾" OVER FIRE BOX SHEET.
FINISH AND FILLING PLATES BETWEEN CAB AND BOILER TO BE ⅛" THICK AND TO BE APPLIED WITH BOLT, NOT LAG SCREWS.
CAB KNEES TO BE DESIGNED TO FIT BETWEEN STAYBOLTS SO STAYS CAN BE INSPECTED WITHOUT REMOVING KNEES.
CAB TO BE APPLIED DIRECT TO STEEL RUNNING BOARD.
CAB TO HAVE WOOD FLOOR 1¾" THICK.
ALL HOLES IN CAB FLOOR FOR PIPING TO BE COVERED WITH PLATES ⅛" THICK, SECURED BY BOLTS.
INJECTOR CHECK PIPE HOLES IN CAB TO BE LARGE ENOUGH TO ADMIT PIPE NUTS WITH COVER PLATE ⅛" THICK SECURED BY BOLTS.

66 CAB TO BE FITTED WITH SUITABLE SLIDING WINDOWS AND DOORS GLAZED WITH DOUBLE THICK "A" GLASS; EACH WINDOW SASH HAVING FOUR PANES. LOOKOUT WINDOWS TO BE PROVIDED IN ALL DOORS AND IN FRONT OF CAB OVER BOILER.
CAB TO BE PROVIDED WITH HEAVY CANVAS CURTAINS.

67 CAB TO BE LOCATED SO AS TO PERMIT ENGINEER SITTING TO REAR OF END OF BOILER, INSTEAD OF ALONG SIDE OF BOILER
CAB TO BE PROVIDED WITH CONVENIENT TOOL BOXES AT BOTH SIDES OF CAB AND CUSHIONS AND ARM RESTS FOR ENGINEER AND FIREMAN.

71 CAB APRON TO BE OF DIAMOND PATTERN (OMITTED FROM 962 BY MISTAKE. M.M.F. 12.5.17.)
CAB APRON HINGE BOLTS TO HAVE COTTERS.

72 OIL BOX AND TOOL BOX MADE OF STEEL PLATES TO BE APPLIED UNDER CAB BOARD ON LEFT SIDE LOCATED SO AS NOT TO INTERFERE WITH ACCESS TO THE WASHOUT PLUGS. BOX TO BE 30" LONG, 18" WIDE AND 18" HIGH WITH HINGED LID ON SIDES.

73 FOOT PLATE AT REAR TO BE OF CAST STEEL WITH EXTRA HEAVY DRAWBAR POCKET AND EXTRA HEAVY DOUBLE SAFETY CHAINS WITH CLEVIS ON FRONT END OF CHAIN TO CONNECT BY PINS TO TENDER FRAMES.

74 DRAWBAR BETWEEN ENGINE AND TENDER TO BE STRAIGHT AND TO BE OF AMPLE SIZE.
HOLES IN DRAWBAR TO BE ELONGATED TO ALLOW FOR COMPRESSION OF THE SPRING BUFFER. (SEE SUP. 14R)

75 RADIAL BUFFER SPRING TYPE, MANUFACTURED BY ECONOMY DEVICES CORPORATION, TO BE APPLIED BETWEEN ENGINE AND TENDER.

76 RUNNING BOARD TO BE STEEL PLATE DIAMOND PATTERN.
RUNNING BOARD TO EXTEND SAME WIDTH, THE ENTIRE LENGTH AND TO HAVE CHAIN RAILING.
RUNNING BOARDS TO BE AT LEAST 24" WIDE WITH TOE BOARD 3" HIGH AND PROVIDED ON OUTSIDE WITH SUBSTANTIAL RAILING 30" HIGH WITH INTERMEDIATE RAIL AND TOP RAIL MADE OF 3/16" GALVANIZED SOLID OVAL LINK PROOF CHAIN SUPPORTED ON VERTICAL POSTS MADE OF STEEL ANGLES. HAND RAIL POSTS TO BE BOLTED THROUGH BRACKETS IF POSSIBLE; IF THIS IN NOT POSSIBLE, THE BOARDS ARE TO BE REINFORCED WHERE POSTS ARE ATTACHED.
CHAIN TO BE FASTENED AT EACH POST.
RUNNING BOARDS TO BE FULL WIDTH THROUGHOUT THEIR WHOLE LENGTH. STEPS WITH CHAIN HAND RAILS TO BE PROVIDED ON BOTH SIDES FOR REACHING RUNNING BOARDS FROM THE FRONT END OF THE LOCOMOTIVE.

77 PLATFORM AND STEPS OF THE PASSENGER CAR TYPE, TO BE PROVIDED AT FRONT OF ENGINE, SAME AS FOR 6-34 D 941 ETC. APPROVED.
PLATFORM AND STEPS TO BE APPLIED SO THAT THE PISTON HEAD AND ROD CAN BE REMOVED WITHOUT TAKING DOWN THE PLATFORM AND STEPS. THESE STEPS TO BE 24" WIDE, AND PLATFORMSS ALSO TO HAVE CLEAR SPACE ACROSS TRACK NOT LESS THAN 24" WIDE FROM INSIDE OF POSTS LONGITUDINALLY OF THE LOCO. THIS WORK TO BE OF STEEL CONSTRUCTION THROUGHOUT, BUT STEP TREADS AND PLATFORM TO BE PROVIDED WITH WOODEN TOPS. TOP OF BOTTOM STEP TO BE 12" FROM TOP OF RAIL, AND TREAD TO BE NOT LESS THAN 8" AND PREFERABLY 10" DEEP, AND TO HAVE BACKSTOP AT LEAST 4" HIGH. OTHER STEPS TO HAVE TREADS AND RISERS TO SUIT DIMENSIONS OF LOCO. BUT TO BE AS LIBERAL AS POSSIBLE IN REGARD TO WIDTH OF TREAD.
METAL STRIP TO BE APPLIED TO HOLD DOWN WOOD LINING AT FRONT PLATFORM WHERE PASSENGER CAR STEPS HAVE TO BE APPLIED.

78 PROVISION MUST BE MADE FOR EASY ACCESS FROM FRONT BUMPER TO RUNNING BOARD, WITH CONVENEENT STEPS AND HAND HOLDS.
PLATFORM ON FRONT OF ENGINE TO BE EASILY AND SAFETY ACCESSIBLE TO TRAINMEN COMING FROM RUNNING BOARD, OR VICE VERSA.

79 GRAB IRON AMPLE IN NUMBER, AND OF SUBSTANTIAL CONSTRUCTION TO BE PROVIDED ON ALL STAIRWAYS. RAILINGS WITH TWO LINES OF 3/16" CHAIN TO BE PROVIDED ACROSS PLATFORMS EXCEPT AT MIDDLE, WHICH IS TO BE CLOSED BY CHAIN ACROSS SPACE OVER COUPLER. RAILINGS AND GRAB IRONS TO BE ARRANGED CONVENIENTLY FOR TRAINMEN'S USE IN GETTING ON AND OFF ENGINE.
RAILING POSTS ON FRONT BUMPER BEAM TO BE MADE OF STEEL, 30" HIGH, WELL SECURED AND FINISHED, AND OF SUFFICIENT DIAMETER AND STRENGTH TO SUPPORT THE WEIGHT OF THE HEAVIEST TRAINMAN IN SWINGING ON AND OFF THE FOOT BOARD.

81 FRONT BUMPER TO BE AS SHOWN ON HOMESTEAD STEEL WORK'S PRINT G-537, PATTERN 5-G-45.

82 FRONT COUPLER POCKET TO HAVE EXTENDED SHELF AND ADJUSTABLE WEDGE. COUPLER CASTING TO BE SECURED TO BUMPER BEAM WITH NOT LESS THAN FOUR BOLTS 1½" DIAMETER.

83 TWO SAFETY CHAINS TO BE PROVIDED ON FRONT END OF ENGINE. CHAINS TO BE 28" CENTERS, THE RIGHT HAND CHAIN TO BE PROVIDED WITH HOOK, AND LEFT HAND CHAIN TO HAVE LINK. THE CHAINS TO BE PROVIDED AS SHOWN ON RY.CO'S SKETCH A-2125-B.

84 GOLLMAR IMPROVED AIR OPERATED AUTOMATIC BELL RINGER MFD. BY THE HARRY VISSERING CO. WITH CAB VALVES IN CONVENIENT LOCATION FOR ENGINEER

85 SCREENS TO BE PROVIDED IN TOP OF SAND BOXES.
SANDER VALVES TO BE CONVENIENTLY LOCATED IN CAB FOR ENGINEER WHILE SEATED.

86 BOILER JACKET TO BE NO.20 W. G. AMERICAN SHEET & TIN PLATE CO'S STEEL NEATLY SECURED BY BANDS. (SEE SUP. 17)
JACKET TO BE SECURED BY CLAMPS AND ½" BOLTS.
STEEL RING ⅜" THICK TO BE APPLIED AROUND FIRST COURSE OF BOILER JUST BACK OF SMOKE BOX BUTTING AGINST FRONT OF LAGGING AND JACKET. OUTSIDE SURFACE OF RING TO BE FLUSH WITH OUTSIDE OF JACKET. FRONT JACKET BAND TO FOLD OVER THE FRONT OF THIS RING. RING TO BE LAPPED AT THE TOP AND WITH KNEES AT BOTTOM ALLOWING ½" DRAW. RING TO BE SECURED AT TOP AND BOTTOM BY ⅜" BOLT.

87 JACKET OVER FIREBOX OUTSIDE OF CAB TO BE IN FOUR PIECES LAPPED AT TOP AND SECURED BY CLAMPS AND ½" BOLTS, LOWER SECTION TO BE JOINTED WITH A HOOK JOINT JUST ABOVE THE TOP ROW OF TATE STAYS. PLACE A 2" ANGLE AT RUNNING BOARD TO PROTECT LOWER EDGE OF LAGGING. JACKET AND LAGGING INSIDE OF CAB TO BE ARRANGED SAME AS OUTSIDE OF CAB.
TOP AND SIDES OF BOILER INSIDE OF CAB TO BE LAGGED AND JACKETED. BACK HEAD OF BOILER TO BE LAGGED AND JACKETED. REMOVABLE JACKET OVER ROOF, SIDES AND END OF FIREBOX IN ORDER TO EASILY REACH STAYBOLTS.
BACK HEAD LAGGING IN FOUR SECTIONS PARTED HORIZONTALLY JUST ABOVE TOP ROW OF STAYS AND SECURED BY STUDS, ABOUT 9" APART, TO THE BACK HEAD JACKET ARRANGEMENT.

88 COLLAR ON JACKET AROUND THE WASHOUT PLUGS TO BE LARGE ENOUGHT TO ALLOW USE OF SOCKET WRENCH.

89 ALL STEAM PIPES IN CAB AND TO PUMP TO BE COVERED.

96 ENGINE FRAMES TO BE THOROUGHLY ANNEALED. FRAMES TO BE CAST WITH TEST BAR ON BOTH ENDS, BOTH OF WHICH ARE TO BE GIVEN PHYSICAL TEST TO DETERMINE IF FRAMES ARE ANNEALED THOROUGHLY.
FRAME TO HAVE TOP RAIL OVER CYLINDER. FRAMES TO BE THOROUGHLY BRACED TOGETHER AND TO THE BOILER BY SUITABLE CAST STEEL BRACES, ETC.
FRAME PEDESTAL CAPS OF STEEL WITH DEEP RECESSES FOR LUGS ON FRAME AND WITH TWO BOLTS EACH END. FRAME AND CAP TO HAVE ½" RADIUS IN ANGLES WHERE THEY ARE FITTED TOGETHER.

97 PEDESTALS PROTECTED FROM WEAR BY SHOES AND ADJUSTABLE WEDGES OF HUNT SPILLER GUN IRON.
SHOES AND WEDGES TO BE PLANED 1/32" LARGER INSIDE THAN SIZE OF FRAME, AND SHOES TO HAVE NO VERTICAL PLAY WHATEVER.
PROVISION TO BE MADE FOR CLEARANCE OF 3" ABOVE, AND 2½" BELOW, DRIVING BOXES.

98 CYLINDERS TO BE MADE OF CLOSE GRAINED IRON AS HARD AS CAN BE WORKED, AND TO CONFORM TO AMERICAN SOCIETY FOR TESTING MATERIALS' SPECIFICATION A-45-14
CYLINDERS TO BE CAST WITH HALF SADDLE ATTACHED, SECURED TOGETHER IN A SUBSTANTIAL MANNER AND ACCURATELY BOLTED AND KEYED TO FRAMES. RIGHT AND LEFT HAND CYLINDERS TO BE REVERSIBLE AND INTERCHANGEABLE.
CYLINDER BARREL TO BE OF SUFFICIENT THICKNESS TO PERMIT OF BEING BORED OUT FOR ⅜" BUSHING.
COUNTERBORE OF CYLINDERS TO BE BEVELED INSTEAD OF SQUARE.
STEAM PORTS AND EXHAUST PORTS TO HAVE AMPLE AREA.
ALL PASSAGES IN CYLINDER TO BE DRAINED WITH DRAIN COCKS IN STEAM AND EXHAUST PORTS.
CYLINDER COCKS TO BE CONNECTED TO BOTTOM OF CYLINDER.
CYLINDERS TO BE TESTED DURING DAY WORKING HOURS AND IN THE PRESENCE OF THE RY.CO'S INSPECTOR TO 10 PER CENT. ABOVE THE WORKING PRESSURE. (SEE SUP. 17)

99 THE END FLANGES OF CYLINDERS TO PROJECT FAR ENOUGH TO BE TURNED SO THAT A 1" BAND CAN BE APPLIED.
NO PLUGS, PATCHES, ETC. TO BE APPLIED TO CYLINDER WITHOUT THE APPROVAL OF RY.CO'S INSPECTOR.

100 LUBRICATOR STEAM VALVE TO HAVE EXTENSION HANDLE.
NATHAN TRIPLE BULLS EYE SIGHT FEED LUBRICATOR TO BE CONNECTED TO STEAM CHESTS TO LUBRICATE VALVES AND CYLINDERS THROUGH SUITABLE PIPES OF COPPER UNDER BOILER JACKET. (SEE SUP. 11)
OIL PIPES TO BE PROTECTED FROM CUTTING ON FRONT WIND SHEET AND JACKET AT FRONT BY USING SLEEVES OVER PIPE AT THESE POINTS.

101 CYLINDER HEAD STUDS TO BE NICKED WITH ROUND NOSED TOOL IN CENTRAL PART OF STUD. CYLINDER AND STEAM CHEST HEADS TO BE FLUSH WITH NUTS, SO THEY CAN BE EASILY REMOVED.

102 CYLINDERS TO BE LAGGED WITH SECTIONAL MAGNESIA SAME AS FOR BOILER. CYLINDER CASINGS OF SHEET STEEL PAINTED.
LAGGING AND SHEET ⅛" THICK TO BE APPLIED TO UNDER SIDE OF CYLINDERS BETWEEN FRAMES.

103 STEAM CHEST CAP TO BE CAST STEEL.
STEAM CHEST COVERS PRESSED STEEL KNOBBLED
STEAM CHEST CASINGS OF SHEET STEEL PAINTED.

104 VALVE SEATS TO BE RAISED 1½" ABOVE STEAM CHEST.
STEAM CHEST TO HAVE RELIEF VALVE ON FRONT END.

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135 BRAKE ROCKER BOXES TO CLEAR RAIL BY AT LEAST 12".
FRONT BRAKE SHOE HANGER TO BE SUPPORTED WITH A YOKE OVER THE FRAME SIMILAR TO DETAIL NOW IN USE ON EDGAR THOMPSON WORKS' LOCOMOTIVES.
BRAKE HANGER PINS TO BE IN DOUBLE SHEAR.

11-266-67 Photo copied see box

- T E N D E R -

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142 TANK TO HAVE GRAVITY SLIDE AT BACK OF COAL SPACE, WITH COPING EXTENDING AROUND TOP OF COAL SPACE ONLY.
COAL GATE TO BE OF STEEL, HINGED TYPE.

143 TANK VALVES TO BE OF BRASS, STOP COCK STYLE.
FEED PIPE HOSE TO BE NON-COLLAPSIBLE STYLE.

144 FRONT OF WATER LEGS TO BE SEMI-CIRCULAR WITH TOOL BOXES BUILT INTO FRONT OF BOTH LEGS,- NO EXTRA TOOL BOXES ARE REQUIRED.

145 TENDER FRAME FLOOR TO BE MADE OF WOOD $2\frac{1}{2}$" THICK BY 12" WIDE, TO PREVENT TANK RIVETS FROM BEARING ON THE STEEL END SILLS.
TANK TO BE SECURED FROM MOVING ON FRAMES BY CAST STOPS FRONT AND BACK, BOLTED AND LUGGED TO FRAME IN ADDITION TO THE USUAL HOLDING LUGS.

146 TENDER FRAME TO BE BUILT UP TYPE WITH END SILLS MADE OF CAST STEEL, SIMILAR TO B. L. W. CARD 4835

147 TENDER FRAME TO BE SUBSTANTIALLY BUILT AND THOROUGHLY BRACED, THE UNDER FRAME TO BE ESPECIALLY WELL BRACED TO RESIST SIDE THRUSTS DUE TO SHARP CURVES. PLATE $\frac{1}{2}$" OR $\frac{5}{8}$" THICK TO BE PLACED ON TOP OF FRAME. PLATE TO BE IN ONE PIECE FROM $10\frac{1}{2}$" BACK OF BACK TRUCK CENTRE TO REAR OF BACK END SILL, AND TO BE CUT OUT AT STEPS.
TENDER FRAME TO BE MADE LONG ENOUGH TO PROVIDE A PLATFORM AT REAR END OF TANK. (SEE SUP. 153)

148 FRONT DRAW CASTING TO BE OF CAST STEEL.
FRONT DRAW BAR TO BE STRAIGHT AND TO BE OF APPROVED DESIGN
HOLES IN DRAWBAR TO BE ELONGATED TO ALLOW FOR COMPRESSION OF THE SPRING BUFFER. (SEE SUP. 74)

149 RADIAL BUFFER, SPRING TYPE, MANUFACTURED BY ECONOMY DEVICES CORPORATION, TO BE APPLIED BETWEEN ENGINE AND TENDER.

150 TENDER BACK DRAW CASTING TO BE OF CAST STEEL.

151 TWO SAFETY CHAINS TO BE PROVIDED ON REAR END OF TENDER.
CHAINS TO BE 28" CENTERS, THE RIGHT HAND CHAIN TO BE PROVIDED WITH HOOK AND LEFT HAND CHAIN TO HAVE LINK. THE CHAINS TO BE PROVIDED AS SHOWN ON RY.CO'S SKETCH A-2125-B

152 CAST IRON SILL STEPS TO BE PROVIDED AT FRONT OF TENDER, ON BOTH SIDES.

153 PLATFORM AND STEPS OF THE PASSENGER CAR TYPE TO BE PROVIDED AT REAR END OF TENDER, SAME AS FOR 6-34 D 941 ETC. APPROVED.
THESE STEPS TO BE 24" WIDE AND PLATFORMS ALSO TO HAVE CLEAR SPACE ACROSS TRACK NOT LESS THAN 24" WIDE FROM INSIDE OF POSTS LONGITUDINALLY OF THE LOCO. THIS WORK TO BE OF STEEL CONSTRUCTION THROUGHOUT, BUT STEP TREADS AND PLATFORMS TO BE PROVIDED WITH WOODEN TOPS.
TOP OF BOTTOM STEP TO BE 12" FROM TOP OF RAIL, AND TREAD TO BE NOT LESS THAN 8", AND PREFERABLY 10" DEEP, AND TO HAVE BACKSTOP AT LEAST 4" HIGH. OTHER STEPS TO HAVE TREADS AND RISERS TO SUIT DIMENSIONS OF TENDER, BUT TO BE AS LIBERAL AS POSSIBLE IN REGARD TO WIDTH OF TREAD.
METAL STRIP TO BE APPLIED TO HOLD DOWN THE WOOD LINING AT BACK PLATFORM WHERE PASSENGER CAR STEPS HAVE TO BE APPLIED.

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11p. 268-67 Photo copied see box

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NOTICE
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SOUTHWEST MICROPUBLISHING, INC.

- TENDER -

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PIPE OUTOUT COCK AT PILOT TO BE LOCATED SO THAT IT CAN BE EASILY REACHED WHEN COUPLING HOSE. (SEE SUP. 11)

135 BRAKE ROCKER BOXES TO CLEAR RAIL BY AT LEAST 12".
FRONT BRAKE SHOE HANGER TO BE SUPPORTED WITH A YOKE OVER THE FRAME SIMILAR TO DETAIL NOW IN USE ON EDGAR THOMPSON WORKS' LOCOMOTIVES.
BRAKE HANGER PINS TO BE IN DOUBLE SHEAR.

Pp. 266-67 Photo copied see box

- T E N D E R -

141 TANK TO BE MADE OF CARNEGIE STEEL PLATES $\frac{1}{4}$" THICK STRONGLY RIVETED TOGETHER, AND BRACED AND STAYED SIMILAR TO B.L.W. CARD 6428. (SEE SUP. 17)

142 TANK TO HAVE GRAVITY SLIDE AT BACK OF COAL SPACE, WITH COPING EXTENDING AROUND TOP OF COAL SPACE ONLY.
COAL GATE TO BE OF STEEL, HINGED TYPE.

143 TANK VALVES TO BE OF BRASS, STOP COCK STYLE.
FEED PIPE HOSE TO BE NON-COLLAPSIBLE STYLE.

144 FRONT OF WATER LEGS TO BE SEMI-CIRCULAR WITH TOOL BOXES BUILT INTO FRONT OF BOTH LEGS, - NO EXTRA TOOL BOXES ARE REQUIRED.

145 TENDER FRAME FLOOR TO BE MADE OF WOOD $2\frac{1}{2}$" THICK BY 12" WIDE, TO PREVENT TANK RIVETS FROM BEARING ON THE STEEL END SILLS. TANK TO BE SECURED FROM MOVING ON FRAMES BY CAST STOPS FRONT AND BACK, BOLTED AND LUGGED TO FRAME IN ADDITION TO THE USUAL HOLDING LUGS.

146 TENDER FRAME TO BE BUILT UP TYPE WITH END SILLS MADE OF CAST STEEL, SIMILAR TO B. L. W. CARD 4835

147 TENDER FRAME TO BE SUBSTANTIALLY BUILT AND THOROUGHLY BRACED, THE UNDER FRAME TO BE ESPECIALLY WELL BRACED TO RESIST SIDE THRUSTS DUE TO SHARP CURVES. PLATE $\frac{1}{2}$" OR $\frac{5}{8}$" THICK TO BE PLACED ON TOP OF FRAME. PLATE TO BE IN ONE PIECE FROM $10\frac{1}{2}$" BACK OF BACK TRUCK CENTRE TO REAR OF BACK END SILL, AND TO BE CUT OUT AT STEPS.
TENDER FRAME TO BE MADE LONG ENOUGH TO PROVIDE A PLATFORM AT REAR END OF TANK. (SEE SUP. 153)

148 FRONT DRAW CASTING TO BE OF CAST STEEL.
FRONT DRAW BAR TO BE STRAIGHT AND TO BE OF APPROVED DESIGN
HOLES IN DRAWBAR TO BE ELONGATED TO ALLOW FOR COMPRESSION OF THE SPRING BUFFER. (SEE SUP. 74)

149 RADIAL BUFFER, SPRING TYPE, MANUFACTURED BY ECONOMY DEVICES CORPORATION, TO BE APPLIED BETWEEN ENGINE AND TENDER.

150 TENDER BACK DRAW CASTING TO BE OF CAST STEEL.

151 TWO SAFETY CHAINS TO BE PROVIDED ON REAR END OF TENDER.
CHAINS TO BE 28" CENTERS, THE RIGHT HAND CHAIN TO BE PROVIDED WITH HOOK AND LEFT HAND CHAIN TO HAVE LINK. THE CHAINS TO BE PROVIDED AS SHOWN ON RY.CO'S SKETCH A-2125-B

152 CAST IRON SILL STEPS TO BE PROVIDED AT FRONT OF TENDER, ON BOTH SIDES.

153 PLATFORM AND STEPS OF THE PASSENGER CAR TYPE TO BE PROVIDED AT REAR END OF TENDER, SAME AS FOR 6-34 D 941 ETC. APPROVED.
THESE STEPS TO BE 24" WIDE AND PLATFORMS ALSO TO HAVE CLEAR SPACE ACROSS TRACK NOT LESS THAN 24" WIDE FROM INSIDE OF POSTS LONGITUDINALLY OF THE LOCO. THIS WORK TO BE OF STEEL CONSTRUCTION THROUGHOUT, BUT STEP TREADS AND PLATFORMS TO BE PROVIDED WITH WOODEN TOPS.
TOP OF BOTTOM STEP TO BE 12" FROM TOP OF RAIL, AND TREAD TO BE NOT LESS THAN 8", AND PREFERABLY 10" DEEP, AND TO HAVE BACKSTOP AT LEAST 4" HIGH. OTHER STEPS TO HAVE TREADS AND RISERS TO SUIT DIMENSIONS OF TENDER, BUT TO BE AS LIBERAL AS POSSIBLE IN REGARD TO WIDTH OF TREAD.
METAL STRIP TO BE APPLIED TO HOLD DOWN THE WOOD LINING AT BACK PLATFORM WHERE PASSENGER CAR STEPS HAVE TO BE APPLIED.

156 GRAB IRONS AMPLE IN NUMBER, AND OF SUBSTANTIAL CONSTRUCTION, TO BE PROVIDED ON ALL STAIRWAYS. RAILINGS TO BE PROVIDED ACROSS PLATFORMS EXCEPT AT MIDDLE, WHICH IS TO BE CLOSED BY CHAIN ACROSS SPACE OVER COUPLER. RAILINGS AND GRAB IRONS TO BE ARRANGED CONVENIENTLY FOR THE TRAINMEN'S USE IN GETTING ON AND OFF TENDER.

157 TRUCKS TO BE CENTRE BEARING TYPE WITH STUCKI ROLLER SIDE BEARINGS.
JOURNAL BOX AND COLUMN POST BOLTS TO HAVE BARTLEY NUT LOCKS.
LINERS - TWO $\frac{1}{2}$" THICK TO BE PLACED UNDER JOURNAL BOXES TO PROVIDE FOR ADJUSTMENT FOR WEAR ON THE WHEELS.

158 TENDER JOURNAL BOXES TO BE MC CORD PRESSED STEEL WITH DROP FORGED JOURNAL WEDGES AND HARRISON DUST GUARDS.
JOURNAL BEARINGS TO CONFORM TO RY.CO'S SPECIFICATION AND TO BE MADE BY DAMASCUS BRONZE CO.

159 AXLES TO BE CARBON STEEL TO AMERICAN SOCIETY FOR TESTING MATERIALS SPEC'N. A-21-14.

160 ALL PRESS FITS TO BE MADE WITH A PRESSURE OF NOT LESS THAN 10 TONS PER INCH OF DIAMETER.
THE B. L. W. TO CUT KEYWAYS AND FURNISH KEYS FOR ALL CONNECTIONS SUBJECT TO TORSION.

161 PIPE CLAMPS ON TENDER TO BE EXTRA HEAVY AND TO HAVE BOLTS WITH DOUBLE NUTS. CLAMPS AT FRONT AND BACK TO BE $\frac{3}{8}$" X $2\frac{1}{2}$"

162 TENDER BRAKE BEAMS TO BE NATIONAL HOLLOW.

11-266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-4172
Memorandum Spec'n 11199 DETAILS AS FAR AS PRACTICABLE TO BE SAME AS FOR 6-32 D 788 TO 790
SPECIFICATION FOR LOCOMOTIVES 6 32 D 1097 Gen. as B.L.W. TRACING 32718
FOR MINNESOTA STEEL COMPANY Engine Drawing No. 105
No. 11-2-16

Gauge of Road 4' 8½" Play 7/8" on drivers, 3/4" on tender
Wheelbase, Rigid 8' 6" Driving 8' 6" Total 8' 6"
Total wheelbase, eng. and tend. { Actual 41' 10" / Limited to -----
RAILS, 80 POUNDS
Curves 80 FEET RADIUS GRADES, 4% (SEE SUP. 6)

Limits, Height (SEE SUP. 4) Width (SEE SUP. 4)
Weight (approximate) in working order, Total 126,000 LBS.
On F. tr'k ----- lbs., Drivers 126,000 lbs., B. tr'k ----- lbs.

Tractive power 29,000 lbs., Ratio of adhesion 4.34
Work'g St'm Pres. 180 lbs., Service SWITCHING
Fuel SOFT COAL

FRONT TUBE SHEET TO BE ½" THICK
Boiler STEEL Thick 11/16" Bill 7987
Boiler, Diam. 68" Plan STRAIGHT TOP

Boiler st'm pres. 200 lbs., Tested to { 220 lbs. steam pres. / 267 lbs. water pres.
WITH FACTOR OF SAFETY OF 4½
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS

Dome, diam. 29" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE
Firebox, length 90-3/16" Width 39 1/16" Depth F. 65 3/4" B. 61 3/4"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back ⅜"
Firedoor opening 16" DIAMETER
Water space, Front 4" Sides 3½" Back 3½"
Water space, Frame DOUBLE Riveted
Water space stays ⅜" DIAM. WITH 3/16" HOLES 1¼" DEEP FROM O.S.
Radial stays 11/16" DIAM. Sling stays front TWO ROWS OF B. L. W. EXPANSION STAYS
Button heads below crown on EIGHT central rows
Crown bars NONE Placed -- --- above crown
Crown bolts -----

Flues #9 W. G. STEEL
Tubes #11 W. G. SPELLERIZED STEEL (FROM STOCK, A/C TIME)
Tube ends BEAGED FOR COPPER FERRULES, FIRE BOX ENDS
Number 22 / 144 Diam. 5½" / 2" Length 9' 6"

Heating Surface	Flues 298⁰	Combus. Chamb. -----	Total 1145⁰
	Tubes 710⁰	Fire Box 137⁰	Fire Brick Tubes -----
Grate area 24.6⁰		Ratio to Heating Surface 1 : 46.5	
Superheater 240⁰			

Fire Brick ARCH, NONE

Grates ROCKING BARS AND DROP PLATE (SEE SUP. 8)
Ash Pan, Dampers FRONT AND BACK, OPERATED FROM CAB

Throttle BALANCE Pos. DOME
Dry pipe STEEL

Superheater (SEE SUP. 9)

SMOKE BOX FRONT AND DOOR OF STEEL
Smokebox extension WITH Cleaning hole and cap L. S. ONLY
Spark ejector or hopper WITH
Netting and deflect. plates WITH, NETTING 2¾ X 2¾ MESH

Exhaust nozzles SINGLE, HIGH

Stack STRAIGHT Dia. 18" Hole in S. B., dia. 18¾"
STACK TO HAVE STEEL BASE AND FLARED TOP, SAME AS FOR 6-32 D 788

Safety Valves (SPEC) TWO CROSBY STYLE K-1230
Safety valves NONE with relief lever, Set to 180 LBS.
Whistle B. L. W., WITH BELL 9" LONG

Steam Gauge ONE IRON 7" MAKER:-ASHCROFT (SPEC)
Steam gauge stand IRON **Clock** NONE
WATER GAUGE TO BE LOCATED SO THAT ENGINEER CAN EASILY SEE IT
Water Gauge ONE B.L.W. (IRONCLAD) **Cab Lamps** ELECTRIC (SUP. 23)
Gauge Cocks THREE BACK Surface valve NONE
Lowest gauge cock 4" above highest part of crown
Lubricator steam valve WITHOUT separate dry pipe to dome
Blower Valve B. L. W. (SEE SUP. 11)

Blow off Cock ONE (SEE SUP 12) POS:-LEFT SIDE
Cleaning Plugs (SEE SUP. 13)
Firebox CORNERS, DIAGONAL AND BACK
Crown, THREE EACH SIDE AND THREE BACK
Waist, (SEE SUP. 13)
Front tube sheet, NONE Fusible plug ONE

Pump NONE Pos. -----
Top chamb. ----- Bottom chamb. -----
Feed Cock ----- Feed pipes -----
Checks ----- Check pipes -----

Injectors (SPEC) TWO NATHAN SIMPLEX No. 9
Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER
Pipes, Check IRON Feed IRON Overflow IRON
Check HANCOCK (SEE SUP. 14-15) Pos. RIGHT AND LEFT

Steam Heat NONE

3/1/17 CAB TO BE LINED WITH WOOD
Cab STEEL. VENTILATOR IN CAB ROOF
DROP SEATS NOT WANTED IN CAB

Cab boards STEEL Nosing T-IRON
Running boards STEEL Nosing T-IRON
Hand rail IRON Located on BOILER

21 22 **Back Bumper** BAR STEEL Back drawbar height 28½"

Pilot NONE Pushing shoes CAST IN BUMPER
Front Bumper CAST STEEL Bumper plate NONE
Steps ACROSS FRONT WITH HAND RAIL
STEPS, HAND HOLDS, ETC. TO CONFORM TO I.C.C. REQUIREMENTS
Front Drawhead, Center above rail 33½"
Coupler SHARON M. C. B. AUTO. WITH SHIM WASHERS TO ADJUST THE HEIGHT OF DRAWHEAD

Signal fixtures NONE

23 **Headlight** TWO ROUND CASE 18" Reflector,
Headlight, Nos. on sides WITH H'dl't step WITH
Lamp shelf NONE Nosing ——

Bell 92 POUNDS
Sand Box TWO Diam. 28" Body IRON PAINTED Pipes IRON
Sander (SPEC) LEACH AIR, TRAP A-1 TO SAND FRONT AND BACK (UNIT HAND SANDER) 2-16-17

Dome casing IRON PAINTED

Boiler Jacket #16 PLAN. STEEL Bands IRON Style 9
Boiler Lagging 85% MAGNESIA SECTIONAL 3/1/17
3/1/17 JACKET OVER STAYBOLTS TO BE REMOVABLE.

THE BALDWIN LOCOMOTIVE WORKS
H.R. Greene March 1917
SPECIFICATION FOR LOCOMOTIVES 6 32 D 1097 139
FOR MINNESOTA STEEL COMPANY
No.

Frames CAST STEEL Braces SOLID
3/1/17 **Cylinders,** Diam. 19" Stroke 22"
St'm ports, Length ----- Width 1½" Bridges -----
Exh. ports, Length ----- Width ----- Valve lead 3/16"
Valve travel 5½" Steam lap ⅞" Exhaust clearance -----
Eccentric crank throw 13⅜" By-pass valve NONE
S. P. Lubr. NATHAN FIVE-FEED BULLS EYE (SPEC) (See Sup. 41 line 13)
Cyl'r heads CAST IRON; LUBR.-PIPES OF IRON UNDER JACKET
Cyl'r casings IRON PTD. Head covers STEEL PAINTED
St'm chest casings ----- Covers -----
St'm chest valves 9½" DIAM. PISTON TYPE, INSIDE ADMISSION
Met. pkg (PISTON ROD / VALVE STEMS) RELIANCE (SPEC) (SEE SUP. 25)

Pistons (SEE SUP. 26)
Guides LAIRD TYPE; STEEL Oil cups NEEDLE
Crossheads CAST STEEL WITH BEARINGS OF PHOSPHOR BRONZE
Wrist Pins STEEL Rod cups PLUNGER, FORGED ON (SUP. 27)

Valve Motion WALSCHAERTS
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 42" . Cen. diam. 36", CENTRES CAST STEEL
DRIVING WHEELS TO HAVE HUB LINERS OF BRONZE
Tires VERY HARD STEEL Held by SHRINKAGE AND SHOULDER
Tires, Flanged, Pos. FRONT AND BACK Size 3" X 6"
Tires, Plain, Pos. MIDDLE Size 3" X 7½"
Lateral play between driving boxes and wheel hubs— ⅛" TOTAL
23 **Driving Boxes** CAST STEEL (SEE SUP. 28)
Journals, Diam. 8" Length 9"

Springs, Make UNION SPRING & MFG. CO. (SEE SUP. 28-29)

Front Engine Truck NONE Wheeled -----
To swing ----- each side of cen., Cen. pin liners -----
Journals, Diam. ----- Length ----- Boxes -----
Wheels, Diam. ----- Tread ----- Kind -----
Tires ----- Cent. diam. ----- Size -----
Tires held by -----

Back Engine Truck NONE Wheeled -----
To swing ----- each side of cen., Cen. pin liners -----
Journals, Diam. ----- Length ----- Boxes -----
Wheels, Diam. ----- Tread ----- Kind -----
Tires ----- Cent. diam. ----- Size -----
Tires held by -----

30 **Brake,** position ON ALL DRIVING AND TENDER WHEELS
32 Operating { Engine, Sch. A-1 & SWA WEST'G. AUTO. AND / Parts { Eng. Tr'k, sch. ----- STRAIGHT AIR
Foundation { Drivers, sch. WA-2 BC AMERICAN O.S. EQUALIZED / Parts { Eng. Tr'k, sch. -----
Air pump ONE 8½" CROSS COMPOUND, POS:-LEFT SIDE
Train connections NONE FRONT AND BACK
Train signal, sch. None
3/1/17 AIR PUMP EXHAUST TO BE PIPED INTO CYLINDER SADDLE

Tender EIGHT Wheeled, Drawing No. 435
Weight, with fuel and water, about 100,000 LBS.
SEE THAT TENDER HAS SAME CLEARANCE AS ENGINE
Tank 5,000 Gallons. Bill 4404
TANK "U" SHAPE, SLOPING BACK. FUEL CAPACITY 8 TONS

Tool Boxes HARD WOOD, TOP.

Frame STEEL 10" CHANNELS WITH CAST STEEL BACK BUMPER

Front Drawbar height 26⅜" (SEE SUP. 66)
Pilot NONE Pushing shoes CAST IN BUMPER
Back drawhead, center above rail 33½"
Coupler SHARON M.C.B. AUTO. WITH B.L.W. EXTRA STRONG TWIN SPRING DRAFT GEAR
STEPS, HAND HOLDS, ETC. TO CONFORM TO I.C.C. REQUIREMENTS
Steps ACROSS REAR WITH HAND RAIL
STEPS AND HAND RAIL ON SLOPING BACK OF TANK
Trucks ARCH BAR TYPE WITH STEEL BOLSTERS (SEE SUP. 68)
SPRINGS TO BE EXTRA STRONG
Springs ELLIPTIC. UNION SPRING & MFG. CO'S MAKE
69 Journals, Diam. 5" Length 9"
Wheels, Diam. 33" Tread 4¼" Kind SCHOEN FORGED STEEL
Tires NONE Cen. diam. ----- Size -----
Tires held by ----- WHEEL RIMS 2½" THICK
Safety chains SINGLE

Brake Position ON ALL WHEELS.
Brake sch. FL-1212 AND SWB WEST'G. AUTO. AND STRAIGHT AIR
AIR BRAKES TO CONFORM TO WESTINGHOUSE AIR BRAKE CO'S SPECIFICATION (HEREWITH) (SEE SUP. 70-71-41 TO 58)

List of tools, sch. 29
Photo sch. #2 Inspection (SEE SUP. 2)
To be weighed YES Material spec'ns B. L. W. (SEE SUP. 1)
Certificate of boiler test THREE COPIES OF B.L.W. FORM 1036
Junior laws to 1-13-17 Shipment ON OWN WHEELS

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. Patents } FEED PIPE STRAINER, PATENTED SEPT. 1, 1903 (CAST ON)

Property plates NONE

Painting:—Engine, style 291 OLIVE GREEN AND ALUMINUM
Painting:—Tender, style 291 OLIVE GREEN AND ALUMINUM

LETTERING ETC. TO BE SAME AS FOR 6-32 D. 788 TO 790
Mark on CAB SIDES, BELOW WINDOWS, M. S. CO.
MARK ON TANK SIDES, MINNESOTA STEEL COMPANY

Road Nos. Pos. Road Nos. Name NONE
F. No. PLATE 9
DOME
CAB PANEL
BACK OF TANK

Pl. 266-67 Photo copied see box

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1097

FOR MINNESOTA STEEL COMPANY

1 ALL MATERIALS ENTERING INTO THE CONSTRUCTION OF THIS LOCOMOTIVE WHICH ARE MANUFACTURED BY THE CONSTITUENT COMPANIES OF THE UNITED STATES STEEL CORPORATION, ARE TO BE PURCHASED FROM SUCH COMPANIES.
MR. C.F.W. RYS, CHIEF OF BUREAU OF INSPECTION, CARNEGIE STEEL CO., ACCEPTS FOR THIS LOCO, THE MATERIAL WHICH WAS ORDERED BY MISTAKE FROM THE CENTRAL IRON & STEEL CO.

2 INSPECTION BY MR. C.F.W. RYS, COPIES OF ORDERS FOR MATERIAL TO BE FURNISHED TO HIM. MR. RYS IS TO BE NOTIFIED ALSO TWO OR THREE DAYS BEFORE THE BOILER WORK STARTS, BEFORE THE CYLINDERS ARE TESTED AND BEFORE THE MACHINERY WORK STARTS THROUGH SHOPS, SO HE CAN HAVE HIS INSPECTORS HERE.

3 LOCOMOTIVE TO BE CAPABLE OF HAULING SAME TONNAGE AS 6-32 D 788 TO 790.

4 LOCOMOTIVE AT A HEIGHT OF 10' 6" TO CLEAR OVERHANGING PLATFORM WHICH EXTENDS TO WITHIN 2' 10" OF CENTRE LINE OF TRACK
SEE CO'S SKETCH NO. S-1022 DATED SEPT. 20, 1916
RY. CO. DESIRES US TO CHECK THIS DRAWING AND ADVISE IF IT IS SATISFACTORY.

5 BOILER WORK TO RECEIVE BEST CARE, PARTICULARLY IN CALKING THE FIRE BOX AND DOME SEAMS, AND IN ROLLING FLUES, AND APPLYING STAY BOLTS.

6 CROWN OF FURNACE TO BE SLOPED FOR 4% GRADE AND TO CARRY HIGH WATER LEVEL.

7 WATER SPACE AND RADIAL STAY BOLTS TO BE MADE OF ATLAS STAY BOLT IRON.

8 GRATE BARS TO BE OPERATED FROM CAB. DROP PLATE TO BE OPERATED FROM GROUND.

9 SUPERHEATER AS LOCOMOTIVE SUPERHEATER CO'S SPECIFICATION, NO. M21-060-C DATED 12-1-16 (COPY ATTACHED)
SUPERHEATER, SCHMIDT TYPE WITH TOP HEADER IN SMOKE BOX AND WITH OUTSIDE STEAM PIPE CONNECTIONS TO STEAM CHESTS.
ROYALTY ON SUPERHEATER PAYABLE BY THE B. L. W.

10 ADDITIONAL HAND HOLE AND CAP IN EACH SIDE OF SMOKE BOX FOR INSPECTION OF SUPERHEATER.

11 "T" CONNECTION WITH PLUG TO BE PROVIDED IN BLOWER PIPE WHERE IT ENTERS SMOKE BOX, SO THAT A HOSE FROM AN ENGINE HAVING STEAM CAN BE ATTACHED TO IT.

12 BLOW OFF COCK OF A PATTERN WHICH WILL WORK WITH MUDDY WATER, I.E., HAVING ANGLE GLOBE VALVE WITH MALE SHANK 2" PIPE TAP, CO'S STYLE.

13 CLEANING PLUGS TO BE LOCATED AS FOLLOWS:-
TWO PLUGS UNDER WAIST 16" FROM FRONT TUBE SHEET RIVET, AND ONE UNDER WAIST AHEAD OF THROAT.
TWO PLUGS EACH SIDE IN WAIST JUST AHEAD OF BACK FLUE SHEET.
ONE PLUG IN TOP OF SHELL EACH SIDE 11" FROM FRONT FLUE SHEET RIVET.
ALL WASHOUT PLUGS TO HAVE 2" PIPE THREAD.
FUSIBLE PLUG AS O. I. & M. CO'S PRINT.

14 INJECTOR CHECK TO BE HANCOCK WITH SCREW SHANK AS FIG. 23, PAGE 74, 1905 CATALOGUE. SHANKS WITH STANDARD PIPE THREAD.
FEED WATER HOSE TO BE 3" DIAM.

15 SEDDON BOILER FEED DEVICE TO BE APPLIED.
ROYALTY, IF ANY, PAYABLE BY THE B. L. W.

21 TENDER WEDGE TO HAVE FACE HARDENED AS THE SERVICE IS EXTREMELY SEVERE. (SEE SUP. 66)

22 SAFETY CHAINS BETWEEN ENGINE AND TENDER TO BE AMPLY LONG FOR CURVES.

23 HEADLIGHT EQUIPMENT TO BE PYLE NATIONAL ELECTRIC, TYPE "K" WITH INCANDESCENT HEADLIGHTS AND WITH FOUR EXTRA LIGHTS- ONE UNDER BOILER, ONE ON EACH SIDE OF ENGINE ATTACHED TO UNDERSIDE OF RUNNING BOARDS, AND ONE ON BACK OF CAB ROOF, AS SHOWN ON PHOTO. HEREWITH (PORTER LOCO.) FURNISHED BY R.R. CO. {Provide also light for brake gauge in addition to the usual lights for steam gauge, for water gauge and over engineer. (A.S.M.C. - Manuf. Ry.)}

24 CYLINDER COCKS TO BE LOCATED AS FAR AROUND ON THE INNER SIDE AS POSSIBLE. THREADS ON SHANKS OF CYLINDER COCKS TO BE STANDARD PIPE THREAD.
GUARDS APPLIED IN FRONT OF CYLINDER COCKS.

25 METALLIC PACKING FOR PISTON ROD AS COMPANY'S PRINT A-3201, AND FOR VALVE STEM AS CO'S PRINT A-3208.
PISTON ROD GLAND TO HAVE FOUR STUDS.
VALVE STEM GLAND TO HAVE THREE STUDS.

26 PISTONS WITH CAST STEEL HEADS AND FOLLOWERS.
PISTON HEADS TO HAVE 1" X 3/16" KEY WAYS FOR KEYS BETWEEN HEAD AND FOLLOWERS.
PISTON RODS 3½" DIAMETER WITH TAPER FIT IN CROSSHEAD 3⅜" DIAMETER AT LARGEST END; RODS TO BE KEYED TO CROSSHEAD.
PISTON RODS WITHOUT COLLAR TO HAVE STRAIGHT FIT IN HEAD, AND TO BE PRESSED IN AND SECURED BY NUT.
PARTICULAR ATTENTION TO BE PAID TO TURNING PISTON RODS, SO THAT THE BODY IS EXACT DIAMETER FOR ITS ENTIRE LENGTH.

27 MAIN RODS TO CONNECT TO REAR DRIVERS.
FRONT END OF MAIN ROD TO HAVE VERTICAL KEY FULL WIDTH OF STUB, INSTEAD OF CROSSKEY.
PARALLEL RODS TO HAVE SOLID ENDS.

28 DRIVING BOXES AND SPRING STAPLES TO BE ARRANGED SO THAT STAPLES WILL BE HELD FIRMLY IN POSITION LATERALLY AS WELL AS HORIZONTALLY.

29 DRIVING SPRINGS TO BE EXTRA STRONG FOR ROUGH TRACK.
SPRINGS FOR 6-32 D 788 ETC. WERE CONSIDERED WEAK.
SPRING LINK KEYS TO BE AMPLY STRONG AND OF GOOD MATERIAL.

30 AIR BRAKES TO CONFORM TO WESTINGHOUSE AIR BRAKE CO'S SPECIFICATION (HEREWITH) ATTACHED. (SEE SUP. 41 TO 58)
AIR RESERVOIR TO HAVE EXTRA LARGE CAPACITY, AND TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

31 DRIVING BRAKE SHOES TO BE PERFECTO.

32 LOCOMOTIVE TO BE PROVIDED WITH APPARATUS FOR OPERATING AIR DUMP CARS WITH CONNECTIONS TO FRONT OF ENGINE. (SUP. 71)

33 DRIVING BOX BRASSES TO BE TAPERED FROM A POINT ⅜" ABOVE THE CENTER OF THE JOURNAL SO THE JUNCTURE OF THE CELLAR WITH THE BRASS TO PERMIT THE OIL TO WORK INTO THE BEARING. 3/11

1141

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1097

FOR MINNESOTA STEEL COMPANY

Specification for Type A Double Loop Superheater. SPECIFICATION M21-060-C, DATED DEC. 1, 1916

BOILER TUBES	184 in number 2 in. o. d. 9 ft. 6 in. over tube sheets. Tubes located between and adjacent to boiler flues are to be beaded over at front end.
BOILER FLUES	22 in number 5½ in. o. d. #9 BWG of cold drawn seamless steel Flues to be straight, true to gauge and wall not to vary more than one gauge from specified thickness. Card 10862-R
BOILER FLUE SETTING	½ in. radius on both edges of flue holes in fire box tube sheet and on front edge of flue holes in front tube sheet as shown on drawings, except for copper sheets. Back end to be set with copper ferrule, rolled, beaded and prosseted except for copper sheets. Front end to be rolled and beaded. Rollers to have at least 5 rolls. Prosser to have at least 12 sections. Card 1137
TUBE SHEET LAYOUT	Card 5890
UNITS	22 units 1½ in. o. d. #9 BWG of seamless steel. Pipes united by return bends. Each unit to be tested, before being placed in boiler, with water under pressure of 250 lb. per sq. in. for screwed return bends or 500 lb. per sq. in. for welded return bends.
UNIT PIPE SUPPORTS	Of steel fastened securely on superheater pipes so as not to slide. Card 10773
UNIT PIPE JOINT	To be made in best possible manner to insure absolutely tight joints in accordance with the notation on. Card 1043
UNIT CLAMP BOLT	To be in accordance with requirements of Locomotive Superheater Company Material Specification No. 12. Card 10695
HEADER	To be of close grain cylinder iron, steam tight in every respect. Joint ring for connection to dry pipe to have flat side against header flange. Casting should be moulded with the unit joint face down to secure the best quality of metal on surface where superheater unit joints are made. Each header to have a serial number cast on in such a location as not to be removed in finishing. No patch plugs or chaplets allowed in ball joint seats. Headers must not be treated with sal ammoniac. Header casting to be right under water pressure of 250 lb. Test pressure to be applied separately to the saturated and to the superheated steam passages, so as to insure soundness of all partition walls. Card 1186-F
HEADER SUPPORTS	To be securely fastened to boiler shell with rivets or turned bolts fitted in reamed holes. To be properly located so as to support the header after header has been correctly located. Header should then be secured to supports. This to be done before superheater units are put in place. Card 1323
STEAM PIPE JOINT RINGS	Should be of cast iron.
DEFLECTING PLATE	To be constructed so as to permit easy inspection and removal of superheater units and joints. Design to be in accordance with Card SEE ARRGT.
DAMPER CYLINDER	To be carefully and accurately made. Piston not to be more than 0.01 in. smaller than bore. Bearings for piston and extension to be in line. Piston to be ground and to operate freely under a pressure as low as 40 lb. per sq. in. Steam pipe to damper cylinder should be as short and free from bends as possible so as not to cause water to collect in cylinder. Pipe to be well protected against freezing. Card 1149
DAMPER SHAFT COUNTERWEIGHT	To be painted a light color to render it easily visible by the engineer. Card 1067
S. H. ARRANGEMENT	To be in accordance with. Card 4920
TEST (FINAL)	The superheater, after assembling in boiler and after steam pipes are fitted up, is to be thoroughly tested and to be tight under water pressure of at least 30% more than the working pressure of the boiler.

DAMPER	Card 10882-C	DAMPER SHAFT LINK	Card 1670
DAMPER CYL. ARM	Card 1074	PATENT PLATE	Card 3155
DAMPER CYL. PIPE FITTING	Card	S. H. UNIT BOLT WASHER	Card 1071
DAMPER CYL. PIPE UNION	Card 1287	S. H. UNIT CLAMP	Card 1073
DAMPER CYL. PIPING DIAGRAM	Card 1503	S. H. UNIT CLAMP WASHER	Card 10305
DAMPER CYL. SUPPORT	Card	S. H. PIPE END	Card 1344
DAMPER SHAFT	Card 1235-J	S. H. PIPE BAND	Card 1988
DAMPER SHAFT ARM	Card 1226 & 1234	RETURN BENDS	Card 10094
DAMPER SHAFT BEARING (O.S.)	Card 1223 & 1148	DEFLECTING PLATE HANDLE	Card 1487
DAMPER SHAFT BEARING (L.S.)	Card 1275-E	LUBRICATOR CONNECTION	Card 3023
SPACING OF BANDS & SUPPORTS	Card 10759	DEFLECTING PLATE STUDS	Card 10809
TYPE OF RETURN BENDS	WELDED	DEFLECTING PLATE CLAMP	Card 10809-A

...NOR TO AIR COMPRESSOR WITH
...L POSITION AND AS DIRECTED UNDER

...ARD OF STAYBOLTS AND HIGH ENOUGH
...ELS. ATTACH TO BOILER BY SUB-
... DRAW STRAPS, AND SECURE RUN-
... BRACKETS.

...E TO BE LOCATED IN CONVEN IENT
... POSITION OF ENGINEER WHEN
...AKE VALVE TO BE LOCATED ON THE
...ER HEIGHT AND A TRIFLE FORWARD
...W WHICH OPENS AND WITHIN EASY
...E ON THE BOILER SIDE SO THAT IN
...E WILL BE PUSHED FORWARD, ITS
...PLANE. BOTH BRAKE VALVES TO BE
...ACKETS TO PREVENT VIBRATION WHEN

...ISTANCE FORWARD OF THE BRAKE
...BOILER AND LOW ENOUGH TO ENABLE
...SILY FROM HIS USUAL POSITION
...FIRELY LOSING SIGHT OF THE
...ARATE LAMP FOR THESE GAGES. LO-
...CT VIEW OF THE GAGES AND SO THE
...LECTED IN THE ENGINEER'S EYES.

...LVE TO BE PLACED INSIDE AND
...D OF ENGINEER'S SEAT AND HIGH
...ERMIT OF CLEANING AND ADJUSTMENT.
...ACKETS.

...D HAMMER AND BLOW OUT ALL PIPES
...CESSARY JOINTS AND CLAMP
...NATE, CLAMPS TO BE STRONG AND
...AM NUTS. PIPING TO BE AIR-TIGHT.
... THOSE FOR SANDER AND PUMP
...LL AWAY FROM CONTACT WITH BOILER.
...RICATOR TO BE TAPPED INTO STEAM
...VE AND GOVERNOR.
... AIR CYLINDERS TO BE LOCATED IN
...ACKET, NOT AGAINST BOILER, EMERG
...T TO THE TOP OF THE COMPRESSOR

... TO BE 1¼" COPPER PIPE, IRON
... FROM STEAM VALVE TO GOVERNOR.
... BE COVERED WITH APPROVED ¾"
...BY METAL CASING AND SUBSTANTIALLY
...VIDED IT IS NOT PLACED IN THE BOI
...CET. IN EITHER CASE THERE MUST
...OR OIL PIPES TO FORM POCKETS

...RAKE APPARATUS AIR MUST BE
... MAIN RESERVOIR. TO INSURE THIS
...PIPE 35 TO 40 FEET LONG AND CON-
...IN RESERVOIR. WITHIN 10 FEET
...S DISCHARGE PIPE TO SUFFICIENT
... GRADUALLY SO AS TO DRAIN WITH
...R. PIPE MUST NOT RUN BACK ALONG

... TWO MAIN RESERVOIRS BY 35 TO 40
... RESERVOIR RUN DIRECTLY UNDER AND
...LER, PLACE A PLUGGED TEE AT LOW-
...Y AS PRACTICABLE TO SUFFICIENT
... GRADUALLY IN DIRECTION TO DRAIN
...OLING SECTIONS OF THIS AND DIS-
...N RESERVOIRS (NOT BETWEEN SAME
...ZONTAL CENTER LINE OF THEI RES-
...ALLY TO RUNNING BOARDS.

SPECIFICATION FOR LOCOMOTIVES

FOR MINNESOTA STEEL COMPANY

1 ALL MATERIALS ENTERING INTO THE C
MOTIVE WHICH ARE MANUFACTURED BY
OF THE UNITED STATES STEEL CORPO
FROM SUCH COMPANIES.
MR. C.F.W. RYS, CHIEF OF BUREAU
STEEL CO., ACCEPTS FOR THIS LOCO
ORDERED BY MISTAKE FROM THE CENT

2 INSPECTION BY MR. C.F.W. RYS, CO
TO BE FURNISHED TO HIM. MR. RY
TWO OR THREE DAYS BEFORE THE BOI
CYLINDERS ARE TESTED AND BEFORE
THROUGH SHOPS, SO HE CAN HAVE HI

3 LOCOMOTIVE TO BE CAPABLE OF HAUL
788 TO 790.

4 LOCOMOTIVE AT A HEIGHT OF 10' 6"
FORM WHICH EXTENDS TO WITHIN 2'
SEE CO'S SKETCH NO. S-1022 DATED
RY.CO. DESIRES US TO CHECK THIS
SATISFACTORY.

5 BOILER WORK TO RECEIVE BEST CARE,
THE FIRE BOX AND DOME SEAMS, AND
PLYING STAY BOLTS.

6 CROWN OF FURNACE TO BE SLOPED FO
WATER LEVEL.

7 WATER SPACE AND RADIAL STAY BOLT
BOLT IRON.

8 GRATE BARS TO BE OPERATED FROM C
TED FROM GROUND.

9 SUPERHEATER AS LOCOMOTIVE SUPERH
NO. M21-060-C DATED 12-1-16 (COP
SUPERHEATER, SCHMIDT TYPE WITH T
WITH OUTSIDE STEAM PIPE CONNECTI
ROYALTY ON SUPERHEATER PAYABLE B

10 ADDITIONAL HAND HOLE AND CAP IN
INSPECTION OF SUPERHEATER.

11 "T" CONNECTION WITH PLUG TO BE P
IT ENTERS SMOKE BOX, SO THAT A H
STEAM CAN BE ATTACHED TO IT.

12 BLOW OFF COCK OF A PATTERN WHICH
I.E., HAVING ANGLE GLOBE VALVE W
CO'S STYLE.

13 CLEANING PLUGS TO BE LOCATED AS
TWO PLUGS UNDER WAIST 16" FROM F
ONE UNDER WAIST AHEAD OF THROAT
TWO PLUGS EACH SIDE IN WAIST JUS
ONE PLUG IN TOP OF SHELL EACH SI
RIVET.
ALL WASHOUT PLUGS TO HAVE 2" PI
FUSIBLE PLUG AS O. I. & M. CO'S

14 INJECTOR CHECK TO BE HANCOCK VAL
PAGE 74, 1905 CATALOGUE. SHANKS
FEED WATER HOSE TO BE 3" DIAM.

15 SECOND BOILER FEED DEVICE TO BE
ROYALTY, IF ANY, PAYABLE BY THE

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CLASS 6-32 D 1097

FOR MINNESOTA STEEL COMPANY

1141

41 MATERIAL TO BE ORDERED OF WESTINGHOUSE AND AMERICAN BRAKE CO. ONE SET WESTINGHOUSE SCHEDULES AI,FL,SWA AND SWB WITH:

	Pc.No.
1 - S-3-A BRAKE VALVE (INSTEAD OF S-3)	17539
1 - 3½" SINGLE-POINTER AIR GAGE.....	19100
1 - 8½" C.C.COMPRESSOR,LESS OIL CUPS AND FITTINGS	----
1 - SF-5 (1¼") GOVERNOR	21739
1 - 1¼" STEAM VALVE	17402

GOVERNOR AND STEAM VALVE TO BE USED WITH 1¼" COPPER PIPE, IRON PIPE SIZE, THICHNESS 0.146"

1 - DETROIT DUPLEX SELF-CLOSING TYPE AIR CYLINDER LUBRICATOR, COMPLETE. EMERGENCY VALVE SUITABLE FOR NATHAN ~~V~~ FIVE -FEED LUBRICATOR..... ----

3 - ~~OR MORE~~ WESTINGHOUSE ENAMELED TYPE MAIN RESERVOIRS. COMBINED CAPACITY APPROXIMATELY 70000 CU. IN. OF DIMENSIONS SPECIFIED BY THE LOCOMOTIVE BUILDERS AND SUITABLE FOR LOCATING ONE UNDER EACH RUNNING BOARD, FORWARD OF FIRE BOX, WITH A THIRD BETWEEN ENGINE FRAMES ~~IF NECESSARY~~ TO GET REQUIRED CAPACITY.....

1 - DRAIN COCK FOR EACH MAIN RESERVOIR 7716

PIPE FITTINGS FOR COMPRESSOR DISCHARGE PIPE, CONNECTING PIPE AND BRAKE PIPE TO BE "EXTRA QUALITY PIPE FITTINGS", AS LISTED IN WESTINGHOUSE PUBLICATION 9021 OR CRANE COMPANY'S SPECIAL TESTED AIR BRAKE FITTINGS, AS LISTED ON PAGE 65 OF CRANE CO'S SPECIAL RAILWAY CATALOG NO.42-B,OCT. 1913.

1 - SPECIAL TENDER CYLINDER HOSE,INSTEAD OF STD... 51926

1 - 1¼" X 1¼" X ¾" TENDER DRAIN CUP, WITH ½" DRAIN COCK (SIDE OPENING CLOSED)..... 9333

TENDER BRAKE SCHEDULE TO SUIT FOLLOWING WEIGHT LIMITATIONS:-

22000 TO 35000 LBS.	SCHEDULE FL-1012
35000 " 50000 LBS.	" FL-1212
50000 " 69000 "	" FL-1412

2 - ½" CUT-OUT COCKS 15213

FOR DUMPING LINE:

3 - 1¼" CUT OUT COCKS 2092

4 - 1¼" X 1¼" ANGLE FITTINGS 3788

2 - PAIR 1⅜" X 22" HOSE WITH FP-5 COUPLINGS AND 1¼" NIPPLE, COMPLETE 46242

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1 - SET AMERICAN BRAKE CO'S DRIVER BRAKES, OPERATING ON ALL DRIVERS, WITH SCHEDULE BC.

BRAKE DRIVERS 50% ON 50 LB. BRAKE CYLINDER PRESSURE.

ALL PIPE FITTINGS FOR MAIN BRAKE PIPE TO SUIT 1¼" SIZE.

THE FOREGOING MATERIAL TO BE INSTALLED AS PER FOLLOWING INSTRUCTIONS SUBJECT TO W.A.B.CO'S INSPECTION.

42 INSTRUCTIONS FOR INSTALLATION.

COMPRESSOR AND BRACKET: LOCATE THE 8½" C.C.COMPRESSOR ON LEFT SIDE, FORWARD OF STAYBOLTS, LOW ENOUGH NOT TO OBSTRUCT VIEW AHEAD, SO IT CAN BE REMOVED WITHOUT LIFTING OVER ANY OBSTRUCTIONS AND SO THAT AIR CYLINDER CAPS, CAGES AND LOWER HEADS CAN BE EASILY REMOVED. ATTACH BY STRONG CAST BRACKET, WELL FITTED AND SUBSTANTIALLY SECURED TO BOILER, AND WITH TRUE BEARING FOR COMPRESSOR LUGS, INCLUDING PROVISION AT LOWER LUGS TO TAKE WEIGHT OFF FROM BOLTS.

43 STEAM VALVE: LOCATE HORIZONTALLY IN STEAM TURRET CONVENIENT FOR MANIPULATION FROM RIGHT SIDE OF CAB, EXTENDING STEM, IF NECESSARY, SO THAT HANDLE CAN BE REACHED EASILY, BRACING STEM SUBSTANTIALLY CLOSE TO HANDLE.

46 GOVERNOR: CONNECT SF-5 GOVERNOR TO AIR COMPRESSOR WITH 1¼" IRON PIPE NIPPLE IN USUAL POSITION AND AS DIRECTED UNDER "PIPING"

47 MAIN RESERVOIRS: LOCATE FORWARD OF STAYBOLTS AND HIGH ENOUGH TO CLEAR TOPS OF DRIVING WHEELS. ATTACH TO BOILER BY SUBSTANTIAL CAST BRACKETS, WITH DRAW STRAPS, AND SECURE RUNNING BOARDS TO TOPS OF THESE BRACKETS.

48 BRAKE VALVES: G-6 BRAKE VALVE TO BE LOCATED IN CONVEN IENT POSITION FOR USE FROM USUAL POSITION OF ENGINEER WHEN BRAKING. THE STRAIGHT-AIR BRAKE VALVE TO BE LOCATED ON THE RIGHT SIDE OF CAB AT A PROPER HEIGHT AND A TRIFLE FORWARD OF THE EDGE OF THE CAB WINDOW WHICH OPENS AND WITHIN EASY REACH OF THE ENGINEER. HANDLE ON THE BOILER SIDE SO THAT IN APPLYING THE BRAKE THE HANDLE WILL BE PUSHED FORWARD, ITS MOTION BEING AN A VERTICAL PLANE. BOTH BRAKE VALVES TO BE SUPPORTED BY SUBSTANTIAL BRACKETS TO PREVENT VIBRATION WHEN ENGINE IS RUNNING.

49 AIR GAGES: LOCATE A SHORT DISTANCE FORWARD OF THE BRAKE VALVES, NEAR RIGHT SIDE OF BOILER AND LOW ENOUGH TO ENABLE THE ENGINEER TO READ THEM EASILY FROM HIS USUAL POSITION WHEN BRAKING AND WITHOUT ENTIRELY LOSING SIGHT OF THE TRACK AHEAD. PROVIDE A SEPARATE LAMP FOR THESE GAGES. LOCATE IT SO AS NOT TO OBSTRUCT VIEW OF THE GAGES AND SO THE LAMP'S RAYS WILL NOT BE REFLECTED IN THE ENGINEER'S EYES.

50 REDUCING VALVE: REDUCING VALVE TO BE PLACED INSIDE AND AGAINST SIDE OF CAB, FORWARD OF ENGINEER'S SEAT AND HIGH ENOUGH ABOVE CAB FLOOR TO PERMIT OF CLEANING AND ADJUSTMENT. DIRECT-PASSAGE FEED VALVE BRACKETS.

51 PIPING: REMOVE ALL FINS, AND HAMMER AND BLOW OUT ALL PIPES BEFORE ERECTION. AVOID UNNECESSARY JOINTS AND CLAMP EVERY PIPE SO IT CANNOT VIBRATE. CLAMPS TO BE STRONG AND WELL DESIGNED AND TO HAVE JAM NUTS. PIPING TO BE AIR-TIGHT. LOCATE ALL AIR PIPES EXCEPT THOSE FOR SANDER AND PUMP GOVERNOR SO THEY WILL BE WELL AWAY FROM CONTACT WITH BOILER.

CONNECTION FROM MAIN LUBRICATOR TO BE TAPPED INTO STEAM PIPE BETWEEN MAIN STEAM VALVE AND GOVERNOR.

OIL PIPES TO COMPRESSOR AIR CYLINDERS TO BE LOCATED IN LAGGING IMMEDIATELY UNDER JACKET, NOT AGAINST BOILER, EMERGING FROM THE JACKET ADJACENT TO THE TOP OF THE COMPRESSOR CENTER PIECE.

STEAM PIPE TO COMPRESSOR TO BE 1¼" COPPER PIPE, IRON PIPE SIZE, THICKNESS 0.146" FROM STEAM VALVE TO GOVERNOR. THIS PIPE OUTSIDE OF CAB TO BE COVERED WITH APPROVED ¾" SECTIONAL LAGGING ENCLOSED BY METAL CASING AND SUBSTANTIALLY SECURED BY METAL BANDS, PROVIDED IT IS NOT PLACED IN THE BOILER LAGGING, UNDER THE JACKET. IN EITHER CASE THERE MUST BE NO DEPRESSIONS IN STEAM OR OIL PIPES TO FORM POCKETS WHERE OIL WILL COLLECT.

TO PREVENT FREEZING OF BRAKE APPARATUS AIR MUST BE COOLED BEFORE LEAVING LAST MAIN RESERVOIR. TO INSURE THIS MAKE COMPRESSOR DISCHARGE PIPE 35 TO 40 FEET LONG AND CONNECT TO REAR END OF LEFT MAIN RESERVOIR. WITHIN 10 FEET OF THE COMPRESSOR, BRING ITS DISCHARGE PIPE TO SUFFICIENT HEIGHT TO THEREAFTER SLOPE GRADUALLY SO AS TO DRAIN WITH THE FLOW OF AIR TO RESERVOIR. PIPE MUST NOT RUN BACK ALONG FIRE BOX, UNDER CAB.

CONNECT FORWARD ENDS OF TWO MAIN RESERVOIRS BY 35 TO 40 FEET OF 1" PIPE. FROM LEFT RESERVOIR RUN DIRECTLY UNDER AND AWAY FROM CONTACT WITH BOILER, PLACE A PLUGGED TEE AT LOWEST POINT AND RISE DIRECTLY AS PRACTICABLE TO SUFFICIENT HEIGHT TO THEREAFTER SLOPE GRADUALLY IN DIRECTION TO DRAIN WITH FLOW OF AIR. LOCATE COOLING SECTIONS OF THIS AND DISCHARGE PIPES OUTSIDE OF MAIN RESERVOIRS (NOT BETWEEN SAME AND BOILER) AND ABOVE HORIZONTAL CENTER LINE OF THEI RESERVOIRS, SECURING SUBSTANTIALLY TO RUNNING BOARDS.

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CLASS 6 32 D 1097

FOR Minnesota Steel Company

USE COPPER TUBES FOR AIR CONNECTIONS TO COMPRESSOR GOVERNOR AND AIR GAGES. HIGH PRESSURE GOVERNOR HEAD MUST NOT BE CONNECTED TO DISCHARGE PIPE.

LOCATE BRAKE PIPE CUT-OUT COCK AT PILOT SO THAT IT CAN BE REACHED EASILY WHEN COUPLING HOSE.

MAIN BRAKE PIPE ON ENGINE AND TENDER TO BE $1\frac{1}{2}$" EXTRA HEAVY PIPE. SO THAT ANY BREAKAGE MAY BE QUICKLY AND CHEAPLY REPAIRED USE A NIPPLE OF $1\frac{1}{2}$" STANDARD WEIGHT EACH AT FRONT OF ENGINE AND REAR OF TENDER. THICK 10" IS THE M.C.B. STANDARD LENGTH FOR CARS A LITTLE LONGER MAY WORK IN BETTER; THEREFORE, LOCOMOTIVE BUILDER MAY DECIDE LENGTH OF THESE NIPPLES.

INSTALL ON TYPE 0-6-0 LOCOMOTIVE A $1\frac{1}{2}$" EXTRA HEAVY PIPE FOR DUMPING LINE. THIS TO BE CONNECTED TO MAIN RESERVOIR PIPE TO AUTOMATIC BRAKE VALVE AND EXTEND TO FORWARD END OF ENGINE AND REAR OF TENDER. PIPE TERMINALS TO BE LOCATED ON OPPOSITE SIDE OF COUPLER FROM BRAKE PIPE, OTHER WISE SIMILARLY LOCATED IN RELATION TO COUPLER. $1\frac{1}{2}$" CUT-OUT COCKS, ANGLE FITTINGS AND STANDARD FP-5 HOSE AND COUPLINGS WILL BE USED ON THIS DUMPING LINE.

57 "MOUNTAIN" COCKS: THE TWO $\frac{1}{2}$" COCKS (FOR PREVENTING APPLICATION OF AUTOMATIC BRAKES ON ENGINE AND TENDER WHEN DESIRED) TO BE CONNECTED AS ILLUSTRATED BY FIG. 4, PAGE 8, OF WESTINGHOUSE INSTRUCTION PAMPHLET NO. 5027 OF AUG. 1912. LOCATE ONE FOR ENGINE CONVENIENT FOR OPERATION FROM USUAL POSITION OF THE ENGINEER AND THE OTHER AT FRONT OF TENDER WHERE IT CAN EASILY AND SAFELY BE OPERATED WITH ENGINE MOVING.

BRAKE PIPE TERMINALS TO BE M.C.B. STANDARD.

58 TENDER: BRAKING POWER TO BE 70% OF LIGHT WEIGHT, BASED ON 50 LBS. BRAKE CYLINDER PRESSURE.

BRAKE BEAM HEADS OF DESIGN TO SUIT HEIGHT OF BEAMS AND SPACED 68" CENTERS, PER M. C. B. STANDARD.

STRENGTH OF FOUNDATION BRAKE RIGGING, AND HEIGHT OF BEAMS, TO CONFORM TO M.C.B. STANDARDS AND RECOMMENDED PRACTICE FOR HIGH SPEED BRAKE.

BRAKE BEAM LEVERS NOT TO EXCEED 4 TO 1 PROPORTION.

CYLINDER LEVERS 32" OUT-TO-OUT HOLES.

TENDER CYLINDER PUSH ROD 27". CENTER OF LEVER HOLE TO END.

LOCATE TENDER DRAIN CUP IN AN EASILY ACCESSIBLE POSITION IN BRAKE PIPE, JUST INSIDE OF REAR END SILL IF PRACTICABLE.

SUFFICIENT HOLES AND SUITABLY SPACED IN EACH DEAD LEVER HAND BRAKE ADJUSTER TO FULLY COMPENSATE FOR SHOE WEAR AND, IF STEEL OR STEEL-TIRED WHEELS, FOR TIRE TURNING. WITH NEW SHOES AND WHEELS, MAKE LENGTHS OF RODS SUCH THAT, WITH ALL SLACK LET OUT, A FULL BRAKE APPLICATION FROM 80 LBS. PRESSURE WILL GIVE BETWEEN 5" AND 6" PISTON TRAVEL.

BRAKE, AS WELL AS OTHER LOCOMOTIVE DETAILS, TO COMPLY WITH FEDERAL REQUIREMENTS.

INSTALLATION OF ALL WESTINGHOUSE EQUIPMENT SUBJECT TO W.A.B.Co's INSPECTION.

TENDER

66 TENDER WEDGE BLOCK TO HAVE FACE HARDENED AS THE SERVICE IS EXTREMELY SEVERE. (SEE SUP. 21-22)

67 DRAW CASTINGS BACK OF TENDER TO BE SUBSTANTIALLY SECURED. SAFETY CHAIN IN POCKETS AT REAR OF TENDER SAME AS FOR 6-32 D 788.

68 TENDER SIDE BEARINGS ON TENDER FRAME TO BE SUBSTANTIALLY SUPPORTED AND SIDE BEARINGS ON TRUCKS TO BE ARRANGED SO THAT THEIR ENDS WILL NOT PROJECT OVER THE BOLSTER SIDE PLATES.

69 JOURNAL BOXES TO BE KENSINGTON PRESSED STEEL.

70 TENDER BRAKE BEAMS TO BE VERY SUBSTANTIAL AS THE BRAKE BEAMS FOR 6-32 D 788, ETC. HAVE BEEN CAUSING TROUBLE ACCOUNT. OF BREAKAGES.

BRAKE SHAFT SUPPORTS LOCATED SO THAT THEY WILL CLEAR TENDER WHEELS.

TENDER BRAKE SHOES TO BE STREETER STEEL BACK.

71 LOCOMOTIVE TO BE PROVIDED WITH APPARATUS FOR OPERATING AIR DUMP CARS WITH CONNECTIONS TO BACK OF TENDER. (SUP. 32)

11-266-67 Push coupled see box

THE BALDWIN LOCOMOTIVE WORKS

SPECIFICATION FOR LOCOMOTIVE 6-30-0 62-63

Class Maintenance Construction R. R. Co.

Gauge of Road 4' 8½" Plan 8"

Wheelbase, Rigid 11' 6" Driving 11' 6" Total 11' 6"

Total wheelbase, eng. and tend. {Actual 42'1¾" (M.C.B.) / Limited to ——

Curves 130 FEET RADIUS

Length Engine and Tender overall 57'5" (Not over 57'0")

Limits, Height 15' 0" Width 10' 5"

Weight (approximate) in working order, Total 162,500 lbs.

On F. tr'k —— lbs., Drivers 162,500 lbs., B. tr'k —— lbs.

Tractive power 41,000 lbs., Ratio of adhesion 3.96

Work'g St'm Pres. 185 lbs., Service Switching

Fuel Soft Coal

Boiler Steel Thick 11/16" Bill 7845

Boiler, Diam. 68" Plan Straight Top.

Boiler st'm pres. 200 lbs., Tested to { 220 lbs. steam pres. / 267 lbs. water pres.

Longitud. seams (See sup. 5)

Dome, diam. 29" Pos. Central

Firebox Steel Combustion chamb. None

Firebox, length 72⅛" Width 65½" Depth F. 69½" B. 67½"

Firebox, Tube ½" Crown ⅜" Sides ⅜" Back ⅜"

Firedoor opening One oval 16" x 20"

Water space, Front 4½" Sides 4½" Back 4½"

Water space, Frame Double Riveted

6 Water space stays ⅞" diam. with 3/16" hole 1½" deep from O. S.

Radial stays 1" diam. Sling stays front {Two rows of B. L. W. Expansion Stays

Button heads below crown on Eight central rows

Crown bars None Placed —— above crown

Crown bolts ——

Flues ——

Tubes #11 W. G. Soft Steel, National Tube Co.

Tube ends Swaged for copper ferrules, fire box ends.

Number 262 Diam. 2" Length 16' 0"

Heating Surface	Flues ——	Combus. Chamb. ——	Total 2589 sq. ft.
	Tubes 2456 sq. ft.	Fire Box 129 sq. ft.	Fire Brick Tubes ——
Grate area 32.6 sq. ft.		Ratio to Heating Surface 1 : 79.2	
Superheater ——			

Fire Brick Arch None.

Grates Rocking Bars and Drop Plate

Ash Pan, Dampers None (See sup. 7)

Throttle Balance Pos. Dome

Dry pipe Steel (See sup. 8)

Superheater None

Smokebox extension With Cleaning hole and cap L. S. only

Spark-ejector or Nipper With

Netting and deflect. plates With

Exhaust nozzles Double Nick

Spark Plug Arr. Patent Dia. 18" Hole in S. B. dia. 21½"

Water Glasses One (See sup. 11) Cab Lamps (See sup. 10)

12 Gauge Cocks Three Rear Outlet valve None

Lowest gauge cock ½" above highest part of crown

Lubricator steam valve Without separate dry pipe to dome

Blower Valve B. L. W.

Blow off Cock Two (See sup. 13)

Cleaning Plugs One plug above fire door.

Firebox Crowns Diagonal stays and bean

Crown, Tie Rods Side and four back

Water. None

Front tube sheet. None Fusible plug One

Pumps None Pos. ——

Top chamb. —— Bottom chamb. ——

Feed Cock —— Feed pipes ——

Checks —— Check pipes ——

Injectors from Nathan Mfg. Co.

14 Injectors (Class) Two Simplex "Type R" No. 10

Injectors, Pos. Right and Left Steam pipes Copper

Pipes, Check Iron Feed Iron Overflow Pipes (Size) Pos. Right and Left

Check B. L. W.

Steam Heat None

Cab Steel (See sup. 21-22-23)

Cab boards Steel (See sup. 21) Nosing T-Iron

Running boards Steel Nosing T-Iron

Hand rail Iron Located on Boiler

24 Back Bumper Bar Steel Back drawbar height 28½"

Pilot None Pushing shoes Cast to Suit

26 Front Bumper Cast Steel Bumper plate None

27 Steps, Hand holds etc. to conform to I. C. C. Requirements.

Front Drawhead, Center above rail 33½"

Coupler Simplex M.C.B. Standard, with Simplex Adjustable Pocket.

Coupler to have solid knuckle with 11" face (See sup. 30)

Signal fixtures None

31 Headlight Two Round Cabs 20" Reflector, To burn Kerosene

31 Headlight, Nos. on sides With Hoff's stop

Lamp shelf None Nosing ——

Bell 32 pounds

32 Bell Stay Two Diam. 28" Body Iron Painted Pipes Iron

27 Sander Leach Air Trap A-1 in each box to sand front and back.

32 Dome casing Iron Painted

Driving Boxes #22 Plain, Steel Bands Iron Style 9 Am. M.

Driving Lagging Asbestos Sheet Wood Jacket Asbestos Fire Felt.

Back head of boiler to be lagged and jacketed

THE BALDWIN LOCOMOTIVE WORKS

W. D. Hemley Jr. Engineer

SPECIFICATION FOR LOCOMOTIVE 6-30-0 62-63 1144

Class Maintenance Construction R. R. Co. Further orders (See sup. 4)

Pistons Cast Steel Brass Solid

Cylinders, Diam. 22" Stroke 28"

Stm ports, Length 24½" Width 1⅜" Bridges ——

Exh. ports, Length —— Width —— Valve bars 1"

Valve travel 6" Steam lap 1" Exhaust clearance ——

Eccentric crank throw 16-3/16" By-pass valve None

S. P. Valve Nathan Triple Sheet Fig. 166 Type Size No. 10

Cyl. heads Cast Iron Lugs, Steel or Iron under Jacket

Cyl. casings Iron Ptd. Head covers Steel Painted

Stm chest covers —— Covers ——

Stm chest valves 11" Diam. Piston type

Mod. pkg (Location and Kind) United States Ring Type (Spun)

Pistons Cast Iron Rings Sprung into Solid Head

Guides Steel, Laird Oil cups Needle

Crossheads Cast Steel with Brass Bearings

Wrist Pins Steel Rod cups Plumber

Parallel Rods to have solid ends

Valve Motion Walschaerts

Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

Valve motion to be bushed and case hardened.

All threads on bolts (except staybolts) to be United States Standard.

All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

3/4 Driving, C.S. Diam. 5" Cen. diam. 44" Centers Cast Steel

Tires Steel Held by Shrinkage and Shoulder

Tires, Flanged, Pos. Front and Back Size 4" x 5/8"

Tires, Plain, Pos. Middle Size 4" x 5/8"

Lateral play between driving boxes and wheel hubs— 1/16" total

Driving Boxes Cast Steel

Journals, Diam. 9" Length 12"

Springs, Make B. L. W.

Front Engine Truck None Wheeled ——

To swing —— each side of cen., Cen. pin liners ——

Journals, Diam. —— Length —— Boxes ——

Wheels, Diam. —— Tread —— Kind ——

Tires —— Cen. diam. —— Size ——

Tires held by ——

Back Engine Truck None Wheeled ——

To swing —— each side of cen., Cen. pin liners ——

Journals, Diam. —— Length —— Boxes ——

Wheels, Diam. —— Tread —— Kind ——

Tires —— Cen. diam. —— Size ——

Tires held by ——

30 Brakes, position On all driving and tender wheels

Operating Parts: Engine, sch. #6 ET West'g. Combined Auto. and Eng. Tr'k, sch. —— Straight Air

Foundation Parts: Drivers, sch. M6-3 Bd. Arrangement U.S. Equalized Eng. Tr'k, sch. ——

Air pump One 11" Pos. Left Side

Train connections Front and Back

Train signal, sch. None

Air pump to have Detroit Sight Feed Air Cyls. Lubricator

Air pump to have West'g. Special No. 50 Air Strainer

Main Reservoir to be West'g. Corrugated Type.

Certificate dated 4-1916 covering test of reservoirs No. 1868, 1867, 1868 and certificate dated 4-1916 covering test of reservoir 1866, all furnished by W.A.B. Co. are filed in Mech. Office File No. for 1916.

Tender Eight Wheeled, Drawing No. 899

Weight, with fuel and water, about 110,000 lbs.

Tank, 7000 Gallons, Bill 4259

Tank "U" shape, square top. Fuel capacity 6½ Tons

Tool Boxes Hard Wood, Top

Frame Steel 10" Channels

Front Drawbar height 28½" (See sup. 55)

Filler None Pushing shoes With

Back drawhead, center above rail 33½"

Coupler Simplex M.C.B. Auto. with 5" x 7" shank, provided with West'g. Friction Draft Gear. Coupler to have solid knuckle (Knuckle to have 11" face (MR. 10-31-16)

Steps, Hand holds etc. to conform to I.C.C. requirements.

Trucks Arch Bar type with Metal truck bolsters

Springs Elliptic B. L. W.

60 Journals, Diam. 4½" Length 8"

61 Wheels, Diam. 33" Tread 4½" Kind M.C.B. Solid forged rolled steel

Tires —— Cen. diam. —— Size ——

Tires held by —— Wheel rims 2½" thick

Safety chains Single

Brake Position On all wheels

62 Brake sch. #6 ET West'g. Auto. and Straight Air with 12" x 12" tender cylinder

List of tools, sch. 29

Photo sch. #2 Inspection (See sup 2)

To be weighed Yes Material spec'ns B. L. W. (See sup 1)

Certificate of boiler test Three copies of B.L.W. form 1036

Junior laws to 7-24-16 Shipment On own wheels

Brass shop finish, No. 1

Machine shop finish D-165

3 B. L. W. Patents: Throttle, Patented Jan. 23, 1900 (Cast On); Feed Pipe Strainer, Patented Sept. 1, 1903 (Cast On); Steam Pipe Cover, Patented July 18, 1911 (Cast On)

Property plates None

For Driver Lettering and striping in aluminum. Tank

Painting:—Engine, style 349 Drop Black and Colors

Painting:—Tender, style 349 Drop Black and Colors

Mark on tank sides, Mo. Keesport Connecting R. R.

Road Nos. Pos.	Road Nos.	Name Nos.
F. Ho Plate	23	
Cab Sides	24	
Back of Tank		

11: 266-67 Photo copied see box

SPECIFICATION FOR LOCOMOTIVES 6 36 D 62 - 63

FOR McKeesport Connecting Railroad Company.

1 ALL OF THE MATERIALS ENTERING INTO THE CONSTRUCTION OR PRODUCTION OF ANY ARTICLES OR PRODUCTS COVERED BY THIS SPECIFICATION WHICH ARE MANUFACTURED OR SOLD BY ANY OF THE SUBSIDIARY COMPANIES OF THE UNITED STATES STEEL CORPORATION ARE TO BE PURCHASED FROM SUCH SUBSIDIARY COMPANIES.

2 CONSTRUCTION OF LOCO. IN SHOPS WILL BE SUBJECT TO THE INSPECTION OF MR. BEATTIE AND SHALL HAVE FREE AND FULL ACCESS TO ALL WORK OF CONSTRUCTION, AND NO WORK REJECTED OR CONDEMNED BY HIM SHALL ENTER INTO THE CONSTRUCTION WITHOUT THE PERMISSION OF THE RAILROAD CO. (SEE SUP. 38).

3 THE B. L. W. SHALL ASSUME ALL RESPONSIBILITY FOR AND PROTECT THE RAILROAD CO. AGAINST ALL CLAIMS FOR INFRINGEMENT UNDER ANY PATENTES INVOLVED IN THE ABOVE CONSTRUCTION, EXCEPTING SUCH PARTS AS MAY BE FURNISHED BY RAILROAD COMPANY

4 FURNISH TO RAILROAD COMPANY DUPLICATE SET OF PRINTS SHOWING THE CONSTRUCTION OF LOCOS. IN DETAIL, AFTER DELIVERY OF ENGINES.

5 ALL LONGITUDINAL SEAMS BUTT JOINTED, WITH DOUBLE COVERING STRIPS, SEXTUPLE RIVETED.

6 FLEXIBLE STAYS TO BE TATE, ABOUT 425 IN NUMBER, LOCATED IN THROAT SHEET AND IN BREAKING ZONE SAME AS FOR 6 36 D 21

7 ASH PAN TO BE DESIGNED TO SUIT FIRE-BOX AND TO HAVE HOPPER OPENINGS AND SLIDES ON THE BOTTOM OF PAN TO BE SAME DIMENSIONS AS SHOWN ON MCKEESPORT CONNECTING RAILROAD CO'S PT. A-362. R.R.CO. WILL LEND THEIR PATTERNS OF ASH PAN SLIDE AND ATTACHMENTS.

8 STEAM PIPES TO HAVE OUTSIDE CONNECTIONS TO STEAM CHESTS.

9 STEAM GAUGE TO BE ASHTON IMPROVED 6" DIAL, IRON CASE WITH BRASS RING; TYPE 52-LB., MANUFACTURED BY ASHTON VALVE CO., BOSTON, MASS.
STEAM GAUGE COCKS TO BE NATHAN MFG.CO'S TYPE No.256.
STEAM GAUGE COCKS, ONE TO BE LOCATED SUITABLE FOR REGULAR STEAM GAUGE, AND ONE COCK TO BE LOCATEDON THE LEFT SIDE OF BOILER INSIDE OF CAB NEAR THE FRONT CAB WINDOW FOR THE PURPOSE OF ATTACHING ADDITIONAL GAUGE WHEN SETTING SAFETY VALVES.

10 STEAM GAUGE LAMP TO BE ADLAKE No.17 AND WATER GAUGE LAMP TO BE ADLAKE No.18 MANUFACTURED BY THE ADAMS & WESTLAKE CO., CHICAGO, ILL.

11 WATER GAUGE TO BE REFLEX STYLE K, SIZE No.4. SHOWN IN WELTRONCO MFG. CO'S CATALOGUE.

12 GAUGE COCKS TO BE AMERICAN LOCOMOTIVE CO'S STANDARD TYPE AS PRINT 272-A-1000, (NATHAN MFG.CO.)

13 BLOW-OFF VALVES TO BE OKADEE WITH IRON BODY, SCREWED SIZE 1½" MANUFACTURED BY HORACE L. WINSLOW CO., CHICAGO, ILL. ONE VALVE TO BE LOCATED IN CENTRE OF THROAT SHEET NEAR THE MUD RING, AND ONE IN BOTTOM OF BARREL NEAR FRONT TUBE SHEET BOTH VALVES TO BE CONNECTED TO 1½" PIPE BETWEEN THE FRAMES, THE LENGTH OF THE BOILER AND EXTENDING ABOUT 6" OUTSIDE OF FRAME AHEAD OF THE CYLINDER ON THE LEFT SIDE OF THE ENGINE.

14 INJECTOR OVERFLOW PIPES TO BE SECURELY ATTACHED TO INJECTORS BY UNION CONNECTIONS.

15 FLUE PIPE STRAINER TO BE SAME AS FOR 6 36 D 21

16 SAND SPRINKLER TO BE WELTRONCO MANUFACTURED BY THE WELTRONCO MFG. CO., BOSTON, MASS.

17 CAB TO BE PROVIDED WITH WATERTIGHT FLOORS, SUITABLY INSULATED, AND SUPPORTED ON STEEL PLATES WITH STEEL RUNNING BOARDS. THE INTERIOR OF CAB TO BE PROVIDED WITH OAK FLOORING, 1¼" THICK, ON TOP OF METAL FLOOR.

22 GRAB IRONS ON THE CAB AT GANGWAY TO BE THE SAME STYLE AS SHOWN ON RY.CO'S DRAWING A-372.

23 THE DISTANCE BETWEEN THE ENGINE CAB AND WATER TANK WHEN LOCO. IS ON STRAIGHT TRACK TO BE NOT LESS THAN 2' 9½" AS SHOWN ON MCKEESPORT RAILROAD DRAWING A-376, IN ORDER TO ELIMINATE THE DANGER OF INJURING MAN WHEN ROUNDING CURVES. (SEE SUP. 53)

24 RADIAL BUFFER BEDGE TYPE BETWEEN ENGINE AND TENDER WITH CHAFING IRON OF SUCH RADIUS THAT IT WILL PERMIT PROPER CURVING ON CURVES.

25 FOOT PLATE OF CAST STEEL WITH RIBS SPACED FAR ENOUGH APART TO CLEAR DRAWBAR ON CURVES.

26 FRONT BUMPER FROM COMMONWEALTH STEEL CO. (SEE SUP.28)

27 FOOT-BOARD ACROSS FRONT WITH HANDRAIL ON BUMPER. THE FOOT-BOARD, TOE PLATE, AND STEP IRON TO BE THE SAME DIMENSIONS AS SHOWN ON MCKEESPORT CONNECTING RAILROAD CO'S DWG.A-377.

28 HAND HOLD ON FRONT BUMPER TO EXTEND TO WITHIN 5" OF ENDS OF BUMPER AND TO BE A CONTINUOUS PIECE BENT TO SHAPE AND BE BOLTED TO BUMPER BY A FORGED FOOT. (SEE SUP.30)

29 STEPS TO BE PROVIDED ON EACH SIDE OF BOILER, CONVENIENTLY ARRANGED FOR THE PURPOSE OF GETTING UP TO SANDBOXES.

30 COUPLER SHAFT FRONT OF ENGINE TO BE SET CLOSE AS POSSIBLE TO TOP OF BUMPER SO AS NOT TO INTERFERE WITH GRAB IRON.

31 HEADLIGHTS:- GLADIER HEADLIGHTS WITH COPPER REFLECTOR SILVER PLATED, SPUN METAL RING, HINGED DOUBLE AND SIDE DOOR (SUP.37)

32 CIRCULAR HAND HOLD TO BE APPLIED AROUND TOP OF DOME AND SAND BOXES.

33 CYLINDER COCKS TO BE SAME AS FOR 6 36 D 21

34 HUB LINERS OF SOFT STEEL, WELL CASEHARDENED TO BE PROPERLY SECURED TO WHEEL CENTRES. (SEE SUP. 39)
HUB FACES OF DRIVING BOXES TO BE BABBITTED.

35 AIR LINE CONNECTIONS BETWEEN ENGINE AND TENDER TO BE THE MCLAUGHLIN METAL FLEXIBLE CONDUITS. (SEE SUP. 62)

36 ENGINE AND TENDER TO BE PAINTED WITH ROGERS LOCO. FINISH BRICK AND WITH VALENTINE'S VALSPAR FINISHING VARNISH. LOCO. TO BE FINISHED AND LETTERED AS SHOWN ON MCKEESPORT CONNECTING RAILROAD CO'S PRINT A-372. (HEREWITH)
INTERIOR OF CAB TO BE PAINTED CHROME GREEN.
WINDOW SASH IN CABS TO BE FINISHED DARK OAK.

37 MARK ON FRONT GLASS OF HEADLIGHTS:- SAFETY ALWAYS AS SHOWN ON RY. CO'S PRINT A-372 (HEREWITH).

38 MR. BEATTIE IS TO BE NOTIFIED TWO DAYS BEFORE BOILER IS READY TO UNDERGO HYDRAULIC TEST SO THAT HIS REPRESENTATIVE MAY BE HERE TO WITNESS THE TEST. 9.9.16

39 THE CASE HARDENED HUB LINERS TO BE SECURED TO DRIVING WHEELS BY PATCH BOLTS AND THEN TO BE ELECTRICALLY WELDED AROUND THE EDGE OF LINER TO WHEEL HUB. 9.9.16

SPECIFICATION FOR LOCOMOTIVES 6 36 D 62 - 63

FOR McKeesport Connecting Railroad Company

1146

TENDER

51 COAL-GATES TO BE SUBSTANTIALLY BUILT OF STEEL AND HINGED IN SUCH A MANNER AS TO OPEN INTO THE COAL SPACE OF THE TENDER.

52 TENDER TANK HOSE TO BE GOODRICH HOSE MANUFACTURED BY GOODRICH RUBBER CO., AKRON, OHIO.

53 THE DISTANCE BETWEEN THE ENGINE CAB AND WATER TANK WHEN LOCO. IS ON STRAIGHT TRACK TO BE NOT LESS THAN 2' 9½" AS SHOWN ON MCKEESPORT RAILROAD DRAWING A-376, IN ORDER TO ELIMINATE THE DANGER OF INJURING MAN WHEN ROUNDING CURVES. (SUP. 23)

54 LADDER TO BE APPLIED TO REAR OF TANK.

55 RADIAL BUFFER BEDGE TYPE BETWEEN ENGINE AND TENDER, WITH CHAFING IRON OF SUCH RADIUS THAT IT WILL PERMIT PROPER CURVING ON CURVES.

56 COUPLER SHAFT BACK OF TENDER TO BE SET CLOSE AS POSSIBLE TO TOP OF BUMPER SO AS NOT TO INTERFERE WITH GRAB IRON.

57 TENDER FRAME TO HAVE FOOT BOARD (SAME AS ON FRONT OF ENGINE ACROSS BACK END OF TENDER.

58 THE HANDRAIL ACROSS THE BACK END OF THE TENDER TO BE PROJECTED ON THE OUTSIDE OF TANK, AND SECURED TO THE TANK IN THE SAME MANNER AS SHOWN ON TOOL-BOX ON REAR OF TENDER ON MCKEESPORT CONNECTING RAILROAD'S DRAWING A-376.

59 GRAB IRONS ON THE FRONT OF TENDER AT GANG-WAY TO BE THE SAME STYLE AS SHOWN ON RY.CO'S DRAWING A-372)

60 JOURNALS WITH HARRIGAN JOURNAL BOXES AND END STOP, WITH DUST GUARDS.
HARRINGTON JOURNAL BOXES AS RY.CO'S PRINT MADE BY PENNSYLVANIA CASTING AND MACHINE CO., PREBLE AVE., N.S., PITTSBURGH, PA. ROYALTY, IF ANY, ON HARRIGAN TENDER JOURNAL BOXES, PAYABLE BY R. R. CO.

61 TENDER WHEELS AS PER CARNEGIE SECTION S-1131, ROUGH BORED 5" MOUNTED ON 60,000 LBS. CAPACITY AXLES.

62 AIR LINE CONNECTIONS BETWEEN ENGINE AND TENDER TO BE THE MCLAUGHLIN METAL FLEXIBLE CONDUITS.

THE BALDWIN LOCOMOTIVE WORKS

Memorandum Spec'n 17042

Dup. 6 38 D 62-63, WITH SAME EXTRAS EXCEPT WHERE OTHERWISE SPECIFIED. (See sup.1) MINOR CHANGES AS PER Rr. Co's. SPECIFICATION (HEREWITH)

SPECIFICATION FOR LOCOMOTIVES 6 38 D 75 & 76

FOR Mc KEESPORT CONNECTING R.R. Co.

Gen. as PHOTO. 6107

Engine Drawing No. 17.

3-2-17.

Gauge of Road 4' 8½" Play ¾"

Wheelbase, Rigid 11' 6" Driving 11' 6" Total 11' 6"

Total wheelbase, eng. and tend. { Actual ~~41'-2½"~~ 42' 3½" (JAP ELEK.) / Limited to -----

Curves 130 FEET RADIUS

LENGTH ENGINE AND TENDER OVERALL 57'5" (NOT OVER 59'0")

Limits, Height 15' 0" Width 10' 5"

Weight (approximate) in working order, Total 165000 POUNDS

On F. tr'k ---- lbs., Drivers 165000 lbs., B. tr'k ----- lbs.

Tractive power 41,000 lbs., Ratio of adhesion 4.02

Work'g St'm Pres. 185 lbs., Service SWITCHING

Fuel SOFT COAL

Boiler STEEL Thick 11/16" Bill 7845

Boiler, Diam. 68" Plan STRAIGHT TOP

Boiler st'm pres. 200 lbs., Tested to { 220 lbs. steam pres. / 267 lbs. water pres.

Longitud. seams (SEE SUP. 4)

33 **Dome,** diam. 29" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE

Firebox, length 72⅛" Width 65¼" Depth F. 69½" B. 67½"

Firebox, Tube ½" Crown ⅜" Sides ⅜" Back ⅜"

Firedoor opening ONE OVAL 16" x 20"

Water space, Front 4½" Sides 4½" Back 4½"

Water space, Frame DOUBLE Riveted

5 Water space stays ⅝" DIAM. WITH 3/16" HOLE 1¼" DEEP FROM O.S.

Radial stays 1" DIAM. Sling stays front { TWO ROWS OF B.L.W. EXPANSION STAYS.

Button heads below crown on EIGHT central rows

Crown bars NONE Placed --- above crown

Crown bolts -----

Flues -----

Tubes #11 W.G. SOFT STEEL, NATIONAL TUBE Co.

Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.

Number 262 Diam. 2¼" Length 16' 0"

Heating Surface	Flues ----	Combus. Chamb. ---	Total	2585 □
	Tubes 2456 □	Fire Box 129 □	Fire Brick Tubes -----	
Grate area 32.6 □	Ratio to Heating Surface 1 : 79.2			
Superheater -------				

Fire Brick ARCH NONE

Grates ROCKING BARS AND DROP PLATE

Ash Pan, Dampers NONE (SEE SUP. 6)

Throttle BALANCE (SUP. 7) Pos. DOME

Dry pipe STEEL (SEE SUP. 8)

Superheater NONE

Smokebox extension WITH Cleaning hole and cap R. AND L.

Spark ejector or hopper WITH

Netting and deflect. plates WITH

Exhaust nozzles DOUBLE HIGH

Stack BOOT LEG PATTERN Dia. 18" Hole in S. B., dia. 21¼"

Safety Valves (Spec) TWO CROSBY 3" MUFFLED (SEE SUP. 9)

Safety valves NONE with relief lever, Set to 185 LBS.

Whistle CHIME WITH CHAIN CONNECTION (INSTEAD OF CORD) SAME AS FOR 6 - 36 D 21

Steam Gauge ONE (SEE SUP. 10) MAKER (SEE SUP. 10)

Steam gauge stand IRON **Clock** NONE

Water Gauge ONE (SEE SUP. 12) **Cab Lamps** (SEE SUP 11-32)

13 **Gauge Cocks** THREE BACK Surface valve NONE

Lowest gauge cock 3½" above highest part of crown

Lubricator steam valve WITHOUT separate dry pipe to dome

Blower Valve B.L.W.

Blow off Cock TWO (SEE SUP. 14)

Cleaning Plugs ONE PLUG ABOVE FIRE DOOR.

Firebox CORNERS DIAGONAL, SIDES AND BACK.

Crown, TWO EACH SIDE AND FOUR BACK.

Waist, NONE

Front tube sheet, NONE Fusible plug ONE

Pump NONE Pos. -----

Top chamb. ----- Bottom chamb. ----

Feed Cock ----- Feed pipes ----

Checks ----- Check pipes ----

INJECTORS FROM NATHAN MFG. Co.

15 **Injectors** (Not Spec) TWO SIMPLEX "TYPE R" No. 10

16 Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER

21 Pipes, Check IRON Feed IRON Overflow IRON (SUP. 15)

Check B.L.W. Pos. RIGHT AND LEFT

Steam Heat NONE

Cab STEEL (SEE SUP. 22 ETC.)

Cab boards STEEL (SEE SUP. 22) Nosing T-IRON

Running boards STEEL Nosing T-IRON

Hand rail IRON Located on BOILER

35 **Back Bumper** BAR STEEL Back drawbar height 29¼"

Pilot NONE Pushing shoes CAST IN BUMPER

Front Bumper CAST STEEL (SUP. 27) Bumper plate NONE

28 **Steps** HAND HOLDS, ETC. TO CONFORM TO I.C.C. REQUIREMENTS

Front Drawhead, Center above rail 33½"

Coupler SIMPLEX M.C.B. STANDARD, WITH ADJUSTABLE POCKET.

COUPLER TO HAVE SOLID KNUCKLE WITH 11" FACE (SEE SUP 31)

Signal fixtures NONE

Headlight TWO ROUND CASE 18" Reflector, (SEE SUP. 32)

Headlight, Nos. on sides WITH H'dl't step (SEE SUP. 30)

Lamp shelf NONE Nosing -----

Bell 92 POUNDS

33 **Sand Box** (Spec) TWO Diam. 28" Body IRON PAINTED Pipes IRON

Sander GRAHAM - WHITE PERFECT IN EACH BOX TO SAND FRONT AND BACK

Dome casing IRON PAINTED (SEE SUP. 33)

Boiler Jacket #22 PLAIN STEEL Bands IRON Style 9 AND 14

Boiler Lagging JOHNS-MANVILLE FIRE FELT.

BACK HEAD OF BOILER TO BE LAGGED AND JACKETED.

11-266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS

E. M. Kalbach July 1917

SPECIFICATION FOR LOCOMOTIVES 6 38 D 75 - 76

FOR Mc KEESPORT CONNECTING R.R. Co.

148

Frames CAST STEEL Braces SOLID

3d **Cylinders,** Diam. 22" Stroke 28"

St'm ports, Length 24½" Width 1⅝" Bridges ----

Exh. ports, Length --- Width ----- Valve lead ¼"

Valve travel 5¾" Steam lap ⅞" Exhaust clearance -----

Eccentric crank throw 16-3/16" By-pass valve NONE

S. F. Lubr. (Spec) NATHAN TRIPLE BULLS EYE No. 166 F-3 SIZE No. 10

Cyl'r heads CAST IRON; LUBR. PIPES OF IRON UNDER JACKET

Cyl'r casings IRON PTD. Head covers STEEL PAINTED

St'm chest casings ----- Covers ----

St'm chest valves 11" DIAM. PISTON TYPE

Met. pkg (PISTON RODS / VALVE STEMS) UNITED STATES KING TYPE (Spec)

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD

Guides LAIRD STEEL Oil cups NEEDLE

Crossheads CAST STEEL WITH BRASS BEARINGS

Wrist Pins STEEL Rod cups PLUNGER

PARALLEL RODS TO HAVE SOLID ENDS.

Valve Motion WALSCHAERTS

Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

VALVE MOTION TO BE BUSHED AND CASE HARDENED.

All threads on bolts (except staybolts) to be United States Standard.

All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B.L.W.

36 **Drivers,** O. S. Diam. 52" Cen. diam. 44" CENTRES CAST STEEL

35 **Tires** STEEL Held by SHRINKAGE AND SHOULDER

Tires, Flanged, Pos. FRONT AND BACK Size 4" x 5½"

Tires, Plain, Pos. MIDDLE Size 4" x 6½"

Lateral play between driving boxes and wheel hubs - 1/16" TOTAL

Driving Boxes CAST STEEL (SEE SUP. 36)

Journals, Diam. 9" Length 12"

Springs. Make B.L.W.

Front Engine Truck NONE Wheeled ------

To swing ---- each side of cen., Cen. pin liners ----

Journals, Diam. --- Length ---- Boxes ----

Wheels, Diam. ----- Tread --- Kind ----

Tires ----- Cen. diam. ---- Size ---

Tires held by -----

Back Engine Truck ---- Wheeled ----

To swing ----each side of cen., Cen. pin liners ----

Journals, Diam. ----- Length ---- Boxes ---

Wheels, Diam. ---- Tread---- Kind ----

Tires ------- Cen. diam. --- Size ---

Tires held by ------

41 **Brake,** position ON ALL DRIVING AND TENDER WHEELS

Operating Parts: Engine, Sch. No. 6 ET WEST'G. COMBINED AUTO. AND STRAIGHT AIR. / Eng. Tr'k, sch. -------

Foundation Parts: Drivers, sch. WM-3 BC AMERICAN O.S. EQUALIZED / Eng. Tr'k, sch. -----

Air pump ONE 11" Pos. LEFT SIDE

Train connections FRONT AND BACK

Train signal, sch. NONE

AIR PUMP TO HAVE DETROIT SIGHT FEED AIR CYLR. LUBRICATOR.

AIR PUMP TO HAVE WEST'G. SPECIAL No. 54 AIR STRAINER.

MAIN RESERVOIR TO BE WEST'G. CERTIFIED TYPE AND TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

CERTIFICATES DATED JUNE 6TH 1917 COVERING TEST OF RESERVOIR Nos. 12604 TO 12607 INC. FURNISHED BY WEST'G. AIR BRAKE Co., ARE FILED IN MAIN OFFICE, FILE No. 84.

61 **Tender** EIGHT Wheeled, Drawing No. 899

Weight, with fuel and water, about 110,000 LBS.

61 **Tank** 5500 Gallons, Bill 4290

TANK "U" SHAPE, SQUARE TOP, FUEL CAPACITY 6½ TONS.

Tool Boxes HARD WOOD, TOP

HEADLIGHT ON TENDER TO BE IN CENTRE OF BACK OF TANK.

Frame STEEL 10" CHANNELS

Front Drawbar height 28½" (SEE SUP. 65 ETC.)

Pilot NONE Pushing shoes AT REAR

Back drawhead, center above rail 33½"

Coupler SIMPLEX M.C.B. AUTO. WITH 5" x 7" SHANK, PROVIDED WITH WEST'G. FRICTION DRAFT GEAR. (SEE SUP. 68)

COUPLER TO HAVE SOLID KNUCKLES, WITH 11" FACE.

67 Steps, HANDHOLDS, ETC. TO CONFORM TO I. C.C. REQUIREMENTS.

70 R.

Trucks ARCH BAR TYPE WITH METAL TRUCK BOLSTERS.

Springs ELLIPTIC, B.L.W.

Journals, Diam. 4½" Length 8" Boxes (SEE SUP. 72 ETC.)

Wheels, Diam. 33" Tread 4¼" Kind SCHOEN STEEL (SEE SUP. 74)

Tires ----- Cen. diam. ---- Size ----

Tires held by ---- WHEEL RIMS 2½" THICK

Safety chains SINGLE

Brake Position ON ALL WHEELS

Brake sch. No. 6 ET WEST'G. AUOT. AND STRAIGHT AIR WITH 12" x 12" TENDER CYLINDER.

List of tools, sch. 29

Photo sch. NONE Inspection (SEE SUP. 2)

To be weighed NO Material specs B.L.W. (SEE SUP. 1)

Certificate of boiler test THREE COPIES OF B.L.W. FORM 1036

Junior laws to 4-2-17 Shipment ON OWN WHEELS

Brass shop finish, No. 1

Machine shop finish D-165

3 **Patents** B. L. W. FEED PIPE STRAINER, PATENTED SEPT. 1, 1903 (CAST ON)

STEAM PIPE COVER, PATENTED JULY 18, 1911 (CAST ON)

Property plates NONE

Painting: —Engine, style 349 DROP BLACK AND (SEE SUP. 42 TO 45)

Painting: —Tender, style 349 DROP BLACK AND (SEE SUP. 42 TO 45)

Mark on TANK SIDES, Mc KEESPORT CONNECTING R. R.

Road Nos. Pos.	Road Nos.	Name NONE
E NO PLATE	25	
CAB SIDES	26	
~~BACK OF TANK~~		
F. SAND BOX		

11-26-67 Photo copied see box

SPECIFICATION FOR LOCOMOTIVES 6 38 D 75 & 76

FOR Mc KEESPORT CONNECTING R. R. Co.

R.

1 ANY OF THE MATERIALS ENTERING INTO THE CONSTRUCTION OR PRODUCTION OF ANY ARTICLES OR PRODUCTS COVERED BY THIS SPECIFICATION WHICH ARE MANUFACTURED OR SOLD BY ANY OF THE SUBSIDIARY COMPANIES OF THE UNITED STATES STEEL CORPORATION ARE TO BE PURCHASED FROM SUCH SUBSIDIARY COMPANIES. EXCEPT FORGINGS AND PLATES MAY BE PURCHASED WHEREVER WE CAN GET THEM IN TIME

2 CONSTRUCTION OF LOCO. IN SHOPS WILL BE SUCJECT TO THE INSPECTION OF MR. BEATTIE WHO SHALL HAVE FREE AND FULL ACCESS TO ALL WORK OF CONSTRUCTION, AND NO WORK REJECTED OR CONDEMNED BY HIM SHALL ENTER INTO THE CONSTRUCTION WITHOUT THE PERMISSION OF THE RAILROAD CO.

3 THE B. L. W. SHALL ASSUME ALL RESPONSIBILITY FOR AND PROTECT THE RAILROAD CO. AGAINST ALL CLAIMS FOR INFRIGEMENT UNDER ANY PATENTES INVOLVED IN THE ABOVE CONSTRUCTION, EXCEPTING SUCH PARTS AS MAY BE FURNISHED BY RAILROAD COMPANY.

4 ALL LONGITUDINAL SEAMS BUTT JOINTED, WITH DOUBLE COVERING STRIPS, SEXTUPLE RIVETED.

5 FLEXIBLE STAYS TO BE TATE 1" DIAM. OF EWALD IRON ABOUT 425 IN NUMBER, LOCATED IN THROAT SHEET AND IN BREAKING ZONE SAME AS FOR 6-38 D 62 ETC.

6 ASH PAN TO BE DESIGNED TO SUIT FIRE-BOX AND TO HAVE HOPPER OPENINGS AND SLIDES ON THE BOTTOM OF PAN, TO BE SAME DIMENSIONS AS SHOWN ON MCKEESPORT CONNECTING RAILROAD CO'S PT. A-362 (R.R.CO. WILL LEND THEIR PATTERNS OF ASH PAN SLIDE AND ATTACHMENTS.)

7 THROTTLE BOX AND PIPE TO BE SAME DESIGN AS FOR LOCOS. NOS.18, 21 AND 22, CLASS 6 - 36 D 21 - 34 - 74

8 STEAM PIPES TO HAVE OUTSIDE CONNECTIONS TO STEAM CHESTS.

9 SAFETY VALVES TO BE HIGH EFFICIENCY TYPE, STYLE "L".

10 STEAM GAUGE TO BE ASHTON IMPROVED 6¾" DIAL, IRON CASE WITH BRASS RING; TYPE 52-LBS., MANUFACTURED BY ASHTON VALVEE CO., BOSTON, MASS.
STEAM GAUGE COCKS TO BE NATHAN MFG. CO'S TYPE NO.256
STEAM GAUGE COCKS, ONE TO BE LOCATED SUITABLE FOR REGULAR STEAM GAUGE, AND ONE COCK TO BE LOCATED ON THE LEFT SIDE OF BOILER INSIDE OF CAB NEAR THE FRONT CAB WINDOW FOR THE PURPOSE OF ATTACHING ADDITIONAL GAUGE WHEN SETTING SAFETY VALVES

11 STEAM GAUGE LAMP TO BE ADLAKE NO.17 AND WATER GAUGE LAMP TO BE ADLAKE NO.18 MANUFACTURED BY THE ADAMS & WESTLAKE CO., CHICAGO, ILL. CAB LIGHTS TO BE ELECTRIC.(SUP. 32)

12 WATER GAUGE TO BE REFLEX STYLE X, SIZE NO.4, SHOWN IN WILTBONCO MFG. CO'S CATALOGUE.

13 GAUGE COCKS TO BE AMERICAN LOCOMOTIVE CO'S STANDARD TYPE AS PRINT 272-A-1000, (NATHAN MFG. CO.)

14 BLOW-OFF VALVES TO BE OKADEE WITH IRON BODY, SCREWED SIZE 1½" MANUFACTURED BY HORACE L. WINSLOW CO., CHICAGO, ILL. ONE VALVE TO BE LOCATED IN CENTRE OF THROAT SHEET NEAR THE MUD RING, AND ONE IN BOTTOM OF BARREL NEAR FRONT TUBE SHEET BOTH VALVES TO BE CONNECTED TO 1½" PIPE BETWEEN THE FRAMES, THE LENGTH OF THE BOILER AND EXTENDING ABOUT 6" OUTSIDE OF FRAME AHEAD OF THE CYLINDER ON THE LEFT SIDE OF THE ENGINE.

15 INJECTOR OVERFLOW PIPES TO BE SECURELY ATTACHED TO INJECTORS BY UNION CONNECTIONS.

16 FEED PIPE STRAINER TO BE SAME AS FOR 6-36 D 21

17 COAL SPRINKLER TO BE WILTBONCO MANUFACTURED BY THE WILTBONCO MFG. CO., BOSTON, MASS.

22 CAB TO BE PROVIDED WITH SUITABLE WINDOWS AND DOORS, CONVENIENTLY ARRANGED, AND SUPPORTED ON STEEL FLOOR WITH STEEL RUNNING BOARDS. THE INTERIOR OF CAB TO BE PROVIDED WITH OAK FLOORING, 1¼" THICK, ON TOP OF METAL FLOOR.

23 GRAB IRONS ON THE CAB AT GANGWAY TO BE THE SAME STYLE AS SHOWN ON RY.CO'S DRAWING A-372
GRAB IRON ON THE CAB AT GANGWAY TO HAVE LOWER END SECURED 6½" ABOVE THE TENDER DECK AS SHOWN ON RY.CO'S DRAWING A-372, REVISED FEBRUARY 21ST, 1917 TO PREVENT CORNERING ON CURVES.

24 THE DISTANCE BETWEEN THE ENGINE CAB AND WATER TANK WHEN LOCO. IS ON STRAIGHT TRACK TO BE NOT LESS THAN 2' 9¼" AS SHOWN ON MCKEESPORT RAILROAD DRAWING A-376, IN ORDER TO ELIMINATE THE DANGER OF INJURING MAN WHEN ROUNDING CURVES. (SEE SUP. 65)

25 RADIAL BUFFER WEDGE TYPE BETWEEN ENGINE AND TENDER WITH CHAFING IRON OF SUCH RADIUS THAT IT WILL PERMIT PROPER CURVING ON CRUVES.

26 FOOT PLATE OF CAST STEEL WITH RIBS SPACED FAR ENOUGH APART TO CLEAR DRAWBAR ON CURVES.

27 FRONT BUMPER FROM COMMONWEALTH STEEL CO.(SEE SUP.29)

28 FOOT-BOARD ACROSS FRONT WITH HANDRAIL ON BUMPER. THE FOOT-BOARD, TOE PLATE, AND STEP IRON TO BE THE SAME DIMENSIONS AS SHOWN ON MCKEESPORT CONNECTING RAILROAD CO'S DWG.A-377.

29 HAND HOLD ON FRONT BUMPER TO EXTEND TO WITHIN 5" OF ENDS OF BUMPER AND TO BE A CONTINUOUS PIECE BENT TO SHAPE AND BE BOLTED TO BUMPER BY A FORGED FOOT. (SEE SUP.31)

30 STEPS TO BE PROVIDED ON EACH SIDE OF BOILER, CONVENIENTLY ARRANGED, FOR THE PURPOSE OF GETTING UP TO SANDBOXES.(SUP.33)
HEADLIGHT STEP TO BE PROVIDED ON EACH SIDE OF SMOKE BOX.

31 COUPLER SHAFT FRONT OF ENGINE TO BE SET CLOSE AS POSSIBLE TO TOP OF BUMPER SO AS NOT TO INTERFERE WITH GRAB IRON. (SUP.29)

32 HEADLIGHT EQUIPMENT TO BE PYLE NATIONAL ELECTRIC, TYPE "K" COMPLETE, WITH HEADLIGHT CASES FITTED WITH 100 WATT HIGH EFFICIENCY LAMPS, THE WIRES TO BE RUN THROUGH STEEL PIPE CONDUIT WITH STANDARD FORM OF JUNCTION BOX FOR EACH OUTLET.
LIGHTS TO BE PROVIDED FOR STEAM GAUGE LAMPS, WATER GAUGE LAMPS AND BACK OF SIGHT FEEDS ON LUBRICATOR; ALSO A SWITCH PROVIDED ON THE RIGHT SIDE OF CAB FOR TURNING OFF THE HEADLIGHTS.
THE CONNECTION BETWEEN THE ENGINE AND TENDER TO BE MADE BELOW THE DECK. (SEE SUP. 11)

33 CIRCULAR HAND HOLD TO BE APPLIED AROUND TOP OF DOME AND SAND BOXES.

34 CYLINDER COCKS TO BE SAME AS FOR 6-36 D 21

35 JOHNSON FLANGE LUBRICATOR TO BE APPLIED TO THE FRONT AND BACK DRIVING WHEEL FLANGES. THESE LUBRICATORS TO BE FURNISHED BY THE MCKEESPORT CONNECTING RAILROAD COMPANY (SEE SUP 46)

36 HUB LINERS OF SOFT STEEL, WELL CASE HARDENED TO BE PROPERLY SECURED TO WHEEL CENTERS. THE HUB LINERS TO BE SECURED TO DRIVING WHEELS BY PATCH BOLTS AND THEN TO BE ELECTRICALLY WELDED AROUND THE EDGE OF LINER TO THE WHEEL HUB.
HUB FACES OF DRIVING BOXES TO BE BABBITTED.

SPECIFICATION FOR LOCOMOTIVES 6 38 D 75 & 76

FOR Mc KEESPORT CONNECTING R. R. Co.

R.

41 AIR LINE CONNECTIONS BETWEEN ENGINE AND TENDER TO BE THE MC LAUGHLIN METAL FLEXIBLE CONDUITS.(SEE SUP. 41)

42 ENGINE AND TENDER TO BE PAINTED WITH ROGERS LOCO. FINISH BLACK AND WITH VALENTINE'S VALSPAR FINISHING VARNISH.
INTERIOR OF CAB TO BE PAINTED CHROME GREEN
WINDOW SASH IN CABS TO BE FINISHED DARK OAK.

43 PAINTING:- UNDERCOAT ON CABS, TENDERS AND DRIVING WHEELS TO BE PAINTED WITH DROP BLACK GROUND IN JAPAN, FINISHED WITH ONE COAT OF VALENTINES FLATTING VARNISH AND TWO COATS OF VALENTINES VALSPAR FINISHING VARNISH.
FRAMES, HAND RAILS, COUPLERS TENDER TRUCKS, PIPES ETC. PAINTED WITH ROGERS LOCOMOTIVE FINISH.

44 LETTERING IN ALUMINUM LEAF WITH STRIPING IN ALUMINUM LEAF AND BROWN WITH NARROW ZINC WHITE BORDER STRIPES AS SHOWN ON RY.CO'S PRINTS A-372, REVISED FEBRUARY 21, 1917 AND A-376, REVISED 2-20-1917 (HEREWITH)

45 MARK ON FRONT GLASS OF HEADLIGHTS:- SAFETY ALWAYS AS SHOWN ON RY.CO'S PRINT A-372 REVISED 2-21-17 (HEREWITH)

46 JOHNSON FLANGE LUBRICATOR TO B E APPLIED IN ACCORDANCE WITH BLUE PRINT HEREWITH.
FLANGE LUBRICATOR INSTRUCTION CARD TO BE PLACED IN CAB OF EACH LOCO. (CARDS HEREWITH.) 6.11.17
IF THESE FLANGE LUBRICATORS DO NOT ARRIVE IN TIME TO BE APPLIED BY B. L. W. TO THE ENGINE, THE LOCOMOTIVE IS TO BE SHIPPED WITHOUT THEM AND THE LUBRICATORS WHEN RECEIVED, ARE TO BE RESHIPPED TO THE RAILWAY COMPANY 9/25/17

TENDER

61 TENDER TO BE SAME AS FOR 6-38 D 62-63 WITH SAME EXTRAS EXCEPT WHERE OTHERWISE SPECIFIED.

62 COAL-GATES TO BE SUBSTANTIALLY BUILT OF STEEL AND HINGED IN SUCH A MANNER AS TO OPEN INTO THE COAL SPACE OF THE TENDER

63 TANK MANHOLE TO BE 18" X 36" LOCATED TRANSVERSELY OF TANK 18" FROM BACK OF TANK TO BACK OF FUNNEL AS SHOWN ON MCKEESPORT CONNECTING R.R.CO'S DRAWING A-376, REVISED FEBRUARY 20TH 1917.

64 TENDER TANK HOSE TO BE GOODRICH HOSE MANUFACTURED BY GOODRICH RUBBER CO., AKRON, OHIO.

65 THE DISTANCE BETWEEN THE ENGINE CAB AND WATER TANK WHEN LOCO. IS ON STRAIGHT TRACK TO BE NOT LESS THAN 2' 9¼" AS SHOWN ON MCKEESPORT RAILROAD DRAWING A-376 (HEREWITH) IN ORDER TO ELIMINATE THE DANGER OF INJURING MAN WHEN ROUNDING CURVES(SUP.

66 GRAB IRONS ON THE FRONT OF TENDER AT GANG-WAY TO BE THE SAME STYLE AS SHOWN ON RY.CO'S DRAWING A-372 REVISED 2-21-17

67 RADIAL BUFFER WEDGE TYPE BETWEEN ENGINE AND TENDER, WITH CHAFING IRON OF SUCH RADIUS THAT IT WILL PERMIT PEROPER CURVING ON CURVES.

68 COUPLER SHAFT BACK OF TENDER TO BE SET CLOSE AS POSSIBLE TO TOP OF BUMPER SO AS NOT TO INTERFERE WITH GRAB IRON.

69 TENDER FRAME TO HAVE FOOT BOARD (SAME AS ON FRONT OF ENGINE) AGROSS BACK END OF TENDER

70 THE HANDRAIL ACROSS THE BACK END OF THE TENDER TO BE PROJECTED ON THE OUTSIDE OF TANK, AND SECURED TO THE TANK IN THE SAME MANNER AS SHOWN ON TOOL-BOX ON REAR OF TENDER ON MCKEESPORT CONNECTING RAILROAD'S DRAWING A-376

71 LADDER TO BE APPLIED TO REAR OF TANK, ON RIGHT SIDE

72 HARRIGAN JOURNAL BOXES AND END STOP, WITH DUST GUARDS.
HARRIGAN JOURNAL BOXES AS RY.CO'S PRINT MADE BY PENNSYLVANIA CASTING AND MACHINE CO., PREBLE AVE., N.S., PITTSBURGH, PA.
ROYALTY, IF ANY, ON HARRIGAN TENDER JOURNAL BOXES, PAYABLE BY R. R. CO.

73 JOURNALS TO BE M.C.B.STANDARD AS SHOWN ON CARNEGIE STEEL CO'S DRAWING S-1617, USING M.C.B. STANDARD BRASS AND WEDGE IN CONNECTION WITH THE HARRIGAN JOURNAL BOX AND END STOP. (THE COLLARS MUST NOT BE TURNED OFF THESE JOURNALS).

74 TENDER WHEELS AS PER CARNEGIE SECTION S-1131, ROUGH BORED 5" MOUNTED ON 60,000 LBS. CAPACITY AXLES.
TENDER WHEELS TO BE M.C.B. STANDARD, MOUNTED ON 60,000 LBS. CAPACITY AXLES.

75 AIR LINE CONNECTIONS BETWEEN ENGINE AND TENDER TO BE THE MC LAUGHLIN METAL FLEXIBLE CONDUITS. (SEE SUP. 41)

11-266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS AS SPECIFICATION C-1962
Memorandum Spec'n 10251 Details to be same as 6 34 D 876 - 877, except as otherwise specified.
SPECIFICATION FOR LOCOMOTIVES 6 34 D 926 Gen. as Neg. 4327
FOR Newburgh & South Shore Ry. Co. **Engine Drawing No.** 12.
J. 6-12-14

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 11' 2" Driving 11' 2" Total 11' 2"
Total wheelbase, eng. and tend. { Actual 41' 2¾" / Limited to -----

Curves -----

Limits, Height ----- Width -----
Weight (approximate) in working order, Total 127,800 lbs.
On F. tr'k ----- lbs., Drivers 127,800 lbs., B. tr'k ----- lbs.

Tractive power 30,600 lbs., Ratio of adhesion 4.14
Work'g St'm Pres. 180 lbs., Service Switching
Fuel Soft Coal

6 **Boiler** Carnegie Steel Thick 11/16" Bill 6749
Boiler, Diam. 64" Plan Straight
Boiler st'm pres. 180 lbs., Tested to { 200 lbs. steam pres. / 240 lbs. water pres.
Longitud. seams Butt jointed, double covering strips.

8 **Dome,** diam. 29" Pos. Central

Firebox Carnegie Steel Combustion chamb. None
Firebox, length 103 3/16" Width 33⅜" Depth F. 65½" B. 62½"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diam.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Single Riveted
Water space stays 1" diam. with 3/16" hole 1¼" deep from O. S.
Tate flexible staybolts, 150 located in breaking zone.
Radial stays 1⅛" diam. Sling stays front One 1 bar
Button heads below crown on Eight central rows
Crown bars None Placed ----- above crown
Crown bolts -----

Tubes #11 W. G. Spellerized Steel.
Tube ends Swaged for copper rings firebox ends.
Tubes, No. 270 Diam. 2" Length 10' 11½"

Heating Surface, Tubes 1540.3 sq ft Firebox 143.7 sq ft Total 1684 sq ft
Grate area 23.8 sq ft Ratio to heat'g surface, 1 : 71
Superheater ----- Feed-water heater -----
Reheater ----- Fire brick tubes -----

Fire Brick arch None

Grates Rocking bars with dump plate.
7 **Ash Pan,** Depth 22" Dampers Front and Back

Throttle Balance Pos. Dome
Dry pipe ~~Cast Iron or~~ Steel

Superheater None

Smokebox extension With Cleaning hole and cap L. S. Only
Spark ~~arrester~~ hopper With
Netting and deflect. plates With
Smoke consumer applied to R. and L. sides of firebox end to smokebox.
Smoke consumer ~~to~~ not be applied to back sheet.
Exhaust nozzles Double High

Stack Straight Diam. 18" Hole in S.B. 21½"

Safety Valves (spac) Two Coale 3"
Safety valves One with relief lever, Set to 180 lbs.
Whistle Crosby

Steam Gauge One Iron 7" Maker, Crosby (spac)
Steam gauge stand Iron **Clock** None

Water Gauge (See Sup. 9) **Cab lamps** to burn oil.
Gauge Cocks Three Beck Surface valve None
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve without separate dry pipe to dome.
Blower Valve B. L. W.

Blow off Cock Two Everlasting. Pos:- { One in throat and one under waist in front.
Cleaning Plugs
Firebox Corners and Back
Crown, Two each side and two back
Waist, None
Front tube sheet, One. Fusible Plug, One.
Two plugs each side near expansion plates so water space between bolts can be cleaned.
Pump None Pos. -----
Top chamb. ----- Bottom chamb. -----
Feed cock ----- Feed pipes -----
Checks ----- Check pipes -----

10 **Injectors** (spac) Two Sellers, class K No. 9½
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. Right and Left

Steam Heat None

11-12 13 **Cab** Steel. Ventilator in cab roof.

12 Cab boards Steel Nosing T-Iron
Running boards Steel Nosing T-Iron
Hand rail Iron Located on Boiler

14 **Back Bumper** Bar Steel Back drawbar height 35½"

17 **Pilot** None Pushing shoes Front
16 **Front Bumper** Oak Bumper plate None
15 **Steps** across front with handrail.

Front Drawhead, Center above rail 33⅛"
Coupler Sharon M. C. B. Auto. fitted in steel socket.
Holes in socket plate to be 10"x 16" with 1⅛" bolts.
Front yoke casting bolts to have double nuts 7-16-14
Flag fixtures (See Sup. 18)

Headlight to be Dressel #251 with #100-A burner.
Headlight Two 22" Reflector, To burn Kerosene
Headlight, Nos. on sides With H'dl't step On Bumper and Smokebox
Lamp shelf None Nosing -----

Bell 92 pounds. Gollmer Air Bell Ringer.
Sand Box (spac) Two Diam. 28" Body Iron Ptd. Pipes Iron
Sander Leach Air, trap A-1, to sand front end back

Dome casing Iron Painted

27 **Boiler Jacket** #22 Soft Steel Ptd. Bands Iron Style 9
Boiler Lagging Magnesia Sectional

THE BALDWIN LOCOMOTIVE WORKS
Engine J. E. Schmidt Switcher
SPECIFICATION FOR LOCOMOTIVES 6 34 D 926
FOR Newburgh & South Shore Ry. Co. 152
J. Furnish Prints (See Sup. 5)

Frames Cast Steel Braces Solid

Cylinders, Diam. 20" Stroke 26"
St'm ports, Length 16" Width 1½" Bridges 1"
Exh. ports, Length 16" Width 2½" Valve lead 1/16"
Valve travel 5½" O. S. lap ¾" Ins. lap -----
Eccentric ~~crank~~ throw 5½"
S. F. Lubr. Nathan Triple Bulls Eye (spac) { Copper pipes under jacket with ~~auto.~~ stm. chest plugs. (K & M Co. Style)
Cyl'r heads Cast Iron
Cyl'r casings Iron Ptd. Head covers Steel Painted
St'm chest casings Iron Ptd. Covers " "
19 St'm chest valves Richardson balanced, with vacuum valves.
Met. pkg { PISTON RODS / VALVE STEMS } UNITED STATES, King Type. (spac)

Pistons Cast iron rings sprung into solid head.
Guides Laird Type, Steel Oil cups Needle
Crossheads Cast Steel, Bresses as Co's print.
Wrist Pins Steel Rod cups { Grease cups forged on, fitted with steel plugs.
Parallel rods to have solid ends.

Valve Motion Stephenson
{ Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 52" Cen. diam. 44"
DRIVERS, Centers, Main Cast Steel, Others Cast Iron.
Tires Steel (Sup 20) Held by Shrinkage & Shoulder
Tires, Flanged, Pos. ALL Size 4"x 5½"
Tires, Plain, Pos. None Size -----
Lateral play between driving boxes and wheel hubs = 1/16" total
Driving Boxes Steeled Cast Iron
Journals, Diam. 8½" Length 8½"

Driving spring staples Wrot Iron

Springs. Make Vanadium Steel, Standard Steel Works.
Spring rigging arranged same as on 6 34 D 726.
Front Engine Truck None Wheeled -----
To swing ----- each side of cen. Cen. pin liners -----
Journals, Diam. -----Length ----- Boxes -----
Wheels, Diam. ----- Tread ----- Kind -----
Tires ----- Cen. diam.----- Size-----
Tires held by-----

Back Engine Truck None Wheeled -----
To swing ----- each side of cen. Cen. pin liners -----
Journals, Diam. -----Length ----- Boxes-----
Wheels, Diam.----- Tread ----- Kind -----
Tires ----- Cen. diam. -----Size -----
Tires held by -----

25 **Brake,** position On All Driving and Tender Wheels.
Operating Parts { Engine, Sch. 6-ET, West'g. Comb. Auto. & Straight Air. / Eng. Tr'k, sch. -----
Foundation Parts { Drivers, sch. WM-2, American Outside Equalized. / Eng. tr'k, sch. -----
26 Air pump One 9½" Pos. Left Side
Train connections Front and Back
Train signal, sch. None

51 **Tender** Eight Wheeled, Drawing No. 435
Weight, with fuel and water, about 80,000 lbs.

52 **Tank** 4000 Gallons, Bill 3834
Tank "U" Shape, Sloping Back. Fuel Capacity 9 tons.

Tool Boxes Two, Hard Wood, on tank.

Frame Steel 10" channels.

53 54 Front drawbar height 33⅜"
Pushing Shoes, At Rear.
53 55 Back drawhead, center above rail 33½"
Coupler Sharon M. C. B. Auto. with Cardwell friction draft gear.

Steps (See Sup. 56 - 57)

Trucks All Metal, with Cast Steel I beam bolsters.

Springs Elliptic, Standard Steel Works Vanadium Steel.
Journals, Diam. 4½" Length 8"
Wheels, Diam. 33" Tread 4½" Kind Schoen Rolled Steel
Tires None Cen. diam. ---- Size -----
Tires held by ----- Rims 2⅜" thick.
Safety chains Single

58 **Brake** Position On All Wheels.
Brake sch. 6-ET, West'g. Auto. & Straight Air with 10"x 12" cyl'r.

List of tools, sch. 29 Bolts, nuts and threads B. L. W. (see sup. 28)
Photo sch. None Inspection (See Sup. 1 to 4)
To be weighed No Material spec'ns B. L. W.
Certificate of boiler test Three copies of B. L. W. form 611.
Junior laws to 6-11-14 Shipment On Own Wheels.

Brass shop finish, No. 1.
Machine shop finish D-165

Patent Plates { Throttle Patented Jan. 23, 1900. (Cast On) / Feed Pipe Strainer Patented Sept. 1, 1903. (Cast On)

Property plates None.

Painting:—Engine, style 291 Olive Green and Aluminum.
Painting:—Tender, style 291 " " " "
Lettering and trade mark as Co's stencils.
Lettering, etc. in silver white, same as for 6 34 D 876 &c.
Mark on cab panels under windows, Ry. Co's trade mark.
Mark on tank sides, NEWBURGH & SOUTH SHORE RY.

No. Pos.	Road No.	Name
F. No. Plate	37	None
F. Sand Box		
Back of Tank		

11. 266-67 Photo copied see box

SPECIFICATION FOR LOCOMOTIVES, 6 34 D 926

FOR, Newburgh & South Shore Ry. Co.

J.

1 All materials manufactured or sold by any of the constituent companies of the U. S. Steel Corporation, which are used in the construction of this loco. are to be purcased from such companies.

2 Locomotive to be inspected by representative of Carnegie Steel Company.

3 Send to C. F. W. Rys, Metalurgical Engineer, Carnegie Steel Co., Pittsburg, Pa., copies of orders covering boiler and firebox plates, axles, tender wheels, driving wheel centers, tires, driving boxes, tender journal boxes, all journal bearings, and bushings, springs, frames, tubes, staybolts, and any wrought iron parts.

4 Notify C. F. W. Rys, Metalurgical Engineer, Carnegie Steel Co., Pittsburg, Pa., three days before we start boiler work and machine work so he can arrange for the inspection. Notify C. F. W. Rys, a day or two before we start rivet work on the boilers and the cylinders are to be tested.

5 Furnish to Ry. Co. one complete set of blue-prints after loco. has been delivered.

6 Design of boiler and details of boiler construction to be in accordance with the Ohio State Law.
Ohio State inspection not required.

7 Ash pan to be self dumping of the same type as used on National Tube Co's loco. at McKeesport. See Ry. Co's print furnished for 6 34 D 876.

8 Pipe line to be applied on right side of dome 1¼" diam. to front beam of engine, with valve at dome and one at side of smokebox.

9 Water gauge provided with Sargent water glass protecter.

10 Injectors improved self acting type, for hot water.

11 Wood lining to be applied inside of cab under windows, right and left.

12 Apply a wood floor on running board inside of cab.
APPLY SHOVELLING PLATE ¼" THICK IN CAB 8/3/14

13 Curtain in back of cab.
Drop seat on engineer's side of cab and box on fireman's side.
Box for three two gallon and one one gallon oil cans located under running board.

14 Chafing plates of steel as Ry. Co's print between engine and tender.

15 All safety appliances to be applied according to Gov't. Laws.

16 Front bumper to be backed with steel or iron plate.

17 Safety chains as Ry. Co's print, front of engine.

18 Flag marker fixtures on hand rail of engine.
Lamp fixtures on sides of smokebox.

19 Valve stem 1¾" diam. to be marked and gauge supplied.

20 Driving tires of Vanadium Steel, purchased from the Railway Steel Spring Co.

25 Brake complete, except main air drums, to be furnished free by Ry.
Give Ry. Co. specification for the air brake equipment.

26 Air pump to be fitted with King Type metallic packing. Steam exhaust from air pump to be ~~applied outside of smoke stack.~~ piped up the smoke stack. 8/3/14

27 ~~Where the cross guards bolt to the ring of the smoke stack there are to be applied~~

28 ~~Bolts for cinder chute to be~~

29 Jacket over stay bolts to be removable ~~Apply angle iron on sides of fire box at bottom of jacket to prevent lagging from falling down~~ ~~Ohio angle iron to be applied~~ 8/3/14

TENDER

37 Lattice work on coal box to keep coal from rolling off.

52 Water cover oblong 3' 0" x 2' 0"
TANK STAY RODS TO HAVE JAWS ON EACH END CONNECTING TO ANGLE IRON RINGS

53 Front and back bumper beams of wood with steel back plate.

54 Chafing plates of steel as Ry. Co's print between engine and tender.
Safety chain U bolt at front of tender frame to have nut on back.

55 Safety chains as Ry. Co's print back of tender.

56 Steps across rear of tender with handrail.
Steps on sloping back of tank on right side only.

57 All safety appliances to be applied in accordance with Government Laws, ie., I. C. C. requirements.

58 Brake Beams to be Huntoon, Extra Heavy.

For Hereafter:
Apply angle iron on sides of boiler fire box at bottom of jacket to prevent lagging from falling down (See sup 29) 8/3/14

THE BALDWIN LOCOMOTIVE WORKS — As Spec'n. C-1578. Minor details as far as practicable to be same as for 8 40 D 7 & 8.

Memorandum Spec'n 17009.

SPECIFICATION FOR LOCOMOTIVES 6 38 D 68 to 70. — Gen. No. 6003. — (Except omit platforms front and back and tender to have sloping back.

FOR Newburgh & South Shore Railway Company. — Engine Drawing No. 16.

L. — 1-16-17.

Gauge of Road 4'8½" Play ⅜"
Wheelbase, Rigid 11'0" Driving 11'0" Total 11'0"
Total wheelbase, eng. and tend. { Actual 44'0" / Limited to ----
Rails, 90 pounds. Steel Ties, 70#
Curves 25 degrees.

Limits, Height 14' 10" Width 10' 2"
Weight (approximate) in working order, Total 178,000 pounds.
On F. tr'k ----- lbs., Drivers 178,000 lbs., B. tr'k ------- lbs.

Tractive power 42090 lbs., Ratio of adhesion 4.2
Work'g St'm Pres. 190 lbs., Service Switching.
Fuel Bituminous Coal.

Front tube sheet to be ½" thick.
69 **Boiler** Steel. Thick ⅜" Bill 8073.
Boiler, Diam. 72" Plan Straight Top.
Boiler st'm pres. 200 lbs., Tested to { 220 lbs. steam pres. / 267 lbs. water pres.
With factor of safety of 5.16
9 Longitud. seams Butt jointed double covering strips, sextuple riveted, 90% seam.

7 **Dome,** diam. 33" Pos. Central.

9 **Firebox** Steel. Combustion chamb. None.
Firebox, length 77⅛" Width 72½ Depth F. 71⅞" B. 69⅜"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back ⅜"
Firedoor opening One oval 16" x 20" (See sup. 10-11)
Water space, Front 4½" Sides 4" Back 4"
Water space, Frame Double. Riveted (See sup. 9)
12 Water space stays 15/16" diam with 3/16" hole, 1¼" deep from O.S.

Radial stays 1" diam. Sling stays front { Three rows of B.L.W. Expansion Stays.
Button heads below crown on Ten. central rows
Crown bars None. Placed --- above crown
Crown bolts ----

Flues #9 W.G. Seamless Steel. (Sup. 13)
Tubes #11 N.G. Spellerized Steel. (See sup. 13)
Tube ends Swaged for copper ferrules, fire box ends.
Number 183 Diam. 2" Length 15' 0"

Heating Surface	Flues 601	Combus. Chamb. None	Total	2196
	Tubes 1429	Fire Box 146	Fire Brick Tubes	20
Grate area 38.9		Ratio to Heating Surface 1 :		56.4
Superheater 505				

14 **Fire Brick** Arch. American, on four tubes 3" O.S. diam. of Seamless Steel 3/16" thick.

Grates Rocking bars and drop plate.
Ash Pan, Dampers None (See sup. 15)

Throttle to be provided with auxiliary drifting valve
Throttle Balance. (Sup. 29) Pos. Dome.
Dry pipe Steel.

Superheater (See sup. 16)

Smokebox extension with 17 Clearing hole and cap L.S. Only.
Spark ejector or hopper with.
Netting and deflect. plates with (See sup. 21)

Exhaust nozzles Single high.

Stack Straight. Dia. 19" Hole in S. B., dia. 22¼"

Safety Valves Two Crosby 3" (See sup. 22)
Safety valves None with relief lever, Set to 190 pounds.
Whistle Crosby Chime (See sup. 22)

2 **Steam Gauge** One Iron 7" MAKER:- Crosby. (Spec)
Steam gauge stand Iron. **Clock** None
Water glass to have Sargent protector.
Water Gauge One B. L. W. **Cab Lamps** Electric.
2 **Gauge Cocks** Three Back. Surface valve None
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve without separate dry pipe to dome
Blower Valve Riggin, quick opening and closing valve.

Blow off Cock Two Everlasting. POS:- (See sup. 24)
Cleaning Plugs One plug above fire door.
Firebox Corners Diagonal, sides, front and back.
Crown, Two right side, three left side and four back.
Waist, One under front.
Front tube sheet, Two. Fusible plug One

Pump None. Pos. ----
Top chamb. ---- Bottom chamb. ----
Feed Cock --- Feed pipes ----
Checks ---- Check pipes ----

24 Injectors to be lifting type, for hot water.
27 **Injectors** (Spec) Two Sellers Class "K" No. 10½
Injectors, Pos. Right and left. Steam pipes Copper.
Pipes, Check Iron. Feed Iron. Overflow Iron.
Check B. L. W. (Sup. 26) Pos. Right and Left.

Steam Heat None.

Cab Steel Plate. (See sup 28-29)

Cab boards Steel. Nosing T-iron.
Running boards Steel. Nosing 3" x 3" angle iron.
Hand rail Iron. (Sup. 72) Located on Boiler.

3 **Back Bumper** Bar Steel. Back drawbar height 33¼"

Pilot None. Pushing shoes at front.
Front Bumper Oak. (Sup. 36) Bumper plate with.
Steps across front (Sup. 37) with hand rail.
Steps, hand holds, etc., to conform to I.C.C. requirements.
Front Drawhead, Center above rail 33½"
Coupler Sharon M. C. B. Automatic. (See sup. 38-39)

Signal fixtures (See sup. 40)

13 **Headlight** Two Round Case 18" Reflector,
Headlight, Nos. on sides with H'd'l't step with
Lamp shelf None. Nosing ----

Bell 92 pounds. Gollmar Air Bell Ringer. (Sup. 29)
Sand Box Two. Diam. 31" Body Iron painted. Pipes Iron.
23 33 Sander (Spec) Leach Air, Trap A-1, with Duplex Engineer's valve.

Dome casing Iron painted.

Boiler Jacket, #22 Soft Steel Pt Bands Iron. Style 9 & 14
Boiler Lagging Magnesia Sectional. (See sup. 42)
Back head of boiler to be lagged and jacketed.

11-266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS — N. O. Nelson — July 1917

SPECIFICATION FOR LOCOMOTIVES 6 38 D 68 to 70. — 155

FOR Newburgh & South Shore Railway Company.

Furnish prints, (See sup. 5)

45 **Frames** Cast steel, annealed. Braces Solid.

46 **Cylinders,** Diam. 22" Stroke 28"
St'm ports, Length 2½" Width 1⅜" Bridges -----
Exh. ports, Length ----- Width ----- Valve lead ¼"
Valve travel 5" Steam lap ⅞" Exhaust clearance -----
Eccentric crank throw 1⅝" By-pass valve None
S. F. Lubr. (Spec) Nathan Five Feed Bulls Eye. (Sup. 47)
Cyl'r heads Cast Iron.
Cyl'r casings Iron Ptd. Head covers Steel painted.
St'm chest casings ---- Covers ----
St'm chest valves 11" diam. Piston Valves, built up type.
Met. pkg { Piston rod / Valve stems } U. S. King type, No. 10 metal. (Spec)

Pistons (See sup. 3-48)
Guides Steel. Oil cups Needle.
Crossheads Alligator type, cast steel. (Sup. 51)
3 **Wrist Pins** Steel. Rod cups (See sup. (Sup. 49-51)
Parallel Rods to have solid ends.

Valve Motion Walschaerts. (See sup. 50-51)
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

4 All threads on bolts (except staybolts) to be United States Standard.
5 All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.
Driving wheels to have hub liners of Bronze.
Drivers, O. S. Diam. 52" Cen. diam. 44"
Wheel Centres,- Main Cast Steel, others, cast iron.
52 **Tires** Vanadium Steel Held by Shrinkage and Shoulder.
Tires, Flanged, Posn. All. Size 4" x 5½" ✓
Tires, Plain, Pos. None. Size ------
Lateral play between driving boxes and wheel hubs- ⅛" total.
Driving Boxes Cast Steel.
9 **Journals,** Diam. 10" Length 13"

Springs. Make Railway Steel Springs Co's. (See sup. 54)

Front Engine Truck None. Wheeled ----
To swing ---- each side of cen., Cen. pin liners ----
Journals, Diam. ----Length --- Boxes -----
Wheels, Diam. --- Tread --- Kind ---
Tires ---- Cen. diam. --- Size ---
Tires held by ----

Back Engine Truck None. Wheeled ---
To swing --- each side of cen., Cen. pin liners ---
Journals, Diam. ---Length --- Boxes ---
Wheels, Diam. --- Tread --- Kind ---
Tires --- Cen. diam. --- Size ---
Tires held by -----

36 **Brake,** position On all driving and tender wheels.
1a 39 Operating Parts { Engine, Sch. No. 6-ET West'g. Combined Auto. and Straight Air. / Eng. Tr'k, schm------
Foundation Parts { Drivers, sch. DM-3 BC American O.S. Equalized. / Eng. Tr'k, sch. -----
Air pump Two 11" Pos. Both left side.
Train connections Front and back.
Train signal, sch. None.
Contracts dated June 6th 1917 and June 6th 1917 between Baldwin Locomotive Works and Nelson Manufacturing Co. and Westinghouse Air Brake Co. are filed in Main Office, File No. 344

60 **Tender** Eight Wheeled, Drawing No. 435
Weight, with fuel and water, about 100,000 pounds.

60 **Tank** 5,000 Gallons. Bill 3,887
Tank "U" shape, with sloping back. Fuel capacity 12 tons.

Tool Boxes of Steel Top.

Frame Steel 10" channels.

71-72 Front Drawbar height 33¾"
Pilot None. Pushing shoes at rear.
Back drawhead, center above rail 33½"
Coupler (See sup. 73-74)

75 Steps Hand holds, etc., to conform to I. C. C. requirements.

Trucks Arch Bar type, all metal, with "I" beam bolster.

Springs Elliptic., Railway Steel Spring Co's.
Journals, Diam. 5" Length 9"
Wheels, Diam. 33" Tread 4¼" Kind Schoen rolled steel.
Tires ----- Cen. diam. ---- Size ----
Tires held by ------ Wheel rims, 2½" thick.
Safety chains Single.

Brake Position On all wheels.
Brake sch. No. 6-ET West'g. Auto. and Straight Air with 12" x 12" cylinders. Slack adjuster on tender. (Sup. 76)
Tender brake beams to be Huntoon, extra heavy type.

List of tools. sch. 29 (See sup.
Photo sch. None. Inspection (See sup. 1-2)
To be weighed No. Material specified B. L. W. (See sup. 1-2)
Certificate of boiler test Three copies of B.L.W. form 1036.
Junior laws to 7-20-17 Shipment On own wheels.

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. Patents } Steam pipe cover, patented Sept. 1, 1903 (Cast On.)

Property plates None.

Painting:—Engine, style 201 Olive Green and Aluminum
Painting:—Tender, style 201 Olive Green and Aluminum

Lettering and Trade Mark as Ry. Co's stencils.
Mark on Cab panels under windows, Ry. Co's Trade Mark.
* Mark on tank sides. { Newburgh & South Shore / (South Shore Belt Line)

Road Nos. Pos. Road Nos. 42 to 44. Name None.
F. No. Plate.
F. Sand Box.
Back of tank.

* Lettering, etc., to be in silver white, same as for 8 40 D 7 etc. The words "SOUTH SHORE BELT LINE" under the name of the road on tank sides are to be enclosed in a long bracket.

1 ALL MATERIALS MANUFACTURED OR SOLD BY ANY CONSTITUENT COMPANY OF THE UNITED STATES STEEL CORPORATION WHICH ARE USED IN THE CONSTRUCTION OF THE LOCOMOTIVE ARE TO BE PURCHASED FROM THAT COMPANY.
SEND TO E. E. STONE, GEN. P. A., AMERICAN STEEL AND WIRE CO., COPIES OF ALL ORDERS ON THE UNITED STATES STEEL CORPORATION OR ANY OF ITS SUBSIDIARY COMPANIES, SEND TO HIM ALSO COPIES OF OUR ORDERS FOR TUBES.

2 LOCOMOTIVE TO BE INSPECTED BY C. F. H. RYS, METALLURGICAL ENGINEER, CARNEGIE STEEL COMPANY, PITTSBURGH, PA. ADVISE HIM A FEW DAYS IN ADVANCE OF TIME WE START WORK IN SHOPS SO THAT HE CAN ARRANGE TO HAVE HIS INSPECTORS HERE.

3 DRIVING AXLES, PISTON RODS AND CRANK PINS TO BE MARKED IN ACCORDANCE WITH I.C. C. REQUIREMENTS.

4 ALL BOLTS FOR PIPE CLAMPS TO HAVE DOUBLE NUTS.

5 ONE COMPLETE SET OF BLUE PRINTS TO BE FURNISHED TO RY. CO. AFTER DELIVERY OF LOCOMOTIVE.

6 BOILER TO BE BUILT TO COMPLY WITH THE REQUIREMENTS OF THE OHIO STATE R. R. COMMISSION, AND THE I.C.C. REQUIREMENTS.

7 DOME TO BE ARRANGED TO PROVIDE FOR INSPECTION WITHOUT REMOVING THROTTLE. EDGE OF DOME OPENING IN BOILER TO BE CHIPPED SMOOTH, SO THAT MAN ENTERING BOILER WILL NOT HAVE TO CONTEND WITH ROUGH EDGE. (SEE SUP. 8-22-25-35)

8 OMIT AUXILIARY DOME

9 FIREBOX SIDES, BACK AND THROAT SHEETS TO BE WELDED TO MUD RING FOR A DISTANCE OF 12" EACH WAY FROM THE CORNER.

10 FIRE DOOR OPENING TO HAVE O'CONNOR FLANGE. (SEE SUP. 80)
ROYALTY ON O'CONNOR FLANGE TO BE PAID BY THE B.L.W.

11 FIRE DOOR TO BE FRANKLIN NO. 8.

12 FLEXIBLE STAYBOLTS TO BE AMERICAN, COMPLETE INSTALLATION ~~949 IN NUMBER~~, INCLUDING CROWN STAYS, FROM AMERICAN Except for radial rows. HAS Tires
FLEXIBLE BOLT CO., PITTSBURGH, PA.

13 TUBES (2" AND 5½") FROM NATIONAL TUBE CO.

14 SMOKE CONSUMER TO BE APPLIED TO SIDE SHEETS OF FIRE BOX.

15 ASH PAN TO BE SELF-DUMPING TYPE, RY. CO'S STANDARD, SIMILAR TO 6 38 D 62.

16 SUPERHEATER AS LOCOMOTIVE SUPERHEATER CO'S SPEC'N., NO. O-7326, DATED MARCH 26, 1917., COPY ATTACHED.
SUPERHEATER TO BE SCHMIDT TYPE, CONNECTING WITH TOP HEADER IN SMOKE BOX, AND WITH OUTSIDE STEAM PIPE CONNECTION TO VALVE CHAMBERS.
ROYALTY ON SUPERHEATER PAYABLE BY THE B. L. W.

17 HAND HOLE AND CAP TO BE APPLIED IN EACH SIDE OF SMOKE BOX FOR INSPECTION OF SUPERHEATER.

21 SMOKE BOX NETTING TO BE DRAFTAC, NO. 393, MADE BY W. S. TAYLOR COMPANY, CLEVELAND, OHIO.

22 WHISTLE AND SAFETY VALVE TO BE APPLIED INSIDE OF MAIN DOME. (SEE SUP. 7-8)

23 GAUGE COCKS TO BE "NEVERLEAK" TYPE AND TO HAVE DRIP PAN ON BACK HEAD.

24 BLOW OFF COCKS.- ONE IN THROAT AND ONE UNDER WAIST NEAR BACK TUBE SHEET.

25 STEAM PIPE LINE TO BE APPLIED ON RIGHT SIDE OF DOME, 1¼" DIAMETER TO FRONT BEAM OF ENGINE, WITH VALVE AT DOME AND ONE AT SIDE OF SMOKE BOX.

26 INJECTORS TO HAVE COMBINATION STEEL AND BRONZE NUT.
BOILER CHECKS TO BE SIMILAR TO 8 40 D 7 & 8 AND TO HAVE FLANGED CONNECTION TO BOILER, WITH SCREW END FOR PIPE.

27 FUEL SPRINKLER (SELLERS SAFETY) IN LEFT SIDE OF CAB

28 ALL STEAM AND AIR GUAGES TO BE PLACED ON BOILER HEAD IN PLAIN SIGHT OF ENGINEER.

29 THE FOLLOWING TO BE LOCATED IN POSITION SO THAT ENGINEER CAN OPERATE SAME WITH HEAD OUT OF CAB WINDOW:-
THROTTLE LEVER.
POWER REVERSE GEAR LEVER.
BRAKE VALVES.
BELL RINGER VALVE.
SANDER VALVES.

30 CAB TO HAVE COPPER GUTTERS ABOVE SIDE WINDOWS.
CAB TO BE WOOD LINED THROUGHOUT.
WOOD FLOOR TO BE APPLIED ON RUNNING BOARDS INSIDE OF CAB
SHOVELLING PLATE ¼" THICK TO BE APPLIED IN CAB.
CAB APRON HINGE BOLTS TO HAVE COTTERS.
~~SHIELD TO BE PROVIDED OVER REVERSE LEVER ROD IN CAB.~~
CURTAIN TO BE APPLIED AT BACK OF CAB.
DROP SEAT ON ENGINEER'S SIDE OF CAB AND BOX SEAT ON FIREMAN'S SIDE, WITH CUSHIONS AND ARM RESTS.

31 CAB SIDE WINDOWS TO HAVE FOUR PANES IN EACH SASH.
STORM WINDOWS TO BE PROVIDED IN FRONT OF CAB DOORS.

32 BOX FOR THREE TWO-GALLON AND ONE ONE GALLON OIL CANS TO BE LOCATED UNDER RUNNING BOARDS, ON LEFT SIDE.

33 ECONOMY DEVICES CORPORATION RADIAL BUFFER TO BE APPLIED BETWEEN ENGINE AND TENDER. (SEE SUP. 71)

34 HAND RAILS ON SIDES OF BOILER TO EXTEND FROM CAB TO FRONT OF SMOKE BOX, WITH CIRCULAR HAND RAIL ON FRONT OF SMOKE BOX DOOR RIM.

35 STEAM DOME AND SAND BOXES TO HAVE CIRCULAR HAND RAILS NEAR TOP WITH SUITABLE STEPS ON SIDES OF BOILER.

36 FRONT BUMPER TO HAVE STEEL PLATE IN FRONT AND BACK OF BUMPER.

37 FOOT BOARD ACROSS FRONT TO BE OF ONE SECTION WITH FOUR HANGERS.

38 COUPLER TO HAVE STEEL BUSHING IN SHANK AND 11" KNUCKLE WITH NACO LOCK, AS NATIONAL MALLEABLE CASTINGS CO'S PRINT 10290-G.
FRONT COUPLER TO BE FITTED IN STEEL POCKET WITH EXTENDED FLOOR AS NATIONAL MALLEABLE CASTINGS CO'S PRINT 11807-G, SECURED WITH 1½" BOLTS, IN HOLES SPACED 10" X 16".
BOLTS TO HAVE DOUBLE NUTS.

11-266-67 Photo copied see box

41 SAFETY CHAINS TO BE APPLIED AT FRONT OF ENGINE AS RY. CO PRINT DATED CLEVELAND, OHIO, DEC. 5, 1908.

42 LAMP FIXTURES ON SIDES OF SMOKE BOX.
FLAG FIXTURES ON HAND RAIL OF ENGINE.

43 HEADLIGHT EQUIPMENT TO BE PYLE NATIONAL ELECTRIC TYPE "K" WITH INCANDESCENT HEADLIGHTS.
FRONT HEADLIGHT TO BE APPLIED TO SMOKEBOX DOOR. (SUP. 70)
CAB LIGHTS TO INCLUDE ONE DROP LIGHT FOR LUBRICATOR 10/6/17.

44 JACKET OVER STAYBOLTS TO BE REMOVABLE.
ANGLE IRON TO BE APPLIED ON SIDES OF FIRE BOX AT BOTTOM OF JACKET TO PREVENT LAGGING FROM FALLING DOWN.

45 FRAMES TO BE MADE WITH FRONT AND BACK LUGS FORGED ON FOR CYLINDER CONNECTIONS.

46 CYLINDER COCKS TO BE WATERTOWN AUTOMATIC, WITH OPERATING LEVER LOCATED CONVENIENT FOR ENGINEER TO OPERATE WITH FOOT

47 CYLINDER LUBRICATOR TO HAVE AUXILIARY OILER FOR AIR PUMP AIR CYLINDER, AND TO BE ATTACHED TO BOILER HEAD AT POINT IN PLAIN SIGHT OF ENGINEER. (SEE SUP. 29)
LUBRICATOR PIPES OF COPPER UNDER JACKET, WITH STEAM CHEST PLUGS.

48 PISTON HEADS TO BE SOLID OF CAST IRON WITH CAST IRON RING SPRUNG IN.

49 RODS TO HAVE GREASE CUPS FORGED ON, FITTED WITH STEEL PLUGS.

50 RAGONNET POWER REVERSE GEAR, ASSEMBLED FOR USE WITH AIR OPERATION ONLY, COVERED BY EXTRA ORDER 3418 DATED 3-30-17

51 CASTLE NUTS TO BE APPLIED ON VALVE MOTION PINS, SIDE ROD KNUCKLE PINS, CROSSHEAD PINS AND WRIST PINS.

52 DRIVING TIRES TO BE PURCHASED FROM THE RAILWAY STEEL SPRING CO.

53 DETROIT FLANGE LUBRICATOR TO BE PIPED TO FRONT OF FRONT DRIVERS AND TO BCK OF BACK DRIVERS.

54 DRIVING SPRING LINKS TO STRADDLE THE FRAME AND TO BE EXTRA STRONG HAVING AMPLE CLEARANCE FROM THE FRAME AND TIRES.
SPRING HANGERS TO BE MADE OF VANADIUM STEEL.
ALL HANGER HOLES IN SPRING RIGGING WHICH ARE SUBJECT TO WEAR ARE TO BE BUSHED.

55 BRAKE FIXTURES, (WEST'G. AND AMERICAN) INCLUDING AIR DRUMS TO BE PURCHASED FROM THE BRAKE COMPANIES AT THE R. R. CO'S SPECIAL PRICE.

56 AIR PUMP TO BE FITTED WITH KING TYPE METALLIC PACKING.
AIR PUMP EXHAUST TO BE PIPED INTO CYLINDER SADDLE.
NATHAN SIGHT FEED LUBRICATOR SELF CLOSING TYPE, FOR AIR PUMP AIR CYLINDER.

57 AIR RESERVOIRS TO BE WEST'G ENAMELLED AND TO HAVE HYDROSTATIC TEST OF 210 POUNDS.
AIR RESERVOIRS TO HAVE SUFFICIENT CAPACITY FOR THE RAGONNET POWER REVERSE GEAR.

58 AIR GAUGES TO BE WEST'G. AIR BRAKE CO'S STANDARD. (SUP. 28)

59 DRIVER BRAKE CYLINDERS TO HAVE J.M. EXPANDER RINGS.
BRAKE GEAR TO HAVE CASE HARDENED PINS AND BUSHINGS AS COVERED BY AMERICAN BRAKE CO'S "BC" SCHEDULE.

TENDER.

65 TENDER TO BE DUPLICATE OF 8 40 D 7 & 8, EXCEPT WHERE OTHERWISE SPECIFIED.

66 TANK STAY RODS TO HAVE JAW ON EACH END CONNECTING TO SIDE TEE IRONS.

67 WATER HOLE COVER TO BE OBLONG, 36" x 24"

68 COAL GATES OF STEEL, DOOR TYPE,
LATTICE WORK ON COAL BOX TO KEEP COAL FROM ROLLING OFF.

69 THE LUGS THAT HOLD TANK TO FRAME TO BE RAISED ½" SO THAT WHEN BOLTS ARE PULLED UP, THE LUGS WILL NOT REST ON THE FRAME.

70 REAR HEADLIGHT TO BE IN CENTRE OF BACK OF TENDER.

71 ECONOMY DEVICES CORPORATIONS RADIAL BUFFER TO BE APPLIED BETWEEN ENGINE AND TENDER. (SEE SUP. 33)

72 SAFETY CHAIN "U" BOLT ON FRONT OF TENDER FRAME TO HAVE TWO NUTS.

73 COUPLER TO BE NATIONAL MALLEABLE CASTINGS CO'S SHANK M. C. B. AUTO. WITH CARDWELL FRICTION DRAFT GEAR.
COUPLER TO HAVE 11" KNUCKLE WITH NACO LOCK.

74 SAFETY CHAINS AT REAR, SEE RY. CO'S PRINT DATED DEC. 5TH 1908.

75 FOOT BOARD ACROSS BACK TO BE OF ONE SECTION WITH FOUR HANGERS AND WITH HAND RAIL.
STEPS ON SLOPING BACK OF TANK, ON RIGHT SIDE ONLY.

76 BRAKE FIXTURES (WEST'G. AND AMERICAN.) AIR DRUMS, TO BE PURCHASED FROM THE BRAKE COMPANIES AT THE R. R. CO'S SPECIAL PRICE.
TENDER BRAKE CYLINDERS TO HAVE J. M. EXPANDER RINGS.

80 LICENSE PLATES 4497 TO 4499, HEREWITH, FURNISHED BY PRATT & O'CONNOR, COVERING THE O'CONNOR FIRE DOOR FLANGE TO BE APPLIED TO BACK HEAD OF BOILER BY MEANS OF ¼" EXTENSION STUDS TAPPED HALF WAY THRU THE SHEET 9/24/17

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-1789

Memorandum Spec'n 10476 Minor details to be same as for 6 34 D 876-877

SPECIFICATION FOR LOCOMOTIVES 8 40 D 6

FOR Newburgh & South Shore Railway Co. Illegible as blue-print from tracing 25403

D 5.27.15 **Engine Drawing No.** 2

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 11'6" Driving 11' 6" Total 20'0"
Total wheelbase, eng. and tend. {Actual 50' 5½" / Limited to -----
Rails 90 lbs. Steel **Ties** 70%.
Curves 25 degrees **Grades** {2 miles, 60 ft. per mile / 2 miles 52 ft. per mile

Limits, Height 15'6" Width 10'2"
Weight (as estimated in working order), Total 189,000 lbs.
On F. Trk 22,000 lbs., Drivers 167,000 lbs., B. Trk ----- lbs.

Tractive power 40,680 lbs. Ratio of adhesion 4.1
Work'g St'm Pres. 150 lbs., Service **Freight and Switching**
Fuel Soft Coal

2 **Boiler** Carnegie Steel Thick ½" Bill 7471
Boiler, Diam. 80" Plan Straight Top
2 Boiler st'm pres. 200 lbs., Tested to {220 lbs. steam pres. / 267 lbs. water pres.
Longitud. seams Butt jointed, double covering strips, sextuple riveted, 90% seam
11½ **Dome,** diam. 33" Pos. Central

9 **Firebox** Carnegie Steel Combustion chamb. None
Firebox, length 96-3/16" Width 75½" Depth F. 76⅛" B. 65"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
7 Firedoor opening One oval 16" x 20"
Water space, Front 4½" Sides 4" Back 4"
Water space, Frame Double Riveted
8 Water space stays 1" diam. with 3/16" hole 1¼" deep from O. S.
Radial stays 1½" diam. Sling stays front {Two rows of Radial / Expansion stays
Button heads below crown on Ten central rows
Crown bars None Placed ---- above crown
Crown bolts ----

Tubes {(5½") #9 BWG Seamless Steel / (2") #11 W. C. Spellerized steel from National Tube Co.
Tube ends Swaged for copper rings, fire box ends
Tubes, No {316 / 211 Diam. {5½" / 2" Length 12' 0"

Heating Surface. Tubes {5½" 537 sq ft / 2" 1529 sq ft} Firebox 165 sq ft Total 2231 sq ft
Grate area 50 sq ft Ratio to heat'g surface, 1 : 44.6
Superheater 494 sq ft Feed-water heater -----
Reheater ----- Fire brick tubes 24.8 sq ft

Fire Brick arch American on four tubes of cold drawn seamless steel, 3" O. S. Diam., 3/16" thick.

Grates Rocking bars and dump plate
10 **Ash Pan,** Depth F. 42", B. 51" Dampers None

Throttle Balance Pos. Dome
Dry pipe Wrot Iron or Steel

Superheater Schmidt. (See sup. 11, 12)

Smokebox Extension With Cleaning hole and cap L.S. only (sup.12)
Spark ejector Copper With
Netting and deflect. plates With

Exhaust nozzles Single - High

Stack Straight Diam. 19" Hole in S.B. 21½"

(Spec) **Safety Valves** Two Crosby, 3"
Safety valves None with relief lever, Set to 180 pounds
Whistle Crosby

Steam Gauge One Iron, 7" MAKER:- Crosby (Spec)
Steam gauge stand Iron **Clock** None

Water Gauge One (See sup. 13) **Cab lamps** To burn oil
Gauge Cocks Three - Back Surface valve None
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve without separate dry pipe to dome.
Blower Valve B. L. W.

Blow off Cock Two,- Everlasting. POS:- {One in throat and one under waist near back tube sheet.
Cleaning Plugs
Firebox Corners diagonal, sides, front and back
Crown, Two R.S., three L. S. and three back
Waist, One under front
Front tube sheet, Two **FUSIBLE PLUG:-** One

Pump None Pos. -----
Top chamb.----- Bottom chamb. -----
Feed cock ----- Feed pipes -----
Checks ----- Check pipes -----

Injectors, to be "hot water" type
15 (Spec) **Injectors** Two Sellers Class "K" - Lifting No. 11½
Injectors, Pos. Right and Left Steam pipes Copper
36 Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. Right and Left
Fuel Sprinkler to be provided
Steam Heat None

16 **Cab** Steel
Cab boards Steel Nosing T-Iron
Running boards Steel Nosing T-Iron
Hand rail Iron Located on Boiler

21 **Back Bumper** Bar Steel Back drawbar height 34½"

Pilot None Pushing shoes Front
Front Bumper Oak Bumper plate With (sup.22)
Steps Across front with handrail

23 **Front Drawhead,** Center above rail 33½"
24 **Coupler** Sharon M. C. B. Auto. fitted in steel pocket with extended floor, holes to be 10" x 16" having 1½" bolts.

Flag fixtures (See sup. 25)

Headlights to be Wabash, all steel
Headlight Two Round Case 18" Reflector, To burn Kerosene
Headlight, Nos. on sides With Hdl't step With
Lamp shelf None Nosing -----

Bell 92 pounds. Gollmar air bell ringer
(Spec) **Sand Box** Two Diam. 31" Body Iron Ptd. Pipes Iron
Sander Leach Air, Trap A-1, with Duplex Engineer's Valve

Dome casing Iron Ptd.
26 **Boiler Jacket** {#22 Soft Steel Painted Bands Iron Style 9 and 14
26 **Boiler Lagging** Magnesia Sectional.
Back head of boiler to be lagged and jacketed 7/22/ml

Ph. 266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS
Engine E. M. Shannon July 1915
SPECIFICATION FOR LOCOMOTIVES 6 40 D 6
FOR Newburgh & South Shore Railway Co.

159

{One complete set of Blue Prints to be furnished after delivery of locomotive.

32 **Frames** Cast Steel Braces Solid

Cylinders, Diam. 23" Stroke 26"
St'm ports, Length 27.95" Width 1½" Bridges 2⅜"
Exh. ports, Length ----- Width ----- Valve lead ¼"
Valve travel 5½" Stm. lap ⅞" Exh. lap 0"
Eccentric crank throw 13-5/16"
S. F. Lubr. (Spec) Nathan five feed bulls eye {Copper pipes under jacket / with steam chest plugs
Cyl'r heads Cast Iron
Cyl'r casings Iron Ptd. Head covers Steel Painted
St'm chest casings ----- Covers -----
28 St'm chest valves 12" Diam. Piston valves
Met. pkg {PISTON ROD / VALVE STEMS} U. S. King Type (Spec)

Pistons (See sup. 29)
Guides Steel
Crossheads (ALLIGATOR TYPE) Cast Steel Oil cups Needle
Wrist Pins Steel Rod cups {Grease cups forged on, fitted with steel plugs
Par. Rods to have solid ends.

Valve Motion Walschaerts
{Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 52" Cen. diam. 44"
Wheel Centres:- Main cast steel, others cast iron
30 **Tires** Vanadium Steel Held by Shrinkage and Shoulder
32 Tires, Flanged, Pos. All Size 4" x 5½"
Tires, Plain, Pos. ----- Size -----
Lateral play between driving boxes and wheel hubs= 1/8" total
31 **Driving Boxes** Cast Steel
Journals, Diam. 10" Length 12"

32 Driving spring staples ~~Wrot Iron~~ Cast Steel.
Spring hangers of Vanadium Steel
Springs. Makes Railway Steel Spring Co. Vanadium Steel

Front Engine Truck Two Wheeled Swing Bolster-Centre Bearing
To swing 4" each side of cen. Cen. pin liners None
Journals, Diam. 6" Length 10" Boxes Cast Iron
Wheels, Diam. 30" Tread ----- Kind Cast Iron Plate centre
30 Tires Steel Con. diam. 25" Size 2½" x 5½"
Tires held by Shrinkage and shoulder

Back Engine Truck None Wheeled -----
To swing ---- each side of cen. Cen. pin liners -----
Journals, Diam. ----- Length ----- Boxes -----
Wheels, Diam. ----- Tread ----- Kind -----
Tires ----- Con. diam. ---- Size ----
Tires held by -----

33 **Brake,** position On all driving and tender wheels
Operating Parts {Engine, Sch. #6 ET West'g Combined Auto. and Straight air / Eng. Trk, sch. -----
Foundation Parts {Drivers, sch. UH-3 American D. S. Equalised / Eng. trk, sch. -----
34 Air pump Two - 9½" Pos. Both, L. S.
36 Train connections Front and Rear
Train signal, sch. None

Tender Eight Wheeled. Drawing No. 435
Weight, with fuel and water, about 100,000 lbs.

Tank 5000 Gallons, Bill 3887
Tank "U" shape, sloping back. **Fuel Capacity** 12 tons (see sup. 1-2)
Tank stay rods to have jaws on each end to connect to side T irons
Tool Boxes Hard Wood, Top

Frame Steel, 10" Channels

Front drawbar height 33¾"

Back drawhead, center above rail 33½"
Coupler Sharon M. C.B. Auto. with Cardwell friction draft gear.

Steps, hand holds, etc., to conform to I. C. C. requirements

Trucks Arch Bar type. All metal trucks with Cast steel "I" beam bolster
Springs Elliptic, of Vanadium Steel, Railway Steel Spring Co. make.
Journals, Diam. 5" Length 9"
Wheels, Diam. 33" Tread 4½" Kind Schoen Rolled Steel
Tires ----- Con. diam. ---- Size -----
Tires held by ----- Wheel rims;- 2½" thick
Safety chains Single

Brake Position On all wheels.
33 Brake sch. #6 ET West'g Auto and Straight Air with 12" x 12" Tender cylinder.

List of tools, sch. 29 Bolts, nuts and threads B. L. W.
Photo sch. 2 Inspection (See sup. 1.2.3)
To be weighed Yes Material spec'ns B. L. W. (See sup. 1)
Certificate of boiler test Three copies of B. L. W. form 611
Junior laws to 7.1.15 Shipment On own wheels

Brass shop finish, No. 1
Machine shop finish D-165

Patent Plates {Throttle, Patented, Jan. 23, 1900 (Cast on) / Feed Pipe Strainer, Patented, Sept. 1, 1903 (Cast on) / Steam Pipe Cover, Patented, July 18, 1911 (Cast on)

Property plates None

Painting:—Engine, style 291 Olive Green and Aluminum
Painting—Tender, style 291 Olive Green and Aluminum
Lettering and Trade Mark as Ry. Co's stencils
Lettering, etc., in silver white, same as for 6 34 D 926.
Mark on cab panels under windows, Ry. Co's Trade Mark
Mark on tank sides, NEWBURGH & SOUTH SHORE RY. (SOUTH SHORE BUILT LINE)

No. Pos. Road No. Name None
F. No. Plate 31
F. Sand Box
Back of Tank

SPECIFICATION FOR LOCOMOTIVES 8 4C D 6

FOR Newburgh & South Shore Railway Co.

1 All materials manufactured or sold by any constituent Company of the United States Steel Corporation which are used in the construction of this locomotive are to be purchased from that Company.

2 Boiler to be inspected and tested by the Hartford Steam Boiler Inspection & Insurance Co. We are to notify S. B. Adams, Asst Chief Inspector when we are ready for him.

3 Inspection of locomotive to be same as for 6 34 D 923, i.e. Locomotive to be inspected by representative of Carnegie Steel Company.
Send to C. F. W. Rys, Metallurgical Engineer, Carnegie Steel Co., Pittsburgh, Pa., copies of orders covering boiler and fire box and tender sheets, boiler braces, all axles tender wheels, driving wheel centres, tires, driving boxes, tender journal boxes, all journal bearings, all bushings, springs, frames, tubes, staybolt material and any wrought iron parts.
Notify C. F. W. Rys, Metallurgical Engineer, Carnegie Steel Co., Pittsburgh, Pa., two or three days before work starts through the boiler, tank and machine Shops so he can arrange for the inspection.
Cylinders must not be tested until their inspector is here to witness same.

4 Locomotive is to be used in hauling hot metal ladles.

5 Boiler to be built to comply with the Ohio State Law.

6 Dome to be arranged to provide for inspection without removing throttle.

7 Fire door to be Franklin No. 2.

8 Flexible staybolts, Tate, about 400 in number in breaking zone.

9 Smoke consumer to be applied to side sheets of fire box.

10 Ash Pan to be self dumping type, same as for McKeesport Conn. R. R. Engines (See Ry. Co's print furnished for 6 34 D 876-877)

11 Superheater, Schmidt. Royalty on superheater payable by The B. L. W.
Superheater as Locomotive Superheater Co's specification P-944, dated 6.15.15, (copy attached).
Steam pipe to be connected to cheeks outside of smoke box.

12 Hand hole and cap to be applied in each side of smoke box for inspection of superheater.

13 Water glass to have Sargent protector.

14 Pipe line to be applied on right side of dome, 1½" diameter to front beam of engine, with valve at dome and one at side of smoke box.

15 Injectors to be equipped with combination steel and bronze nut without extra cost.

16 Wood lining to be applied inside of cab under windows, right and left. SHIELD TO BE PROVIDED OVER REV. LEVER ROD IN CAB. 7/23/15
Wood floor to be applied on running boards inside of cab.
Shovelling plate ¼" thick to be applied in cab.
Drop seat on engineer's side of cab and box on fire-man's side. BOX FOR THREE TWO-GALLON AND ONE ONE-GALLON OIL CANS TO BE LOCATED UNDER RUNNING BOARD ON L.S.
Curtain to be applied at back of cab.

21 Chafing plate of steel as Ry. Co's print No. 5-1 between engine and tender.

22 Front bumper to have plate 1" thick, on the back, and to be sheathed on front and ends with plate ¼" thick.

23 Front draw casting bolts to have double nuts.

24 Safety chains to be applied at front of engine.

25 Flag marker fixtures on hand rail of engine
Lamp fixtures on sides of smoke box.

26 Jacket over stay bolts to be removable.
Angle iron to be applied on sides of fire box at bottom of jacket to prevent lagging from falling down.

27 Cylinder cocks to be Watertown Automatic.

28 Steam chest valve to be Built-up type.

29 Piston heads of cast iron similar to B. L. W. Card 3314 with cast iron rings sprung in.

30 All driving and engine truck tires to be purchased from the Railway Steel Spring Co.

31 Driving boxes to be provided with bronze liners.

32 Driving spring links to straddle the frame, to be extra strong and to have ample clearance from the frame and tires.

33 Air Brake equipment both operating parts and foundation fixtures to be furnished free these works by Ry. Co. and to be applied by B. L. W.

34 Air pump to be fitted with King type metallic packing.
Air pump to exhaust into cylinder saddle.

35 Lubricator to have auxiliary oiler for air pump air cylinder.

36 Bolts for pipe clamps to have double nuts.

TENDER.

41 Water hole cover to be oblong, 36" x 24".

42 Lattice work on coal box to keep coal from rolling off.

43 Chafing plate of steel as Ry. Co's print No. 5-1 between engine and tender.
Oak block 3" thick to be applied between tender wedge block and tender front bumper to give increased gangway between Engine and tender.

44 Safety chain "U" bolt on front of tender frame to have two nuts.

45 Safety chains at rear of tender. PUSHING SHOES AT REAR

46 Step across rear of tender, with hand rail
Steps on sloping back of tank, on right side only.

47 Tender brake beams to be Huntoon Extra heavy type.

pp. 266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS

SUPERHEATER SPECIFICATION FOR LOCOMOTIVES 8 40 D 6

FOR Newburgh & South Shore Railway Co.

161

Locomotive Superheater Company's Specification No. P-944 dated June 15, 1915
Specification for Superheater with Top Header, Double Loop Arrangement.

BOILER TUBES 241 in number 2 O. D. 12 ft. 0 ins. over tube sheets. Tubes located between and adjacent to Boiler flues are to be beaded over at front end.

BOILER FLUES 36 in number 5½ O. D. #9 BWG thick of cold drawn seamless steel Flues to be straight, true to gauge and wall not to vary more than one gauge from specified thickness. as shown on Card 10368-C

BOILER FLUE SETTING Radius ⅛ inch on both edges of flue holes in firebox tube sheet and on front edge of flue holes in front flue sheet as shown on drawings, except for copper sheets. Back end to be set with copper ferrules, rolled, beaded and prossered except for copper sheets. Front end to be rolled and beaded. Rollers to have at least 5 rolls. Prosser to have at least 12 sections Card 1137

TUBE SHEET LAYOUT to be in accordance with Card 5467

S. H. UNITS 36 units 1½ O. D. #9 BWG thick of seamless steel. Pipes united by cast steel return bends as shown on Card 10416-L
Each unit to be tested, before being placed in boiler, with water under pressure of 250 pounds.

S. H. PIPE SUPPORTS Of steel fastened securely on superheater pipes so as not to slide as shown on Card 1790

S. H. PIPE JOINT To be made in best possible manner to insure absolutely tight joints in accordance with the notation on Card 1043

S. H. UNIT CLAMP BOLT To be of steel having a tensile strength between 60,000 lbs. and 70,000 lbs. per sq. inch and to be as shown on Card 1086-A

S. H. HEADER To be of close grain cylinder iron steam tight in every respect. Joint ring for connection to dry pipe to have flat side against header flange. Casting should be moulded with the face having the superheater joints placed downward in the mould to secure the best quality of metal on surface where superheater joints are made. Each header to have a serial number cast on in such a location as not to be removed in finishing. No patch plugs allowed on ball joint seats. Headers must not be treated excessively with sal ammoniac. Header casting to be tight under water pressure of 250 lbs. Test pressure to be applied separately to the saturated and to the superheated steam passages, so as to insure soundness of all partition walls. Card 10005-D

S. H. HEADER SUPPORTS To be securely bolted or riveted to boiler shell. To be properly located so as to support the header after header has been correctly located. Header should then be bolted to supports. This to be done before superheater units are put in place. Card 1383

ST. PIPE JOINT RINGS Should be of cast iron.

DEFLECTING PLATE To be constructed so as to permit easy inspection and removal of superheater units and joints. Design to be in accordance with Card 10421

DAMPER CYLINDER To be carefully and accurately made. Piston not to be more than 0.01 inch smaller than bore. Bearings for Piston and extension to be in line. Piston to be ground and to operate freely under a pressure as low as 40 lbs. per sq. in. Steam Pipe to damper cylinder should be as short and free from bends as possible so as not to cause water to collect in cylinder. Pipe to be protected against freezing. Card 1149

DAMPER SHAFT COUNTERWEIGHT To be painted a light color to render it easily visible by the engineer Card 1067

S. H. ARRANGEMENT To be in accordance with Card 1476

TEST (FINAL) The Superheater, after assembling in boiler and after steam pipes are fitted up, is to be thoroughly tested and to be tight under water pressure of 250 lbs

Name	Card	Name	Card
Damper	10348-B	Damper Shaft Link	1070
Damper Cylinder Arm	1074	Patent Plate	3157
Damper Cylinder Pipe Fitting		S. H. Unit Bolt Washer	1071
Damper Cylinder Pipe Union	1287	S. H. Unit Clamp	1073
Damper Cylinder Piping Diagram	1503	S. H. Unit Clamp Washer	1072
Damper Cylinder Support		S. H. Pipe End	1344
Damper Shaft	1235-J	S. H. Pipe Band	1998
Damper Shaft Arm	1226 and 1234	Return Bends	10300
Damper Shaft Bearing (O. S.)	1223 and 1148	Deflecting Plate Handle	1487
Damper Shaft Bearing (I. S.)	1088	Lubricator Connection	3023

THE BALDWIN LOCOMOTIVE WORKS As Spec'n 0-9259
Memorandum Spec'n 10540 Details to be same as for S 40 D 6 except as otherwise specified.
SPECIFICATION FOR LOCOMOTIVES S 40 D 7 - 8 Class
FOR Newburgh & South Shore Railway Co. Con. as 5558
Engine Drawing No. 2
1-11-16

Gauge of Road 4' 8½" Play ½"
Wheelbase, Rigid 11' 6" Driving 11' 6" Total 20' 0"
Total wheelbase, eng. and tend. { Actual 50' 5½" / Limited to ----
Rails 90 lbs. Steel Ties 70%
Curves 25 degrees Grades { 2 miles 60 ft. per mile / 2 miles 52 ft. per mile
Limits, Height 15' 6" Width 10' 2"
Weight (approximate) in working order, Total 186,000 lbs.
On F. tr'k 22,000 lbs. Drivers 164,000 lbs., B. tr'k ---- lbs.

Tractive power 40,680 lbs., Ratio of adhesion 4
Work'g St'm Pres. 180 lbs., Service Switching (see sup. 3)
Fuel Soft Coal

11 **Boiler** Steel Thick ½" Bill 7673
Boiler, Diam. 80" Plan Straight Top
Boiler st'm pres. 200 lbs., Tested to { 220 lbs. steam pres. / 267 lbs. water pres.
Longitud. seams Butt jointed, double covering strips, sextuple riveted, 90% seam
5 **Dome,** diam. 33" Pos. Central

8 **Firebox** Steel Combustion chamb. None
Firebox, length 96-3/16" Width 75½" Depth F. 76⅛" B. 65"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
6 Firedoor opening One Oval 16" x 20"
Water space, Front 4½" Sides 4" Back 4"
Water space, Frame Double Riveted
7 Water space stays 1" diam. with 3/16" hole 1½" deep from O. S.

Radial stays 1½" Diam. Sling stays front { Two rows of B. L. W. Expansion stays.
Button heads below crown on Ten central rows
Crown bars None Placed ---- above crown
Crown bolts ----

Flues 5½" #9 B. W. G. Seamless Steel from National Tube Co.
Tubes 2" #11 W. G. Spellerized Steel from National Tube Co.
Tube ends Swaged for copper ferrules, fire box ends.
Number 36 / 241 Diam. 5½" / 2" Length 12' 0"

Heating Surface	Flues 537 sq	Combus. Chamb. None	Total 2255.8 sq
	Tubes 1529 sq	Fire Box 165	Fire Brick Tubes 24.8 sq
Grate area 50 sq	Ratio to Heating Surface 1 : 44.6		
Superheater 494 sq			

8 **Fire Brick** ARCH American on four tubes of cold drawn seamless Steel 3" O. S. Diam., 3/16" thick

Grates Rocking bars and drop plate
Ash Pan, Dampers None
Ash pan to be self dumping type, Ry. Co's standard.

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater (See sup. 9)

Smokebox extension With Cleaning hole and cap L. S. only (sup. 10)
Spark ejector-ex hopper With
Netting and deflect. plates With

Exhaust nozzles Single - High

Stack Straight Dia. 19" Hole in S. B., dia. 21½"

Safety Valves (spec.) Two Crosby, 3"
Safety valves None with relief lever, Set to 180 lbs.
Whistle Crosby

Steam Gauge One Iron, 7" MAKER:- Crosby (spec.)
Steam gauge stand Iron **Clock** None
Water glass to have Sargent protector.
Water Gauge One B.L.W. **Cab Lamps** to burn oil
Gauge Cocks Three Back Surface valve None
Lowest gauge cock 3" above highest part of crown
Lubricator steam valve without separate dry pipe to dome
Blower Valve Riggin, Quick opening and closing valve

Blow off Cock Two Everlasting { One in throat and one under waist near back tube sheet.
Cleaning Plugs
Firebox Corners diagonal, sides, front and back.
Crown, Two right side, three left side and three back
Waist, One under front (Two plug above fire door.)
Front tube sheet. Two Fusible plug One (sup. South Works)

Pump None Pos. ----
Top chamb. ---- Bottom chamb. ----
Feed Cock ---- Feed pipes ----
Checks ---- Check pipes ----

12 Injectors to be lifting type for hot water. (Spec.)
Injectors Two Sellers Class "K" No. 11½
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. Right and Left
Engine to be equipped with a fuel sprinkler.
Steam Heat None

13 14 **Cab** Steel

Cab boards Steel Nosing T-Iron
Running boards Steel Nosing T-Iron
Hand rail Iron Located on Boiler

15 **Back Bumper** Bar Steel Back drawbar height 34"

Pilot None Pushing shoes Front
21 **Front Bumper** Oak Bumper plate With (sup. 21)
Steps across front, with hand rail
Steps, hand holds, etc. to conform to I. C. C. requirements.
22 **Front Drawhead,** Center above rail 32½"
Coupler Sharon W. C. B. Auto. fitted in steel pocket with extended floor, holes to be 10" x 16" having 1" bolts.

Signal fixtures (See sup. 23)
Headlights to be Adams and Westlake, New Style 1634.
Front headlight to be applied on smoke box door.
Headlight Two Round Case 18" Reflector, To burn Kerosene
Headlight, Nos. on sides With H'dl't step With
Lamp shelf None Nosing ----

Bell 92 pounds. Collmar air bell ringer
Sand Box Two Diam. 31" Body Iron Painted Pipes Iron
Sander Leach Air, Trap A-1, with Duplex Engineer's Valve

Dome casing Iron Painted

24 **Boiler Jacket** { #22 Soft Steel Ptd. Bands Iron Style 9 and 14
Boiler Lagging Magnesia Sectional
Back head of Boiler to be lagged and jacketed.

11-266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS
N. T. Bamsley Mar. 1916
SPECIFICATION FOR LOCOMOTIVES S 40 D 7 and 8
FOR Newburgh & South Shore Railway Co.
163
One complete set of Blue prints to be furnished after delivery of locomotive.

Frames Cast Steel Braces Solid

25 **Cylinders,** Diam. 23" Stroke 26"
St'm ports, Length 27.95" Width 1½" Bridges 3½"
Exh. ports, Length --- Width ---- Valve lead ¼"
Valve travel 5½" Steam lap ⅞" Exhaust clearance ----
Eccentric crank throw 13-5/16".
S. P. Lubr. Nathan five feed Sylle Eye { Copper pipes under jacket with steam chest plugs.
Cyl'r heads Cast Iron
Cyl'r casings Iron Ptd. Head covers Steel Painted
St'm chest casings ---- Covers ----
St'm chest valves 12" Diam. Piston valves, Built up type.
Met. pkg (PISTON RODS / VALVE STEMS) U. S. Mfg Type, No. 10 (not spec.)

26 **Piston** heads of cast iron with cast iron rings sprung in.
Guides Steel Oil cups Needle
Crossheads Alligator Type, Cast Steel
26 3/4 **Wrist Pins** Steel Rod cups { Grease cups forged on, fitted with steel plugs
26 Parallel Rods to have solid ends.

Valve Motion Walschaerts
{ Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 52" Cen. diam. 44"
Wheel Centers:- Main cast steel, others cast iron
27 4 **Tires** Vanadium Steel Held by Shrinkage and Boulder
Tires, Flanged, Pos. All Size 4" x 5½"
Tires, Plain, Pos. ---- Size ----
Lateral play between driving boxes and wheel hubs - ½" total
27 **Driving Boxes** Cast Steel
3 4 **Journals,** Diam. 10" Length 12"
Driving spring steples Cast Steel
30 Spring hangers of Vanadium Steel
Springs. Make Railway Steel Spring Co's Vanadium Steel

Front Engine Truck Two Wheeled Swing Bolster Centre Bearing
To swing 4" each side of cen., Cen. pin liners None
3 4 Journals, Diam. 6" Length 10" Boxes Cast Iron
Wheels, Diam. 30" Tread ---- Kind Cast Iron Plate centre
27 Tires Vanadium Steel Cen. diam. 25" Size 2½" x 5½"
Tires held by Shrinkage and Shoulder

Back Engine Truck None Wheeled ----
To swing ---- each side of cen., Cen. pin liners ----
Journals, Diam. ---- Length ---- Boxes ----
Wheels, Diam. ---- Tread ---- Kind ----
Tires ---- Cen. diam. ---- Size ----
Tires held by ----

31 **Brake,** position On all driving and tender wheels.
Operating { Engine, Sch. #6-ET West'g Combined Auto. and Straight Air
Parts { Eng. Tr'k, sch. ----
Foundation { Drivers, sch. ET-3 American O. S. Equalised
Parts { Eng. Tr'k, sch. ----
Air pump Two 9½" Pos. Both Left Side
Train connections Front and Rear
Train signal, sch. None

36 **Tender** Eight Wheeled, Drawing No. 495
Weight, with fuel and water, about 100,000 lbs.

36 **Tank** 5000 Gallons, Bill 3887
Tank "U" Shape, slopping sack. Fuel Cap. 12 tons.
Tank stay rods to have jaws on each end to connect to side T irons
Tool Boxes Hard Wood, Top

Frame Steel 10" Channels.

39 Front Drawbar height 33½"
Pilot None Pushing shoes at rear
Back drawhead, center above rail 33½"
41 **Coupler** Sharon M.C.B. Auto. with Cardwell friction draft gear.

42 Steps, hand holds, etc. to conform to I. C. C. requirements.

Trucks Arch Bar Type. All metal trucks with Cast Steel "I" beam bolster.
Springs Eliptic, of Vanadium Steel, Railway Steel Spring Co. make
Journals, Diam. 5" Length 9"
Wheels, Diam. 33" Tread 4½" Kind Schoen Rolled Steel
Tires None Cen. diam. ---- Size ----
Tires held by ---- Wheel rims 2½" thick
Safety chains Single

Brake Position On all wheels.
Brake sch. #6-ET West'g Auto. and Straight air with 12" x 12" cylinder. Tender brake beams to be Huntoon Extra heavy type.

List of tools, sch. 29
Photo sch. None Inspection (See sup. 1-2)
To be weighed None Material spec'ns B. L. W. (See sup. 1-7) 26)
Certificate of boiler test Three copies of B.L.W. form 1036
Junior laws to 1-25-16 Shipment On own wheels.

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. Patents { Throttle, Patented Jan. 23, 1900 (Cast on) / Feed Water Strainer, Patented Sept. 1, 1903 (Cast on) / Steam Pipe Cover, Patented Sept. 19, 1911 (Cast on)

Property plates None

Painting:—Engine, style 291 Olive Green and Aluminum
Painting:—Tender, style 291 Olive Green and Aluminum

Lettering and Trade Mark as Ry. Co's stencils.
Mark on cab panels under windows, Ry. Co's Trade Mark
Mark on tank sides { NEWBURGH & SOUTH SHORE (South Shore Belt Line)

Road Nos. Pos.	Road Nos.	Name None
F. No. Plate	32	
F. Sand Box	33	
Back of tank.		

Lettering, etc. to be in silver white, same as for S 40 D 6, except, the words "SOUTH SHORE BELT LINE" under the name of the road are to be enclosed in a long bracket.

SPECIFICATION FOR LOCOMOTIVES 8 40 D 7 - 8

FOR Newburgh & South Shore Railway Co.

1 All materials manufactured or sold by any constituent Company of the United States Steel Corporation which are used in the construction of these locomotives are to be purchased from that Company.
Send E. E. Stone, Gen. P. A., American Steel and Wire Co., Western Reserve Building, Cleveland, Ohio., Copies of orders on the United States Steel Corporation or any of its subsidiary companies; send to him also copies of our orders for tubes.

2 Locomotive, to be inspected by B.L.W., Construction to be inspected by C&W Co's. Inspectors.
~~Locomotive to be inspected by Representative of Carnegie Steel Company. Send to C. P. W. Rye, Metallurgical Engineer, Carnegie Steel Co., Pittsburgh, Pa., copies of orders covering boiler and fire box and tender sheets, boiler, brace, all axles, tender wheels, driving wheel centers, tires, driving boxes, tender journal boxes, all journal bearings, all bushings, springs, frames, tubes, staybolt material and any cast iron parts. Notify C. P. W. Rye, Metallurgical Engineer, Carnegie Steel Co., Pittsburgh, Pa., two or three days before work starts through the roller, tank and machine shops so he can arrange for the inspection. Cylinders must not be tested until their inspector is here to witness same.~~

3 Locomotive is to be used in hauling hot metal ladles (see sup. 11)

4 Boiler to be built to comply with the requirements of the Ohio State R. R. Commission, and the I.C.C. requirements.

5 Dome to be arranged to provide for inspection without removing throttle. Edge of dome opening in boiler to be chipped smooth, so that man entering boiler will not have to contend with rough edge. (see sup. 11)

6 Fire door to be Franklin No. 8.

7 Flexible staybolts to be American Flexible, 75# in number in breaking zone.

8 Smoke consumer to be applied to side sheets of fire box.

9 Superheater, Schmidt Type, placed in 5½" tubes, connecting with top header in smoke box.
Steam pipe to be connected to cheats outside of smoke box.
Royalty on superheater payable by The B. L. W.
Superheater as Locomotive Superheater Co's specification P-944 dated June 15, 1915. (Copy attached)
Superheater Tubes 5½" diam. may be taken from B.L.W. Stock (of Tim.)

10 Hand hole and cap to be applied in each side of smoke box for inspection of superheater.

11 Steam pipe line to be applied on right side of dome, 1½" diameter to front beam of engine, with valve at dome and one at side of smoke box.

12 Injectors to be equipped with combination steel and bronze nut.

13 Wood lining to be applied inside of cab under windows, right and left. Cab to have copper gutter above windows 3/25/16
Wood floor to be applied on running boards inside of cab.
Shovelling plate ¼" thick to be applied in cab.
Drop seat on engineer's side of cab and box on fireman's side.
Shield to be provided over reverse lever rod in cab.
Curtain to be applied at back of cab.
Cab apron hinge bolts to have rollers 4/9/16

14 Box for three Two-Gallon and one One-Gallon oil cans to be located under running board, on left side.

15 Chafing plate of steel between engine and tender, as Ry.Co's print received Jan. 27, 1916.

16 Front bumper to have steel plate on both front and back, the plate on front and ends to be ½" thick, and the plate on back to be 1" thick.
Front draw casting bolts to have double nuts.

17 Safety chains to be applied at front of engine as Ry. Co's print dated Cleveland, Ohio, Dec. 5, 1908.

18 Flag fixtures on hand rail of engine.
Lamp fixtures on sides of smoke box.

19 Jacket over staybolts to be removable.
Angle iron to be applied on sides of fire box at bottom of jacket to prevent lagging from falling down.

20 Cylinder cocks to be Watertown Automatic.

21 Piston rods, wrist pins, connecting rods and stub straps of open hearth steel to A.S.T.M. spec'ns A-20-14 (Furnished by Carnegie)

22 All driving and engine truck tires to be purchased from the Railway Steel Spring Co.

23 Detroit flange lubricator to be applied to front and back pairs of driving wheels.

24 Driving boxes to be provided with bronze liners.
Do not apply liners on hubs of driving wheels.

25 Driving spring links to straddle the frame and to be extra strong having ample clearance from the frame and tires.

26 Brake fixtures complete, including air drums to be furnished free these works by Ry. Co. and to be applied by B. L. W.

27 Air pump to be fitted with King type metallic packing.
Air pump exhaust to be piped into cylinder saddle.
Lubricator to have auxiliary oiler for air pump air cylinder.

28 Bolts for pipe clamps to have double nuts.

29 Driving axles, truck axles, piston rods and crank pins to be marked in accordance with M.C.B. requirements.
Main and side rods, not to be marked. 4.26.16

TENDER.

30 Water hole cover to be oolong, 36" x 24"

31 Lattice work on coal box to keep coal from rolling off.

32 The lugs that hold tank to frame to be raised ½" so that when bolts are pulled up the lugs will not rest on the frame.

33 Chafing plate of steel between engine and tender as Ry. Co's print received January 27, 1916.
Oak block 3" thick to be applied between tender wedge block, and tender front bumper to give increased gangway between engine and tender.

34 Safety chain "U" bolt on front of tender frame to have two nuts.

35 Safety chains at rear of tender.

36 Step across rear of tender, with hand rail.
Steps on sloping back of tank, on right side only.

11 266-67 Both copies see box

165

THE BALDWIN LOCOMOTIVE WORKS

SUPERHEATER SPECIFICATION FOR LOCOMOTIVES 8 40 D 7 and 8

FOR Newburgh & South Shore Railway Co.

Locomotive Superheater Company's Specification No. P-944 dated June 15, 1915
Specification for Superheater with Top Header, Double Loop Arrangement.

BOILER TUBES	241 in number 2" O. D. 12 ft. 0 ins. over tube sheets. Tubes located between and adjacent to Boiler flues are to be beaded over at front end.
BOILER FLUES	36 in number 5½" O. D. #9 B.W.G. thick of cold drawn seamless steel. Flues to be straight, true to gauge and wall not to vary more than one gauge from specified thickness. as shown on **Card** 10308-C
BOILER FLUE SETTING	Radius ⅛ inch on both edges of flue holes in firebox tube sheet and on front edge of flue holes in front flue sheet as shown on drawings, except for copper sheets. Back end to be set with copper ferrules, rolled, beaded and prossered except for copper sheets. Front end to be rolled and beaded. Rollers to have at least 5 rolls. Prosser to have at least 12 sections **Card** 1137
TUBE SHEET LAYOUT	to be in accordance with **Card** 5467
S. H. UNITS	36 units 1½" O. D. #9 B.W.G. thick of seamless steel. Pipes united by cast steel return bends as shown on **Card** 10416-L Each unit to be tested, before being placed in boiler, with water under pressure of 250 pounds.
S. H. PIPE SUPPORTS	Of steel fastened securely on superheater pipes so as not to slide as shown on **Card** 1790
S. H. PIPE JOINT	To be made in best possible manner to insure absolutely tight joints in accordance with the notation on **Card** 1043
S. H. UNIT CLAMP BOLT	To be of steel having a tensile strength between 60,000 lbs. and 70,000 lbs. per sq. inch and to be as shown on **Card** 1086-A
S. H. HEADER	To be of close grain cylinder iron, steam tight in every respect. Joint ring for connection to dry pipe to have flat side against header flange. Casting should be moulded with the face having the superheater joints placed downward in the mould to secure the best quality of metal on surface where superheater joints are made. Each header to have a serial number cast on in such a location as not to be removed in finishing. No patch plugs allowed on ball joint seats. Headers must not be treated excessively with sal ammoniac. Header casting to be tight under water pressure of 250 lbs. Test pressure to be applied separately to the saturated and to the superheated steam passages, so as to insure soundness of all partition walls. **Card** 10005-D
S. H. HEADER SUPPORTS	To be securely bolted or riveted to boiler shell. To be properly located so as to support the header after header has been correctly located. Header should then be bolted to supports. This to be done before superheater units are put in place. **Card** 1323
ST. PIPE JOINT RINGS	Should be of cast iron.
DEFLECTING PLATE	To be constructed so as to permit easy inspection and removal of superheater units and joints. Design to be in accordance with **Card** 10421
DAMPER CYLINDER	To be carefully and accurately made. Piston not to be more than 0.01 inch smaller than bore. Bearings for Piston and extension to be in line. Piston to be ground and to operate freely under a pressure as low as 40 lbs. per sq. in. Steam Pipe to damper cylinder should be as short and free from bends as possible so as not to cause water to collect in cylinder. Pipe to be protected against freezing. **Card** 1149
DAMPER SHAFT COUNTERWEIGHT	To be painted a light color to render it easily visible by the engineer **Card** 1067
S. H. ARRANGEMENT	To be in accordance with **Card** 4476
TEST (FINAL)	The Superheater, after assembling in boiler and after steam pipes are fitted up, is to be thoroughly tested and to be tight under water pressure of 250 lbs.

Name	Card	Name	Card
Damper	10348-B	Damper Shaft Link	1070
Damper Cylinder Arm	1074	Patent Plate	3157
Damper Cylinder Pipe Fitting		S. H. Unit Bolt Washer	1071
Damper Cylinder Pipe Union	1287	S. H. Unit Clamp	1073
Damper Cylinder Piping Diagram	1503	S. H. Unit Clamp Washer	1072
Damper Cylinder Support		S. H. Pipe End	1344
Damper Shaft	1235-J	S. H. Pipe Band	1988
Damper Shaft Arm	1226 and 1234	Return Bends	10300
Damper Shaft Bearing (O. S.)	1223 and 1148	Deflecting Plate Handle	1487
Damper Shaft Bearing (I. S.)	1088	Lubricator Connection	3023

1-266-67. Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS AS SPEC'N C 4525. MINOR DETAILS TO BE SAME AS FOR 8 40 E 4. EXCEPT AS OTHERWISE SPECIFIED.

Memorandum Spec'n 17010.

SPECIFICATION FOR LOCOMOTIVES 8 42 E 17. Gen. as PHOTO. 2162 EXCEPT WITH WALSCHAERTS VALVE MOTION, OUTSIDE STEAM PIPES, AND SLOPING BACK TANK.

Engine Drawing No. 5

FOR MD. **L.** NEWBURGH & SOUTH SHORE RAILWAY COMPANY.

1-16-17.

10 **Gauge of Road** 4' 8½" Var. ¼" EXCEPT 7/8" FOR F & B DRIVERS.
Wheelbase. Rigid 16' 0" Driving 16' 0" Total 16' 0"
Total engine 51' 0"

RAILS, 90 POUNDS. STEEL TIES 70% GRADES 2 MILES 60 FEET PER MILE
Curves 12 DEGREES. 2 MILES 52 FEET PER MILE

Limits. Height 15' 0" Width 10' 2"
Weight 216,000 POUNDS.
On drivers 214,000 On B. Truck ---- On F.
Weight per sq. in. of piston 4

Work'g St'm Pres. 180 POUNDS. SAFETY-VALVES (SEE SUP. 1-29)
Fuel BITUMINOUS COAL.

Fire door sheet 7/16" THICK.
10 **Boiler** STEEL. Diameter 64½" Working pressure 180
Barrel 6" thick. STRAIGHT TOP.
Barrel over tubes 220 Outside of firebox 267
WITH FACTOR OF SAFETY OF 4.7
11 RIVETED. DOUBLE BUTTS, DOUBLE COVERING STRIPS, SEXTUPLE
11 **Dome,** Diameter 26" Thickness 15/16"

13 **Firebox** STEEL.
15 Thickness 1/2" Length 75" Width 75" Depth 78 7/16"
60 Thickness sides 5/16" back 5/16" crown 3/8" tube 1/2"
Water space F. 5" S. 4" B. 3" Back 3"
Crown stayed with 1" STAYBOLTS 4.0" (SEE SUP. 14-15)
Staybolts 1/2" Pitch 4" x 4"
Roof and crown DOUBLE. Plates
16 Radial stays 1" DIAM. SCREWED THROUGH } THREE ROWS OF B.L.W. EXPANSION STAYS.
Radial stays 1" diam. screwed through
Button heads TEN.
Crown bolts Pitch ---- above crown
Crown stays -----

Flues SEAMLESS STEEL. (SUP. 17)
Tubes U. S. SEAMLESS STEEL. (SEE SUP. 17)
Tube plates BEVELED FOR COPPER FERRULES, FIRE BOX ENDS.
Number 32 Diam. 5 3/8" 2" Length 14' 9"
242

Heating Tubes 760 sq. ft. Combus. Chamb. NONE. Total 2842.7 sq. ft.
Surface Tubes 1858 sq. ft. Fire Box 197 sq. ft. Fire Brick Tubes 27.7 sq. ft.
Grate area 52.7 sq. ft. Ratio to Heating Surface 1 to 45.3
Superheater 614 sq. ft.

18 **Fire Brick** ARCH, AMERICAN, ON FOUR TUBES, 3" O.S. DIAM. OF SEAMLESS STEEL #7 W. G. THICK.

Grates SHAKER TYPE WITH DROP PLATE.
19 **Ash Pan,** Dampers FRONT AND BACK.

THROTTLE TO BE PROVIDED WITH AUXILIARY DRIFTING VALVE
Throttle BALANCE. (SUP. 33) POS. DOME
Dry pipe STEEL.

Superheater (SEE SUP. 23)

21 C **Smokebox** Extension WITH 24 Cleaning hole and cap L.S. ONLY.
Spark ~~ejector or~~ hopper WITH.
Netting and deflect. plates WITH (SEE SUP. 25)

Exhaust nozzles SINGLE - HIGH.

Stack CAST IRON, STRAIGHT. Dia. 19" Hole in S. B., dia. 22¼"

Safety Valves TWO CROSBY 3" (SEE SUP. 26) (specid)
Safety valves NONE with relief lever. Set to 180 POUNDS.
Whistle CROSBY CHIME. (SEE SUP. 26)

37 S **Steam Gauge** ONE IRON, 7" MAKER:- CROSBY (specid)
Steam gauge stand IRON. **Clock** NONE.
WATER GLASS TO HAVE IRONCLAD PROTECTOR.
Water Gauge ONE B. L. W. **Cab Lamps** ELECTRIC.
27 **Gauge Cocks** THREE BACK (SUP. 27) Surface valve NONE
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve WITHOUT separate dry pipe to dome
Blower Valve RIGGIN, QUICK OPENING AND CLOSING VALVE

Blow off Cock TWO EVERLASTING POS:- (SEE SUP. 28)
Cleaning Plugs ONE PLUG ABOVE FIRE DOOR.
Firebox CORNERS, DIAGONAL, SIDES, FRONT AND BACK.
Crown TWO LEFT SIDE, THREE LEFT SIDE AND THREE BACK.
Waist. ONE UNDER FRONT.
Front tube sheet, TWO. Fusible plug ONE.

Pump NONE. Pos. ----
Top Hamb ----- Bottom check -----
Feed Cock ----- Feed pipes ----
Checks ----- Back pipes ---

30 INJECTORS TO BE LIFTING TYPE FOR HOT WATER.
31 S **Injectors** TWO SELLERS, CLASS "K" (specid) No. 10½
Injectors, Pos. RIGHT AND LEFT. Steam pipes COPPER.
Pipes Check IRON. Feed IRON. Overflow IRON.
Check B.L.W. (SEE SUP. 30) Pos. RIGHT AND LEFT.

Steam Heat NONE.

32 S **Cab** SHEET STEEL, (SEE SUP. 34, ETC.) VENTILATOR IN CAB ROOF.

Cab boards STEEL. Nosing T-IRON.
Running boards STEEL. Nosing (SEE SUP. 39)
Hand rail IRON. (SEE SUP. 40-45) Located on BOILER.

37 **Back Bumper** BAR STEEL. Back drawbar height 34¼"
38

Pilot NONE. Pushing shoes AT FRONT.
63 **Front Bumper** OAK (SEE SUP. 46) Bumper plate WITH.
11.5 S **Steps** ACROSS FRONT (SEE SUP. 47) WITH HAND RAIL.
STEP, HAND HOLDS, ETC. TO CONFORM TO I. C. C. REQUIREMENTS.
Front Drawhead, Center above rail 33½"
Coupler SHARON M. C. B. AUTO. (SEE SUP. 48-49)

Signal fixtures (SEE SUP. 50)

Headlight TWO ROUND CASE 12" Reflector (SEE SUP. 51)
Headlight, Nos. on sides WITH H'dl't step WITH
Lamp shell NONE Nosing ---

Bell 92 POUNDS. GOLDMAR AIR BELL RINGER. (SEE SUP. 33)
Sand Box TWO Diam. 31" Body IRON PAINTED. Pipes IRON.
Sanders (type) LEACH AIR, TRAP A-1, WITH DUPLEX ENGINEER'S VALVE.

Dome casing IRON PAINTED. (SEE SUP. 45)

52 **Boiler Jacket** #22 SOFT STEEL Bands IRON. Style 9 & 14.
Boiler Lagging MAGNESIA SECTIONAL.
BACK HEAD OF BOILER TO BE LAGGED AND JACKETED.

THE BALDWIN LOCOMOTIVE WORKS
W. C. Webster Philadelphia.

SPECIFICATION FOR LOCOMOTIVES 8 42 E 17. 16T

FOR **L.** NEWBURGH & SOUTH SHORE RAILWAY COMPANY. FURNISH PRINTS (SEE SUP. 7)

54 **Frames** CAST STEEL. ANNEALED Braces SOLID.

51 C **Cylinders,** Diam. 24" Stroke 30"
St'm ports. Length 25.7 Width 1½" Bridges ----
Exh. ports, Length ---- Width ---- Valve lead ¼"
Valve travel 6¼" Steam lap 1" Exhaust clearance ----
Eccentric crank throw 13¾" By-pass valve NONE
S.P.: Lub. NATHAN FIVE FEED BULLS EYE. (SUP. 55) (specid)
Cyl'r heads CAST IRON.
Cyl'r casings IRON PTD. Head covers STEEL PAINTED.
St'm chest casings ---- Covers ----
St'm chest valves 12" DIAM. PISTON VALVES, BUILT UP TYPE.
Met. pkg PISTON RODS / VALVE STEMS U. S. KING TYPE, No. 10 METAL (specid)

Pistons (SEE SUP. 5-56)
Guides STEEL. Oil cups NEEDLE.
Crossheads ALLIGATOR TYPE, CAST STEEL. (SEE SUP. 58)
58 **Wrist Pins** STEEL. Rod cups (SUP. 57-58)
PARALLEL RODS TO HAVE SOLID ENDS. (SEE SUP. 58)

Valve Motion WALSCHAERTS. (SEE SUP. 58-59)
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

6 All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B.L.W.
60 DRIVING WHEELS TO HAVE HUB LINERS OF BRONZE.
Drivers, O. S. Diam. 54" Cen. diam. 46", CENTERS CAST STEEL

61 **Tires** VANADIUM STEEL Held by SHRINKAGE AND SHOULDER.
Tires, Flanged, Pos. ALL. Size 4" X 5½"
Tires, Plain, Pos. NONE. Size ----
Lateral play between driving boxes and wheel hubs = ⅛" TOTAL.
Driving Boxes CAST STEEL WITH OIL LUBRICATION.
5 **Journals,** Diam. MAIN 10" OTHERS 9" Length 12"

Springs. Make RAILWAY STEEL SPRING CO.'S. (SEE SUP. 63)

Front Engine Truck NONE Wheeled ----
To swing ---- each side of cen., Cen. pin liners ---
Journals, Diam. --- Length ---- Boxes ----
Wheels, Diam. ---- Tread ----Kind ----
Tires ----- Cen. diam. --- Size ---
Tires held by ------

Back Engine Truck NONE Wheeled ----
To swing ---- each side of cen., Cen. pin liners ----
Journals, Diam. ---- Length ---- Boxes ----
Wheels, Diam. --- Tread --- Kind ----
Tires ---- Cen. diam. ----- Size ----
Tires held by ----------

67 to 71 **Brake,** position ON ALL DRIVING AND TENDER WHEELS.
Operating Parts: Engine, Sch. No. 6-ET WEST'G. COMBINED AUTO. AND STRAIGHT AIR. Eng. Tr'k, sch. -----
Foundation Parts: Drivers, sch. WN-3 BC AMERICAN O.S. EQUALIZED Eng. Tr'k, sch. ----
Air pump TWO 11" Pos. BOTH LEFT SIDE.
Train connections FRONT AND BACK.
Train signal, sch. NONE.

75 C **Tender** EIGHT Wheeled. Drawing No. 793
Weight, with fuel and water, about 130,000 POUNDS.

75 C **Tank** 7,000 Gallons. Bill 4498
TANK "U" SHAPE, WATER BOTTOM TYPE, SLOPING BACK. FUEL CAP. 12 TON

Tool Boxes OF STEEL, TOP.

Frame STEEL, 13" CHANNELS.

80 Front Drawbar height 31⅝"
81 Pilot NONE. Pushing shoes AT REAR.
Back drawhead, center above rail 33½"
Coupler (SEE SUP. 82-83)

84 Steps HAND HOLDS, ETC. TO CONFORM TO I.C.C. REQUIREMENTS.

Trucks ARCH BAR TYPE, ALL METAL WITH "I" BEAM BOLSTER.

Springs ELLIPTIC. RAILWAY STEEL SPRING CO'S MAKE.
Journals, Diam. 5½" Length 10"
Wheels, Diam. 33" Tread 4¼" Kind SCHOEN ROLLED STEEL.
Tires NONE. Cen. diam. --- Size ---
Tires held by ---- WHEEL RIMS 2½" THICK.
Safety chains SINGLE.

Brake Position ON ALL WHEELS.
86 Brake sch. No. 6-ET WEST'G. AUTO. AND STRAIGHT AIR WITH 14"X 12" CYLINDER. SLACK ADJUSTER, ON TENDER.
TENDER BRAKE BEAMS TO BE HUNTOON EXTRA HEAVY TYPE.

List of tools, sch. 29
Photo sch. #2 Inspection ~~B. L. W.~~ (SEE SUP. 4)
To be weighed YES Material spec'ns B. L. W. (SEE SUP. 2-3)
Certificate of boiler test THREE COPIES OF B.L.W. FORM 1036
Junior laws to 7-1-17 Shipment ON OWN WHEELS.

Brass shop finish, No. 1
Machine shop finish D-165.

B. L. W. FEED PIPE STRAINER, PATENTED SEPT. 1, 1903 (CAST ON)
Patents STEAM PIPE COVER, PATENTED JULY 18, 1911 (CAST ON)

Property plates NONE.

Painting: Engine, style 291 OLIVE GREEN AND ALUMINUM
Painting:- Tender, style 291 OLIVE GREEN AND ALUMINUM

LETTERING AND TRADE MARK AS RY. CO'S STENCILS.
* Mark on CAB PANELS UNDER WINDOWS, RY. CO'S TRADE MARK.
MARK ON TANK SIDES. NEWBURGH & SOUTH SHORE (South Shore Belt Line)

Road Nos. Pos. Road Nos. Name NONE.
F. NO. PLATE 51
F. SAND BOX
BACK OF TANK.

* LETTERING, ETC. TO BE IN SILVER WHITE, SAME AS FOR 8 40 D 7 ETC. THE WORDS "SOUTH SHORE BELT LINE" UNDER THE NAME OF THE ROAD ON TANK SIDES ARE TO BE ENCLOSED IN A LONG BRACKET.

11-266-67 Photo copied see box

SPECIFICATION FOR LOCOMOTIVES 8 42 E 17.

FOR. NEWBURGH & SOUTH SHORE RAILWAY COMPANY.

1 LOCOMOTIVE IS TO BE USED IN HAULING HOT METAL LADLES. (SUP. 29)

2 ALL MATERIALS MANUFACTURED OR SOLD BY ANY CONSTITUENT COMPANY OF THE UNITED STATES STEEL CORPORATION WHICH ARE USED IN THE CONSTRUCTION OF THE LOCOMOTIVE ARE TO BE PURCHASED FROM THAT COMPANY.
SEND TO F.E. STONE, GEN. P.A., AMERICAN STEEL AND WIRE CO., COPIES OF ALL ORDERS ON THE UNITED STATES STEEL CORPORATION OR ANY OF ITS SUBSIDIARY COMPANIES, SEND TO HIM ALSO COPIES OF OUR ORDERS FOR TUBES.

3 PISTON RODS, WRIST PINS, CONNECTING RODS AND STUB STRAPS OF OPEN HEARTH STEEL TO A.S.T.M. SPEC'N A-20-14 AND TO BE FURNISHED BY CARNEGIE STEEL COMPANY.

4 LOCOMOTIVE TO BE INSPECTED BY C.F.W. RYS, METALLURGICAL ENGINEER, CARNEGIE STEEL COMPANY, PITTSBURGH, PENNA. ADVISE HIM A FEW DAYS IN ADVANCE OF TIME WE START WORK IN SHOPS SO THAT HE CAN ARRANGE TO HAVE HIS INSPECTORS HERE.

5 DRIVING AXLES, PISTON RODS AND CRANK PINS TO BE MARKED IN ACCORDANCE WITH I.C.C. REQUIREMENTS.

6 ALL BOLTS FOR PIPE CLAMPS TO HAVE DOUBLE NUTS.

7 ONE COMPLETE SET OF BLUE PRINTS TO BE FURNISHED TO RY. CO AFTER DELIVERY OF LOCOMOTIVE.

10 BOILER TO BE BUILT TO COMPLY WITH THE REQUIREMENTS OF THE OHIO STATE R.R. COMMISSION, AND THE I.C.C. REQUIREMENTS.

11 DOME TO BE ARRANGED TO PROVIDE FOR INSPECTION WITHOUT REMOVING THROTTLE. EDGE OF DOME OPENING IN BOILER TO BE SHIPPED SMOOTH, SO THAT MAN ENTERING BOILER WILL NOT HAVE TO CONTEND WITH ROUGH EDGE. (SEE SUP. 26-29-45)

12 OMIT AUXILIARY DOME.

13 FIREBOX SIDES, BACK AND THROAT SHEETS TO BE WELDED TO MUD RING FOR A DISTANCE OF 12" EACHWAY FROM THE CORNER.

14 FIRE DOOR OPENING TO HAVE O'CONNOR FLANGE.
ROYALTY ON O'CONNOR FLANGE TO BE PAID BY THE B.L.W.
FIRE DOOR FLANGE LICENSE PLATE#, NUMBER 1324 FURNISHED BY PRATT & O'CONNOR ARE TO BE ATTACHED TO THE BOILER BACK-HEAD WITH ¼" EXTENSION STUDS TAPPED HALF WAY THRU THE SHEET.

15 FIRE DOOR TO BE FRANKLIN No. 8.

16 FLEXIBLE STAYBOLTS TO BE AMERICAN, COMPLETE INSTALATION, ~~ABOUT 1000 IN NUMBER~~, INCLUDING CROWN STAYS, AS FROM AMERICAN FLEXIBLE BOLT COMPANY, PITTSBURGH, PA.

17 TUBES (2" AND 5½") NATIONAL TUBE CO'S FROM STOCK (A/C TIME)
TUBES ARRANGED AS LOCO. SUPERHEATER CO'S PRINT 5969.

18 SMOKE CONSUMER TO BE APPLIED TO SIDE SHEETS OF FIRE BOX.

19 ASH PAN TO BE SELF-DUMPING TYPE, SIMILAR TO 6 38 D 62.

23 SUPERHEATER AS LOCOMOTIVE SUPERHEATER CO'S SPEC'N No. O-7313 DATED, MARCH 22ND, 1917. COPY ATTACHED.
SUPERHEATER TO BE SCHMIDT TYPE, CONNECTING WITH TOP HEADER IN SMOKE BOX, AND WITH OUTSIDE STEAM PIPE CONNECTIONS TO VALVE CHAMBERS.
ROYALTY ON SUPERHEATER, PAYABLE BY THE B. L. W.

24 HAND HOLE AND CAP TO BE APPLIED IN EACH SIDE OF SMOKE BOX FOR INSPECTION OF SUPERHEATER.

25 SMOKE BOX NETTING TO BE DRAFTAC, No. 393, MADE BY W. S. TYLER COMPANY., CLEVELAND, OHIO.

26 WHISTLE AND SAFETY VALVE TO BE APPLIED IN SIDE OF MAIN DOME.

27 GAUGE COCKS TO BE "NEVERLEAK" TYPE, AND TO HAVE DRIP PAN ON BACK HEAD.

28 BLOW OFF COCKS, ONE IN THROAT AND ONE UNDER WAIST NEAR BACK TUBE SHEET.

29 STEAM PIPE LINE TO BE APPLIED ON RIGHT SIDE OF DOME, 1¼" DIAMETER TO FRONT BEAM OF ENGINE, WITH VALVE AT DOME AND ONE AT SIDE OF SMOKE BOX. (SEE SUP. 1)

30 INJECTORS TO HAVE COMBINATION STEEL AND BRONZE NUT.
BOILER CHECKS TO BE SIMILAR TO 8 40 D 7 & 8 AND TO HAVE FLANGED CONNECTION TO BOILER, WITH SCREW END FOR PIPE.

31 FUEL SPRINKLER (SELLERS SAFETY) IN LEFT SIDE OF CAB.

32 ALL STEAM AND AIR GAUGES TO BE PLACED ON BOILER HEAD IN PLAIN SIGHT OF ENGINEER.

33 THE FOLLOWING TO BE LOCATED IN POSITION SO THAT ENGINEER CAN OPERATE SAME WITH HEAD OUT OF CAB WINDOW:-
THROTTLE LEVER.
POWER REVERSE GEAR LEVER.
BRAKE VALVES
BELL RINGER VALVE.
SANDER VALVES.

34 CAB TO HAVE COPPER GUTTERS ABOVE SIDE WINDOWS.
CAB TO BE WOOD LINED THROUGH OUT.
WOOD FLOOR TO BE APPLIED ON RUNNING BOARDS INSIDE OF CAB.
SHOVELLING PLATE ¼" THICK TO BE APPLIED IN CAB.
CAB APRON HINGE BOLTS TO HAVE COTTERS.
~~SHIELD TO BE PROVIDED OVER REVERSE LEVER ROD IN CAB.~~
CURTAIN TO BE APPLIED AT BACK OF CAB.
DROP SEAT ON ENGINEER'S SIDE OF CAB AND BOX SEAT ON FIREMAN'S SIDE, WITH CUSHIONS AND ARM RESTS.

35 CAB SIDE WINDOWS TO HAVE FOUR PANES IN EACH SASH.
STORM WINDOWS TO BE PROVIDED IN FRONT OF CAB DOORS.

36 BOX FOR THREE TWO-GALLON AND ONE ONE-GALLON OIL CANS TO BE LOCATED UNDER RUNNING BOARD, ON LEFT SIDE.

37 FOOT PLATE TO BE HEAVY.

38 ECONOMY DEVICES CORPORATIONS RADIAL BUFFER TO BE APPLIED BETWEEN ENGINE AND TENDER. (SEE SUP. 80)

39 RUNNING BOARDS TO HAVE 3" X 3" X ⅜" ANGLE IRON ON EDGE.

40 HAND RAILS ON SIDES OF BOILER TO EXTEND FROM CAB TO FRONT OF SMOKE BOX, WITH CIRCULAR HAND RAIL ON FRONT OF SMOKE BOX DOOR RIM.

170

...LE THE FRAME AND TO BE
...ARANCE FROM THE FRAME AND

...VANADIUM STEEL.
...GGING WHICH ARE SUBJECT TO

...MERICAN) INCLUDING AIR DRUMS
...E COMPANIES AT THE R.R. CO'S

...NG TYPE METALLIC PACKING.
... INTO CYLINDER SADDLE.
...R SELF CLOSING TYPE, FOR
...SUP. 33)

...ENAMELLED AND TO HAVE HEADS
...CIENT CAPACITY FOR THE

...BRAKE CO'S STANDARD. (SUP. 32)

...VE J.M. EXPANDER RINGS.
...ENED PINS AND BUSHINGS AS
...O'S "BC" SCHEDULE.

...R.

...ON EACH END TO CONNECT TO SIDE
...TO BE OBLONG, 36" x 24".

...ESIGN AS FOR 6 38 D 68 - 70,
...NK.

...YPE.
... KEEP COAL FROM ROLLING OFF.

...FRAME TO BE RAISED ½" SO THAT WHEN
...UGS WILL NOT REST ON THE FRAME.

...NTRE OF BACK OF TENDER. (SUP. 51)

...NS RADIAL BUFFER TO BE APPLIED
... (SEE SUP. 38)

...FRONT OF TENDER FRAME TO HAVE 2 NUTS.

...LEABLE CASTINGS CO'S SHARON M.C.B. AUTO.
...EFT GEAR. COUPLER TO HAVE 11" KNUCKLE

...RY. CO'S PRINT DATED DEC. 9, 1908.

...O BE OF ONE SECTION WITH FOUR HANGERS

...TANK, ON RIGHT SIDE ONLY.

...ND AMERICAN) AND AIR DRUMS TO BE
...COMPANIES AT R.R. CO'S SPECIAL PRICE.
... HAVE J. M. EXPANDER RINGS. (SUP. 85)

SPECIFICATION FOR LOCOMOTIVES 8 - 42 E 17

FOR NEWBURGH & SOUTH SHORE RAILWAY COMPANY

Specification for Type A Double Loop Superheater...SPECIFICATION O-7313 DATED MARCH 22, 1917.

BOILER TUBES 242 ...in number..... 2 .....o. d. ..... 14 ..... ft..... 9 .....in. over tube sheets. Tubes located between and adjacent to boiler flues are to be headed over at front end.

BOILER FLUES 36 ...in number..... 5½" .....o. d. #9 BWG.....of cold drawn seamless steel. Flues to be straight, true to gauge and wall not to vary more than one gauge from specified thickness.....Card.....1912

BOILER FLUE SETTING ⅛ in. radius on both edges of flue holes in fire box tube sheet and on front edge of flue holes in front tube sheet as shown on drawings, except for copper sheets. Back end to be set with copper ferrule, rolled, beaded and prossered except for copper sheets. Front end to be rolled and beaded. Rollers to have at least 5 rolls. Prosser to have at least 12 sections.....Card.....1137

TUBE SHEET LAYOUT

UNITS 36 units 1½" o. d. #9 BWG .....of seamless steel. Pipes united by return bends.....Card.....5968
Each unit to be tested, before being placed in boiler, with water under pressure of 250 lb. per sq. in for screwed return bends or 500 lb. per sq. in. for welded return bends.

UNIT PIPE SUPPORTS Of steel fastened securely on superheater pipes so as not to slide.....Card.....10773

UNIT PIPE JOINT To be made in best possible manner to insure absolutely tight joints in accordance with the notation on.....Card.....1043

UNIT CLAMP BOLT To be in accordance with requirements of Locomotive Superheater Company Material Specification No. 12.....Card.....10695

HEADER To be of close grain cylinder iron, steam tight in every respect. Joint ring for connection to dry pipe to have flat side against header flange. Casting should be moulded with the unit joint face down to secure the best quality of metal on surface where superheater unit joints are made. Each header to have a serial number cast on in such a location as not to be removed in finishing. No patch plugs or chaplets allowed in ball joint seats. Headers must not be treated with sal ammoniac. Header casting to be tight under water pressure of 250 lb. Test pressure to be applied separately to the saturated and to the superheated steam passages, so as to insure soundness of all partition walls.....Card 10005-D

HEADER SUPPORTS To be securely fastened to boiler shell with rivets or turned bolts fitted in reamed holes. To be properly located so as to support the header after header has been correctly located. Header should then be secured to supports. This to be done before superheater units are put in place.....Card.....1323

STEAM PIPE JOINT RINGS Should be of cast iron.

DEFLECTING PLATE To be constructed so as to permit easy inspection and removal of superheater units and joints. Design to be in accordance with.....Card SEE ARRGT.

DAMPER CYLINDER To be carefully and accurately made. Piston not to be more than 0.01 in. smaller than bore. Bearings for piston and extension to be in line. Piston to be ground and to operate freely under a pressure as low as 40 lb. per sq. in. Steam pipe to damper cylinder should be as short and free from bends as possible so as not to cause water to collect in cylinder. Pipe to be well protected against freezing.....Card.....1149

DAMPER SHAFT COUNTERWEIGHT To be painted a light color to render it easily visible by the engineer.....Card.....1067

S. H. ARRANGEMENT To be in accordance with.....Card.....4991

TEST (FINAL) The superheater, after assembling in boiler and after steam pipes are fitted up, is to be thoroughly tested and to be tight under water pressure of at least 30% more than the working pressure of the boiler.

DAMPER	.....Card.....10882-T.....	DAMPER SHAFT LINK	.....Card.....1070
DAMPER CYL. ARM.	.....Card.....1024.....	PATENT PLATE	.....Card.....3157
DAMPER CYL. PIPE FITTING	.....Card.....	S. H. UNIT BOLT WASHER	.....Card.....1071
DAMPER CYL. PIPE UNION	.....Card.....1287.....	S. H. UNIT CLAMP	.....Card.....1073
DAMPER CYL. PIPING DIAGRAM	.....Card.....1503.....	S. H. UNIT CLAMP WASHER	.....Card.....10305
DAMPER CYL. SUPPORT	.....Card.....	S. H. PIPE END	.....Card.....1344
DAMPER SHAFT	.....Card.....1235-J.....	S. H. PIPE BAND	.....Card.....1928
DAMPER SHAFT ARM	.....Card.....1234 & 1226.....	RETURN BENDS	.....Card.....10300
DAMPER SHAFT BEARING (O.S.)	.....Card.....1223 & 1148.....	DEFLECTING PLATE HANDLE	.....Card.....1167
DAMPER SHAFT BEARING (I.S.)	.....Card.....10386-F.....	LUBRICATOR CONNECTION	.....Card.....3023
SPACING OF BANDS & SUPPORTS	.....Card.....10792.....	DEFLECTING PLATE STUDS	.....Card.....10709
TYPE OF RETURN BENDS	.....CAST STEEL.....	DEFLECTING PLATE CLAMP	.....Card.....10299-A

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-3470.

Memorandum Spec'n 10956.

SPECIFICATION FOR LOCOMOTIVES 8 44 E 1 to 43 Gen. as Photo. 4239 except with Walschaerts Valve Gear.

FOR The Lake Terminal Railroad Co. 4-24-16. **Engine Drawing No.** 1

R.

Gauge of Road 4' 8½" Plain 7/8" except 7" for F.& B.Drivers.
Wheelbase, Rigid 15' 0" Driving 15' 0" Total 15' 0"
Total wheelbase engine and tender: Actual 49' 5" Limited to -----

Curves 300 feet radius.

Limits, Height 14' 2" Width -----
Weight on drivers 228,000 lbs. Total 228,000 lbs.
On front truck ----- lbs. On trailing truck ----- lbs.

Total engine 52,000 lbs. Ratio of adhesion 4.39
Work'g St'm Pres. 180 lbs Steam Switching
Fuel Bituminous Coal.

11 **Boiler** Steel Thick 13/16" & 7/8" Radial stay steel See hereafter
Boiler Diam. 70" Fire Extended Wagon Top
Boiler tubes pipes, 200 No. Diameter 2" 220 lbs steam press. 267 lbs water press.
Longitudinal seams (See sup. 13)

14 **Dome,** Diam. 33" Pos. Forward of firebox. (Sup. 33)

Firebox Steel Thickness Sides None
Firebox length 102" Width 72" Depth F 77⅝" B 65½"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firebox openings One Oval 13" x 18" (See sup. 15)
Water space F. 5" Sides 5" Back 5"
Water Space Stays Double Riveted
16 Water space stays 1" diam. with 3/16" hole 1½" deep from O. S.

16 Radial stays 1" diam. Sag stays front } Three rows of B.L.W. expansion stays.
Button heads horizontal rows Ten Vertical rows
Crown bars None. Radial ----- above crown
Diagonal stays -----

Flues Steel.
Tubes 211 N. S. National Tube Co's Seamless Hot Rolled Steel
Tube ends Swaged for copper ferrules firebox ends
Number 400 Diam 2" Length 15' 0"

Heating Flues None. Combus. Chamb. None. Total 3729.3 sq ft
Surface Tubes 3515.4 Fire Box 188.9 Fire Brick Tubes 28.3 sq ft
Grate area 54 sq ft Ratio to Heating Surface 1 : 69
Superheater

Fire Brick Arch on tubes (See sup. 17)

Grates Ry.Co's Standard, Shaker type.
Ash Pan, Dampers None.
Ash pan to have a cast steel frame.

Throttle Balance (See sup.31) Pos Dome.
Dry pipe Steel.

Superheater None.

Smokebox extension With Cleaning hole and cap L. S. only.
Spark-ejector or hopper With
Netting and deflect. plates With

Exhaust nozzles Double high.

Stack Cast iron, straight Dia 20" Hole in S. B., dia. 22"

Safety Valves (Spec) Two Kunkle 3½" Lock-up type, one muffled
Safety valves None. with relief lever. Set to 180 lbs. muffled 183 lbs. open
Whistle B.-L. W. Chime.

Steam Gauge One Iron 7" (Spec) Maker:—Crosby (See sup.30)
Steam gauge stand Iron **Clock** None

Water Gauge (See sup.18-19) **Cab Lamps** to burn oil
Gauge Cocks (See sup. 19) Surface valve None
Lowest gauge cock 5" above highest part of crown
Lubricator steam valve without separate dry pipe to dome
Blower Valve Two B. L. W.

Blow off Cock One Everlasting. Pos:—Front
Cleaning Plugs One plug above fire door
Firebox Corners diagonal sides and back
Crown Three each side and four back
Waist One under front.
Front tube sheet. One. Fusible plug One

Pump None. Pos. -----
Top chamb. ----- Bottom chamb. -----
Feed Cock ----- Feed pipes -----
Checks ----- Check pipes -----

26 Injectors to be non-lifting type placed under cab
Injectors (Spec) Two Nathan Simplex No. 11
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check (See sup. 26) Pos. Top of boiler

Steam Heat None.

Cab Sheet steel, lined with wood. (See sup. 29 to 31)
Ventilator in cab roof

Cab boards Steel and wood Nosing 3" x 3" x ⅜" angle iron
Running boards Steel Nosing 3" x 3" x ⅜" angle iron
Hand rail Iron (See sup. 33) Located on Boiler

32 **Back Bumper** Bar Steel. Back drawbar height 30"

Pilot None. Pushing shoes Cast in bumper.
Front Bumper Commonwealth Cast Steel Bumper plate None.
Steps across front with handrail. (See sup. 33-34)
Steps, hand holds etc. to conform to I.C.C. requirements.
Front Drawhead, Centre above rail 33½"
Coupler National Sharon M. C. B. Auto. with 13" knuckle and with extended floor. (See sup. 35)

Signal fixtures None

Headlight from Dayton Mfg. Co. (See sup. 36)
Headlight Two Round Case 18" Reflector, To burn Kerosene
Headlight, Nos. on sides With H'd'l't step With
Lamp shelf None Nosing -----

Bell of Brass 92 pounds Gollmar Air Bell Ringer. (Sup. 31)
37 **Sand Box** Three Diam. 38" Body Iron Painted. Pipes Iron
33 Sander (Spec) Leach Air Trap A-1 in each box to sand front and back

Dome casing Iron Painted

Boiler Jacket #22 Plan. Steel Bands Iron Style 9 and 14.
Boiler Lagging Magnesia sectional
Back head of boiler to be lagged and jacketed

11-266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS
T. J. Shattuck Sept 1916

SPECIFICATION FOR LOCOMOTIVES 8 44 E 1 to 43 170

FOR The Lake Terminal Railroad Co.

B. Furnish prints (See sup. 5)

Frames Cast Steel, annealed. Braces Solid.

37 **Cylinders,** Diam. 25" Stroke 30"
St'm ports, Length 27.95" Width 1⅞" Bridges -----
Exh. ports, Length ----- Width ----- Valve lead ¼"
Valve travel 6¼" Steam lap ⅞" Exhaust clearance -----
Eccentric crank throw 18-1/16" By-pass valve None
S. F. Lubr. (Spec) Nathan Three feed bulls eye. (See sup.38)
Cyl'r heads Cast steel; Lubr. pipes of Iron under jacket
Cyl'r casings Iron Pto. Head covers Steel Painted
St'm chest casings ----- Covers -----
St'm chest valves 12" diam. Piston type, Inside admission
Met. pkg (Piston rods / Valve stems) United States, King type (Spec)

Pistons (See sup. 39)
Guides Forged Steel Oil cups Needle.
40 **Crossheads** Alligator type cast steel, with gibs of bronze
Wrist Pins Steel Rod cups Grease on all rods.
41 Parallel rods to have solid ends.

Valve Motion Walschaerts. (See sup.42)
Links, sliding blocks, pins, lifting links and eccentric rod laws to be well case hardened or to have hardened bushings.

1 All threads on bolts (except stayboltsl to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

43 **Drivers,** O. S. Diam. 55" Cen. diam. 48" Centres of cast steel

46 **Tires** Steel Held by Shrinkage and Shoulder
Tires, Flanged, Pos. All Size 3½" x 5½"
Tires, Plain, Pos. None. Size -----
Lateral play between driving boxes and wheel hubs = 1/16" total
Driving Boxes Cast steel, with Elvin Lubricators
Journals, Diam. Main 10½" Others 10" Length 12"

Springs. Make B. L. W. (See sup. 47)

Front Engine Truck None. Wheeled -----
To swing -----each side of cen., Cen. pin liners -----
Journals, Diam. ----- Length ---- Boxes -----
Wheels, Diam. ----- Tread ----- Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----

Back Engine Truck None Wheeled -----
To swing -----each side of cen., Cen. pin liners -----
Journals, Diam. ----- Length ----- Boxes -----
Wheels, Diam. ----- Tread -----Kind -----
Tires ----- Cen. diam -----Size -----
Tires held by -----

51 **Tender** Eight Wheeled, Drawing No. 841.
Weight, with fuel and water, about 140,000 lbs.

51 **Tank** 7,000 Gallons, Bill 4254.
Tank Water bottom type. Fuel capacity 12 tons.

Tool Boxes Steel, Top.

Frame Steel 13" Channels (Sup. 54)

Front Drawbar height 30" (See sup.55)
Pilot None Pushing shoes Cast in bumper.
Back drawhead, center above rail 33½"
Coupler M. C. B. Auto. with Westinghouse friction draft gear.

Steps, hand holds etc. to conform to I. C. C. requirements.
Steps across rear with handrails. (See sup.56)

Trucks Diamond Arch bar, with Simplex bolsters.

Springs Elliptic. B. L. W. make.
Journals, Diam. 5½" Length 10" (See sup. 57-58)
Wheels, Diam. 33" Tread 4¼" Kind Schoen rolled steel.
Tires None. Cen. diam. ----- Size -----
Tires held by ----- Wheel Rims 2½" thick.
Safety chains Single.

Brake Position On all wheels.
Brake sch. #6 ET Westinghouse Auto. and straight air with 14" x 12" tender cylinder. (See sup. 59-60)

List of tools sent 20
Photo set. #2 Inspection B.L.W. except (See sup. 11)
To be weighed Yes. Material specifications B. L. W. (See sup.1)
Certificate of boiler test Three copies of B.L.W. form 1036
Journal laws to 6-1-16. Shipment On own wheels.

Brass shop finish No 1.
Machine shop finish D-155

B. L. W. Throttle, Patented Jan. 23, 1900 (Cast On)
Patents

Property plates None

Painting: Engine, style 366 Olive Green and Gold.
Painting Tender, style 366 Olive Green and Gold.
Lettering, striping etc. in gold leaf as Ry.Co's print 1-1-7531
Mark on tank sides L. T. R. R.

31 **Brake,** position On all driving and tender wheels
Operating Parts } Engine, Sch. #6 ET West'g. Combined Auto and Eng. Tr'k, sch. ----- Straight Air
Foundation Parts } Drivers, sch. WN-3-BC American O. S. Equalized Eng. Tr'k, sch. -----
Air pump Two 11" Pos. Both Left Side. (See sup. 48)
Train connections Front and back.
Train signal, sch. None.
Air gauge, Crosby duplex (See sup. 30)
Main air reservoirs to be enamelled

Road Nos. Pos. Road Nos. Name None.
F. No Plate 30 to 33-32
10/14/20 ~~Front Sand Box~~ Sides of cab.
Back of tank.

SPECIFICATION FOR LOCOMOTIVES 8 44 E 1 TO ~~3~~

FOR THE LAKE TERMINAL RAILROAD COMPANY.

R.

1 ALL MATERIALS ENTERING INTO THE CONSTRUCTION OF THESE LOCOMOTIVES WHICH ARE MANUFACTURED OR SOLD BY ANY OF THE CONSTITUENT COMPANIES OF THE UNITED STATES STEEL CORPORATION ARE TO BE PURCHASED FROM SAME. EXCEPT FORGINGS MAY BE PURCHASED FROM STANDARD STEEL WORKS (A/C TIME)

2 BOILER AND ENGINE COMPLETE TO MEET ALL REQUIREMENTS OF THE FEDERAL AND OHIO STATE LAWS.

3 EACH 2[illegible],000 LBS. IF POSSIBLE, NOTWITHSTANDING OMISSION OF SUPERHEATER.

4 [illegible] TO BE APPLIED TO ALL BOLTS, WHERE POSSIBLE TO DO SO.

5 TWO SETS OF BLUE PRINTS TO BE FURNISHED RY.CO. AFTER COMPLETION OF ENGINES.

6 BOILER TO BE INSPECTED BY HARTFORD STEAM BOILER INSPECTION & INSURANCE CO., 142 SOUTH FOURTH STREET, PHILA., PA. ADVISE THEM WHEN TO SEND AN INSPECTOR TO LOOK OVER THE WORK DURING CONSTRUCTION AND ~~THERE~~ THEN TO MAKE FINAL INSPECTION AND APPLY A HYDROSTATIC TEST AFTER BOILER IS COMPLETED. 8/7/16

~~XX BOILER TO BE INSPECTED BY HARTFORD STEAM BOILER INSPECTION & INSURANCE CO. (SEE SUP. 7-12)~~ 8/7/16

12 WHEN DESIGN OF BOILER IS COMPLETED SEND PRINT TO H. A. EDWARDS, MGR. HARTFORD STEAM BOILER INSPECTION & INSURANCE CO. 311 LEADER BLDG., CLEVELAND, OHIO.

13 LONGITUDINAL SEAMS, BUTT JOINTED, DOUBLE COVERING STRIPS RESPECTIVELY RIVETED, 30% SEAM.

14 AUXILIARY DOME TO BE PROVIDED FOR SAFETY VALVES, WHISTLE AND FOR INSPECTION OF THE BOILER.

15 FIRE DOOR TO BE FRANKLIN PNEUMATIC.

16 STAYBOLTS, COMPLETE INSTALLATION OF TATE FLEXIBLE STAYBOLTS, ABOUT 1000 IN NUMBER OF BETHLEHEM IRON.

17 FIRE BRICK ARCH, SECURITY FROM AMERICAN ARCH CO., ON [illegible] TUBES 3" DIAMETER OF #7 W. G. SHELBY SEAMLESS STEEL

18 WATER GAUGE GLASS TO BE RY.CO'S STANDARD, WITH IRONCLAD PROTECTOR.
WATER COLUMN. BALDWIN STANDARD WITH TOP STEAM CONNECTIONS ON TOP FLANGE OF BOILER WITH COPPER PIPE CONNECTIONS TO TOP OF COLUMN, TUBULAR GLASS ⅝" x 12", PLACED ON BOILER HEAD IN PLAIN SIGHT OF ENGINEER.

19 GAUGE COCKS - THREE NATHAN NEVER-LEAK TYPE, WITH DRIP PAN, ON BOILER HEAD. HEIGHT OF BOTTOM GAUGE COCK AND LOWER REGISTER OF WATER COLUMN TO BE EXACTLY 5" ABOVE THE HIGHEST POINT OF CROWN SHEET.

26 INJECTOR CHECKS TO BE SELLERS DOUBLE COMBINED CHECK AND STOP VALVES.
FLANGED JOINTS ON CHECK PIPES AND STEAM PIPES TO INJECTORS.

27 FEED WATER STRAINER TO BE NATHAN.

28 COAL SPRINKLER, SELLERS SAFETY, ON LEFT SIDE UNDER ENGINE CAB.

29 BACK OF CAB TO BE APPROXIMATELY 50" FROM BOILER HEAD, SAME AS THOSE BUILT FOR BELT RAILWAY OF CHICAGO, AS PER PHOTO. ATTACHED TO SPECIFICATIONS.
STORM WINDOW IN FRONT CAB DOOR.

30 STEAM AND AIR GAUGES ON BOILER HEAD IN PLAIN SIGHT OF ENGINEER.

31 THROTTLE LEVER, RAGONNET REVERSE GEAR LEVER, BRAKE VALVES. BELL RINGER VALVE AND SAND VALVE TO BE PLACED IN POSITION SO THAT ENGINEER CAN OPERATE SAME WITH HEAD OUT OF CAB WINDOW.

32 SPRING BUFFER TO BE PROVIDED ON FRONT OF TENDER.

33 CIRCULAR HAND RAILS ON STEAM DOME AND SAND BOXES, NEAR TOP. WITH SUITABLE STEPS ON SIDE OF BOILER, ALSO HAND RAIL ON SIDE OF BOILER, EXTENDING FROM CAB TO FRONT OF SMOKE BOX, CIRCULAR HAND RAIL ON FRONT OF SMOKE BOX DOOR RIM.

34 FOOT BOARDS, FRONT, TO BE OF ONE SECTION, WITH FOUR HANGERS ON EACH BOARD.

35 COUPLER AND COUPLER POCKET AS NATIONAL MALLEABLE CASTINGS Co's PRINTS, Nos. 10290-G FOR COUPEER, AND 11839-C FOR POCKET.

36 HEADLIGHT TO BE DAYTON #1395 WITH A-18 INTERIOR. FRONT HEADLIGHT PLACED ON SMOKE BOX DOOR ABOVE NUMBER PLATE, BACK HEADLIGHT PLACED ON CENTER OF BACK OF TENDER. (SUP. 53)

37 CYLINDER COCKS - OPERATING LEVERS LOCATED CONVENIENT FOR ENGINEER TO OPERATE WITH FOOT WHILE HEAD IS OUT OF CAB WINDOW.

38 LUBRICATORS ATTACHED TO BOILER HEAD AT POINT IN PLAIN SIGHT OF ENGINEER.

39 PISTON HEADS OF STEEL, FITTED WITH APPROVED FORM OF STEAM PACKING, I.E., DUNBAR SECTIONAL.

40 CROSSHEADS TO HAVE ARM BOLTED TO BODY.
CROSSHEAD PINS MUST BE REMOVABLE WITHOUT DISCONNECTING BACK END OF MAIN ROD.

41 CONNECTING RODS, MAIN TO BE "I" SECTION.
MAIN ROD WEDGE KEY TO BE LOCATED BACK OF MAIN PIN (INSTEAD OF IN FRONT)

42 REVERSE GEAR TO BE RAGONNET POWER REVERSE, AS COVERED ON EXTRA ORDER 6845 DATED 7-6-16. (SEE SUP. 31)

43 DRIVING WHEELS TO HAVE HUB PLATES OF BRASS SET IN.

M. 266-67 Photo copied see box

SPECIFICATION FOR LOCOMOTIVES 8 44 E 1 TO ~~3~~

FOR THE LAKE TERMINAL RAILROAD COMPANY.

46 CHICAGO FLANGE OILER WITH PIPE CONNECTIONS TO FRONT AND REAR DRIVERS.

47 ALL HOLES IN DRIVING SPRING HANGERS SUBJECT TO WEAR TO BE BUSHED.

48 TWO 11" WESTINGHOUSE AIR PUMPS WITH RESERVOIR CAPACITY FOR RAGONNET REVERSE GEAR, ENGINE AND TENDER BRAKES AND TRAIN LINE.
AIR PUMP EXHAUST TO BE PIPED TO CYLINDER SADDLE EXHAUST.

49 For Hereafter. Crosshead wrist pins to be secured as shown by Section "C" on Co's print herewith. - (Sent to Vault to be filed) 4.26.24.

TENDER.

51 TANK AS B. L. W. CARD 5209 EXCEPT OMIT TOOL BOXES FROM LEGS.
TANK COPING SET IN AT SIDE, SIMILAR TO 12 42 68 DD 1, SO THAT ENGINEMEN WILL HAVE CLEAR VIEW OVER TANK.

52 COAL GATES OF THE STEEL DOOR TYPE.

53 HEADLIGHT TO BE DAYTON #1395 WITH A-18 INTERIOR. BACK HEADLIGHT PLACED ON CENTER OF BACK OF TENDER. (SUP. 36)

54 TENDER END SILLS OF CAST STEEL.

55 SPRING BUFFER TO BE PROVIDED ON FRONT OF TENDER.

56 FOOT BOARDS AT REAR TO BE OF ONE-SECTION, WITH FOUR HANGERS ON EACH BOARD.

57 TENDER AXLES OF CARNEGIE STEEL.

58 JOURNAL BOXES TO BE OF PRESSED STEEL.

59 TENDER BRAKE BEAMS TO BE NATIONAL HOLLOW.

60 SLACK ADJUSTER ON TENDER.

Vol. 266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS Dup. of B 44 E 1 to 3 with some extras, except where otherwise specified

Memorandum Spec'n 10938

SPECIFICATION FOR LOCOMOTIVES 8 44 E 4

Gen. sh. Photos. 4259 (except with Walschaerts valve gear)

Engine Drawing No. 1

FOR The Lake Terminal Railroad Company

4-20-16 (spec)

Gauge of Road 4' 8½" Play ¾" except ⅞" for F.& B.Drivers

Wheelbase, Rigid 15' 0" Driving 15' 0" Total 15' 0"

Total wheelbase, eng. and tend. {Actual 49' 5" / Limited to ----

Curves 300 feet radius

Limits, Height 14' 8" Width ----

Weight (approximate) in working order, Total 228,000 lbs.

On F. tr'k ---- lbs., Drivers 228,000 lbs., B. tr'k ---- lbs.

Tractive power 52,000 lbs., Ratio of adhesion 4.39

Work'g St'm Pres. 180 lbs., Service Switching

Fuel Bituminous Coal

5 Boiler Steel Thick 13/16" & ⅞" Bill {7826 / 7908 for hereafter 9/1/.

Boiler, Diam. 78" Plan Extended Wagon top

5 Boiler st'm pres. 200 lbs., Tested to {220 lbs. steam pres. / 267 lbs. water pres.

Longitud. seams (See supplement 7)

28 Dome, diam. 33" Pos. Forward of firebox (Sup.

Firebox Steel Combustion chamb. None

Firebox, length 108" Width 72" Depth F. 77⅛" B. 65⅛"

Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"

Firedoor opening One oval 13" x 18" (See sup. 8)

Water space, Front 5" Sides 5" Back 5"

Water space, Frame Double Riveted

9 Water space stays 1" diameter with 3/16" hole 1½" deep from O.S.

Radial stays 1" diameter Sling stays front {Three rods of B. L. W. Expansion Stays

Button heads below crown on Ten central rows

Crown bars None Placed ---- above crown

Crown bolts ----

Flues # 9 BWG Pittsburgh Steel Products Co's (A/c time)

Tubes #11 WG National Tube Co's Seamless Hot Rolled Steel

Tube ends Staged for copper ferrules firebox ends

Number 36 / 214 Diam. 2¼" / 2" Length 15' 0"

Heating Surface	Flues 773 □	Combus. Chamb. ----	Total 2893.3 □		
	Tubes 1906 □	Fire Box 186 □	Fire Brick Tubes 28.3 □		
Grate area 54 □	Ratio to Heating Surface 1 : 53.6				
Superheater 657 □					

Fire Brick Arch, on tubes (See supplement 10)

Grates Railway Co's Standard, Shaker type

Ash Pan, Dampers None

Ash Pan to have a cast steel frame

Throttle Balance (Sup. 26) Pos. Dome

Dry pipe Steel Steam pipes (See sup. 12)

Superheater Schmidt Type (See supplement 11)

Smokebox extension With Cleaning hole and cap Left side only

Spark-arrester-as hopper With

Netting and deflect. plates With

Exhaust nozzles Single high

Stack Cast iron, straight Dia. 20" Hole in S. B., dia. 22"

Safety Valves Two Kunkle 3½" Locomotive type. One muffled

Safety valves None with relief lever, Set to 180 pounds. One muffled

Whistle B. L. W. Chime

Steam Gauge One iron 7" (spec) Maker—Crosby (See sup. 25)

Steam gauge stand Iron Clock None

Water Gauge (Sup. 13-14) Cab Lamps to burn oil

Gauge Cocks (Sup. 14) Surface valve None

Lowest gauge cock 5" above highest part of crown

Lubricator steam valve without separate dry pipe to dome

Blower Valve Two B. L. W.

Blow off Cock One Everlasting Foot Front

Cleaning Plugs One plug above fire door

Firebox Corners diagonal, sides and back

Crown, Three each side and four back

Waist, One under front

Front tube sheet, One Fusible plug One

Pump None Pos. ----

Top chamb. ---- Bottom chamb. ----

Feed Cock ---- Feed pipes ----

Checks ---- Check pipes ----

21 Injectors to be non-lifting type placed under cab

Injectors Two Nathan Simplex No. 11

Injectors, Pos. Right and left Steam pipes Copper

Pipes, Check Iron Feed Iron Overflow Iron

Check (See supplement 21) Pos. Top of boiler

Steam Heat None

Cab Sheet steel, lined with wood (See supplement 24)

Ventilator in cab roof

Cab boards Steel and wood Nosing 3" x 3" x ½" angle iron

Running boards Steel Nosing 3" x 3" x ½" angle iron

Hand rail Iron (Sup. 28) Located on Boiler

27 Back Bumper Bar steel Back drawbar height 30"

Pilot None Pushing shoes Cast in bumper

Front Bumper Commonwealth Cast Steel Bumper plate None

Steps across front with handrail (See supplement 2-59)

Steps, hand holds, etc., to conform to I.C.C requirements

Front Drawhead, Center above rail 33½"

Coupler National Sharon M. C. B. Auto. with 13" knuckle and with extended floor (See supplement 30)

Signal fixtures None

Headlight from Dayton Manufacturing Company (See sup. 31-63)

Headlight Two Round Case 18" Reflector, To burn Kerosene

Headlight, Nos. on sides With H'd'l't step With

Lamp shelf None Nosing ----

Bell of brass 92 pounds: Goliath Air Bell Ringer (Sup. 29)

26 Sand Box Three Diam. 38" Body Iron painted Pipes Iron

26 Sander (spec) Leach Air Trap A-1 in each box to sand front and back

Dome casing Iron painted

Boiler Jacket #22 Plan. Steel Bands Iron Style 9 and 14

Boiler Lagging Magnesia Sectional

Back head of boiler to be lagged and jacketed

THE BALDWIN LOCOMOTIVE WORKS

A. J. Blanchard Supt.

SPECIFICATION FOR LOCOMOTIVES 8 44 E 4

176

FOR The Lake Terminal Railroad Company

Furnish prints (See sup. 4)

Firebox Cast steel, annealed Braces Solid

32 Cylinders, Diam. 25" Stroke 30"

St'm ports, Length 27.95" Width 1⅞" Bridges ----

Exh. ports, Length ---- Width ---- Valve lead ¼"

Valve travel 6¼" Steam lap ⅞" Exhaust clearance ----

Eccentric crank throw 18-1/16" By-pass valve None

S. F. Lubr. Nathan Five feed Bulls Eye (See sup. 33)

Cyl'r heads Cast steel; Lubr. pipes of iron under jacket

Cyl'r casings Iron painted Head covers Steel painted

St'm chest casings ---- Covers ----

St'm chest valves 12" diameter Piston type, inside admission

Met. pkg {Piston rods / Valve stems} United States, King type (spec)

Pistons (See supplement 34)

Guides Forged steel Oil cups Needle

35 Crossheads Alligator type, Cast steel, with gibs of bronze

Wrist Pins Steel Rod cups Grease for all rods

Parallel Rods to have solid ends (See sup. 36)

Valve Motion Walschaerts (See supplement 37)

Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard. All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

38 Drivers, O. S. Diam. 55" Cen. diam. 48" Centers of cast steel

46 Tires Steel Held by Shrinkage and shoulder

Tires, Flanged, Pos. All Size 3½" x 5½"

Tires, Plain, Pos. None Size ----

Lateral play between driving boxes and wheel hubs— 1/16" total

Driving Boxes Cast steel, with Elvin Lubricators

Journals, Diam. {Main 10½" / Others 10"} Length 12"

Springs Make B. L. W. (See supplement 47)

Front Engine Truck None Wheeled ----

To swing ---- each side of cen., Cen. pin liners ----

Journals, Diam. ---- Length ---- Boxes ----

Wheels, Diam. ---- Tread ---- Kind ----

Tires ---- Cen. diam. ---- Size ----

Tires held by ----

Back Engine Truck None Wheeled ----

To swing ---- each side of cen., Cen. pin liners ----

Journals, Diam. ---- Length ---- Boxes ----

Wheels, Diam. ---- Tread ---- Kind ----

Tires ---- Cen. diam. ---- Size ----

Tires held by ----

54 Brake, position On all driving and tender wheels

Operating Parts | Engine, Sch. #6 ET West'g Combined Auto and Eng. Tr'k, sch. ---- straight air

Foundation Parts | Drivers, sch. WA-3-80 American O. S. Equalized Eng. Tr'k, sch. ----

Air pump Two 11" Pos. Both left side (See sup. 48)

Train connections Front and back

Train signal, sch. None

Air gauge, Crosby Duplex (See supplement 49)

Main air reservoirs to be enameled

61 Tender Eight Wheeled, Drawing No. 841

Weight, with fuel and water, about 140,000 pounds

64 Tank 7,000 Gallons, Bill 4254

Tank Water bottom type Fuel capacity 12 tons

Tool Boxes Steel, top

Frame Steel 13" channels (See supplement 64)

Front Drawbar height 30" (See supplement 65)

Pilot None Pushing shoes Cast in bumper

Back drawhead, center above rail 33½"

Coupler M.C.B.Auto. with Westinghouse Friction Draft Gear.

Steps, hand holds, etc., to conform to I.C.C. requirements

Steps across rear with handrails (See supplement 2-66)

Trucks Diamond Arch Bar, with Simplex Bolsters

Springs Elliptic B. L. W. make

Journals, Diam. 5½" Length 10" (See supplement 67- 68)

Wheels, Diam. 33" Tread 4¼" Kind Schoen Rolled Steel

Tires None Cen. diam. --- Size ---

Tires held by --- Wheel rims 2½" thick

Safety chains Single

Brake Position On all wheels

Brake sch. #6 ET Westinghouse Auto and straight air with 14" x 12" tender cylinder (See supplement 69- 70)

List of tools, sch. 29

Photo sch. None Inspection B. L. W., except (Sup. 5 - 6)

To be weighed Yes Material spec'ns B. L. W. (See sup. 1)

Certificate of boiler test Three copies of B. L. W. form 1036

Junior laws to 6-1-16 Shipment On own wheels

Brass shop finish, No. 1

Machine shop finish D-165

B. L. W. Patents { Throttle, Patented Jan. 23, 1900 (Cast on) / Steam Pipe Cover, Patented July 18, 1900 (Cast on)

Property plates None

Painting:—Engine, style 366, Olive Green and Gold

Painting:—Tender, style 366, Olive Green and Gold

Lettering, etc., in Gold Leaf as Ry. Co's print 1-1-7531

Mark on tank sides L. T. R. R.

Road Nos. Pos. Road Nos. Name None

F. No. Plate 33

~~Front Sand Box~~

Cab sides

Back of tank

SPECIFICATION FOR LOCOMOTIVES 8 44 E 4

FOR THE LAKE TERMINAL RAILROAD COMPANY

1 ALL MATERIALS ENTERING INTO THE CONSTRUCTION OF THESE LOCOMOTIVES WHICH ARE MANUFACTURED OR SOLD BY ANY OF THE CONSTITUENT COMPANIES OF THE UNITED STATES STEEL CORPORATION ARE TO BE PURCHASED FROM SAME, EXCEPT FORGINGS MAY BE PURCHASED FROM STANDARD STEEL WORKS (ACCOUNT OF TIME)

2 BOILER AND ENGINE COMPLETE TO MEET ALL REQUIREMENTS OF THE FEDERAL AND OHIO STATE LAWS.

3 CASTLE NUTS TO BE APPLIED TO ALL BOLTS, WHERE POSSIBLE TO DO SO.

4 TWO SETS OF BLUE PRINTS OF PARTS THAT ARE DIFFERENT FROM 8 44 E 1 TO 3, TO BE FURNISHED RY. CO. AFTER COMPLETION OF ENGINES.

5 BOILER TO BE INSPECTED BY HARTFORD STEAM BOILER INSPECTION & INSURANCE CO., 142 SOUTH FOURTH STREET, PHILA., PENNA. ADVISE THEM WHEN TO SEND AN INSPECTOR TO LOOK OVER THE WORK DURING CONSTRUCTION AND THEN TO MAKE FINAL INSPECTION AND APPLY A HYDROSTATIC TEST AFTER BOILER IS COMPLETED. (SUP. 2)

6 WHEN DESIGN OF BOILER IS COMPLETED SEND PRINT TO H. A. BAUMHAROT, MGR. HARTFORD STEAM BOILER INSPECTION & INSURANCE CO. 311 LEADER BLDG., CLEVELAND, OHIO.

7 LONGITUDINAL SEAMS, BUTT JOINTED, DOUBLE COVERING STRIPS SEXTUPLE RIVETED, 90 % SEAMS.
AUXILIARY DOME TO BE PROVIDED FOR SAFETY VALVES, WHISTLE AND FOR INSPECTION OF THE BOILER.

8 FIRE DOOR TO BE FRANKLIN PNEUMATIC.

9 STAYBOLTS, COMPLETE INSTALLATION OF TATE FLEXIBLE STAYBOLTS, ABOUT 1000 IN NUMBER OF BETHLEHEM IRON.

10 FIRE BRICK ARCH, SECURITY FROM AMERICAN ARCH CO., ON FOUR TUBES 3" DIAMETER OF #7 WG SHELBY SEAMLESS STEEL.

11 SUPERHEATER TO BE AS LOCOMOTIVE SUPERHEATER CO'S SPECIFICATION O-5981 DATED 8-9-16 (COPY ATTACHED)
ROYALTY ON SUPERHEATER PAYABLE BY B. L. W.
SUPERHEATER PIPES 1½" DIAMETER FROM THE PITTSBURGH STEEL PRODUCTS CO., (ACCOUNT OF TIME)

12 STEAM PIPES TO HAVE OUTSIDE CONNECTION TO STEAM CHESTS. ADDITIONAL HAND HOLE AND CAP IN EACH SIDE OF SMOKE BOX FOR INSPECTION OF SUPERHEATER.

13 WATER GAUGE GLASS TO BE RY. CO'S STANDARD, WITH IRONCLAD PROTECTOR.
WATER COLUMN BALDWIN STANDARD WITH TOP STEAM CONNECTIONS ON TOP FLANGE OF BOILER WITH COPPER PIPE CONNECTIONS TO TOP OF COLUMN, TUBULAR GLASS ⅝" x 12" PLACED ON BOILER HEAD IN PLAIN SIGHT OF ENGINEER.

14 GAUGE COCKS - THREE NATHAN NEVER-LEAK TYPE, WITH DRIP PAN, ON BOILER HEAD. HEIGHT OF BOTTOM GAUGE COCK AND LOWER REGISTER OF WATER COLUMN TO BE EXACTLY 5" ABOVE THE HIGHEST POINT OF CROWN SHEET.

21 INJECTOR CHECKS TO BE SELLERS DOUBLE COMBINED CHECK AND STOP VALVES.
FLANGED JOINTS ON CHECK PIPES AND STEAM PIPES TO INJECTORS.

22 FEED WATER STRAINER TO BE NATHAN.

23 COAL SPRINKLER, SELLERS SAFETY, ON LEFT SIDE UNDER ENGINE CAB.

24 BACK OF CAB TO BE APPROXIMATELY 50" FROM BOILER HEAD, SAME AS THOSE BUILT FOR BELT RAILWAY OF CHICAGO, AS PER PHOTO. ATTACHED TO SPECIFICATIONS.
STORM WINDOW IN FRONT CAB DOOR.

25 STEAM AND AIR GAUGES ON BOILER HEAD IN PLAIN SIGHT OF ENGINEER.

26 THROTTLE LEVER, RAGONNET REVERSE GEAR LEVER, BRAKE VALVES, BELL RINGER VALVE AND SAND VALVE TO BE PLACED IN POSITION SO THAT ENGINEER CAN OPERATE SAME WITH HEAD OUT OF CAB WINDOW.

27 SPRING BUFFER TO BE PROVIDED ON FRONT OF TENDER. (SEE SUP. 65)

28 CIRCULAR HAND RAILS ON STEAM DOME AND SAND BOXES, NEAR TOP, WITH SUITABLE STEPS ON SIDE OF BOILER, ALSO HAND RAIL ON SIDE OF BOILER, EXTENDING FROM CAB TO FRONT OF SMOKE BOX, CIRCULAR HAND RAIL ON FRONT OF SMOKE BOX DOOR-RAIL. (12-2/7/18)

29 FOOT BOARDS, FRONT, TO BE OF ONE SECTION, WITH FOUR HANGERS ON EACH BOARD,

30 COUPLER AND COUPLER POCKET AS NATIONAL MALLEABLE CASTINGS CO'S PRINTS, NOS. 10290-G FOR COUPLER, AND 11839-C FOR POCKET.

31 HEADLIGHT TO BE DAYTON #1395 WITH A-18 INTERIOR. FRONT HEADLIGHT PLACED ON SMOKE BOX DOOR ABOVE NUMBER PLATE, BACK HEADLIGHT PLACED ON CENTER OF BACK OF TENDER. (SUP. 63)

32 CYLINDER COCKS - OPERATING LEVERS LOCATED CONVENIENT FOR ENGINEER TO OPERATE WITH FOOT WHILE HEAD IS OUT OF CAB WINDOW.

33 LUBRICATORS ATTACHED TO BOILER HEAD AT POINT IN PLAIN SIGHT OF ENGINEER.

34 PISTON HEADS OF STEEL, FITTED WITH APPROVED FORM OF STEAM PACKING, I.E., DUNBAR SECTIONAL.

35 CROSSHEADS TO HAVE ARM BOLTED TO BODY.
CROSSHEAD PINS MUST BE REMOVABLE WITHOUT DISCONNECTING BACK END OF MAIN ROD.

36 CONNECTING RODS, MAIN TO BE "I" SECTION.
MAIN ROD WEDGE KEY TO BE LOCATED BACK OF MAIN PIN (INSTEAD OF IN FRONT)

37 REVERSE GEAR TO BE RAGONNET POWER REVERSE, AS COVERED ON EXTRA ORDER 6845 DATED 7-6-16. (SEE SUP. 25)

38 DRIVING WHEELS TO HAVE HUB PLATES OF BRASS SET IN.

pp. 266-67 Photo copied see box

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THE BALDWIN LOCOMOTIVE WORKS

SUPERHEATER SPECIFICATION FOR LOCOMOTIVES 8 44 E 4

FOR THE LAKE TERMINAL RAILROAD CO.

R.

Locomotive Superheater Company's Specification No. O-5981 dated August 9TH 1916.
Specification for Superheater with Top Header, Double Loop Arrangement.

BOILER TUBES	244 in number 2" O. D. 15 ft. 0 ins. over tube sheets. Tubes located between and adjacent to Boiler flues are to be beaded over at front end.
BOILER FLUES	36 in number 5½" O. D. #9 BWG thick of cold drawn seamless steel. Flues to be straight, true to gauge and wall not to vary more than one gauge from specified thickness, as shown on Card 10862-D
BOILER FLUE SETTING	Radius 1/16 inch on both edges of flue holes in firebox tube sheet and on front edge of flue holes in front flue sheet as shown on drawings, except for copper sheets. Back end to be set with copper ferrules, rolled, beaded and prossered except for copper sheets. Front end to be rolled and beaded. Rollers to have at least 5 rolls. Prosser to have at least 12 sections Card 1137
TUBE SHEET LAYOUT	to be in accordance with Card 5795
S. H. UNITS	36 units 1½" O. D. #9 BWG thick of seamless steel. Pipes united by cast steel return bends as shown on Card SEE ARRGT.
	Each unit to be tested, before being placed in boiler, with water under pressure of 500 pounds.
S. H. PIPE SUPPORTS	Of steel fastened securely on superheater pipes so as not to slide as shown on Card 10773
S. H. PIPE JOINT	To be made in best possible manner to insure absolutely tight joints in accordance with the notation on Card 1052
S. H. UNIT CLAMP BOLT	~~To be of steel having a tensile strength between 60,000 lbs. and 70,000 lbs. per sq. inch and to be as shown on~~ IN ACCORDANCE WITH MATERIAL SPECIFICATION #12 Card 1064-N
S. H. HEADER	To be of close grain cylinder iron, steam tight in every respect. Joint ring for connection to dry pipe to have flat side against header flange. Casting should be moulded with the face having the superheater joints placed downward in the mould to secure the best quality of metal on surface where superheater joints are made. Each header to have a serial number cast on in such a location as not to be removed in finishing. No patch plugs allowed on ball joint seats. Headers must not be treated excessively with sal ammoniac. Header casting to be tight under water pressure of 250 lbs. Test pressure to be applied separately to the saturated and to the superheated steam passages, so as to insure soundness of all partition walls. Card 10272
S. H. HEADER SUPPORTS	To be securely bolted or riveted to boiler shell. To be properly located so as to support the header after header has been correctly located. Header should then be bolted to supports. This to be done before superheater units are put in place. Card 1323
ST. PIPE JOINT RINGS	Should be of cast iron.
DEFLECTING PLATE	To be constructed so as to permit easy inspection and removal of superheater units and joints. Design to be in accordance with Card SEE ARRGT.
DAMPER CYLINDER	To be carefully and accurately made. Piston not to be more than 0.01 inch smaller than bore. Bearings for Piston and extension to be in line. Piston to be ground and to operate freely under a pressure as low as 40 lbs. per sq. in. Steam Pipe to damper cylinder should be as short and free from bends as possible so as not to cause water to collect in cylinder. Pipe to be protected against freezing. Card 1149
DAMPER SHAFT COUNTERWEIGHT	To be painted a light color to render it easily visible by the engineer Card 1067
S. H. ARRANGEMENT	To be in accordance with Card 4829-A
TEST (FINAL)	The Superheater, after assembling in boiler and after steam pipes are fitted up, is to be thoroughly tested and to be tight under water pressure of 250 lbs.

Name	Card	Name	Card
Damper	10800-S	Damper Shaft Link	10786-A
Damper Cylinder Arm	1246	Patent Plate	3158
Damper Cylinder Pipe Fitting		S. H. Unit Bolt Washer	1071
Damper Cylinder Pipe Union	1287	S. H. Unit Clamp	1073
Damper Cylinder Piping Diagram	1503	S. H. Unit Clamp Washer	10305
Damper Cylinder Support	1598-B	S. H. Pipe End	1344
Damper Shaft	1235-J	S. H. Pipe Band	1988
Damper Shaft Arm	1234 & 1246	Return Bends	10094
Damper Shaft Bearing (O. S.)	1223	Deflecting Plate Handle	1487
Damper Shaft Bearing (I. S.)	1275-C	Lubricator Connection	3023
		SPACING OF BANDS AND SUPPORTS CARD	10759
		DAMPER DETAILS CARD	10809

SUPERHEATER UNITS TO HAVE WELDED RETURN BENDS.

D E A

T OMIT TOOL BOXES FROM LEGS.
AR TO 12 42 68 DD 1, SO
IEW OVER TANK.

2.

A-18 INTERIOR, BACK
OK OF TENDER. (SEE SUP. 31)

FRONT OF TENDER. (SUP. 27)

SECTION, WITH FOUR

TEEL.

& HOLLOW.

1-266-67 Photo copied see box

SPECIFICATION FOR LOCOMOTIV
FOR THE LAKE TERMINAL RAIL

1 ALL MATERIALS ENTERING INTO
LOCOMOTIVES UNION ARE MANUFA
CONSTITUENT COMPANIES OF THE
TION ARE TO BE PURCHASED FRO
BE PURCHASED FROM STANDARD S

2 BOILER AND ENGINE COMPLETE T
THE FEDERAL AND OHIO STATE L

3 CASTLE NUTS TO BE APPLIED TO
DO SO.

4 TWO SETS OF BLUE PRINTS OF P
B 44 E 1 TO 3, TO BE FURNISH
ENGINES.

5 BOILER TO BE INSPECTED BY H
& INSURANCE CO., 142 SOUTH
ADVISE THEM WHEN TO SEND AN
DURING CONSTRUCTION AND THE
APPLY A HYDROSTATIC TEST AF

6 WHEN DESIGN OF BOILER IS CO
BAUMHARDT, MGR. HARTFORD ST
SURANCE CO. 311 LEADER BLDG.

7 LONGITUDINAL SEAMS, BUTT JOI
SEXTUPLE RIVETED, 90 % SEAMS
AUXILIARY DOME TO BE PROVIDE
AND FOR INSPECTION OF THE BO

8 FIRE DOOR TO BE FRANKLIN PNE

9 STAYBOLTS, COMPLETE INSTALLA
BOLTS, ABOUT 1000 IN NUMBER

10 FIRE BRICK ARCH, SECURITY FB
FOUR TUBES 3" DIAMETER OF #7

11 SUPERHEATER TO BE AS LOCOMOT
CATION O-5981 DATED 8-9-16 (
ROYALTY ON SUPERHEATER PAYAB
SUPERHEATER PIPES 1½" DIAMET
PRODUCTS CO., (ACCOUNT OF TH

12 STEAM PIPES TO HAVE OUTSIDE
ADDITIONAL HAND HOLE AND CAP
INSPECTION OF SUPERHEATER.

13 WATER GAUGE GLASS TO BE RY.
PROTECTOR.
WATER COLUMN BALDWIN STANDAR
ON TOP FLANGE OF BOILER WITH
TOP OF COLUMN, TUBULAR GLASS
HEAD IN PLAIN SIGHT OF ENGIN

14 GAUGE COCKS - THREE NATHAN M
PAN, ON BOILER HEAD. HEIGHT
LOWER REGISTER OF WATER COLU
THE HIGHEST POINT OF CROWN SH

SPECIFICATION FOR LOCOMOTIVES B 44 E 4
FOR THE LAKE TERMINAL RAILROAD COMPANY.

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16 CHICAGO FLANGE OILER WITH PIPE CONNECTIONS TO FRONT AND REAR DRIVERS.

17 ALL HOLES IN DRIVING SPRING HANGERS SUBJECT TO WEAR TO BE BUSHED.

18 TWO 11" WESTINGHOUSE AIR PUMPS WITH RESERVOIRS CAPACITY FOR RAGONNET REVERSE GEAR, ENGINE AND TENDER BRAKES AND TRAIN LINE.
AIR PUMP EXHAUST TO BE PIPED TO CYLINDER SADDLE EXHAUST.

19 For Navarro Crosshead wrist pins to be secured as shown by section "C" on Co's print herewith - Sent to Wauk to be filed - 4.26.26.

TENDER

61 TANK AS B. L. W. CARD 5209 EXCEPT OMIT TOOL BOXES FROM LEGS. TANK COPING SET IN AT SIDE, SIMILAR TO 12 42 68 DD 1, SO THAT ENGINEMEN WILL HAVE CLEAR VIEW OVER TANK.

62 COAL GATES OF THE STEEL DOOR TYPE.

63 HEADLIGHT TO BE DAYTON #1395 WITH A-18 INTERIOR, BACK HEADLIGHT PLACED ON CENTER OF BACK OF TENDER. (SEE SUP. 31)

64 TENDER END SILLS OF CAST STEEL.

65 SPRING BUFFER TO BE PROVIDED ON FRONT OF TENDER. (SUP. 27)

66 FOOT BOARDS AT REAR TO BE OF ONE-SECTION, WITH FOUR HANGERS ON EACH BOARD.

67 TENDER AXLES OF CARNEGIE STEEL.

68 JOURNAL BOXES TO BE OF PRESSED STEEL.

69 TENDER BRAKE BEAMS TO BE NATIONAL HOLLOW.

70 SLACK ADJUSTER ON TENDER.

THE BALDWIN LOCOMOTIVE WORKS As Spec. C-3517

Memorandum Spec'n 10968

SPECIFICATION FOR LOCOMOTIVES 6 36 D 229 & 230

Gen. as Photo 3518 Except omitting auxiliary dome

FOR The River Terminal Railway Co.

Engine Drawing No. 21

5-3-16.

Gauge of Road 4' 8½" Play ¾" **Wheelbase,** Rigid 11' 0" Driving 11' 0" Total 11' 0"

Total wheelbase eng. and tend. (Actual 42' 0" (Limited to' ----

Curves ----

Limits, Height ----- Width ----

Weight approximate on working order. Total 147,000 lbs.

On F. Truck --- lbs. Drivers 147,000lbs B. Truck --- lbs.

Tractive power 38,000 lbs., Ratio of adhesion 3.87

Work'g St'm Pres. 190 lbs., Service Switching

Fuel Soft Coal

6 **Boiler** Steel Thick ¾" Bill 7669

Boiler. Diam. 72" Plan Straight Top

6 Boiler st'm pres. 190 lbs., Tested to 210 lbs. steam pres. / 254 lbs. water pres.

Longitud. seams Butt jointed double covering strips.

4 **Dome,** diam. 33" Pos. Central

Firebox Steel Combustion chamb. None

Firebox, length 108-3/16" Width 42⅛" Depth F. 67⅛" B. 62⅛"

Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"

Firedoor opening 16" diam.

Water space, Front 4" Sides 3" Back 3"

Water space, Frame Single Riveted

Water space stays ⅝" diam. with 3/16" hole 1¼" deep from O.S.

Radial stays 1" diam. Sling stays front } Three rows of B.L.W. Expansion stays.

Button heads below crown on eight central rows

Crown bars None Placed --- above crown

Crown bolts ---

Tubes #12 W.G. Charcoal Iron or Steel

Tube ends Swaged for copper ferrules firebox ends.

Number 330 Diam. 2" Length 10' 5"

Heating Flues ---- Combus. Chamb. --- Total 1967⁵

Surface Tubes 1800⁵ Fire Box 167⁵ Fire Brick Tubes ---

Grate area 31.6⁵ Ratio to Heating Surface 1 : 62

Superheater ----

Fire Brick Arch on studs

Grates Rocking bars and drop plate

Ash Pan, Dampers Front and Back

Throttle Balance Pos. Dome

Dry pipe Steel

Superheater None

Smokebox extension With Cleaning hole and cap L.S. only.

Spark ejector or hopper With

Netting and deflect. plates With

Exhaust nozzles Double high

Stack Straight Dia. 18" Hole in S. B., dia. 21¼"

1 **Safety Valves** (spec.) Two Crosby 3" (See sup. 7)

Safety valves None with relief lever Set to 190 pounds

Whistle B. L. W. plain

Steam Gauge One Iron 7" MAKER: - Ashcroft (not spec.)

Steam gauge stand Iron **Clock** None

Water Gauge One B.L.W.(Ironclad) **Cab Lamps** To burn oil

Gauge Cocks Three Back Surface valve None

Lowest gauge cock 3½" above highest part of crown

Lubricator steam valve to have separate dry pipe to dome

Blower Valve B. L. W.

Blow off Cock One Everlasting 2" Pos Front

Cleaning Plugs

Firebox Corners, diagonal and sides

Crown, Three each side and three back

Waist. One under front.

Front tube sheet. Two Fusible plug One

Pump None Pos. ---

Top chamb. --- Bottom chamb. ---

Feed Cock --- Feed pipes ---

Checks --- Check pipes ---

Hp3 **Injectors** (spec.) Two Sellers Class N No. 9½

Injectors, Pos. Right and Left Steam pipes Copper

Pipes, Check Iron Feed Iron Overflow Iron

Check (See sup. 2) Pos. Right and Left

Steam Heat None

Cab Wood

Cab boards Wood Nosing None

Running boards Wood Nosing None

Hand rail Iron Located on Boiler

Back Bumper Bar Steel Back drawbar height 35¾"

Steel plate front and back of front bumper

Pilot None Pushing shoes at front

Front Bumper Oak Bumper plate None

Steps Across front with suitable handrails

Front Drawhead, Center above rail 33½"

Coupler Tower all steel M.C.B. Auto. with 11" face.

Signal fixtures None

Headlight Two Round Case 16" Reflector, To burn Kerosene

Headlight, Nos. on sides With H'd'l't step With

Lamp shelf None Nosing ----

Bell 94 pounds

Sand Box Two Diam. 28" Body Iron ptd. Pipes Iron

Sander Hand in each box, to sand front and back Leach, D2 Sept 27, Ord. 11407-11610

Dome casing Iron ptd.

Boiler Jacket #22 soft steel ptd Bands Iron Style 9

Boiler Lagging Magnesia sectional

Pp 266-67 Pub copied see box

THE BALDWIN LOCOMOTIVE WORKS

N. Haswell. Eng right

SPECIFICATION FOR LOCOMOTIVES 6 36 D 229 and 230

180

FOR The River Terminal Railway Co.

Frames Cast Steel Braces Solid

Cylinders, Diam. 21" Stroke 26"

St'm ports, Length 19" Width 1⅞" Bridges 1⅜"

Exh. ports, Length 19" Width 3" Valve lead 1/16"

Valve travel 5½" Steam lap ⅞" Exhaust clearance ---

Eccentric throw 5" By-pass valve None

S. P. Lubr. Nathan Triple Bulls Eye

Cyl'r heads Cast Iron Lubr. pipes of Iron under jacket.

Cyl'r casings Iron ptd Head covers Steel painted

St'm chest casings Iron ptd Covers Steel painted

St'm chest valves Richardson Balanced, with vacuum valve

Met. pkg (piston rods / valve stems) U. S. (not spec.)

Pistons Cast Iron rings sprung into solid head

Guides Steel Oil cups Needle

Crossheads Cast Steel

Wrist Pins Steel Rod cups Plunger forged on

Par Rods to have solid ends.

Valve Motion Stephenson

Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.

All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 50" Cen. diam. 44" Centres Cast Steel

Tires Steel Held by Shrinkage and Shoulder

Tires, Flanged, Pos. All 3" x 5½"

Tires, Plain, Pos. None Size ---

Lateral play between driving boxes and wheel hubs = 1/16" total

Driving Boxes Cast Steel

Journals, Diam. 9" Length 12"

Springs. Make B. L. W.

Front Engine Truck None Wheeled ----

To swing --- each side of cen., Cen. pin liners ---

Journals, Diam. --- Length --- Boxes ---

Wheels, Diam. --- Tread --- Kind ---

Tires --- Cen. diam. --- Size ---

Tires held by ---

Back Engine Truck None Wheeled ---

To swing --- each side of cen., Cen. pin liners ---

Journals, Diam. --- Length --- Boxes ---

Wheels, Diam. --- Tread --- Kind ---

Tires ----- Cen. diam. --- Size ---

Tires held by ---

Brake, position On all driving and tender wheels

Operating Parts: Engine, Sch. #6 ET West'g. Combined Auto and Straight Air

Eng. Trk, sch. ----

Foundation Parts: Drivers, sch. Wi-2 American O.S. Equalized.

Eng. Trk, sch. ---

Air pump Two 9½" Pos. Left Side

Train connections Front and rear

Train signal, sch. None

Tender Eight Wheeled. Drawing No. 365

Weight, with fuel and water, about 90,000 lbs.

Tank 4500 Gallons, Bill 4131

Tank "U" shape, sloping back Fuel Cap. 8 tons.

Tool Boxes Hardwood, Top

Frame Oak and Yellow Pine with steel plate in front and back of Front and Back Bumpers

Front Drawbar height 32"

Pilot None Pushing shoes at rear

Back drawhead, center above rail 33½"

Coupler Tower all steel M.C.B. Auto. with 11" face

Steps, hand holds, etc., to conform to I.C.C. requirements

Steps { Across rear with suitable handrails, also steps and handrails on sloping back of tank.

Trucks Arch Bar Type, with cast steel bolsters.

Springs Elliptic B. L. W.

Journals, Diam. 4½" Length 8"

Wheels, Diam. 30" Tread 4½" Kind Chilled cast iron plate

Tires None Cen. diam. --- Size ---

Tires held by ----

Safety chains Single

Brake Position On all wheels

Brake sch. #6 ET West'g Auto and straight air 10" x 12" tender cylinder

Side collar on tank to be moved in so as not to obstruct the engineers view looking back through cab window.

List of tools, sch. 29

Photos Nos. None Inspection B. L. W.

To be weighed No Material Specs B. L. W.

Certificate of boiler test Three copies of B. L. W. form 1036

Boiler laws to 6-30-16 Shipment On own wheels

Brass shop finish. No. 1

Machine shop finish D-165

B. L. W.

Patents Throttle, Patented Jan. 23, 1900 (Cast on)

Property plate None

Painting: Engine, style 291 Olive Green and Aluminum

Painting: Tender, style 291 Olive Green and Aluminum

Mark on Tank sides, THE RIVER TERMINAL RAILWAY COMPANY

Road Nos. Pos.	Road Nos.	Name None
F. No. Plate	36	
F. Sand Box	37	
Cab sides		
Back of tank		

Pp. 266-67 Photo copied see box

SPECIFICATION FOR LOCOMOTIVES S 36 D 229 and 230

FOR The River Terminal Railway Co.

1 A Tee with plug locking down to be placed in each injector, delivery pipe just outside of cab.

2 Sellers combined vertical main check and stop valves, with shanks threaded U.S. Standard pipe thread.

3 Feed water strainers to be Sellers Improved.

4 Provision to be made in dome for the attachment of a 2" pipe for drawing steam, to be used in case of emergency.

5 Auxiliary Dome, None

6 Boiler to conform to the requirements of the Ohio R. R. Commission and the I. C. C.

7 Safety valves to be applied in the back of the main dome

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-1305
Dup. 6-36 D 229-230 WITH SAME EXTRAS EXCEPT WHERE OTHERWISE SPEC'D.

Memorandum Spec'n 11196

SPECIFICATION FOR LOCOMOTIVES 6 36 D 239 - 240 — Gen. as PHOTO. 3518 EXCEPT WITH WALSCHAERTS VALVE MOTION, PISTON VALVE, AND OUTSIDE STEAM PIPES.

FOR THE RIVER TERMINAL RAILWAY COMPANY — 10-31-16 — **Engine Drawing No.** 36

R.

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"
Total wheelbase, eng. and tend { Actual 42' 6¼" / Limited to ABOUT 42' 6"

Curves -----

Limits, Height ----- Width -----
Weight (approximate) in working order, Total 148,000 LBS.
On F. tr'k ----- lbs.. Drivers 148,000 lbs., B. tr'k ----- lbs.

Tractive power 38,000 lbs., Ratio of adhesion 3.9
Work'g St'm Pres. 190 lbs., Service SWITCHING
Fuel SOFT COAL

BOILER TO BE CONSTRUCTED TO MEET THE REQUIREMENTS OF THE OHIO RAILROAD COMMISSION AND THE INTERSTATE COMMERCE COMMISSION

Boiler STEEL Thick ¾" Bill 7972
Boiler, Diam. 72" Plan STRAIGHT TOP
Boiler st'm pres. 190 lbs., Tested to { 210 lbs. steam pres. / 254 lbs. water pres.
WITH FACTOR OF SAFETY OF 4.88
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS
FRONT TUBE SHEET ½" THICK
* **Dome,** diam. 33" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE
Firebox, length 108-3/16" Width 42⅛" Depth F. 67½" B. 62½"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" DIAM.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame SINGLE Riveted
Water space stays ⅞" DIAM. WITH 3/10" HOLES, 1½" DEEP FROM O.S.
FLEXIBLE STAYBOLTS, AMERICAN 15/16" DIAM.-.500 IN BREAKING ZONE
Radial stays 1" DIAM. Sling stays from { THREE ROWS OF B. L. W. EXPANSION STAYS
Button heads below crown on EIGHT central rows
Crown bars NONE Placed ----- above crown
Crown bolts ------

Flues #9 W. G. SEAMLESS STEEL
Tubes #12 W. G. CHARCOAL IRON OR STEEL
Tube ends BEAGED FOR COPPER FERRULES FIREBOX ENDS
Number 175 Diam. 2" / 2¼" Length 10' 5"

Heating Surface: Flues 417⁰ Combus. Chamb. ----- Total 1530⁰
Tubes 947⁰ Fire Box 166⁰ Fire Brick Tubes -----
Grate area 31.6 Ratio to Heating Surface 1 : 48.5
Superheater 346⁰

Fire Brick ARCH ON STUDS

Grates ROCKING BARS WITH DROP PLATE
Ash Pan, Dampers FRONT AND BACK

Throttle BALANCE Pos. DOME
Dry pipe STEEL
SUPERHEATER, SCHMIDT TYPE WITH TOP HEADER IN SMOKE BOX AND WITH OUTSIDE STEAM PIPE CONNECTIONS TO STEAM CHESTS. ROYALTY PAYABLE BY THE B.L.W. SUPERHEATER AS LOCO. SUPERHEATER CO'S SPEC'N. NO. R12-060-A DATED NOV. 22ND 1916. COPY ATTACHED.
Smokebox extension WITH { Cleaning hole and cap LEFT SIDE ONLY WITH ADDITIONAL HOLE IN EACH SIDE OF SMOKE BOX FOR INSPECTION OF SUPERHEATER
Spark ejector or hopper WITH
Netting and deflect. plates WITH

Exhaust nozzles SINGLE HIGH

Stack STRAIGHT Dia. 18" Hole in S. B., dia. 21⅝"
** PROVISION TO BE MADE IN COME FOR THE ATTACHMENT OF A 2" PIPE FOR BLOWING STEAM, TO BE USED IN CASE OF EMERGENCY.

Safety Valves (Spec) TWO CROSBY 3" IN BACK OF MAIN DOME
Safety valves NONE with relief lever, Set to 190 POUNDS
Whistle B. L. W. PLAIN

Steam Gauge ONE IRON 7" MAKER:-ASHCROFT (NOT Spec)
Steam gauge stand IRON **Clock** NONE

Water Gauge ONE B.L.W. (IRONCLAD) **Cab Lamps** TO BURN ACETYLENE
Gauge Cocks THREE BACK Surface valve NONE
Lowest gauge cock 3¼" above highest part of crown
Lubricator steam valve TO HAVE separate dry pipe to dome
Blower Valve B. L. W.
BLOWER LINE TO HAVE CUT OUT VALVE
Blow off Cock ONE EVERLASTING 2" POS:-FRONT
Cleaning Plugs
Firebox CORNERS, DIAGONAL AND SIDES
Crown, THREE EACH SIDE AND THREE BACK
Waist, ONE UNDER FRONT
Front tube sheet, TWO Fusible plug ONE
LOCATION OF PLUGS SHOWN ON PRINT OF B.L.W. BOILER CARD 11861 IS APPROVED EXCEPT APPLY ONE ADDITIONAL PLUG IN EACH SIDE OF WAIST NEAR FRONT AS SHOWN IN PENCIL ON PRINT.

PUMP - NONE

A TEE WITH PLUG LOOKING DOWN TO BE PLACED IN EACH INJECTOR DELIVERY PIPE JUST OUTSIDE OF CAB.
Injectors (Spec) TWO SELLERS, CLASS "N" No. 9½
Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER
Pipes, Check IRON Feed IRON Overflow IRON
Check { SELLERS COMBINED VERTICAL MAIN CHECK AND POS:-R AND L STOP VALVE WITH SHANKS THREADED U.S.STD PIPE THREAD
FEED WATER STRAINERS TO BE SELLERS IMPROVED
Steam Heat NONE

Cab WOOD

Cab boards WOOD Nosing NONE
Running boards WOOD Nosing NONE
Hand rail IRON Located on BOILER

Back Bumper BAR STEEL Back drawbar height 34½"
BACK FOOT PLATE TO WEIGH 1900 POUNDS
STEEL PLATE FRONT AND BACK OF FRONT BUMPER
Pilot NONE Pushing shoes AT FRONT
Front Bumper OAK Bumper plate NONE
Steps ACROSS FRONT WITH HAND RAIL

Front Drawhead, Center above rail 33½"
Coupler TOWER ALL STEEL M.C.B. AUTO. WITH 11" FACE

Signal fixtures NONE
HEADLIGHT EQUIPMENT TO BE ADAMS & WESTLAKE AS SHOWN ON PAGE 81, WITH GENERATOR AS SHOWN ON PAGE 89, OF A. & W. CATALOGUE
Headlight TWO ROUND CASE 18" Reflector, To burn ACETYLENE
Headlight, Nos. on sides WITH H'dl't step WITH
Lamp shelf NONE Nosing -----

Bell 92 POUNDS
Sand Box TWO Diam. 28" Body IRON PAINTED Pipes IRON
Sander (Spec) LEACH AIR TRAP A-1 IN EACH BOX

Dome casing IRON PAINTED

Boiler Jacket #22 Soft Steel Ptd Bands IRON Style 9 AND 14
Boiler Lagging MAGNESIA SECTIONAL
BACK HEAD OF BOILER TO BE LAGGED AND JACKETED

#p. 266-67 Ref. copied see box

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SPECIFICATION FOR LOCOMOTIVES 6 36 D 239 - 240

FOR The River Terminal Railway Co.

Specification for Type A Double Loop Superheater specification R12-060-A, dated Nov. 22nd 1916

BOILER TUBES	175 in number 2 o. d. 10 ft 5 in. over tube sheets. Tubes located between and adjacent to boiler flues are to be beaded over at front end.	
BOILER FLUES	28 in number 5½ o. d. #9 B.W.G. of cold drawn seamless steel. Flues to be straight, true to gauge and wall not to vary more than one gauge from specified thickness.	Card 10731
BOILER FLUE SETTING	⅛ in. radius on both edges of flue holes in fire box tube sheet and on front edge of flue holes in front tube sheet as shown on drawings, except for copper sheets. Back end to be set with copper ferrule, rolled, beaded and prossered except for copper sheets. Front end to be rolled and beaded. Rollers to have at least 5 rolls. Prosser to have at least 12 sections.	Card 1137 Card 5884
TUBE SHEET LAYOUT		
UNITS	28 units 1½ o. d. #9 B.W.G. of seamless steel. Pipes united by return bends. Each unit to be tested, before being placed in boiler, with water under pressure of 250 lb. per sq. in. for screwed return bends or 500 lb. per sq. in. for welded return bends.	
UNIT PIPE SUPPORTS	Of steel fastened securely on superheater pipes so as not to slide.	Card 10773
UNIT PIPE JOINT	To be made in best possible manner to insure absolutely tight joints in accordance with the notation on	Card 1043
UNIT CLAMP BOLT	To be in accordance with requirements of Locomotive Superheater Company Material Specification No. 12.	Card 10695
HEADER	To be of close grain cylinder iron, steam tight in every respect. Joint ring for connection to dry pipe to have flat side against header flange. Casting should be moulded with the unit joint face down to secure the best quality of metal on surface where superheater unit joints are made. Each header to have a serial number cast on in such a location as not to be removed in finishing. No patch plugs or chaplets allowed in ball joint seats. Headers must not be treated with sal ammoniac. Header casting to be tight under water pressure of 250 lb. Test pressure to be applied separately to the saturated and to the superheated steam passages, so as to insure soundness of all partition walls.	Card 1992-A
HEADER SUPPORTS	To be securely fastened to boiler shell with rivets or turned bolts fitted in reamed holes. To be properly located so as to support the header after header has been correctly located. Header should then be secured to supports. This to be done before superheater units are put in place	Card 1323
STEAM PIPE JOINT RINGS	Should be of cast iron.	
DEFLECTING PLATE	To be constructed so as to permit easy inspection and removal of superheater units and joints. Design to be in accordance with	Card See Arrgt.
DAMPER CYLINDER	To be carefully and accurately made. Piston not to be more than 0.01 in. smaller than bore. Bearings for piston and extension to be in line. Piston to be ground and to operate freely under a pressure as low as 40 lb. per sq. in. Steam pipe to damper cylinder should be as short and free from bends as possible so as not to cause water to collect in cylinder. Pipe to be well protected against freezing.	Card 1149
DAMPER SHAFT COUNTERWEIGHT	To be painted a light color to render it easily visible by the engineer	Card 1067
S. H. ARRANGEMENT	To be in accordance with	Card 4921
TEST (FINAL)	The superheater, after assembling in boiler and after steam pipes are fitted up, is to be thoroughly tested and to be tight under water pressure of at least 30% more than the working pressure of the boiler.	

DAMPER	Card 10882-D	DAMPER SHAFT LINK	Card 1070
DAMPER CYL. ARM	Card 1074	PATENT PLATE	Card 3158
DAMPER CYL. PIPE FITTING	Card	S. H. UNIT BOLT WASHER	Card 1073
DAMPER CYL. PIPE UNION	Card 1287	S. H. UNIT CLAMP	Card 1073
DAMPER CYL. PIPING DIAGRAM	Card 1503	S. H. UNIT CLAMP WASHER	Card 10809
DAMPER CYL. SUPPORT	Card	S. H. PIPE END	Card 1344
DAMPER SHAFT	Card 1235-J	S. H. PIPE BAND	Card 1988
DAMPER SHAFT ARM	Card 1226 & 1234	RETURN BENDS	Card 10094
DAMPER SHAFT BEARING (O.S.)	Card 1233 & 1148	DEFLECTING PLATE HANDLE	Card 1487
DAMPER SHAFT BEARING (I.S.)	Card 10886-P	LUBRICATOR CONNECTION	Card 3023
SPACING OF BANDS & SUPPORTS	Card 10759	DEFLECTING PLATE STUDS	Card 10809
TYPE OF RETURN BENDS	Welded	DEFLECTING PLATE CLAMP	Card 10809-A

OF PRINTS OF BOILER
ING PARTS TO BE FURN-
RAILWAY COMPANY.

CITY 8 TONS

NOT TO OBSTRUCT ENGI-
E WINDOW.

STEEL PLATE IN FRONT

T REAR

TH 11" FACE

.C.C. REQUIREMENTS

EPS AND HANDRAILS ON

OLSTERS
9-230

D CAST IRON PLATE

T AIR WITH 10" X 12"

Boiler Inspection & Ins. Co.
Future Address
2 will be ready
3.7.17. Orig.

(except see *above)

. W. FORM 1036

EELS (SEE (*) BELOW)

. 23, 1900 (CAST ON)
Y 18, 1911 (CAST ON)

ND ALUMINUM
ND ALUMINUM

D 229-230.
RAILWAY COMPANY

ONE

T.-. Order No. 11197.
-.

11p. 266-67 Phot. copies see box

THE BALDWIN LOCOMOTIVE W

Memorandum Spec'n 11196

SPECIFICATION FOR LOC

FOR THE RIVER TERMIN
R.

Gauge of Road 4' 8½"
Wheelbase, Rigid 11' 0
Total wheelbase, eng. and tend.

Curves -----

Limits, Height -----
Weight (approximate in work
On F. tr'k ----- lbs.. Dri

Tractive power 30,000 lbs.,
Work'g St'm Pres. 190
Fuel SOFT COAL
BOILER TO BE CONSTRUCTE
OHIO RAILROAD COMMISSIO
Boiler STEEL
Boiler, Diam. 72" Plan

Boiler st'm pres. 190 lb
WITH FACTOR OF SAFETY O
Longitud. seams BUTT JOINT
FRONT TUBE SHEET ½" THI
* **Dome,** diam. 33"

Firebox STEEL
Firebox, length 108-3/16"
Firebox, Tube ½"
Firedoor opening 16" DIAM
Water space, Front 4"
Water space, Frame SINGLE
Water space stays ⅝" DIAM.
FLEXIBLE STAYBOLTS, AMER
Radial stays 1" DIAM.
Button heads below crown on
Crown bars NONE
Crown bolts ------

Flues #9 W. G. SEAMLE
Tubes #12 W. G. CHAR
Tube ends BEADED FOR
Number 20
175

Heating Flues 417
Surface Tubes 947
Grate area 31.6
Superheater 346

Fire Brick ARCH ON ST

Grates ROCKING BARS
Ash Pan, Dampers FRON

Throttle BALANCE
Dry pipe STEEL
SUPERHEATER, SCHMIDT T
WITH OUTSIDE STEAM PIP
PAYABLE BY THE B.L.W.
SPEC'N. NO. R12-060-A
Smokebox extension WITH
Spark ejector on hopper WIT
Netting and deflect. plates
Exhaust nozzles SINGLE HI
Stack STRAIGHT
PROVISION TO BE MADE
FOR CAB HEAT STEAM, TO BE

THE BALDWIN LOCOMOTIVE WORKS

E. H. Frech March, 1917

SPECIFICATION FOR LOCOMOTIVES 6 36 D 239 - 240

184

FOR THE RIVER TERMINAL RAILWAY CO.

ONE SET OF PRINTS OF BOILER AND BEARING PARTS TO BE FURNISHED TO RAILWAY COMPANY.

Frames CAST STEEL Braces SOLID

Cylinders, Diam. 21" Stroke 26"
St'm ports, Length 23-3/16" Width 1¾" Bridges -----
Exh. ports, Length ----- Width ----- Valve lead 3/16"
Valve travel 5½" Steam lap ¾" Exhaust clearance -----
Eccentric crank throw 13½" (32 cm) By-pass valve NONE
S. F. Lubr. DETROIT FIVE FEED No. 42 BULLS EYE
Cyl'r heads CAST IRON; LUBR. PIPES OF IRON UNDER JACKET
Cyl'r casings IRON PTD. Head covers STEEL PAINTED
St'm chest casings ----- Covers -----
St'm chest valves 10" DIAM. PISTON TYPE
Met. pkg {PISTON RODS / VALVE STEMS} UNITED STATES (NOT A SPEC)

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD
Guides STEEL Oil cups NEEDLE
Crossheads CAST STEEL, WITH BRASS GIBS (Order 7 on photostat of W.L. Case print 303-P-3042
Wrist Pins STEEL Rod cups PLUNGER, FORGED ON
PARALLEL RODS TO HAVE SOLID ENDS

Valve Motion WALSCHAERTS

Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.
DRIVING WHEELS TO HAVE HUB LINERS OF BRASS
Drivers, O. S. Diam. 50" Cen. diam. 44" CENTRES CAST STEEL

Tires STEEL Held by SHRINKAGE AND SHOULDER
Tires, Flanged, Pos. ALL Size 3" X 5½"
Tires, Plain, Pos. ----- Size -----
Lateral play between driving boxes and wheel hubs – 1/16" TOTAL
Driving Boxes CAST STEEL
Journals, Diam. 9" Length 12"
Hereafter:- Front driving Springs to have two plates
P. R. Stiff Co. 4/18/17
Springs. Make B. L. W.

Front Engine Truck NONE Wheeled -----
To swing -----each side of cen., Cen. pin liners -----
Journals, Diam. ----- Length ----- Boxes -----
Wheels, Diam. ----- Tread ----- Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----

Back Engine Truck NONE Wheeled -----
To swing -----each side of cen., Cen. pin liners -----
Journals, Diam. ----- Length ----- Boxes -----
Wheels, Diam. ----- Tread ----- Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----

Brake, position ON ALL DRIVING AND TENDER WHEELS
Operating Parts — Engine, Sch. #6 ET WEST'G. COMBINED AUTO. AND STRAIGHT AIR
Foundation Parts — Eng. Tr'k, sch. -----
Drivers, sch. 188-2 AMERICAN O.S. EQUALIZED
Eng. Tr'k, sch. -----
Air pump ONE 8½" CROSS COMPOUND, POS:- LEFT SIDE
Train connections FRONT AND BACK
Train signal, sch. NONE
AIR RESERVOIRS TO BE 10" X 20½" DIAM. AND TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

Tender EIGHT Wheeled, Drawing No. 918
Weight, with fuel and water, about 90,000 LBS.
TANK "U" SHAPE, SLOPING BACK. FUEL CAPACITY 8 TONS
Tank 4500 Gallons, Bill 4280
SIDE COLLAR ON TANK TO BE MOVED IN SO AS NOT TO OBSTRUCT ENGINEER'S VIEW WHEN LOOKING BACK THROUGH CAB WINDOW.
Tool Boxes HARD WOOD, TOP

Frame STEEL 8" AND 10" CHANNELS, WITH STEEL PLATE IN FRONT AND BACK OF FRONT AND BACK BUMPERS
Front Drawbar height 32"
Pilot NONE Pushing shoes AT REAR
Back drawhead, center above rail 33½"
Coupler TOWER ALL STEEL M.C.B. AUTO. WITH 11" FACE

STEPS, HAND HOLDS, ETC. TO CONFORM TO I.C.C. REQUIREMENTS
Steps ACROSS BACK WITH HANDRAILS, ALSO STEPS AND HANDRAILS ON SLOPING BACK OF TANK.
Trucks ARCH BAR TYPE WITH CAST STEEL BOLSTERS
TRUCKS TO BE HEAVIER THAN FOR 6-36 D 229-230
Springs ELLIPTIC. B. L. W.
Journals, Diam. 5" Length 9"
Wheels, Diam. 33" Tread 4½" Kind CHILLED CAST IRON PLATE
Tires NONE Cen. diam. ----- Size -----
Tires held by -----
Safety chains SINGLE

Brake Position ON ALL WHEELS
Brake sch. #6 ET WEST'G. AUTO. AND STRAIGHT AIR WITH 10" X 12" TENDER CYLINDER

* Boiler to be inspected by The Hartford Steam Boiler Inspection & Ins. Co. ~~two inspectors from Address Swedlow two days ahead of time they will be ready.~~ 3.7.17.

List of tools, sch. 29
Photo sch. NONE Inspection B. L. W. (except see *above)
To be weighed YES Material specns B. L. W.
Certificate of boiler test THREE COPIES OF B. L. W. FORM 1036
Junior laws to 1-15-17 Shipment ON OWN WHEELS (SEE (*) BELOW)

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. Patents — THROTTLE, , PATENTED JAN. 23, 1900 (CAST ON)
STEAM PIPE COVER, PATENTED JULY 18, 1911 (CAST ON)

Property plates NONE

Painting:—Engine, style 291 OLIVE GREEN AND ALUMINUM
Painting:—Tender, style 291 OLIVE GREEN AND ALUMINUM

LETTERING, ETC. TO BE SAME AS FOR 6-36 D 229-230.
Mark on TANK SIDES, THE RIVER TERMINAL RAILWAY COMPANY

Road Nos. Pos.	Road Nos.	Name NONE
F. No PLATE	38	
F. SAND BOX	39	
CAB SIDES		
BACK OF TANK		

*EXTRAS ORDERED THROUGH EXTRA WORK DEPT., ORDER NO. 11497, DATED 11-29-16 TO BE SHIPPED WITH LOCOS.

THE BALDWIN LOCOMOTIVE WORKS As Spec'n No. C-4699

Memorandum Spec'n 17046

SPECIFICATION FOR LOCOMOTIVES 6-36 D 281

FOR The Detroit Edison Company

R. 3-6-17

Gen. as Photo. 5761

Engine Drawing No. 1

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"
Total wheelbase engine standing Actual 42' 6" Limited to -----
Curves -----
Rails, 60 pounds and 70 pounds
See print showing "Plan of Detroit Edison Co's property" received with letter dated 2-17-1917
Limits, Height 14' 0" Width -----
Weight approximate on working order, Total 140,000 pounds
On F. truck ----- lbs. Drivers 140,000 lbs. B. truck ----- lbs.

Tractive power 35080 lbs. Ratio of adhesion 4.
Work'g St'm Pres. 180 lbs. Service Switching
Fuel Soft Coal or Coke
Boiler to pass I. C. C. requirements, and Federal Inspection
Front tube sheet to be ½" thick
Boiler Steel Thick 11/16" Bal 8107
Boiler, Diam. 68" Plan Straight Top

Boiler st'm pres 180 lbs. Tested to 200 lbs. steam pres. with factor of safety of 5. 240 lbs. water pres.
Longitud. seams Butt jointed, double covering strips

Dome, diam 29" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 108⅛" Width 42" Depth F 65¾" B 62⅜"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back ⅜"
Firedoor opening 16" diam.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Single Riveted
Water space stays ⅞" diam. with 3/10" holes 1½" deep from O.S.
Flexible staybolts, Tate, of Ewald Iron about 300 in number, in breaking zone.
Radial stays 1" diam. Sling stays from Two rows of B. L. W. Expansion Stays
Button heads below crown on Eight central rows
Crown bars None Placed ----- above crown
Crown bolts -----

Flues -----
Tubes #12 W. G. Charcoal Iron or Steel
Tube ends Swaged for copper ferrules, fire box ends
Number 317 Diam. 2" Length 10' 5"

Heating Flues ----- Combus. Chamb. ----- Total 1896⁰
Surface Tubes 1715.3⁰ Fire Box 180.7⁰ Fire Brick Tubes -----
Grate area 31.5⁰ Ratio to Heating Surface 1 : 60
Superheater -----

Fire Brick Arch on Studs

Grates Rocking bars and drop plate
Ash Pan, Dampers Front and Back
Ash pan dumping mechanism to be operated by air

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Smokebox extension With Cleaning hole and cap L. S. Only
Spark ~~arrestor~~ deflector hopper With
Netting and deflector plates With

Exhaust nozzles Double, high

Stack Straight Dia. 18" Hole in S. B. dia. 21⅝"
Special attention to be given to location of headlight so that no part will interfere with the opening of smoke-box front door

Safety Valves Two Consolidated 3"
Safety valves None with relief lever, Set to 180 pounds
Whistle B. L. W. plain

Steam Gauge One Iron 7" MAKER:-Ashcroft
Steam gauge stand Iron **Clock** None

Water Gauge One B.L.W. (Ironclad) **Cab Lamps** Electric
Gauge Cocks Three Back Surface valve None
Lowest gauge cock 3¼" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One B.L.W., POS:-Front
Cleaning Plugs
Firebox Corners, front ones diagonal, sides and back
Crown, Two each side and four back
Waist, One under front
Front tube sheet, One Fusible plug One

Pump None Pos. -----
Top chamb. ----- Bottom chamb. -----
Feed Cock ----- Feed pipes -----
Checks ----- Check pipes -----

Injectors Two Monitor No. 9
Injectors, Pos Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. Right and Left
Steam Heat None

Cab Steel

Cab boards Wood Nosing None
Running boards Wood Nosing None
Hand rail Iron Located on Boiler

Back Bumper Bar Steel Back drawbar height 31½"
Spring buffer between Engine and Tender

Pilot None Pushing shoes at front
Front Bumper Oak Bumper plate None
Steps across front with hand rails
Steps, hand holds, etc. to conform to I.C.C. requirements
Front Drawhead, Center above rail 33½"
Coupler Sharon Swing Head Type

Signal fixtures None
Headlight Equipment to be Pyle National Electric, type K, with incandescent headlights.
* **Headlight** Two Round Case 18" Reflector,
Headlight, Nos. on sides With H'd'l't step With
Lamp shelf None Nosing -----

Bell 92 pounds. Gollmar Air Bell Ringer
Sand Box Two Diam. 28" Body Iron Painted Pipes Iron
Sander Leach Air, Trap A-1 in each box, to sand front and back

Dome casing Iron Painted

Boiler Jacket #18 Soft Steel Pt. Bands Iron Style 9
Boiler Lagging Magnesia sectional.

11-266-67 Phil. copied see box

THE BALDWIN LOCOMOTIVE WORKS

SPECIFICATION FOR LOCOMOTIVES 6-36 D 281

FOR The Detroit Edison Company

R.

Frames Cast Steel Braces Solid

Cylinders, Diam. 21" Stroke 26"
St'm ports, Length 19" Width 1⅜" Bridges 1⅜"
Exh. ports, Length 19" Width 3" Valve lead 1/16"
Valve travel 5½" Steam lap ⅞" Exhaust clearance -----
Eccentric crank-throw 5" By-pass valve None
S. F. Lubr. Michigan Triple Bulls Eye
Cyl'r heads Cast Iron; Lubr. pipes of Iron under Jacket
Cyl'r casings Iron Ptd. Head covers Steel Painted
St'm chest casings Iron Ptd. Covers Steel Painted
St'm chest valves Richardson Balanced, with vacuum valve
Met. pkg {Piston rods / Valve stems} United States

Pistons Cast Iron Rings sprung into solid head
Guides Steel Oil cups Needle
Crossheads Cast steel, with gibs of brass or bronze
Wrist Pins Steel Rod cups Plunger
Parallel Rods to have solid ends

Valve Motion Stephenson
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.
Power reverse gear to be Ragonnet, as covered by Extra Order No. 5827 dated 1917.
All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.
Main Driving wheels only to have hub liners of Brass
Drivers, O. S. Diam. 50" Cen. diam. 44"
Wheel Centers:-Main cast steel, others cast iron
Tires Steel Held by Shrinkage and Shoulder
Tires, Flanged, Pos. Front and Back Size 3" X 5½" Jos
Tires, Plain, Pos. Middle Size 3" X 6½" Ex
Lateral play between driving boxes and wheel hubs = 1/16" total
Driving Boxes Steeled Cast Iron
Journals, Diam. 9" Length 12"

Springs. Make B. L. W.

Front Engine Truck None Wheeled -----
To swing ----- each side of cen., Cen. pin liners -----
Journals, Diam. ----- Length----- Boxes -----
Wheels, Diam. ----- Tread -----Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----

Back Engine Truck None Wheeled -----
To swing ----- each side of cen., Cen. pin liners -----
Journals, Diam. ----- Length----- Boxes -----
Wheels, Diam. ----- Tread -----Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----

Brake position On all driving and tender wheels
Operating Parts: Engine, Sch. No. 6-ET West'g. Combined Auto. and Straight Air; Eng. Tr'k, sch. -----
Foundation Parts: Drivers, sch. BM-2 American O.S. Equalized; Eng. Tr'k, sch. -----
Air pump. One - 9½" Pos. L. S. ahead of fire box
Train connections Front and Back
Train signal, sch. None
Air Pump exhaust connection to be made at a point below cylinder saddle, and toward the ground, i.e., in bottom of exhaust passage in cylinder.
Air reservoir to have hydrostatic test of 210 pounds
Certificates dated June 6th 1917 covering test of reservoir Nos. 12735 to 12756 inc. furnished by West'g. Air Brake Co., are filed in Main Office, File No. 17537

Tender Eight Wheeled. Drawing No. 435
Weight, with fuel and water, about 80,000 pounds

Tank 4000 Gallons. Bill 4517
Tank "U" shape, straight top. Fuel capacity 8 tons

Tool Boxes of hard wood, Top.
Tender frame plating of Steel
Frame Steel 10" channels with steel end sills.
Spring buffer between engine and tender
Front Drawbar height 29⅞"
Pilot None Pushing shoes at rear
Back drawhead, center above rail 33½"
Coupler Sharon Swing Head Type.

Steps across rear with hand rails.
Steps, hand holds, etc. to conform to I.C.C. requirements
Trucks Arch bar type with Cast steel bolsters

Springs Elliptic. B. L. W.
Journals, Diam. 4½" Length 8"
Wheels, Diam. 33" Tread 4½" Kind Chilled Cast Iron Plate
Tires None Cen. diam. ----- Size -----
Tires held by -----
Safety chains Single

Brake Position On all wheels
Brake sch. No. 6 ET West'g. Auto. and Straight Air with 10" X 12" cylinder.

List of tools, sch. 29
Photo sch. None Inspection B. L. W.
To be weighed Yes Material spec'ns B. L. W.
Certificate of boiler test Three copies of B.L.W. form 1036.
Junior laws to 6-8-17 Shipment On own wheels

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. Patents } Feed Water Strainer, Patented Sept. 1, 1903 (Cast On)

Property plates None

Painting: Engine, style 291 Olive Green and Gold
Painting:—Tender, style 291 Olive Green and Gold

Mark on tank to be in 6" plain block letters
Marked on tank sides, DELRAY TERMINAL R. R.
Road numbers to be Roman type, in 3" figures on Sand box and in 7" figures on Cab sides and back of tank.

Road Nos. Pos.	Road Nos.	Name None
F. No. Plate	112	
F. Sand Box		
Cab Sides		
Back of Tank		

THE BALDWIN LOCOMOTIVE WORKS As Spec'n. C-4911

Memorandum Spec'n 17087

SPECIFICATION FOR LOCOMOTIVES 6 32 1/3 C 2 & 3. Gen. as Photo. 4038

FOR United States Government **Engine Drawing No. 2**

5-15-17

Gauge of Road 4'8½" Play ⅜"
Wheelbase, Rigid 7'0" Driven 7'0" Total 16' 6"
Total wheelbase, eng. and tend. (Actual ----, Limited to ----)
Rails 85 lb. sections
Curves 95 ft. radius Grade 2%

Limits, Height See (1) Width See (1)
Weight approximate on working order, Total 119,000 pounds
On F. tr'k ----- lbs., Drivers 100,000 lbs., B tr'k 19,000 lbs.

Tractive power 23,100 lbs., Ratio of adhesion 4.3
Work'g St'm Pres. 160 lbs. Service Switching
Fuel Bituminous Coal

Front tube sheet to be ½" thick
Boiler Steel Thick 9/16" Bill 8171
Boiler, Diam. 52" Plan Straight top

Boiler st'm pres. 180 lbs. Test hydr. (200 lbs. steam pres., 240 lbs. water pres.)
with factor of safety of 5.4
Longitud. seams butt jointed double covering strips

Dome, Diam. 20" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 60" Width 48" Depth F. 51½" B. 49¼"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diam.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Double Riveted
Water space stays 1" diam. with 3/4" holes 1¼" deep from O.S.

Radial stays 1" diam. Sling stays front (Two rows of B.L.W. Expansion Stays)
Button heads below crown on Eight central rows
Crown bars None Placed ——— above crown
Crown bolts ----

Flues ----
Tubes #11 W.G. Charcoal Iron or Steel
Tube ends Swaged for copper ferrules, fire box ends
Number 172 Diam. 2" Length 12'0"

Heating Surface Flues --- Combus. Chamb. ---- Total 1152
Tubes 1073 Fire Box 79 Fire Brick Tubes ----
Grate area 20 Ratio to Heating Surface 1 : 57.6
Superheater -----

Fire Brick Arch on Studs

Grates Rocking bars and drop plate
Ash Pan, Dampers Front and Back

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Smokebox extension With Cleaning hole and cap L.S. Only
Spark ejector on hopper With
Netting and deflect. plates With

Exhaust nozzles Double High

Stack Cast Iron, Straight Dia. 18" Hole in S. B. dia. 21"

Safety Valves (Spec) Two Lonergan 3"
Safety valves None with relief lever, Set to 160 pounds
Whistle One B.L.W. Plain

Steam Gauge One Iron 7" Maker:- Ashcroft (Spec)
Steam gauge stand Iron **Clock** None

Water Gauge One Klinger Reflex **Cab Lamps** to burn oil
Gauge Cocks Three Back Surface valve None
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve without separate dry pipe to dome
Blower Valve B.L.W.

Blow off Cock One Everlasting 1½" Pos. Front
Cleaning Plugs One Plug above fire door
Firebox Corners diagonal and back
Crown, Two each side, and two back
Waist, One under front
Front tube sheet, One Fusible plug One

Pump None Pos. ----
Top chamb. ---- Bottom chamb. -----
Feed Cock ----- Feed pipes -----
Checks ----- Check pipes -----

Injectors (Spec) Two Seller Class "N" No. 9½
Injectors Pos. R. and L. Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B.L.W. Pos. R. and L.

Steam Heat None

Cab Steel

Cab boards Iron Nosing 1½" T-Iron
Running boards Iron Nosing 1½" T-Iron
Hand rail Iron Located on Tank

Back Bumper Oak

Pilot None Pushing shoes Front and Back
Front Bumper Oak Bumper plate With
Steps across front and back with hand rails
Steps, hand holds etc. to conform to I.C.C. requirements
F. & B. Drawhead, Center above rail 33½"
Coupler Simplex M.C.B. Auto. as shown on Vulcan Iron Works print 57-24-76.
Couplers to be radial type with slotted knuckles.
Signal fixtures None

Headlight Two Round Case 16" Reflector, To burn Kerosene
Headlight, Nos. on sides With H'd'l't step With
Lamp shelf None Nosing ———

Bell 85 pounds Gollmar Air Bell Ringer
Sand Box Two Diam. 28" Body Iron painted Pipes Iron
Sander Leach Air Trap (Not Spec) A-1, in each box to sand front and back

Dome casing Iron Painted

Boiler Jacket Soft Steel Ptd. Bands Iron Style 9 and 14
Boiler Lagging Magnesia Sectional.
Back head of boiler to be lagged and jacketed.

11-266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS
H. Scheib July 1917
SPECIFICATION FOR LOCOMOTIVES 6 32 1/3 C 2&3 188
FOR United States Government

Frames Cast Steel Braces Solid

Cylinders, Diam. 19" Stroke 24"
St'm ports, Length 16" Width 1¼" Bridges 1"
Exh. ports, Length 16" Width 2½" Valve load 3/32"
Valve travel 5" Steam lap ¾" Exhaust clearance ----
Eccentric crank throw 4½" By-pass valve None
S. F. Lubr. Nathan Triple #9 Bulls Eye (Spec)
Cyl'r heads Cast Iron: Lubr. pipes of iron under jacket
Cyl'r casings Iron Ptd. Head covers Steel painted
St'm chest casings Iron Ptd. Covers Steel painted
(2) St'm chest valves Richardson balanced, with vacuum valves
Met. pkg (Piston rods / Valve stems) U.S. King Type (Not Spec)

(2) **Pistons** Cast Iron rings sprung into solid head
Guides Steel Oil cups Needle
Crossheads Cast Steel
Wrist Pins Steel Rod cups For grease lubricator
Parallel rods to have solid ends, rod brasses to be interchangeable with U.S. Govt. present locos., as measured by Mr. H. Scheib
Valve Motion Stephenson
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B.L.W.
Driving wheels without hub liners
Drivers, O. S. Diam. 51" Cen. diam. 44" centres cast iron

Tires Steel Held by Shrinkage and Shoulder
Tires, Flanged, Pos. All Size 3½" x 5½"
Tires, Plain, Pos. None Size ----
Lateral play between driving boxes and wheel hubs = 1/16" total
Driving Boxes Steeled cast iron, with grease lubricators
Journals, Diam. 8" Length 8½"

Springs. Make B.L.W.

Front Engine Truck None Wheels of -----
To swing --- each side of cen., Cen. pin liners ----
Journals, Diam. ---- Length ---- Boxes -----
Wheels, Diam. ---- Tread --- Kind -----
Tires ----- Cen. diam. ---- Size
Tires held by ------

Back Engine Truck Two Wheeled Swing Bolster, Centre bearing
(3) To swing 10" each side of cen., Cen. pin liners None
Journals, Diam. 5" Length 7½" Boxes Cast Iron
Wheels, Diam. 28" Tread 4½" Kind Chilled cast iron plate
Tires None Cen. diam. ---- Size -----
Tires held by -----
Engine truck wheels without hub liners

Brake, position On all driving wheels (No Tender)
Operating Parts: Engine, Sch. No. 6-ET, West'g. Combined Auto. and Straight Air
Eng. Tr'k, sch. -----
Foundation Parts: Drivers, sch. NY-2, American O.S. Equalized
Eng. Tr'k, sch. -----
Air pump One 9½" Pos. Left Side
Train connections Front and Back
Train signal, sch. None
Air reservoir to have hydrostatic test of 210 lbs.
Air pump exhaust to be piped into cylinder saddle
~~Steam connections to be provided to air cylinder.~~ 5/1/17
Certificates dated July 6th 1917 covering test of reservoir Nos. 13606 to 13609 inclusive, furnished by West'g. Air Brake Co., are filed in Main Office, File No. 270

Tender None

Tank 1800 Gallons Bill 4554
Saddle tank over top of boiler
Fuel box on rear extension of engine frame, back of cab.
Fuel capacity 4 tons.

(1) U.S. Govt., present locos conforms to following clearance limits which are satisfactory to Govt. for new locos.
Locos. clears rails 3½" at lowest points, which are engine truck pedestal bolts. Main rod end is 8" above rail, when tires are new.
Width of Cab 110"
Width over back bumper 116"
Width over front bumper 117."

(2) Valve stems to be 1⅝" diameter
Piston rods to be 3½" diameter

(3) Back engine truck to be regular swing link type, with links 23" long, and with outside journals.

(4) Locomotive, as it goes through the shops, will not be inspected by the United States Government, but the Government will inspect the boiler and will test same and the construction of the locomotive afterwards. As soon as we are ready for the boiler inspector, we are to telephone to Mr. F. S. Carter, Walnut 3188, giving him a few hours notice in order that he may be able to provide an inspector.
Copies of tests of all materials entering into the construction of locomotive are to be sent to Inspector of Engineering Material, U.S. Navy, Room 417, Post Office Building, Philadelphia, Pa.

List of tools, sch. 29
Photo Sch. #2 Inspection See note (4) above
To be weighed Yes Material specs B.L.W.
Certificate of Boiler test Three copies of B.L.W. Form 1036
Junior Laws to 6-30-17 Shipment On Own Wheels

Brass shop finish No. 1
Machine shop finish D-165

B.L.W. Patents } None

Property Plates, None

Painting, Style 220, Black and Gold

Mark on Tank Sides { U. S. NAVY YARD / NORFOLK, VA.

Road Nos. Pos.	Road Nos.	Name None
F. No. Plate	6	
Cab Sides	7	
Back of fuel box		

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-3337

Memorandum Spec'n 10960

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1092. (Gen. as Neg. 4843.

FOR Port Commissioners of Jacksonville, Florida. 4-27-16. **Engine Drawing No. 92.**

Re.

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"
Total wheelbase engine and tender Actual 39' 10" Limited to -----
Rails, 70 pounds.
Curves 30 degrees. Maximum grade, 2%.

Limits. Max. as to ----- Min. -----
Weight Engine on drivers Total 123,500 lbs. On Front ----- On Drivers 123,500 lbs. On Trailer ----- On
Total engine power 28,720 lbs. Ratio of adhesion 4.3
Work'g St'm Pres. 180 lbs. Maximum Switching.
Fuel Oil
Oil burning arrangement-B.L.W. front end type with royalty payable by B. L. W.

Boiler Steel Thickness ⅝" Fire Sheet 7780
Boiler Diameter 64" Pitch Straight Top.
Working pressure 180 lbs. Per Sq. In. 300 lbs. steam pressure
240 lbs. water pressure.
Longitudinal seams Butt jointed, double covering strips.

Dome, Diameter 26" Plate Central.

Firebox Steel Thickness Sides & Back ⅝" Crown None.
Tube plate thickness ½" Inside 36-1/16" Width 32¼" Depth Front 71½" Back 69"
Water space: Front 4" Sides 3" Back 3½"
Mud ring: Front 4" Sides 3" Back 3½"
Water space above crown 4" Sides 3" Back 3½"
Radial stays 1" diam. Staybolts Front {Two rows of B.L.W. Expansion Stays.
Staybolts in back row on 4½ inch centres Crown bars None. Plates above crown
Crown sheet -----
Firebox Steel.
Tubes 312 No. B. W. Charcoal Iron or steel.
Tubes ends swaged for copper ferrules, fire box ends.
Number 270 Diam. 2" Length 10' 3"

Heating Tubes None. Combustion Chamber None Total 1628 sq. ft.
Surface Tubes 1473 sq. ft. Fire Box 155 sq. ft. Brick Tubes -----
Grate area 42 sq. ft. Ratio to Heating Surface 1 to 74
Superheater -----

Fire Brick Pavement in pan
Fire box lined with fire brick for oil burning

Grates None.
Ash Pan, Dampers Front only.

Throttle Balance Pos. Dome.
Dry pipe Steel

Superheater None.

Smokebox Extension Wit[h] Diaphragm plate and cap L.S. only.
Spark arrester or Stack Cap With.
Netting and deflect. plates None.

Exhaust nozzles Double Lor.
Cleaning Pipe:-With
Stack Straight Dia. 16" Hole in S. B. dia. 17½"
Oil burning apparatus and oil tank on tender to be designed so that they will be readily removable if Co. desires to change loco. to a coal burner.

Safety Valves (not spec) Two Coale 3"
Safety valves None with relief lever. Set to 180 pounds.
Whistle B. L. W. plain.

Steam Gauge One Iron 7" MAKER:-Ashcroft. (not spec)
Steam gauge stand Iron **Clock** None.

Water Gauge One B.L.W.(Ironclad) **Cab Lamps** to burn oil.
Gauge Cocks Three Back. Surface valve None.
Lowest gauge cock 3¼" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One B.L.W. Pos:-Front.
Cleaning Plugs
Firebox Corners, sides and back.
Crown Two each side and two back.
Waist One under front.
Front tube sheet One Fusible plug One

Pump None. Pos -----
Top Chamb -----
Feed Cock ----- Feed pipes -----
Checks ----- Check pipes -----

Injectors (not spec) Two Sellers, Class "N" No. 8½
Injectors Pos Right and Left Steam pipes Copper.
Pipes Check Iron Feed Iron Overflow Iron
Check Sellers. Pos. Top of Boiler.

Steam Heat None.

Cab Wood

Cab boards Wood Nosing None.
Running boards Wood Nosing None.
Hand rail Iron Located on Boiler.

Back Bumper Bar Steel Back drawbar height 34"

Pilot None Pushing shoes at front.
Front Bumper Oak Bumper plate None.
Steps across front with handrail.

Front Drawhead, Center above rail 33½"
Coupler M. C. B. Auto.

Signal fixtures None.

Headlight Two Round Case 16" Reflector. To burn Kerosene.
Headlight Nos on smoke With H'dl't step With
Lamp shelf None. Nosing -----

Bell 92 pounds.
Sand Box Two Diam. 28" Body Iron Painted Pipes Iron.
Sander (not spec) Leach air, Trap A-1 in each box to sand front and rear.

Dome casing Iron Painted.

Boiler Jacket #22 Soft Steel Pt'd Bands Iron Style 9
Boiler Lagging Magnesia sectional.

11-166-67 Plots copied see box

THE BALDWIN LOCOMOTIVE WORKS
H. E. Rudolph.

190

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1092.

FOR Port Commissioners of Jacksonville, Florida.

Re.

Frames Cast Steel Braces Solid

Cylinders, Diam. 19" Stroke 26"
St'm ports, Length 16" Width 1¼" Bridges 1"
Exh. ports, Length 16" Width 2⅛" Valve head ⅛"
Valve travel 5½" Steam lap ¾" Exhaust clearance -----
Eccentric crank throw 2¼" By-pass valve None. (corrected to 2⅛" sec 7146)
S. F. Lubr. Detroit Triple #22 Bulls Eye, with oil control valve.
Cyl'r heads Cast Iron. Lubr. pipes of Iron under jacket.
Cyl'r casings Iron Ptd. Head covers Steel Painted.
St'm chest casings Iron Ptd. Covers Steel Painted.
St'm chest valves Richardson Balanced, with vacuum valves.
Met. pkg (PISTON ROD / VALVE STEMS) UNITED STATES. (not spec)

Pistons Cast Iron rings sprung into solid head.
Guides Steel Oil cups Needle.
Crossheads Cast Steel
Wrist Pins Steel Rod cups Plunger, forged on.
Parallel Rods to have solid ends.

Valve Motion Southern; Royalty payable by B. L. W.
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except stayboits) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 50" Cen. diam. 44", Centres Cast Iron.

Tires Steel Held by Shrinkage and Shoulder.
Tires, Flanged, Pos. Front and Back. Size 3" x 5½"
Tires, Plain, Pos. Middle Size 3" x 6½"
Lateral play between driving boxes and wheel hubs = 1/16" total.
Driving Boxes Steeled Cast Iron.
Journals, Diam. 8" Length 9"

Springs. Make B. L. W.

Front Engine Truck None. Wheeled -----
To swing ----- each side of cen. Cen. pin liners -----
Journals, Diam. ----- Length ----- Boxes -----
Wheels, Diam. ----- Tread ----- Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----

Back Engine Truck None. Wheeled -----
To swing ----- each side of cen. Cen. pin liners -----
Journals, Diam. ----- Length ----- Boxes -----
Wheels, Diam. ----- Tread ----- Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----

Brake, position On all driving and tender wheels.
Operating Parts: Engine, Sch. #6 ET West'g. Combined Auto. and Straight Air; Eng. Trk. sch. -----
Foundation Parts: Drivers, sch. WA-2 American O.S. Equalized.; Eng. Trk. sch. -----
Air pump One 9½" Pos. Left Side.
Train connections Front and Back.
Train signal, sch. None.

For Hereafter:- Apply oil heater in oil tank. See report dated August 4, 1916 from Engineer Thos. King, File 4860. R.S. McC. 8/9/16

Tender Eight Wheeled. Drawing No. 356
Weight, with fuel and water, about 70,000 lbs.

Tank Oil 1600, Water 3500 Gallons, Bill 4233, 3952
Tank "U" shape, sloping back.
Height from rail to top of tank water hole 114"
Tool Boxes of hard wood, Top.

Frame Oak and Yellow Pine.

Front Drawbar height 33½"
Pilot None. Pushing shoes at rear.
Back drawbar centre above rail 33½"
Coupler M. C. B. Automatic.

Steps, hand holds etc. to conform to I.C.C. requirements.
Steps across rear with handrail.
Steps and hand rails on sloping back of tank.
Trucks Arch bar type with steel bolsters.

Springs Elliptic. B.L.W.
Journals, Diam. 4½" Length 8"
Wheels Diam. 33" Tread 4½" Kind Chilled Cast Iron. Plate.
Tires None. Cen. diam. ----- Size -----
Tires held by -----
Safety chains Single.

Brake Position On all wheels.
Brake sch. #6 ET West'g. Auto. and Straight Air with 10" x 12" cylinder.

Two pressed steel re-railers, two hydraulic jacks of sufficient size and of design best adapted for service in re-railing the engine or cars, ~~two truck chains, especially made (square links) with slip hook, two heavy car chains twenty-five feet long, for pulling cars within derailments.~~ to be ordered through Extra Work Dept. Org. No. 5188 dated 8/9/16.

List of tools, sch. 31
Photo sch. #2 Inspection B. L. W.
To be weighed No. Material specifics B. L. W.
Certificate of boiler test Three copies of B.L.W. form 1036.
Junior laws to 5-20-16. Shipment (in own wheels. (see ★ below)

Brass shop finish No. 1
Machine shop finish D-165.

B. L. W. Throttle, Patented Jan. 23, 1900 (Cast On)
Patents Feed Pipe Strainer, Patented Sept. 1, 1903 (Cast On)

Property plates None.

Painting: Engine, style 291 Olive Green and Aluminum.
Painting: Tender, style 291 Olive Green and Aluminum.

Mark on tank sides, MUNICIPAL DOCKS & TERMINALS

Road Nos. Pos.	Road Nos.	Name None.
F. No Plate	100	
F. Sand Box		
Cab Sides		
Back of tank.		

★ One set of coal grates-Rocking bars with drop plate with necessary rigging, high exhaust and netting and deflecting plate for smoke box, to be Ordered through Extra Work Dept., Order No. 4860 dated 5-26-16 and to be shipped with loco. (Charge) Extra Order 4860 to include also the following:- Ash Pan fire door and set of tools for burning coal. 8/9/16

THE BALDWIN LOCOMOTIVE WORKS — As Co's Spec's dated Mar.9-1916 Herewith interchangeable with 6-32 D 969 except as otherwise specified. Ry. Co's Class S 51 20/24 140

Memorandum Spec'n 10941

SPECIFICATION FOR LOCOMOTIVES 6 34 D 947

FOR Board of State Harbor Commissioners. 4-5-16. **Engine Drawing No.** 79

R. (San Francisco, California).

Gauge of Road 4' 8½" Play ¾"

Wheelbase, Rigid 10' 6" Driving 10' 6" Total 10' 6"

1 Total wheelbase, eng. and tend. { Actual 42'8½" / Limited to -----

2 **Curves** 35 degrees.

Limits, Height (See sup.1) Width (See sup.1)

Weight (approximate) in working order, Total 145,000 lbs.

On F. tr'k ----- lbs.. Drivers 145,000 lbs.. B. tr'k ----- lbs.

Tractive power 27,300 lbs.. Ratio of adhesion 5.3

Work'g St'm Pres. 175 lbs. Service Switching.

Fuel Oil (See sup. 27)

18 **Boiler** Steel Thick 9/16" Bill 6743

Boiler, Diam. 65" Plan Straight Top.

20 Boiler st'm pres. 175 lbs.. Tested to { 195 lbs. steam pres. / 234 lbs. water pres.

Longitud. seams Diamond. (See sup. 22)

21 **Dome,** diam. 29" Pos. Central.

23 **Firebox** Steel Combustion chamb. None.

Firebox, length 108" Width 40½" Depth F. 64⅛" B. 60⅛"

Firebox, Tube ½" Crown ⅜" Sides ⅜" Back ⅜"

Firedoor opening 13" x 18" (See sup. 23)

24 Water space, Front 4" Sides 3½" Back 3½"

Water space, Frame Double Riveted

Water space stays ⅝" diameter (See sup. 25-26)

7 Radial stays None. Sling stays front None

Button heads below crown on ----- central rows

Crown bars (See sup. 26) Placed 4" above crown

Crown bolts (See sup. 26)

Flues None.

Tubes No. 0.125 M. M. W. G. Seamless Steel.

Tube ends Swaged for copper ferrules fire box ends.

Number 237 Diam. 2" Length 11' 6"

Heating Surface: Flues None Combus. Chamb. None Total 1567.0

Tubes 1417.0 Fire Box 150.0 Fire Brick Tubes -----

Grate area 30.2 Ratio to Heating Surface 1 : 52

Superheater -----

Fire Brick (See sup. 27)

27 **Grates** None.

Ash Pan, Dampers Front only.

Throttle Balance (See sup. 36) Pos. Dome.

37 Dry pipe Wrought Iron.

Superheater None.

38 **Smokebox** extension With Cleaning hole and cap None.

Spark ejector or hopper None

Netting and deflect. plates None.

37 Exhaust nozzles Single Low.

Cleaning Pipe, With

Stack Cast Iron, Straight Dia. 16" Hole in S. B., dia. 22½"

---

1 **Safety Valves** (Spec) Two Crosby 3" muffled, with guideless discs.

Safety valves One with relief lever, Set to 175 lbs.

Whistle 6" Chime.

Steam Gauge One Iron 6½" dial. MAKER:-Ashcroft. (Spec)

Steam gauge stand Iron **Clock** None.

Water Gauge (See sup. 41) **Cab Lamps** to burn Acetylene.

Gauge Cocks Three (Sup. 42) Surface valve None

Lowest gauge cock 3" above highest part of crown

Lubricator steam valve to have separate dry pipe to dome

Blower Valve (See sup. 43)

Blow off Cock Two (See sup. 44)

46 **Cleaning Plugs** One plug above fire door.

Firebox Corners diagonal, one each side and one back.

Crown, Three each side and four back.

Waist, One in first course and one in second course.

Front tube sheet, Two - Fusible plug (Sup 46)

Pump None. Pos. -----

Top chamb. ----- Bottom chamb. -----

Feed Cock ----- Feed pipes -----

Checks ----- Check pipes -----

53 **Injectors** (Spec) Two Monitor, Three Handled No.9

Injectors, Pos. Right and left (Sup 53) Steam pipes Copper.

Pipes, Check Iron Feed Iron Overflow Iron

Check Co's style Pos. Right and left.

Steam Heat None.

5 **Cab** Steel, lined with white wood.

Ventilator in cab roof.

Cab boards Roughened steel Nosing T-Iron.

Running boards Roughened Steel Nosing T-Iron.

Hand rail 1¼" Iron Located on Boiler.

60 **Back Bumper** Bar Steel Back drawbar height 29"

Pilot None. Pushing shoes at front.

61 **Front Bumper** Cast Steel Bumper plate None.

62 **Steps** across front with handrail.

63 **Front Drawhead,** Center above rail 35" light.

Coupler Climax All-steel M. C. B. short Stem.

Signal fixtures (See sup. 64)

Headlight (See sup. 65) Reflector, To burn Acetylene.

Headlight, Nos. on sides With H'd'l't step With

Lamp shelf None. Nosing -----

Bell Co's style. Bell Ringer (See sup. 66)

71 **Sand Box** Two Diam. 32" Body Iron Painted Pipes Iron

Sander (Spec) D. & R. G. Never-Clog, also hand sander, in each box to sand front and back.

Dome casing (See sup. 72)

Boiler Jacket (See sup. 73) Bands Iron Styles and S

Boiler Lagging (See sup. 73)

11-266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS

E.H. Fulbach. Original 1921

SPECIFICATION FOR LOCOMOTIVES 6 34 D 947 Furnish prints (See sup. 17)

FOR Board of State Harbor Commissioners

R. (San Francisco, California)

---

7 **Frames** Hammered Iron Braces Solid

9 **Cylinders,** Diam. 28" Stroke 24"

St'm ports, Length 18" Width 1⅝" Bridges 1½"

Exh. ports, Length 18" Width 3½" Valve lead 3/16"

Valve travel 5½" Steam lap ¾" Exhaust clearance line and line.

Eccentric crank throw 13-25/32"

83 S. F. Lubr. (Spec) Nathan Triple Bull's Eye No. 9

Cyl'r heads Cast Steel; Lubr. pipes of Iron under jacket.

Cyl'r casings (See sup. 84) Head covers Steel Painted ⅜" thick.

85 St'm chest casings Iron Ptd. Covers Steel Painted ⅜" thick.

86 St'm chest valves Richardson Balanced, with relief valves.

91 Met. pkg (Piston rod / Valve stems) (Spec) Kilborn & Baker (Southern Pac. Co.)

Pistons (See sup. 92)

93 **Guides** Open Hearth Steel Oil cups Needle, Co's style

Crossheads "Alligator" type, Cast Steel. (See sup. 94)

96 **Wrist Pins** O.H.Steel Rod and cups (See sup. 96)

Valve Motion Walschaerts' (See sup. 101 to 105)

Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

10 All threads on bolts (except staybolts) to be United States Standard.

11 All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W. (See sup. 6)

104 **Drivers,** O. S. Diam. 51" Cen. diam. 44" Centers Cast Steel.

107 **Tires** Steel Held by Shrinkage and Shoulder.

Tires, Flanged, Pos. All Size 3½" x 5½"

Tires, Plain, Pos. ----- Size -----

Lateral play between driving boxes and wheel hubs = ⅛" total.

Driving Boxes Cast Steel. (See sup. 108)

110 **Journals,** Diam. 9" Length 12"

Spring Steeples, Cast Steel

116 **Springs,** Make B.L.W.

Front Engine Truck None Wheeled -----

To swing -----each side of cen., Cen. pin liners -----

Journals, Diam. ----- Length ----- Boxes -----

Wheels, Diam. ----- Tread ----- Kind -----

Tires ----- Cen. diam. ----- Size -----

Tires held by -----

Back Engine Truck None Wheeled -----

To swing -----each side of cen., Cen. pin liners -----

Journals, Diam. ----- Length ----- Boxes -----

Wheels, Diam. ----- Tread ----- Kind -----

Tires ----- Cen. diam. ----- Size -----

Tires held by -----

117 to 120 **Brakes,** position On all driving and tender wheels.

Operating Parts: Engine, Sch. UF- New York Combined Auto. and Eng. Tr'k, sch. ----- Straight Air

Foundation Parts: Drivers, sch. F-2 New York O. S. Equalized. Eng. Tr'k, sch. -----

Air pump (See sup 117) Pos. Left Side.

Train connections Front and Back.

Train signal, sch. None.

---

151 **Tender** Eight Wheeled, Drawing No. 597

Weight, with fuel and water, about 100,000 lbs.

152 **Tank** { Oil 1800 Gallons, Bill 4239 / Water 5000 3987

Tank "U" shape, sloping back.

Tool Boxes of steel plates on top at rear, Co's style.

164 **Frame** Steel 10" channels. (See sup. 154 etc.)

Front Drawbar height 30½"

Pilot None. Pushing shoes Cast in bumper.

Back drawhead, center above rail light 35"

Coupler Climax All-steel, M. C. B. Automatic. (Sup. 169-170)

Steps across rear with handrail, also steps on sloping back of tank. (See sup. 171-172)

Trucks (See sup. 173) etc.)

Springs Elliptic. Standard Steel Works.

175 Journals, Diam. 4½" Length 8" Boxes (See sup. 181)

Wheels, Diam. 33" Tread 4½" Kind Rolled Steel.

Tires ----- Cen. diam. ----- Size -----

Tires held by ----- Wheel rims 2½" thick.

Safety chains Single.

182 **Brake** Position On all wheels.

Brake sch LT New York Auto. and Straight Air, with 10" x 12"

191 tender cylinder.

List of tools, sch. 31 (See sup. 16)

Photo sch. None Inspection (See sup. 3)

To be weighed Yes. Material spec'ns (See sup. 366)

Certificate of boiler test Three copies of B.L.W. form 1036.

Junior laws to 6-1-16. Shipment On own wheels (See sup. 12)

Brass shop finish, No. 1

Machine shop finish D-165.

B. L. W. Patents: Throttle, Patented Jan. 23, 1900 (Cast On); Feed Pipe Strainer, Patented Sept 1, 1903 (Cast On)

Property plates None.

Painting: —Engine, style 291 Olive Green and Gold

Painting: —Tender, style 291 Olive Green and Gold.

Lettering, etc. to be same style as for 6 32 D 969

Mark on cab sides, BOARD OF STATE HARBOR COMMISSIONERS

Mark on cab sides below lettering, S 51 20/24 140

Mark on tank sides, STATE BELT RAILROAD

Mark on each end of front and back bumper beams, KEEP OFF

Road Nos. Pos.	Road Nos.	Name None.
F.Nc Plate	8	
F.Sand Box		
Back of Tank.		

SPECIFICATION FOR LOCOMOTIVES 6 34 D 947

FOR Board of State Harber Commissioners
(San Francisco, California)

1 Actual height to top of stack 13' 8½"
Height over safety valves may be 14' 3"
Width over cylinders 10' 3"
Length over couplers 58' 5½"

2 Couplings, safety bars, draw bar, all pipe and hose connections between engine and tender to freely permit of operation on curves of 35 degrees.

3 Locomotive to be inspected by Hunt & Co. The only material which they will inspect at point of manufacture in are the ~~boiler shell and fire box steel and boiler tubes.~~ Wheels and axles only 4/29/16
Furnish to them copies of our orders for this material, informing the mills from whom we purchased the same Hunt & Co. are to make the inspection before shipment to our works.

4 All materials to conform to the regular B. L. W. material specifications, except fire box steel and wearing bearings (See sup. S-6)

5 Fire box steel plates must conform to the following chemical analysis:-

Phosphorus, not over	0.03 per cent.
Carbon, between	0.15 and 0.25 per cent.
Manganese, not over	0.45 per cent.
Silicon, not over	0.02 per cent.
Sulphur, not over	0.03 per cent.

6 Wearing Bearings, Phosphor Bronze: All bronze to be made from new metals and should show the following analyses:-

Copper	79.70 per cent.	Lead	9.50 per cent
Tin	10.70 per cent.	Phosphorus	0.80 per cent

Bronze will not be used should analyses show results outside the following limits:-
Tin, below 9.00 per cent. or over 11.00 per cent.
Lead, below 8.00 per cent. or over 11.00 per cent.
Phosphorus below 0.70 per cent. or over 1.00 per cent.
Bronze will also be rejected in case it contains 0.80 per cent. of any other substances other than the four elements mentioned in this specification.

7 Co. are not willing to consider any change from crossbar boiler and hammered iron engine frames as called for by their specification.

8 All castings must carry in raised letters and figures the Railroad Company's pattern classification(if furnished).

9 All axles, crank pins, connecting rods, piston rods and driving tires must be stamped as print CA-3020.

10 All screw threads, bolt heads and nuts to conform to United States Standard (U. S. Standard) except holes tapped in boiler, or otherwise shown on drawings.

11 Steel taper pins as Company's style, must be made to finish the nuts when practicable, and must be used on connecting rod keys, piston and valve rod keys, link block pins, valve rods, link blocks, eccentric yoke and crank pins.
Pilot keys must be used on outside ends of connecting rod bolts.

12 All driving and Journal boxes to be oiled with Galena ~~Signal Oil~~, and packed with wool waste.
~~Graphite waste~~ to be used on ~~top~~ of driving boxes.
~~Holes must be allowed to drain~~ on all at least fourteenth ~~inches~~ before it is placed in ~~journal boxes~~.

16 Tools Co's style as List, i.e., same as furnished with engine No. 1, Class 6 32 D 734, as follows:-

Cab Seat	Pinch Bar
Cab lamps	Hammers
Oil Cans	Chisles
Torch	Wrenches.
Tallow Pot	Wrenches, A, C, H, BB, BK, BM
Jack Screws Two 24" and Lever	Cab Tool Box

17 The B. L. W. will be required to furnish the Board of State Harbor Commissioners complete blue-prints of general and detailed plans showing the construction of the locomotive.

18 Boiler to have sloping back head.

19 Boiler plates to be annealed after flanging.
Heaters must not be applied to sheets after annealing.

20 Boiler must be fired up to a steam pressure of 10% in excess of working pressure.
This pressure must be reduced twice to 80% of working pressure and raised to 10% in excess of working pressure.
Record of test to be sent to S. H. P.
Tests made before lagging and jacket are applied.
After all steam joints are made, and all piping and lagging and jacket are applied, the boiler must be fired up a second time, steam raised to working pressure, and all steam joints tested, and made perfectly tight under pressure.

21 Dome of Open Hearth Steel, pressed out in one piece.
Dome cap of Open Hearth Forged Steel.

22 Dome course of boiler must be welded underneath dome, and reinforced with a plate on inside of boiler placed diagonally so as to obtain advantage of the Diamond seam riveting.
Circumferential seams of barrel and throat sheets must be double riveted lap joints.
Rivets to be made of steel.
All rivet holes reamed perfectly true before rivets are inserted. No drifting allowed.
All seams of boiler shell and fire box caulked inside and outside.

23 Crown and sides sheets in one piece.
Fire door Datum, as So. Pac. Co's print CA-3130, approved.

24 Mud ring of wrought iron; or O. H. Steel, ~~forged~~ as Company's style, ~~3/8~~ deep, ~~corners~~ of deep at corners, machined inside and outside.
Mud ring must have ~~a~~ width at bottom corners, and must extend to ~~3/8~~ below sheets, to permit caulking.

25 Stay bolts Nelson, ~~tapped~~ ~~pitch~~ ~~inches~~ ~~diameter~~ as ~~marked~~, and to have twelve (12) threads ~~per inch~~.
Stay bolts must have ~~holes~~ drilled ~~in ends~~ ~~to show~~ ~~point~~ of ~~thread~~ with ~~inside~~ ~~sheet~~.
~~Top row of crown bolts~~ ~~to be~~ ~~drilled~~ ~~for~~ ~~cotter~~ ~~pins~~.

26 ~~Crown staybolts~~ ~~diameter~~ ~~pitch~~ ~~inches~~ ~~apart~~ ~~crown sheet~~ ~~radius~~ ~~of~~ ~~crown~~ ~~sheet~~ ~~to~~ ~~be~~ ~~radius~~ ~~of~~ ~~outside~~ ~~of~~ ~~shell~~ ~~plus~~ ~~inches~~.
~~Crown staybolts~~ ~~to be~~ ~~drilled~~ ~~for~~ ~~cotter~~ ~~pins~~.
~~Two rows~~ ~~sheet~~ ~~to be~~ ~~drilled~~ ~~for~~ ~~cotter~~ ~~pins~~.
~~Radial staybolts~~ ~~to be~~ ~~drilled~~ ~~for~~ ~~cotter~~ ~~pins~~.
~~Flue sheet~~ ~~to be~~ ~~drilled~~ ~~for~~ ~~cotter~~ ~~pins~~.

27 ~~Roof~~ ~~sheet~~ ~~to be~~ ~~drilled~~ ~~for~~ ~~cotter~~ ~~pins~~.

11-266-67 Photo copied see box

36 Throttle stand pipe as per Company's style.
Throttle valve must have not less than 1" maximum lift when open.
Throttle lever wrot iron.
Throttle lever latch, latch handle and latch quadrant drop forged steel.
Quadrant and latch case hardened.
Throttle lever and all details as per Company's style.
Throttle stem to have a brass sleeve where it passes through stuffing box. Throttle lever to extend out to the reverse lever not less than 5 inches above the lever.

37 Dry pipe elbow and end of Cast Iron, secured to dry pipe as per Company's style.
Steam pipe double cone cast iron as per Company's style.
Steam pipes as per Company's style, secured to cylinder saddle by four 1½" tap bolts.

38 Smoke box ¼" thick.
Liner ⅜" thick in smoke box over cylinder saddle and cinder hopper.
Smoke box front and door of pressed steel.

39 Exhaust pipe secured to cylinder by six (6) bolts as per Company's style.

40 Cleaning pipe to be 24" at bottom of flounce, flounce 12" high and 16" at the top, top section 16" diam. with 10" sliding sleeve, length of cleaning pipe to be 2" below top of exhaust nozzle and 3" below smoke stack lower end and made of #10 tank steel properly riveted and provided with side brackets to slide up and down in the smoke box brackets.

41 Water gauge to be Delco as Nathan Manufacturing Co's Print No. 833, with round water glass ⅜" diam.

42 Gauge cocks to be placed in their proper location in the boiler back head.

43 Blower valve 1" diameter, Company's style, connected to 1" blower pipe.

44 Blow-off cocks, two Company's style, one in waist in first course, and one in throat, located as per Company's style.
The letters "Boiler end" must be cast on end which is applied next to boiler.
Cocks tapped for 2" standard pipe tap.
The connections between cocks and boiler must be 2" hydraulic pipe nipple.
The 2" wrot iron discharge pipe on both cocks must extend on both sides of engine and be fitted with caps, so a as to permit of blowing off on either side.
Cocks to be operated from running board on left side of engine.
Piping, method of applying and operating to be as per Company's style.

45 Washout plugs:-2" diameter taper 12 threads per inch as per Company's style and located as per Company's style.
Front tube sheet plugs near bottom of sheet, to clear steam and exhaust pipes.
Top plugs in each side of back head in line with side water space.
One fusible plug 2-3/16" taper, 12 threads, as per Company's style, located as per Company's style.
The fusible metal one part tins and eight parts lead.
Plug must be tinned with pure tin before filling.

46. Water gauge to be tubular type with B. L. W. fittings and with Delco guard, as Nathan Mfg. Co's print 833. 4/20/16

51 All tapped holes in boiler to have twelve threads per inch, except for blow-off cock, which must be standard pipe tap.

52 All globe valves to be Star renewable and reversible white bronze discs and seats.
Cock and valve handles of malleable iron, Company's style.
Gaskets, Company's style.

53 Injectors to be provided with control handles extending inside of cab.
The injectors are to be placed outside of cab fastened to the boiler and to be located so that the overflow nozzle will be above the top water line of the tank.

54 Injector feed pipes to clear rail by at least 16"
Feed pipes at hose coupling to be not more than 56" center to center.

55 Feed Pipe Strainers, B. L. W. 2½" with Co's style couplings.

56 Coal sprinkler valve to be Nathan Manufacturing Company's No. 745.

57 Turret of brass, Company's style, with 3½" dry pipe to dome.

58 Cab doors and windows of clear, close grained Ash.
Cab door fixtures, Company's style.
Plank flooring, of Oak on top of running boards inside of Cab, Company's style.
Cab bracket of steel plate and angle iron, Company's style.
Openings in front of cab for reach rod as small as possible and allow free movement of reach rod.
Cabs taken to have opening in cab floor for reverse lever no larger than necessary for free movement of lever.
Cab window on side to be two-thirds the length of cab, arranged in two sliding sashes.

57 Running board nosing to be 1½" x 1½" T-Iron riveted to plate with ½" rivets, spaced about 6" apart.
Space between running boards and boiler filled in, Company's style.

60 Tail bar to be recessed into frame, top and bottom.

61 Bumper:- Provision made for push pockets in beam, attaching front end draw casting holes for signal brackets, step and safety appliances.
Handholds on front bumper, Company's style.
Bolts securing these handholds double nutted (nuts on top) ends of bolts riveted over.
Steps of oak, secured to wrot iron brackets as Company's style.
Bolt securing step brackets to front bumper must have double nuts, with ends of bolts riveted over.

62 Steps, couplers, handholds etc. to conform with the I.C.C. requirements.

63 Front draw casting of malleable iron.

64 Signal brackets of malleable iron, Company's style on engine and tender.

65 Headlights:- Two 18" Buck 1419½ headlight cases, one front and one back.
One generator to be furnished and applied by Railway Co., except ½" iron pipe for headlight to be applied by B.L.W.

66 Bell ringer to be Collmar, as Company's print.

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SPECIFICATION FOR LOCOMOTIVES S 34 D 949.

To Board of State Harbor Commissioners.

196

81 Frame:- Forward section bolted to main frame as per Company's style, with all bolts double nutted.
Front lug for key, back lug to bear against cylinder.
Main frame in one section.
Lugs on frame just ahead of deck plate to receive front end of deck plate as per Co's style.
Pedestal brace wrot iron as per Company's style.
Double nut and key used in securing pedestal brace to frame as per Company's style. (See sup. 109)
Deck plate of cast steel as per Company's style.

82 Each cylinder to be cast in one piece with half saddle.
Front cylinder heads to be grooved, Company's style, to allow for breakage under excessive pressure. (See sup. 1)

83 Lubricator to have boiler valve.
Cylinder cocks as per Company's style attached with 1" gas pipe.
Drain hole in cylinder ½" diameter.
Cylinder cock lever in cab to be as per Company's style.

84 Cylinders lagged with same material as boiler and neatly cased with painted iron, #14 B. W. G. thick

85 Valve yoke of hammered iron 5" diameter as per Co's style.
~~Valve rod of cast iron or steel as per Co's style.~~
~~The ball joint connecting valve stem and valve rod,~~
~~shall be provided with a nut as per Company's style.~~
DOES NOT APPLY TO THIS DESIGN R.G.A. 9.18.23
Vacuum relief valves to be Southern Pacific Standard.

91 Metallic packing rings for piston rods and valve stems to be Company's style. Piston rod packing to be [illegible] Packing. See that the [illegible] is [illegible] in. Be sure that the packing is not right on the [illegible] spring must have [illegible] to [illegible] On a valve stem [illegible] is all that is necessary, the adjustment can be made by the glands, leaving them longer if necessary. (See blue-print) or use a neck ring ahead of the spring to fill in with.
The small bevel (marked in red on the blue-print) on the large metallic ring should NEVER be disturbed when making repairs. You will note the Metallic's shoulder next to the piston should be 1/32" away from the shoulder on the housing so that when the engine makes on revolution the Metallic conforms itself to the rod and closes up the opening of the Metallic, and comes against the shoulders.
The small Metallic ring goes next to the housing, next to the gland, and the larger ring crowds the smaller one out of business until the two brass housings come together, when the Metallic is worn out.
The formula for the Packing is - Lead .820%, Antimony 13%, Tin .34%, and a tracing of copper.
You will also find with this letter under separate cover blue print for the making of the Kilborn & Baker Packing, for the 4" reinforced Piston rod, you will note No. 7 ring is in halves but for the plain rod it is not necessary.

92 Pistons:- To have solid heads of cast iron, fitted with approved form of steam packing, consisting of three (3) rings of [illegible] width and [illegible]" deep.
Piston heads with two water grooves, as per Company's style
Piston rods O. H. Steel, as per Company's style (See sup. 9)
Rods with enlarged ends, piston head fit taper ~~½~~ in 5" and secured by wrot iron nut pinned on to end of rod and riveted over after nut is screwed up.
Crosshead fit taper ~~½~~ in 5" and secured by steel key ~~½~~" thick and 3½" wide.
Key and keyway made with round corners and sufficient clearance allowed in crosshead for about ~~½~~" draw after key is driven tight.
Rods rolled between fits.
Rod fit in crosshead and piston head must be ground to a perfect fit.
piston rods made sufficient length to allow piston heads to be pushed clear of cylinder at forward end to renew piston rings without disturbing stuffing-boxes, packing, or cross-head key.

93 Guides fitted to guide yoke of wrought iron.

94 Crosshead shoes to be as per Company's style.
Crosshead wrist pins to have grease cups as S.P.L.W.Card 2099.

95 Southern Pacific standard method of grease cup on connecting and crosshead wrist pins. (See sup. 9)
Wrist pin bearing surfaces ground true on dead centers.
Wrist pin pressed into wheel centers at a pressure of not over ten (10) tons nor less than seven (7) tons per inch diameter and to be riveted over on back end.

96 Connecting and parallel rods of open hearth hammered steel.
Main rods "I" section, others rectangular. (See sup. 9)
Parallel rods with solid ends.
Taper of bolts must be 1/16" in 12".
Grease cups forged solid on rods. (See sup. 103)
Main rod front end solid, back end marine type, same as for 6 22-1/2 C 1, bolts driven from bottom of rod with nuts on top.

101 Valve gear to be of the straight line type graduated to cut off at 0-6", 18", 24" of stroke.
All pins and holes to be bushed and case hardened.

102 Valve gear to be of the same general design as for Belt Railroad, Engine #7 (American Loco. Co) with crosshead connecting link to lap and lead bar is not to be below bottom guide bar
In addition to locating the lower end of the combining lever so that it will not be lower than the bottom guide bar, the Valve-motion crosshead guide is to be secured by casting which is fastened to the steam-chest; the link bearing casting is to be fastened to the main guide yoke; this is the same arrangement as on Co's present Loco. built by ALCO and which is referred to in Co's specification.

103 Oil cups, Company's style, to have fourteen (14) threads, for all bearings and pins of valve motion except back end main rods and parallel rods.

104 Links, sliding blocks, link hangers and link saddles, Hammered Iron Case Hardened, as per Company's style.
Motion work pins of Machinery Steel. (See sup. 11)
Taper on motion pins as per Company's style.

105 Reverse shaft of wrought iron with arms forged on as per Company's style.
Reverse shaft spring coil as per Co's style.
Reverse lever of wrot iron.
Reverse lever latch handle drop forged steel, applied on back of lever.
Latch wrot iron case hardened., three teeth in latch, ½" Pitch.
Quadrant wrot iron case hardened, solid 1⅞" wide, 2" deep
Reverse lever and quadrant as per Co's style.
Round taper pins must pass through nut and bolt of reach rod pin.
Round taper pin must pass through nut and bolt of fulcrum pin.

106 Driving wheel centers turned to agree with M.M.Association gauges, correctly quartered, and pressed on axles at a pressure of ten (10) tons for every inch diameter of axle.
Wheel centers mounted before tires are applied and secured with steel keys on line connecting center of crank pin and center of axle.
All the revolving weight and two-thirds of the reciprocating weight must be used in counterbalance.

107 ~~Standard equal to (a/o time)~~ Driving tires of Midvale Special Hard Switching Steel.
Driving tires M.M.Association standard tread, and bored as M.M. Association gauges (See sup.9)
Outer surface of tires, including periphery and sides must be trued up in lathe after being shrunk on wheel centers.

108 Driving boxes as per Company's style.
Face of box next to hub to be bronzed.
Collars secured to boxes by ⅜" collar bolts.
Bolts held in position by flat keys.
Driving box bearings as per Co's style with two babbitt strips 2" wide.
Bearings pressed in from side of boxes at a pressure of not less than thirty (30) tons.

109 Gibs and wedges of Phosphor Bronze with ⅜" fillet on inside.

110 Driving axles Steel as per Company's style, with enlarged wheel fits. (See sup.9)
All journals rolled.

116 Springs on engine of Vanadium Steel, tempered in oil.
Equalizing beams of wrought iron.

117 Air pump to be One 8½" West'g. Cross compound.
Air pump exhaust connected with exhaust through back wall of cylinder saddle.

118 Main air reservoirs with a capacity of at least 50,000 cu. in.

119 Air brakes tested with a pressure of 120 lbs. per sq. in., all joints being first covered with soap suds, and all castings, joints, pipes and their connections must, under that pressure be free from leakage.
Brakes must be prompt in their action, both when applied and when released, being free from all avoidable friction.
All pipes blown out thoroughly with steam after bending to remove scale.

120 Driver brake cylinders to be placed outside of frames under rear end of cab.
Perfecto "T" driving brake shoes.
Driver brake fulcrum levers to clear top of rail 7"

PLEASE NOTE FOR RECORD AND FOR HEREAFTER:- the following from report dated 10-2-16 from engineer T. R. Shank.
Make slot wider in Reverse Link Bearing to clear front bolt at back end of Radius rod.
Front blow off cock in waist was taken off at destination.
Cleaning hole, 1½" diameter, drilled in bottom of smoke box a and tapped with 12 thread tap.
Coupler pocket originally specified removed and short one put on.
Hole 1½" drilled and tapped in dome cap for steam blow off valve.
Two additional Tank knees added to hold tank in place.
Tank valves applied to oil tank as used on Southern Pacific.
Round corners on cab apron to clear tank.
Apply 1½" pipe in blow off cock. 10/ 11/16

For Hercafter - Ry. Co. advises they can only furnish the Metallic packing rings for piston rods and valve stems - the other parts consisting of glands, cups and springs must therefore be furnished by the Loco. Builders. 11.13.23.

SPECIFICATION FOR LOCOMOTIVES 6 34 D 947

FOR Board of State Harbor Commissioners

T E N D E R :

150 Tender to be duplicate of that on engine 6, Class 6 32 D 969 except as noted.

151 Tank:- All seams to be single riveted with $\frac{7}{8}$" steel rivets spaced 1$\frac{1}{2}$" apart. (see sup. 194 to 198)
Tank hose Anaconda 3" tank hose 42" long wire lined and with hose clamps as per Company's style.
Tank man-hole Company's style, located as per Co's style. (See sup. 194 to 198)
Tank secured to tender frame as per Company's style.
Tank valves and fixtures as per Company's style.

152 Signal lamp brackets of malleable iron with location as per Co's style.

153 Hand holds on back bumper as per Co's style, secured to back bumper by four $\frac{3}{4}$" bolts.
The bolts double nutted (nuts on top) the ends of bolts riveted over.

154 Tender Frame:- Body bolsters as per Co's style.
Special attention to be given to the construction.
The upper plate wrot iron 1" thick by 10" wide.
The lower plate wrot iron 2" thick by 10" wide, reduced to 1$\frac{3}{4}$" thick at ends.
The upper and lower plates riveted together by three 1" steel rivets at each end.
The upper plate riveted to angle iron by three 1" steel rivets.
Each angle iron riveted to center sill by four $\frac{7}{8}$" rivets of steel.
The ends of the lower plate of body bolster riveted to side sill by five 1" steel rivets, all as per Co's style.
Body center plate of cast steel as per Co's style.
Contour of center plate M. C. B. Standard.
Wearing surface must be smooth.
Body center plate securely bolted to body bolster with ten 1" bolts, as per Co's style.
Body side bearings of cast steel, as per Co's style, and must be bolted to body bolster with four 1" bolts, as per Co's style.
Bumper beams front and back of hollow cast steel.
Center sills and side sills, 10" rolled steel channel, weighing 30 lbs. per foot.
Special attention is directed to the method of securing sills together and to end sill plates.
In addition to the bolster described above, the side sills must be secured to end sill plates by 1" corner angle plate using $\frac{7}{8}$" steel rivets, as per Co's style.

The corner angle plates secured by 1" steel rivets to end sill plates

At the rear the center sills must be riveted with 1" steel rivets to draw casting as per Co's style.
The center sills riveted at front with 1" steel rivets to front drawhead as per Co's style.
Midway between body bolsters, the center sills must be further secured together by a steel plate $\frac{3}{4}$" thick by 15$\frac{1}{2}$" wide, riveted with $\frac{7}{8}$" steel rivets as per Co's style.
Diagonal braces 1" x 6" securely riveted with 1" steel rivets to end sill plates and to side and center sills with $\frac{7}{8}$" rivets as per Co's style.
Tender frame will be further secured by four connecting rods 1$\frac{1}{2}$" diameter with 1$\frac{3}{8}$" enlarged ends.

155 Flooring Yellow Pine 1$\frac{7}{8}$" thick by 111" long, upon which tank will rest.
Flooring secured to frame by $\frac{3}{4}$" bolts as per Co's style.
Ends of flooring bound by 1$\frac{1}{2}$" x 1$\frac{1}{2}$" angle iron which must be secured by wood screws as per Co's style.

164 Drawbar wrot iron 3" x 5" section as per Co's style.
The slotted hole applied next to engine.
Safety bars wrot iron 2" x 3" section as per Co's style.

167 Chafing iron and pocket as per Co's style and secured to tender frame as per Co's style.
Chafing iron at front of tender cast iron with chilled face.
Chafing iron pocket of cast steel.

168 Buffer springs C. H. Steel 6$\frac{1}{2}$" x 8" M. C. B. standard.

169 Miner Tandem Spring Draft Gear.
Drawbar stops as per Co's style, securely riveted to draw casting, each by twelve 1" steel rivets as per Co's style.
A 1$\frac{3}{8}$" double refined iron rivet used to secure malleable iron draft thimble to coupler yoke.
A $\frac{1}{2}$" steel tie plate bolted to drawbar follower guides and draw casting by $\frac{7}{8}$" bolts as per Co's style.
Draft springs 6$\frac{1}{2}$" x 8" M. C. B. standard as per Co's style. two per tender.
It must not be necessary to compress draft springs to apply them in position. Follower plates of C. HI Steel 6$\frac{1}{2}$" wide by 9$\frac{3}{8}$" x 1$\frac{1}{2}$" WITH 2" round boss 1" high pressed up in center as per Co's style.

170 Coupler riveted to yoke with double refined iron rivets as per Company's style.
Coupler yoke wrot iron 1$\frac{1}{2}$" x 4" section with 1" wrot iron filler block riveted to back end as per Co's style.

171 Steps at front of tender frame of cast iron as per Co's style.
Steps at rear of tender frame of oak, secured to wrot iron brackets as per Company's style.
The bolts securing step brackets to back bumper must have double nuts. Ends of bolts riveted over.

172 Steps on slope of tank of steel $\frac{1}{4}$" thick 16" wide as per Co's style riveted and secured to slope of tank by $\frac{7}{8}$" steel rivets on R. H. side only.

173 Truck wheelbase 5' 6".
Height from top of rail, tender loaded, to contact surface of center plate 25$\frac{5}{8}$", to top wide bearing 28$\frac{3}{8}$"
Truck:- See that all holes in arch bars, spring planks and column castings are drilled to templates to insure arch bars and journal boxes being in perfect alignment when put together.
Andrews cast steel tender truck side frames.
Simplex bolsters as per Co's style.
Bottom bar of wrought iron, double refined as per Co's style.
Truck center plates cast steel annealed, M. C. B. contour, as per Company's style.
King bolts wrot iron or C. H. Steel as per Co's style.
Spring planks, angles and plates.
Holes must be reamed.
All dimensions involving fits must be accurate and as per Company's style.

174 Truck side bearings Miner Gravity Roller type 5" high with auxiliary spring as per Co's style.
Base castings of side bearings securely riveted by bolster manufacturer to bolster channel to exact centers, as per Co's style.
Clearance between upper and lower side bearing must be 3/16" under light tender.
Additional bearings at side of both trucks.

176 Axles of open hearth hammered steel (See sup. 9)
Ends of axles finished smooth.
All journals rolled.

11-266-67 Photo copied see box

SPECIFICATION FOR LOCOMOTIVES 6 34 D 947

FOR Board of State Harbor Commissioners.

181 Journal boxes, M. C. B. dimensions, of malleable iron, as per Company's style.
Journal box bolts 1$\frac{1}{2}$" diameter by 16$\frac{1}{2}$" long of wrot iron or C. H. Steel, single nutted and keyed with $\frac{3}{8}$" No. 14 steel split keys to pinch nuts as per Co's style.
Journal bearings M. C. B. Standard as per Co's style.
Journal bearing wedges, M. C. B. standard, and made of cast steel, drop forged steel or malleable iron, as per Company's style. Size of wedges cast or stamped on each wedge.
Each box with dust guards made of base wood or poplar, which must be covered with No. 4 white canvas duck tacked on with 6 oz. tacks, hole in center of canvas cut 3" in diameter and then cut radially at twelve (12) equal points to a sufficient depth to permit canvas fitting axle snugly.
Each dust guard with inserts of .028 M. M. Gauge tin as per Company's style.

182 Brake:- Braking power must be 100% of the light weight of tender based upon an efficient air brake pressure of 60 lbs. in air brake cylinder.
Piston travel must not exceed 7" nor be less than 5" when brakes are adjusted.
Brake cylinder supported from tender frame by brackets as per Company's style.
Cylinder brackets made of $\frac{3}{4}$" wrot iron or C. H. Steel plate 15$\frac{3}{8}$" wide and secured to each center sill as per Co's style.

183 Air hose 1$\frac{1}{4}$" diameter 22" long.
Piping as per Company's style.
Train line 1$\frac{1}{2}$" wrot iron pipe.
End of train line pipe on rear located 17" from center line of tender and 24$\frac{1}{2}$" from top of rail and 1$\frac{1}{2}$" angle cock as per Company's style.
All piping well secured to tender frame by wrot iron or C. H. steel pipe clamps.
Red lead or white lead must not be used on pipe joints.
Plumbago may be used.
All piping well blown out with steam before application to tender.
All brakes must be tested and all castings, pipes, joints, and their connections must be free from leakage under an air pressure of 120 lbs.

184 Brake beams 6" rolled steel "I" section weighing 1228 lbs. per foot with forged steel fulcrums and malleable iron brake heads as per Co's style.
Brake beam hangers $\frac{3}{4}$" square iron or C. H. steel brought to $\frac{7}{8}$" circular section to take brake head eye, beam hangers supported from lugs on column castings and secured to same by 1$\frac{1}{2}$" wrot iron or open hearth steel pin with $\frac{3}{8}$" split key of No. 14 steel.

186 Brake beam safety chains at each end of beam spaced 20" apart secured to beam by a $\frac{7}{8}$" eye bolt and nut, end of bolt riveted over.
Air brake pins C. H. steel turned or drop forged to within 1/64" of size, as per Co's style, and secured by $\frac{3}{8}$" cotter keys.
All holes for air brake pins must be drilled.
Brake beams wrot iron or C. H. steel, I-ins with cheek flanges within 24" long with lowerings 6" and 12" bottom at center $\frac{5}{8}$" x $\frac{3}{4}$".
Ends tapered to $\frac{5}{8}$" x $\frac{3}{4}$"

191 Dead lever anchors malleable iron secured to bolster channel by two $\frac{3}{4}$" rivets as per Co's style.
Brake shoes steel backed M. C. B. Christie Congdon Shoes as per Company's style.
Shoes secured to head with M. C. B. standard steel keys as per Company's style.

194 Man hole in water tank to be larger than for 6 32 D 969 placed on top and at rear of water tank, 16 inches high and 18 inches diameter, hinged cover to swing open toward the rear.

195 Oil tank man-hole 18 inches diameter, 4 inches to 6 inches high and placed in the longitudinal centre, and as near as possible to the transverse centre of top of tank, made of cast iron or steel, cover to be hinged and to be fitted so that it will be oil tight when fastened shut, with hinged studs and crank-handle nuts. Four such fasteners equal distance apart.

196 Valve to be provided inside of oil tank to shut off oil supply in emergency.

197 Drain pipe in bottom of oil tank to be tapped into a flange riveted to tank.

198 Oil and heater connections between engine and tender to be McLaughlin flexible joints.

THE BALDWIN LOCOMOTIVE WORKS Dup. 6 32 D 878, with some extras Except as otherwise specified.

Memorandum Spec'n 10135

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1057

FOR Jacksonville Terminal Company. **Engine Drawing No.** 92

J. 11-10-13

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"
Total wheelbase, eng and tend (Actual 40' 6½" (Limited to -----

Curves -----

Limits, Height ----- Width -----
Weight (approximate) in working order, Total 123,000 lbs.
On F. tr'k ----- lbs., Drivers 123,000 lbs., B. tr'k ----- lbs.

Tractive power 28,720 lbs., Ratio of adhesion 4.2
Work'g St'm Pres. 180 lbs., Service Switching
Fuel Soft Coal

Boiler Steel Thick ⅞" Bill 7114
Boiler, Diam. 64" Plan Straight
Boiler st'm pres 180 lbs., Tested to { 200 lbs. steam pres. / 240 lbs water pres.
Longitud seams Butt jointed, double covering strips.

7 **Dome,** diam. 29" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 96 1/16" Width 32⅞" Depth F. 71⅝" B. 69⅜"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diam.
Water space, Front 4" Sides 3" Back 3½"
Water space, Frame Single Riveted
Water space stays 1" diam. with 3/16" hole 1½" deep from O. S.

Radial stays 1⅛" diam. Sling stays front One I bar
Button heads below crown on Eight central rows
Crown bars None Placed ----- above crown
Crown bolts -----

Tubes #12 W. G. Charcoal Iron
Tube ends Swaged for copper rings firebox ends.
Tubes, No. 270 Diam. 2" Length 10' 6"

Heating Surface, Tubes 1473 sq Firebox 155 sq Total 1628 sq
Grate area 22 sq Ratio to heat'g surface, 1 : 74
Superheater ----- Feed-water heater -----
Reheater ----- Fire brick tubes -----

Fire Brick arch On Studs.

Grates Rocking bars and drop plate.
Ash Pan, Depth 22" Dampers (See Sup. 1)

Throttle Balance Pos. Dome
Dry pipe Wrot Iron ~~or Steel~~ (MUST BE OF WROT IRON)

Superheater None

Smokebox to have self cleaning front end arrangement.
Smokebox extension With Cleaning hole and cap R. and L.
Spark ~~arrester~~ hopper With
Netting and deflect. plates With

Exhaust nozzles Double High

Stack Straight Diam. 16" Hole in S.B. 17¼"
Stack of cast iron seperate from base.

Safety Valves (NOT SPEC) Two Consolidated 3". One Muffled.
Safety valves None with relief lever, Set to { 180 muffled. / 183 open.
Whistle Chime

Steam Gauge One Iron 7" Maker, Ashcroft (NOT SPEC)
Steam gauge stand Iron **Clock** None

Water Gauge One (See Sup. 2) **Cab lamps** to burn oil.
Gauge Cocks Three Back Surface valve None
Lowest gauge cock 3" above highest part of crown

Blower Valve B. L. W.

Blow off Cock Four Everlasting 1½" Pos:- (See Sup. 3)
4 **Cleaning Plugs** Fusible Plug, One.
Firebox Corners.
Crown, Two each side and two back.
Waist, Two under, - One in first course and one in second
Front tube sheet, One. One plug above fire-door.
Two plugs each side of waist above center.

Pump None Pos. -----
Top chamb. ----- Bottom chamb. -----
Feed cock ----- Feed pipes -----
Checks ----- Check pipes -----

Injectors (SPEC) Two Nathen Monitor No. 9.
Injectors, Pos. R. and L. Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check Sellers Duplex Pos. On Top of Boiler.

Steam Heat None

Cab Steel, lined with wood. (See Sup. 5)
Ventilator in top of cab.

Cab boards Steel Nosing T-Iron
Running boards Steel Nosing T-Iron
Hand rail Iron Located on Boiler.

Back Bumper Bar Steel Back drawbar height 34½"

Pilot None Pushing shoes Cast in Bumper
Front Bumper Cast Steel Bumper plate None
Steps Divided across front with handrail.
Steps, handholds, etc. to conform to I. C. C. requirements.
Front Drawhead, Center above rail 33½"
Coupler (See Sup. 6) M. C. B. Auto.

Flag fixtures None

Headlight Two Round Case 16" Reflector, To burn Kerosene
Headlight, Nos. on sides With H'd'l't step On Bumper & on Smokebox.
Lamp shelf None Nosing -----

Bell 92 pounds. Gollmer Air Bell Ringer.
7 **Sand Box** (NOT SPEC) Two Diam. 28" Body Iron Ptd. Pipes Iron
Sander Leach Air, trap A-1, to send front and back.

Dome casing Iron Painted.

Boiler Jacket #22 Plain, ~~Steel~~ Iron (NOT SPEC) Bands Iron Style 9.
Boiler Lagging Magnesia Sectional.

#206-67 Pitch cyl'd see box

THE BALDWIN LOCOMOTIVE WORKS

Engine R. E. McGaffey Dec. 1913

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1057 200

FOR Jacksonville Terminal Company.

J.

1 **Frames** Cast Steel Braces Solid

Cylinders, Diam. 19" Stroke 26"
St'm ports, Length 16" Width 1½" Bridges 1"
Exh. ports, Length 16" Width 2½" Valve lead ⅛"
Valve travel 8½" O. S. lap ⅝" Ins. lap -----
Eccentric crank throw 20"
S. F. Lubr. (SPEC) Detroit Triple #22 Bulls Eye { Iron pipes / under jacket
Cyl'r heads Cast Iron
Cyl'r casings Iron Ptd. Head covers Steel Finished
St'm chest casings Iron Ptd. Covers " "
St'm chest valves Richardson balanced, with vacuum valves.
Met. pkg { PISTON ROD / VALVE STEMS } UNITED STATES, Multiengular. (SPEC)

Pistons Cast iron rings sprung into solid head.
Guides Steel Oil cups Needle
Crossheads Cast Steel
Wrist Pins Steel Rod cups Plunger forged on.
Parallel rods with solid ends.

14 **Valve Motion** ~~Brown~~ SOUTHERN LOCOMOTIVE VALVE GEAR 4-4-13
{ Links, sliding blocks, pins, lifting links and eccentric rod jaws to be / well case hardened or to have hardened bushings.
13 Regennet air reverse gear.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings Damascus

Drivers, O. S. Diam. 50" Cen. diam. 44", Centers Cast Iron.

Tires Steel Held by Shrinkage & Shoulder.
Tires, Flanged, Pos. ALL Size 3"x 5½"
Tires, Plain, Pos. None Size -----
Lateral play between driving boxes and wheel hubs – 1/16" total
Driving Boxes Steeled Cast Iron.
Journals, Diam. 8" Length 9"

Driving spring staples Wrot Iron

Springs. Make B. L. W. (See Sup. 9)

Front Engine Truck None Wheeled -----
To swing ----- each side of cen. Cen. pin liners -----
Journals, Diam. ---- Length ----- Boxes -----
Wheels, Diam. ----- Tread -----Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----

Back Engine Truck None Wheeled
To swing ---- each side of cen. Cen. pin liners ----
Journals, Diam. ---- Length ---- Boxes ----
Wheels, Diam. ---- Tread ---- Kind ----
Tires ---- Cen. diam. ---- Size ----
Tires held by -----

10 **Brake,** position On All Driving and Tender Wheels.
12 Operating Parts { Engine, Sch. 6-ET, West'g. Comb. Auto. & Streight Air. / Eng. Tr'k, sch. -----
Foundation Parts { Drivers, sch. WM-2, American C. S. Equalized. / Eng. tr'k, sch. -----
10 Air pump { One 9½" Cross Compound } Position, Left Side.
Train connections Front and Back.
Train signal, sch. -----

21 **Tender** Eight Wheeled, Drawing No. 435
Weight, with fuel and water, about 70,000 lbs.

Tank 3500 Gallons, Bill 3743
Tank "U" Shape, Sloping Back. Fuel Capacity 6 tons.

Tool Boxes Of Herd Wood, Top.

Frame Steel 10" channels.
Pushing Shoes, At Rear.
Front drawbar height 32½"

23 Back drawhead, center above rail 33½"
Coupler (See Sup. 22) M. C. B. Auto.

Steps (See Sup. 24)
Steps divided across rear with handrail.
Trucks Archbar, Steel Bolster.

Springs (See Sup. 25) Elliptic, B. L. W.
Journals, Diam. 4½" Length 8"
Wheels, Diam. 33" Tread 4½" Kind Chilled Cast Iron Plate.
Tires None Cen. diam. ----- Size -----
Tires held by -----
Safety chains Single

Brake Position On All Wheels.
Brake sch. 6-ET, West'g. Auto. & Streight Air with 10"x 12" brake cylinder.

List of tools, sch. 29 Bolts, nuts and threads B. L. W.
Photo sch. #2 Inspection by Alfred Lovell
To be weighed Yes Material spec'ns B. L. W.
Certificate of boiler test Three copies of B. L. W. form 611.
Junior laws to 11-12-13 Shipment On Own Wheels.

Brass shop finish, No. 1.
Machine shop finish D-160, except injector check pipes ptd.

Patent Plates { Throttle Patented Jan. 23, 1900. (Cast On) / Feed Pipe Strainer Patented Sept. 1, 1903. (Cast On)

Property plates None

Engine to be well painted; Co. claims that painting on Eng. 4, 6 32 D 878 was not satisfactory.
7 **Painting:** –Engine, style { 326, Except Bands on dome and sandbox to be of brass. } Olive Green and Gold
Painting:–Tender, style " " " "
Striping, numbering and lettering in gold leaf as Company's two pencil sketches, ie., same as for 6 32 D 878.
Mark on tank sides, JACKSONVILLE TERMINAL CO.

Engine road number in brass set in dome and sides of cab.
No. Pos. Road No. Name None
F. No. Plate 5
Dome
Cab Sides
Side cellar of tank.

#66-67 Photo copied see box

SPECIFICATION FOR LOCOMOTIVES, 6 32 D 1057

FOR, Jacksonville Terminal Company

J.

1 Ash pan with dampers suitably located to blow backward to both pans, the blowers to come from front and left side blow-off cocks; front pan to be provided with shield to keep cinders from driving boxes.

2 Glass water gauge, Ironclad, from Sargent Co., $\frac{3}{8}$"x 12"

3 Blow-off cocks to be placed one in front, one back, and one each side of firebox.

4 Cleaning holes with $1\frac{1}{2}$" pipe thread; holes located as shown by Co's sketch dated Nov. 12th, 1913.

5 Cab equipped with storm curtains.

6 Couplers from the National Malleable Castings Co. Couplers to have extended floor coupler pockets.

7 Brass bands on dome and sand boxes in place of bands in gold leaf.

8 Flanges of pedestal shoes and wedges to be made $\frac{5}{8}$" thick and lap about $1\frac{1}{2}$"; thickness of wedge at top $\frac{3}{4}$"§ give more flanges to boxes to lap over jaw. (See sketch dated 11-12-13) Corners of all pedestal jaws to be chamfered, and shoes and wedges with fillet to correspond.

9 Springs and spring hangers should be made 20% heavier (those on engine 4, class 6 32 D 878 were too light and had to be replaced)

10 Air pump exhaust to lead in cylinder saddle.

11 Air reservoirs to be placed under raised running boards, on each side of engine, and to have total capacity of 32,000 cubic inches.

12 American Brake Shoe & Foundry Co's interchangeable brake shoes heads for all driving wheels.

13 Ragonnet Air Reverse Gear covered by Extra Order No. 11109, dated 11-26-13.

14 Royalty on ~~Brown~~ Valve Gear payable by B. L. W.
12/24/13 B. L. W. has permission to make all parts for ~~Brown~~ Valve motion.

" . Valves to be set in accordance with instructions from - W. S. Murnin. (Copy sent to E.E. and to Cost Dept.)

TENDER

21 Tender to have cast steel center bearings.

22 Couplers from the National Malleable Castings Co. Couplers to have extended floor coupler pockets.

23 Apply $1\frac{1}{2}$" instead of $1\frac{1}{4}$" bolts in drawhead at rear of tender.

24 Steps, handholds, etc. to conform to I. C. C. requirements. Steps and handrails on both sides of sloping top of tank, same as shown by Photo. 2034, class 6 32 D 354.

25 Springs and spring hangers should be made 20% heavier (those on engine 4, class 6 32 D 878 were too light and had to be replaced.)

THE BALDWIN LOCOMOTIVE WORKS — As Spec'n 6-4361 Details as far as practicable to be same as for 6 32 D 1057

Memorandum Spec'n 11248

SPECIFICATION FOR LOCOMOTIVES 6 34 D 958 — Gen. as photo. 5539

FOR Jacksonville Terminal Company — **Engine Drawing No.** 82.

12.13.16.

Gauge of Road 4' 8½" Play ⅜"

Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"

Total wheelbase, eng. and tend. {Actual 41' 1" / Limited to ----

Curves -----

Limits, Height ----- Width -----

Weight approximate ... Total 130,000 pounds

On F. trk ---- lbs ... 130,000 lbs, B. trk ---- lbs

Tractive power 31800 lbs ... 4.1

Work'g St'm Pres. 180 lbs ... Switching

5 **Fuel** ~~Coal~~ Soft Coal

FRONT TUBE SHEET TO BE ½" THICK

Boiler Steel Thick 1¹⁵/₁₆" Bll 8037

Boiler, Diam. 64" Plan Straight Top

{Boiler shops 200 lbs. Tested to 327 lbs steam pres.
{WITH FACTOR OF SAFETY OF 3.0 267 lbs working pres.

2 Long'tud seams Butt joints, double covering strips

1 **Dome,** Diam. 26" Pos. Central

2 **Firebox** Steel ... Thick ... Width "one"

3 Firebox, Inside 96-3⅛" Width 41" Depth F. 65" B. 63⅛"

Firebox, Tube ⅜" ... Side ⅜" Back 5⅛"

Firedoor opening 16" diam.

Water spaces, front 4" Side 3½" Back 3½"

Water space, Frame Single Rr. 4

Water spaces, stayed ⅞" diam. with 3¹/₁₆ holes 14" deep from F.S.

3 Radial stays 1" diam. Staybolts, ... {Two rows of B.L.W.
Button heads below crown on ... row {Expansion stays
Crown bars None Placed ---- (See sup. 3)

Crown bolts ----

Flues #9 W.I. Seamless Steel

4 **Tubes** #12 W.G. Charcoal Iron

Tube ends Swaged for copper ferrules, fire box ends

Number 21 / 143 Diam. 5½" / 2" Length 10' 6"

Heating Flues 315 Comb'us Chamb. ---- Total 1240

Surface Tubes 780 Fire Box 145 Fire Brick Tubes ----

Grate area 27.4 Ratio H. Heating Surface to 1 : 45.3

Superheater 236

Fire Brick Arch, ~~None~~ ON STUDS.

~~Fire box lined with fire brick for oil burning~~

~~fire brick pavement in pan.~~

5 **Grates** ~~None~~ ROCKING BARS AND DROP PLATE.

20 **Ash Pan,** Dampers ~~Front of each section~~ BACK ONLY

Throttle Balance Pos. Dome

Dry pipe Wrought iron

6 **Superheater** Schmidt type

7 **Smokebox** extension With Cleaning hole and cap L.S. only

Spark ejector or hopper ~~None~~ WITH

Netting and deflect. plates ~~None~~ WITH

Front end arrangement to be self-cleaning type

Exhaust nozzles Single ~~two~~ HIGH.

~~Blowing Pipe, With~~

Stack Cast Iron, Straight Dia. 16" Hole in S. B., dia. 17½"

Stack to have separate base.

Safety Valves (NOT SPEC) Two Consolidated 3". {One Muffled / 180 pounds Muffled / 183 pounds Open

Safety valves None with relief lever, Set to

Whistle Chime

Steam Gauge One Iron 7" MAKER:- Ashcroft (Spec)

Steam gauge stand Iron **Clock** None

8 **Water Gauge** One (See sup. 8) **Cab Lamps** to burn oil

Gauge Cocks Three Back Surface valve None

Lowest gauge cock 3¼" above highest part of crown

Lubricator steam valve to have ... dry pipe to dome

Blower Valve B. L. W.

9 **Blow off Cock** Four Everlasting 1½" Pos:- (see sup. 9)

Cleaning Plugs One plug above fire door

Firebox Corners diagonal

10 Crown, Two each side and two back

Waist Two under:- One in first and one in second courses

Foundation ring One Fusible plug One

Pump None Pos. ----

Top chamb. ---- Bottom chamb. ----

Feed Cock ---- Feed pipes ----

Check ---- Check pipes ----

Injectors (Spec) Two Hancock type "A" No. 9

Injector Pos. Right and left Steam pipes Copper

Pipes, Tank Iron Feed Iron Overflow Iron

Check Sellers Duplex Pos. Top of Boiler

Steam Heat None

11 **Cab** Steel, lined with wood. Ventilator in cab roof

Cab boards Steel Nosing T - Iron

Running boards Steel Nosing T - Iron

12 Hand rail Brass Located on Boiler

Back Bumper Bar Steel Back drawbar height 34¼"

Pilot None Pushing shoes Cast in bumper

Front Bumper Cast Steel Bumper plate None

Steps across front, divided, with hand rail

Steps, handhold etc. to conform to I. C. C. requirements.

Front Drawhead, Center above rail 33½"

Coupler Sharon M. C. B. steel, swing type, from National Malleable Castings Co., with extended floor coupler pockets.

Signal fixtures None

Headlight Two Round Case 16" Reflector, To burn Kerosene

Headlight, Nos. on sides With H'd'l't step With

Lamp shelf None Nosing ----

Bell 92 pounds Gollmar air bell ringer

Sand Box (NOT SPEC) Two Diam. 28" Body ~~Iron~~ SAME PLAN, IRON UNPAINTED. Iron

Sander Leach air trap "A-1" in each box to send front and back.

Dome casing #16 Planished Iron, unpainted

Boiler Jacket #22 Plan. Steel Bands Iron Style 9 and 14

Boiler Lagging Magnesia Sectional

Back head of boiler to be lagged down to staybolts.

11-266-67. Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS

J. A. Pfeiffer — May 1917

SPECIFICATION FOR LOCOMOTIVES 6 34 D 958

FOR Jacksonville Terminal Company

Frames Cast Steel Braces Solid

13 **Cylinders,** Diam. 20" Stroke 26"

St'm ports, Length 27.7" Width 1½" Bridges 3⅞"

Exh. ports, Length ---- Width ---- Valve lead ⅛"

Valve travel 5½" Steam lap ⅞" Exhaust clearance ----

Eccentric crank throw 21" By-pass valve ----

S. F. Lubr. (Spec) Detroit Five Feed #42, Bulls Eye.

14 Cyl'r heads Cast Iron; Lubr. pipes of iron under jacket.

Cyl'r casings (see sup. 14) Head covers Steel painted

St'm chest casings ---- Covers ----

15 St'm chest valves 12" diam., Piston type

Met. pkg {PISTON RODS / VALVE STEMS} U. S. Multi-angular type (NOT SPEC)

16 **Pistons** Cast iron rings sprung into solid head

Guides Steel Oil cups Needle

Crossheads Alligator type, Cast Steel, with bronze gibs,

Wrist Pins Steel 17 Rod cups Plunger, forged on.

18 **Valve Motion** Southern, Royalty payable by The B.L.W.

Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.

All finished movable nuts of steel or of iron case hardened.

Wearing Bearings Damascus Bronze

Driving wheels without hub liners

Drivers, O. S. Diam. 50" Cen. diam. 44", Centres Cast Iron

Tires Steel Held by Shrinkage and Shoulder

Tires, Flanged, Pos. All Size 3" x 5½"

Tires, Plain, Pos. None Size ----

Lateral play between driving boxes and wheel hubs = 1/16" total

Driving Boxes Steeled Cast Iron

Journals, Diam. 8½" Length 9"

19 **Springs.** Make B. L. W.

Front Engine Truck None Wheeled -----

To swing ---- each side of cen., Cen. pin liners ----

Journals, Diam. --- Length --- Boxes ----

Wheels, Diam. ---- Tread --- Kind ----

Tires ---- Cen. diam. --- Size ----

Tires held by ----

Back Engine Truck None Wheeled ----

To swing --- each side of cen., Cen. pin liners ---

Journals, Diam. --- Length ---- Boxes ----

Wheels, Diam. --- Tread --- Kind ----

Tires ---- Cen. diam. --- Size ---

Tires held by -----

20 **Brake,** position On all driving and tender wheels

Operating Parts: Engine, Sch. No. 6-ET West'g. Combined Auto, and Straight Air; Eng. Tr'k, sch. ----

Foundation Parts: Drivers, sch. WM-2 American O. S. Equalized; Eng. Tr'k, sch. ----

Air pump ONE 8½" Cross Compound Pos. Left side

Train connections Front and Back

Train signal, sch. None

CERTIFICATES DATED APRIL 28TH 1917 COVERING TEST OF RESERVOIR NOS. 9610 11128-11129 INC. FURNISHED BY WEST'G. AIR BRAKE CO., ARE FILED IN MAIN OFFICE, FILE NO. 11459

Tender Eight Wheeled, Drawing No. 435

Weight, with fuel and water, about 70,000 pounds

Tank {~~Oil 1600~~ / Water 3500 Gallons, Bill ~~4504~~ 4424

Tank "U" shape, sloping back Fuel capacity 6 tons

Tool Boxes of hard wood, Top

Frame Steel 10" channels

Frame center bearings of cast steel

Front Drawbar height 33½"

Pilot None Pushing shoes at rear

Back drawhead, center above rail 33½" Drawhead secured by 1½" bolts.

Coupler Sharon M. C. B. Steel, swing type, from National Malleable Castings Co. with extended floor coupler pockets.

Steps, handholds, etc. to conform to I. C. C. Requirements.

Steps across rear, divided, with hand rails

Steps and hand rails on both sides of sloping back of tank.

Trucks Arch bar type with steel bolsters

Truck center bearings of cast steel

19 Springs Elliptic. B. L. W.

Journals, Diam. 4½" Length 8"

Wheels. Diam. 33" Tread 4½" Kind Chilled Cast Iron Plate

Tires None Cen. diam. ---- Size ----

Tires held by ----

Safety chains Single

Brake Position On all wheels

Brake sch. No. 6-ET West'g Auto and Straight Air with 10" x 12" tender cylinder.

List of tools, sch. ~~31~~ 29

Photo sch. ~~8~~ None Inspection by Alfred Lovell

To be weighed Yes Material spec'ns B. L. W.

Certificate of boiler test Three copies of B. L. W. form 1036

Junior laws to 5.2.17 Shipment On own wheels (See sup. 29)

Brass shop finish, No. 1

Machine shop finish D-160, Except main rod to be painted in Channel and finished on edges, and Injector check pipes to be painted. hand rail brass, AND DOME, SAND BOX AND CYLINDER CASING OF PLANISHED IRON, UNPAINTED.

B. L. W. Patents } Feed pipe strainer, patented Sept. 1, 1903 (Cast On)

Property plates None

26 **Painting:**—Engine, style 336, Olive Green and Gold

28 Painting:—Tender, style 336, Olive Green and Gold

27 Mark on tank sides, JACKSONVILLE TERMINAL CO.

28 Road Nos. Pos. Road Nos. Name None

F. No. Plate 6

Dome

Cab Sides

Side of Collar of Tank

Back of Tank

SPECIFICATION FOR CLASS 6 34 D 958

For Jacksonville Terminal Company

Specification for Type A Double Loop Superheater. Specification O-6922, dated Jan. 29, 1917.

BOILER TUBES	143 in number 2 o. d 10 ft 6 in. over tube sheets. Tubes located between and adjacent to boiler flues are to be beaded over at front end.
BOILER FLUES	21 in number 5½ o. d #9 B.W.G. of cold drawn seamless steel. Flues to be straight, true to gauge and wall not to vary more than one gauge from specified thickness. Card 1912-W
BOILER FLUE SETTING	½ in. radius on both edges of flue holes in fire box tube sheet and on front edge of flue holes in front tube sheet as shown on drawings, except for copper sheets. Back end to be set with copper ferrule, rolled, beaded and prossed except for copper sheets. Front end to be rolled and beaded. Rollers to have at least 5 rolls. Prosser to have at least 12 sections. Card 1137
TUBE SHEET LAYOUT	Card 5221
UNITS	21 units 1½ o. d #9 B.W.G. of seamless steel. Pipes united by return bends. Each unit to be tested, before being placed in boiler, with water under pressure of 250 lb. per sq. in. for screwed return bends or 500 lb. per sq. in. for welded return bends.
UNIT PIPE SUPPORTS	Of steel fastened securely on superheater pipes so as not to slide. Card 10773
UNIT PIPE JOINT	To be made in best possible manner to insure absolutely tight joints in accordance with the notation on. Card 1052
UNIT CLAMP BOLT	To be in accordance with requirements of Locomotive Superheater Company Material Specification No 12. Card 1064-E
HEADER	To be of close grain cylinder iron, steam tight in every respect. Joint ring for connection to dry pipe to have flat side against header flange. Casting should be moulded with the unit joint face down to secure the best quality of metal on surface where superheater unit joints are made. Each header to have a serial number cast on in such a location as not to be removed in finishing. No patch plugs or chaplets allowed in ball joint seats. Headers must not be treated with sal ammoniac. Header casting to be tight under water pressure of 250 lb. Test pressure to be applied separately to the saturated and to the superheated steam passages, so as to insure soundness of all partition walls. Card 10266-A
HEADER SUPPORTS	To be securely fastened to boiler shell with rivets or turned bolts fitted in reamed holes. To be properly located so as to support the header after header has been correctly located. Header should then be secured to supports. This to be done before superheater units are put in place. Card 1323
STEAM PIPE JOINT RINGS	Should be of cast iron.
DEFLECTING PLATE	To be constructed so as to permit easy inspection and removal of superheater units and joints. Design to be in accordance with. Card 10022
DAMPER CYLINDER	To be carefully and accurately made. Piston not to be more than 0.01 in. smaller than bore. Bearings for piston and extension to be in line. Piston to be ground and to operate freely under a pressure as low as 40 lb. per sq. in. Steam pipe to damper cylinder should be as short and free from bends as possible so as not to cause water to collect in cylinder. Pipe to be well protected against freezing. Card 1149
DAMPER SHAFT COUNTERWEIGHT	To be painted a light color to render it easily visible by the engineer. Card 1067
S. H. ARRANGEMENT	To be in accordance with. Card 4123-C
TEST (FINAL	The superheater, after assembling in boiler and after steam pipes are fitted up, is to be thoroughly tested and to be tight under water pressure of at least 30% more than the working pressure of the boiler.

DAMPER	Card 1956-F	DAMPER SHAFT LINK	Card 1070
DAMPER CYL. ARM	Card 1074	PATENT PLATE	Card 3157
DAMPER CYL. PIPE FITTING	Card	S. H. UNIT BOLT WASHER	Card 1071
DAMPER CYL. PIPE UNION	Card 1287	S. H. UNIT CLAMP	Card 1073
DAMPER CYL. PIPING DIAGRAM	Card 1503	S. H. UNIT CLAMP WASHER	Card 10305
DAMPER CYL. SUPPORT	Card	S. H. PIPE END	Card 1244
DAMPER SHAFT	Card 1235-H	S. H. PIPE BAND	Card 1988
DAMPER SHAFT ARM	Card 1226 & 1234	RETURN BENDS	Card 10299
DAMPER SHAFT BEARING (O.S.)	Card 1148 & 1223	DEFLECTING PLATE HANDLE	Card 1087
DAMPER SHAFT BEARING (I.S.)	Card 1275-J	LUBRICATOR CONNECTION	Card 3023
SPACING OF BANDS & SUPPORTS	Card 10792	DEFLECTING PLATE STUDS	Card 10809
TYPE OF RETURN BENDS	Cast Steel	DEFLECTING PLATE CLAMP	Card 10809-A

11-266-67 Photo copied see box

SPECIFICATION FOR LOCOMOTIVES 6 34 D 958

FOR Jacksonville Terminal Company

205

1 Dome of O. H. Steel, pressed in one piece.

2 Fire box seams to be electric welded.

3 Crown Stay heads to be thin account oil fuel
Staybolt behind all brick walls to be ~~drilled through with 3/10" holes.~~ Hollow NR. 5187

4 All tubes to be electric welded in fire box end.

5 Oil burning equipment, including removable tank and appliances to be ~~applied~~ furnished so Co. can convert loco. to oil burner, ~~but do not provide the coal burning appliances.~~ (SEE SUP. 29)
Royalty if any on Oil burning work to be paid by B. L. W.

6 Superheater as Loco. Superheater Co's Spec'n No. O-6922, dated Jan. 29, 1917 (Copy attached)
Superheater to connect with top header in smoke box, and to have outside steam pipe connections to valve chambers.
Royalty on Superheater payable by The B. L. W.

7 Hand hole and cap in each side of smoke box for inspection of Superheater.

8 Water Gauge to be Ironclad from Sargent Co., 8" x 12"

9 Blow off cocks, Position,- One in front, one in back and one on each side of firebox. (SEE SUP. 33)

10 Cleaning holes to have 1½" pipe thread.
Holes to be located same as for 6 32 D 1057.
Two plugs each side in waist above centre.

11 Cab to be equipped with storm curtains.

12 Hand rail on boiler and on front of smokebox to be of brass, with brass knobs, located as shown on Photo 5539.

13 Flanges on pedestal shoes and wedges to be made ⅞" thick, and lap about 1¼"; thickness of wedge at top to be ¾", more flange to be given to bosses to lap over jaws, Ry. Co's standard.
Corners of all pedestal jaws to be chamfered, and shoes and wedges to have fillet to correspond.

14 Cylinder Casings to be # 16 Planished Iron, unpainted

15 Valve stems to be 1¼" diam.

16 Piston rods to be bolted to crossheads.

17 Main rods to be connected to back pair of drivers, as shown on Photo. 5539. Parallel rods to have solid ends.

18 Ragonnet air reverse gear as covered by extra order No. 2938 dated 3-22-17.

19 Springs and spring rigging to be extra heavy.

20 Air pump exhaust to be piped into cylinder saddle.

21 Air reservoirs to have capacity of 32000 cubic inches and to be placed under raised running boards, on each side of engine.
Air reservoirs to have hydrostatic test of 210 pounds.

22 Brake shoe heads on all driving wheels to be interchangeable, from the American Brake Shoe and Foundry Company.

26 Dome and sand boxes to have brass bands instead of bands in gold leaf.

Engine and tender to be well painted.

27 Mark on tank to be in Gold leaf, same style as shown on Co's pencil sketch (herewith) located same as on loco. No. 5, B. L. W. class 6 32 D 1057.

28 Road number to be in brass, of shape to correspond with lettering and to be placed on Dome, Cab sides, side collar of tank, and on plate underneath rear headlight.

29 ~~One set of coal burning grates including frames, bars and grate rigging (bars to be same style as for 6-32-D 1057) to be ordered through the Extra Work Dept., Order Number 1946, and to be shipped with locomotive. Charge~~ 5/16/17.
LOCOMOTIVE TO BE BUILT AS A COAL BURNER USING THE FRAMES, GRATES AND RIGGING COVERED IN ABOVE ORDER. THE OIL BURNING DETAIL PARTS PREVIOUSLY ORDERED FOR THIS LOCOMOTIVE ARE TO BE FURNISHED EXTRA ON ORDER 1946 DATED 5-16-17 AND ARE TO BE SHIPPED WITH THE LOCOMOTIVE.

30 ~~Ash pan dampers to be suitably located to blow backwards to both pans.~~
~~Blowers to come from front and left side. Blow off cocks front pan to be provided with shield to keep cinders from driving boxes.~~ 6.16.17

31 SOUTHERN LOCOMOTIVE VALVE GEAR LICENSE PLATES HEREWITH TO BE APPLIED TO THE REAR END OF THE LINK SUPPORT ON EACH SIDE OF LOCOMOTIVE.

32 Ash pan to be made with tight bottom of continuous sheet with arrangement for blowing out ashes through door in rear of pan by means of water, tapped from leg, arrange suitable valve connection in front end of box. 6.16.17

33 Blow-off cocks to discharge underneath ash pan. 6.16.17

THE BALDWIN LOCOMOTIVE WORKS — As Spec'n 6-2319 Minor details as far as practicable to be same as for 6 32 D 1058

Memorandum Spec'n 10012

SPECIFICATION FOR LOCOMOTIVES 6 34 D 943

Gen. as Mem. 6767 — Except with Southern Valve Motion.

FOR Norfolk & Portsmouth Belt Line R. R. Co. — **Engine Drawing No.** 77

12-16-15

Gauge of Road 4' 8½" Play ⅝"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"
Total wheelbase, eng. and tend. { Actual 42' 1⅝" / Limited to ----

Curves ----

Limits, Height ----- Width ----
Weight (approximate) in working order, Total 130,000 lbs.
On F. tr'k ---- lbs., Drivers 130,000 lbs., B. tr'k ----- lbs.

Tractive power 32,500 lbs., Ratio of adhesion 4
Work'g St'm Pres. 200 lbs., Service Switching
Fuel Soft Coal

Boiler Steel Thick 1 1/16" Bill 7631
Boiler, Diam. 64" Plan Straight Top
Boiler st'm pres. 200 lbs., Tested to { 220 lbs. steam pres. / 267 lbs. water pres.
Longitud. seams Butt jointed, double covering strips.

Dome, diam. 29" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 102-9/16" Width 40" Depth F. 65⅝" B. 62⅝"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diam.
Water space, Front 4" Sides 4" Back 3½"
Water space, Frame Double Riveted
Water space stays ⅞" diam. with 3/16" hole 1½" deep from O. S.

Radial stays 1" diam. Sling stays front { Two Rows of B.L.W. Expansion Stays.
Button heads below crown on Six central rows
Crown bars None Placed ---- above crown
Crown bolts ----

{ Flues None
Tubes #12 W. G. Charcoal Iron
Tube ends Swaged for copper ferrules, fire box ends.
Number 280 Diam. 2" Length 11' 0"

{ Heating Surface | Flues None Combus. Chamb. None Total 1762.4 sq
Tubes 1600 sq Fire Box 145 sq Fire Brick Tubes 14.4 sq
Grate area 28.5 sq Ratio to Heating Surface 1 : 62
Superheater ----

Fire Brick Arch, On Two Tubes of seamless steel 3" O.S.Diam.

Grates Rocking bars and drop plate
Ash Pan, Dampers Front and Back

Throttle Balance Pos. Dome
Dry pipe Wrot Iron

Superheater None

Smokebox extension With Cleaning hole and cap L. S. only
Spark-ejector or hopper With
Netting and deflect. plates With

Exhaust nozzles Double high

Stack Cast Iron, Straight Dia. 18" Hole in S. B., dia. 31½"

(Spec) **Safety Valves** Two Crosby 3"
Safety valves None with relief lever, Set to 200 pounds
Whistle B. L. W.

Steam Gauge One Iron 7" MAKER:- Ashcroft (Not Spec)
Steam gauge stand Iron **Clock** None

Water Gauge One B.L.W. (Pronclad) **Cab Lamps** to burn oil
Gauge Cocks Three - Back Surface valve None
Lowest gauge cock 2½" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One B. L. W. POS:- Front
Cleaning Plugs
Firebox Corners diagonal and back
Crown, Two each side and two back.
Waist, One under front
Front tube sheet, One Fusible plug One

Pump None Pos ----
Top chamb---- Bottom chamb ----
Feed Cock ---- Feed pipes----
Checks ---- Check pipes----

Injector overflow pipes to run into ash pan
(Spec) **Injectors** Two Sellers "1887", Type "N" No. 9½
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check Sellers double. Pos. Top of boiler

Steam Heat None

Cab Steel

Running boards to be covered with wood in cab. KP 1-21-16
Cab boards Steel Nosing T-Iron
Running boards Steel Nosing T-Iron
Hand rail Iron Located on Boiler

Back Bumper Bar Steel Back drawbar height 30½"

Front bumper to have 1" iron plate on front and back
Pilot None Pushing shoes at front
Front Bumper Oak Bumper plate None
Steps across front with hand rail.
Steps, hand holds, etc. to conform to I. C. C. requirements.
Front Drawhead, Center above rail 34½" (light)
Coupler Sharon M. C. B. Auto.

Signal fixtures None

Headlight Two Round Case 18" Reflector, To burn Kerosene
Headlight, Nos. on sides With H'd'l't step With
Lamp shelf None Nosing ----

Bell 92 pounds Gollmar Air Bell Ringer
Sand Box (Not Spec) Two Diam. 28" Body Iron Ptd. Pipes Iron
Sander Leach Air, Trap A-1 in each box, to sand front and rear

Dome casing Iron Painted

Boiler Jacket #22 Plan.Steel Bands Iron Style 9 and 14
Boiler Lagging Magnesia Sectional
Back head of boiler to be lagged and jacketed.

11-266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS

M. K. Wright — Manigle

SPECIFICATION FOR LOCOMOTIVES 6 34 D 943

FOR Norfolk & Portsmouth Belt Line R. R. Co.

207

Frames Cast Steel Braces Solid

Cylinders, Diam. 20" Stroke 24"
Sl'm ports, Length 16" Width 1½" Bridges 1"
Exh. ports, Length 16" Width 2½" Valve lead ⅛"
Valve travel 5½" Steam lap ⅞" Exhaust clearance ----
Eccentric crank throw 20"
S. F. Lubr. (Not Spec) Detroit Triple #22 Bulls Eye
Cyl'r heads Cast Iron; Lubr. pipes of copper under jacket
Cyl'r casings Iron Ptd. Head covers Steel Painted
St'm chest casings Iron Ptd. Covers Steel Painted
St'm chest valves Richardson Balanced, with vacuum valves
Met. pkg { PISTON RODS / VALVE STEMS U. S. (Not Spec)
Piston rods to be keyed to crosshead.
Pistons Cast Iron rings sprung into solid head.
Guides Laird Type, Steel Oil cups Needle
Crossheads Cast Steel, Bearings of cast iron.
Wrist Pins Steel Rod cups Plunger
Parallel Rods to have solid ends.

Valve Motion Southern, Royalty payable by B.L.W.
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 50" Cen. diam. 44"
Wheel Centers, Main Cast Steel, Others Cast Iron
Tires Steel Held by Shrinkage and Shoulder
Tires, Flanged, Pos. Front and Rear Size 3" x 5½"
Tires, Plain, Pos. Middle. Size 3" x 6½"
Lateral play between driving boxes and wheel hubs = 1/16" total
Driving Boxes Steeled Cast Iron
Journals, Diam. 9" Length 10"

Springs. Make B. L. W.

Front Engine Truck None Wheeled ----
To swing ---- each side of cen., Cen. pin liners ----
Journals, Diam. ---- Length --- Boxes ----
Wheels, Diam. ---- Tread ---- Kind ----
Tires ---- Cen. diam. ---- Size ----
Tires held by ----

Back Engine Truck None Wheeled ----
To swing ---- each side of cen., Cen. pin liners ----
Journals, Diam. ---- Length --- Boxes ----
Wheels, Diam. --- Tread --- Kind ----
Tires ---- Cen. diam. ---- Size ----
Tires held by ----

Brake, position On all driving and tender wheels.
Operating Parts { Engine, Sch. #6-ET West'g Combined Auto. and Straight Air / Eng. Tr'k, sch. ----- }
Foundation Parts { Drivers, sch. WM-2 American O. S. Equalized / Eng. Tr'k, sch. ---- }
Air pump Two - 9½" Pos. Both Left side
Train connections Front and Back
Train signal, sch. None
Air Drums to be West'g Enameled.

Tender Eight Wheeled, Drawing No. 918
Weight, with fuel and water, about 90,000 lbs.

Tank 4500 Gallons. Bill 3760
Tank "U" Shape, Sloping back. Fuel Cap. 6 tons

Tool Boxes Hard wood top

Frame Steel 8" and 10" Channels.

Front Drawbar height 31½"
Pilot None Pushing shoes at rear
Back drawhead, center above rail 34½" (Light)
Coupler Sharon M. C. B. Auto.

Steps, hand holds, etc. to conform to I.C.C. requirements.
Steps across rear with hand rail.
Steps and hand rails on sloping back of tank
Trucks Arch Bar Type with Cast Steel Bolster

Springs Elliptic. B. L. W. make
Journals, Diam. 5" Length 9"
Wheels, Diam. 30" Tread 4½" Kind Chilled Cast Iron Plate
Tires None Cen. diam.---- Size ----
Tires held by ----
Safety chains Single

Brake Position On all wheels.
Brake sch. #6-ET West'g Auto. and Straight Air with 12" x 12" cylinder

List of tools, sch. 29
Photo sch. None Inspection (See sup /)
To be weighed Yes Material specs (See sup./-2)
Certificate of boiler test Three Copies of B.L.W. form 1036
Junior laws to 2-1-16 Shipment On own wheels.

Brass shop finish, No. 1
Machine shop finish D-106

B. L. W. Patents { Throttle, Patented Jan. 23, 1900 (Cast on) / Feed Pipe Strainer, Patented Sept. 1, 1903 (Cast on)

Property plates None

Painting P. R. R. style, same as for 6 32 D 929 and 1058
Painting: Engine, style 248, Dark Green and Gold
Painting: Tender, style 248, Dark Green and Gold

Mark on tank in spencerian letters, same as for 6 32 D 1058
Mark on tank sides N. & P. BELT LINE

Road Nos. Pos.	Road Nos.	Name None
F. No. Plate	11	
F. Sand Box		
Cab Panel		
Back of tank		

pp. 266-67 Mat copied see box

THE BALDWIN LOCOMOTIVE WORKS — As SPECIFICATION C-4265 EXACT DUPLICATE OF 6-34 D 949 EXCEPT WHERE OTHERWISE SPEC'D.

Memorandum Spec'n 11183

SPECIFICATION FOR LOCOMOTIVES 6 34 D 949 — **Ry. Co's Class**

Gen. as PHOTO. 4767 (EXCEPT WITH STEPHENSON VALVE MOTION.)

FOR NORFOLK & PORTSMOUTH BELT LINE R. R. Co. — **Engine Drawing No.** 80

F. 10-24-16.

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11'0"
Total wheelbase, eng. and tend. (Actual 42' 1½" / Limited to -----)

Curves -----

Limits, Height ----- Width -----
Weight (approximate) in working order. Total 135,000 LBS.
On F. tr'k ----- lbs., Drivers 135,000 lbs., B. tr'k ----- lbs.

Tractive power 32,500 lbs., Ratio of adhesion 4.1
Work'g St'm Pres. 200 lbs., Service SWITCHING
Fuel SOFT COAL

FRONT TUBE SHEET TO BE ½" THICK
Boiler STEEL Thick 11/16" Bill 7955
Boiler, Diam. 64" Plan STRAIGHT TOP

Boiler st'm pres. 200 lbs., Tested to (220 lbs. steam pres. / 267 lbs. water pres.) WITH FACTOR OF SAFETY OF 4.9
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS.

Dome, diam. 29" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE
Firebox, length 102-9/16" Width 40" Depth F. 65⅞" B. 62⅞"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" DIAM.
Water space, Front 4" Sides 4" Back 3½"
Water space, Frame DOUBLE Riveted
Water space stays ⅜" DIAM. WITH 3/16" HOLE 1¼" DEEP FROM O.S.

Radial stays 1" DIAM. Sling stays front (TWO ROWS OF B.L.W. EXPANSION STAYS.)
Button heads below crown on SIX central rows
Crown bars NONE Placed ----- above crown
Crown bolts -----

Flues NONE
Tubes #12 W.G. CHARCOAL IRON
Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.
Number 280 Diam. 2" Length 11' 0"

Heating Surface	Flues -----	Combus. Chamb. -----	Total 1762.4
	Tubes 1600	Fire Box 148	Fire Brick Tubes 14.4
Grate area 28.5	Ratio to Heating Surface 1 : 62		
Superheater ----			

Fire Brick ARCH, ON TWO TUBES OF SEAMLESS STEEL 3" O.S.DIAM.

Grates ROCKING BARS AND DROP PLATE
Ash Pan, Dampers FRONT AND BACK

Throttle BALANCE Pos. DOME
Dry pipe STEEL

Superheater NONE

Smokebox extension WITH Cleaning hole and cap L. S. ONLY
Spark arrester hopper WITH
Netting and deflect. plates WITH

Exhaust nozzles DOUBLE HIGH

Stack CAST IRON, STRAIGHT Dia. 18" Hole in S. B. dia. 21½"

3 Safety Valves (spec) TWO CROSBY 3"
Safety valves NONE with relief lever, Set to 200 POUNDS
Whistle B. L. W. PLAIN

Steam Gauge ONE IRON 7" MAKER:- ASHCROFT (not spec)
Steam gauge stand IRON **Clock** NONE

Water Gauge ONE B.L.W. (IRONCLAD) **Cab Lamps** TO BURN OIL
Gauge Cocks THREE - BACK Surface valve NONE
Lowest gauge cock 3¼" above highest part of crown
Lubricator steam valve TO HAVE separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock ONE B. L. W. POS:- FRONT
Cleaning Plugs
Firebox CORNERS DIAGONAL AND BACK
Crown, TWO EACH SIDE AND TWO BACK
Waist, ONE UNDER FRONT
Front tube sheet, ONE Fusible plug ONE

Pump NONE Pos. ----
Top chamb. ---- Bottom chamb. ----
Feed Cock ---- Feed pipes ----
Checks ---- Check pipes ----

Injectors (spec) TWO SELLERS "1887", TYPE "N" No. 9½
Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER
Pipes, Check COPPER Feed IRON Overflow IRON
Check SELLERS DOUBLE Pos. TOP OF BOILER
INJECTOR OVERFLOW PIPES TO RUN INTO ASH PAN
Steam Heat NONE

Cab STEEL

Running boards to be covered with wood in cab MR 12-21-16.
Cab boards STEEL Nosing T-IRON
Running boards STEEL Nosing T-IRON
Hand rail IRON Located on BOILER

Back Bumper BAR STEEL Back drawbar height 30½"

FRONT BUMPER TO HAVE 1" IRON PLATE ON FRONT AND BACK
Pilot NONE Pushing shoes AT FRONT
Front Bumper OAK Bumper plate NONE
Steps ACROSS FRONT WITH HAND RAIL
STEPS, HAND HOLDS, ETC. TO CONFORM TO I. C. C. REQUIREMENTS.
Front Drawhead, Center above rail 34½" (LIGHT)
Coupler SHARON M. C. B. AUTOMATIC

Signal fixtures NONE

Headlight TWO ROUND CASE 18" Reflector, To burn KEROSENE
Headlight, Nos. on sides WITH H'd'l't step WITH
Lamp shelf NONE Nosing ----

Bell 92 POUNDS GOLLMAR AIR BELL RINGER
Sand Box TWO Diam. 28" Body IRON PAINTED Pipes IRON
Sander LEACH AIR, TRAP A-1 IN EACH BOX, TO SAND FRONT AND BACK (not spec)

Dome casing IRON PAINTED

Boiler Jacket #22 PLAN. STEEL Bands IRON Style 9 AND 14
Boiler Lagging MAGNESIA SECTIONAL
BACK HEAD OF BOILER TO BE LAGGED AND JACKETED.

THE BALDWIN LOCOMOTIVE WORKS — Jan 1917

SPECIFICATION FOR LOCOMOTIVES 6 34 D 949 — 210

FOR NORFOLK & PORTSMOUTH BELT LINE R. R. Co.

Frames CAST STEEL Braces SOLID

Cylinders, Diam. 20" Stroke 24"
Stm ports, Length 16" Width 11" Bridges 1"
Exh. ports, Length 16" Width 2½" Valve feed LINE AND LINE IN FULL GEAR.
Valve travel 5¼" Steam lap ¾" Exhaust clearance -----
Eccentric-sheave throw ¾ By-pass valve -----
S. P. Lubr. DETROIT TRIPLE #22 BULLS EYE
Cyl'r heads CAST IRON; LUBR. PIPES OF COPPER UNDER JACKET
Cyl'r casings IRON ETC. Head covers STEEL PAINTED
St'm chest castings IRON ETC. Covers STEEL PAINTED
St'm chest valves RICHARDSON BALANCED, WITH VACUUM VALVES
Met. pkg (water space, steam, valve) UNITED STATES (not spec)
PISTON RODS TO BE KEYED TO CROSSHEAD
Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD
Guides LAING TYPE, STEEL Oil cups NEEDLE
Crossheads CAST STEEL, BEARINGS OF CAST IRON
Wrist Pins STEEL Rod cups PLUNGER
PARALLEL RODS TO HAVE SOLID ENDS.

4 Valve Motion STEPHENSON
Links sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except stayboits) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.
MAIN WHEELS ONLY TO HAVE HUB LINERS OF BRASS
Drivers, O. S. Diam. 50" Cen. diam. 44"
WHEEL CENTERS, MAIN CAST STEEL, OTHERS CAST IRON
Tires STEEL Held by SHRINKAGE AND SHOULDER
Tires, Flanged, Pos. FRONT AND BACK Size 3" x 5⅞"
Tires, Plain, Pos. MIDDLE Size 3" x 6½"
Lateral play between driving boxes and wheel hubs = 1/16" TOTAL
Driving Boxes STEELED CAST IRON
Journals, Diam. 9" Length 10"

Springs Make B. L. W.

Front Engine Truck NONE Wheeled -----
To swing ----- each side of cen., Cen. pin liners -----
Journals, Diam. ----- Length ----- Boxes -----
Wheels, Diam. ----- Tread ----- Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----

Back Engine Truck NONE Wheeled -----
To swing ----- each side of cen., Cen. pin liners -----
Journals, Diam. ----- Length ----- Boxes -----
Wheels, Diam. ----- Tread ----- Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----

Brake, position ON ALL DRIVING AND TENDER WHEELS
Operating: Engine, Sch. #6 ET WEST'G. COMBINED AUTO. AND STRAIGHT AIR
Parts: Eng. Tr'k, sch. -----
Foundation: Drivers, sch. WM-2 AMERICAN O.S. EQUALIZED
Parts: Eng. Tr'k, sch. -----
Air pump Two - 9½" Pos. BOTH ON LEFT SIDE
Train connections FRONT AND BACK
Train signal, sch. NONE
AIR DRAWN TO BE WEST'G. ENGRAVED

Tender EIGHT WHEELED, Drawing No. 918
Weight, with fuel and water, about 90,000 POUNDS

Tank 4500 Gallons, Bill 4361
TANK "U" SHAPE, SLOPING BACK. FUEL CAPACITY 6 TONS

Tool Boxes HARD WOOD, TOP

Frame STEEL 8" AND 10" CHANNELS

Front Drawbar height 31½"
Pilot NONE Pushing shoes AT REAR
Back drawhead, center above rail 31½" (LIGHT)
Coupler SHARON M. C. B. AUTO.

STEPS, HAND HOLDS, ETC. TO CONFORM TO I. C. C. REQUIREMENTS
Steps ACROSS REAR WITH HAND RAIL
STEPS AND HAND RAILS ON SLOPING BACK OF TANK
Trucks ARCH BAR TYPE WITH CAST STEEL BOLSTER

Springs ELLIPTIC. B.L.W. MAKE
Journals, Diam. 5" Length 9"
Wheels, Diam. 30" Tread 4½" Kind CHILLED CAST IRON PLATE
Tires NONE Cen. diam. ----- Size ----
Tires held by -----
Safety chains SINGLE
BRAKE SHAFT STEP TO BE APPLIED ON WATER LEG OF TANK.
Brake Position ON ALL WHEELS
Brake sch. #6 ET WEST'G. AUTO. AND STRAIGHT AIR WITH 12" x 12" CYLINDERS.

List of tools, sch. 29
Photo sch. NONE Inspection (SEE SUP. /)
To be weighed YES Material spec'ns (SEE SUP. /)
Certificate of boiler test THREE COPIES OF B.L.W. FORM 1036.
Junior laws to 11.25.16 Shipment ON OWN WHEELS, UNDER STEAM.

Brass shop finish, No. 1
Machine shop finish D-106

Patents B. L. W. THROTTLE, PATENTED JAN. 23, 1900 (CAST ON)
FEED PIPE STRAINER, PATENTED SEPT. 1, 1903 (CAST ON)

Property plates NONE

PAINTING - P.R.R. STYLE, SAME AS FOR 6 - 34 D 943
Painting - Engine, style 248, DARK GREEN AND GOLD
Painting - Tender, style 248, DARK GREEN AND GOLD
LETTERING, ETC. TO BE SAME AS FOR 6 - 34 D 943
NAME ON TANK IN SPENCERIAN LETTERS,
Mark on TANK SIDES, N. & P. BELT LINE

Road Nos. Pos. Road Nos. Name NONE
F. No. PLATE 12
F. SAND BOX
CAB PANEL
BACK OF TANK

pp. 266-67 Phil. copies see box

SPECIFICATION FOR LOCOMOTIVES 6 3½ D 949

FOR NORFOLK & PORTSMOUTH BELT LINE R. R. Co.

1 BOILER AND FIRE BOX STEEL TO CONFORM TO P.R.R. CO'S SPECIFICATION I-C. OTHERWISE MATERIALS TO CONFORM TO A.L.W. SPECIFICATIONS.
BOILER AND FIRE BOX STEEL TO BE TESTED BY W. R. GARDEN, RESIDENT INSPECTOR, THE P. R. R. CO., 1615 FILBERT ST., PHILADELPHIA, PA., BUT IN ADDITION TO THIS IT IS DESIRED THAT THE BOILER MATERIAL SHALL BE SAMPLED BY THE P. R. R. CO'S INSPECTOR AND THE MATERIAL PROPERLY STAMPED SO THAT THE SAMPLES AND SHEETS CAN BE PROPERLY IDENTIFIED AND RECORDED WHEN PUT IN THE BOILER IN ORDER THAT THE DEFINITE TESTS OF THE MATERIAL CAN BE DETERMINED IN CASE OF AN EXPLOSION AND FIGURES BEING REQUIRED IN COURT.
COPIES IN DUPLICATE OF ORDERS FOR MATERIALS TO BE SENT TO C. D. YOUNG, ENGINEER OF TESTS, THE PENNSYLVANIA R. R. CO. ALTOONA PA.
LOCOMOTIVE TO BE INSPECTED DURING CONSTRUCTION BY MR. J. E. BRUNNELL, P. R. R. INSPECTOR.

2 SMOKE BOX:- NO OPENING HAVING AN AREA GREATER THAN ONE SQUARE INCH TO BE ALLOWED IN THE SMOKE BOX.
NETTING TO BE DOUBLE CRIMPED 2½ x 2½ PER SQUARE INCH, OF .135" WIRE, AND TO BE FASTENED SECURELY TO SUITABLE FRAMES.

3 SAFETY VALVES SHALL BE SUCH AS WILL DISCHARGE ALL OF THE STEAM THAT MAY BE GENERATED WITH THE BLOWER OR WITHOUT RAISING THE BOILER PRESSURE MORE THAN 5% ABOVE THE WORKING PRESSURE.

4 RAGONNET POWER REVERSE GEAR, COVERED BY EXTRA ORDER No. 11470 DATED 12-4-6

THE BALDWIN LOCOMOTIVE WORKS AS RAILWAY CO'S SPECIFICATION

Memorandum Spec'n 10236 — As many parts as possible to be interchangeable with 6 32 D 949 and 973.

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1060 & 1061 — Gen. as Neg. 4311

FOR Public Belt Railroad Commission. — **Engine Drawing No.** 96

J. (New Orleans) 5-18-14

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"
Total wheelbase, eng. and tend. (Actual 41' 0½" (Limited to -----

Curves -----

Limits, Height 14' 3" Width -----
Weight approximate in working order. Total 130,000 lbs.
On F. tr'k ----- lbs. Drivers 130,000 lbs. B. tr'k ----- lbs.
Weight not to be less than amount specified.
Tractive power 26,500 lbs. Ratio of adhesion 4.9
Work'g St'm Pres. 180 lbs. Service Switching
Fuel Soft Coal

Boiler Steel Thick 11/16" Bill 7255
Boiler Diam. 64" Plan Straight
Boiler steel 180 lbs. Tested to (200 lbs. steam pres. (240 lbs. water pres.
Longitudinal seams Butt jointed, double covering strips.

5 **Dome,** diam. 29" Plate Central

6 **Firebox** Steel Combustion chamb. None
Firebox, length 96 3/16" Width 41" Depth F. 66" B 63½"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back 5/16"
Firedoor opening 16" diam.
Water space, Front 4" Sides 3½" Back 3½"
Water space, Frame Single Riveted
Water space stays (see sup. 7)

Radial stays 1" diam. Sling stays front One ⊥ bar
Button heads below crown sheet Eight central rows
Crown bars None Placed ----- above crown
Crown bolts -----

Tubes 2" diam. of 12 W. G. Spellerized Steel.
5½" diam. of 9 B.W.G. Seamless Steel.
Tube ends Swaged for copper rings firebox ends.
Tubes, No. 143 Diam. 2" Length 10' 6"
21 5½"

Heating Surface, Tubes 2" 780 sq. ft. Firebox 146 sq. ft. Total 1241 sq. ft.
5½" 315
Grate area 27.4 sq. ft. Ratio to heat'g surface, 1 : 45.4
Superheater 252 sq. ft. Feed-water heater -----
Reheater ----- Fire brick tubes -----

Fire Brick arch None

Grates Rocking bars with drop plate at back.
10 **Ash Pan,** Depth 24" Dampers Front and Back

Throttle Balance Pos. Dome
Dry pipe Wrot Iron. Steam Pipes, outside connected type.

11 **Superheater** Schmidt double header type.

12 **Smokebox** extension With Cleaning hole and cap R. and L.
Spark ~~arrester~~ hopper With
Netting and deflect. plates With

Exhaust nozzles Double High

Stack Straight Diam. 18" Hole in S.B. 19½"
Stack to be Purchaser's standard type, with an ornamental top.

Safety Valves (not spec) Two Consolidated 3"
Safety valves None with relief lever, Set to 180 lbs.
Whistle B. L. W. with valve made of Tropenas Metal

Steam Gauge One Iron 7" Maker, Ashcroft (not spec)
Steam gauge stand Iron **Clock** None

Water Gauge One Klinger **Cab lamps** to burn oil
Gauge Cocks Three back Surface valve None
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome.
Blower Valve B. L. W.

Blow off Cock One B. L. W. Pos:- Front
13 **Cleaning Plugs**
Firebox Corners
Crown, Two each sides and two back
Waist, One under front.
Front tube sheet, One. Fusible Plug, One.

Pump None Pos. -----
Top chamb. ----- Bottom chamb. -----
Feed cock ----- Feed pipes -----
Checks ----- Check pipes -----

Injectors (not spec) Two Monitor
Injectors, Pos. R. and L. No. 9.
Pipes, Check Iron Feed Iron Steam pipes Copper
Check Nathan Overflow Iron
Pos. R. and L.

Steam Heat None

Cab Steel, lined with wood. Ventilator in roof.

Running board in cab to be covered with wood 1" thick (see sup. 4)
Cab boards Steel Nosing T-iron
Running boards Steel Nosing T-iron
Hand rail Iron Pipe Located on Boiler

14 **Back Bumper** Bar Steel Back drawbar height 34"

Pilot None Pushing shoes Front
Front Bumper O. H. Cast Steel Bumper plate None
Steps across front with handrail.

Front Drawhead, Center above rail 33½"
Coupler Tower M. C. B. Auto. with 13" knuckle.

Flag fixtures Iron on Bumper.

Headlight Two Round Case 16" Reflector, To burn Kerosene
Headlight, Nos. on sides With H'd'l't step With
Lamp shelf None Nosing -----

Bell 92 pounds.
Sand Box Two Diam. 28" Body Iron Ptd. Pipes Iron
Sander Hand

Dome casing Iron Painted

Boiler Jacket #22 Plan. Steel Bands Plan. Steel
Boiler Lagging Magnesia Sectional

11p. 266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS

Engine J. J. Fleming — Junelight

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1060 & 1061 — 213

FOR Public Belt Railroad Commission

J.

15 **Frames** Cast Steel Braces Solid

16 **Cylinders,** Diam. 19" Stroke 24"
St'm ports, Length 37.7" Width 1½" Bridges 3⅞"
Exh. ports, Length 37.7" Width ----- Valve lead 1/16"
Valve travel 5½" Eccentric crank throw 12"
S. F. Lubr. (not spec) Detroit Five Feed #42 Bulls Eye } Copper pipes under jacket
Cyl'r heads Cast Iron
Cyl'r casings ~~Nickel Iron~~ Plan. Steel Head covers Steel finished.
St'm chest casings ----- Covers -----
17/18 St'm chest valves Piston type, 12" diam. inside admission.
Met. pkg. (Piston rod, valve stems) UNITED STATES (not spec)

Pistons Cast iron rings sprung into solid head.
Guides Steel Oil cups Needle
Crossheads Alligator, cast steel, with brass gibs.
Wrist Pins Steel Rod cups Compression Grease
Parallel rods with solid ends.

Valve Motion Walschaerts
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 50" Cen. diam. 44"
Centers of cast iron, except main of cast steel.
Tires Herdest Steel Held by Shrinkage & Shoulder.
Tires, Flanged, Pos. ALL Size 3" x 5½"
Tires, Plain, Pos. ----- Size -----
Lateral play between driving boxes and wheel hubs – 1/16" total
Driving Boxes Cast Steel
Journals, Diam. 8" Length 9"

Driving spring staples Wrot Iron

21 **Springs.** Make B. L. W.

Front Engine Truck None Wheeled -----
To swing ----- each side of cen. Cen. pin liners -----
Journals, Diam. -----Length ----- Boxes -----
Wheels, Diam. ---- Tread ---- Kind -----
Tires ----- Cen. diam. ---- Size -----
Tires held by -----

Back Engine Truck None Wheeled -----
To swing ----- each side of cen. Cen. pin liners -----
Journals, Diam. ---- Length ----- Boxes -----
Wheels, Diam. ----- Tread ---- Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----

22 **Brake,** position On all Driving and Tender Wheels.
Operating Parts: Engine, Sch. 6-ET, West'g. Comb. Auto. & Straight Air.
Foundation Parts: Drivers, sch. WM-2, American O. S. Equalized.
Eng. tr'k, sch. -----
Air pump One 9½" Pos. Left Side
Train connections Front and Back
Train signal, sch. None

Tender Eight Wheeled, Drawing No. 435
Weight, with fuel and water, about 80,000 lbs.
Weight not to be less than amount specified.
Tank 4000 Gallons, Bill 3834
Tank "U" Shape, Sloping Back. Fuel Capacity 5 tons.
Apply Lindstrome syphon pipe tank valve, as Western Ry. Equipment
Tool Boxes One, of steel. Co's pt. sk. 14-1198.
Pushing Shoes, Cast in Back Bumper.
Frame Steel 10" channels.
Tender back bumper of O. H. Cast Steel.
Front drawbar height 34½"
Spring buffer between engine and tender with round chafing iron.
Back drawhead, center above rail 33½"
Coupler Tower M. C. B. Auto. with 13" knuckle.
Provide combination brackets for flags and lamps on rear of tender on each corner at the top.
Steps across rear with handrail on bumper, also steps on sloping back, to conform to I. C. C. requirements.
Trucks Arch Bar, Cast Steel Bolsters.

Springs Elliptic, B. L. W.
Journals, Diam. 4½" Length 8"
Wheels, Diam. 33" Tread 4½" Kind Chilled Cast Iron Plate
Tires ----- Cen. diam. ----- Size -----
Tires held by -----
Safety chains Single

Brake Position On All Wheels.
Brake sch. 6-ET, West'g. Auto. & Straight Air with 10" x 12" tender cylinder.
Brake work to be kept high above rail.

4 List of tools, sch. 29 Bolts, nuts and threads B. L. W.
Photo sch. 2 Inspection (see sup. 1)
To be weighed Yes Material spec'ns B. L. W.
Certificate of boiler test Three copies of B. L. W. form 611.
Junior laws to 5-24-14 Shipment On Own Wheels.

Brass shop finish, No. 1.
Machine shop finish D-165, except cylinder head covers finished.

2 Patent Plates: Cab Ventilator 722539 Mar. 10, 1903. (Brass Plate)
Feed Pipe Str. Patented Sept. 1, 1903. (Cast On)
Rushton Throttle Patented Jan. 23, 1900. (Cast On)

Property plates None

Painting:—Engine, style 291 Olive Green and Aluminum.
Painting:—Tender, style 291 " " " "

Mark on tank sides, PUBLIC BELT RAILROAD

No. Pos.	Road No.	Name
F. No. Plate	12	None
Dome	12	
Back of Tank		

SPECIFICATION FOR LOCOMOTIVES, 6 32 D 1060 & 1061.

FOR, Public Belt Railroad Commission.

J.

1 Inspection:- ~~Inspectors will be assigned by the Public Belt Railroad Commission, whose duty it will be to inspect the locomotives and test the same; no locomotive will be accepted which has not been inspected and tested by an authorized agent or inspector of the Public Belt Railroad Commission on delivery.~~ INSPECTION B.L.W. EXCEPT CUSTOMER WILL INSPECT AFTER DELIVERY. Verbal L.W. 6/12/14

2 The contract price shall also include the possible cost of any patented invention, article or arrangement that may be furnished with the locomotive.

4 Tools to be furnished with engines:-
Two jack screws and levers.
One pinch bar.
Suitable wrenches to fit all nuts and bolts of locomotive.
Two monkey wrenches.
One set of driving box packing tools.
One machinists hammer.
One soft hammer.
Three cold chisels
One engineer's torch.
Two Alexander Car Replacers 50 tons.

5 Dome of the one piece type.

6 Firebox to be set on top of frame with 2" blocks between bottom of mud ring and top rail of frame.

7 Hollow staybolts of iron $\frac{3}{8}$" diameter, screwed end riveted to inside and outside sheets so as to be visible and accessible.
200 Tate flexible staybolts $\frac{7}{8}$" diameter to be applied in breaking zone of firebox.

21 Engine springs of steel, tempered in oil, equalizer of spring rigging, between middle and rear drivers to be hung by hanger passing through suitableslot in frame and properly secured with gibs in place of equalizer stand above frame.

22 Air reservoirs to be located under running boards similar to Nos. 3901 (6 36 D 132). Reservoirs to be raised sufficiently to clear valve gear and give easy access to spring rigging.

For Hereafter
Two extra rivets for Superheater as required by owners Insp. 6HCC 4/3/14

For Hereafter:-
Have pedestal or casting 3/8" further from the driving box to give more clearance for pedestal wedge.
B.L.W. 6/9/14

10 Ash pan with dampers located not lower than 19" above rail.

11 Superheater on Loco. Superheater Co's Specification No. O-2444 dated June 10, 1914.
Royalty on superheater payable by B. L. W.

12 Apply a cleaning hole right and left in smokebox for inspection of superheater.

13 Provide one washout plug in each back corner of firebox so placed as to be readily removable without disconnecting the apron.
Plugs to be $1\frac{1}{2}$" from bottom of plug to top of mud ring.

14 Spring buffer between engine and tender with round chafing iron.

15 Frames thoroughly braced with lateral and diagonal bracing between frames.

16 Cylinders to be fitted with bushings, suitable for superheated steam.
Valve chamber to be fitted with bushings suitable for superheated steam.

17 Cylinders lagged with same material as boiler.

18 Steam chest valves to be equipped with vacuum valves.

11-266-67 Ashpan copied see box

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THE BALDWIN LOCOMOTIVE WORKS

SUPERHEATER SPECIFICATION FOR LOCOMOTIVES 6 32 D 1060 & 1061

FOR Public Belt Railroad Commission

J.

Locomotive Superheater Company's Specification No. O-2444 dated June 10, 1914
Specification for Superheater with Top Header, Double Loop Arrangement.

BOILER TUBES	143 in number 2" O. D. 10 ft. 6 ins. over tube sheets. Tubes located between and adjacent to Boiler flues are to be beaded over at front end.
BOILER FLUES	21 in number $5\frac{1}{2}$" O. D. #9 B.W.G. thick of cold drawn seamless steel. Flues to be straight, true to gauge and wall not to vary more than one gauge from specified thickness, as shown on **Card 1912-M**
BOILER FLUE SETTING	Radius $\frac{1}{16}$ inch on both edges of flue holes in firebox tube sheet and on front edge of flue holes in front flue sheet as shown on drawings, except for copper sheets. Back end to be set with copper ferrules, rolled, beaded and prossered except for copper sheets. Front end to be rolled and beaded. Rollers to have at least 5 rolls. Prosser to have at least 12 sections **Card 1137**
TUBE SHEET LAYOUT	to be in accordance with **Card 5221**
S. H. UNITS	21 units $1\frac{1}{2}$" O. D. #9 B.W.G. thick of seamless steel. Pipes united by cast steel return bends as shown on **Card 1910-B** Each unit to be tested, before being placed in boiler, with water under pressure of 250 pounds.
S. H. PIPE SUPPORTS	Of steel fastened securely on superheater pipes so as not to slide as shown on **Card 1790**
S. H. PIPE JOINT	To be made in best possible manner to insure absolutely tight joints in accordance with the notation on **Card 1052**
S. H. UNIT CLAMP BOLT	To be of steel having a tensile strength between 60,000 lbs, and 70,000 lbs. per sq. inch and to be as shown on **Card 1064-E**
S. H. HEADER	To be of close grain cylinder iron, steam tight in every respect. Joint ring for connection to dry pipe to have flat side against header flange. Casting should be moulded with the face having the superheater joints placed downward in the mould to secure the best quality of metal on surface where superheater joints are made. Each header to have a serial number cast on in such a location as not to be removed in finishing. No patch plugs allowed on ball joint seats. Headers must not be treated excessively with sal ammoniac. Header casting to be tight under water pressure of 250 lbs. Test pressure to be applied separately to the saturated and to the superheated steam passages, so as to insure soundness of all partition walls. **Card 10023**
S. H. HEADER SUPPORTS	To be securely bolted or riveted to boiler shell. To be properly located so as to support the header after header has been correctly located. Header should then be bolted to supports. This to be done before superheater units are put in place. **Card 1323**
ST. PIPE JOINT RINGS	Should be of cast iron.
DEFLECTING PLATE	To be constructed so as to permit easy inspection and removal of superheater units and joints. Design to be in accordance with **Card 10022**
DAMPER CYLINDER	To be carefully and accurately made. Piston not to be more than 0.01 inch smaller than bore. Bearings for Piston and extension to be in line. Piston to be ground and to operate freely under a pressure as low as 40 lbs. per sq. in. Steam Pipe to damper cylinder should be as short and free from bends as possible so as not to cause water to collect in cylinder. Pipe to be protected against freezing. **Card 1149**
DAMPER SHAFT COUNTERWEIGHT	To be painted a light color to render it easily visible by the engineer **Card 1067**
S. H. ARRANGEMENT	To be in accordance with **Card 4123-A**
TEST (FINAL)	The Superheater, after assembling in boiler and after steam pipes are fitted up, is to be thoroughly tested and to be tight under water pressure of 250 lbs.

Name	Card	Name	Card
Damper	1956-F	Damper Shaft Link	1070
Damper Cylinder Arm	1074	Patent Plate	3007
Damper Cylinder Pipe Fitting	1069-A	S. H. Unit Bolt Washer	1071
Damper Cylinder Pipe Union	1287	S. H. Unit Clamp	1073
Damper Cylinder Piping Diagram	1503	S. H. Unit Clamp Washer	1072
Damper Cylinder Support		S. H. Pipe End	1344
Damper Shaft	1235-H	S. H. Pipe Band	1793
Damper Shaft Arm	1226 & 1234	Return Bends	1151
Damper Shaft Bearing (O. S.)	1148 & 1223	Deflecting Plate Handle	1487
Damper Shaft Bearing (I. S.)	1088	Lubricator Connection	3023

pp. 266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS AS MY. CO'S SPECIFICATION.
Memorandum Spec'n 10605 As many parts as possible to be interchangeable with 6-32-D-1060-1061 (SUP. 1)
SPECIFICATION FOR LOCOMOTIVES 6-32-D-1065 to 1069 Gen. as Neg. 5088
FOR Public Belt Railroad Commission Engine Drawing No. 100
(New Orleans, La.) 7.28.15

Gauge of Road 4' 8½" Play 1"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"
Total wheelbase, eng. and tend. (Actual 41' 0½" / Limited to ~~~~)

Curves 43 degrees

Limits, Height 14' 3" Width -----
Weight (approximate) in working order, Total 130,000 lbs.
On F. truck ----- lbs., Drivers 130,000 lbs., B. truck ----- lbs.
Weight not to be less than amount specified.
Tractive power 29,400 lbs. Ratio of adhesion 4.42
Work'g St'm Pres. 200 lbs. Service Switching
Fuel Soft Coal

Boiler Steel Thick 11/16" Bill 7255
Boiler, Diam. 64" Plan Straight Top
Boiler st'm pres. 200 lbs. Tested to (220 lbs. steam pres. / 267 lbs. water pres.
Longitud seams Butt jointed, double covering strips

5 **Dome,** diam. 29" Pos. Central

6 **Firebox** Steel Combustion chamb. None
Firebox, length 96-3/16" Width 41" Depth F. 66" B. 63½"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back 5/16"
Firedoor opening 16" diam.
Water space, Front 4" Sides 3½" Back 3½"
6 Water space, Frame Single Riveted
Water space stays (See sup. 7)

Radial stays 1" diam. Stay stays from One I bar
Button heads below crown on Eight central rows
Crown bars None Placed ----- above crown
Crown bolts -----

Tubes 5½" # 9 B. W. G. Seamless Steel
2" #12 W. G. Spellerized Steel
Tube ends Swaged for copper ferrules, fire box ends.
Tubes, No. 21 Diam. 5½" Length 10' 6"
143 2"

Heating Surface, Tubes 5½" 315⁶ / 2" 780⁶ Firebox 146⁶ Total 1241⁶
Grate area 27.4⁶ Ratio to heat'g surface, 1 : 45.4
Superheater 252⁶ Feed-water heater -----
Reheater ----- Fire brick tubes -----

Fire Brick arch on studs

Grates Rocking bars with drop plate at back,
8 **Ash Pan,** Depth 24" Dampers Front and Back

Throttle Balance Pos. Dome
9 Dry pipe ~~Cast Iron~~ Steel.

10 **Superheater** Schmidt double header type.

Smokebox extension With Cleaning hole and cap R. and L. (See sup. 11)
Spark arrester hopper With
Netting and deflect. plates With

Exhaust nozzles Double High

Stack Straight Diam. 18" Hole in S.B. 19½"
Stack to be fly. Co's standard type, with an ornamental top

Safety Valves (NOT SPEC) Two Ashton 3" Muffled
Safety valves None with relief lever, Set to 200 lbs.
Whistle B. L. W. with valve made of Tropenas Metal

Steam Gauge One Iron 7" MAKER:- Ashcroft (NOT SPEC)
Steam gauge stand Iron **Clock** None

Water Gauge One Klinger **Cab lamps** to burn oil
Gauge Cocks Three Back Surface valve None
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One Southern Packless, POS:- Right Side
13 **Cleaning Plugs**
Firebox Corners diagonal
Crown, Two each side and two back
Waist One under front
Front tube sheet. One FUSIBLE PLUG:- One

Pump None Pos. -----
Top chamb. ----- Bottom chamb. -----
Feed cock ----- Feed pipes -----
Checks ----- Check pipes -----

Injectors (NOT SPEC) Two Monitor No. 9
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check Sellers Pos. Right and Left

Steam Heat None

Cab, Steel, lined with wood, Ventilator in cab roof.

Cab boards Steel Nosing T-Iron
14½ Running boards Steel Nosing T-Iron
Hand rail Iron Pipe Located on Boiler

16 **Back Bumper** Bar Steel Back drawbar height 34"

Pilot None Pushing shoes Front
Front Bumper O. H. Cast Steel Bumper plate None
Steps across front with handrail

Front Drawhead, Center above rail 32½"
Coupler Tower M.C.B. Auto. with 13" knuckle, with National Malleable coupler pocket having extension floor.

Flag fixtures Iron on bumper.

Headlight Two Round Case 16" Reflector. To burn Kerosene
Headlight, Nos. on sides With H'd'l't step With
Lamp shelf None Nosing -----

Bell 92 pounds
Sand Box Two Diam. 28" Body Iron Ptd. Pipes Iron
Sander, Hand —

Dome casing Iron Painted

Boiler Jacket #22 Plan. Steel Bands Plan. Steel Style 9
Boiler Lagging Magnesia Sectional

THE BALDWIN LOCOMOTIVE WORKS
Engine P. Steuart Aug. 1915
SPECIFICATION FOR LOCOMOTIVES 6-32-D-1065 to 1069
FOR Public Belt Railroad Commission

217

6-17 **Frames** Cast Steel Braces Solid

15 **Cylinders,** Diam. 19" Stroke 24"
St'm ports, Length 37.7" Width 1¾" Bridges 3/8"
Exh. ports, Length 37.7" Width ----- Valve bad ⅛"
Valve travel 5½" Stm. lap ⅞" Exh. lap -----
Eccentric crank throw 21"
S. F. Lubr. (Not Spec) Detroit Five Feed No. 42 Bull's Eye {Copper pipes under jacket
Cyl'r heads Cast Iron
Cyl'r casings Plan. Steel Head covers Steel Finished
St'm chest casings ----- Covers -----
15 St'm chest valves Piston type, 12" diam., inside admission
Met. pkg. (PISTON ROD / VALVE STEM) U. S. (Not Spec)

Pistons Cast Iron rings sprung into solid head
Guides Steel Oil cups Needle
Crossheads Alligator, cast steel, with brass gibs.
Wrist Pins Steel Rod cups Compression Grease
Parallel rods to have solid ends.

Valve Motion Southern
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 50" Cen. diam. 44"
22 Centres of cast iron, except main of cast steel
Tires Steel (sup. 24) Held by Shrinkage and Shoulder
Tires, Flanged, Pos. Front and Back Size 3" x 5½"
Tires, Plain, Pos. Middle Size 3" x 6½"
Lateral play between driving boxes and wheel hubs - 1/16" total
22 **Driving Boxes** Cast Steel
Journals, Diam. 8½" Length 9"

Driving spring staples Wrot Iron

23 **Springs.** Make B. L. W.

Front Engine Truck None Wheeled -----
To swing ----- each side of cen. Cen. pin liners -----
Journals, Diam. ----- Length ----- Boxes -----
Wheels, Diam. ----- Tread ----- Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----

Back Engine Truck None Wheeled -----
To swing ----- each side of cen. Cen. pin liners -----
Journals, Diam. ----- Length ----- Boxes -----
Wheels, Diam. ----- Tread ----- Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----

24 **Brake,** position On all Driving and Tender wheels.
Operating Parts } Engine, Sch. 6-ET, West'g Comb. Auto. & Straight Air.
Eng. Tr'k, sch. -----
Foundation Parts } Drivers, sch. UM-2, American O.S. Equalized
Eng. tr'k, sch. -----
Air pump One 9½" Pos. Left Side
Train connections Front and Back
Train signal, sch. None

16 Tender Eight Wheeled, Drawing No. 435
Weight, with fuel and water, about 80,000 lbs.
Weight not to be less than amount specified
Tank 4000 Gallons, Bill 3834
Tank "U" shape, sloping back. Fuel Capacity 5 tons.

Tool Boxes One, of steel, Top.

Frame Steel 10" channels (See sup. 42) {PUSHING SHOES CAST IN S. BUMPER
Tender back bumper of Open Hearth Cast Steel
16 Front drawbar height 34⅜"

Back drawhead, center above rail 33½"
Coupler Tower M.C.B.Auto. with 13" knuckle, with National Malleable coupler pocket having extension floor.

Steps across rear with hand rail on bumper, also steps on sloping back, to conform to I. C. C. requirements.
Trucks Arch Bar type with Cast Steel Bolsters.

Springs Elliptic, B. L. W.
Journals, Diam. 4½" Length 8"
Wheels, Diam. 33" Tread 4½" Kind Chilled Cast Iron Plate
Tires None Cen. diam. ----- Size -----
Tires held by -----
Safety chains Single

Brake Position On all wheels.
Brake sch. #6 ET West'g Auto. and Straight Air with 10" x 12" tender cylinder.
Brake work to be kept high above rail

14 List of tools, sch. 29 Bolts, nuts and threads B. L. W.
Photo sch. ~~None~~ 2 7/15 Inspection (See sup. 2)
To be weighed Yes Material specifns B. L. W.
Certificate of boiler test Three copies of B. L. W. form 611
Junior laws to 8.5.15 Shipment On own wheels.

Brass shop finish, No. 1
Machine shop finish D-165, except cylinder head covers finished.

3 Patent Plates }
~~Cab Ventilator, 722539 Mar. 10, 1903 (Brass Plate)~~
Feed Pipe Strainer, Patented Sept. 1, 1903 (Cast on)
Rughton Throttle, Patented Jan. 23, 1900 (Cast on)
~~Steam Pipe Casing Patented July 18 1911.~~ (Cast On)

Property plates None

Painting: Engine, style 291 Olive Green and Aluminum
Painting: Tender, style 291 Olive Green and Aluminum

Mark on tank sides, PUBLIC BELT RAILROAD

No. Pos. Road No. 15-419 Name None
F. No. Plate
Dome
Back of tank

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1065 to 1069

FOR Public Belt Railroad Commission.

1. Locomotives, except where otherwise specified, are to be duplicate of 6 32 D 1060 - 1064 and all essential wearing parts of new locomotives are to be interchangeable with the previous locomotives, 6 32 D 1060-1064.

2. Inspection, B. L. W. except customer will inspect after delivery.
Inspectors will be assigned by the Public Belt Railroad Commission, whose duty it will be to inspect the locomotives and test the same; no locomotive will be accepted which has not been inspected and tested by an authorized agent or inspector of the Public Belt Railroad Commission on delivery.

3. The contract price shall also include the possible cost of any patented invention, article or arrangement that may be furnished with the locomotive.

4. Tools Equipment to include the following:-
Two jack screws and levers.
One pinch bar.
Suitable wrenches to fit all nuts and bolts of locomotive.
Two monkey wrenches.
One set of driving box packing tools.
One machinists hammer.
One soft hammer.
Three cold chisels.
One engineer's torch.
Two Alexander Car Replacers No. 1 special for 80 lb. rails.

5. Dome of the one piece type.

6. Fire box to be set on top of frame with 2" blocks between bottom of mud ring and top of frame.

7. Stay bolts of hollow iron 5/8" diameter, screwed and riveted to inside and outside sheets so as to be visible and accessible. Flexible staybolts, 200 Tate 5/8" and 1" diameter to be applied in breaking in one of fire box.
All stay bolts to be exposed.

8. Ash Pan to be made with tight bottom of continuous sheet with arrangement for blowing out ashes through door in rear of pan by means of water, tapped from water leg, arranged with suitable valve connection and perforated pipe outlet in front end of box. Ash Pan B.L.W. Tracing 29302. 9/3/15
Ash pan with dampers located not lower than 19" above rail.

9. Steam pipes to be outside connected type.

10. Superheater: latest accepted practice subject to approval of Public Belt R. R. as Locomotive Superheater Co's Specification No. C-3900 dated August 5th 1915 copy attached.
Royalty on superheater, payable by The B. L. W.

11. Cleaning hole and cap in each side of smoke box for inspection of superheater.

12. Particular attention to be paid to front end arrangement, to eliminate throwing of sparks. These locomotives will have to work around cotton warehouses and Ry. Co. looks to us to furnish a successful arrangement.

13. One washout plug in each back corner of firebox so placed as to be readily removable without disconnecting the apron. Plugs to be 1½" from bottom of plug to top of mud ring.

14. Running boards to be covered with wood 1" thick in cab.

15. Spring buffer between engine and tender with round chafing iron, suitable for operation on 43 degree curves.

16. Frames thoroughly braced with lateral and diagonal bracing between frames.

17. Cylinders to be fitted with bushings, suitable for superheated steam.
Valve chamber to be fitted with bushings suitable for superheated steam.

18. Steam chest valves to be equipped with vacuum valves.

19. Power Reverse Gear to be Ragonet Type, covered by Ex. Order No. 6803 dated 8-24-15

20. Driving tires of hardest "C" grade oil heat treated steel.

21. All driving wheel centres to have Brass hub plates.

22. Engine springs of steel, tempered in oil.

23. Air reservoirs to be located under cab on each side and under running board on left side. Reservoirs to be raised sufficiently to clear valve gear and give easy access to spring rigging.

24. Southern Locomotive Valve Gear Co. is arranging to send one of their experts to these works to look over the valve motion of these engines and to assist B.L.W. men in setting the valves. 9/3/15

For Hereafter:-
Have pedestal Cassette 3/8" further from the driving box to give more clearance for pedestal radius. R.F.H. & C. 5/9/17

TENDER.

25. Lindstroms syphon pipe tank valve as Western Ry. Equipment Co's print, Sketch 14-1198.

26. Tender frame to have 1½" truss rods arranged longitudinally.

27. Provide combination brackets for flags and lamps on rear of tender on each corner at the top.

pp. 266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS

SUPERHEATER SPECIFICATION FOR LOCOMOTIVES 6 32 D 1065 to 1069

FOR Public Belt Railroad Commission

219

Locomotive Superheater Company's Specification No. C-3900 dated August 5th, 1915
Specification for Superheater with Top Header, Double Loop Arrangement.

BOILER TUBES 143 in number 2 O. D. 10 ft. 6 ins. over tube sheets. Tubes located between and adjacent to Boiler flues are to be beaded over at front end.

BOILER FLUES 21 in number 5½ O. D. #9 BWG thick of cold drawn seamless steel. Flues to be straight, true to gauge and wall not to vary more than one gauge from specified thickness, as shown on Card 1912-B

BOILER FLUE SETTING Radius 1/8 inch on both edges of flue holes in firebox tube sheet and on front edge of flue holes in front flue sheet as shown on drawings, except for copper sheets. Back end to be set with copper ferrules, rolled, beaded and prossered except for copper sheets. Front end to be rolled and beaded. Rollers to have at least 5 rolls. Prosser to have at least 12 sections Card 1137

TUBE SHEET LAYOUT
S. H. UNITS to be in accordance with Card 5821
21 units 1½ O. D. #9 BWG thick of seamless steel. Pipes united by cast steel return bends as shown on Card 10476-H

Each unit to be tested, before being placed in boiler, with water under pressure of 250 pounds.

S. H. PIPE SUPPORTS Of steel fastened securely on superheater pipes so as not to slide as shown on Card 1796

S. H. PIPE JOINT To be made in best possible manner to insure absolutely tight joints in accordance with the notation on Card 1052

S. H. UNIT CLAMP BOLT To be of steel having a tensile strength between 60,000 lbs. and 70,000 lbs. per sq. inch and to be as shown on Card 1064-E

S. H. HEADER To be of close grain cylinder iron, steam tight in every respect. Joint ring for connection to dry pipe to have flat side against header flange. Casting should be moulded with the face having the superheater joints placed downward in the mould to secure the best quality of metal on surface where superheater joints are made. Each header to have a serial number cast on in such a location as not to be removed in finishing. No patch plugs allowed on ball joint seats. Headers must not be treated excessively with sal ammoniac. Header casting to be tight under water pressure of 250 lbs. Test pressure to be applied separately to the saturated and to the superheated steam passages, so as to insure soundness of all partition walls. Card 10025

S. H. HEADER SUPPORTS To be securely bolted or riveted to boiler shell. To be properly located so as to support the header after header has been correctly located. Header should then be bolted to supports. This to be done before superheater units are put in place. Card 1303

ST. PIPE JOINT RINGS Should be of cast iron.

DEFLECTING PLATE To be constructed so as to permit easy inspection and removal of superheater units and joints. Design to be in accordance with Card 10022

DAMPER CYLINDER To be carefully and accurately made. Piston not to be more than 0.01 inch smaller than bore. Bearings for Piston and extension to be in line. Piston to be ground and to operate freely under a pressure as low as 40 lbs. per sq. in. Steam Pipe to damper cylinder should be as short and free from bends as possible so as not to cause water to collect in cylinder. Pipe to be protected against freezing. Card 1149

DAMPER SHAFT COUNTERWEIGHT To be painted a light color to render it easily visible by the engineer Card 1067

S. H. ARRANGEMENT To be in accordance with Card 4113-B

TEST (FINAL) The Superheater, after assembling in boiler and after steam pipes are fitted up, is to be thoroughly tested and to be tight under water pressure of 250 lbs.

Name	Card	Name	Card
Damper	1956-F	Damper Shaft Link	1072
Damper Cylinder Arm	1074	Patent Plate	2120
Damper Cylinder Pipe Fitting		S. H. Unit Bolt Washer	1052
Damper Cylinder Pipe Union	1287	S. H. Unit Clamp	1073
Damper Cylinder Piping Diagram	1503	S. H. Unit Clamp Washer	1072
Damper Cylinder Support		S. H. Pipe End	1344
Damper Shaft	1235-H	S. H. Pipe Band	1988
Damper Shaft Arm	1226 and 1234	Return Bends	10300
Damper Shaft Bearing (O. S.)	1148 and 1223	Deflecting Plate Handle	1482
Damper Shaft Bearing (I. S.)	1088	Lubricator Connection	3028

pp. 266-67 Phil. copied see box

THE BALDWIN LOCOMOTIVE WORKS — As Spec'n C-3871 Duplicate of 4 30 C 49, except where otherwise specified.

Memorandum Spec'n 11149

SPECIFICATION FOR LOCOMOTIVES 4 30 C 57 — Gen. as

FOR Bush Terminal Company — Engine Drawing No. 3

9-13-16

* Change to Coal Bur. Ex-6236-C-12-17

Gauge of Road 4' 8½" Play 3"
Wheelbase, Rigid 7' 6" Driving 7' 6" Total 7' 6"
Total wheelbase, eng. and tend. {Actual —— Limited to ——

Curves —— Grades 6 %

Limits, Height —— Width ——
Weight (approximate) In working order, Total 102,000 pounds
On F. tr'k —— lbs. Driving 102,000 lbs. B. tr'k —— lbs.

Tractive power 27,040 lbs. Ratio of adhesion 3.8
Work'g St'm Pres. 180 lbs. Service Switching
Fuel Oil *
Oil burning arrangement B. L. W. standard, weir oil burner type front end of fire box. Royalties if any, payable by B. L. W.
Boiler Steel Thick ⅞" Bill 7930
Boiler, Diam. 56" Plan Straight Top
Boiler st'm pres. 180 lbs., Tested to {200 lbs. steam pres. 240 lbs. water pres.
Longitud. seams Butt jointed, double covering straps

Dome, diam. 29" Pos. Central

Firebox Steel — Combustion chamb. None
Firebox, length 54⅞" Width 66⅛" Depth F. 64⅜" B. 62⅜"
Firebox, Tube ½" Crown ½" Sides ½" Back ½"
Firedoor opening 16" diam. Crown and sides in one piece
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Single Riveted
Water space stays ⅝" diam. with 3/16" holes 14" deep from O.S.

Radial stays 1" diameter Sling stays front {Two rows of B. L. W. Expansion stays
Button heads below crown on six central rows
Crown bars None Placed —— above crown
Crown bolts ——
Expansion pads at fire box are to have ½" holes drilled through the pads opposite the stay bolts

Tubes 12 W.G. Iron
Tube ends Brazed, with copper ferrules, fire box ends
Number 200 Diam. 2" Length 11' 0"

Heating Surface	Flues ——	Comb. Chamb. ——	Total 1283.3
	Tubes 1183.1	Fire Box 81.2	Fire Brick Tubes ——
Grate area 16.3	Ratio to Heating Surface 1 : 79		
Superheater ——			

Fire Brick Arch None
Fire box lined with fire brick for oil burning
Fire brick pavement in pan.
Grates None
Ash Pan, Dampers Front and in middle

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Smokebox extension None Cleaning hole and cap None
Spark ejector or nipper None
Netting and deflect. plates None

Exhaust nozzle Double, Lap
Blower pipe — with
Stack Straight Dia. 18" Hole in S. B., dia. 22½"
Oil burning equipment taken from locomotive on Extra Order 8-30 to be used on this locomotive.

Safety Valves Two Consolidated 3"
Safety valves None with relief lever, Set to 180 pounds
Whistle B. L. W. Plain

Steam Gauge One Iron 7" Manufacturer
Steam gauge stand Iron Check None
Water Gauge to be Company's standard
Water Gauge One Sargeant No. 100 Cock Lengths to suit cab
Gauge Cocks Three Gage Surface water type
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One B. L. W. Pipe Lengths as
Clothing Fitted
Firebox, Sides, Back, Throat and Crown Iron
Crown, Two layers steel and asbestos board
Weld, One sheet, Front
Front tube sheet, One Fusible plug None

Pump None Pipe ——
Top chamb. —— Bottom chamb. ——
Feed Cock —— Feed Pipes ——
Checks —— Check Pipes ——

Injectors Two Monitor
Injectors, Pos. Right and left Lever Reverse Lever Quadrant
Pipes, Check, Combined Feed Pipe and Overflow
Check B. L. W. Pos. Right and left
Checked to Water Into Extended Foot Plate Pipes by Elbows
Steam Heat None

Cab Iron

Cab boards Iron Ridging Iron
Running boards Steel and Wood, with Iron Nosing Iron Angles Iron
Hand rail Iron Located on Boiler Side

Back Bumper Oak

Pilot None Pushing Blocks Front and Back
Front Bumper Oak Bumper plate None
Steps Ironed front and back with hand rail
Steps, hand holes, etc., to conform to I. C. C. requirements
F. & B. Drawhead, Center above rail 34½"
Coupler Tower M. C. B. Automatic with 19" face to fit drawbars

Signal fixtures None

Headlights to be Dressel-Schroeder, Accuracy of Time
Headlight Two Round Globe 16" Reflector, To burn Kerosene
Headlight, Num. on Sides White Light Blue with White Border
Lamp shell Iron Mounting None

Bell 92 pounds
Sand Box Two Diam. 28" Body Iron painted Pipes Iron
Sander Valve, in each box, to sand front and rear.

Dome casing Iron painted

Boiler Jacket #22 Plain Steel Bands Iron Style 9
Boiler Lagging Magnesia Sectional

THE BALDWIN LOCOMOTIVE WORKS *

SPECIFICATION FOR LOCOMOTIVES 4 30 C 57 — 221

FOR Bush Terminal Company

Frames Cast Steel Braces Solid

Cylinders, Diam. 18" Stroke 24"
St'm ports, Length 16" Width 1½" Bridges 1"
Exh. ports, Length 16" Width 2½" Valve lead 3/32"
Valve travel 5½" Steam lap 1" Exhaust clearance ——
Eccentric crank throw 5" By-pass valve None
S. F. Lubr. Nathan Three Feed type No. 166-F-3 Bulls Eye
Cyl'r heads Cast Front Lubr. pipes of copper under jacket
Cyl'r casings Iron painted Head covers Steel painted
St'm chest casings Iron painted Covers Steel painted
St'm chest valves Balanced with vacuum valves
Met. pkg. {Piston rods Valve stems U. S.

Pistons Cast iron rings sprung into solid head
Guides Steel Oil cups Needle
Crossheads Cast steel
Wrist Pins Steel Rod cups Plunger
Parallel rods to have straps, keys and brasses

Valve Motion Stephenson
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

X12659.23 X5547.24 Tires
Drivers, O. S. Diam. 44" Cen. diam. 38", Centers cast steel
Driving wheels to have brass hub liners
Tires Steel Held by Shrinkage and shoulder
Tires, Flanged, Pos. All Size 3" x 5½"
Tires, Plain, Pos. None Size ——
Lateral play between driving boxes and wheel hubs = 1/32" total
Driving Boxes Steeled cast iron
Journals, Diam. 8½" Length 10"

Springs. Make B. L. W.

Front Engine Truck None Wheeled ——
To swing —— each side of cen., Cen. pin liners ——
Journals, Diam. —— Length —— Boxes ——
Wheels, Diam. —— Tread —— Kind ——
Tires —— Cen. diam. —— Size ——
Tires held by ——

Back Engine Truck None Wheeled ——
To swing —— each side of cen., Cen. pin liners ——
Journals, Diam. —— Length —— Boxes ——
Wheels, Diam. —— Tread —— Kind ——
Tires —— Cen. diam. —— Size ——
Tires held by ——

Brake, position On all driving wheels (No tender)
Operating Parts — Engine, Sch. S American Steam; Eng. Tr'k, sch. ——
Foundation Parts — Drivers, sch. WY-2 American O. S. Equalized; Eng. Tr'k, sch. ——
Air pump —— Pos. ——
Train connections ——
Train signal, sch. ——
One feed from main lubricator to be piped to the brake operating valve.

Tender None Wheeled, Drawing No. ——
Weight, with fuel and water, about ——

Tank {Oil 500 Water 1400 Gallons, Bill L326 L335
Water tanks located at sides of boiler.
Oil tank located on rear extension of engine frame, back of cab
Tool Boxes ——

Frame ——

Front Drawbar height ——
Pilot —— Pushing shoes ——
Back drawhead, center above rail ——
Coupler ——

Steps ——

Trucks ——

Springs ——
Journals, Diam. —— Length ——
Wheels, Diam. —— Tread —— Kind ——
Tires —— Cen. diam. —— Size ——
Tires held by ——
Safety chains ——

Brake Position ——
Brake sch. ——

List of tools, sch. 31
Photo sch. None Inspection B. L. W.
To be weighed Yes Material spec'ns B. L. W.
Certificate of boiler test Three copies of B. L. W. form 1036
Junior laws to 9-13-16 Shipment On own wheels, under steam. 9-7-16.

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. Patents — Throttle, patented Jan. 23, 1900 (Cast on)

Property plates None

Painting:—Engine, style 220, Olive Green and Aluminum
Painting:—Tender, style ——

Lettering to be similar to 4 30 C 49
Mark on tank sides, Bush Terminal

Road number to be 6" x 6" on iron panel on cab sides
Road Nos. Pos. Road Nos. Name None
F. No. Plate 14
Dome
Cab sides
Back of fuel box

THE BALDWIN LOCOMOTIVE WORKS As Spec'n. C-21144

Memorandum Spec'n 17058

SPECIFICATION FOR LOCOMOTIVES 6 36 D 28½

FOR Swift & Company
For St. Joseph Union Terminal Railway Company

Gen. as Photo. 3796
Engine Drawing No. 11

3-19-17

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"
Total wheelbase, eng. and tend. { Actual 43' 10" / Limited to ——

Curves ——

Limits, Height —— Width ——
Weight (approximate) in working order, Total 140,000 pounds
On F. tr'k —— lbs., Drivers 140,000 lbs., B. tr'k —— lbs.

Tractive power 35080 lbs., Ratio of adhesion 4.
Work'g St'm Pres. 180 lbs., Service Switching
Fuel Soft Coal

Front tube sheet to be ½" thick
Boiler Steel Thick 11/16" Bill 8082
Boiler, Diam. 68" Plan Straight Top
{ Boiler st'm pres. 180 lbs., Tested to { 200 lbs. steam pres. / 240 lbs. water pres. } with factor of safety of 5.
Longitud. seams Butt jointed, double covering strips

Dome, diam. 29" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 108-3/16" Width 42⅛" Depth F. 65½" B. 62½"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diam.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Single Riveted
Water space stays ⅜" diam. with 3⅛" holes 1¼" deep from O.S.

Radial stays 1" diam. Sling stays front { Two rods of B. L. W. Expansion stays
Button heads below crown on Eight central rows
Crown bars None Placed —— above crown
Crown bolts ——

*11 pc Time
Tubes #12 W. G. Charcoal Iron or Steel
Tube ends Staged for copper ferrules, fire box ends
Number 322 Diam. 2" Length 10' 5"

Heating Surface	Flues ——	Combus. Chamb. ——	Total 1903.5
	Tubes 1742.3	Fire Box 161.2	Fire Brick Tubes ——
Grate area 31.5	Ratio to Heating Surface 1 : 60		
Superheater ——			

Fire Brick Arch on studs

Grates Rocking bars and drop plate
Ash Pan, Dampers Front and back

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Smokebox extension With Cleaning hole and cap L. S. Only
Spark ejector or hopper With
Netting and deflect. plates With

Exhaust nozzles Double high

Stack Straight Dia. 18" Hole in S. B., dia. 21½"

(Not spec.)
Safety Valves Two Consolidated 3"
Safety valves None with relief lever, Set to 180 pounds
Whistle B. L. W. plain

Steam Gauge One Iron 7" MAKER:-Ashcroft (Not spec.)
Steam gauge stand Iron **Clock** None

Water Gauge One B.L.W. (Ironclad) **Cab Lamps** to burn oil
Gauge Cocks Three - Back Surface valve None
Lowest gauge cock 3¼" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One B. L. W. POS:-Front
Cleaning Plugs
Firebox Corners diagonal, sides and back
Crown, Three each side and two back
Waist, One under front
Front tube sheet, One Fusible plug One

Pump None Pos. ——
Top chamb. —— Bottom chamb. ——
Feed Cock —— Feed pipes ——
Checks —— Check pipes ——

(Not spec.)
Injectors Two Monitor No. 9
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. Right and Left

Steam Heat None

Cab Wood

Cab boards Wood Nosing None
Running boards Wood Nosing None
Hand rail Iron Located on Boiler

Back Bumper Bar Steel Back drawbar height 34¾"

Pilot None Pushing shoes at front
Front Bumper Oak Bumper plate None
Steps across front with hand rails
Steps, hand holds, etc. to conform to I.C.C. requirements
Front Drawhead, Center above rail 33½"
Coupler M. C. B. Automatic

Signal fixtures None

Headlight Two Round Case 16" Reflector, To burn Kerosene
Headlight, Nos. on sides With H'd'l't step With
Lamp shelf None Nosing ——

Bell 92 pounds. Gollmar Air Bell Ringer
Sand Box Two Diam. 28" Body Iron Painted Pipes Iron
Sander / Leach Air Trap A-1 in each box, to sand front and back

Dome casing Iron Painted

Boiler Jacket #22 Soft Steel Pt. Bands Iron Style 9
Boiler Lagging Magnesia sectional

11-266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS
J. V. Applin Sept 1917

SPECIFICATION FOR LOCOMOTIVES 6 36 D 28½

FOR Swift & Company, for St. Joseph Union Terminal Railway Company

223

Frames Cast Steel Braces Solid

Cylinders, Diam. 21" Stroke 25"
St'm ports, Length 19" Width 1⅝" Bridges 1⅜"
Exh. ports, Length 19" Width 3" Valve lead 1/16"
Valve travel 5¼" Steam lap ⅞" Exhaust clearance ——
Eccentric-crank throw 5" By-pass valve None
S. P. Lubr. Michigan Triple Bulls Eye
Cyl'r heads Cast Iron; Lubr. pipes of Iron under jacket
Cyl'r casings Iron Ptd. Head covers Steel Painted
St'm chest casings Iron Ptd. Covers Steel Painted
St'm chest valves, Richardson balanced, with vacuum valves
Met. pkg (Piston Rods / Valve Stems) United States (Not spec.)

Pistons Cast Iron rings sprung into solid head
Guides Steel Oil cups Needle
Crossheads Cast Steel
Wrist Pins Steel Rod cups Plunger
Parallel Rods to have solid ends

Valve Motion Stephenson
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings Chicago Bearing Metal Co's Composition "A"
Main Driving Wheels only to have hub liners of brass
Drivers, O. S. Diam. 50" Cen. diam. 44"
Wheel centers:- Main, cast steel, Others cast iron
Tires Steel Held by Shrinkage and Shoulder
Tires, Flanged, Pos. Front and back Size 3" X 5½"
Tires, Plain, Pos. Middle Size 3" X 6½"
Lateral play between driving boxes and wheel hubs = 1/16" total
Driving Boxes Steeled Cast Iron
Journals, Diam. 9" Length 12"

Springs. Make B. L. W.

Front Engine Truck None Wheeled ——
To swing ——each side of cen., Cen. pin liners ——
Journals, Diam.—— Length—— Boxes ——
Wheels, Diam. —— Tread—— Kind ——
Tires —— Cen. diam.—— Size ——
Tires held by ——

Back Engine Truck None Wheeled ——
To swing ——each side of cen., Cen. pin liners ——
Journals, Diam.—— Length —— Boxes——
Wheels, Diam. —— Tread ——Kind ——
Tires —— Cen. diam.—— Size——
Tires held by ——

Brake, position On all driving and tender wheels
Operating Parts { Engine, Sch. No.6-ET West'g. Combined Auto. and Straight Air / Eng. Tr'k, sch. —— }
Foundation Parts { Drivers, sch. WM-2 American O.S. Equalized / Eng. Tr'k, sch. —— }
Air pump One 9½" Pos. Left Side
Train connections Front and Back
Train signal, sch. None
Air reservoir to have hydrostatic test of 210 pounds
Certificates dated June 6th 1917 covering test of reservoir Nos. 12692 and 12730 furnished by West'g. Air Brake Co., are filed in Main Office, File No. 4656.

Tender Eight Wheeled, Drawing No. 610
Weight, with fuel and water, about 115,000 pounds

Tank 6,000 Gallons. Bill 4550
Tank "U" shape, sloping back. Fuel capacity 10 tons

Tool Boxes Hard Wood, top

Frame Steel 12" Channels

Front Drawbar height 30¾"
Pilot None Pushing shoes at rear
Back drawhead, center above rail 33½"
Coupler M. C. B. Automatic
Steps, hand holds, etc. to conform to I. C. C. requirements
Steps across rear with hand rails
Steps and hand rails on sloping back of tank

Trucks Arch bar type with cast steel bolsters

Springs Coil, B. L. W.
Journals, Diam. 5" Length 9"
Wheels, Diam. 30" Tread 4¼" Kind Chilled Cast Iron Plate
Tires None Cen. diam. —— Size ——
Tires held by ——
Safety chains Single

Brake Position On all wheels
Brake sch. No. 6-ET West'g. Automatic and Straight Air with 12" X 12" cylinder

List of tools, sch. 29
Photo sch. None Inspection by Alfred Lovell
To be weighed No Material specifs B. L. W.
Certificate of boiler test Three copies of B.L.W. form 1036
Junior laws to 3-15-17 Shipment On own wheels

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. Patents * Feed Pipe Strainer, Patented Sept. 1, 1903 (Cast On)

Property plates None

Painting:—Engine, style 291 Olive Green and Aluminum
Painting:—Tender, style 291 Olive Green and Aluminum

Mark on Cab sides, U. T. RY.

Road number on tank sides to be large
Road Nos. Pos. Road Nos. Name None
F.No. Plate 2
F.Sand box
Tank Sides

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-2357 and supplemental list of changes received Jan. 10,1916. As far as practicable, details to be same as on 6 32 D 786.

Memorandum Spec'n 10854 **Ry. Co's Class**

SPECIFICATION FOR LOCOMOTIVES 6 36 D 215 Gen. as Neg. 4385

FOR Chicago Heights Terminal Transfer Railroad 2/10/16 **Engine Drawing No.** 21 1-20-16.

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"
Total wheelbase, eng. and tend. { Actual 41' 9" / Limited to -----

2 **Curves** 35 degrees. Rails 70 lbs.

Limits, Height 14' 2" (See Supp. 18) Width 10' 10"
Weight (approximate) in working order, Total 147,000 lbs.
On F. tr'k ----- lbs., Drivers 147,000 lbs.. B. tr'k ----- lbs.

Tractive power 35,610 lbs., Ratio of adhesion 4.1
Work'g St'm Pres. 190 lbs., Service Switching
Fuel Soft Coal

3 **Boiler** Steel Thick ⅞" Bill 7669
Boiler, Diam. 72" Plan Straight top.
Boiler st'm pres. 200 lbs.. Tested to { 220 lbs. steam pres. / 267 lbs. water pres.
3 Longitud seams Buttjointed, double covering strips.

Dome, diam. 33" Pos. Central

3½ **Firebox** Steel Combustion chamb. None
Firebox, length 108-3/16" Width 42⅛" Depth: F. 67½" B. 62½"
Firebox, Tube ⅜" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diam.
Water space. Front 4" Sides 3" Back 3"
5 Water space, Frame double Riveted
Water space stays ⅞" dia. with 3/16" hole 1¼" deep from C.S.

Radial stays 1" diam. Sling stays front { Three rows of B.L.W. Expansion stays.
Button heads below crown on Eight central rows
Crown bars None Placed ----- above crown
Crown bolts -----

Flues None
6 **Tubes** #12 W.G. Charcoal Iron or Steel
Tube ends Swaged for copper ferrulee fire box ends.
Number 330 Diam. 2" Length 10' 5"

Heating Surface Flues None Combus. Chamb. None Total 1967⁰
Tubes 1800 Fire Box 167⁰ Fire Brick Tubes -----
Grate area 31.6 Ratio to Heating Surface 1 . 62
Superheater -----

Fire Brick arch None

7 **Grates** Rocking Bars and drop plate.
Ash Pan, Dampers front and back.

8 **Throttle** Balance Pos. Dome
Dry pipe Steel

Superheater None

9 **Smokebox** extension Wita Cleaning hole and cap Right and Left
Spark ejector or hopper With
Netting and deflect. plates With

Exhaust nozzles Double high

Stack Straight Dia. 18" Hole in S. B., dia. 21½"

18 **Safety Valves** (spec) Two Crosby 3"
Safety valves None with relief lever, Set to 190 pounds.
Whistle B.L.W. Chime low tone.

Steam Gauge One Iron 7" Maker:-Ashcroft. (Spec)
Steam gauge stand Iron **Clock** None

Water Gauge One B.L.W.(Ironclad) **Cab Lamps** to burn oil
Gauge Cocks Three Back Surface valve None
Lowest gauge cock 3" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

10 **Blow off Cock** Two Scully Everlasting 2" POS:-Right and left
11 **Cleaning Plugs**
Firebox Corners diagonal and sides
Crown, Three each side and three back.
Waist, One under front
Front tube sheet, Two Fusible plug None

Pump None Pos. -----
Top chamb. ----- Bottom chamb. -----
Feed Cock ----- Feed pipes -----
Checks ----- Check pipes -----

Injectors (spec) Two Hancock Type "A" No. 9
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B.L.W.(See sup.12) Pos. Right and Left
Locate Park-Skamiller stand to be moved ahead with the steam gauge stand. Place on top of the engine stand
Approved A.S. Hall

Steam Heat None

Cab Wood Ventilator in cab roof

Cab boards Wood Nosing None
Running boards Wood Nosing None
Hand rail Iron Located on Boiler

Back Bumper Bar Steel Back drawbar height 35½"

Pilot None Pushing shoes Cast in bumper.
Front Bumper Cast Steel Bumper plate None
Steps across front with handrail.
Steps, hand holds etc. to conform to I.C.C. requirements.
Front Drawhead, Center above rail 33½"
Coupler M. C. B. Automatic

Signal fixtures None

Headlight Two Round Case 18" Reflector, To burn Kerosene
Headlight, Nos. on sides With H'd'l't step With
Lamp shelf None Nosing -----

Bell 92 pounds. Gollmar Air Bell Ringer.
Sand Box (not spec) Two Diam. 28" Body Iron ptd. Pipes Iron
Sander Leach Air Trap A-1 in each box, to sand front and back.

Dome casing Iron painted.

Boiler Jacket #22 Plan. Steel Bands Iron Style 9
Boiler Lagging Magnesia sectional.

Ry. Co. 206-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS M. C. Beckley 8/Nov 1916

SPECIFICATION FOR LOCOMOTIVES 6 36 D 215 225

FOR Chicago Heights Terminal Transfer Railroad Co.

Frames Cast Steel Braces Solid

Cylinders, Diam. 21" Stroke 26"
St'm ports, Length 19" Width 1⅝" Bridges 1⅜"
Exh. ports, Length 29" Width 3" Valve lead 1/32"
Valve travel 5½" Steam lap 1" Exhaust clearance -----
Eccentric-crank throw 5" By-pass valve None
S. F. Lubr. (Spec) Detroit Triple #22 Bulls Eye.
Cyl'r heads Cast Iron; Lubr. pipes of Iron under jacket.
Cyl'r casings Iron ptd. Head covers Steel Painted.
St'm chest casings Iron ptd. Covers Steel Painted.
St'm chest valves Richardson Balanced, with vacuum valves.
Met. pkg (PISTON RODS / VALVE STEMS) Hayden. (Spec)

13 **Pistons** Cast iron rings sprung into solid head.
Guides Laird type Steel Oil cups Needle.
Crossheads Cast Steel
Wrist Pins Steel Rod cups Grease cups forged on all rods.
Parallel rods to have solid ends.

14 **Valve Motion** Stephenson.
15 Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 52" Cen. diam. 44" Centres Cast Steel
Driving wheels to have Bronze hub liners.
Tires Steel Held by Shrinkage and Shoulder.
Tires, Flanged, Pos. All Size 4" x 5½"
Tires, Plain, Pos. None Size -----
Lateral play between driving boxes and wheel hubs-1/16" total.
16 **Driving Boxes** Cast Steel
Journals, Diam. 9" Length 12"

17 **Springs.** Make Standard Steel Works.

Front Engine Truck None Wheeled -----
To swing -----each side of cen., Cen. pin liners -----
Journals, Diam.----- Length----- Boxes-----
Wheels, Diam. ----- Tread----- Kind-----
Tires----- Cen. diam. ----- Size-----
Tires held by-----

Back Engine Truck None Wheeled -----
To swing----- each side of cen., Cen. pin liners-----
Journals, Diam.----- Length----- Boxes
Wheels, Diam. ----- Tread -----Kind-----
Tires ----- Cen. diam. ----- Size-----
Tires held by -----

Brake, position On all driving and tender wheels.
Operating Parts { Engine, Sch. #6 ET West'g Combined Auto. and / Eng. Tr'k, sch. ----- Straight Air
Foundation Parts { Drivers, sch. M-3 American D.S. equalized. / Eng. Tr'k, sch. -----
Air pump One 9½" Pos. Left Side.
Train connections Front and back.
Train signal, sch. None

Tender Eight Wheeled, Drawing No. 435
Weight, with fuel and water, about 100,000 lbs.

Tank 5,000 Gallons, Bill 3887
Tank "U" Shape sloping back. Fuel capacity 8 tons.

Tool Boxes Hard Wood, Top.

26 **Frame** Steel 10" Channels.

Front Drawbar height 32½"
Pilot None Pushing shoes Cast in back bumper.
Back drawhead, center above rail 33½"
Coupler M.C.B. Automatic with Westinghouse Friction Draft gear.

27 Steps and handrails on sloping back of tank.
Steps across rear with handrail.

Trucks Arch Bar type with Cast Steel Bolster.

Springs Elliptic. Standard Steel Works make.
Journals, Diam. 5" Length 9"
Wheels, Diam. 33" Tread 4½" Kind Chilled cast iron plate.
Tires None Cen. diam. -----Size -----
Tires held by -----
Safety chains Single

Brake Position On all wheels.
Brake sch. #6 ET West'g Automatic and Straight Air with 12" x 12" cylinder.

List of tools, sch. 29
Photo sch. None Inspection B. L. W.
To be weighed Yes. Material specns B. L. W.
Certificate of boiler test Three copies of B.L.W. form 1036.
Junior laws to 2-9-16. Shipment On own wheels.

Brass shop finish, No. 1
Machine shop finish D-165.

B. L. W. Patents { Throttle , Patented Jan. 23, 1900 (Cast On) / Feed Pipe Strainer, Patented Sep. 1, 1903 (Cast On)

Property plates None

Painting:—Engine, style 291 Olive Green and Aluminum.
Painting:—Tender, style 291 Olive Green and Aluminum.

Lettering, etc. to be same as for 6 32 D 786. 4/10/16
Mark on both sides of front sand box, C. H. T. T. R. R. "
Mark on cab panel and tank sides, C. H. T. T. R. R. "

Road Nos. Pos. Road Nos. Name None
F.No.Plate 8
Back of tank.

266-67 Photo copied see box

SPECIFICATION FOR LOCOMOTIVES 6 35 D 215

FOR Chicago Heights Terminal Transfer Railroad Co.

226

1 All present requirements of the Interstate Commerce Commission to be complied with.

2 Ry.Co's truck is not in best of condition.

3 Ry.Co. has experienced considerable trouble with former locomotives in connection with boiler and firebox work, which should be given particular attention on this locomotive; it is thought that bad water conditions had something to do with it.

4 Fire box to be located over and above frames so that ash pan and mud ring will be readily accessible for repairs.

5 Mud ring of cast steel in one piece, and not welded.

6 Tubes of Charcoal Iron. If these cannot be secured in time, to avoid delay, B. L. W. is privileged to use lap welded steel of make recommended by B. L. W.

7 Drop plate to operate opposite to the one on 6 32 D 786, i.e. Drop plate to be placed at back end of fire box.

8 In connection with the manner of connecting the throttle rod to the throttle rigging inside of the dome, the purchaser asks that if it is passed through any castings or equipment on top of the boiler ¼" clearance be provided on all sides of the stem.

9 Particular attention to be given to brace rods in front of engine as considerable trouble was experienced with broken braces on 6 32 D 786.

10 Blow-off cocks to be arranged to be operated from cab.

11 Blow-off cocks and plugs to be located as shown in yellow on prints of B. L. W. boiler cards 11571 and 11572.
One plug in each side of waist, 18" above centre of boiler and 18" from front tube sheet.

12 Boiler checks to be securely fastened with four studs and Ball joint and nuts and screwed into shell.

13 Piston rods to be keyed to crosshead and securely fastened to piston head by taper fit and nut.

14 All holes in links and link lifters bushed with case hardened bushings.

15 Apply Ragonnet power reverse gear as covered on Extra Order No. 1674 dated 2-12-16.

16 Driving boxes to be equipped with Alvin Grease Cellars.

17 Spring rigging to have extra strong hangers.
Springs to be extra strong.

18 Safety Valves may be placed 15'0" above rail 4.11.16

FOR HEREAFTER :- MAKE THROTTLE LEVER LINK 4" LONGER TO BRING THE LEVER WITHIN REACH OF ENGINEER. R.S.McC. 5/9/16

TENDER.

26 Tender bumpers, front and back of cast steel.

27 All present requirements of the Interstate Commerce Commission to be complied with.
Steps, couplers, handholds, etc. to conform to the I.C.C. requirements.

THE BALDWIN LOCOMOTIVE WORKS As Spec'n 0-3569.
Memorandum Spec'n 10953. Dup. of 6-36 D 176 except where otherwise specified.

SPECIFICATION FOR LOCOMOTIVES 6 36 D 228 Gen. as 2174

FOR Chicago Short Line Railway Company **Engine Drawing No.** 22

4-26-16.

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Right 11' 0" Driving 11' 0" Total 11' 0"
Total engine wheelbase, eng. and tend. Actual 41' 10" Limited to ----

Curves 22 degrees

Limits, Height --- Width ----
Weight (approximate) in working order, Total 141,000 lbs.
On F. tr'k ----- lbs., Drivers 141,000 lbs., B. tr'k ---- lbs.

Tractive power 34,400 lbs., Ratio of adhesion 4.1
Work'g St'm Pres. 180 lbs., Service Switching
Fuel Soft Coal

Boiler Steel Thick 11/16" Bill 7796
Boiler, Diam. 68" Plan Straight Top
Boiler st'm pres. 180 lbs., Tested to 200 lbs. steam pres. / 240 lbs. water pres.
Longitud. seams Butt jointed, double covering strips

Dome, diam. 29" Pos. Central

3 **Firebox** Steel Combustion chamb. None
Firebox, length 108-3/16" Width 42⅛" Depth F. 65⅛" B. 62⅛"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
1 Firedoor opening 16" diameter
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Single Riveted
Water space stays 1" diam. with 3/16" hole 1½" deep from O.S.

Radial stays 1½" Sling stays front Two rows of B. L. W. Expansion Stays
Button heads below crown on Eight central rows
Crown bars None Placed --- above crown
Crown bolts ----

Flues ---- (account of time #12 W.G. hereafter) 7/12/16
2 **Tubes** 2¼ W.G. Spellerized Steel
Tube ends Swaged for copper ferrules firebox ends
Number 318 Diam. 2" Length 10' 5"

Heating Surface	Flues ----	Combus. Chamb. ----	Total 1682.2 sq. ft.
	Tubes 1721	Fire Box 161.2	Fire Brick Tubes
Grate area 31.5 sq. ft.	Ratio to Heating Surface 1 : 59.8		
Superheater -----			

5 **Fire Brick** Arch, On studs

4 **Grates** Rocking bars and drop plates
6 **Ash Pan,** Dampers Front and Back

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Smokebox extension With Cleaning hole and cap L.S. only
Spark-plate-or hopper With
7 Netting and deflect. plates With

Exhaust nozzles Double High

Stack Straight Dia. 18" Hole in S. B., dia. 21½"

Safety Valves (Spec.) Two Crosby 3"
Safety valves None with relief lever, Set to 180 lbs.
Whistle B.L.W. Plain with lever in cab

Steam Gauge Two Iron 7" Maker:-Ashcroft (Spec.)
Steam gauge stand Iron **Clock** None

Water Gauge One B.L.W. (Ironclad) **Cab Lamps** (See sup. 11)
Gauge Cocks Three back Surface valve None
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve without separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One Crane, 2" Pos:-(See sup. 89)
8 **Cleaning Plugs**
9 Firebox Corners diagonal, sides and back
Crown, Three each side, and four back
Waist, Two under (See sup. 9)
7 Front tube sheet, One Fusible plug None

Pump None Pos. -----
Top chamb. ---- Bottom chamb. ----
Feed Cock ---- Feed pipes ----
Checks ---- Check pipes ----

Injectors (Spec.) Two Sellers No. 10½
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check Sellers Duplex with stop valve Pos. Top of boiler

Steam Heat None

Cab Wood
Cab to be large and roomy, with large ventilator in roof.

Cab boards Wood Nosing None
Running boards Wood Nosing None
Hand rail Iron Located on Boiler

10 **Back Bumper** Bar Steel Back drawbar height 32½"

Pilot None Pushing shoes at Front
Front Bumper Cast Iron Bumper plate None
Steps Across front with handrail

Front Drawhead, Center above rail 33½"
Coupler Sharon M.C.B. Automatic.

Signal fixtures Iron on Bumper

11 **Headlight** Two Round Case 18" Reflector,
Headlight, Nos. on sides With H'd'l't step With
Lamp shelf None Nosing -----

Bell 92 pounds Collmar Air Bell Ringer
Sand Box Two Diam. 28" Body Iron painted Pipes Iron
Sander Leach Air, Trap A-1, in each box to sand front and back (Spec.)

Dome casing Iron Painted

Boiler Jacket #22 Plan. Steel Bands Iron Style 9 and 14
Boiler Lagging Magnesia sectional
Backhead of boiler to be lagged and jacketed
Removable lagging for staybolt inspection as B.L.W. print 5185

Ap. 206-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS
N. P. Grance. Jr. Engrg.
SPECIFICATION FOR LOCOMOTIVES 6 36 D 228. 228
FOR Chicago Short Line Railway Company.

Frames Cast Steel Braces Solid

Cylinders, Diam. 21" Stroke 28"
St'm ports, Length 19" Width 1⅞" Bridges 1½"
Exh. ports, Length 19" Width 2½" Valve lead ¼"
Valve travel 5½" Steam lap ⅞" Exhaust clearance -----
Eccentric crank throw 10⅝"
S. F. (Lubr.) Nathan Triple Bulls Eye.
Cyl'r heads Cast Iron; Lubr. pipes of Iron under jacket
Cyl'r casings Iron Ptd. Head covers Steel painted
St'm chest casings Iron Ptd. Covers Steel painted
St'm chest valves Balanced, with vacuum valves
Met. pkg (Piston rods Locate eyebs) UNITED STATES (Not Spec.)

12 **Pistons** Cast Iron rings sprung into solid head
13 **Guides** Laird Type, Steel 14 Oil cups Needle
Crossheads Cast Steel
Wrist Pins Steel Rod cups (See sup. 15-3/16)
Rods (See Sup. 15-16)

Valve Motion Walschaerts.
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.
Ragonnet Power Reverse Gear. (See sup. 17)

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

18 **Drivers,** O. S. Diam. 51" Cen. diam. 44" Centers Cast Steel

Tires Steel Held by Shrinkage and Shoulder
Tires, Flanged, Pos. Front and Back Size 3½"x 5½"
Tires, Plain, Pos. Middle Size 3½"x 6½"
Lateral play between driving boxes and wheel hubs - 1/16" total
19 **Driving Boxes** Cast Steel with Elvin Lubricators
Journals, Diam. 9" Length 12"

Springs. Make B. L. W.

Front Engine Truck None Wheeled ----
To swing --- each side of cen., Cen. pin liners ---
Journals, Diam. --- Length --- Boxes ---
Wheels, Diam. --- Tread --- Kind ---
Tires --- Cen. diam. --- Size ---
Tires held by ---

Back Engine Truck None Wheeled ---
To swing --- each side of cen., Cen. pin liners ---
Journals, Diam. --- Length --- Boxes ---
Wheels, Diam. --- Tread --- Kind ---
Tires --- Cen. diam. --- Size ---
Tires held by

20 **Brake,** position On all driving and tender wheels
22 Operating Parts: Engine, Sch. 6-ET West'g. Comb. Automatic and Straight Air.
27 Foundation Parts: Drivers, sch. WM-2, American O. S. Equalized
Eng. Tr'k, sch. ----
Air pump One 8½" Ga'ou Compound. Pos:- Left Side
Train connections Front and Back
Train signal, sch. None

41 **Tender** Eight Wheeled, Drawing No. 435
Weight, with fuel and water, about 100,000 lbs.

Tank 5,000 Gallons, Bill 4241
Tank "U" shape, sloping Back. Fuel Capacity 7 tons
41 Manhole in tank to be 4' 0" across tank and 2' 0" in length
Tool Boxes Hard Wood, Top.

Frame Steel 10" Channels

Front Drawbar height 32½"
Pilot None Pushing shoes At rear
Back drawhead, center above rail 33⅛"
Coupler Sharon M.C.B. Auto., with Farlow-Westinghouse Friction Draft Gear.
Steps, hand holds, etc., to conform to I.C.C. requirements
Steps across rear with handrail on bumper.
Steps on sloping back of tank.
Trucks Arch Bar Type with Cast Steel bolster

Springs Elliptic. B. L. W.
Journals, Diam. 5" Length 9"
Wheels, Diam. 33" Tread 4½" Kind Chilled Cast Iron Plate
Tires None Cen. diam. --- Size ----
Tires held by ---
Safety chains Single

Brake Position On all Wheels
Brake sch. 6 ET West'g. Auto. and Straight Air with 12"x 12" tender cylinder.

List of tools, sch. 29
Photo sch. None Inspection B. L. W.
To be weighed No Material specs. B. L. W.
Certificate of boiler test Three copies of B. L. W. form 1036
Junior laws to 6-10-16 Shipment On own wheels, (See sup. 28)

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. Patents: Throttle Patented Jan. 23rd, 1900 (Cast on)
Feed Pipe Strainer Patented Sept. 1st, 1903 (Cast on)

Property plates None

Painting:—Engine, style 291 Olive Green and Aluminum
Painting:—Tender, style 291 Olive Green and Aluminum

Lettering, etc., to be same as for 6 36 D 176.
Mark on sides of cab and tank collar, C. S. L. R'Y. CO.

Road Nos. Pos.	Road Nos.	Name None
F. No. Plate	9	
Dome		
Sides of Tank		
Back of Tank		

1926-67 Photo copied see box

SPECIFICATION FOR LOCOMOTIVES 6 36 D 228.

FOR Chicago Short Line Railway Company.

M

1 Fire Door to have Franklin Opener, Butterfly type.

2 Sufficient room to be left between crown-sheet and the top row of flues so that there will be sufficient body of metal to take care of the expansion and contraction.

3 Smoke consumer to be applied to consist of Three holes through each side water space of fire box provided with three steam jets.

4 Grates to have Rocking bars, double connected, with small fingers and with drop plate at rear of firebox.

5 Ash pan as B.L.W. print 25734 arranged so that it can be readily removed without having to jack up the boiler. Ash Pan slides for 6 36 D 176 have been unsatisfactory on account of warping. Ry.Co. suggest that heavy cast iron slide be used for this locomotive.

6 Spark hopper to have slide instead of cover.

7 Holes to be drilled in the side of the smokebox front at points on line with cleaning plug, in the front tube sheet, to permit of cleaning tools and steam jet being inserted from the outside: plug to be placed in the hole.

8 Arrangement of cleaning plugs as B.L.W. pt. 25723, except provide only one blow-off cock instead of two, and locate it in throat at mud ring.

9 Two plugs in barrel of boiler, conveniently located for thorough cleaning of same, i.e., One plug each side in first course above center line of boiler.
Two plugs in barrel of boiler just above Crown sheet for using straight hose nozzle. (Insert Sup. 29)
One plug above fire-door for cleaning all points around top of fire-door.
Additional plugs as shown in red on B.L.W. Boiler tracing No. 10822, to be located as follows:- In the center of the firebox one on each side; In the boiler under the dome one on each side of the hole shown by the print located about one foot up on the sides of the boiler, these plugs to be located so that the driving wheels will not interfere with getting at the plugs with a tool; One plug on each side of the boiler toward the front and located so that the wheels will not interfere with them; In other words, six additional cleaning plugs are desired.

10 Chafing plates between engine and tender to be broad to prevent catching when working on 22 degree curves.

11 Headlight Equipment to be Schroeder Electric, with full equipment of cab lights, type RE, Schroeder blue-print No. 500. Generator to be placed on top of boiler in front of cab.

12 Piston rods to be keyed to crossheads.

13 Guides to be fitted with cover.

14 One Oil Cup to be placed on guides, located centrally.

15 Connecting rods forged solid, and furnished with all necessary bolts, wedges and brasses.
Back ends of main rods to be forged with open jaw (Forked end type) to receive brass and wedge block, and held by outside bolts.
Wedge bolts at back end of main rod to be arranged so as not to protmude beyond the bottom of strap more than 1" to prevent bolts from being knocked off.
Parallel rods to have solid ends.

16 Grease cups to be forged solid on main and side rods.

17 Power reverse gear covered by Extra Order No. 6634 dated June 22, 1916.

18 All driving wheels to have cast iron hub liners applied in two halves so they can be easily renewed.

19 Driving box wedge bolts to be 1" diameter at neck with threads same as for 6 36 D 176.

20 Air brake distributing valve to be located in such a position as to avoid chance of freezing.

26 Air pump drip cocks to be fitted with drain pipe.

27 Brake shoe heads for drivers to be arranged to permit of adjustment that will allow the brake shoes to be inserted from the top rather than from the side and without disturbing any part of the brake rigging.

28 Galena Oil to be used for initial lubrication.

29 Two plugs in backhead of boiler just above crown sheet for using straight hose nozzle

FOR HEREAFTER:- the upper pins in the brake hangers to be extended through frame fillings with nuts on the inside
R.S.McC. 9/24/16

Hereafter, Seams on front back and sides of Cab to be butt seams instead of lap. Letter Chicago Office 6-[illegible]-1916

T E N D E R

11 Coping on tender to be arranged so as not to obstruct the view of the engineer and fireman when looking to rear.

p. 256-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS As Spec'n 6-3265.
As many details as practicable to be made interchangeable with those on 6-38 D18

Memorandum Spec'n 10631

SPECIFICATION FOR LOCOMOTIVES 6 38 D 48

Gen. as Neg. 3816 except with Wagon Top Boiler, Piston valve cylinders and Walschaerts Valve Motion

FOR Chicago, West Pullman & Southern R. R. Co.

Engine Drawing No. 14

12-30-15.

Gauge of Road 4' 8½" Play ⅜"
Wheelbase. Rigid 11' 6" Driving 11' 6" Total 11' 6"
Total wheelbase engine and tend. { Actual 43' 3" / Limited to -----

Curves -----

Limits, Height 14' 7" Width -----
Weight (approximate in working order, Total 157,000 lbs.
On F. tr'k ----- lbs., Drivers 157,000 lbs. B. tr'k ----- lbs.

Tractive power 38,500 lbs., Ratio of adhesion 4.
Work'g St'm Pres. 180 lbs., Service Switching
Fuel Soft Coal.

Boiler Steel Thick ⅜" and 13/16 Bill 7055.
Boiler, Diam. 72" Plan Extended Wagon Top.
Boiler st'm pres 180 lbs., Tested to { 200 lbs. steam pres. / 240 lbs. water pres
Longitud. seams Butt jointed, double covering strips.

Dome, diam. 33" Pos. Forward of firebox.

Firebox Steel Combustion chamb. None
Firebox, length 114-3/16" Width 42⅛" Depth F. 73⅞" B. 71⅜"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diam.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Double Riveted
Water space stays ⅞" diam. with 3/16" hole 1⅜" deep from C.S.

Radial stays 1" diam. Sling stays front { Three rows of P. L. W. Expansion Stays.
Button heads below crown on Eight central rows
Crown bars None Placed ----- above crown
Crown bolts -----

Flues #9 W. G. Steel
Tubes #12 W. G. Spellerized Steel
Tube ends Swaged for copper rings fire box ends.
Number 32 / 213 Diam. 5½" / 2" Length 10' 5"

Heating Surface Flues 476 sq. ft. Combus. Chamb. None Total 1617 sq. ft.
Tubes 1152 sq. ft. Fire Box 189 sq. ft. Fire Brick Tubes -----
Grate area 33.4 sq. ft. Ratio to Heating Surface 1 : 54.4
Superheater 372 sq. ft.

Fire Brick Arch on strude.

2 **Grates** Rocking bars and drop plate.
Ash Pan, Dampers Front and back.

Throttle Balance Pos. Dome.
Dry pipe Steel

Superheater With (See sup.3)

4 **Smokebox** extension With Cleaning hole and cap L. S. only.
Spark-ejector or hopper With
Netting and deflect. plates With

Exhaust nozzles Single high

Stack Straight Dia. 18" Hole in S. S., dia. 21½"

Safety Valves (not spare) Two Consolidated 3"
Safety valves None with relief lever, Set to 185 pounds.
Whistle B. L. W.

Steam Gauge Two Iron 7" Baker-Ashcroft. (Spare)
Steam gauge stand Iron **Clock** None

Water Gauge One Nathan Reflex **Cab Lamps** to burn oil.
Gauge Cocks Three Back. Surface valve None
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve without separate dry pipe to dome
Blower Valve B. L. W. 1½"

Blow off Cock One Crane 2" (to use stock) PCS:-Front
Cleaning Plugs
Firebox Corners diagonal, sides and back.
Crown, Three each side and two back.
Waist, One under front
Front tube sheet, One Fusible plug One

Pump None Pos. -----
Top chamb. ----- Bottom chamb. -----
Feed Cock ----- Feed pipes -----
Checks ----- Check pipes -----

6 **Injectors** Two Koniter XX No. 10
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check (See sup.5) Pos. Right and Left

Steam Heat None

Cab Wood

Cab boards Wood Nosing None
Running boards Wood Nosing None
Hand rail Iron Located on Boiler.

Back Bumper Bar Steel Back drawbar height 30⅛"

Pilot None Pushing shoes at front.
7 **Front Bumper** Cab Bumper plate None
Steps across front with handrail.
Steps, hand holds etc. to conform to I. C. C. requirements.
Front Drawhead, Center above rail 33½"
Coupler M. C. B. Automatic.

Signal fixtures Iron on bumper.

Headlight Two Round Case 16" Reflector, To burn Kerosene
Headlight, Nos. on sides With H'd'l'st step With
Lamp shelf None Nosing ----

Bell 92 pounds. Gollmar Air Bell Ringer.
Sand Box (not spec) Two Diam. 28" Body Iron Painted Pipes Iron
Sander Leach Air, Trap A-1 in each box to sand front and rear.

Dome casing Iron Painted.

Boiler Jacket #22 Soft Steel Pt. Bands Iron Style 9
Boiler Lagging Magnesia Sectional.

THE BALDWIN LOCOMOTIVE WORKS
H. J. Smith March 1916

SPECIFICATION FOR LOCOMOTIVES 6 38 D 48

FOR Chicago, West Pullman & Southern R. R. Co.

7 **Frames** Cast Steel Braces Solid

Cylinders, Diam. 22" Stroke 26"
St'm ports, Length 24.55" Width 1-11/16" Bridges -----
Exh. ports, Length ----- Width ----- Valve lead ⅛"
Valve travel 5½" Steam lap 13/16 Exhaust clearance -----
Eccentric crank throw 13-1/16" By-pass valve
S. F. Lubr. Nathan Five Feed Bulls Eye.
Cyl'r heads Cast Steel; Lubr. pipes of Iron under jacket.
Cyl'r casings Iron Ptd. Head covers Steel painted.
St'm chest casings ----- Covers -----
St'm chest valves 11" diam. Piston Type
Met. pkg { Piston rods / Valve stems } Lewis and Kunzer.
Piston rods to be keyed to crossheads.
Pistons Cast Iron rings sprung into solid head.
9 **Guides** Steel Oil cups Needle
Crossheads Cast Steel
Wrist Pins Steel Rod cups Plunger forged on.
10 Parallel rods to have solid ends.

Valve Motion Walschaerts.
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 50" Cen. diam. 44" Centres of Cast Steel

11/12 **Tires** Steel (See sup.11) Held by Shrinkage and Shoulder.
Tires, Flanged, Pos. All Size 3" x 5½"
Tires, Plain, Pos. None Size -----
Lateral play between driving boxes and wheel hubs—1/16" total.
Driving Boxes Cast Steel.
Journals, Diam. 9" Length 12"

Springs. Make B. L. W.

Front Engine Truck None Wheeled -----
To swing -----each side of cen., Cen. pin liners -----
Journals, Diam. ----- Length ----- Boxes -----
Wheels, Diam. ----- Tread -----Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----

Back Engine Truck None Wheeled -----
To swing -----each side of cen., Cen. pin liners -----
Journals, Diam. ----- Length ----- Boxes -----
Wheels, Diam. ----- Tread -----Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----

Brake, position On all driving and tender wheels.
Operating Parts { Engine, Sch. #6 ET West'g Combined Auto. and Eng. Tr'k, sch. ----- Straight Air
Foundation Parts { Drivers, sch. Wh-3 American O.S. Equalized. Eng. Tr'k, sch. -----
Air pump One 11" Pos. Left Side.
Train connections Front and Back.
Train signal, sch. None

Tender Eight Wheeled, Drawing No. 435.
Weight, with fuel and water, about 100,000 lbs.

Tank 5,000 Gallons, Bill 3887
Tank "U" Shape, sloping back. Fuel capacity 8 tons.

Tool Boxes Hard Wood, Top.

Frame Structural Steel 10" Channels.

Front Drawbar height 30⅜"
Pilot None Pushing shoes at rear.
Back drawhead, center above rail 33½"
Coupler M. C. B. Automatic.

Steps, hand holds etc. to conform to I. C. C. requirements.
Steps across rear with handrails.

Trucks Arch bar type with steel bolsters.

Springs Elliptic B.L.W. make.
Journals, Diam. 5" Length 9" McCord journal boxes.
Wheels, Diam. 33" Tread 4½" Kind Chilled Cast Iron plate.
Tires ----- Cen. diam. ----- Size -----
Tires held by -----
Safety chains Single.

Brake Position On all wheels.
Brake sch. #6 ET West'g Auto. and Straight Air with 12" x 12" tender cylinder.
Tender brake beams to be Crece.

List of tools, sch. 29
Photo sch. #2 Inspection Alfred Lovell.
To be weighed Yes. Material spec'ns B. L. W.
Certificate of boiler test Three copies of B. L. W. form 1036.
Junior laws to 3-1-16 Shipment On own wheels.

Brass shop finish, No. 1
Machine shop finish D-165.

B. L. W. Patents
- Throttle — Patented Jan. 23, 1900 (Cast On)
- Feed Pipe Strainer, — Patented Sept. 1, 1903 (Cast On)
- Steam Pipe Cover — Patented July 18, 1911 (Cast On)

Property plates None

13 **Painting:** Engine, style 291 Olive Green and Aluminum.
Painting:—Tender, style 291 Olive Green and Aluminum.

Mark on tank sides, CHICAGO, WEST PULLMAN & SOUTHERN RAILROAD

13 Road Nos. Pos. — Road Nos. 22 — Name None
F. No Plate
F. Sand Box
Cab Sides Sides of Roof

SPECIFICATION FOR LOCOMOTIVES 6 38 D 48

FOR Chicago, West Pullman & Southern R. R. Co.

1 All castings such as truck centers, top and bottom of cast steel

2 Grate to be arranged to be dumped outside of cab.

3 Superheater as Locomotive Superheat Co's Spec'n P-1076, dated Jan. 29-1916.
Superheater Schmidt type placed in 5½" tubes connecting with top header in smoke box and with outside steam pipe connections to valve chamber.
Royalty on superheater payable by B. L. W.

4 Additional hand hole and cup to be applied in each side of smoke box for inspection of superheater.

5 Injector check to be Nathan reversible stop check, No. 287-A.

6 Furnish Nathan Coal Sprinkler.

7 Bumper brackets, front of locomotive to be of cast steel.

8 Back foot plate to be heavy.

9 "T" shape guide standards to be applied on back end of guides.

10 Main rods to be coupled to middle pair of drivers.

11 Driving tires from Railway Steel Spring Co.

12 Apply Detroit flange lubricator to tires of front and back driving wheels.

13 Lettering, etc. to be applied in silvered colored paint same as for 6 36 D 139.
Figures to be 10" high on front number plate, front sand box and on sides of cab and tank. The number on sides of tank to be 10" above the lettering.
Mark on sides of tank to be in letters 6½" high, 4" wide.

14. Final test of locomotive to be made in the day time with full working steam pressure and with wheels resting on the track, in other words, test to be made under actual operating conditions so as to detect before shipment any leaks or defects which might not be located under a night test. Mr. Lovell will furnish a certificate that the locomotive complies in every respect with Co's plans and specifications so that when the engine arrives at destination it can go into immediate service. 3/29/16

11-266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS

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SUPERHEATER SPECIFICATION FOR LOCOMOTIVES 6 38 D 48

FOR Chicago, West Pullman & Southern R. R. Co.

Locomotive Superheater Company's Specification No. P-1076 dated Jan. 29, 1916.
Specification for Superheater with Top Header, Double Loop Arrangement.

BOILER TUBES 213 in number 2 O. D. 10 ft. 5 ins. over tube sheets. Tubes located between and adjacent to Boiler flues are to be beaded over at front end.

BOILER FLUES 32 in number 5½ O. D. #9 B.W.G. thick of cold drawn seamless steel. Flues to be straight, true to gauge and wall not to vary more than one gauge from specified thickness, as shown on **Card 10731**

BOILER FLUE SETTING Radius 1/16 inch on both edges of flue holes in firebox tube sheet and on front edge of flue holes in front flue sheet as shown on drawings, except for copper sheets. Back end to be set with copper ferrules, rolled, beaded and prossered except for copper sheets. Front end to be rolled and beaded. Rollers to have at least 5 rolls. Prosser to have at least 12 sections **Card 1137**

TUBE SHEET LAYOUT to be in accordance with **Card 5637**

S. H. UNITS 32 units 1½ O. D. #9 B.W.G. thick of seamless steel. Pipes united by cast steel return bends as shown on **Card 10694-L**
Each unit to be tested, before being placed in boiler, with water under pressure of 250 pounds.

S. H. PIPE SUPPORTS Of steel fastened securely on superheater pipes so as not to slide as shown on **Card 1790**

S. H. PIPE JOINT To be made in best possible manner to insure absolutely tight joints in accordance with the notation on **Card 1043**

S. H. UNIT CLAMP BOLT To be of steel having a tensile strength between 60,000 lbs, and 70,000 lbs. per sq. inch and to be as shown on **Card 1086-A**

S. H. HEADER To be of close grain cylinder iron, steam tight in every respect. Joint ring for connection to dry pipe to have flat side against header flange. Casting should be moulded with the face having the superheater joints placed downward in the mould to secure the best quality of metal on surface where superheater joints are made. Each header to have a serial number cast on in such a location as not to be removed in finishing. No patch plugs allowed on ball joint seats. Headers must not be treated excessively with sal ammoniac. Header casting to be tight under water pressure of 250 lbs. Test pressure to be applied separately to the saturated and to the superheated steam passages, so as to insure soundness of all partition walls. **Card 10140-E**

S. H. HEADER SUPPORTS To be securely bolted or riveted to boiler shell. To be properly located so as to support the header after header has been correctly located. Header should then be bolted to supports. This to be done before superheater units are put in place. **Card 1323**

ST. PIPE JOINT RINGS Should be of cast iron.

DEFLECTING PLATE To be constructed so as to permit easy inspection and removal of superheater units and joints. Design to be in accordance with **Card 10730**

DAMPER CYLINDER To be carefully and accurately made. Piston not to be more than 0.01 inch smaller than bore. Bearings for Piston and extension to be in line. Piston to be ground and to operate freely under a pressure as low as 40 lbs. per sq. in. Steam Pipe to damper cylinder should be as short and free from bends as possible so as not to cause water to collect in cylinder. Pipe to be protected against freezing. **Card 1149**

DAMPER SHAFT COUNTERWEIGHT To be painted a light color to render it easily visible by the engineer **Card 1067**

S. H. ARRANGEMENT To be in accordance with **Card 4665**

TEST (FINAL) The Superheater, after assembling in boiler and after steam pipes are fitted up, is to be thoroughly tested and to be tight under water pressure of 250 lbs.

Name	Card	Name	Card
Damper	10651-L	Damper Shaft Link	1070
Damper Cylinder Arm	1074	Patent Plate	3157
Damper Cylinder Pipe Fitting		S. H. Unit Bolt Washer	1071
Damper Cylinder Pipe Union	1287	S. H. Unit Clamp	1073
Damper Cylinder Piping Diagram	1503	S. H. Unit Clamp Washer	1072
Damper Cylinder Support		S. H. Pipe End	1344
Damper Shaft	1235-M	S. H. Pipe Band	1988
Damper Shaft Arm	1234 & 1226	Return Bends	10300
Damper Shaft Bearing (O. S.)	1148 & 1223	Deflecting Plate Handle	1487
Damper Shaft Bearing (I. S.)	1275-G	Lubricator Connection	3023

THE BALDWIN LOCOMOTIVE WORKS AS SPEC'N C-2109
All parts to be interchangeable with S 34 D 536, including wheels, etc.

Memorandum Spec'n 10862

SPECIFICATION FOR LOCOMOTIVES S 34 D 544 and 545 7/14/15 Gen. as Neg. 4328

FOR Akron & Barberton Belt R. R. Co. **Engine Drawing No.** 43

10-26-15

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 13' 0" Driving 13' 0" Total 21' 4"
Total wheelbase, eng. and tend. {Actual 48' 10½" / Limited to ------

Curves 32 degrees **Rails** 60 lbs.

Limits, Height 15' 0" Width -----
Weight (approximate) in working order, Total 144,500 lbs.
On F. tr'k 16,500 lbs., Drivers 128,000 lbs., B. tr'k ----- lbs.

Tractive power 29,370 lbs., Ratio of adhesion 4.4
Work'g St'm Pres. 180 lbs., Service Switching
Fuel Soft Coal

6 **Boiler** Steel Thick 11/16" Bill 6758
Boiler, Diam. 68" Plan Straight Top
Boiler st'm pres. 180 lbs., Tested to {200 lbs. steam pres. / 240 lbs. water pres.
Longitud. seams Butt jointed, double covering strips.

7 **Dome,** diam. 29" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 102-3/16" Width 41½" Depth F. 70¾" B. 68½"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening One Oval 13" x 18"
Water space, Front 4" Sides 3½" Back 3"
Water space, Frame Single Riveted
Water space stays ⅝" diam. with 3/16" hole 1½" deep from O. S.

9 Radial stays 1" diam. Sling stays front {Two Rows of B.L.W. Expansion Stays
Button heads below crown on Eight central rows
Crown bars None Placed ---- above crown
Crown bolts -----

Tubes #12 W. G. Charcoal Iron
Tube ends Swaged for copper ferrules, fire box ends.
Tubes, No 273 Diam. 2" Length 11' 10"

Heating Surface, Tubes 1686 sq. ft. Firebox 161 sq. ft. Total 1841 sq. ft.
Grate area 29.2 sq. ft. Ratio to heat'g surface, 1 : 63
Superheater ----- Feed-water heater -----
Reheater ----- Fire brick tubes -----

Fire Brick arch None

Grates Rocking bars and drop plate
9 **Ash Pan,** Depth 27" Dampers Front and Back

Throttle Balance Pos. Dome
Dry pipe Wrot Iron

Superheater None

Smokebox extension With Cleaning hole and cap R. and L.
Spark-ejector-exhaust With
Netting and deflect. plates With

Exhaust nozzles Double, High

Stack Straight Diam. 18" Hole in S.B. 18"
Stack to have steel base

Safety Valves Three Crosby 3½"
Safety valves One with relief lever, Set to 180 lbs.
Whistle Chime, B. L. W.

Steam Gauge One Iron 7" MAKER:- Ashcroft
Steam gauge stand Iron **Clock** None

Water Gauge One Klinger **Cab lamps** to burn oil
Gauge Cocks Three Back Surface valve None
Lowest gauge cock 2½" above highest part of crown
Lubricator steam valve without separate dry pipe to dome.
Blower Valve B. L. W.

Blow off Cock One Johnstone POS:- Front
Cleaning Plugs as shown on B.L.W. Tracing 35513 7/14/15
Firebox Corners, back ones diagonal, sides and back
Crown, Three each side and two back
Waist, Two under, one near front and one near fire box
Front tube sheet, One FUSIBLE PLUG:- One
All plugs as P.R.R. standard tracing 33772-A
Plugs to have square and large outer ends. (ORDER WAS 7/7/15)

Pump None Pos. -----
Top chamb. ---- Bottom chamb. -----
Feed cock ---- Feed pipes -----
Checks ---- Check pipes -----

Injectors Two Sellers Class "N" Improved No. 9
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. Right and Left

Steam Heat None

10 **Cab** Steel
Cab brackets of cast iron instead of steel plate.
Cab boards to be covered with wood 1½" thick 7/14/15
Cab boards Steel Nosing T-Iron
Running boards Steel Nosing T-Iron
Hand rail Iron Located on Boiler

11 **Back Bumper** Bar Steel Back drawbar height 31½"

Pilot None Pushing shoes Front
Front Bumper Cast Iron Bumper plate None
5 **Steps** across front, with hand rail on bumper.

Front Drawhead, Center above rail 33½"
Coupler, Sharon Tower H. C. B. Automatic, of Steel 7/14/15

Flag fixtures None

Headlight Two Square Case 23" Reflector, To burn Kerosene
Headlight, Nos. on sides With H'dl't step With
Lamp shelf Iron Nosing Iron Ptd.

Bell 92 pounds Gollmar Air Bell Ringer
Sand Box Two Diam. 28" Body Iron Painted Pipes Iron
Sander Leach Air, Trap A-1, in each sand box.

Dome casing Iron Painted

Boiler Jacket #22 Plain Steel Bands Iron Style 9
Boiler Lagging Magnesia Sectional

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1 p. 266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS

Engine M. A. McFaddin Dec 1915 Feb. 1916

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SPECIFICATION FOR LOCOMOTIVES S 34 D 544 and 545 One set of prints to be sent to M. H. Crawford 7/14/15

FOR Akron & Barberton Belt R. R. Co.

Frames Hammered Iron, 4½" thick Braces Welded

12 **Cylinders,** Diam. 20" Stroke 24"
St'm ports, Length 16" Width 1¾" Bridges 1½"
Exh. ports, Length 16" Width 2¾" Valve lead ¼"
Valve travel 5½" O. S. lap ¾" Ins. lap -----
Eccentric crank throw 5¾"
S. F. Lubr. Nathan Triple Bulls Eye {Copper pipes under jacket
Cyl'r heads Cast Iron
Cyl'r casings Iron Ptd. Head covers Steel Painted
St'm chest casings Iron Ptd. Covers Steel Painted
St'm chest valves Richardson Balanced, with vacuum valves
Mat. pkg {PACKING RINGS United States (worsted) / VALVE STEMS

13 **Pistons** Cast Iron rings sprung into solid head
18 **Guides** Laird Type, Steel Oil cups Needle
Crossheads Cast Steel
Main Pins Steel Rod cups Plunger, forged on

16 **Valve Motion** Walschaerts
{Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings of Phosphor Bronze

Drivers, O. S. Diam. 80" Cen. diam. 44" Centres Cast Steel

15 **Tires** Steel Held by Shrinkage and Shoulder
Tires, Flanged, Pos. Front and Back Size 3" x 5½"
Tires, Plain, Pos. Middle Size 3" x 6½"
Lateral play between driving boxes and wheel hubs - 1/16" total
Driving Boxes Steeled Cast Iron
Journals, Diam. 8" Length 12"

Driving spring stirrups Wrot Iron

17 **Springs,** Make B. L. W.

19 **Front Engine Truck** Two Wheeled Swing Bolster, Centre Bearing
To swing 5½" each side of cen. Cen. pin liners None
Journals, Diam. 5½" Length 9" Boxes Cast Iron
Wheels, Diam. 30" Tread ----- Kind Cast Iron Spoke Center
Tires Steel Cen. diam. 28" Size 3½" x 5½"
Tires held by Shrinkage and Shoulder

Back Engine Truck None Wheeled -----
To swing ----- each side of cen. Cen. pin liners -----
Journals, Diam. ----- Length ----- Boxes -----
Wheels, Diam. ----- Tread ----- Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----

19 **Brakes,** position On all driving and tender wheels.
Operating Parts {Engine, Sch. A-1 and SUA West'g Auto. and Straight Air / Eng. Tr'k, sch. -----
Foundation Parts {Drivers, sch. BE-2 American Outside Equalized / Eng. tr'k, sch. -----
20 Air pump Two - 9½ Pos. Right and Left
Train connections Front and Back
Train signal, sch. None

Tender Eight Wheeled, Drawing No. 610
Weight, with fuel and water, about 130,000 lbs.

30 **Tank** 7600 Gallons, Bill - 4059
31 35 Tank "U" Shape, Straight Top. 30 Fuel Capacity 10 tons.
Ladder on back of tank
Tool Boxes of hard wood, top

Frame Steel, 12" channels.

11 Front drawbar height 30½"

Back drawhead, center above rail 33½"
Coupler Sharon Tower H. C. B. Auto. of steel, with Westinghouse Friction Draft Gear.
Rear end bumping beam to be used in pushing cars.
5 32 Steps across rear with hand rail on bumper
Push Pole pockets must be on the corners (not 10" in)
Trucks Arch Bar type with Steel Bolsters.

Springs Elliptic, B. L. W. make
Journals, Diam. 5½" Length 10"
Wheels, Diam. 33" Tread 4½" Kind Rolled Steel
Tires None Cen. diam. ---- Size ----
Tires held by ---- Wheel Rims 2½" thick
Safety chains Single

Brake Position On all wheels.
Brake sch. FL-1212 and SUB West'g Auto. and Straight Air
Introduce brake shaft to be arranged so that brake wheel will be 44" above top of tank.
Brake shaft pillow to be applied to side of tank 7/14/15

List of tools, sch. 29 Bolts, nuts and threads B. L. W.
Photo sch. None Inspection (See Sup. 4.
To be weighed No Material spec'ns (See sup. 1.
Certificate of boiler test ~~Three copies of B. L. W. form 611~~ (See Sup. 2.)
Junior laws to 11-15-15 Shipment On own wheels.

Brass shop finish, No. 1
Machine shop finish D-165

Patent Plates {Throttle, Patented Jan. 23, 1900 (Cast on) / Feed Pipe Strainer, Patented Sept. 1, 1903 (Cast on)

Property plates None

Paintings:—Engine, style 214 Olive Green and Color
Painting:—Tender, style 214 Olive Green and Color
Lettering, etc. to be same as for S 34 D 536, Style and size of lettering, etc., to conform to Penna. Lines Standard.
Mark on tank sides, AKRON & BARBERTON BELT R. R. CO.

No. Pos.	Road No.	Name None
F. No. Plate	? for 544 / for 545 7/14/15	
Cab Panel		
Back of tank		

To get the engine away from the sets of engine truck springs made from defective plate by Standard Steel Works, and send another set of engine truck springs made to meet P.R.R. Spec. No. 126 C, ordered through Penna. Lines Dept. Order No. 1157 dated C. I. 31 Lbs. No Charge. 7/14/15 Sent 8-24-16 per Order 1157 C.I. 31

1906-67 Photo copied see box

SPECIFICATION FOR LOCOMOTIVE 8 34 D 544 and 545

FOR Akron & Barberton Belt R. R. Co.

1 All material entering into the construction of locomotive to be in accordance with Pennsylvania specifications as follows:-

1-C Boiler and fire box steel
3-A Tin and Terne Plate
4-A Steel Billets or blooms for forgings
5 Alloys
5-A Driving Axles
6 Crank Pin Steel
7-D Stay Bolt Iron
8-B Soft Steel Bars
9-G Bar Iron
10-B Carbon Steel Axles for tender and engine trucks.
11-C Chains
12-C Helical Springs
13 Elliptical Springs
14-D Cast Iron Wheels.
15 Wire Netting for spark arrester.
17-B Iron and steel boiler tubes, superheater tubes, arch tubes and safe end material
18 Lard Oil
19-A Wrought Iron and Steel Pipe
29-J Tires
32-C Phosphor Bronze Bearing Metal
33-E Lumber
34-A Locomotive Spring Steel
35-A Wood Preservative
36-A Steel Castings
43-A Pig Lead
44-F Air Brake Hose
45-B Waste
46-B Plush
47 Phosphor Copper
52-A Steel Automatic Coupler
55-A Air Signal Hose
56 Bulls eye lubricator glasses
57 Lining metal for journal bearings
58-A Standard Black for use on steel or iron.
61 Klinger Water Gauge Glasses
64-A Wrought Steel single plate wheel
67 Glass Water gauge and Lubricator Tubes
88-A Instructions for using wood preservative
93-A Key denoting finish, materials, etc. shown on drawings
97-B Method of applying and maintaining tubes on arch pipes in locomotive boilers.
106-E Rules for inspection and care of boilers and their appurtenances.
124-C Sectional Magnesia Lagging
130 Steam Gauges
130-A Journal box packing
131 Carbon Steel Billets for case hardened forging.
116 Tank hose
134-B Cast Steel Bolsters
135 Cast Steel truck sides.
185 Heat treated carbon steel jack shafts, driving and trailer axles for locomotives
186 Heat treated carbon steel crank pins
187 Carbon Steel billets for locomotive heat treated forgings.
197 Cast steel frames for locos and pedestal type tender trucks
199 Instructions to be followed in painting the different parts of new and repaired locomotives and tenders.
L-5 Instructions for welding flues to back flue sheet.
L-6-B Piston rod and ring limits.
L-9-A Cylinder and piston valve bushing limits.
L-10-A Piston valve limits.
L-15-A Wheels and axles.
L-16 Driver box limit
L-17 Main rod limits.
191 Axle turning and wheel fit limits for car, tender and engine trucks.

2- Certificate of Axle test for Journals in accordance with the requirements of the I.C.C. and the Ohio State Railroad Commission in form. One certified M.P.-72 in copies of M.P.-1 and One copy of M.P.-1. One certificate of Journal M.P.-72 and M.P.-1 to be forwarded in the rod and the remainder to be sent to Mr. D. T. Crawford 1/3/12

4 Locomotive to be inspected by a representative of the Pennsylvania Lines East.
Copies of orders placed with the various manufacturers for material to be sent to Mr. J. T. Wallis, Gen. S.M.P., P.R.R. Altoona, Pa., so he may arrange to have his inspectors on hand at works of manufacturers to make inspection and take samples of material to be forwarded to the Laboratory at Altoona for test.

5 All devices and parts of engine to comply with the requirements of the I. C. C. and Ohio State Commissions.

6 All boiler fittings to have 12 "V" threads, the same as Pennsylvania Lines West; to enable securing plugs, etc. from Lines West.

7 Dome of one piece type.

8 Boiler stays to be provided with 12 U. S. Standard threads instead of 12 "V" threads.

9 Ash Pan, slide bottom type, if of such a design as to not allow fire to fall along the line. The P.L.W. to submit design to be approved.
Ash Pan to be as P.L.W. Tracing 29754 and 6027.

10 Piping of double strength with extra heavy fittings to be applied in cab.

11 Spring buffer between engine and tender. Strong connection between engine and tender.

12 Use 21" cylinder pattern

13 Piston rods of steel, ground and keyed to crosshead.

14 Parallel rods to have solid ends.

15 Tires to be hard material to withstand continuous switching work.

16 Reverse Shaft of Wrot Iron.

17 Equalizing beams of wrot Iron.

18 Front engine truck frame of Wrought Iron.

19 Engineer's brake valve to be C-6.
Sight feed lubricator on air pump air cylinder.
J. M. Expander rings for driver brake cylinders.
Double header cock, piece 44845 instead of cutout cock, piece 2135.

20 One air pump exactly same as for 8 34 D 536 to be placed on left side, the other one to be placed on the right hand side in the same location or as near as may be.

21 Certificate of boiler test: Three copies of B.L.W. Form 2911 (see Sub 2) and four copies of I.C.C. Form 4141 for Cyl. Certificate of tubes test: Three copies of B.L.W. Form 1036 and four copies of I.C.C. Form 4, B.L.W. Form 1141 for Sub 1 Photo

TENDER.

30 Tank to be exact duplicate in every particular of 8 34 D 536, except that the water capacity should be 7600 gallons instead of 7000 gallons. Fuel capacity to be 10 instead of 12 tons Tank capacity and wheelbase to be as shown on B.L.W. Tracing 30180 11/10

31 Tank man hole to be oblong, 18" x 36".

32 Two steps and top hand hold to be placed on the inside of tank wall, to permit going from deck to the top of tank. These steps are to be narrow and placed so as not to interfere with passage of fireman through gangway.

33 Heavy corner irons on each corner of tank

11-266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS AS SPECIFICATION C-1623

Memorandum Spec'n 10244

SPECIFICATION FOR LOCOMOTIVES 8 26 D 198

FOR The Alexandria & Western Railway Co.

J. 5-28-14

Gen. as Neg. 1957

Engine Drawing No. 42

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 14' 6" Driving 14' 6" Total 21' 10"
Total wheelbase, eng. and tend. {Actual 44' 7" / Limited to -----

Curves 6 degrees on Y's

Limits, Height ----- Width -----
Weight (approximate) in working order, Total 90,000 lbs.
On F. tr'k 14,000 lbs., Drivers 76,000 lbs., B. tr'k ----- lbs.

Tractive power 15,800 lbs., Ratio of adhesion 4.1
Work'g St'm Pres. 180 lbs., Service Freight
Fuel Soft Coal

Boiler Steel Thick ½" & 9/16" Bill 72-58
Boiler, Diam. 48" Plan Extended Wagon Top
Boiler st'm pres. 200 lbs., Tested to {220 lbs. steam pres. / 267 lbs. water pres.
Longitud. seams Butt jointed, double covering strips.

Dome, diam. 26" Pos. Forward of Firebox

Firebox Steel Combustion chamb. None
Firebox, length 64 15/16" Width 34½" Depth F. 62 5/8 B. 61 5/8
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diameter
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Single Riveted
Water space stays 1" diam. with 3/16" hole 1½" deep from O. S.

Radial stays 1½" diam. Sling stays front One I bar
Button heads below crown on 5/X central rows
Crown bars None Plate ----- above crown
Crown bolts -----

Tubes #12 W. G. ~~Charcoal Iron or Seamless Steel,~~ Spellerized Steel
Tube ends Swaged for copper rings firebox ends.
Tubes, No 156 Diam. 2" Length 10' 9"

Heating Surface, Tubes 877.0' Firebox 95.0' Total 966.1'
Grate area 45.2' Ratio to heat'g surface, 1 : 62.8'
Superheater —— Feed water heater ——
Reheater —— Fire brick tubes ——

Fire Brick arch On Studs

Grates Rocking bars and drop plate.
Ash Pan, Depth 16" (Hand type) Dampers FRONT & BACK
Ash pan to be equipped with dumping arrangement to comply with I. C. C. requirements.
Throttle Balance Pos. Dome
Dry pipe ~~Cast Iron or~~ Steel

Superheater None

Smokebox extension With Cleaning hole and cap L. S. Only
Spark ~~arrester~~ hopper With
Netting and deflect. plates With

Exhaust nozzles Double High

Stack Cast Iron, straight Diam. 16" Hole in S.B. 18"

Safety Valves (Not Spec) Two Coale 2½"
Safety valves None with relief lever, Set to 180 lbs.
Whistle B. L. W.

Steam Gauge One Iron 7" Maker, Ashcroft (Not spec)
Steam gauge stand Iron **Clock** None

Water Gauge One B.L.W.(Ironclad) **Cab lamps** Electric
Gauge Cocks Three Back Surface valve None
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome.
Blower Valve B. L. W.

Blow off Cock One B. L. W. Pos:- Left Side
Cleaning Plugs front ones diagonal, right side and front
Firebox Corners, ~~sides, front and back~~
Crown, Two each side and two back
Waist, One under front.
Front tube sheet, One. Fusible Plug, One.

Pump None Pos.-----
Top chamb. ----- Bottom chamb. -----
Feed cock ----- Feed pipes -----
Checks ----- Check pipes -----

Injectors (Not Spec) Two Monitor No. 7.
Injectors, Pos. R. and L. Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. R. and L.

Steam Heat None

Cab Wood.

Cab boards Wood Nosing None
Running boards Wood Nosing None
Hand rail Iron Located on Boiler

Back Bumper Bar Steel Back drawbar height 32¾"

Pilot Wood Pushing shoes None
Front Bumper Oak Bumper plate With
Steps, handholds, etc. to conform to I. C. C. requirements

Front Drawhead, Center above rail 33⅛"
Coupler M. C. B. Auto. having knuckle with 13" face.

Flag fixtures Iron on Bumper.

Headlight:- Pyle National Electric.
Headlight One Round Case 18" Reflector, To burn -----
Headlight, Nos. on sides With H'dl't step With
Lamp shelf None Nosing -----

Bell 85 pounds.
Sand Box (Not Spec) One Diam. 28" Body Iron Ptd. Pipes Iron
Sander Leach Air, trap A and D combination to sand front and rear.

Dome casing Iron Painted.

Boiler Jacket #18 Soft Steel Ptd. Bands Iron Style 9
Boiler Lagging Magnesia Sectional

THE BALDWIN LOCOMOTIVE WORKS

Engine R.E.McFalls. July 1914

SPECIFICATION FOR LOCOMOTIVES 8 26 D 198

FOR The Alexandria & Western Railway Co.

J.

238

Frames Cast Steel Braces Solid

Cylinders, Diam. 16" Stroke 24"
St'm ports, Length 15" Width 1¼" Bridges /"
Exh. ports, Length 15" Width 2½" Valve lead 3/32"
Valve travel 5½" O. S. lap 7/8" Ins. lap ——
Eccentric crank throw 9 3/16"
S. F. Lubr. (Not Spec) Michigan Triple Bulls Eye {Iron pipes / Under ~~O.D. of~~ jacket 7/8"
Cyl'r heads Cast Iron
Cyl'r casings Iron Ptd. Head covers Steel Pointed
St'm chest casings Iron Ptd. Covers " "
St'm chest valves Richardson balanced, with vacuum valves.
Met. pkg {Piston rods / Valve stems} UNITED STATES (Not spec)

Pistons Cast iron rings sprung into solid head.
Guides Steel Oil cups Needle
Crossheads Cast Steel
Wrist Pins Steel Rod cups Plunger.
Parallel rods to have solid ends.

Valve Motion Walschaerts.
{Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 50" Cen. diam. 44" Centers Cast Iron

Tires Steel Held by Shrinkage & Shoulder.
Tires, Flanged, Pos. Front and Back Size 3"x 5½"
Tires, Plain, Pos. Middle Size 3"x 6½"
Lateral play between driving boxes and wheel hubs - 1/16" total
Driving Boxes Steeled Cast Iron
Journals, Diam. 7" Length 8"

Driving spring staples Wrot Iron

Springs. Make B. L. W.

Front Engine Truck Two Wheeled Swing Bolster
To swing 2½" each side of cen. Cen. pin liners None
Journals, Diam. 4½" Length 8" Boxes Cast Iron
Wheels, Diam. 30" Tread 4½" Kind Chilled Cast Iron, spoke
Tires ----- Cen. diam. ----- Size -----
Tires held by -----

Back Engine Truck None Wheeled -----
To swing -----each side of cen. Cen. pin liners -----
Journals, Diam. ----- Length ----- Boxes -----
Wheels, Diam. ----- Tread ----- Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----

Brake, position On all Driving and Tender Wheels.
Operating Parts {Engine, Sch. 6-ET, West'g. Comb. Auto. & Straight Air. / Eng. Tr'k, sch. -----}
Foundation Parts {Drivers, sch. NM-1, American O. S. Equalized. / Eng. tr'k, sch. -----}
Air pump One 9½" Pos. Left Side
Train connections Front end Back
Train signal, sch. None

Tender Eight Wheeled, Drawing No. 435
Weight, with fuel and water, about 80,000 lbs.

Tank 4000 Gallons, Bill 3839
Tank "U" Shape, Straight Top. Fuel Cap. 5 tons.

Tool Boxes Hard Wood, top.

Frame Steel 10" channels.

Front drawbar height 30"

Back drawhead, center above rail 33⅛"
Coupler M. C. B. Auto. having knuckle with 13" face.

Steps, handholds, etc. to conform to I. C. C. requirements.
Steps across rear with handrail.

Trucks Arch Bar, Steel Bolster.

Springs Elliptic, B. L. W.
Journals, Diam. 4½" Length 8"
Wheels, Diam. 33" Tread 4½" Kind Chilled Cast Iron Plate
Tires ----- Cen. diam. ----- Size -----
Tires held by -----
Safety chains Single

Brake Position On All Wheels.
Brake sch. 6-ET, West'g. Auto. & Straight Air with 10"x 12" tender cylinder.

One pair of wrecking frogs.
List of tools, sch. 26 Bolts, nuts and threads B. L. W.
Photo sch. 2 Inspection B. L. W.
To be weighed Yes Material spec'ns B. L. W.
Certificate of boiler test Three copies of B. L. W. form 611.
Junior laws to 6-15-14 Shipment On Own Wheels.

Brass shop finish, No. 1.
Machine shop finish D-165

Patent Plates {Rushton throttle Patented Jan. 23 - 1900 (Cast on) / Feed pipe strainer Patented Sept. 1 - 1903 (Cast on)}

Property plates None

Painting:—Engine, style 291 Olive Green and Aluminum.
Painting:—Tender, style 291 " " " "

Mark on cab panels, A. & W. RY.
Mark on tank sides, ALEXANDRIA & WESTERN RY.
Mark on back of tank near top, 4000 GALLONS
Road number on back of tank to be of large size.

No. Pos.	Road No.	Name None
F. No. Plate	9	
Sand Box		
Back of Tank		

11-266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS Dup. 8 26 D 198 with same extras except as otherwise specified.

Memorandum Spec'n 10852

SPECIFICATION FOR LOCOMOTIVES 8 26 D 203.

FOR The Alexandria & Western Railway Co.

Gen. as Reg. 1957

Engine Drawing No. 42

1/10/16

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 14' 6" Driving 14' 6" Total 21' 10"
Total wheelbase, eng. and tend. Actual 44' 7" Limited to -----

Curves 6 degrees on 1's

Limits, Height ----- Width -----
Weight (approximate) in working order Total 90,000 lbs.
On F. tr'k 14,000 lbs. Drivers 76,000 lbs. B. tr'k -----

Tractive power 18,600 lbs. Ratio of adhesion 4
Work'g St'm Pres. 180 lbs., Service Freight
Fuel Soft Coal

Boiler Steel Thick ⅜" & 9/16" Bill 7258
Boiler, Diam. 48" Plan Extended Wagon Top
Boiler st'm pres. 200 lbs. Tested to 220 lbs. steam pres / 267 lbs. water pres
Longitud. seams Butt jointed, double covering strips.

Dome, diam. 25" Pos. Forward of Firebox

Firebox Steel Combustion chamb. None
Firebox, length 64-15/16" Width 34⅜" Depth F. 62⅝" B. 61⅜"
Firebox, Tube ⅜" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diameter.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Single Riveted
Water space stays 1" diam. with 7/16" hole 1⅛" deep from C. S.

Radial stays 1⅛" diam. Sling stays front One ⊥ bar
Button heads below crown on six central rows
Crown bars None Placed ----- above crown
Crown bolts -----

Flues None
Tubes #12 W.G. Charcoal Iron
Tube ends Swaged for copper ferrules firebox ends.
Number 156 Diam. 2" Length 10' 9"

Heating Surface: Flues None Combus. Chamb. None Total 966 sq. ft.
Tubes 871 sq. ft. Fire Box 95 sq. ft. Fire Brick Tubes -----
Grate area 15.4 sq. ft. Ratio to Heating Surface 1 : 62.8
Superheater -----

Fire Brick arch on studs.

Grates Rocking bars and drop plate.
Ash Pan, Dampers Front and back.
Ash pan to be equipped with dumping arrangement to comply with I. C. C. requirements.
Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Smokebox extension With Cleaning hole and cap L. S. Only
Spark ejector or hopper With
Netting and deflect. plates With

Exhaust nozzles Double high

Stack Cast Iron, straight Dia. 16" Hole in S. B., dia 18"

Safety Valves (NOT SPEC) Two Coale 3½"
Safety valves None with relief lever, Set to 180 lbs.
Whistle B. L. W. plain

Steam Gauge One Iron 7" Maker:- Ashcroft (NOT SPEC)
Steam gauge stand Iron **Clock** None

Water Gauge One B.L.W.(Ironclad) **Cab Lamps** Electric
Gauge Cocks Three Back Surface valve None
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One B. L. W. POS:-Left Side
Cleaning Plugs
Firebox Corners, front ones diagonal, right side and front
Crown, Two each side and two back.
Waist, One under front.
Front tube sheet, One Fusible plug One

Pump None Pos. -----
Top chamb. ----- Bottom chamb. -----
Feed Cock ----- Feed pipes -----
Checks ----- Check pipes -----

Injectors (NOT SPEC) Two Monitor No. 7
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. Right and Left

Steam Heat None

Cab Wood.

Cab boards Wood Nosing None
Running boards Wood Nosing None
Hand rail Iron Located on Boiler

Back Bumper Bar Steel Back drawbar height 32½"

Pilot Wood Pushing shoes None
Front Bumper Oak Bumper plate With
Steps, handholds, etc. to conform to I.C.C. requirements.

Front Drawhead, Center above rail 33½"
Coupler M. C. B. Automatic, having knuckle with 13" face.

Signal fixtures Iron on Bumper.

Headlight Equipment to be Pyle National Electric.
Headlight One Round Case 18" Reflector, To burn -----
Headlight, Nos. on sides With H'dl't step With
Lamp shelf None Nosing -----

Bell 85 pounds.
Sand Box One Diam. 28" Body Iron Painted Pipes Iron
Sander (NOT SPEC) Leach Air, Trap A and D combination to sand front and rear.

Dome casing Iron Painted.

Boiler Jacket #18 Soft Steel Ptd. Bands Iron Style 9
Boiler Lagging Magnesia Sectional.

THE BALDWIN LOCOMOTIVE WORKS
R E McFalls May 19 16

2110

SPECIFICATION FOR LOCOMOTIVES 8 26 D 203.

FOR The Alexandria & Western Railway Co.

Frames Cast Steel Braces Solid

Cylinders, Diam. 16" Stroke 24"
St'm ports, Length 15" Width 1½" Bridges 1"
Exh. ports, Length 15" Width 2½" Valve lead 5/16"
Valve travel 5½" Steam lap ⅞" Exhaust clearance -----
Eccentric crank throw 9-3/16"
S. F. Lubr. (NOT SPEC) Michigan Triple Bulls Eye
Cyl'r heads Cast Iron Lubr. pipes of Iron under jacket.
Cyl'r casings Iron painted Head covers Steel painted.
St'm chest casings Iron painted Covers Steel painted.
St'm chest valves Richardson balanced, with vacuum valves.
Met. pkg (PISTON RODS / VALVE STEMS) UNITED STATES (NOT SPEC)

Pistons Cast iron rings sprung into solid head.
Guides Steel- Oil cups Needle
Crossheads Cast Steel
Wrist Pins Steel Rod cups Plunger
Parallel rods to have solid ends.

Valve Motion Walschaerts.
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 50" Cen. diam. 44" Centres Cast Iron.

Tires Steel Held by Shrinkage and Shoulder.
Tires, Flanged, Pos. Front and Back Size 3" x 5½"
Tires, Plain, Pos. Middle Size 3" x 6½"
Lateral play between driving boxes and wheel hubs-1/16" total.
Driving Boxes Steeled Cast Iron
Journals, Diam. 7" Length 8"

Springs. Make B. L. W.

Front Engine Truck Two Wheeled Swing Bolster.
To swing 2½" each side of cen., Cen. pin liners None
Journals, Diam. 4½" Length 8" Boxes Cast Iron
Wheels, Diam. 30" Tread 4½" Kind Chilled Cast Iron, spoke
Tires ----- Cen. diam. ----- Size -----
Tires held by -----

Back Engine Truck None Wheeled -----
To swing ----- each side of cen., Cen. pin liners -----
Journals, Diam. ----- Length ----- Boxes -----
Wheels, Diam. ----- Tread ----- Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----

Brake, position On all Driving and Tender Wheels.
Operating Parts: Engine, Sch. 6-ET, West'g Combined Auto. and Eng. Tr'k, sch. ----- Straight Air
Foundation Parts: Drivers, sch. WM-1, American C. S. Equalized. Eng. Tr'k, sch. -----
Air pump One 9½" Pos. Left Side
Train connections Front and Back
Train signal, sch. None

Tender Eight Wheeled, Drawing No. 495
Weight, with fuel and water, about 80,000 lbs.

Tank 4,000 Gallons, Bill 3839
Tank "U" Shape, Straight Top. Fuel Capacity 5 tons.

Tool Boxes Hard Wood, Top.

Frame Steel 10" Channels.

Front Drawbar height 30"
Pilot None Pushing shoes None
Back drawhead, center above rail 33½"
Coupler M. C. B. Automatic having knuckle with 13" face.

Steps, hand holds, etc. to conform to I.C.C. requirements.
Steps across rear with handrail.

Trucks Arch Bar, type with steel bolster.

Springs Elliptic, B. L. W.
Journals, Diam. 4¼" Length 8"
Wheels, Diam. 33" Tread 4¼" Kind Chilled Cast Iron Plate.
Tires None Cen. diam. ----- Size -----
Tires held by -----
Safety chains Single

Brake Position On all wheels.
Brake sch. #6-ET West'g Automatic and Straight Air with 10" x 12" tender cylinder.

Do not fail to get Photo. of Locomotive.
List of tools, sch. 26 One pair of wrecking frogs.
Photo sch. 2 Inspection B. L. W.
To be weighed No Material spec'ns B. L. W.
Certificate of boiler test Three Copies of B.L.W. form 1036.
Junior laws to 6-15-14. Shipment On Own Wheels.

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. Patents: Rushton throttle — Patented Jan. 23 - 1900 (Cast On)
Feed pipe strainer — Patented Sept. 1 - 1903 (Cast On)

Property plates None

Painting: Engine, style 291 Olive Green and Aluminum.
Painting:—Tender, style 291 " " " "
Lettering etc. to be same as for 8 26 D 198
Mark on cab panels, A. & W. RY.
Mark on tank sides, ALEXANDRIA & WESTERN RY.
Mark on back of tank near top, 4000 GALLONS
Road number on back of tank to be of large size.

Road Nos. Pos.	Road Nos.	Name None
F.No.Plate		
Sand Box	10	
Back of Tank		

THE BALDWIN LOCOMOTIVE WORKS As Spec'n. C-4767

Memorandum Spec'n 17044

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1110

FOR Midland Valley Railroad Company

R. 3-5-17

Gen. as Photo. 5539

Engine Drawing No. 106

Gauge of Road 4' 8½" Play ⅜"

Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"

Total wheelbase, eng. and tend. { Actual 46' 0⅜" / Limited to -----

Curves -----

Limits, Height ----- Wid ----

Weight (approximate) in working order, Tot: ...unds

On F. tr'k ------ lbs., Drivers 128,000 lbs., R. tr'k ----- lbs.

Tractive power 29,500 lbs., Ratio of adhesion 4.3

Work'g St'm Pres. 200 lbs., Service Switching

Fuel Arkansas Soft Coal

Front tube sheet to be ½" thick

Boiler Steel Thick 11/16" Bill 8106

Boiler, Diam. 64" Plan Straight Top

Boiler st'm pres. 200 lbs., Tested to { 220 lbs. steam pres. / 267 lbs. water pres.
With factor of safety of 5

Longitud. seams { Butt jointed, double covering strips, sextuple riveted

Dome, diam. 29" Pos. Central

Firebox Steel Combustion chamb. None

Firebox, length 96-3/16" Width 40" Depth F. 66" B. 63½"

Firebox, Tube ½" Crown ⅜" Sides ⅜" Back 5/16"

Firedoor opening 16" diam.

Water space, Front 4" Sides 4" Back 4"

Water space, Frame Single Riveted

/ Water space stays ⅜" diam. with 3/16" holes 1⅝" deep from O.S.

/ Radial stays 1" diam. Sling stays front { Two rows of B. L. W. Expansion Stays

Button heads below crown on Eight central rows

Crown bars None Placed ----- above crown

Crown bolts ------

Flues #9 W. G. Charcoal Iron or Steel

Tubes #12 W. G. Charcoal Iron or Steel

Tube ends Swaged for copper ferrules, fire box ends

Number 21 / 143 Diam. 5½" / 2⅝" Length 10' 6"

Heating Surface Flues 3150 Combus. Chamb. ----- Total 1241⁰

Tubes 7800 Fire Box 1460 Fire Brick Tubes -----

Grate area 26.70 Ratio to Heating Surface 1 : 46.5

Superheater 2520

Fire Brick Arch, On Studs

Grates Rocking bars and drop plate

Ash Pan, Dampers Front and Back

Throttle to be provided with auxiliary drifting valve

Throttle Balance Pos. Dome

Dry pipe Steel

Superheater (See sup. 2)

21 **Smokebox** extension With Cleaning hole and cap None (Sup. 3)

Spark ejector or hopper None

6 Netting and deflect. plates With

Exhaust nozzles Single high

Stack Steel, straight Dia. 18" Hole in S. B., dia. 19½"

Safety Valves (spec) Two Crosby 2"

Safety valves None with relief lever, Set to 200 pounds

Whistle B. L. W. plain

Steam Gauge One Iron 7" MAKER:-Ashcroft (spec)

Steam gauge stand Iron **Clock** None

Water Gauge One Klinger-Refler **Cab Lamps** Electric

Gauge Cocks Three Back Surface valve None

Lowest gauge cock 3½" above highest part of crown

Lubricator steam valve to have separate dry pipe to dome

Blower Valve B. L. W.

Blow off Cock One Okadee POS:-Front

Cleaning Plugs

Firebox Corners, diagonal

Crown, Two each side and two back

Waist, One under front

Front tube sheet, One Fusible plug None

Pump None Pos. -----

Top chamb. ----- Bottom chamb. -----

Feed Cock ----- Feed pipes -----

Checks ----- Check pipes -----

Injectors (not spec) Two Hancock, type "A" No. 7

Injectors, Pos. Right and Left Steam pipes Copper

Pipes, Check Iron Feed Iron Overflow Iron

Check Hancock Pos. Right and Left

Steam Heat None

6 **Cab** Steel

Cab boards Steel Nosing T-Iron

Running boards Steel Nosing T-Iron

Hand rail Iron Located on Boiler

7 **Back Bumper** Bar Steel Back drawbar height 34"

Pilot None Pushing shoes Cast in bumper

Front Bumper Cast Steel Bumper plate With

Steps across front with handrails

Steps, hand holds, etc. to conform to I.C.C. requirements.

Front Drawhead, Center above rail 33½"

Coupler Simplex M. C. B. Automatic

Signal fixtures Iron on Bumper

8 **Headlight** Two Round Case 18" Reflector,

Headlight, Nos. on sides With H'd'l't step With

Lamp shelf None Nosing -----

Bell 92 pounds. ~~Collmar Security~~ Air Bell Ringer 7/24/17

Sand Box Two Diam. 28" Body Iron Painted Pipes Iron

Sander (not spec) Leach Air Trap A-1 in each box, to sand front and back

Dome casing Iron Painted

Boiler Jacket #22 Plan. Steel Bands Iron Style 9

Boiler Lagging Magnesia sectional

11: 266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS

E. M. Hallback July 1917

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1110

2442

FOR Midland Valley Railroad Company

R.

Frames Cast Steel Braces Solid

Cylinders, Diam. 19" Stroke 24"

St'm ports, Length 37.7" Width 1⅜" Bridges -----

Exh. ports, Length ----- Width ----- Valve lead ⅛"

Valve travel 5½" Steam lap ⅞" Exhaust clearance -----

Eccentric crank throw 21" By-pass valve None

S. F. Lubr. (Spec) Detroit Five Feed No. 42 Bulls Eye (See sup. 9)

Cyl'r heads Front of cast iron; back of cast steel

Cyl'r casings Iron Pto. Head covers Steel Painted

St'm chest casings ----- Covers -----

St'm chest valves 12" diam. Piston type

Met. pkg { Piston rods / Valve stems U. S. King type (manspec)

Pistons (See sup. 10)

Guides Steel Oil cups Needle

Crossheads Cast steel with gibs of phosphor bronze

Wrist Pins Steel Rod cups Grease cups, for all rods

Parallel rods to have solid ends

11 / 12 **Valve Motion** Southern – Royalty payable by The B.L.W.

Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.

All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Driving wheels to have hub liners of Brass

Drivers, O. S. Diam. 50" Cen. diam. 44"

Wheel centers:- Main cast Steel, other cast iron

Tires Steel (Sup. 13) Held by Shrinkage and Shoulder

Tires, Flanged, Pos. All Size 3" X 5½"

Tires, Plain, Pos. None Size -----

Lateral play between driving boxes and wheel hubs = 1/16" total

Driving Boxes Cast steel

Journals, Diam. 8½" Length 9"

Springs. Make Railway Steel Spring Co's

Front Engine Truck None Wheeled -----

To swing----- each side of cen., Cen. pin liners -----

Journals, Diam.----- Length ----- Boxes-----

Wheels, Diam.----- Tread ----- Kind-----

Tires ----- Cen. diam.----- Size -----

Tires held by -----

Back Engine Truck None Wheeled -----

To swing----- each side of cen., Cen. pin liners -----

Journals, Diam. -----Length ----- Boxes -----

Wheels, Diam. ----- Tread ----- Kind -----

Tires ----- Cen. diam.----- Size-----

Tires held by -----

14 / 15 **Brake,** position On all driving and tender wheels

Operating Parts { Engine, Sch. No. 6 ET West'g. Combined Auto. and Straight Air / Eng. Tr'k, sch. -----

Foundation Parts { Drivers, sch. VM-2-BC American O.S. Equalized / Eng. Tr'k, sch. -----

Air pump One 11" Pos. Left Side

Train connections Front and Back

Train signal, sch. None

Air reservoir to have hydrostatic test of 210 pounds.

Certificates dated June 6th 1917 covering test of reservoir Nos. 12681 to 12683 inclusive, furnished by West'g. Air Brake Co., are filed in Main Office, File No. 263

Tender Eight Wheeled, Drawing No. 610

Weight, with fuel and water, about 115,000 pounds

Tank 6000 Gallons Bill 4481

Tank "U" shape, sloping back. Fuel Capacity 10 tons

Tool Boxes of Hard Wood, Top

31 **Frame** Steel 12" Channels

Spring buffer to be applied between engine and tender

Front Drawbar height 31⅜"

Pilot None Pushing shoes at rear

Back drawhead, center above rail 33½"

31 **Coupler** Simplex M.C.B. Auto. with Miner friction draft gear

Steps, hand holds, etc. to conform to I.C.C. requirements.

Steps across rear with hand rails.

Steps and hand rails on sloping back of tank.

Trucks Arch bar type with steel bolsters

Springs Elliptic. Railway Steel Spring Co's make

Journals, Diam. 5" Length 9"

Wheels, Diam. 33" Tread 4¼" Kind Chilled Cast Iron Plate

Tires None Cen. diam. ----Size -----

Tires held by -----

Safety chains Single

Brake Position On all wheels

Brake sch. No. 6 ET West'g. Auto. and Straight Air with 12" x 12" tender cylinder

List of tools, sch. 29

Photo sch. #2 Inspection B. L. W.

To be weighed Yes Material specins B. L. W.

Certificate of boiler test Three copies of B.L.W. form 1036

Junior laws to 4-14-17 Shipment On own wheels

Brass shop finish, No. 1

Machine shop finish D-165

B. L. W. Patents: Feed Pipe Strainer, Patented Sept. 1, 1903 (Cast On); Steam Pipe Cover, , Patented July 18, 1911 (Cast On)

* Property plates ~~None~~, Two for Engine and two for Tender to read as follows:- { J. R. K. DELANY / TRUSTEE, LESSOR AND OWNER 8/9/17.

Painting:--Engine, style 291 Olive Green and Aluminum

Painting:--Tender, style 291 Olive Green and Aluminum

Lettering, etc. to be same style as for 12-38½ E 118 etc.

Mark on tank sides, MIDLAND VALLEY

Mark on back of tank, in small letters and figures, 6000 GALS.

Road Nos. Pos.	Road Nos.	Name None
F. No. Plate	101	
F. Sand Box		
Cab Sides		

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1110

FOR MIDLAND VALLEY RAILROAD COMPANY

Specification for Type A Double Loop Superheater. SPECIFICATION O-7527 DATED MAY 1, 1917.

BOILER TUBES	143 ...in number 2 ...o.d 10 ...ft 6 ...in. over tube sheets. Tubes located between and adjacent to boiler flues are to be beaded over at front end.
BOILER FLUES	21 ...in number 5½" ...o.d #9 BWG ...of cold drawn seamless steel. Flues to be straight, true to gauge and wall not to vary more than one gauge from specified thickness ...Card 1912-M
BOILER FLUE SETTING	⅛ in. radius on both edges of flue holes in fire box tube sheet and on front edge of flue holes in front tube sheet as shown on drawings, except for copper sheets. Back end to be set with copper ferrule, rolled, beaded and prossered except for copper sheets. Front end to be rolled and beaded. Rollers to have at least 5 rolls. Prosser to have at least 12 sections...Card 1137
TUBE SHEET LAYOUT	...Card 5221
UNITS	21 ...units 1½" ...o.d. #9 BWG ...of seamless steel. Pipes united by return bends. Each unit to be tested, before being placed in boiler, with water under pressure of 250 lb. per sq. in. for screwed return bends or 500 lb. per sq. in. for welded return bends.
UNIT PIPE SUPPORTS	Of steel fastened securely on superheater pipes so as not to slide...Card 10773
UNIT PIPE JOINT	To be made in best possible manner to insure absolutely tight joints in accordance with the notation on...Card 1052
UNIT CLAMP BOLT	To be in accordance with requirements of Locomotive Superheater Company Material Specification No. 12...Card 1064-E
HEADER	To be of close grain cylinder iron, steam tight in every respect. Joint ring for connection to dry pipe to have flat side against header flange. Casting should be moulded with the unit joint face down to secure the best quality of metal on surface where superheater unit joints are made. Each header to have a serial number cast on in such a location as not to be removed in finishing. No patch plugs or chaplets allowed in ball joint seats. Headers must not be treated with sal ammoniac. Header casting to be tight under water pressure of 250 lb. Test pressure to be applied separately to the saturated and to the superheated steam passages, so as to insure soundness of all partition walls...Card 10266-A
HEADER SUPPORTS	To be securely fastened to boiler shell with rivets or turned bolts fitted in reamed holes. To be properly located so as to support the header after header has been correctly located. Header should then be secured to supports. This to be done before superheater units are put in place...Card 1323
STEAM PIPE JOINT RINGS	Should be of cast iron.
DEFLECTING PLATE	To be constructed so as to permit easy inspection and removal of superheater units and joints. Design to be in accordance with...Card 10022
DAMPER CYLINDER	To be carefully and accurately made. Pistons not to be more than 0.01 in. smaller than bore. Bearings for piston and extension to be in line. Piston to be ground and to operate freely under a pressure as low as 40 lb. per sq. in. Steam pipe to damper cylinder should be as short and free from bends as possible so as not to cause water to collect in cylinder. Pipe to be well protected against freezing...Card 1149
DAMPER SHAFT COUNTERWEIGHT	To be painted a light color to render it easily visible by the engineer...Card 1067
S. H. ARRANGEMENT	To be in accordance with...Card 4123-D
TEST (FINAL)	The superheater, after assembling in boiler and after steam pipes are fitted up, is to be thoroughly tested and to be tight under water pressure of at least 30% more than the working pressure of the boiler.

DAMPER	Card 1956-F	DAMPER SHAFT LINK	Card 1078
DAMPER CYL. ARM	Card 1076	PATENT PLATE	Card 3136
DAMPER CYL. PIPE FITTING	Card	S. H. UNIT BOLT WASHER	Card 1071
DAMPER CYL. PIPE UNION	Card 1282	S. H. UNIT CLAMP	Card 1073
DAMPER CYL. PIPING DIAGRAM	Card 1945	S. H. UNIT CLAMP WASHER	Card 10305
DAMPER CYL. SUPPORT	Card	S. H. PIPE END	Card 1346
DAMPER SHAFT	Card 1235-H	S. H. PIPE BAND	Card 1983
DAMPER SHAFT ARM	Card 1226 & 1234	RETURN BENDS	Card 10282
DAMPER SHAFT BEARING (O.S.)	Card 1148 & 1223	DEFLECTING PLATE HANDLE	Card 1187
DAMPER SHAFT BEARING (I.S.)	Card 1227-J	LUBRICATOR CONNECTION	Card 3023
SPACING OF BANDS & SUPPORTS	Card 1079	DEFLECTING PLATE STUDS	Card 10809
TYPE OF RETURN BENDS	Class 6	DEFLECTING PLATE CLAMP	Card 10809-A

11-266-67 Mech. capital sec box

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1110

FOR Midland Valley Railroad Company

J.

2444

1 Radial stay bolts of Ewald Iron.
Water space stay bolts of Ewald Iron.
Tate flexible stay bolts of Ewald Iron about 250 in number, located in breaking zone.

2 Superheater as Loco. Superheater Co's Spec'n No. O-7527 dated May 1, 1917 Copy attached.
Superheater:- Schmidt type, connecting with top header in smoke box, and with outside steam pipe connections to valve chambers.
Royalty on superheater payable by The B. L. W.

3 Hand hole and cap in each side of smoke box for inspection of superheater.

4 Smoke box front and door of steel.

5 Front end arrangement to be M. M. Standard self cleaning type.

6 Cab to have ventilator in roof.
Cab side windows to be large.

7 Spring buffer to be applied between engine and tender.

8 Headlight Equipment to be Pyle National Electric Type F with Incandescent headlights.

TENDER

9 Lubricator pipes of copper under jacket.

3/ Tender back bumper for use with coupler having shank 31" long, as shown on B. L. W. tracing 34267 is approved.

10 Piston heads of Hunt Spiller Iron, fitted with Packing Rings of Hunt Spiller Iron.

11 Southern Locomotive Valve Gear Patent plates (herewith) covering valve gear to be applied to the rear end of the link support on each side of the Locomotive.

12 Power Reverse gear to be Ragonnet, as covered by Extra Order No. 4639 dated May 2, 1917.

13 Driving tires from Railway Steel Spring Co.

14 Air reservoirs to be enamelled and to have hydrostatic test of 210 lbs.

15 Brake work to have case hardened bushings.

11-266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS As Spec. C-4251
Memorandum Spec'n 11181 — Miner details wherever practicable to be same as for 10 34 E 2025 - 2026

SPECIFICATION FOR LOCOMOTIVES 12 38 ½ E 118 - 119 — Gen. as Photo. 6000

FOR Midland Valley Railroad Company — 10-23-16 — **Engine Drawing No.** 19

R.

Gauge of Road 4' 8½" Play ¾" except ⅞" for F & B drivers
Wheelbase, Rigid 15' 0" Driving 15' 0" Total 31' 8"
Total wheelbase, eng. and tend. Actual 61' 7¾" / Limited to ——
Grades compensated for curves. Rails, 65 to 75 lbs.
Curves 6 Degrees Grades, 0.6 of 1%
Bridges: Cooper E-40
Limits, Height —— Width ——
Weight (approximate) in working order, Total 200,500 lbs.
On F. tr'k 18,000 lbs., Drivers 154,500 lbs., B. tr'k 28,000 lbs.

Tractive power 37,370 lbs., Ratio of adhesion 4.1
Work'g St'm Pres. 185 lbs., Service Freight
Fuel Arkansas Soft Coal

Front tube sheet to be ½" thick
Boiler Steel Thick 1 1/16" Bill 7953
Boiler, Diam. 66" Plan Straight Top
Boiler st'm pres. 200 lbs., Tested to 220 lbs. steam pres. / 267 lbs. water pres.
With factor of safety of 4.77
Longitud. seams Butt jointed double covering strips, sextuple riveted

½ **Dome,** diam. 29" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 102 3/4" Width 65 7/8" Depth F. 67½" B. 56½"
Firebox, Tube 1/2" Crown 3/8" Sides 5/16" Back 5/16"
3 Firedoor opening Oval 16" x 20"
Water space, Front 4½" Sides 4½" Back 4½"
Water space, Frame Double Riveted
4 Water space stays ⅞" diam. with 3/16" holes 1¼" deep from O.S.

4 Radial stays 1" diam. Sling stays front } Two rows of B.L.W. Expansion Stays
Button heads below crown on Ten central rows
Crown bars None Placed ——— above crown
Crown bolts ———

Flues #9 W. G. Steel
Tubes #11 W. G. Charcoal Iron or Steel
Tube ends Swaged for copper ferrules firebox ends
Number 24/172 Diam. 5 3/8 / 2" Length 19' 3"

Heating Surface	Flues 647.0	Combus. Chamb. ——— Total	2566.5	
	Tubes 1726.0	Fire Box 161.5	Fire Brick Tubes	28.5
Grate area 46.8	Ratio to Heating Surface 1 :	54.8		
Superheater 562.0				

Fire Brick Arch (See sup. 5)

Grates Rocking Bars and Drop Plate
Ash Pan, Dampers ~~Front and~~ Back only EMS. 3-13-17.

Throttle Balance Pos. Dove
Dry pipe Steel

Superheater (See sup. 6)

6 **Smokebox** extension With Cleaning hole and cap None (Sup. 8)
Spark ejector or hopper None
7 Netting and deflect. plates With

Exhaust nozzles Single, High

Stack Steel, Straight Dia. 18" Hole in S. B., dia. 18 5/8"

Safety Valves (spec) Two Crosby 3"
Safety valves None with relief lever, Set to 185 lbs.
Whistle B. L. W. plain

Steam Gauge One Iron 7". MAKER:—ASHCROFT (not spec)
Steam gauge stand Iron **Clock** None

Water Gauge One Klinger Reflex **Cab Lamps** Electric
Gauge Cocks Three Back Surface valve None
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One Okadee POS:—Front
Cleaning Plugs
Firebox Corners diagonal; sides and back
Crown, Two each side and four back
Waist, Two under, one in first and one in third courses
Front tube sheet, Two Fusible plug One

Pump None Pos. ———
Top chamb. ——— Bottom chamb. ———
Feed Cock ——— Feed pipes ———
Checks ——— Check pipes ———

Injectors (not spec) Two Monitor see E-7564-B No. 10
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check Hancock Pos. Top of boiler

Steam Heat None

Cab Steel with large side windows

Cab boards Steel Nosing T-Iron
Running boards Steel Nosing T-Iron
Hand rail Iron Located on Boiler

11 37 **Back Bumper** Bar Steel Back drawbar height 32½"

10 **Pilot** Wood Pushing shoes Cast in bumper
Front Bumper Cast Steel Bumper plate With
Steps, hand holds etc. to conform to I.C.C. requirements

Front Drawhead, Center above rail 33½"
Coupler Simplex M. C. B. Automatic

Signal fixtures (See sup. 12-36)

13 **Headlight** One Round Case 18" Reflector,
Headlight, Nos. on sides With H'd'l't step With
Lamp shelf None Nosing ———

Bell 92 pounds. Security Air Bell Ringer
Sand Box One Diam. 33" Body Iron Painted Pipes Iron
Sander (not spec) Leach Air Trap A-10, sanding front of front wheels, and back of main wheels
Dome casing Iron Painted

Boiler Jacket #22 Plan. Steel Bands Iron Style 9
Boiler Lagging Magnesia sectional

THE BALDWIN LOCOMOTIVE WORKS — E. M. Shaumil. — Feb 1917 — 2446

SPECIFICATION FOR LOCOMOTIVES 12 38 ½ E 118 - 119

FOR Midland Valley Railroad Company

R.

11 **Frames** Cast Steel Braces Solid

Cylinders, Diam. 22" Stroke 28"
St'm ports, Length 25 3/4" Width 1½" Bridges ———
Exh. ports, Length ——— Width ——— Valve lead ⅛"
Valve travel 5 3/4" Steam lap 1" Exhaust clearance ———
Eccentric crank throw 22" By-pass valve None
S. F. Lubr. (spec) Detroit five feed #42 Bulls Eye
Cyl'r heads (See sup. 15) ; Lubr. pipes of copper under jacket
Cyl'r casings Iron Ptd. Head covers Steel Painted
St'm chest casings ——— Covers ———
St'm chest valves 12" diam. Piston Type
Met. pkg (Piston rods / Valve stems) U. S. King Type (spec)

Pistons (See sup. 16)
Guides Steel Oil cups Needle
17 **Crossheads** Cast Steel
Wrist Pins Steel Rod cups Grease Cups for all rods
Parallel Rods to have solid ends

21 **Valve Motion** Southern, Royalty payable by The B.L.W.
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

25 **Drivers,** O. S. Diam. 57" Cen. diam. 50" Centres Cast Steel

23 ½ **Tires** Steel Held by Shrinkage and Shoulder
Tires, Flanged, Pos. All Size 3½" x 5½"
Tires, Plain, Pos. ——— Size ———
Lateral play between driving boxes and wheel hubs — 1/16" total
Driving Boxes Cast Steel, with Elvin grease cellars
Journals, Diam. Main 9" / Others 8½" Length 12"

Springs. Make, Railway Steel Spring Co.

Front Engine Truck Two Wheeled Swing Bolster Cen. Bearing
To swing 2½" each side of cen., Cen. pin liners None
Journals, Diam. 5½" Length 10" Boxes Cast Iron
26 Wheels, Diam. 33" Tread ——Kind Cast Steel Spoke Centre
27 Tires Steel Cen. diam. 28" Size 2½" x 5½"
Tires held by Bolted type fastening

Back Engine Truck Two Wheeled Outside Bearing Type
To swing 3" each side of cen., Cen. pin liners None
Journals, Diam. 7½" Length 12" Boxes Cast Steel
26 Wheels, Diam. 40" Tread ——Kind Cast Steel Spoke Centre
27 Tires Steel Cen. diam. 34" Size 3" x 5½"
Tires held by Bolted type fastening

28 **Brake,** position On all driving and tender wheels
Operating Parts: Engine, Sch. No. 6 ET Westc Combined Auto. and Straight Air. 3-2-17.
Eng. Tr'k, sch. ———
Foundation Parts: Drivers, sch. UN-2 BC American O.S. Equalized
Eng. Tr'k, sch. ———
Air pump Two 9½" Pos. Both Left Side see E-5645-13
Train connections Front and Back
Train signal, sch. None

Air reservoir to have a hydrostatic test of 210 pounds.
Certificates dated 11-25-16 covering test of reservoirs, Nos 6134-6136, furnished by Westg Air Brake Co. are filed in Main Office file #263 3/6/17

35 ½ **Tender** Eight Wheeled. Drawing No. 610
Weight, with fuel and water, about 115,000 lbs.

Tank 6000 Gallons. Bill 3689
Tank "U" shape, straight top. Fuel capacity 10 tons

Tool Boxes Hard Wood, Top

Frame Steel 12" Channels

37 Front Drawbar height 30 7/8"
Pilot None Pushing shoes None
Back drawhead center above rail 33½"
Coupler Simplex M.C.B. Auto. with Miner friction draft gear, Type "A-18"

Steps, hand holds etc. to conform to I.C.C. requirements

Trucks Arch Bar Type with Cast Steel Bolsters

Springs Elliptic. Railway Steel Spring Co.
Journals, Diam. 5" Length 9"
Wheels, Diam. 33" Tread 1¼" Kind Chilled Cast Iron Plate
Tires None Cen. diam. ——— Size ———
Tires held by ———
Safety chains Single

Brake Position On all wheels
Brake sch. No. 6 ET Westc Auto and Straight Air with 12 x 12 cyl. 3-2-17.

List of tools, sch. 29
Photo sch. #2 Inspection B. L. W. (see sup 29)
To be weighed Yes Material spec'ns B. L. W.
Certificate of boiler test Three copies of B.L.W. form 1036
Junior laws to 12-1-16 Shipment On own wheels

Brass shop finish, No. 1
Machine shop finish D-165

Patents: B. L. W. Throttle, Patented Jan. 23, 1900 (Cast On); Feed Pipe Strainer, Patented Sept. 1, 1903 (Cast On); Steam Pipe Cover, Patented July 18, 1911 (Cast On); Back Engine Truck, 1060499, Apr. 29, 1913 (Brass Plate)

Property plates: For engine and tender to read as follows:— B. L. W. for engine and tender none; J. R. K. Delaney, Trustee, Lessor and Owner. 3/13/17

Painting:—Engine, style 291 Olive Green and Aluminum
Painting:—Tender, style 291 Olive Green and Aluminum

LETTERING, etc. to be same style as for 10 34 E 2025 etc.
Mark on tank sides, MIDLAND VALLEY
Mark on back of tank, in small letters and figures, 6000 GALS.

Road Nos. Pos.	Road Nos.	Name None
F. No Plate	70	
Sand Box	71	
Cab Sides		

SPECIFICATION FOR 12 38½ E 118 AND 119

FOR MIDLAND VALLEY RAILROAD COMPANY

Specification for Type A Double Loop Superheater. SPECIFICATION No. O-6383 DATED DECEMBER 18, 1916

BOILER TUBES	172 in number 2 o.d. 19 ft. 3 in. over tube sheets. Tubes located between and adjacent to boiler flues are to be beaded over at front end.	
BOILER FLUES	24 in number 5½ o.d. 4½ B.W.G. of cold drawn seamless steel. Flues to be straight, true to gauge and wall not to vary more than one gauge from specified thickness.	Card 1109-S
BOILER FLUE SETTING	½ in. radius on both edges of flue holes in fire box tube sheet and on front edge of flue holes in front tube sheet as shown on drawings, except for copper sheets. Back end to be set with copper ferrule, rolled, beaded and prossered except for copper sheets. Front end to be rolled and beaded. Rollers to have at least 5 rolls. Prosser to have at least 12 sections.	Card 1136
TUBE SHEET LAYOUT		Card 553-A
UNITS	24 units 1½ o.d. #9 B.W.G. of seamless steel. Pipes united by return bends. Each unit to be tested, before being placed in boiler, with water under pressure of 250 lb. per sq. in. for screwed return bends or 500 lb. per sq. in. for welded return bends.	
UNIT PIPE SUPPORTS	Of steel fastened securely on superheater pipes so as not to slide.	Card 10773
UNIT PIPE JOINT	To be made in best possible manner to insure absolutely tight joints in accordance with the notation on	Card 1052
UNIT CLAMP BOLT	To be in accordance with requirements of Locomotive Superheater Company Material Specification No. 12	Card 1061-E
HEADER	To be of close grain cylinder iron, steam tight in every respect. Joint ring for connection to dry pipe to have flat side against header flange. Casting should be moulded with the unit joint face down to secure the best quality of metal on surface where superheater unit joints are made. Each header to have a serial number cast on in such a location as not to be removed in finishing. No patch plugs or chaplets allowed in ball joint seats. Headers must not be treated with sal ammoniac. Header casting to be tight under water pressure of 250 lb. Test pressure to be applied separately to the saturated and to the superheated steam passages, so as to insure soundness of all partition walls.	Card 10502
HEADER SUPPORTS	To be securely fastened to boiler shell with rivets or turned bolts fitted in reamed holes. To be properly located so as to support the header after header has been correctly located. Header should then be secured to supports. This to be done before superheater units are put in place.	Card 1323
STEAM PIPE JOINT RINGS	Should be of cast iron.	
DEFLECTING PLATE	To be constructed so as to permit easy inspection and removal of superheater units and joints. Design to be in accordance with	Card 10598
DAMPER CYLINDER	To be carefully and accurately made. Piston not to be more than 0.01 in. smaller than bore. Bearings for piston and extension to be in line. Piston to be ground and to operate freely under a pressure as low as 40 lb. per sq. in. Steam pipe to damper cylinder should be as short and free from bends as possible so as not to cause water to collect in cylinder. Pipe to be well protected against freezing.	Card 1242-A
DAMPER SHAFT COUNTERWEIGHT	To be painted a light color to render it easily visible by the engineer	Card 1067
S H ARRANGEMENT	To be in accordance with	Card 4571-A
TEST (FINAL)	The superheater, after assembling in boiler and after steam pipes are fitted up, is to be thoroughly tested and to be tight under water pressure of at least 30% more than the working pressure of the boiler.	

DAMPER	Card 10597-A	DAMPER SHAFT LINK	Card 1070
DAMPER CYL. ARM	Card 1074	PATENT PLATE	Card 3156
DAMPER CYL. PIPE FITTING	Card 1069-A	S. H. UNIT BOLT WASHER	Card 1071
DAMPER CYL. PIPE UNION	Card 1287	S. H. UNIT CLAMP	Card 1073
DAMPER CYL. PIPING DIAGRAM	Card	S. H. UNIT CLAMP WASHER	Card 10305
DAMPER CYL. SUPPORT	Card	S. H. PIPE END	Card 1344
DAMPER SHAFT	Card 1068-B	S. H. PIPE BAND	Card 1988
DAMPER SHAFT ARM	Card 1065	RETURN BENDS	Card 10096
DAMPER SHAFT BEARING (O.S.)	Card 1077	DEFLECTING PLATE HANDLE	Card 1487
DAMPER SHAFT BEARING (L.S.)	Card 1275-E	LUBRICATOR CONNECTION	Card 3023
SPACING OF BANDS & SUPPORTS	Card 10759	DEFLECTING PLATE STUDS	Card 10809
TYPE OF RETURN BENDS	WELDED	DEFLECTING PLATE CLAMP	Card 10809-A

11-266-67 Photo copied see box

SPECIFICATION FOR LOCOMOTIVES 12 38½ E 118 - 119

FOR MIDLAND VALLEY RAILROAD COMPANY

2148

1 DOME O.H. STEEL, PRESSED OUT IN ONE PIECE.

2 AUXILIARY DOME FOR SAFETY VALVES AND WHISTLE.

3 FIREDOOR, FRANKLIN "BUTTER-FLY" TYPE.

4 WATER SPACE AND RADIAL STAYS OF EWALD IRON. TATE FLEXIBLE STAYBOLTS OF EWALD IRON, ABOUT 300 IN NUMBER IN BREAKING ZONE.

5 FIREBRICK - AMERICAN ARCH CO'S SECURITY ARCH SUPPORTED ON FOUR TUBES OF SEAMLESS STEEL No. 7 W. G. THICK, 3" O.S.DIAM

6 SUPERHEATER AS LOCO. SUPERHEATER CO'S SPEC'N. No. O-6383 DATED DEC. 18, 1916 COPY ATTACHED. SUPERHEATER, SCHMIDT TYPE, CONNECTING WITH TOP HEADER IN SMOKE BOX, AND WITH OUTSIDE STEAM PIPE CONNECTIONS TO VALVE CHAMBERS. ROYALTY ON SUPERHEATER PAYABLE BY THE B. L. W.

7 SMOKEBOX FRONT AND DOOR OF STEEL.

8 HAND HOLE AND CAP IN EACH SIDE OF SMOKE BOX FOR INSPECTION OF SUPERHEATER.

9 FRONT END ARRANGEMENT TO BE M.M. STANDARD SELF CLEANER TYPE.

10 PILOT TO BE RAILROAD CO'S STANDARD DESIGN.

11 SPRING BUFFER TO BE APPLIED BETWEEN ENGINE AND TENDER.

12 COMBINATION BRACKET, RY. CO'S STYLE FOR BLIZZARD LAMPS AND FLAGS TO BE APPLIED ON FRONT AT CENTRE OF SMOKE BOX AT EACH SIDE,. PROVIDE ALSO A FIXTURE ON EACH END OF PILOT BEAM FOR FLAGS AND A PAIR OF BRACKETS ON FACE OF PILOT BEAM FOR LAMPS.

13 HEADLIGHT EQUIPMENT TO BE PYLE NATIONAL ELECTRIC WITH INCANDESCENT HEADLIGHT.

14 ENGINE FRAMES TO HAVE COMMONWEALTH CRADDLE CASTING AND TAIL PIECE.

15 CYLINDER HEADS:-FRONT, CAST IRON, BACK, CAST STEEL

16 PISTON HEADS OF HUNT SPILLER IRON FITTED WITH PACKING RINGS OF HUNT SPILLER IRON.

17 CROSSHEAD GIBS OF PHOSPHOR BRONZE.

21 SOUTHERN LOCO. VALVE GEAR LICENSE PLATES, TO BE APPLIED TO THE REAR END OF THE LINK SUPPORT ON EACH SIDE OF LOCO.

22 RAGONNET POWER REVERSE GEAR. REVERSE GEAR IS COVERED ON EXTRA ORDER No. 11868 DATED NOVEMBER 22ND 1916.

23 CHICAGO FLANGE OILERS ELLIOTT SYSTEM, TO BE APPLIED TO FRONT OF FRONT DRIVERS.

24 DRIVING TIRES, RAILWAY STEEL SPRING CO.

25 DRIVING WHEELS TO HAVE HUB LINERS OF BRONZE.

26 ENGINE TRUCK WHEELS, FRONT AND BACK FROM THE RAILWAY STEEL SPRING CO.

27 FRONT AND BACK ENGINE TRUCK WHEELS TO HAVE HUB LINERS OF BRONZE.

28 AIR RESERVOIRS TO BE ENAMELLED. BRAKE RIGGING TO HAVE CASE HARDENED BUSHING.

29. Mr. E. L. Peirce is to be notified three or four days before locos. are ready for delivery so he can arrange to have official here to see them before they are shipped. 2.14.17

Hereafter.- brake levers to be arranged so that locks will be above deck and lug on back of mud ring to be cut out to allow the raising of girder rods. 3.26.17.

TENDER.

35 TENDER TO BE OF THE LONG, LOW DESIGN, HAVING TRUCKS WELL SPACED.

36 COMBINATION BRACKETS FOR FLAGS AND LAMPS TO BE APPLIED ON EACH REAR CORNER OF TENDER AT THE TOP.

37 SPRING BUFFER TO BE APPLIED BETWEEN ENGINE AND TENDER.

Hereafter. Tank funnel to be 18" x 36". See report Engr. R. W. MACHAN, DATED 5.8.17. FILE No. VERBAL MR. WHF. 5.15.17.

11-266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS AS SPEC'N C-3330

Memorandum Spec'n 10816

SPECIFICATION FOR LOCOMOTIVES 8 30 C 699

FOR Midland Pennsylvania R. R. Co.

Gen. as 5004

Engine Drawing No. 88

12-18-15

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 8' 6" Driving 8' 6" Total 22' 7"
Total wheelbase, eng. and tend. (Actual 49' 0" (Limited to -----

Curves ----

Limits, Height ---- Width ----
Weight (approximate, in working order. Total 115,000 lbs.
On F. tr'k 37,000 lbs., Drivers 78,000 lbs., B. tr'k ----

Tractive power 18,470 lbs., Ratio of adhesion 4.2
Work'g St'm Pres. 190 lbs., Service Passenger
Fuel Soft Coal

Boiler Steel Thick 9/16" and ⅝" Bill 7666
Boiler, Diam. 58" Plan Extended Wagon Top
Boiler st'm pres. 190 lbs., Tested to (210 lbs. steam pres. (254 lbs. water pres.
Longitud. seams Butt jointed, double covering strips, 90% seams

Dome, diam. 29" Pos. Forward of fire box.

Firebox Steel Combustion chamb. None
Firebox, length 102½" Width 41⅛" Depth F. 64⅛" B. 56½"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back ⅜"
Firedoor opening 16" diam.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Single Riveted
Water space stays ⅜" diam. with 3/16" hole 1½" deep from O. S.

Radial stays 1" diam. Sling stays front {Two Rows of B.L.W. Expansion Stays.
Button heads below crown on Eight central rows
Crown bars None Placed ---- above crown
Crown bolts ----

Flues None
Tubes #12 W. G. Charcoal Iron
Tube ends Swaged for copper ferrules, fire box ends.
Number 267 Diam. 2" Length 11' 7½"

Heating Surface Flues None Combus. Chamb. None Total 1756 sq. ft.
Tubes 1614 sq. ft. Fire Box 142 sq. ft. Fire Brick Tubes----
Grate area 29.3 sq. ft. Ratio to Heating Surface 1 : 60
Superheater ----

Fire Brick Arch on studs.

Grates Rocking Bars and Drop Plate
Ash Pan, Dampers Front only

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Smokebox extension With Cleaning hole and cap L. S. only
Spark ejector ~~or hopper~~ operated by steam to deliver to right side
Netting and deflect. plates With

Exhaust nozzles Double - high

Stack Straight Dia. 16" Hole in S. B., dia. 20½"

Safety Valves (Not Spec.) Two Consolidated 2½"
Safety valves None with relief lever, Set to 190 lbs.
Whistle B. L. W.

Steam Gauge One Iron 7" MAKER:- Ashcroft (Spec.)
Steam gauge stand Iron **Clock** None

Water Gauge One Reflex **Cab Lamps** to burn oil
Gauge Cocks Three Back Surface valve None
Lowest gauge cock 2½" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One B.L.W. POS:- Front
Cleaning Plugs
Firebox Corners, back ones, diagonal and back
Crown, Two Right side, Three Left side and two back
Waist, One under front
Front tube sheet, One Fusible plug One

Pump None Pos. ----
Top chamb. --- Bottom chamb. ----
Feed Cock ---- Feed pipes ----
Checks---- Check pipes ----

Injectors Two Sellers No. 8½
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. Right and Left

Steam Heat Safety Car Heating and Lighting Co's

Cab Wood

Cab boards Wood Nosing None
Running boards Wood Nosing None
Hand rail Iron Located on Boiler

Back Bumper Bar Steel Back drawbar height 37½"

Pilot Wood Pushing shoes None
Front Bumper Oak Bumper plate With
Steps, hand holds, etc. to conform to I.C.C. requirements.

Front Drawhead, Center above rail 33½"
Coupler Janney M.C.B. Auto.

Signal fixtures Iron on bumper.

Headlight Two Round Case 16" Reflector, To burn Kerosene
Headlight, Nos. on sides With H'd'l't step With
Lamp shelf None Nosing ---

Bell 92 pounds. Bell ringer Gollmer Air
Sand Box Iron Diam. 28" Body Iron Ptd. Pipes Iron
Sander (Not Spec.) Leach Air Trap A-1

Dome casing Iron painted

Boiler Jacket #22 Soft Steel Ptd. Bands Iron Style 9
Boiler Lagging Magnesia Sectional

THE BALDWIN LOCOMOTIVE WORKS

N. E. Rudolph Feb. 1916

SPECIFICATION FOR LOCOMOTIVES 8 30 C 699

FOR Midland Pennsylvania R. R. Co.

260

Frames Cast Steel Braces Solid

Cylinders, Diam. 18" Stroke 24"
St'm ports, Length 16" Width 1½" Bridges 1"
Exh. ports, Length 16" Width 2½" Valve lead 3/32"
Valve travel 5½" Steam lap ¾" Exhaust clearance ----
Eccentric-crank throw 5¼"
S. F. Lubr. (Not Spec.) Michigan Triple Bulls Eye
Cyl'r heads Cast Iron, Lubr. pipes of Iron under jacket.
Cyl'r casings Iron Ptd. Head covers Steel Painted
St'm chest casings Iron Ptd. Covers Steel Painted
St'm chest valves Richardson Balanced, with vacuum valves
Met. pkg (Piston Rods, Valve Stems) U. S. (Not Spec.)

Pistons Cast Iron rings sprung into Solid head
Guides Steel Oil cups Needle
Crossheads Cast Steel
Wrist Pins Steel Rod cups Needle
Parallel rods to have solid ends.

Valve Motion Stephenson.
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 68" Cen. diam. 62" Centres Cast Iron

Tires Steel Held by Shrinkage and Shoulder
Tires, Flanged, Pos. All Size 3" x 5½"
Tires, Plain, Pos. None Size ----
Lateral play between driving boxes and wheel hubs - 1/16" total
Driving Boxes Steeled Cast Iron, with Elvin Lubricators.
Journals, Diam. 8" Length 10"

Springs. Make B. L. W.

Front Engine Truck Four Wheeled Swing Bolster, Centre Bearing
To swing 4½" each side of cen., Cen. pin liners None
Journals, Diam. 5½" Length 10" Boxes Cast Iron
Wheels, Diam. 30" Tread---- Kind Cast Iron spoke Centre
Tires Steel Cen. diam. 28" Size 2½" x 5½"
Tires held by Shrinkage and Shoulder

Back Engine Truck None Wheeled----
To swing --- each side of cen., Cen. pin liners----
Journals, Diam.---- Length---- Boxes---
Wheels, Diam. ---- Tread ---- Kind ----
Tires ---- Cen. diam. ---- Size----
Tires held by ----

Brake, position On all driving and tender wheels.
Operating Parts | Engine, Sch. A-1 West'g Auto. Air; Eng. Tr'k, sch.----
Foundation Parts | Drivers, sch. MV-2 American O.S. Equalized; Eng. Tr'k, sch.----
Air pump One 9½" Pos. Left Side
Train connections Front and Back
Train signal, sch. J
AIR PUMP EXHAUST TO BE PIPED INTO CYLINDER SADDLE.

Tender Eight Wheeled, Drawing No. 965
Weight, with fuel and water, about 80,000 lbs.

Tank 4,000 Gallons, Bill 3863
Tank "U" Shape, Straight Top, Fuel Capacity 6 tons

Tool Boxes Hard Wood, Top

Frame. Oak and Yellow Pine

Front Drawbar height 33½"
Pilot of wood at rear Pushing shoes None
Back drawhead, center above rail 33½"
Coupler Janney M. C. B. Automatic

Steps, hand holds, etc. to conform to I.C.C. requirements

Trucks Arch Bar type, with Steel bolster.

Springs Elliptic. B. L. W. make.
Journals, Diam. 4½" Length 8"
Wheels, Diam. 33" Tread 4½" Kind Chilled Cast Iron Plate
Tires None Cen. diam. ---- Size ----
Tires held by ----
Safety chains Single

Brake Position On all wheels.
Brake sch. PK-1012 West'g Automatic Air
Train Signal Sch. J.

List of tools, sch. 29
Photo sch. None Inspection B. L. W.
To be weighed Yes Material spec'ns B. L. W.
Certificate of boiler test Three copies of B.L.W. form 1036
Junior laws to 1-31-16 Shipment On own wheels.

Brass shop finish, No. 1
Machine shop finish D-165

Front Engine Truck Four Wheeled Swing Bolster, Centre Bearing
To swing 4½" each side of cen., Cen. pin liners None
Journals, Diam. 5½" Length 10" Boxes Cast Iron
Wheels, Diam. 30" Tread---- Kind Cast Iron spoke Centre
Tires Steel Cen. diam. 28" Size 2½" x 5½"
Tires held by Shrinkage and Shoulder

B. L. W. Patents | Throttle, Patented Jan. 23, 1900 (Cast on)
Feed Pipe Strainer, Patented Sept. 1, 1903 (Cast on)

Property plates None

Painting: Engine, style ---- Black, no striping
Painting:- Tender, style ---- Black, no striping

Lettering, sic. in aluminum leaf
Mark on tank sides, MIDLAND PENNSYLVANIA

Road Nos. Pos. Road Nos. Name None
F. No. Plate 1
Sand Box
Back of tank

LOCOMOTIVE TO BE REPAINTED, - ORDERED THROUGH EXTRA WORK DEP'T. ORDER No. 8586 DATED 8-18-16, NO CHANGE.

11-266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS — AS SPEC'N C-2992
Memorandum Spec'n 10644 — Locs. to be built in accordance with B.L.W. Std. Spec'n and design
SPECIFICATION FOR LOCOMOTIVES 8 20 C 43 — Gen. as Neg. 4640 {Except with Radley & Hunter stack and somewhat smaller.
FOR Sheffield & Tiennsta Ry. Co. — Engine Drawing No. 19
10-1-15

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 7' 4" Driving 7' 4" Total 21'0"
Total wheelbase, eng. and tend. {Actual 43' 2⅜" / Limited to -----
Maximum grades 2%. Lightest rails, 52 lbs. per yard.
Curves sharpest, 16 degrees.

Limits, Height ----- Width -----
Weight (approximate) in working order, Total 65,000 lbs.
On F. tr'k 22,000 lbs., Drivers 43,000 lbs., B. tr'k ----- lbs.

Tractive power 10,110 lbs., Ratio of adhesion 4.25
Work'g St'm Pres. 160 lbs., Service Passenger and Freight
Fuel Soft Coal

Boiler Steel Thick ⅞" Bill 7559
Boiler, Diam. 44" Plan Extended Wagon Top
Boiler st'm pres. 180 lbs., Tested to {200 lbs. steam pres. / 240 lbs. water pres.
Longitud. seams Butt jointed, double covering strips

Dome, diam. 28" Pos. Forward of fire box.

Firebox Steel Combustion chamb. None
Firebox, length 55-15/16" Width 34⅜" Depth F. 57" B. 55⅜"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diam.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Single Riveted
Water space stays ⅞" diam. with 3/16" hole 1½" deep from O. S.
All staybolt holes to be drilled
Radial stays 1" diam. Sling stays front {Two rows of B. L. W. Expansion Stays
Button heads below crown on Four central rows
Crown bars None Placed ----- above crown
Crown bolts -----

Tubes #12 W. G. Charcoal Iron
Tube ends Swaged for copper ferrules, fire box ends.
Tubes, No. 117 Diam. 2" Length 10' 9½"

Heating Surface, Tubes 656 sq Firebox 68 sq Total 724 sq
Grate area 13.3 sq Ratio to heat'g surface, 1 : 54.4
Superheater ----- Feed-water heater -----
Reheater ---- Fire brick tubes ----

Fire Brick arch None

Grates Rocking bars and drop plate
Ash Pan, Depth 12" Dampers Front and Back

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Smokebox extension With Cleaning hole and cap L. S. only
Spark arrester-hopper With
Netting and deflect. plates None

Exhaust nozzles Double Lee

Stack Radley & Hunter Diam. 13" Hole in S.B. 14"
Stack to have extra thick diaphragm.

Safety Valves (not spec'd.) Two Coale - 1½"
Safety valves None with relief lever, Set to 160 lbs.
Whistle B. L. W. plain

Steam Gauge One 6" Iron (Iron Record 2231-1919 BRASS FOR 43 ONLY 4/C TIME KIP 7/5/15) MAKER:- Ashcroft (not spec'd.)
Steam gauge stand Iron **Clock** None

Water Gauge One B.L.W.(Ironclad) **Cab fittings** Electric
Gauge Cocks Three - Back Surface valve None
Lowest gauge cock 3" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome.
Blower Valve B. L. W.

Blow off Cock One B. L. W. POS:- Front
Cleaning Plugs
Firebox Corners, front ones diagonal
Crown, Two Right Side, one Left side and two back.
Waist, One under front.
Front tube sheet, One FUSIBLE PLUG:- One

Pump None Pos. -----
Top chamb. ----- Bottom chamb. -----
Feed cock----- Feed pipes -----
Checks ----- Check pipes -----

Injectors Two Sellers Class "M" No. 6½
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. Right and Left

Steam Heat Consolidated system

Cab Steel

Cab boards Wood Nosing None
Running boards Wood Nosing None
Hand rail Iron Located on Boiler

Back Bumper Bar Steel Back drawbar height 28½"

Ribs on Pilot to be faced with iron stays
Pilot Wood Pushing shoes None
Front Bumper Oak Bumper plate With
Steps, hand holds, etc. to conform to I. C. C. requirements

Front Drawhead, Center above rail 33½"
Coupler, M. C. B. Auto. short shank pivoted type.

Flag fixtures Iron on bumper
Headlights to be Electric with incandescent lamps in case to throw wide angle beam.
Headlight Two Round Case 14" Reflector,
Headlight, Nos. on sides With H'd'l't step None
Lamp shelf None Nosing -----

Bell 65 pounds
Sand Box One Diam. 23" (not spec'd.) Body Iron Ptd. Pipes Iron
Sander Leach air, Trap A-10, to sand front and rear

Dome casing Iron Painted
Boiler Jacket (#22 Soft) Steel Ptd. Bands Iron Style 9
Boiler Lagging B. L. W. Plastic Magnesia (from stock)
Canvas curtain, reinforced with wood strips, to be hung at back of cab to protect engine in bad weather, curtain to roll up close to cab roof when not in use.

THE BALDWIN LOCOMOTIVE WORKS
Engine L. M. Steele Nov. 1915 — 252
SPECIFICATION FOR LOCOMOTIVES 8 20 C 43
FOR Sheffield & Tiennsta Ry. Co.

Frames Cast Steel Braces Solid

Cylinders, Diam. 13" Stroke 22"
St'm ports, Length 13" Width 1½" Bridges 1"
Exh. ports, Length 13" Width 2½" Valve lead 3/32"
Valve travel 5" O. S. lap ¾" Ins. lap -----
Eccentric crank throws 8" Brass lubr. pipes of iron under jacket
S. F. Lubr. Michigan Triple Sulls Eye, 2 pint capacity
Cyl'r heads Cast Iron
Cyl'r castings Iron Ptd. Head covers Steel painted
St'm chest castings Iron Ptd. Covers Steel painted
St'm chest valves Richardson balanced with vacuum valves
Met. plug (not spec'd.) U. S.

Pistons Cast Iron rings spring into solid head
Valves Steel Oil cups Needle
Crossheads ALLIGATOR Type Cast Steel
Valve Pins Steel Rod cups Plunger
Parallel rods to have straps, keys and brasses

Valve Setting Stephenson
(Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 80" Con. diam. 44". Centres Cast Iron

Tires Steel Held by Shrinkage and Shoulder
Tires, Flanged, Pos. All Size 3" x 6½"
Tires, Plain, Pos. ----- Size -----
Lateral play between driving boxes and wheel hubs - 1/32" total
Driving Boxes Cast Iron
Journals, Diam. 8" Length 8"

Driving spring staples Wrot Iron

Springs Made B. L. W.

Front Engine Truck Four Wheeled **Rear** Delong Swivel Beister
To swing 9½" each side of cen. Cen. pin liners None
Journals, Diam. 4½" Length 7½" Boxes Cast Iron
Wheels, Diam. 28" Tread 4" Kind Chilled Cast Iron Spoke
Tires None Cen. diam. ----- Size -----
Tires held by -----

Back Engine Truck None Wheeled -----
To swing ----- each side of cen. Cen. pin liners -----
Journals, Diam. ----- Length ----- Boxes -----
Wheels, Diam. ----- Tread ----- Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----
Boyer Speed Recorder 11/5/16

Brakes, position On all driving and tender wheels.
Operating Parts {Engine, Sch. 30-ET Nest'g Combined Auto. and Eng. Trk, sch. ----- Straight air
Foundation Parts {Drivers, sch. WF 1 American O. S. Equalized Eng. trk, sch. -----
Air pump One - 9½" Pos. Left Side
Train connections Front and Rear
Train signal, sch. L

Tender Eight Wheeled, Drawing No. 406
Weight, with fuel and water, about 44,000 lbs.

Tank 2000 Gallons, Bill 4031
Tank "U" shape, Straight Top. Fuel Capacity 5 tons.

Tool Boxes Hard wood, Top

Frame Steel 8" Channels.

Front drawbar height 26½"

Back drawhead, center above rail 33½"
Coupler M. C. B. Auto. short shank pivoted type

Steps, hand holds, etc. to conform to I. C. C. requirements

Trucks Arch bar type, with Cast Steel bolsters.

Springs Elliptic. B. L. W. make
Journals, Diam. 5½" Length 9"
Wheels, Diam. 30" Tread 4½" Kind Chilled Cast Iron Plate
Tires None Cen. diam. ----- Size ----
Tires held by -----
Safety chains Single

Brake Position On all wheels.
Brake sch. #6-ET West'g Auto. and Straight Air with 10" x 12" tender cylinder.

List of tools, sch. 26 Bolts, nuts and threads B. L. W.
Photo sch. None Inspection B. L. W.
To be weighed Yes Material spec'ns B. L. W.
Certificate of boiler test Three copies of B. L. W. form 611
Junior laws to 11-11-15 Shipment on own wheels

Brass shop finish, No. 1
Machine shop finish D-165

Patents {Throttle, Patented, Jan. 23, 1900, (Cast on)
Feed Pipe Strainer, Patented, Sept. 1, 1903, (Cast on)

Property plates B. L. W. for engine and tender

Paintings—Engine, style 291, Olive Green and Aluminum
Painting—Tender, style 291, Olive Green and Aluminum

Mark on tank sides, S. & T. RY.

No. Pos. Road No. Name None
F. No. Plate 11
Sand Box
Cab Sides
Back of tank

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-3225

Memorandum Spec'n 10627

SPECIFICATION FOR LOCOMOTIVES 8 30 D 682

FOR Lake Champlain and Moriah R. R. Co.

Gen. as Neg. 8774 {Except with Southern Valve Gear, two bend bumper, platform, cab, tender, and step at front of engine.

Engine Drawing No. 83

12-29-15.

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 12' 6" Driving 12' 6" Total 19' 9"
Total wheelbase, engine and tend { Actual 41' 1" / Limited to 42' 1½"

Curves 17 degrees. **Grades** 4%

Limits, Height 15' 6" Width -----
Weight (approximate working order), Total 106,000 lbs.
On F. tr'k 16,000 lbs., Drivers 90,000 lbs., B. tr'k ----- lbs.

Tractive power 22720 lbs., Ratio of adhesion 4.
Work'g St'm Pres. 165 lbs., Service Switching
Fuel Soft Coal.

Boiler Steel Thick 9/16" Bill 7649
Boiler, Diam. 58" Fitn Straight Top.
Boiler steam pres. 200 lbs., Tested to { 220 lbs. steam pres. / 267 lbs. water pres.
Longitud seams Butt jointed, double covering strips, 90% seam.
Dome, diam. 29" Pos. Central
Fire door seam to be riveted instead of using tap bolts.
Fire door to be Franklin Automatic.
Firebox Steel Combustion chamb. None
Firebox, length 78-3/16" Width 42⅛" Depth F. 63⅜" B. 60⅜"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back 5/16"
Firedoor opening 16" diam. {Crown and sides to be in one piece and to be caulked on both sides.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Double Riveted
Water space stays 1" diam. with 3/16" hole 1½" deep from O. S. Flexible staybolts about 270 in breaking zone similar to 8 32 D 782 Flexible staybolts to be TATE
Radial stays 1" diam. Sling stays front {Two rows of B.L.W. Expansion stays.
Button heads below crown sheet Eight vertical rows
Crown bars None Placed ----- above crown
Crown bolts -----

Flues None
Tubes #12 W.G. Charcoal Iron
Tube ends Swaged for copper ferrules firebox ends.
Number 215 Diam. 2" Length 11' 3"

Heating Surface Flues None Combus. Chamb. None Total 1381 sq. ft.
Tubes 1257 sq. ft. Fire Box 113 sq. ft. Fire Brick Tubes 11 sq. ft.
Grate area 22.9 sq. ft. Ratio to Heating Surface 1 : 60.3
Superheater -----

Fire Brick Arch American Arch Co's on Two tubes 3" O.S. diam.

Grates Rocking bars and drop plate.
Ash Pan, Dampers Front and back.
Ash pan slides in bottom to open from cab.

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Smokebox extension With Cleaning hole and cap L.S. only
Spark ejector or hopper With
Netting and deflect. plates With
Front end arrangement to be self cleaning.
Exhaust nozzles Single high

Stack Cast Iron, Straight Dia. 16" Hole in S. B., dia. 18"
Engine and tender to pass U. S. Standard safety appliance inspection, and to comply with rules and instructions of I.C.C. in effect January 1st, 1916.

Safety Valves (Spec) Two Crosby 2½" Muffled.
Safety valves None with relief lever, Set to 165 lbs.
Whistle B. L. W. plain

Steam Gauge One Iron 7" Maker:-Ashcroft. (Not Spec)
Steam gauge stand Iron **Clock** None

Water Gauge One Ashcroft **Cab Lamps** to burn oil.
Gauge Cocks Three Back. Surface valve None
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One Everlasting 1½" POS:-Front
Cleaning Plugs
Firebox Cornere, back ones diagonal.
Crown, Two each side and two back.
Waist, One under front.
Front tube sheet, One Fusible plug One

Pump None Pos. -----
Top chamb. ----- Bottom chamb. -----
Feed Cock ----- Feed pipes -----
Checks ----- Check pipes -----
One valve 2" diam. to be applied in front of dome.

Injectors (Spec) Two Sellers No. 10½
Injectors, Pos. Right and Left, Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check {Sellers combined main check and step valve, with screw shank Pos. Right and Left.

Steam Heat None

Cab Steel, lined with wood. Ventilator in cab roof.

Cab boards Wood Nosing None
Running boards Wood Nosing None
Hand rail Iron Located on Boiler

Back Bumper Bar Steel Back drawbar height 30"
Spring chafing plate to be applied on tender same as for 8 32 D 782 and 12 38 ½ E 30 and 42.
Pilot None Pushing shoes at front
Front Bumper Oak Bumper plate With
Steps across front with handrail on bumper.
Steps, hand holds etc. to conform to I.C.C. requirements.
Front Drawhead, Center above rail 33½"
Coupler Tower M.C.B. Auto. with solid knuckle.

Signal fixtures Ixon on bumper.

Headlight Two Round Case 16" Reflector, To burn Kerosene
Headlight, Nos. on sides With H'd'l't step With
Lamp shelf None Nosing -----

Bell 92 pounds. Gollmar Air Bell Ringer.
Sand Box Two Diam. 28" Body Iron Painted Pipes Iron
Sander (Spec) Leach Auto. Air Trap A-1 with hand attachment, front and rear.
Dome casing Iron Painted.

Boiler Jacket #23 Plan. Steel Bands Iron Style 9
Boiler Lagging Magnesia Sectional.

11-266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS
H.B. Swingle Manager 191

2514

SPECIFICATION FOR LOCOMOTIVES 8 30 D 682

FOR Lake Champlain and Moriah R. R. Co.

Frames Cast Steel Braces Solid

Cylinders, Diam. 18" Stroke 24"
St'm ports, Length 16" Width 1¾" Bridges 1"
Exh. ports, Length 16" Width 2½" Valve lead ⅛"
Valve travel 5½" Steam lap ¾" Exhaust clearance -----
Eccentric crank throw 20" By-pass valve
S. F. Lubr. (Spec) Detroit Triple #22 Bulls Eye
Cyl'r heads Cast Iron; Lubr. pipes of Iron under jacket.
Cyl'r casings Iron Ptd. Head covers Steel Painted.
St'm chest casings Iron Ptd. Covers Steel Painted.
St'm chest valves Richardson balanced, with vacuum valves.
Met. pkg {PISTON ROD / VALVE STEMS} Trojan. (Spec)

Pistons Cast iron rings sprung into solid head.
Guides Steel Oil cups Needle
Crossheads Cast Steel, similar to 8 32 D 782
Wrist Pins Steel Rod cups {For hard grease for all main and side rod bearings.
Parallel rods to have solid ends

Valve Motion Southern
{Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.
Royalty on valve motion payable by The B. L. W.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 48" Cen. diam. 41" Centres Cast Steel

Tires Steel Held by Shrinkage and Shoulder.
Tires, Flanged, Pos. All Size 3½" x 5½"
Tires, Plain, Pos. ----- Size -----
Lateral play between driving boxes and wheel hubs = 1/16" total.
Driving Boxes Steeled Cast Iron
Journals, Diam. 7½" Length 8½"
Driving Boxes to have Franklin hard grease lubricater.

Springs. Make B. L. W.

Front Engine Truck Two Wheeled Swing Bolster.
To swing 12" each side of cen., Cen. pin liners None
Journals, Diam. 5" Length 9" Boxes Cast Iron
Wheels, Diam. 31" Tread ----- Kind Cast Iron spoke centre.
Tires Steel Cen. diam. 25" Size 2" x 5½"
Tires held by Shrinkage and Shoulder.

Back Engine Truck None Wheeled
To swing ----- each side of cen., Cen. pin liners -----
Journals, Diam. ----- Length ----- Boxes -----
Wheels, Diam. ----- Tread ----- Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----

Brake, position On all driving and tender wheels.
Operating Parts {Engine, Sch. #6 ET West'g Combined Auto. and Straight Air / Eng. Tr'k, sch. ----- Straight Air
Foundation Parts {Drivers, sch. M-1 American O.S. Equalized. / Eng. Tr'k, sch. -----
Air pump Two 9½" Pos. Both, Left Side.
Train connections Front and Back.
Train signal, sch. None
Air Reservoirs to be enamelled.
Driving brake Shoes to be Perfecto type.

Tender Eight Wheeled, Drawing No. 918
Weight, with fuel and water, about 70,000 lbs.

Tank 3500 Gallons. Bill 4135
Tank "U" Shape, Sloping back. Fuel Capacity 5 tons.

Tool Boxes of steel top.
Tender Frame construction to be All Steel.
Frame Steel 8" and 10" Channels.

Front Drawbar height 29⅜"
Pilot None Pushing shoes at rear
Back drawhead, center above rail 32½"
Coupler Tower M.C.B. Auto. with solid knuckle.

Steps, hand holds etc. to conform to I.C.C. requirements.
Steps across rear with handrail .on bumper.

Trucks Arch Bar type with Steel Bolsters.

Springs Elliptic. B.L.W. make.
Journals, Diam. 4½" Length 8" Journal Boxes to be Kensington Steel.
Wheels, Diam. 30" Tread 4½" Kind Solid forged rolled steel.
Tires None Cen. diam. ----- Size -----
Tires held by ----- Wheel rims 2½" thick.
Safety chains Single.

Brake Position On all wheels.
Brake sch. #6 ET West'g Auto. and Straight Air with 10" x 12" tender cylinder.
Tender Brake Shoes to be Diamond "S" type.

List of tools, sch. 29
Photo sch. 2 Inspection B. L. W.
To be weighed Yes. Material spec'ns B. L. W.
Certificate of boiler test Three copies of B. L. W. form 1026.
Junior laws to 2-15-16. Shipment On own wheels.

Brass shop finish. No. 1
Machine shop finish D-165.

B. L. W. Patents { Throttle , Patented Jan. 23, 1900 (Cast On) / Feed Pipe Strainer, Patented Sept. 1, 1903 (Cast On)

Property plates None

Painting:—Engine, style 291 Olive Green and Aluminum.
Painting:—Tender, style 291 Olive Green and Aluminum.

Lettering etc. to be similar to 8 32 D 782
Mark on Sides of cab and tank, L. C. & M. R. R. Co.
Mark on back of tank, 3500 GALS.

Road Nos. Pos.	Road Nos.	Name None
F.No Plate	18	
Dome and		
Back of tank.		

pp. 266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS As Ry. Co's Spec'n. 192

Memorandum Spec'n 11108

SPECIFICATION FOR LOCOMOTIVES 10 18 1/2 C 18 6-24-16. Gen. as 10 18 1/3 C 17 PHOTO. 477

FOR Sandy River and Rangeley Lakes Railroad. Engine Drawing No. 6

R.

Gauge of Road 2' 0" Play 1/2"
Wheelbase, Rigid 5' 0" Driving 5' 0" Total 26' 0"
Total wheelbase, eng. and tend. { Actual ——— / Limited to ———

Curves ———

Limits, Height ——— Width (See sup. 45)
Weight (approximate) in working order, Total 66,500 lbs.
On F. tr'k 6,000 lbs., Drivers 38,000 lbs., B. tr'k 22,500 lbs.

Tractive power 9800 lbs., Ratio of adhesion 3.8
Work'g St'm Pres. 180 lbs., Service Passenger and Freight
Fuel Soft Coal.

16 Boiler Steel (Sup. 22) Thick 7/16" Bill 7886
Boiler, Diam. 43" Plan Straight Top.
21 Boiler st'm pres. 180 lbs., Tested to { 200 lbs. steam pres. / 240 lbs. water pres.
Longitud. seams (See sup 23)

17 18 Dome, diam. 22" Pos. Central (See sup. 17-18-24)

Firebox O.H. Steel Combustion chamb. None
Firebox, length 46-1 1/16" Width 39 3/8" Depth F. 51 1/2" B. 50"
Firebox, Tube 1/2" Crown 3/8" Sides 5/16" Back 5/16"
Firedoor opening 14" diameter
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Single Riveted (See sup. 25)
26 Water space stays 1" diam. with 3/16" hole 1 1/4" deep from O.S.

26 Radial stays 1 1/8" diam. Sling stays front (See sup 26)
Button heads below crown on Four central rows
Crown bars None Placed ——— above crown
Crown bolts ———

Flues ———
Tubes #12 B. W. G. Hot Rolled Seamless Steel (Sup 28)
Tube ends Swaged for Copper ferrules firebox ends.
Number 136 Diam. 1 3/4" Length 9' 8"

Heating Surface	Flues ———	Combus. Chamb. ———	Total 659 sq ft	
	Tubes 597 sq ft	Fire Box 62 sq ft	Fire Brick Tubes ———	
Grate area 12.7 sq ft	Ratio to Heating Surface 1 : 52			
Superheater ———				

Fire Brick Arch on studs

Grates Cast Iron Rocking, finger type, without dump
Ash Pan, Dampers Right and Left (See sup. 29)

Throttle Balance (Sup. 30) Pos. Dome
Dry pipe Steel Steam Piped, Cast Iron

Superheater None

Smokebox extension With Cleaning hole and cap L.S. Only
Spark ejector or hopper None
Netting and deflect. plates With (See sup. 32)

Exhaust nozzles Single High (See sup. 33)

Stack Cast Iron, Taper Dia. 11" Hole in S. B. dia. 11"
Stack 45" high, 11" diam. at bottom, 12 1/2" diam. at top

Safety Valves (spec) Two Ashton 2", one muffled (See sup. 34)
Safety valves None with relief lever, Set to { 180 lbs. muffled / 183 lbs. Open
Whistle Cast Iron Chime

Steam Gauge One Iron 6 3/4" dial Makers:-Star (spec) (See sup. 35)
Steam gauge stand Iron Clock None

Water Gauge (See sup 41) 13 Cab Lamps to burn oil
12 Gauge Cocks Three Back Surface valve None
Lowest gauge cock 3" above highest part of crown
Lubricator steam valve (Sup 54) separate dry pipe to dome
Blower Valve Hancock, with 3/4" blower pipe

Blow off Cock One Bordo 1 1/2" Pos:-Front
Cleaning Plugs 2" diam., 12 threads per inch
Firebox Corners diagonal
Crown, (None on sides) Two back
Waist, One in bottom back of front tube sheet
Front tube sheet, One Fusible plug None

Pump None Pos. ———
Top chamb. ——— Bottom chamb. ———
Feed Cock ——— Feed pipes ———
Checks ——— Check pipes ———

Injectors (spec) Two Hancock, type "A" No. 6
Injectors, Pos Right and Left, in cab Steam pipes Copper
Pipes, Check Copper Feed Copper Overflow Iron
Check Hancock vertical, with stop valve Pos:-Right and Left

Steam Heat None

11a Cab Wood Ventilator in Cab Roof
Steam turret of brass in cab. Gong with

Cab boards (See sup 47) Nosing T-Iron
Running boards (See sup 47) Nosing T-Iron
Hand rail Iron Located on Boiler

Back Bumper Iron

Pilot Hard Wood (short type) Pushing shoes Front and Back
Front Bumper Oak Bumper plate With
Steps (See sup 11)

F. & B Drawhead, Center above rail 17"
Coupler Three quarter size Climax M.C.B. Auto. from National Malleable Castings Co. in malleable iron pocket bolted to bumper.
Signal fixtures Iron on Bumper (See sup. 48)

19 Headlight One Round Case 14" Reflector, To burn Kerosene
Headlight, Nos. on sides None H'd'l't step None
Lamp shelf None Nosing ———

Bell 85 pounds.
Sand Box One Diam. 23" Body Iron Painted Pipes Iron
Sander (spec) Hamilton double pneumatic

Dome casing Iron Painted

Boiler Jacket (See sup 50) Bands (See sup 50) Style 9
Boiler Lagging Magnesia sectional

THE BALDWIN LOCOMOTIVE WORKS

E. Worley Sept 1916

SPECIFICATION FOR LOCOMOTIVES 10 18 1/2 C 18

FOR Sandy River and Rangeley Lakes Railroad. Furnish Prints (See sup 6)

R.

256

31 Frames O.S. of Wheels, Cast Steel Braces Solid

32 Cylinders, Diam. 12" Stroke 16"
St'm ports, Length 12" Width 1" Bridges 3/8"
Exh. ports, Length 12" Width 2" Valve lead 1/8"
Valve travel 2 1/2" Steam lap 3/8" Exhaust clearance ———
Eccentric cranks throw 7" By-pass valve None
S. P. Lubr. Detroit Triple #22 Bulls Eye (See sup. 54)
Cyl'r heads Cast Iron; Lubr. pipes of Copper under jacket
Cyl'r casings Iron Ptd. Head covers Steel, Painted
St'm chest castings Iron Ptd. Covers Steel Painted
St'm chest valves Richardson Balanced, (See sup 53)
Met. pkg (piston rods / valve stems) Trojan (spec)

Packing (See sup 4-57)
37 Guides Laird type, forged steel Oil cups As Ry. Co's trac. 2752
Crossheads Laird type, Cast Steel (See sup. 59)
Wrist Pins (Sup 60) Rod cups (See sup 67)

Valve Motion Walschaerts
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

9 All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 36" Cen. diam. 30" Centres Cast Iron

68 Tires O.H. Steel Held by Shrinkage and Shoulder
Tires, Flanged, Pos. All Size 3" x 5"
Tires, Plain, Pos. None Size ———
Lateral play between driving boxes and wheel hubs— 1/32" total
67 Driving Boxes Gun Iron, with bronze bearings
70 Journals, Diam. 6 1/2" Length 6"

Springs. Make (See sup 71)

72 Front Engine Truck Two Wheeled Swing Bolster Side Bearing
To swing 2" each side of cen., Cen. pin liners None
73 Journals, Diam. 3 1/2" Length 6" Boxes Cast Iron
Wheels, Diam. 22" Tread 3 3/4" Kind (See sup 74)
Tires None Cen. diam. ——— Size———
Tires held by ———

75 Back Engine Truck Four Wheeled (See sup
76 Journals, Diam. 4" Length 6" Boxes Cast Iron
77 Wheels, Diam. 22" Tread 3 3/4" Kind (See sup 77)
Tires None Cen. diam. ——— Siz. ———
Tires held by ———

82 Brake, position On all Driving and Back Engine Truck Wheels
83 Operating Parts { Engine, Sch. A-1 / B. Eng. Tr'k, sch. } West'g. House Auto. Air
Foundation Parts { Drivers, sch. W-1 / B. Eng. Tr'k, sch. — } American O. S. Equalized / B. L. W.
Air pump One 8" Pos. L. S. of Boiler
Train connections Front and Back
Train signal, sch. None

Tender None Wheeled, Drawing No. ———
Weight, with fuel and water, about ———

Tank 1,000 Gallons, Bill 3731
Tank (See sup. 79 etc.)

Tool Boxes ———

Frame ———

Front Drawbar height ———
Pilot ——— Pushing shoes ———
Back drawhead, center above rail ———
Coupler ———

Steps ———

Trucks ———

Springs ———
Journals, Diam. ——— Length ———
Wheels, Diam. ——— Tread ——— Kind ———
Tires ——— Cen. diam. ——— Size ———
Tires held by ———
Safety chains ———

Brake Position ———
Brake sch. ———

List of tools, sch. 26 (See sup. 80-81)
Photo sch. #2 Inspection B.L.W. except (See sup 1)
To be weighed Yes Material specifications B.L.W. except (See sup 22-27)
Certificate of boiler test (See sup 20)
Junior laws to 8-1-16 Shipment On Car (See sup 8)

(x) Brass shop finish, No. 1
Machine shop finish D-165

12-7 B. L. W. Patents } Throttle, Patented Jan. 23, 1900 (Cast On)

Property plates None

Painting:—Engine, style ——— Black, No Striping
Painting:—Tender, style ———
Lettering, etc. to be Roman type in Gold leaf same style and size as for 10 18 1/2 C 17
Mark on tank sides, S. R. & R. L. (in letters 6" high)

Numbers on cab and tank to be in 9" figures.
Road Nos. Pos. Road Nos. Name None
F. No Plate 10
Sand Box
Cab Sides
Back of Tank

(x) Loco. to be painted black including jacket
Faces of Tires, edges of running boards, and parts of machinery outside of frames which are usually polished to be painted lead color

11. 266-67 Photo copied see box

1 THE RAILROAD COMPANY RESERVES THE RIGHT TO PLACE AS MANY INSPECTORS AS MAY BE DEEMED NECESSARY AT THE B. L. W. THESE INSPECTORS TO HAVE FREE ACCESS AT ALL TIMES TO ALL DRAWINGS AND WORK THAT THEY MAY SEE THAT THE PROVISIONS OF THIS SPECIFICATION ARE COMPLIED WITH IN EVERY RESPECT. ANY MATERIAL OR WORKMANSHIP WHICH DOES NOT CONFORM TO THIS SPECIFICATION WILL BE REJECTED AND MUST BE REPLACED BY THE B. L. W.
MR. P.M. HAMMETT, SUPT. MOTIVE POWER IS TO BE NOTIFIED WHEN LOCO. IS ERECTING SHOP SO THAT HE CAN ARRANGE TO INSPECT IT BEFORE IT LEAVES THE SHOPS.

2 ALL MATERIAL AND WORKMANSHIP TO BE OF THE BEST QUALITY AND ALL WORK ACCURATELY FITTED.
ALL PRINCIPAL AND WEARING PARTS OF LOCOS. TO BE FITTED TO GAUGES AND TEMPLATES TO INSURE THOROUGH INTERCHANGEABILITY

3 NO DEVIATION FROM THE SPECIFICATIONS OR DRAWINGS WILL BE PERMITTED, EXCEPT ON WRITTEN ORDER OF THE RAILROAD COMPANY OR ITS AUTHORIZED REPRESENTATIVE.

4 ALL GUN IRON TO BE FURNISHED BY THE HUNT-SPILLER CO., BOSTON MASS.

5 ALL STEEL CASTINGS TO BE ANNEALED.

6 AFTER LOCOMOTIVES ARE COMPLETED, THE B.L.W. TO FURNISH TO THE RAILROAD COMPANY, ONE COMPLETE SET OF BLUE-PRINTS FROM DRAWINGS COVERING ALL DETAILS OF LOCOMOTIVES.

7 THE B. L. W. TO ASSUME THE ROYALTIES ON ALL PATENTED ARTICLES, EXCEPT WHERE OTHERWISE SPECIFIED, AND TO PROTECT THE RAILROAD COMPANY FROM LOSS BY REASON OF ANY CLAIM FOR INFRINGEMENT UNDER ANY PATENTS INVOLVED IN THE CONSTRUCTION OF THE LOCOMOTIVES OR OF ANY PARTS OF LOCOMOTIVES MANUFACTURED BY THE LOCOMOTIVE COMPANY. DUE NOTICE OF SUCH CLAIM IS TO BE GIVEN THE LOCOMOTIVE COMPANY, IN WRITING AND THE ENTIRE DEFENCE OF ANY ACTION ARISING FROM SUCH CLAIM WILL BE CONDUCTED BY COUNSEL FOR THE LOCOMOTIVE COMPANY AT ITS OWN EXPENSE.
THE RAILROAD COMPANY WILL ASSUME THE ROYALTY FOR THE USE OF THE MUDGE-SLATER SPARK ARRESTER, CONTROLLED BY MUDGE AND COMPANY, CHICAGO, ILL.

8 PERFECTION WASTE PACKING TO BE APPLIED, WITH GALENA OIL

9 ALL BOLT HEADS, NUTS AND SCREW THREADS TO BE UNITED STATES STANDARD, EXCEPT FOR HOLES TAPPED IN BOILER, OR WHERE SHOWN OTHERWISE IN SPECIFICATION OR ON DRAWINGS. ALL FINISHED NUTS TO BE CASE HARDENED.

10 AXLES, WRIST PINS, AND PISTON RODS, TO HAVE DATE OF APPLICATION, ORIGINAL DIAMETER AND KIND OF MATERIAL STAMPED ON ENDS

11 ALL SAFETY APPLIANCES, SUCH AS STEPS, HANDHOLDS, LADDERS, UNCOUPLING RODS ETC. MUST CONFORM STRICTLY TO THE UNITED STATES SAFETY APPLIANCES AS REQUIRED BY THE ORDER ISSUED BY THE INTERSTATE COMMERCE COMMISSION.

12 MUDGE-SLATER LICENSE PLATE NO. 2608 (HEREWITH) TO BE SECURELY ATTACHED TO THE TOP OF THE ARRESTER NEAR THE FRONT END.

16 BOILER AND ITS APPURTENANCES AND ALL DETAILS OF LOCOMOTIVE MUST CONFORM TO THE REQUIREMENTS OF THE LOCOMOTIVE INSPECTION DEPARTMENT OF THE INTERSTATE COMMERCE COMMISSION.

17 THE B. L. W. INITIALS AND SHOP NUMBER TO BE STAMPED ON THE FRONT SIDE OF DOME RING NEAR THE TOP, IN ⅜" LETTERS AND FIGS.

18 BADGE PLATE AS R.R.CO'S DRAWING 3412, SHOWING ALLOWED WORKING PRESSURE, TO BE SECURED TO THE BACK HEAD OF BOILER.

19 THE B.L.W. TO FURNISH AND SEND TO SUPERINTENDENT MOTIVE POWER OF THE R.R.CO. COPIES OF THE REPORTS OF TESTS COVERING MATERIAL USED IN THE DIFFERENT COURSES OF THE BOILER SHELL.

20 THE B.L.W. TO FILL OUT IN TRIPLICATE AND SEND TO THE SUPERINTENDENT MOTIVE POWER OF THE R.R.CO., THE SPECIFICATION CARD AND CERTIFICATE OF INSPECTION REQUIRED BY THE LOCOMOTIVE INSPECTION DEPARTMENT OF THE INTERSTATE COMMERCE COMMISSION, COPY OF LOCOMOTIVE INSPECTION CERTIFICATE TO BE FRAMED AND POSTED IN CAB.

21 BOILER TO HAVE A FACTOR OF SAFETY OF 4½

22 BOILER STEEL TO CONFORM TO THE AMERICAN SOCIETY FOR TESTING MATERIALS SPEC'N. A-30-14 (SEE SUP. 19)

23 BOILER HORIZONTAL SEAMS TO BE BUTT JOINTED, SEXTUPLE RIVETED WITH WELT STRIPS INSIDE AND OUTSIDE. PLATES TO BE PLANED ON EDGES AND CAULKED WITH ROUND NOSE TOOL. RIVET HOLES TO BE REAMED AFTER PLATES ARE ASSEMBLED.

24 DOME TO BE SECURED TO BOILER BY A FLANGED COLLAR OF AMPLE STRENGTH, THE OPENING IN SHELL TO BE THOROUGHLY REINFORCED.

25 MUD RING TO BE STRAIGHT OF FORGED IRON OR CAST STEEL ACCURATELY FITTED.

26 THREE FRONT ROWS OF CROWN STAYS TO BE TATE FLEXIBLE BOLTS. WATER SPACE AND CROWN STAYS OF ULSTER SPECIAL STAYBOLT IRON WATER SPACE AND RADIAL STAYS TO HAVE WHITWORTH THREADS. STAYBOLTS SPACED NOT OVER 4" CENTER TO CENTER

27 BOILER BRACES TO BE DOUBLE REFINED IRON TO CONFORM TO THE AMERICAN SOCIETY FOR TESTING MATERIALS SPEC'N. A-40-13

28 TUBES TO BE MANUFACTURED BY THE NATIONAL TUBE CO.

29 ASH PAN OF SHEET IRON ARRANGED TO DUMP WITHOUT THE NECESSITY OF ANY ONE GOING UNDER THE ENGINE.

30 THROTTLE STAND PIPE TO BE SO CONNECTED TO DRY PIPE THAT IT CAN READILY BE REMOVED TO PERMIT INTERNAL INSPECTION OF BOILER.

31 SMOKE BOX EXTENSION IN ONE PIECE.
LINER TO BE APPLIED IN BOTTOM OF SMOKE BOX.
SMOKEBOX FRONT AND DOOR OF PRESSED STEEL, CAREFULLY FITTED.

32 SMOKE BOX TO BE FITTED WITH MUDGE SLATER SPARK ARRESTER WITH DRAFTAC NETTING. (SEE SUP. 12)

33 EXHAUST PIPE OF CAST IRON WITH DOUBLE CIRCULAR NOZZLE.

34 SAFETY VALVES TO BE TAPPED 2" PIPE TAP, IN DOME CAP.

35 STEAM GAUGE TO BE GRADUATED TO 350 LBS.
STEAM GAUGE VALVES TO BE HANCOCK, AS M.C.TRAC. 3383.
ONE STEAM GAUGE VALVE TO BE APPLIED IN TOP OF BOILER BACK OF DOME FOR ATTACHMENT OF SAFETY VALVE TEST GAUGE.

41 WATER GAUGE HANLON BULLS EYE TYPE MADE BY M. J. HANLON CO., FITCHBURG, MASS. GAUGE TO BE RY. CO'S STYLE WITH DOUBLE ROW OF PLAIN GLASSES ON EACH SIDE, 14 GLASSES IN ALL.

42 GAUGE COCKS TO BE AS M. C. TRACING 920.

43 STEAM GAUGE AND WATER GAUGE LAMPS TO BE M. C. PATTERN.

44 ALL PIPING, FITTINGS AND VALVES IN CAB, WHICH ARE SUBJECTED TO BOILER PRESSURE, TO BE EXTRA HEAVY, AND MUST NOT BE FASTENED TO CAB.

45 CAB NOT TO BE OVER 7' 6" WIDE OUTSIDE.
CAB WINDOW SASH TO BE OF CHERRY.
CAB DOORS TO BE HINGED TO BACK POST TO SWING IN.
CAB SEATS TO HAVE CANVAS COVERED CUSHIONS.
ARM RESTS TO BE PROVIDED FOR ENGINEER AND FIREMAN.

46 CAB APRONS OF LINDEN PLATE.

47 CAB BOARDS OF PLAIN SHEET STEEL, COVERED WITH ASH ½" THICK IN CAB. (SEE SUPPLEMENT 50)
RUNNING BOARDS OF LINDEN PLATE, DIAMOND PATTERN.

48 SIGNAL LAMP BRACKETS OF CAST STEEL TO BE FURNISHED BY CHESTER STEEL CASTING COMPANY.
SIGNAL LAMP BRACKETS TO BE APPLIED ON SMOKEBOX AS M.C.TRAC. 2324 AND ON FRONT BUMPER AND BACK OF LOCO. AS M.C.TRAC. 3032.

49 HEADLIGHT TO BE ALL STEEL FROM THE F. O. DEWEY COMPANY, LOCATED ON TOP OF SMOKEBOX.

50 BOILER JACKET NO 20 SHEET STEEL FREE FROM SCALE SECURED BY BANDS AND CLIPS. JACKET TO BE PAINTED BLACK.
BACKHEAD NOT TO BE LAGGED.

51 FRONT SECTION OF FRAMES TO BE DOUBLE WITH LOWER PART IN ONE PIECE WITH MAIN FRAME. UPPER PART TO BE SEPARATE AND BOLTED TO MAIN FRAME.
TANK TO BE LOCATED ON SLAB EXTENSION OF MAIN ENGINE FRAME AND TO BE WELL BRACED.
PEDESTAL CAPS OF FORGED IRON BOLTED TO FRAME.
PEDESTALS PROTECTED FROM WEAR BY CAST IRON SHOES AND ADJUSTABLE WEDGES.

52 CYLINDER WALLS TO BE HEAVY ENOUGH TO STAND BORING.
CYLINDER TO BE CAST WITH HALF SADDLE ATTACHED, BOLTED TOGETHER AND TO SMOKE BOX AND BOLTED AND KEYED TO FRAME.

53 EACH STEAM CHEST TO HAVE ONE VACUUM VALVE.

54 OIL PIPES FROM LUBRICATOR TO CYLINDER TESTED TO 500 POUNDS.
LUBRICATOR GLASS VALVE TO BE HANCOCK APPLIED WITH SEPARATE DRY PIPE TO DOME.

55 CYLINDERS LAGGED WITH MAGNESIA AND JACKETED.

56 CYLINDER COCKS OF MALLEABLE IRON WITH FORGED STEEL DROPS AS SHOWN ON CO'S TRAC. 2363. CYLINDER COCKS OPERATED FROM CAB.

57 PISTON HEADS OF CAST IRON IN ONE PIECE WITH SOLID HEADS FITTED WITH 2" GUN IRON PACKING RINGS AND BRASS BREAK JOINTS.
PISTON RODS OF [Supp. 78] FORGED HAMMERED STEEL.

58 GUIDES TO BE BOLTED TO CYLINDER HEADS AND TO GUIDE YOKE.

59 CROSSHEAD TO HAVE BIRD CAGE IRON WITH DIAGONAL STRIPS OF BABBITT. (SEE SUPPLEMENT 4)

60 WRIST PINS OF [Supp. 78] CAMBRIA COFFIN PROCESS STEEL (SEE SUP. 78)

61 MAIN AND SIDE RODS OF HAMMERED O. H. STEEL, RECTANGULAR SECTION.
MAIN ROD FRONT END TO BE SOLID WITH ADJUSTABLE BRASSES.
MAIN ROD BACK END TO HAVE STRAP WITH WEDGE ADJUSTMENT FOR BRASSES.
SIDE RODS TO HAVE SOLID ENDS FITTED WITH BRONZE BUSHINGS.
RODS TO BE FITTED WITH GREASE CUPS FORGED ON AS PER RY. CO'S TRACING 2424.

62 DRIVING TIRES FROM STANDARD STEEL WORKS.

63 DRIVING CRANKS OF CAST STEEL PRESSED ON AXLE AND KEYED.

64 DRIVING AXLES OF [Supp. 78] CAMBRIA COFFIN PROCESS STEEL. (SEE SUP. 78)

65 SPRINGS FROM THE PITTSBURG SPRING AND STEEL COMPANY.

66 FRONT ENGINE TRUCK OF THE RADIAL DESIGN.

67 FRONT ENGINE TRUCK AXLES OF [Supp. 78] CAMBRIA COFFIN PROCESS STEEL.

68 FRONT ENGINE TRUCK WHEELS TO BE SINGLE PLATE CHILLED, GRIFFIN WHEEL CO'S F. C. S. GRADE.

69 BACK TRUCK TO BE A CONTINUOUS IRON FRAME, PEDESTAL TYPE, WITH EQUALIZERS AND SEMI-ELLIPTIC SPRINGS.

70 BACK ENGINE TRUCK JOURNAL WEDGES OF CAST IRON.
JOURNAL BRASSES TO BE LEAD LINED, AS RY. CO'S PT. 20094.

71 BACK ENGINE TRUCK AXLES OF [Supp. 78] CAMBRIA COFFIN PROCESS STEEL.
BACK ENGINE TRUCK WHEELS TO BE SINGLE PLATE CHILLED, GRIFFIN WHEEL CO'S F. C. S. GRADE.

72 PISTON RODS, WRIST PINS AND AXLES TO BE OF STANDARD STEEL WORKS HEAT TREATED MATERIAL INSTEAD OF CAMBRIA COFFIN PROCESS STEEL (ACCOUNT OF TIME) (SEE SUP. 10, 57, 60, 70, 73 AND 77)

73 TANK TO BE OF STEEL, WATER LEG TYPE, WELL STAYED AND EQUIPPED WITH SPLASH PLATES. FUEL CAPACITY 1½ TONS.
OMIT COLLAR BACK OF COAL BOARD.
HAND RAIL TO BE APPLIED BACK OF COAL BOARD.
TANK VALVES TO BE AS M. C. TRACING 3087.

80 TOOL BOXES TO BE PROVIDED UNDER CAB BOARDS, ON EACH SIDE.

81 TOOL EQUIPMENT TO INCLUDE THE FOLLOWING:-

TWO BLOCKS FOR MAIN PIN.	TWO ENGINE CHAINS.
TWO CROSSHEAD BLOCKS	ONE SLEDGE
TWO OAK WEDGES	20 FEET OF BELL CORD
ONE PINCH BAR	ONE FRONT ENGINE TRUCK BRASS
ONE BACK ENGINE TRUCK BRASS.	

82 AIR PUMP THROTTLE TO BE HANCOCK.

83 MAIN RESERVOIRS TO BE LOCATED UNDERNEATH THE RUNNING BOARD BRACKETS.

84 BACK TRUCK BRAKE BEAMS OF OAK WITH CAST IRON HEADS AS RY. CO'S PRINT 20095 WITH 3/16" IRON PLATE ON TOP SIDE. (SUP. 86)

85 ALL BRAKE SHOES FROM THE AMERICAN BRAKE SHOE AND FOUNDRY CO.

86 BRAKE FOR BACK TRUCK TO BE MADE BY THE B. L. W. AND OPERATED BY A W. A. B. 6" x 8" TENDER BRAKE CYLINDER, TYPE L, PO. 37074, WITH PLAIN PRESSURE HEAD PO. 8614.

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-4133

Memorandum Spec'n 11125 — Minor details as far as practicable to be same as for 10 44 E 249 - 251

SPECIFICATION FOR LOCOMOTIVES 10 34 ½ C 114

FOR Interstate Railroad Company — **Engine Drawing No.** 10

7-29-16

Gauge of Road 4' 8½" — Play ¾" except ⅞" for trailing wheels
Wheelbase, Rigid 15' 6" — Driving 6' 6" — Total 27' 3"
Total wheelbase, eng. and tend. { Actual 58' 1½" / Limited to ----
Rails 80 lbs.
Curves ---- — Grades 2.17%

Limits, Height 15' 6" — Width 10' 4"
Weight (approximate) in working order, Total 181,000 lbs.
On F. tr'k 40,000 lbs., Drivers 100,000 lbs., B. tr'k 41,000 lbs.

Tractive power 26,800 lbs., Ratio of adhesion 3.73
Work'g St'm Pres. 200 lbs., Service Passenger
Fuel Soft coal

Boiler Steel — Thick 11/16" and ¾" Bill 7923
Boiler, Diam. 68" — Plan Extended Wagon Top
Boiler st'm pres. 200 lbs., Tested to { 220 lbs. steam pres. / 267 lbs. water pres.
Longitud. seams Butt jointed, double covering strips, sextuple riveted.
Dome, diam. 33" — Pos. Forward of firebox
Auxiliary dome
Firebox Steel — Combustion chamb. None
Firebox, length 108" — Width 66" — Depth F. 72½" B. 70½"
Firebox, Tube ½" — Crown ⅜" — Sides 5/16" Back 5/16"
Firedoor opening One oval 16" x 20"
Water space, Front 4" — Sides 4" — Back 4"
Water space, Frame Double — Riveted
Water space stays ⅞" diam. with 3/16" hole 1½" deep from O.S.
Tate flexible staybolts, about 300 in breaking zone.
Radial stays 1" diameter — Sling stays front { Three rows of B. L. W. expansion stays. / central rows
Button heads below crown on ten
Crown bars None — Placed ----- above crown
Crown bolts -- -
Stays 1" diameter in back head only account error
Flues ----
Tubes #12 W.G. charcoal iron or steel
Tube ends swaged for copper ferrules firebox ends
Number 331 — Diam. 2" — Length 15' 6"

Heating Surface	Flues ----	Combus. Chamb. ----	Total 2880 sq		
	Tubes 2672 sq	Fire Box 187 sq	Fire Brick Tubes 21 sq		
Grate area 49.5 sq	Ratio to Heating Surface 1 : 58.2				
Superheater ----					

Fire Brick Arch "Security" on three tubes 3" O.S. diameter of seamless steel 3/16" thick

Grates Rocking bars and drop plate
Ash Pan, Dampers None

Throttle Balance — Pos. Dome
Dry pipe Steel

Superheater None

Smokebox extension — With — Cleaning hole and cap L.S. only
Spark-arrester-on-hopper — With
Netting and deflect. plates — With

Exhaust nozzles Double, high

Stack Straight — Dia. 18" — Hole in S. B., dia. 21"

Safety Valves (SPACE) Two Crosby, 2½"
Safety valves None with relief lever, Set to 200 pounds
Whistle B. L. W. plain

Steam Gauge One iron 7" — MAKER: Ashcroft (NOT SPACE)
Steam gauge stand Iron — **Clock** None

Water Gauge One Klinger B-5 — **Cab Lamps** Electric
Gauge Cocks Three back — Surface valve None
Lowest gauge cock 2½" above highest part of crown
Lubricator steam valve without separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One Crane 2" — Pos: Left side
Cleaning Plugs
Firebox Corners diagonal and sides
Crown, Two right side, three left side and four back
Waist, Two under, one front and one back
Front tube sheet, Two — Fusible plug One

Pump None — Pos. ---
Top chamb. --- — Bottom chamb. ---
Feed Cock --- — Feed pipes ---
Checks --- — Check pipes ---

Injectors (NOT SPACE) Two Monitor — No. 11
Injectors, Pos. Right and left — Steam pipes Copper
Pipes, Check Iron — Feed Iron — Overflow Iron
Check Standard Hancock vertical #6, Figure 25 — Pos: R. and L.
Injector steam pipes in cab to be lagged
Steam Heat Consolidated system

Cab Steel
CAB DECK TO BE PRICK PUNCHED. 12/29/16

Cab boards Steel — Nosing T-iron
Running boards Steel — Nosing T-iron
Hand rail Iron — Located on boiler

Back Bumper Bar steel — Back drawbar height 32½"

Pilot Wood — Pushing shoes None
Front Bumper Oak — Bumper plate With
Steps, hand holds, etc., to conform to I. C. C. requirements

Front Drawhead, Center above rail 33½"
Coupler M. C. B. auto. from the National Malleable Castings Co.

Signal fixtures Iron on bumper
Headlight equipment to be Pyle National Electric with incandescent headlight
Headlight Two Round Case 18" — Reflector,
Headlight, Nos. on sides With — H'd'l't step With
Lamp shelf None — Nosing ---

Bell 92 pounds. Gollmar Air bell ringer
Sand Box One — Diam. 36" — Body Iron painted — Pipes Iron
Sander (NOT SPACE) Leach air double trap, A-10 to sand front and back of driving wheels
Dome casing Iron painted

Boiler Jacket #22 Plain steel bands Iron — Style 9
Boiler Lagging Magnesia sectional

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11. 266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS
H O Hobart — Nov 1916

SPECIFICATION FOR LOCOMOTIVES 10 34 ½ C 114

260

FOR Interstate Railroad Company

Frames Cast steel — Braces Solid

Cylinders, Diam. 20" — Stroke 26"
St'm ports, Length 18" — Width 1⅝" — Bridges 1⅜"
Exh. ports, Length 18" — Width 3" — Valve lead 3/16"
Valve travel 5½" — Steam lap ⅞" — Exhaust clearance ---
Eccentric crank throw 21" — By-pass valve None
S. F. Lubr. (SPACE) Nathan Triple Bulls Eye
Cyl'r heads Cast iron: Lubr. pipes of iron under jacket
Cyl'r casings Iron painted — Head covers Steel painted
St'm chest casings Iron painted — Covers Steel painted
St'm chest valves Richardson Balanced, with vacuum valves
Met. pkg { PISTON ROD / VALVE STEMS } U. S. (NOT SPACE)

Pistons Cast iron rings sprung into solid heads
Guides Steel — Oil cups Needle
Crossheads Cast steel
Wrist Pins Steel — Rod cups Plunger, forged on rods
Parallel rods to have solid ends

✱ **Valve Motion** Southern, Royalty payable by The B. L. W.
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.
Brown reverse gear

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.
Castle nuts and cotter keys for all movable bolts and pins

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 66" — Cen. diam. 60", Centers cast steel

Tires Steel — Held by Shrinkage and shoulder
Tires, Flanged, Pos. All — Size 3" x 5½"
Tires, Plain, Pos. ---- — Size ----
Lateral play between driving boxes and wheel hubs = 1/16" total
Driving Boxes Cast steel
Journals, Diam. 9" — Length 12"

Springs. Make B. L. W.

Front Engine Truck four Wheeled Swing bolster center bearing
To swing 2½" each side of cen., Cen. pin liners None
Journals, Diam. 6" — Length 12" — Boxes Cast iron
Wheels, Diam. 33" — Tread --- Kind Cast iron spoke center
Tires Steel — Cen. diam. 28" — Size 2½" x 5½"
Tires held by Shrinkage and shoulder

TRAILING WHEELS Two.
To swing --- each side of cen., Cen. pin liners None
Journals, Diam. 8" — Length 12" — Boxes Cast steel
Wheels, Diam. 44" — Tread --- Kind Cast steel spoke center
Tires Steel — Cen. diam. 39" — Size 2½" x 5½"
Tires held by Shrinkage and shoulder

Brake, position On all driving and tender wheels
Operating Parts { Engine, Sch. No. 6 ET West'g. Combined auto. and straight air / Eng. Tr'k, sch. ---
Foundation Parts { Drivers, sch. WX-2 American C. S. Equalized / Eng. Tr'k, sch. ----
Air pump One 9½" — Pos. left side
Train connections Front and back
Train signal, sch. L
Air pump steam pipes in cab to be lagged
Driver brake shoes to be Perfecto center lug type from the American Brake Shoe & Foundry Company.
Air reservoirs to have hydrostatic test of 210 lbs. 7/3/16

Tender Eight Wheeled, Drawing No. 610
Weight, with fuel and water, about 115,000 pounds

Tank 6000 — Gallons, Bill 4340
Tank ~~full sheet~~ water bottom type. Fuel capacity 12 tons
R.S. Mec. 1.9.17

Tool Boxes Steel, Top

Frame Steel 12" channels

Front Drawbar height 32½"
Pilot Wood,, at rear — Pushing shoes None
Back drawhead, center above rail 33½"
Coupler M. C. B. auto. from the National Malleable Castings Co. with Farlow draft gear.
For Hyperion - Tender complete to have long shank to comply with the I.C.C. requirements for switching locos. 1.4.17
Steps, hand holds, etc., to conform to I. C. C. requirements

Trucks Arch Bar type, with cast steel bolsters

Springs Elliptic B. L. W.
Journals, Diam. 5" — Length 9"
Wheels, Diam. 33" — Tread 4½" Kind Solid forged rolled steel
Tires None — Cen. diam. --- Size ---
Tires held by --- — Wheel rims 2½" thick
Safety chains Single

Brake Position On all wheels
Brake sch. No. 6 ET West'g. auto and straight air with 12" x 12" tender cylinder
Tender brake shoes of gray iron with steel backs from the American Brake Shoe & Foundry Company

List of tools, sch. 29
Photo sch. 2 — Inspection by Alfred Lovell
To be weighed Yes — Material spec'ns B. L. W.
Certificate of boiler test Three copies of B. L. W. form 1036
Junior laws to 11-1-16 — Shipment On own wheels

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. Patents { Throttle, Patented Jan. 23, 1900 (Cast on) / Feed Pipe Strainer, Patented Sept. 1, 1903 (Cast on)

Property plates None
MARK ON BACK OF TANK IN UPPER RIGHT HAND CORNER } 6000 GALLONS 12/8/16

Painting:—Engine, style ---- Olive Green, no striping
Painting:—Tender, style ---- Olive Green, no striping
Lettering, etc., in Gold same style as shown on Ry. Co's photo. herewith. Letters and figures to be 8" high x 12" wide
Mark on cab sides, I. R. R.
Mark on tank sides, INTERSTATE
Road number on cab to be placed below mark

Road Nos. Pos.	Road Nos.	Name None
F. No. Plate	9	
Sand box		
Cab sides		
Back of tank		

✱ Southern Valve Gear parts to be interchangeable with 10 44 E 249 to 251 as far as possible

THE BALDWIN LOCOMOTIVE WORKS — As Spec'n C-3882
Memorandum Spec'n 10966 — Dup. 6-32 D 1053, with same extra except as otherwise specified.
SPECIFICATION FOR LOCOMOTIVES 6 32 D 1093, 1094 — Gen. as 5579 (except with alligator type Crossheads)
FOR Calumet, Hammond & Southeastern R. R. Co. — Engine Drawing No 1064.
P — 4-29-16

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 10' 6" Driving 10' 6" Total 10' 6"
Total wheelbase, eng. and tend (Actual 39' 11½" / Limited to -----)

Curves 200 feet radius.

Limits, Height ---- Width ----
Weight approximate weight in working order Total 123,000 lbs.
On Front Truck ---- lbs. On Drivers 123,000 lbs. On Back Truck ----
Tractive power 38620 lbs. Ratio of adhesion 4.3
Work'g St'm Pres. 180 lbs. Service Switching.
Fuel Soft Coal.

12 Boiler and engine to conform to Illinois and I.C.C. requirements
Boiler Steel Thick 11/16" Bill 6929
Boiler, Diam. 64" Plan Straight Top.
Boiler Centres 200 lbs. Tested to 220 lbs. steam pres. 187 lbs. water pres.
Longitudinal seams Butt jointed double covering strips.
Dome one piece type.
Dome, Diam 29" Pos. Central

Firebox Steel Combustion chamber None
Firebox, Length 82 13/16" Width 41⅜" Depth F 62½" B 59½"
Firebox Tube ⅜" Crown ⅜" Sides ⅜" Back 5/16"
Firebox opening 16" diam.
Water space Front 4" Sides 3½" Back 3½"
Water space Front single Riveted
Water space Stays 1" diam. with 3/16" hole 1½" deep from O.S.

Radial stays 1½" diam Sling stays front (Two rows of B. L. W. Expansion stays)
Bulge bears below next ring ten Vertical ---
Crown bars none Plated ---- above crown
Crown bolts ----

Flues ----
Tubes #12 W. G. Parkesburg Charcoal Iron.
Tube ends Swaged for copper ferrules firebox ends.
Number 264 Diam 2" Length 10' 3"
All tubes to be beaded in front tube sheet.

Heating Flues ---- Combus. Chamb ---- Total 1527 sq ft
Surface Tubes 1405 sq ft Fire Box 122 sq ft Fire Brick Tubes ----
Grate area 23.7 sq ft Ratio to Heating Surface 1 : 64
Superheater ----

Fire Brick arch On Studs
Three combustion jets to be provided, leading to three tubes in each side of fire box.
Grates (See sup. 3)
Ash Pan, Dampers front and back

Throttle Balance Pos. Dome
Dry pipe ~~Wrot Iron or~~ steel

Superheater None

Smokebox extension with Cleaning hole and cap L.S. only
Spark ~~ejector or~~ hopper with
Netting and deflect. plates with

Exhaust nozzles Double high

Stack Straight Dia. 18" Hole in S. B. dia. 21½"

Safety Valves (Spec) Two Coale 3" muffled.
Safety valves none with relief lever, Set to 180 lbs.
Whistle B. L. W. Plain.

Steam Gauge One Iron 7" Maker: - Ashcroft (NOT Spec)
Steam gauge stand Iron **Clock** None

Water Gauge One (See sup. 11) **Cab Lamps** Electric
5 **Gauge Cocks** Three back. Surface valve none
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve without separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One Johnstone Pos:- Front.
Cleaning Plugs
Firebox Corners diagonal and sides.
Crown. Two each side and three back.
Waist. One under front.
Front tube sheet. Two Fusible plug One

Pump None Pos. ----
Top chamb. --- Bottom chamb ---
Feed Cock ---- Feed pipes -----
Checks------ Check pipes -----

6 **Injectors** (Not Spec) Two Simplex Type "R" No. 8
Injectors, Pos Right and left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check (See sup. 6a) Pos. Right and Left.

Steam Heat None

Cab Steel

Cab boards Steel Nosing Tee Iron
Running boards Steel Nosing Tee Iron
Hand rail Iron Located on Boiler

Back Bumper Bar Steel Back drawbar height 28"

Pilot None Pushing shoes Cast in bumper.
Front Bumper Cast Steel Bumper plate None
Steps Across front with hand rail. Pin box on front bumper.
Steps, hand holds etc. to conform to I.C.C. requirements.
Front Drawhead, Center above rail 33½"
10 **Coupler** Sharon, M.C.B. Auto. Swing type with 6" x 6" short shank.

Signal fixtures None

Headlight to have Pyle National Electric Equipment
Headlight Two round case 18" Reflector.
Headlight, Nos. on sides with H'dl't step with
Lamp shelf None Nosing ----

Bell 92 pounds. Little Giant Air Bell Ringer.
Sand Box Two Diam. 28" Body Iron Ptd. Pipes Iron
Sander (Not Spec) Leach air, Trap "A-1" in each box to sand front and back

Dome casing Iron painted

Boiler Jacket #22 Plan. Steel Bands Iron Style 9
Boiler Lagging Magnesia Sectional

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11 p. 266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS — As Finished — Page 262
SPECIFICATION FOR LOCOMOTIVES 6 32 D 1093, 1094
FOR Calumet, Hammond & Southeastern R. R. Co.
(Furnish outline drawings in triplicate (diagram) send to Co. also one set of prints of principal details

Frames Cast Steel Braces Solid

Cylinders, Diam. 19" Stroke 24"
Stm ports, Length 16" Width 1¼" Bridges 1"
Exh. ports, Length 16" Width 2½" Valve lead 1/16"
Valve travel 5½" Steam lap ¾" Exhaust clearance ----
Eccentric crank throw 5"
11 S. P. Lubr. Nathan Triple #9 - 1912 Bull's Eye (Spec)
Cyl'r heads Cast Iron; Lubr. pipes of Iron under jacket
Cyl'r casings Iron Ptd. Head covers Steel Painted
St'm chest casings Iron ptd. Covers Steel painted
St'm chest valves Richardson balanced, with vacuum valves.
Met. pkg (PISTON ROD / VALVE STEMS) UNITED STATES KING TYPE. (NOT Spec)

Pistons Cast Iron rings sprung into solid heads.
Guides Two bar type, Steel Oil cups Needle.
Crossheads Alligator type, cast Steel
Wrist Pins Steel Rod cups Plunger forged on
12 Parallel rods to have strap ends

Valve Motion Stephenson
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except stayholts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

12 **Drivers,** O. S Diam. 46" Cen. diam. 40" Centres Cast Steel

Tires Steel Held by Shrinkage and Shoulder.
Tires, Flanged, Pos. Front and back Size 3" x 5½"
Tires, Plain, Pos. Middle Size 3" x 6½"
Lateral play between driving boxes and wheel hubs = 1/16"
Driving Boxes Steeled Cast Iron
Journals, Diam. 8½" Length 8½"

Springs, Make B. L. W.

Front Engine Truck None Wheeled ----
To swing --- each side of cen., Cen. pin liners ---
Journals, Diam. --- Length --- Boxes ---
Wheels, Diam. --- Tread --- Kind ----
Tires --- Cen. diam. --- Size ---
Tires held by

Back Engine Truck None Wheeled ---
To swing --- each side of cen., Cen. pin liners ----
Journals, Diam. --- Length --- Boxes ----
Wheels, Diam. --- Tread --- Kind ---
Tires ---- Cen. diam. --- Size ----
Tires held by -----

13 **Brake,** position On all driving and Tender wheels.
Operating / Engine, Sch. L1 New York Combined Auto. and Straight Air.
Parts / Eng. Trk, sch. ----
Foundation / Drivers, sch. F-2 New York O. S. Equalized.
Parts / Eng. Trk, sch. -----
11 Air pump Two 9½" Pos. both Left side
Train connections Front and back.
Train signal, sch. None
Pump governor and steam valves to be 1½"

Tender Eight Wheeled, Drawing No. 435
Weight, with fuel and water, about 80,000 lbs.

Tank 4,000 Gallons. Bill 3648
Tank "U" shape, sloping back. Fuel capacity 7 tons.
Hose couplings American Gravity, from Adrian Mfg. Co.
Tool Boxes Hard wood, top.
Tender bumpers, front and back, cast steel
Frame Steel 10" channels.

Front Drawbar height 29½"
Pilot None Pushing shoes at rear
Back drawhead, center above rail 33½"
Coupler Sharon M.C.B. Auto. swing type, with 6" x 6" short shank.
Coupler pockets to have extended floor to prevent drooping of coupler.
Steps, handrails, etc. to conform to I. C. C. requirements.
Steps Across rear with handrail.
Trucks Diamond Arch Bar Type with Cast Steel Bolsters

Springs Elliptic. B. L. W.
Journals, Diam. 4½" Length 8"
Wheels, Diam. 33" Tread 4½" Kind Chilled Cast Iron Plate
Tires --- Cen. diam. --- Size ----
Tires held by ----
Safety chains Single

Brake Position On all wheels
Brake sch. LT New York Auto. and Straight Air with 10" x 12" Tender cylinder.

List of tools, sch 29 Bolts, nuts and threads B. L. W.
Photo sch. None Inspection B.L.W. (see sup. 1)
To be weighed No Material specifications B. L. W.
Certificate of boiler test (see sup. 2)
Junior laws to 5/15/16 Suspended On own wheels.

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. Throttle Pat'd Jan. 23, 1900 (Cast on)
Patents Feed Pipe Strainer Pat'd Sept. 1, 1903 (cast on.)

Property plates None

Painting: Engine, style 291 Olive Green and Aluminum
Painting: Tender, style 291 Olive Green and Aluminum

Lettering etc. as Ry. Co, print S-356 (herewith)
Mark on Cab sides, C. H. & S.
Mark on Tank sides, CALUMET, HAMMOND AND SOUTHEASTERN

Road Nos. Pos.	Road Nos.	Name, None
F. No Plate	6	
F. Sand Box	7	
Cab Sides		
Back of tank		

For Hereafter:- Change location of hole in boiler under the dome so as to provide clearance for throttle crank. 7/15/16 R. S. MSC.

Hereafter:- Seams on front, back and sides of Cab to be butt Seams instead of Lap. Letter Change Office Oct. 7-1916

11. 266-67 Photo copied see box

Specifications for Locomotives 6 - 32 D 1093, 1094
for Calumet, Hammond and Southeastern R. R. Co.

1 The Ry. Co's Inspector will make inspection of the boiler after the tubes are in, witness the Hydrostatic tests, and the steam tests. Advise F. W. two days in advance of the time the inspector should be here for this purpose.

2 Certificate of boiler test:- Four copies of Ry. Co's form 519 (I.C.C. form)
And four copies of Boiler spec'n B.L.E. form 491

3 Grates Bar type fire grates, with dump grates to be as shown on Ry. Co's sketch

4 Water gauge connections to boiler to be Nathan quick closing safety cutout valves.
Water gauge to have Delco Guard.

5 Gauge cocks to be Nathan never leak.

6 Injector checks to be Nathan reversible stop check valve type 287-A.

7 Intermediate checks to be provided in the delivery pipes between the injector and the main check.

8 Hose couplings, for feed water, American gravity from Adrian Mfg. Co.

9 Coal sprinkler to be provided.

10 Coupler pocket to have extended floor to prevent drooping of coupler

11 Cylinder lubricator to have auxiliary air pump air cylinder attachment with connections to the air pump air cylinder.

12 Main connecting rod to connect to middle pair of driving wheels.

13 Air Reservoirs to be B. L. W.

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-2492

Memorandum Spec'n 10434

SPECIFICATION FOR LOCOMOTIVES 6-36 D 178 Gen. as ~~XEK~~ print from G.L.W. tracing 28014

FOR Chestnut Ridge R.R. Co. 3. 25. 15 **Engine Drawing No.** 25.

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"
Total wheelbase, eng. and tend. { Actual 41' 5½" / Limited to ------
CURVES, 15 degrees. One grade of 1%, 1500 ft. long against load. Length of haul 2 miles. One grade of 1% with curve of 6 degrees, compensated. Rails 80 lbs. No. 7 frogs.

Limits, Height ----- Width -----
Weight (approximate) in working order, Total 146,000 lbs.
On F. tr'k ----- lbs., Drivers 146000 lbs., B. tr'k ----- lbs.
Weight on Driving Wheels limited to 146,000 lbs.
Tractive power 35400 lbs., Ratio of adhesion 4.1
Work'g St'm Pres. 185 lbs., Service Switching
Fuel Soft Coal and Buckwheat

Boiler Steel Thick ⅜" Bill 7425
Boiler, Diam. 66" Plan Straight top
Boiler st'm pres. 200 lbs., Tested to { 220 lbs. steam pres. / 267 lbs. water pres.
Longitud. seams Butt jointed, double covering strips, sextuple riveted, 90% seam.
Dome, diam. 29" Pos. Central
Fire box to be Wootten type
Firebox Steel Combustion chamb. None
Firebox, length 107⅞" Width 100" Depth F. 61" B. 53"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back ⅜"
Firedoor opening Two 16"dia. Crown and sides in one piece
Water space, Front 4" Sides 3½" Back 3½"
Water space, Frame Double Riveted
Water space stays ⅞" diam. with 3/16" hole 1½" deep from O. S.
Flexible stay bolts, 351 American 15/16" diam. in breaking zone
Radial stays 1" diam. Sling stays front { Two rows of Tate / Expansion stays
Button heads below crown on Eight central rows
Crown bars None Placed ----- above crown
Crown bolts -----

Tubes #12 B. G. Charcoal Iron or Steel
Tube ends Swaged for copper rings fire box ends.
Tubes, No. 306 Diam. 2" Length 11' 0"

Heating Surface, Tubes 1749⁶ Firebox 171⁶ Total 1920⁶
Grate area 75⁶ Ratio to heat'g surface, 1 : 25.6
Superheater ---- Feed-water heater -----
Reheater ----- Fire brick tubes -----

Fire Brick arch None

Grates Rocking bars and drop plate
Ash Pan, Depth F. 41½", B. 47½" Dampers Back only

Throttle Balance Pos. Dome
Dry pipe ~~Steel Iron on~~ Steel

Superheater None

Smokebox extension With Cleaning hole and cap L. S. only
Spark ~~ejector on~~ hopper With
Netting and deflect. plates With

Exhaust nozzles Double, High

Stack Straight Diam. 18" Hole in S.B. 22"
Railroad Co. is burning the following coals:- 30% Westmoreland Soft Coal; 70% Buckwheat Coal.
It may be possible at some future time, Railroad Co. will burn No. 1 Buckwheat Coal exclusively.

Safety Valves (not spec) Two Coale 3"
Safety valves None with relief lever, Set to 185 lbs.
Whistle B. L. W. Plain

Steam Gauge One Iron, 7" Maker:-Ashcroft (not spec)
Steam gauge stand Iron **Clock** None
Water gauge to be on right side
Water Gauge One - Klinger **Cab lamps** To burn oil
Gauge Cocks Three - Back Surface valve None
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome.
Blower Valve B. L. W.

Blow off Cock One - Crane 2" (to use stock) Posit:- Front
Cleaning Plugs
Firebox Corners diagonal, sides and back
Crown, Two R. S., three L. S. and four back
Waist. One under front
Front tube sheet, One Fusible Plug :- One

Pump None Pos. -----
Top chamb. ---- Bottom chamb. -----
Feed cock ---- Feed pipes -----
Checks ---- Check pipes -----

Injectors (spec) Two Sellers, Class "N" No. 9½
Injectors, Pos. R. and L. Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. R. and L.

Steam Heat None

Cab Steel, - placed at back end.

Cab boards Steel Nosing T Iron
Running boards Steel Nosing T-Iron
Hand rail Iron Located on Boiler

Back Bumper Bar Steel Back drawbar height 31"
Spring buffer between Engine and tender.

Pilot None Pushing shoes At front
Front Bumper Oak Bumper plate With
Steps Across front with handrail
Steps, hand holds, etc., to conform to I. C. C. requirements
Front Drawhead, Center above rail 33½"
Coupler M. C. B. Auto

Flag fixtures Iron on bumper

Headlight Two Round Case (to use stock) 16" Reflector, To burn Kerosene
Headlight, Nos. on sides With H'dl't step With
Lamp shelf None Nosing ------

Bell 92 pounds
Sand Box Two Diam. 28" Body Iron ptd. Pipes Iron
Sander (spec) Leach Air Trap A-1 in each box, to sand front and rear.

Dome casing Iron ptd.
Boiler Jacket { #22 Soft Steel ptd. Bands Iron Style - 9
Boiler Lagging Magnesia - sectional

11-266-67 Photo copied see box

THE BALDWIN LOCOMOTIVE WORKS

Engine H. J. Berry May 1915

SPECIFICATION FOR LOCOMOTIVES 6 36 D 178

FOR Chestnut Ridge R. R. Co.

265

Frames Cast Steel Braces Solid

Cylinders, Diam. 21" Stroke 26"
St'm ports, Length 19" Width 1⅜" Bridges 1⅜"
Exh. ports, Length 19" Width 3" Valve lead ⅛"
Valve travel 5½" O. S. lap ⅞" Ins. lap -----
Eccentric crank throw 11½"
S. F. Lubr. (Spec) Detroit Triple #22 Bull's Eye { Iron pipes / under jacket
Cyl'r heads Cast Iron
Cyl'r casings Iron ptd. Head covers Steel painted
St'm chest casings Iron ptd. Covers Steel painted
St'm chest valves Richardson Balanced, with vacuum valves
Met. pkg { PISTON ROD / VALVE STEMS U. S. (not spec)

Pistons Cast Iron rings sprung into solid head
Guides Steel Oil cups Hapsett wick feed (to use stock)
Crossheads Cast Steel
Wrist Pins Steel Rod cups Plunger
Par. Rods to have solid ends

Valve Motion Walschaerts
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 51" Cen. diam. 44"
Wheel centres, Main Cast Steel, others Cast Iron
Tires Steel Held by Shrinkage and Shoulder
Tires, Flanged, Pos. Front and Rear Size 3½" x 5½"
Tires, Plain, Pos. Middle Size 3½" x 6½"
Lateral play between driving boxes and wheel hubs - 1/10" total
Driving Boxes Steeled Cast Iron
Journals, Diam. 9" Length 11"

Driving spring staples Wrot Iron

Springs. Make B. L. W.

Front Engine Truck None Wheeled -----
To swing----- each side of cen. Cen. pin liners -----
Journals, Diam. ----- Length ----- Boxes -----
Wheels, Diam. ----- Tread ----- Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----

Back Engine Truck None Wheeled -----
To swing -----each side of cen. Cen. pin liners -----
Journals, Diam. ----- Length ----- Boxes -----
Wheels, Diam. ----- Tread ----- Kind -----
Tires ----- Cen. diam. ---- Size ----
Tires held by -----

Brake, position On all driving and tender wheels
Operating Parts { Engine, Sch. #6-ET. West'g. Combined Auto. and / Eng. Tr'k, sch. ----- straight air
Foundation Parts { Drivers, sch. WS-2 American C. S. Equalised / Eng. tr'k, sch. -----
Air pump One 11" Pos. L. S.
Train connections Front and Back
Train signal, sch. None
Air Reservoirs to have large capacity

Tender Eight Wheeled, Drawing No. 435
Weight, with fuel and water, about 90,000 lbs
Tender to be duplicate of New Jersey Zinc Co's Eng. 7 Class 638 D 13
Tank 4500 Gallons, Bill 3938
Tank "U" shape, sloping back. Fuel Capacity 8 tons.

Tool Boxes Hard wood, top.

Frame Steel 10" Channels, with cast steel bumpers.
Pushing shoes cast in rear bumper
Front drawbar height 28½"
Spring Buffer between engine and tender
Back drawhead, center above rail 33½"
Coupler M. C. B. Auto.

Steps, hand holds, etc., to conform to I. C. C. Requirements
Steps, across rear, with hand rail. Steps on sloping back of tank.

Trucks All metal arch bar trucks

Springs Elliptic. B. L. W.
Journals, Diam. 5" Length 9"
Wheels, Diam. 33" Tread 4½" Kind Chilled Cast Iron plate
Tires None Cen. diam. ---- Size -----
Tires held by -----
Safety chains Single

Brake Position on all wheels
Brake sch. #6 ET West'g Auto. and straight air with 12" x 12" tender cylinder.

List of tools, sch. 29 Bolts, nuts and threads B. L. W.
Photo sch. 2 Inspection B. L. W. (except as noted below)
To be weighed Yes Material specs B. L. W.
Certificate of boiler test Three copies of B. L. W. form 611
Junior laws to 4.1.15 Shipment On own wheels, UNDER STEAM. 5/18/15

Brass shop finish, No. 1
Machine shop finish D-165

Patent Plates { **Throttle** Patented Jan. 23, 1900 (cast on) / **Feed Pipe strainer,** Patented Sept. 1, 1903 (cast on)

Property plates None

Painting:—Engine, style 291 Black and Yellow
Painting:—Tender, style 291 Black and Yellow

Lettering, etc., to be same as for 6 38 D 13 (STYLE)
Mark on tank sides, CHESTNUT RIDGE RAILWAY

~~Road number on sides of tank to be under centre of mark.~~ 5/18/15.

No. Pos.	Road No.	Name None
F. No. Plate	4	
F. Sand Box		
Cab Sides		
Back of tank		

Mr. S.H. Poole of the Fidelity & Casualty Co., 320 Walnut St., Phila., is to be advised when boiler shell is ready and before tubes are put in place so that inspection and test can be made. He is to be notified also when boiler is ready for testing so that the test may be witnessed by the above company.

THE BALDWIN LOCOMOTIVE WORKS As Spec'n 0-3972.

Memorandum Spec'n 10906.

SPECIFICATION FOR LOCOMOTIVES 6 36 D 217

FOR Cornwall Railroad Co.

B.

Gen. as Neg. 3796.

Engine Drawing No. 11

3-13-16.

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"
Total wheelbase, eng. and tend. Actual 41' 7" / Limited to -----

Curves -----

Limits, Height ----- Width -----
Weight (approximate in working order) Total 141,000 lbs.
On F. tr'k ----- lbs., Drivers 141,000 lbs., B. tr'k ----- lbs.

Tractive power 34,400 lbs., Ratio of adhesion 4.1
Work'g St'm Pres. 180 lbs., Service Switching.
Fuel Soft Coal.

Boiler Steel Thick 11/16" Bill 7626.
Boiler, Diam. 68" Plan Straight Top.
Boiler st'm pres. 200 lbs., Tested to 220 lbs. steam pres. / 267 lbs. water pres.
Longitud. seams Butt jointed, double covering stripe.

Dome, diam. 29" Pos. Central.

Firebox Steel Combustion chamb. None.
Firebox, length 108-3/16" Width 42⅛" Depth F. 65⅝" B. 62⅛"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diam.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Single Riveted
Water space stays ⅝" diam. with 2/16" hole 1⅛" deep from O. S.
Flexible Staybolts:-450 American, furnished free by R.R. Co.
Radial stays 1" diam. Sling stays front Two rows of B.L.W. Expansion Stays.
Button heads below crown on Eight central rows
Crown bars None. Placed ----- above crown
Crown bolts -----
Staybolt threads to have U.S. Standard form.

Flues None.
Tubes (on account of time) 2¼" W. G. Charcoal Iron, Parkesburg tubes. (Not Spec)
Tube ends Swaged for copper ferrules, fire box ends.
Number 322 Diam. 2" Length 10' 5"

Heating Surface: Flues None Combus. Chamb. None Total 1902 sq. ft.
Tubes 1742 sq. ft. Fire Box 161 sq. ft. Fire Brick Tubes -----
Grate area 31.5 sq. ft. Ratio to Heating Surface 1 : 60
Superheater -----

Fire Brick Arch On Studs.

Grates Rocking Bars and Drop plate.
Ash Pan, Dampers Front and Back.

Throttle Balance Pos. Dome.
Dry pipe Steel

Superheater None.

Smokebox extension With Cleaning hole and cap L.S. only.
Spark-ejector-to hopper With
Netting and deflect. plates With

Exhaust nozzles Double high.

Stack Cast Iron straight Dia. 18" Hole in S. B., dia. 21½"

Safety Valves (not spec) Two Consolidated 3"
Safety valves None with relief lever, Set to 180 lbs.
Whistle B. L. W. plain.

Steam Gauge One Iron 7" Maker:-Ashcroft. (not spec)
Steam gauge stand Iron **Clock** None.
* Gauge cocks to have babbitt seats. (Spec) 4/22/16.
Water Gauge One B.L.W.(Ironclad) **Cab Lamps** To burn oil.
* **Gauge Cocks** Three Back. Surface valve None
Lowest gauge cock 3" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One B.L.W. Pos:-Front.
Cleaning Plugs
Firebox Corners diagonal, sides and back.
Crown, Three each side and two back.
Waist, One under front.
Front tube sheet, One Fusible plug One

Pump None. Pos. -----
Top chamb. ----- Bottom chamb. -----
Feed Cock ----- Feed pipes -----
Checks ----- Check pipes -----

Injectors (Spec) Two Sellers Class "N" Improved. No. 9
Injectors, Pos. Right and Left. Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. Right and Left.

Steam Heat None.

Cab Wood

Cab boards Wood Nosing None.
Running boards Wood Nosing None.
Hand rail Iron Located on Boiler.

Back Bumper Bar Steel Back drawbar height 31"

Front Bumper reinforced with heavy plate in back of bumper.
Pilot None. Pushing shoes at front.
Front Bumper Oak Bumper plate None.
Steps across front with suitable handrails.
Steps, hand holds etc. to conform to I.C.C. requirements.
Front Drawhead, Center above rail 33½"
Coupler M. C. B. Automatic.

Signal fixtures Iron on bumper.

Headlight Two Round Case 16" Reflector, To burn Kerosene.
Headlight, Nos. on sides With H'd'l't step With
Lamp shelf None. Nosing -----

Bell 92 pounds.
Sand Box Two Diam. 28" Body Iron Painted. Pipes Iron
Sanders (not spec) Leach Air Trap A-1 in each box, to sand front and back.

Dome casing Iron Painted.

Boiler Jacket #22 Soft. Steel Pt Bands Iron Style 9
Boiler Lagging Magnesia sectional.

N. Conklin May 1916

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SPECIFICATION FOR LOCOMOTIVES 6 36 D 217

FOR Cornwall Railroad Co.

B.

Frames Cast Steel Braces Solid

Cylinders, Diam. 21" Stroke 26"
St'm ports, Length 19" Width 1⅝" Bridges 1⅜"
Exh. ports, Length 19" Width 3" Valve head 1 1/16"
Valve travel 5⅛" Steam lap ⅞" Exhaust clearance -----
Eccentric-crank-throw 5"
S. F. Lubr. (Spec) Detroit Triple #22 Bulls Eye.
Cyl'r heads Cast Iron; Lubr. pipes of Iron under jacket.
Cyl'r casings Iron Ptd. Head covers Steel Painted.
St'm chest casings Iron Ptd. Covers Steel Painted.
St'm chest valves Richardson Balanced, with vacuum valves.
Met. pkg (Piston rod / Valve stems) UNITED STATES. (not spec)

Pistons Cast Iron rings sprung into solid head.
Guides Steel Oil cups Needle.
Crossheads Cast Steel
Wrist Pins Steel Rod cups for grease, forged solid on rods
Parallel Rods to have solid ends.

Valve Motion Stephenson.
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 51" Cen. diam. 44"
Wheel Centres, Main Cast Steel, others, Cast Iron.
Tires Steel Held by Shrinkage and Sheulder.
Tires, Flanged, Pos. Front and Back. Size 3½" x 5½"
Tires, Plain, Pos. Middle Size 3½" x 6½"
Lateral play between driving boxes and wheel hubs = 1/16" total.
Driving Boxes Cast Steel
Journals, Diam. 9" Length 12"

Springs. Make B. L. W.

Front Engine Truck None Wheeled-----
To swing -----each side of cen., Cen. pin liners -----
Journals, Diam.----- Length----- Boxes -----
Wheels, Diam. ----- Tread -----Kind-----
Tires ----- Cen. diam.----- Size -----
Tires held by -----

Back Engine Truck None Wheeled -----
To swing----- each side of cen., Cen. pin liners -----
Journals, Diam. -----Length ----- Boxes-----
Wheels, Diam. ----- Tread -----Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----

Brake, position On all driving and tender wheels.
Operating Parts: Engine, Sch. #6 ET West'g. Comb. Auto. and Eng. Tr'k, sch.----- Straight Air
Foundation Parts: Drivers, sch. WM-2 American O. S. Equalized. / Eng. Tr'k, sch.-----
Air pump One 9½" Pos. Left Side.
Train connections Front and Back.
Train signal, sch. None.
Brake Shoes from American Brake Shoes & Foundry Co.

Tender Eight Wheeled, Drawing No. 918
Weight, with fuel and water, about 80,000 lbs.

Tank 4,000 Gallons, Bill 4123.
Tank "U" Shape, sloping back. Fuel capacity 6 tons.

Tool Boxes Hard Wood, Top.

Frame Steel 8" and 10" Channels.

Front Drawbar height 30⅞"
Pilot None. Pushing shoes at rear.
Back drawhead, center above rail 33½"
Coupler M. C. B. Automatic.
Back tender bumper to be reinforced with heavy steel plate in back of bumper.
Steps, hand holds etc. to conform to I. C. C. requirements.
Steps across rear with suitable handrails, also steps and hand-rails on sloping back of tank.
~~Trucks~~ Trucks, Arch Bar Type with Cast Steel Bolsters.
Springs Elliptic. B.L.W. make.
Journals, Diam. 4½" Length 8"
Wheels, Diam. 30" Tread 4½" Kind Chilled Cast Iron plate.
Tires ----- Cen. diam.----- Size -----
Tires held by -----
Safety chains Single.

Brake Position On all wheels.
Brake sch. #6 ET, West'g. Auto. and Straight Air with 10" x 12" tender cylinder, and Christy brake shoes.

List of tools, sch. 29
Photo sch. None. Inspection B. L. W. except see (*) below.
To be weighed Yes. Material spec'ns B. L. W.
Certificate of boiler test Three copies of B.L.W. form 1036.
Junior laws to 3-24-16. Shipment On own wheels, UNDER STEAM 5.9.16.

Brass shop finish, No. 1
Machine shop finish D-165.

B L W. Patents: Throttle, Patented Jan. 23, 1900 (Cast On); Feed Pipe Strainer, Patented Sept. 1, 1903 (Cast On)

Property plates None.

Painting:—Engine, style 291 Olive Green and Aluminum.
Painting:—Tender, style 291 Olive Green and Aluminum.

Mark on tank sides, CORNWALL R. R.

Road Nos. Pos.	Road Nos.	Name None.
F.No Plate	7	
Cab Sides		
Back of tank.		

(*) Mr. W. H. Hill, M.M. is to be notified one day ahead when boiler will be ready for inspection.

THE BALDWIN LOCOMOTIVE WORKS As Spec'n. C-4038

Memorandum Spec'n 11154

SPECIFICATION FOR LOCOMOTIVES 6 36 D 235

FOR CANTON RAILROAD COMPANY

M

9-21-16

Gen. as Photo. 4867 {Except with sloping back tender

Engine Drawing No. 34

Gauge of Road 4' 8½" Play ¾"

Wheelbase, Rigid 11' 6" Driving 11' 6" Total 11' 6"

Total wheelbase, eng. and tend. {Actual 44' 10" {Limited to ---

RAILS 60 AND 80 POUNDS

Curves 20 DEGREES (SEE SUPPLEMENT 10)

Limits, Height --- Width 11' 0"

Weight (approximate) in working order, Total 162,000 POUNDS

On F. tr'k --- lbs., Drivers 162,000 lbs., B. tr'k --- lbs.

Tractive power 41,200 lbs., Ratio of adhesion 3.94

Work'g St'm Pres. 200 lbs., Service SWITCHING

Fuel SOFT COAL

Boiler STEEL Thick 11/16" Bill 7928

Boiler, Diam. 68" Plan STRAIGHT TOP

Boiler st'm pres. 200 lbs., Tested to {220 lbs. steam pres. {267 lbs. water pres.

Longitud. seams BUTT JOINTED, WITH DOUBLE COVERING STRIPS

Dome, diam. 29" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE

Firebox, length 72⅛" Width 65¼" Depth F. 69½" B. 67½"

Firebox, Tube ½" Crown ⅜" Sides ⅜" Back ⅜"

Firedoor opening OVAL 13" x 18", CROWN AND SIDES IN ONE PIECE

Water space, Front 4½" Sides 4½" Back 4½"

Water space, Frame DOUBLE Riveted

Water space stays ⅞" DIAM. WITH 3/16" HOLES 1¼" DEEP FROM O.S.

Radial stays 1" DIAMETER Sling stays front {TWO ROWS OF B. L. W. EXPANSION STAYS

Button heads below crown on SIX central rows

Crown bars NONE Placed --- above crown ---

Crown bolts ---

Flues ---

Tubes #11 W.G. CHARCOAL IRON OR SPELLERIZED STEEL

Tube ends SWAGED FOR COPPER FERRULES, FIREBOX ENDS

Number 262 Diam. 2¼" Length 16' 0"

Heating Surface Flues --- Combus. Chamb. --- Total 2586 sq.ft.

Tubes 2456 sq.ft. Fire Box 130 sq.ft. Fire Brick Tubes ---

Grate area 32.6 sq.ft. Ratio to Heating Surface 1 : 79.3

Superheater ---

Fire Brick ARCH ON ANGLE IRONS

2 **Grates** ROCKING BARS, WITH DROP PLATE AT BACK

3 **Ash Pan,** Dampers NONE

Throttle BALANCE Pos. DOME

Dry pipe STEEL

Superheater NONE

Smokebox extension WITH Cleaning hole and cap LEFT SIDE ONLY

Spark ~~ejector~~ deflector hopper WITH

Netting and deflect. plates WITH

Exhaust nozzles SINGLE, HIGH

Stack CAST IRON STRAIGHT Dia. 17" Hole in S. B., dia. 20"

STACK TO BE SIMILAR TO PHOTO. 4673 OR 3248.

Safety Valves (Spec.) TWO COALE 3" MUFFLED

Safety valves NONE with relief lever, Set to 200 POUNDS

Whistle CHIME

Steam Gauge ONE IRON 7" MAKER: ASHCROFT (Not. Spec.)

Steam gauge stand IRON **Clock** NONE

Water Gauge {ONE HANLON {No. 5 BULLS EYE **Cab Lamps** TO BURN OIL

Gauge Cocks THREE BACK Surface valve NONE

Lowest gauge cock 3½" above highest part of crown

Lubricator steam valve TO HAVE separate dry pipe to dome

Blower Valve B. L. W.

Blow off Cock TWO EVERLASTING 1½" Pos: RIGHT AND LEFT

Cleaning Plugs ONE PLUG ABOVE FIRE DOOR

Firebox CORNERS DIAGONAL, SIDES AND BACK

Crown, TWO EACH SIDE AND FOUR BACK

Waist, ONE UNDER FRONT

Front tube sheet, ONE Fusible plug ONE

Pump NONE Pos. ---

Top chamb. --- Bottom chamb. ---

Feed Cock --- Feed pipes ---

Checks --- Check pipes ---

5 **Injectors** (Spec.) TWO SELLERS, CLASS P No. 10½

Injectors, Pos. BACK HEAD Steam pipes COPPER

Pipes, Check IRON Feed IRON Overflow IRON (see sup. 6)

Check (SEE SUP. 4) Pos. (SEE SUP. 4)

Steam Heat NONE

8 **Cab** STEEL, WOOD LINED. VENTILATOR IN ROOF

9 Cab boards STEEL Nosing T-IRON

Running boards STEEL Nosing T-IRON

Hand rail IRON Located on BOILER

10 **Back Bumper** CAST STEEL FOOT PLATE Back drawbar height 28¾"

Pilot NONE Pushing shoes CAST IN BUMPER

Front Bumper CAST STEEL Bumper plate NONE

Steps ACROSS FRONT WITH HAND RAILS.

STEPS, HAND HOLDS, ETC., TO CONFORM TO I. C. C. REQUIREMENTS

Front Drawhead, Center above rail 33½"

Coupler STARK AUTO.

Signal fixtures IRON ON BUMPER

Headlight TWO ROUND CASE 18" Reflector, To burn KEROSENE

Headlight, Nos. on sides WITH H'dl't step WITH

Lamp shelf NONE Nosing ---

Bell 92 POUNDS

Sand Box TWO Diam. 28" Body IRON PAINTED Pipes IRON

Sander, (Spec.) HANSON AIR IN EACH BOX, TO SAND FRONT AND BACK

Dome casing IRON PAINTED

Boiler Jacket #20 SOFT STEEL PTD Bands IRON Style 9 AND 14

Boiler Lagging MAGNESIA SECTIONAL

BACKHEAD OF BOILER TO BE LAGGED AND JACKETED

THE BALDWIN LOCOMOTIVE WORKS

(for T. Bennett (Dec. 1916)

SPECIFICATION FOR LOCOMOTIVES 6 36 D 235

FOR CANTON RAILROAD COMPANY

M

11 **Frames** CAST STEEL Braces SOLID

11 **Cylinders,** Diam. 21" Stroke 28"

St'm ports, Length 19" Width 1⅜" Bridges 1⅞"

Exh. ports, Length 19" Width 3" Valve lead 3/16"

Valve travel 5½" Steam lap ⅞" Exhaust clearance ---

Eccentric crank throw 21" By-pass valve NONE

S. F. Lubr. (Spec.) DETROIT TRIPLE #22, BULLS EYE

Cyl'r heads CAST IRON: LUBR. PIPES OF COPPER UNDER JACKET

Cyl'r casings IRON PAINTED Head covers STEEL PAINTED

St'm chest casings IRON PAINTED Covers STEEL PAINTED

12 St'm chest valves BALANCED WITH VACUUM VALVES

Met. pkg {PISTON ROD VALVE STEMS TROJAN (Spec.)

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD

Guides STEEL Oil cups NEEDLE

13 **Crossheads** CAST STEEL. BEARINGS OF GUN IRON BABBITTED

14 **Wrist Pins** STEEL Rod cups {COMPRESSION GREASE CUPS {FORGED ON RODS

PARALLEL RODS TO HAVE SOLID ENDS

Valve Motion SOUTHERN: ROYALTY PAYABLE BY B. L. W.

Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

LEWIS POWER REVERSE GEAR

All threads on bolts (except staybolts) to be United States Standard.

All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

16 **Drivers,** O. S. Diam. 51" Cen. diam. 44", CENTERS CAST STEEL

15 **Tires** STEEL Held by SHRINKAGE AND SHOULDER

Tires, Flanged, Pos. FRONT AND BACK Size 3½" x 5½"

Tires, Plain, Pos. MIDDLE Size 3½" x 6½"

Lateral play between driving boxes and wheel hubs = 1/16" TOTAL

17 **Driving Boxes** CAST STEEL

Journals, Diam. 9" Length 12"

DRIVING BOX OIL CELLARS TO BE CUT DOWN ABOUT ½" ON INSIDE AND TO HAVE SMALL PLATES BOLTED OVER OPENING TO FACILITATE RESPONGING THE BOXES

Springs. Make B. L. W.

Front Engine Truck NONE Wheeled ---

To swing --- each side of cen., Cen. pin liners ---

Journals, Diam. --- Length --- Boxes ---

Wheels, Diam. --- Tread --- Kind ---

Tires --- Cen. diam. --- Size

Tires held by ---

Back Engine Truck NONE Wheeled ---

To swing --- each side of cen., Cen. pin liners ---

Journals, Diam. --- Length --- Boxes ---

Wheels, Diam. --- Tread --- Kind ---

Tires --- Cen. diam. --- Size ---

Tires held by ---

19 **Brake,** position ON ALL DRIVING AND TENDER WHEELS

Operating Parts {Engine, Sch. #6 ET WEST'G. COMBINED AUTO. AND STRAIGHT AIR {Eng. Tr'k, sch. ---

Foundation Parts {Drivers, sch. WM-3 AMERICAN O. S. EQUALIZED {Eng. Tr'k, sch. ---

18 Air pump ONE 9½" Pos. LEFT SIDE

Train connections FRONT AND BACK

Train signal, sch. NONE

Air reservoir to have hydrostatic test of 210 lbs.

11* **Tender** EIGHT Wheeled. Drawing No. 435

Weight, with fuel and water, about 110,000 POUNDS

11* **Tank** 5500 Gallons, Bill 4341

TANK "U" SHAPE, SLOPING BACK. FUEL CAPACITY 8 TONS

Tool Boxes HARDWOOD, TOP

43 **Frame** STEEL 10" CHANNELS

44 Front Drawbar height 30⅝"

Pilot NONE Pushing shoes AT REAR

Back drawhead, center above rail 33½"

Coupler STARK AUTO. WITH FARLOW DRAFT GEAR

STEPS, HAND HOLDS, ETC., TO CONFORM TO I. C. C. REQUIREMENTS

Steps ACROSS REAR WITH HANDRAILS

STEPS ON SLOPING BACK OF TANK

Trucks ARCH BAR TYPE WITH CAST STEEL BOLSTERS

Springs ELLIPTIC B. L. W.

Journals, Diam. 5" Length 9"

Wheels, Diam. 33" Tread 4¼" Kind CHILLED CAST IRON, PLATE

Tires NONE Cen. diam. --- Size ---

Tires held by ---

Safety chains SINGLE

Brake Position ON ALL WHEELS

Brake sch. #6 ET, WEST'G. AUTO. AND STRAIGHT AIR WITH 12" x 12" TENDER CYLINDER

ONE PAIR TILDEN RE-RAILING FROGS

List of tools, sch. 29

Photo sch. NONE Inspection B. L. W.

To be weighed YES Material specns B. L. W.

Certificate of boiler test THREE COPIES OF B. L. W. FORM 1036

Junior laws to 12-1-16 Shipment {ON OWN WHEELS (see sup. 21) {under steam. 12/24/16

Brass shop finish, No. 1

Machine shop finish D-165

B. L. W. Patents THROTTLE, PATENTED JAN. 23, 1900 (CAST ON)

Property plates NONE

Painting: Engine, style 291, OLIVE GREEN AND ALUMINUM

Painting:- Tender, style 291, OLIVE GREEN AND ALUMINUM

LETTERING, ETC., TO BE SIMILAR TO 6 32 D 1063

Mark on TANK SIDES, THE CANTON RAILROAD COMPANY

MARK ON TANK TO BE IN 7" LETTERS

Road Nos. Pos.	Road Nos.	Name NONE
F. No. PLATE	3	
BOTH SAND BOXES		
BACK OF TANK		

SPECIFICATION FOR LOCOMOTIVES 6-36-D 235

FOR CANTON RAILROAD COMPANY

250

1 WATER SPACE AND RADIAL STAYS NOT OVER 4" CENTER TO CENTER.
FALLS HOLLOW STAYBOLTS BEHIND ALL FURNACE BEARERS AND PADS.
TATE FLEXIBLE STAYS OF EWALD IRON ABOUT 400 IN NARROW IN BREAKING ZONE.

2 GRATES TO BE HINGED TO BACK SHEET SO THAT PLATE WILL DROP INTO BACK OF ASH PAN.

3 ASH PAN TO HAVE SAME SLOPE IN BACK AS IN FRONT.

4 INJECTOR CHECK TO BE SELLERS DOUBLE BACKHEAD TYPE WITH STOP VALVE.

4a FEED WATER STRAINER TO BE SELLERS No. 3, AS SHOWN ON THEIR PRINT NO. 32198.

6 INJECTOR OVER FLOW TO BE PIPED INTO ASH PAN.

7 SELLERS METTING DOWN NOSE, COLD WATER ATTACHMENT.

8 CAB SIDE WINDOWS TO BE LARGE TO PROVIDE TWO THIRDS OPEN SPACE.

9 ENGINE AND TENDER FLOOR TO BE ON SAME LEVEL.

10 CONNECTION BETWEEN ENGINE AND TENDER DESIGNED FOR 35 DEGREE CURVE.
RADIAL BUFFER BETWEEN ENGINE AND TENDER (Edgemont Devices Corporation).

11 CYLINDERS TO BE BORED AND REAMED.

12 STEAM CHEST VALVES TO BE JACK WILSON DOUBLE PONTOZ SLIDE VALVES.

13 GARRETT TO BE INTERCHANGEABLE IN CROSSHEAD BEARINGS.

14 CROSSHEAD PINS AND ALL KNUCKLE PINS TO HAVE CASTELLATED NUTS.

15 ELESCO SYLPHON- EXPANSION PISTON LUBRICATOR, PENDULUM TYPE, FOR FRONT OF FRONT DRIVERS AND BACK OF MAIN DRIVERS AND FURNISHED AND APPLIED AT THE B. L. E.

16 DRIVING WHEELS OF ARMY AND CENTERS OF STEEL.

17 DRIVING BOX BRASSES TO BE TURNED WITH A SHOULDER OF NOT LESS THAN 3/4", AND TO BE PLANED INTO SHAPE FROM FLAT BARS. DRIVING BOXES TO BE OF THE TYPE KNOWN AS STRAPPED THROUGH THE JAWS.

18 FIRE BRICKS TO BE SUPPORTED INTO STEINER SADDLE SO AS TO PROVIDE AIR SPACE AND SO THAT BACK CORNER CAN BE STANDING.

19 SPARK ARRESTER TO BE BURT PLATE ABOVE RAIL.
SPARK ARRESTER SCREEN TO BE OF STEEL.

21 EXTRAS ORDERED THROUGH EXTRA WORK DEPARTMENT, ORDER No. 11499, DATED 11-10-16, TO BE SHIPPED WITH LOCOMOTIVES.

T E N D E R

11 MANHOLE TO BE APPLIED BACK OF COAL SPACE.

11a STEEL PLATE TO BE APPLIED IN FRONT AND BACK OF SIDE SILLS.

12 ENGINE AND TENDER FLOOR TO BE ON SAME LEVEL.

14 CONNECTION BETWEEN ENGINE AND TENDER DESIGNED FOR 35 DEGREE CURVE.
RADIAL BUFFER BETWEEN ENGINE AND TENDER (Edgemont Devices Corporation)

THE BALDWIN LOCOMOTIVE WORKS — As Spec. C-2467

Memorandum Spec'n 10448

SPECIFICATION FOR LOCOMOTIVES 6 38 D 42

FOR The La Salle & Bureau County R. R. Co. — 3.15.15 — Gen. as Neg. 4545 With pilot at front of engine — Engine Drawing No. 11

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 11' 6" Driving 11' 6" Total 11' 6"
Total wheelbase, eng. and tend. { Actual 43' 3" / Limited to ------
Rails 65 and 75 lbs.
Curves 16 degrees. Maximum grade 2%, 500 ft. long

Limits, Height ----- Width -----
Weight (approximate) in working order, Total 152,000 lbs
On F. tr'k ----- lbs., Drivers 152,000 lbs., B. tr'k ----- lbs.

Tractive power 38500- lbs., Ratio of adhesion 4
Work'g St'm Pres. 180 lbs., Service Switching
Fuel Soft Coal

Boiler Steel Thick 13/16" Bill 6318
Boiler, Diam. 78" Plan Straight top
Boiler st'm pres. 200 lbs., Tested to { 220 lbs. steam pres. / 267 lbs. water pres.
Longitud. seams Butt jointed, double covering strips

Dome, diam. 33" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 120-3/16" Width 42⅛" Depth F. 73⅞" B. 71⅛"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diam.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Double Riveted
Water space stays 1" Diam. with 3/16" hole 1½" deep from O.S.

Radial stays 1⅛" diam. Sling stays front One ⊥ bar
Button heads below crown on Eight central rows
Crown bars None Placed ----- above crown
Crown bolts ----

Tubes #12 B.W.G. Charcoal Iron or steel
Tube ends Swaged for copper rings fire box ends
Tubes, No. 374 Diam. 2" Length 10' 5"

Heating Surface, Tubes 2024.° Firebox 192.° Total 2216.°
Grate area 35.1 °° Ratio to heat'g surface, 1 : 63
Superheater ~~~ Feed-water heater ~~~
Reheater ~~~ Fire brick tubes ~~~

Fire Brick arch On Studs

Grates Rocking bars and drop plate
Ash Pan, Depth F. 29° B. 34° Dampers FRONT AND BACK.
Ash pan to be drop type.

Throttle Balance Pos. Dome
Dry pipe ~~Cast Iron or~~ Steel

Superheater None

Smokebox extension With Cleaning hole and cap L. S. only
Spark ejector or hopper With
Netting and deflect. plates With

Exhaust nozzles Double - high

Stack Straight Diam. 18" Hole in S.B. 22"

Safety Valves (NOT SPAC.) Two - Coale 3"
Safety valves None with relief lever, Set to 180 lbs.
Whistle B. L. W.

Steam Gauge One - Iron 7" Maker:- Ashcroft (NOT SPAC.)
Steam gauge stand Iron **Clock** None

Water Gauge One B.L.W.(Ironclad) **Cab lamps** To burn oil
Gauge Cocks Three-back Surface valve None
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L.W.

Blow off Cock One B. L. W. Pos:-Front
Cleaning Plugs
Firebox Corners diagonal, sides and back
Crown, Three each side and two back
Waist, One under front
Front tube sheet, One. **Fusible Plug:-** One

Pump None Pos. -----
Top chamb. ----- Bottom chamb. -----
Feed cock ----- Feed pipes -----
Checks ----- Check pipes -----

Injectors (SPAC.) Two Sellers Lifting No. 10
Injectors, Pos. R. and L. Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B.L.W. Pos. R. and L.

Steam Heat None

Cab Wood

Cab boards Wood Nosing None
Running boards Wood Nosing None
Hand rail Iron Located on Boiler

Back Bumper Bar steel Back drawbar height 30½" (24¾" for 4-6-2 & 4-8-2 on account of arch. FOR MACHANTIE.

Pilot to be detachable, (at front only)
Pilot Wood Pushing shoes None
Front Bumper Oak Bumper plate With
Steps, foot-boards at front, with handrail.
Steps, hand holds, etc. to conform to I. C. C. requirements
Front Drawhead, Center above rail 33½"
Coupler M.C.B. Autol

Flag fixtures Iron on bumper

Headlight Two Round Case 18Z (to use stock) Reflector, To burn Kerosene
Headlight, Nos. on sides With H'dl't step With
Lamp shelf None Nosing -----

Bell 92 pounds. Gollmer Air Bell Ringer
Sand Box Two Diam. 28" Body Iron Ptd. Pipes Iron
Sander (NOT SPAC.) Leach Air. Trap A-1 in each box, to sand front and rear

Dome casing Iron ptd.
Boiler Jacket { #22 Soft steel ptd. Bands Iron Style 9
Boiler Lagging Magnesia - sectional
Jacket over stays to be detachable to allow for Interstate inspection.

THE BALDWIN LOCOMOTIVE WORKS — 272

Engine J. L. Bird — April 1915

SPECIFICATION FOR LOCOMOTIVES 6 38 D 42

FOR The La Salle & Bureau County R. R. Co.

Frames Cast Steel Braces Solid
Engine frames to be apply strong
Cylinders, Diam. 22" Stroke 26"
St'm ports, Length 19" Width 1⅝" Bridges 1⅜"
Exh. ports, Length 19" Width 3" Valve lead 1/16"
Valve travel 5½" O. S. lap ⅞" Ins. lap -----
Eccentric crank throw 5"
S. F. Lubr. (NOT SPAC.) Michigan triple bull's eye { Iron pipes / under jacket
Cyl'r heads Cast Iron
Cyl'r casings Iron Ptd. Head covers Steel painted
St'm chest casings Iron Ptd. Covers Steel painted
St'm chest valves Richardson Balanced, with vacuum valves
Met. pkg { PISTON ROD / VALVE STEMS Jerome (SPAC.) NO.-5891-1925 / NO.-5221-1936

Pistons Cast iron rings sprung into solid head
Guides Steel Oil cups Needle
Crossheads Cast Steel
Wrist Pins Steel Rod cups Hard Grease
Par. Rods to have solid ends

Valve Motion Stephenson
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 50" Cen. diam. 44" Centres Cast Steel

Tires Steel Held by Shrinkage and Shoulder
Tires, Flanged, Pos. Front and rear Size 3" x 5½"
Tires, Plain, Pos. Middle Size 3" x 6⅛"
Lateral play between driving boxes and wheel hubs -- 1/16" total
Driving Boxes Steeled Cast Iron
Journals, Diam. 9" Length 12"

Driving spring staples Wrot Iron

Springs. Make B. L. W.

Front Engine Truck None Wheeled -----
To swing----- each side of cen. Cen. pin liners -----
Journals, Diam----- Length----- Boxes -----
Wheels, Diam. ----- Tread -----Kind -----
Tires ----- Cen. diam. Size
Tires held by -----

Back Engine Truck None Wheeled -----
To swing ---- each side of cen. Cen. pin liners -----
Journals, Diam----- Length ----- Boxes -----
Wheels, Diam. ----- Tread -----Kind -----
Tires ----- Cen. diam. Size
Tires held by-----

Brake, position On all driving and tender wheels
Operating Parts { Engine, Sch. 6 ET. Westg. Combined Auto and straight air / Eng. Tr'k, sch. -----
Foundation Parts { Drivers, sch. WH-3 American C. S. Equalized / Eng. tr'k, sch. -----
Air pump One- 11" Pos. L. S.
Train connections Front and rear
Train signal, sch. None
Driver brake to be Push type

Tender Eight Wheeled, Drawing No. 435
Weight, with fuel and water, about 100,000 lbs.

Tank 5,000 Gallons, Bill 3887
Tank "U" shape sloping back. Fuel cap. 8 tons

Tool Boxes Hard wood, top

Frame Steel, 10" channels

Front drawbar height 30⅝"

Back drawhead, center above rail 33½"
Coupler M. C. B. auto.

Steps and hand rail on sloping back of tank
Steps, foot-boards at rear with hand rails PUSHING SHOES AT REAR

Trucks Arch bar type, Cast steel bolsters.

Springs Elliptic. B. L. W.
Journals, Diam. 5" Length 9"
Wheels, Diam. 30" Tread 4½" Kind Chilled Cast Iron plate
Tires None Cen. diam. ---- Size -----
Tires held by -----
Safety chains Single

Brake Position On all wheels
Brake sch. #6 ET. Westg. Auto and straight air with 12" x 12" tender cylinder.

List of tools, sch. 29 Bolts, nuts and threads B. L. W.
Photo sch. None Inspection ~~B. L. W.~~ BY THE PHILADELPHIA INSPECTION BUREAU. 4-8-15.
To be weighed Yes Material spec'ns B. L. W.
Certificate of boiler test Three copies of B. L. W. form 611
Junior laws to 3.1st.15. Shipment on own wheels

Brass shop finish, No. 1
Machine shop finish D-165

Patent Plates { THROTTLE, PATENTED JAN. 23, 1900 (CAST ON) / FEED PIPE STRAINER, PATENTED SEPT 1, 1903 (CAST ON)

Property plates None

Painting: Engine, style 291 Olive Green and Aluminum
Painting: Tender, style 291 Olive Green and Aluminum

Mark on tank sides, LA SALLE & BUREAU COUNTY R. R. CO.

Road No. Name None
No. Pos.
F. No. Plate 2
F. Sand Box
Cab sides
Back of tank

* Philadelphia Inspection Bureau desire to secure tests of the material in spectacle plate before and after shaping and during fabrication in the various departments and make a general inspection of the boiler and tender during construction, witnessing hydrostatic and steam tests and the final running test. W.H.S.15

THE BALDWIN LOCOMOTIVE WORKS As Spec'n. C-4512
Dup: 6-36 D 5 to 8 except where otherwise specified

Memorandum Spec'n 17001

SPECIFICATION FOR LOCOMOTIVES 6 36 D 252 & 253

Gen. as Photo. 3796

Engine Drawing No. 11

FOR The Colorado & Wyoming Railway Company

R. 1-3-17

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"
Total wheelbase, eng. and tend. { Actual 41'4" / Limited to ——

Curves ——

Limits, Height ——— Width ———
Weight (approximate) in working order, Total 140,000 pounds
On F. tr'k ——— lbs., Drivers 140,000 lbs., B. tr'k ——— lbs.

Tractive power 35,080 lbs., Ratio of adhesion 3.9
Work'g St'm Pres. 180 lbs., Service Switching
Fuel Soft Coal

Front tube sheet to be ½" thick
Boiler Steel Thick 1 1/16" Bill 8082
Boiler, Diam. 68" Plan Straight Top

Boiler st'm pres. 180 lbs. Tested to { 200 lbs. steam pres. / 240 lbs. water pres.
with factor of safety of 5.
Longitud seams Butt jointed, double covering strips

Dome, diam. 29" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 108-3/16" Width 42⅛" Depth F. 65½" B. 62½"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Fireboxe opening 16" diam.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Double Riveted
Water space stays ⅞" diam. with 3/16" holes 1¼" deep from O.S.

Radial stays 1" diam. Sling stays front { Two rows of B. L. W. Expansion stays
Button heads below crown on Eight central rows
Crown bars None Placed ——— above crown
Crown bolts ———

Flues ———
Tubes #12 B. G. Charcoal Iron or Steel
Tube ends Singed for copper ferrules, fire box ends
Number 322 Diam. 2" Length 10' 5"

Heating. Surface Flues ——— Combus. Chamb. ——— Total 1903.5 sq ft
Tubes 1742.3 sq ft Fire Box 161.2 sq ft Fire Brick Tubes ———
Grate area 31.5 sq ft Ratio to Heating Surface 1 : 60
Superheater ———

Fire Brick Arch on Studs

Grates Rocking bars and drop plate
Ash Pan, Dampers Front and Back

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Smokebox extension With Cleaning hole and cap L. S. Only
Spark-ejector or hopper With
Netting and deflect. plates With

Exhaust nozzles Double High

Stack Straight Dia. 18" Hole in S. B., dia. 21½"
Smoke stack and base to be of Cast Iron

Safety Valves Two Crosby 3" (Spec)
Safety valves None with relief lever, Set to 180 pounds
Whistle B. L. W. plain

Steam Gauge One Iron 7" MAKER:—Ashcroft (not spec)
Steam gauge stand Iron **Clock** None

Water Gauge One B.L.W. (Ironclad) **Cab Lamps** to burn oil
Gauge Cocks Three Back Surface valve None
Lowest gauge cock 3¼" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One B. L. W. POS:—Front
Cleaning Plugs
Firebox Corners diagonal, sides and back
Crown, three each side and two back
Waist, One under front
Front tube sheet, One Fusible plug One

Pump None Pos. ———
Top chamb. ——— Bottom chamb. ———
Feed Cock ——— Feed pipes ———
Checks ——— Check pipes ———

(not spec)
Injectors Two Monitor No. 9
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. Right and Left

Steam Heat None

Cab Steel

Cab boards Iron Nosing T-Iron
Running boards Iron Nosing T-Iron
Hand rail Iron Located on Boiler

Back Bumper Bar Steel Back drawbar height 34¾"

Pilot None Pushing shoes at front
Front Bumper Oak Bumper plate None
Steps across front with hand rails
Steps, hand holds, etc. to conform to I.C.C. requirements
Front Drawhead, Center above rail 33½"
Coupler M. C. B. Automatic

Signal fixtures None
Headlights to conform to late specification of I. C. C. Order No. 31 of October 11, 1915.
Headlight Two Round Case 16" Reflector, To burn Kerosene
Headlight, Nos. on sides With H'dl't step With
Lamp shelf None Nosing ———

Bell 92 pounds
Sand Box Two Diam. 28" Body Iron Painted Pipes Iron
Sander (not spec) Leach Air Trap A-1 in each box to sand front and back.

Dome casing Iron Painted

Boiler Jacket #22 Soft Steel Pt'd Bands Iron Style 9
Boiler Lagging Magnesia sectional

THE BALDWIN LOCOMOTIVE WORKS
J. V. Applin July 1917

SPECIFICATION FOR LOCOMOTIVES 6 36 D 252 & 253

274

FOR The Colorado & Wyoming Railway Co.

R.

Frames Cast Steel Braces Solid

Cylinders, Diam. 21" Stroke 26"
St'm ports, Length 19" Width 1⅞" Bridges 1⅜"
Exh. ports, Length 19" Width 3" Valve lead 1/16"
Valve travel 5¼" Steam lap ⅞" Exhaust clearance ———
Eccentric crank throw 5" By-pass valve None
S. F. Lubr. Michigan Triple Bull's Eye (not spec)
Cyl'r heads Cast Iron; Lubr. pipes of copper under jacket
Cyl'r casings Iron Pt'd. Head covers Steel Painted
St'm chest casings Iron Pt'd. Covers Steel Painted
St'm chest valves Richardson balanced, with vacuum valves
Met. pkg { Piston rods / Valve stems } United States (not spec)

Pistons Cast Iron rings sprung into solid head
Guides Steel Oil cups Needle
Crossheads Cast Steel
Wrist Pins Steel Rod cups Plunger
Parallel Rods to have solid ends

Valve Motion Stephenson
{ Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.
Main driving wheels only to have hub liners of brass
Drivers, O. S. Diam. 50" Cen. diam. 44"
Wheel centers:— Main, cast steel, Others, cast iron
Tires Steel Held by Shrinkage and Shoulder
Tires, Flanged, Pos. Front and Back Size 3" X 5½"
Tires, Plain, Pos. Middle Size 3" X 6½"
Lateral play between driving boxes and wheel hubs = 1/16" total
Driving Boxes Steeled Cast Iron
Journals, Diam. 9" Length 12"
Franklin Driving Box Lubricators for all wheels

Springs. Make B. L. W.

Front Engine Truck None Wheeled ———
To swing ——— each side of cen., Cen. pin liners ———
Journals, Diam. ——— Length ——— Boxes ———
Wheels, Diam. ——— Tread ——— Kind ———
Tires ——— Cen. diam. ——— Size ———
Tires held by ———

Back Engine Truck None Wheeled ———
To swing ——— each side of cen., Cen. pin liners ———
Journals, Diam. ——— Length ——— Boxes ———
Wheels, Diam. ——— Tread ——— Kind ———
Tires ——— Cen. diam. ——— Size ———
Tires held by ———

Brake, position On all driving and tender wheels
Operating Parts { Engine, Sch. SMA mod. West'g. Straight Air / Eng. Tr'k, sch. ———
Foundation Parts { Drivers, sch. WM-2 American O.S. Equalized / Eng. Tr'k, sch. ———
Air pump One 9½" Pos. Left Side
Train connections None
Train signal, sch. None * Engine and tender to be piped so brakes can be used in train during transit. 4.19.17
Brake equipment to include S-3 brake valve, C-6 feed valve, one 3½" single pointer straight air gauge, one safety valve for engine and one safety valve for tender, main reservoir, and driver brake cylinder to suit design. Duplex 3½" air gauge furnished on Ex. Ord. 9282. 9.10.17.
Omit train connections front of engine and back of tender, and provide one pair of hose and couplings for connections between engine and tender. Air reservoir to have hydrostatic test of 210 lbs.
Certificates dated April 13th 1917 covering test of reservoir Nos. 10697 to 10700 inc. furnished by West'g. Air Brake Co., are filed in Main Office, File No. 605.

Tender Eight Wheeled, Drawing No. 365
Weight, with fuel and water, about 80,000 pounds

* **Tank** 4000 Gallons. Bill 4474
Tank "U" shape, sloping back. Fuel cap. 5 tons.

Tool Boxes of hard wood, top.

Frame Oak and Yellow Pine

Front Drawbar height 31⅜"
Pilot None Pushing shoes at rear
Back drawhead, center above rail 33½"
Coupler M. C. B. Automatic
Steps, hand holds, etc. to conform to I.C.C. requirements
Steps across rear with hand rails
Steps and hand rails on sloping back of tank

Trucks Arch bar type with cast steel bolsters

Springs Elliptic. B. L. W.
Journals, Diam. 4½" Length 8"
Wheels, Diam. 33" Tread 1¼" Kind Chilled Cast Iron Plate
Tires None Cen. diam. ——— Size ———
Tires held by ———
Safety chains Single

* **Brake** Position On all wheels
Brake sch. SMA mod. West'g. Straight Air with 10" X 12" cylinder.
* Flare board of tank to stand out from the top of the inside of the coal space to give the engineer a clear view while looking back over the tank

List of tools, sch. 29
Photo sch. #2 Inspection B. L. W.
To be weighed No Material specs B. L. W.
Certificate of boiler test Three copies of B.L.W. form 1036
Junior laws to 3-15-17 Shipment On own wheels

Brass shop finish, No. 1
Machine shop finish D-165

Patents B. L. W. { Feed Pipe Strainer, patented Sept. 1, 1903 (Cast On)

Property plates None

Painting:—Engine, style ——— 291 Black and Yellow
Painting:—Tender, style ——— 291 Black and Yellow

Mark on Cab sides, C. & W. Ry.
Mark in 6" plain block letters similar to 6-34 D 629 etc.
Road Numbers on sides of tank to be 24" high

Road Nos. Pos.	Road Nos.	Name None
F.No. Plate	1105	
Dome	1106	
Sides of Tank		
Back of Tank		

THE BALDWIN LOCOMOTIVE WORKS As Spec'n 0-3688

Memorandum Spec'n 10836

SPECIFICATION FOR LOCOMOTIVES 6 38 D 47

FOR The Fairport, Painesville & Eastern R. R. Co.

Gen. as 2518 [illegible] with Walschaerts Valve Motion [illegible] cylinders, and saddles

Engine Drawing No. 11.

12-27-15.

Gauge of Road 4' 8½" Play ⅜"

10 **Wheelbase,** Rigid 11' 0" Driving 11' 0" Total 11' 0"

Total wheelbase, eng. and tend. { Actual 42' 7" / Limited to 42' 7½"

Rails, 80 and 90 lbs.

Curves 16 degrees, **Grades** 2½%

Limits, Height ----- Width -----

Weight (approximate) in working order, Total 156,000 lbs.

On F. tr'k ----- lbs., Drivers 156,000 lbs., B. tr'k ----- lbs.

Tractive power 38900 lbs., Ratio of adhesion 4.05

Work'g St'm Pres. 180 lbs., Service Switching.

Fuel Soft Coal.

1 **Boiler** Steel Thick 13/16" Bill 7651

Boiler, Diam. 76" Plan Straight Top

Boiler st'm pres. 200 lbs., Tested to { 220 lbs. steam pres. / 267 lbs. water pres.

Longitud. seams Butt jointed, with double covering strips.

Dome, diam. 33" Pos. Central

Firebox Steel Combustion chamb. None

Firebox, length 112-3/16" Width 41⅜" Depth F. 69½" B. 66⅜"

Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"

Firedoor opening 16" diameter.

Water space, Front 4" Sides 3½" Back 3½"

Water space, Frame Single Riveted

3 Water space stays ⅞" diam. with 3/16" hole 1½" deep from O.S.

Radial stays 1" diam. Sling stays front { Three rows of B.L.W. Expansion stays.

Button heads below crown on Right central rows

Crown bars None Placed ----- above crown

Crown bolts -----

Tubes 5½" # 9 W. G. Seamless Steel.

Tubes 2" #11 W.G. Seamless Steel.

Tube ends Swaged for copper ferrules fire box ends.

Number { 26 / 179 Diam. 5½" / 2" Length 10' 5"

Heating Surface	Flues 387	Combus. Chamb. None	Total 1565
	Tubes 1178	Fire Box 170	Fire Brick Tubes 33
Grate area 32.3	Ratio to Heating Surface 1 : 48		
Superheater 324			

Fire Brick Arch, Security on Two Tubes, 3" O.S. diameter.

Grates Rocking Bars and drop plate.

Ash Pan, Dampers Front and back.

Throttle Balance Pos. Dome.

Dry pipe Steel

Superheater (See sup. 1)

Smokebox extension With Cleaning hole and cap B.L.W. only

Spark arrester on stopper With

Netting and deflector plates With

Exhaust nozzles Single Nipple.

Stack Cast Iron Straight Dia. 18" Hole in S. S. dia. 9"

(not spaced) **Safety Valves** Two Coale 3"

Safety valves None with relief lever, Set to 200 lbs.

Whistle B. L. W.

Steam Gauge One Iron 7" Ashcroft (not spaced)

Steam gauge stand Iron Clock None

Water Gauge One B.L.W.(Ironclad) **Cab Lamps** To burn oil.

Gauge Cocks Three Back. Surface valve None

Lowest gauge cock 3" above highest part of crown

Lubricator steam valve to have separate dry pipe to dome

Blower Valve B. L. W.

Blow off Cock One Crane 2" (to use stock) Pos. Left Side.

Cleaning Plugs

Firebox Corners diagonal Right Side and Back.

Crown, Three each side and three back.

Waist, One under front.

Front tube sheet, One Fusible plug One

Pump None Pos. -----

Top chamb. ----- Bottom chamb. -----

Feed Cock ----- Feed pipes -----

Checks ----- Check pipes -----

(not spaced) **Injectors** Two Simplex, Non-Lifting No. 8

Injectors, Pos. Right and Left Steam pipes Copper

Pipes, Check Copper Feed Iron Overflow Iron

Check B. L. W. Pos. Right and Left.

Steam Heat None

Cab Wood

Cab boards Wood Nosing None

Running boards Wood Nosing None

Hand rail Iron Located on Boiler.

Back Bumper Bar Steel Back drawbar height 33⅛"

Pilot None Pushing shoes at Frame.

7 **Front Bumper** Cab 7 Bumper plate With

Steps across front with handrails.

Steps, hand holds etc. to conform to I.C.C. requirements.

Front Drawhead, Center above rail 33⅛"

Coupler M. C. B. Automatic.

Signal fixtures Iron on Bumper.

Headlight Two Round Glass 23" Reflector, To burn Kerosene

Headlight Not on Cab With Light shelf None Nosing None

Bell to be provided.

Sand Box Two Diam. 21" Body Steel Painted Plate Iron

Sander Steam Air, Type A-1, In front box to sand front and rear.

Dome casing Iron Painted.

Cylinder Jacketing Soft Steel Polished Iron Style 9 and 10

Boiler Lagging Magnesia Sectional.

Thickness of lagging as in Lagging Spec. Jacketed.

THE BALDWIN LOCOMOTIVE WORKS

J. Shelton

SPECIFICATION FOR LOCOMOTIVES 6 38 D 47

FOR The Fairport, Painesville & Eastern R. R. Co.

276

8-17 **Frames** Cast Steel Braces Solid

10 **Cylinders,** Diam. 22" Stroke 26"

St'm ports, Length 24.55" Width 1½" Bridges -----

Exh. ports, Length ----- Width ----- Valve lead ¼"

Valve travel 5½" Steam lap ⅞" Exhaust clearance -----

Eccentric crank throw 13⅜" By-pass valve None

S. F. Lubr. (not spaced) Michigan Five Feed Bulls Eye

Cyl'r heads Cast Iron; Lubr. pipes of Iron under jacket.

Cyl'r casings Iron Painted Head covers Steel Painted.

St'm chest casings ----- Covers -----

St'm chest valves 11" dia. Piston Type.

Met. pkg { PISTON RODS / VALVE STEMS UNITED STATES (not spaced)

Pistons Cast Iron rings sprung into solid head.

Guides Laird Type, Steel Oil cups Needle

Crossheads Cast Steel

Wrist Pins Steel Rod cups Plunger

Parallel rods to have solid ends.

Valve Motion Walschaert's

{ Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.

All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

16 **Drivers,** O. S. Diam. 50" Cen. diam. 44" Centres Cast Steel

All driving wheels to have bronze hub liners.

Tires Steel Held by Shrinkage and Shoulder

Tires, Flanged, Pos. All Size 3" x 5½"

Tires, Plain, Pos. None Size -----

Lateral play between driving boxes and wheel hubs - 1/16" total

Driving Boxes Cast Steel.

Journals, Diam. 9" Length 12"

Springs. Make B. L. W.

Front Engine Truck None Wheeled -----

To swing ----- each side of cen., Cen. pin liners -----

Journals, Diam. ----- Length ----- Boxes -----

Wheels, Diam. ----- Tread ----- Kind -----

Tires ----- Cen. diam. ----- Size -----

Tires held by -----

Back Engine Truck None Wheeled -----

To swing ----- each side of cen., Cen. pin liners -----

Journals, Diam. ----- Length ----- Boxes -----

Wheels, Diam. ----- Tread ----- Kind -----

Tires ----- Cen. diam. ----- Size -----

Tires held by -----

Brake, position On all driving and tender wheels.

Operating / Parts: Engine, Sch. A-1 and SWA, West'g Automatic and Straight Air; Eng. Tr'k, sch. -----

Foundation / Parts: Drivers, sch. B. L. W.; Eng. Tr'k, sch. -----

Air pump One 11" Pos. Left Side.

Train connections Front and back.

Train signal, sch. None

Provide ample reservoir capacity

Tender Eight Wheeled, Drawing No. 918

Weight, with fuel and water, about 100,000 lbs.

Tank 5,000 Gallons, Bill 3887

Tank "U" Shape sloping top. Fuel Capacity 8 tons.

Tool Boxes Hard Wood, Top.

Frame Steel 8" & 10" Channels.

Front Drawbar height 36⅜" 33⅛"

Pilot None Pushing shoes at rear.

Back drawhead, center above rail 33⅛"

Coupler M.C.B. Automatic.

Steps, hand holds etc. to conform to I.C.C. requirements.

Steps across rear of tender with handrail.

Steps and handrail on sloping back of tank.

Trucks Arch Bar type with cast steel bolster.

Springs Elliptic B.L.W. make

Journals, Diam. 5" Length 9"

Wheels, Diam. 33" Tread 4½" Kind Chilled Cast Iron plate.

Tires None Cen. diam. ----- Size -----

Tires held by -----

Safety chains Single.

Brake Position On all wheels.

Brake sch. FL-1212 and SWB Westinghouse Auto. and straight air.

List of tools, sch. 29

Photo sch. 2 Inspection B. L. W. (See sup. 2)

To be weighed Yes. Material spec'ns B. L. W.

Certificate of boiler test Three copies of B.L.W. form 1C36.

Junior laws to 1-1-16. Shipment On own wheels.

Brass shop finish, No. 1

Machine shop finish D-165.

B. L. W. Patents: Throttle, Patented Jan. 23, 1900 (Cast On); Feed Pipe Strainer, Patented Sept. 1, 1903 (Cast On); Steam Pipe Cover, Patented July 18, 1911 (Cast On)

Property plates None

Painting: Engine, style 291 Olive Green and Aluminum

Painting:—Tender, style 291 Olive Green and Aluminum

Mark on Cab sides under windows, F. P. & E. R. R. Co.

Road Nos. Pos.	Road Nos.	Name None
F.No Plate	2	
F.Sand Box		
Sides of tank		
Back of tank.		

SUPERHEATER FOR LOCOMOTIVES 6 38 D 47

FOR The Fairport, Painesville & Eastern R. R. Co.

1 Boiler to conform to the requirements of the Ohio State R. R. Commission.

2 Boiler to be inspected by the Hartford Steam Boiler & Insurance Co. Be sure to advise them in time for them to see the interior of the boiler.

3 Firebox to have an installation of 380 Baldwin Flexible staybolts.

4 Superheater of the Schmidt type placed in 5½" tubes connecting with top header in smoke box and with outside steam pipes connections to valve chamber. Superheater units to have welded return bends.
Royalty on superheater payable by B.L.W.
Superheater as Loco. Superheater Co's Spec'n No. P-1069 dated Jan. 25-1916. Copy attached.

5 Additional hand hole and cap to be applied in each side of smoke box for inspection of superheater.

6 Buffer with a large radius and deep face, to be applied between engine and tender.

7 Steel plate ¾" thick to be applied in front of front bumper.

8 Cast Iron foot plate back of front bumper to be omitted to give better distribution of weight.
Shorten back foot plate 5" so that present overhang back of rear drivers will not be increased.

9 Engine frames to have single front rails.

10 Distance from center of cylinders to front tube sheet to be 32"

Hereafter: Drawbars to be made heavier
See Letter dated July 29th 1916 from Diamond Alkali Co.
File No. 1225
K.R. 8/1/16.

11 Driving wheels to be spaced evenly, that is 8' 4" centers to center.
Driving wheel centers to be made from the steam patterns as those on 6 36 D 39

THE BALDWIN LOCOMOTIVE WORKS

SUPERHEATER SPECIFICATION FOR LOCOMOTIVES 6 38 D 47.

FOR The Fairport, Painesville & Eastern R. R. Co.

278

Locomotive Superheater Company's Specification No. P-1069 dated Jan. 25, 1916.
Specification for Superheater with Top Header, Double Loop Arrangement.

BOILER TUBES 179 in number 2 O. D. 10 ft. 5 ins. over tube sheets. Tubes located between and adjacent to Boiler flues are to be beaded over at front end.

BOILER FLUES 26 in number 5½ O. D. #9 BWG thick of cold drawn seamless steel. Flues to be straight, true to gauge and wall not to vary more than one gauge from specified thickness, as shown on Card 10731

BOILER FLUE SETTING Radius 1/16 inch on both edges of flue holes in firebox tube sheet and on front edge of flue holes in front flue sheet as shown on drawings, except for copper sheets. Back end to be set with copper ferrules, rolled, beaded and prossered except for copper sheets. Front end to be rolled and beaded. Rollers to have at least 5 rolls. Prosser to have at least 12 sections Card 1137

TUBE SHEET LAYOUT to be in accordance with Card 5635

S. H. UNITS 26 units 1½ O. D. #9 BWG thick of seamless steel. Pipes united by cast steel return bends as shown on Card 10704-F
Each unit to be tested, before being placed in boiler, with water under pressure of 250 pounds.

S. H. PIPE SUPPORTS Of steel fastened securely on superheater pipes so as not to slide as shown on Card 10010

S. H. PIPE JOINT To be made in best possible manner to insure absolutely tight joints in accordance with the notation on Card 1043

S. H. UNIT CLAMP BOLT To be of steel having a tensile strength between 60,000 lbs, and 70,000 lbs. per sq. inch and to be as shown on Card 1086-A

S. H. HEADER To be of close grain cylinder iron, steam tight in every respect. Joint ring for connection to dry pipe to have flat side against header flange. Casting should be moulded with the face having the superheater joints placed downward in the mould to secure the best quality of metal on surface where superheater joints are made. Each header to have a serial number cast on in such a location as not to be removed in finishing. No patch plugs allowed on ball joint seats. Headers must not be treated excessively with sal ammoniac. Header casting to be tight under water pressure of 250 lbs. Test pressure to be applied separately to the saturated and to the superheated steam passages, so as to insure soundness of all partition walls. Card 10154-F

S. H. HEADER SUPPORTS To be securely bolted or riveted to boiler shell. To be properly located so as to support the header after header has been correctly located. Header should then be bolted to supports. This to be done before superheater units are put in place. Card 1323

ST. PIPE JOINT RINGS Should be of cast iron.

DEFLECTING PLATE To be constructed so as to permit easy inspection and removal of superheater units and joints. Design to be in accordance with Card 10721

DAMPER CYLINDER To be carefully and accurately made. Piston not to be more than 0.01 inch smaller than bore. Bearings for Piston and extension to be in line. Piston to be ground and to operate freely under a pressure as low as 40 lbs. per sq. in. Steam Pipe to damper cylinder should be as short and free from bends as possible so as not to cause water to collect in cylinder. Pipe to be protected against freezing. Card 1149

DAMPER SHAFT COUNTERWEIGHT To be painted a light color to render it easily visible by the engineer Card 1067-A

S. H. ARRANGEMENT To be in accordance with Card 4660

TEST (FINAL.) The Superheater, after assembling in boiler and after steam pipes are fitted up, is to be thoroughly tested and to be tight under water pressure of 250 lbs.

Name	Card	Name	Card
Damper	10651-K	Damper Shaft Link	1078
Damper Cylinder Arm	1074	Patent Plate	3158
Damper Cylinder Pipe Fitting		S. H. Unit Bolt Washer	1071
Damper Cylinder Pipe Union	1287	S. H. Unit Clamp	1073
Damper Cylinder Piping Diagram	1503	S. H. Unit Clamp Washer	1072
Damper Cylinder Support		S. H. Pipe End	1344
Damper Shaft	1235-H	S. H. Pipe Band	1988
Damper Shaft Arm	1226 & 1234-C	Return Bends	10694
Damper Shaft Bearing (O. S.)	1223 & 1148	Deflecting Plate Handle	1487
Damper Shaft Bearing (I. S.)	10386-D	Lubricator Connection	3023

THE BALDWIN LOCOMOTIVE WORKS Sup. to 34 E 2051 with some extras
Memorandum Spec'n 11144 Except as otherwise specified.
SPECIFICATION FOR LOCOMOTIVES 10 34 E 2051 Cyl. 22 and 32 x 32
FOR Minnesota, Dakota & Western Ry. Co. Engine Drawing No. ---
8-5-16

Gauge of Road 4' 8½" Play ½" except (See sup. 32).
Wheelbase, Rigid 15' 0" Driving 15' 0" Total 23' 0"
Total wheelbase, eng. and tend. { Actual 53' 9" / Limited to -----

Curves -----

Limits, Height 15' 0" Width 10' 0"
Weight (approximate) in working order, Total 151,000 pounds
On F. tr'k 14,000 lbs., Drivers 137,000 lbs., B. tr'k ---- lbs.

Tractive power 28,440 lbs., Ratio of adhesion 4.8
Work'g St'm Pres. 180 lbs., Service Freight
Fuel Soft Coal

Boiler Steel Thick ⅞"x 1 1/16" Bill 7942
Boiler, Diam. 60" Plan Extended Wagon Top
Boiler st'm pres. 200 lbs., Tested to { 220 lbs. steam pres. / 267 lbs. water pres.
Longitud. seams Butt jointed, double covering strips

5 **Dome,** diam. 3½" Pos. Forward of fire box

4 **Firebox** Steel Combustion chamb. None
Firebox, length 108-3/16" Width 41" Depth F. 62½" B. 61½"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diam.
Water space, Front 4" Sides 4" Back 3½"
Water space, Frame Double Riveted
6 Water space stays 1" diam. with 7/16" hole 1½" deep from O.S.

Radial stays 1½" diameter Sling stays front { Five rows of Tate Expansion stays
Button heads below crown on eight central rows
Crown bars None Placed --- above crown
Crown bolts -----

4 { Flues -----
Tubes #12 W.G. Charcoal iron
Tube ends Swaged for copper ferrules fire box ends
Number 275 Diam. 2" Length 13' 10"

Heating Surface { Flues ---- Combus. Chamb. --- Total 2136 sq ft
Tubes 1980 sq ft Fire Box 156 sq ft Fire Brick Tubes ---
Grate area 30.8 sq ft Ratio to Heating Surface 1 : 69.3
Superheater ----

Fire Brick Arch, on studs

7 **Grates** Rocking bars and drop plate
8 **Ash Pan,** Dampers Front and back

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

9 **Smokebox** extension With Cleaning hole and cap Left side only
Spark-ejector-ee hopper With
Netting and deflect. plates With

Exhaust nozzles Single, High

Stack Straight Dia. 14" Hole in S. B., dia. 21½"

(Not spec.)
Safety Valves Two Consolidated 2"
Safety valves None with relief lever, Set to 180 pounds
Whistle Nathan Chime No. 963 A-1070 located on side of dome

Steam Gauge One Iron 7" MAKER:- Ashcroft (Not spec.)
Steam gauge stand Iron **Clock** None

Water Gauge One (See sup. 10) **Cab Lamps** Electric
11 **Gauge Cocks** Three back Surface valve None
Lowest gauge cock 2½" above highest part of crown
Lubricator steam valve without separate dry pipe to dome
Blower Valve B. L. W.

12 **Blow off Cock** One Johnstone 2" Pos:- Front
13 **Cleaning Plugs** One plug above fire door
Firebox Corners, back ones diagonal, sides and back
Crown, Three each side and two back
Waist, (See supplement 13)
Front tube sheet, Two Fusible plug None

Pump None Pos. ---
Top chamb. --- Bottom chamb. ---
Feed Cock --- Feed pipes ---
Checks --- Check pipes ---

(Spec.)
14 **Injectors** Two Nathan Simplex No. 8
Injectors, Pos. Right and left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check Nathan No. 280-A Pos. Right and left

Steam Heat None

15 **Cab** Steel

Cab boards Wood Nosing None
Running boards Wood Nosing None
Hand rail Iron Located on Boiler

16 17 **Back Bumper** Steel Back drawbar height 33½"

Pilot Wood Pushing shoes None
Front Bumper Oak Bumper plate With
Steps, hand holds, etc., to conform to I.C.C. requirements

Front Drawhead, Center above rail 33½"
Coupler Simplex M.C.B. Automatic with extended face and lip

18 Signal fixtures Iron on bumper

19 **Headlight** Two Round Case 18" Reflector,
Headlight, Nos. on sides With H'd'l step With
Lamp shelf None Nosing ----

Bell 93 pounds
Sand Box One Diam. 28" Body Iron painted Pipe Iron
Sander (See supplement 26)

Dome casing Iron painted

Boiler Jacket #22 Soft steel plate Iron Style 9
Boiler Lagging Magnesia Sectional

THE BALDWIN LOCOMOTIVE WORKS
L L Neale Dec 1916
SPECIFICATION FOR LOCOMOTIVES 10 34 E 2051
FOR Minnesota, Dakota & Western Ry. Co.
280

27 **Frames** Cast steel Braces Solid

28 **Cylinders,** Diam. 20" Stroke 26"
St'm ports, Length 16" Width 1½" Bridges 1"
Exh. ports, Length 16" Width 2½" Valve lead 3/16"
Valve travel 5½" Steam lap 15/16" Exhaust clearance ----
Eccentric crank throw 1 7/16" By-pass valve None
S. P. Lubr. (Spec.) Nathan Triple No. 166 F 3 Bull's Eye
Cyl'r heads Cast iron: Lubr. pipes of iron under jacket
Cyl'r casings Iron painted Head covers Steel painted
St'm chest casings Iron painted Covers Steel painted
St'm chest valves Richardson Balanced, with vacuum valves
Met. pkg (PISTON ROD / VALVE STEMS) United States King type. (Not spec.)

Pistons Cast iron rings sprung into solid head
Guides Steel Oil cups Adjustable needle
Crossheads Alligator type, cast steel
Wrist Pins Steel Rod cups (See supplement 27, 30)

Valve Motion Baker-Pilliod, Royalty payable by B.L.W.
31 Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

31 All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 56" Cen. diam. 50" centers cast iron
Tire flanges 1½" high.
Tires Steel Held by Shrinkage and shoulder
Tires, Flanged, Pos. All Size 3" x 8½"
Tires, Plain, Pos. ----- Size -----
Lateral play between driving boxes and wheel hubs— 1/16" total
39 **Driving Boxes** Steeled cast iron with Elvin Lubricators
Journals, Diam. 8" Length 9"

Springs to be B.L.W., except front driving and engine truck. Springs from Fort Pitt Spring & Steel Co., because B.L.W. cannot furnish in time.

Front Engine Truck Two Wheeled Swing bolster
To swing 4½" each side of cen., Cen. pin liners None
Journals, Diam. 5" Length 9" Boxes Cast iron
Wheels, Diam. 30" Tread --- Kind Chilled cast iron spoke
Tires None Cen. diam. --- Size ---
Tires held by ---

Back Engine Truck None Wheeled ---
To swing --- each side of cen., Cen. pin liners ---
Journals, Diam. --- Length --- Boxes ---
Wheels, Diam. --- Tread --- Kind ---
Tires --- Cen. diam. --- Size ---
Tires held by ---

34 **Brake,** position On all driving and tender wheels
Operating Parts { Engine, Sch. No. 8-SF West'g. Combined auto. and / Eng. Tr'k, sch. --- straight air
Foundation Parts { Drivers, sch. UM-2 American Outside Equalized / Eng. Tr'k, sch. ---
Air pump One 9½" Pos. Left side, ahead of fire box
Train connections Front and back
Train signal, sch. None

Tender Eight Wheeled, Drawing No. 419
Weight, with fuel and water, about 100,000 pounds

Tank 8,000 Gallons. Bill 3561.
Tank "U" shape, straight top, Fuel capacity 14 tons

Tool Boxes Hard wood Top

Frame Steel 10" channels

Front Drawbar height 33½"
Pilot None Pushing shoes None
Back drawhead, center above rail 33½"
Coupler Simplex M. C. B. automatic, with extended face and lip

Steps, hand holds, etc., to conform to I. C. C. requirements

Trucks Arch bar type with cast steel bolsters
Tender trucks to be of the built up arch bar type
Springs Elliptic S. L. & W. make
Journals, Diam. 5" Length 9"
Wheels, Diam. 33" Tread 4½" Kind Chilled cast iron, plate
Tires ---- Cen. diam. --- Size ---
Tires held by ---
Safety chains Single

Brake Position On all wheels
Brake sch. No. 8 ET West'g. auto. and straight air with 12" x 12" tender cylinder and with Monarch solid brake beams.

List of tools, sch. 29 Bolts, nuts and threads B. L. W.
Photo sch. 2 Inspection B. L. W. (except see sup. 1)
To be weighed Yes. Material specs'ns B. L. W.
Certificate of boiler test Three copies of B. L. W. form 1036
Junior laws to 10-20-16 Shipment On own wheels

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. Patents { Throttle, Patented Jan. 23, 1900 (Cast on) / Feed Pipe Strainer, Patented Sept. 1, 1903 (Cast on)

Property plates B. L. W. for engine and tender

Lettering, etc., in orange chrome yellow as Ry. Co's print R. R. 35, i.e., same as for 34 E 2014
Painting:—Engine, style ----Olive Green, No striping
Painting:—Tender, style ----Olive Green, No striping
Mark on cab sides, M. D. & W. Ry.
Mark on tank sides { MINNESOTA / DAKOTA & WESTERN RY.
Front number plate of steel attached to headlight support with figures painted on plate.

Road Nos. Pos.	Road Nos.	Name: None
F. No. Plate	103	
Sand box		
Cab sides		
Back of tank		

SPECIFICATION FOR LOCOMOTIVES LO 34 E 2051
FOR Minnesota, Dakota & Western Railway Co.

1 When construction of locomotive is fairly along, i.e., when engine is in the Erecting Shop, the B. L. W. Chicago office is to be notified so that Ry. Co. can send its Representative here to make inspection.

2 Locomotive to conform to all present requirements of the Interstate Commerce Commission.

3 All pipe unions to be "Kewanee" unions.

4 All flue and rivet holes to be drilled and reamed to size.

5 Dome to be built up type with separate top, base and body section.
Dome cap of forged steel.

6 Tate Flexible Staybolts about 72 in crown and 462 in sides applied as per Ry. Co's sketch R. R. 34.

7 Grates, cast iron rocking, suitable for Bituminous coal, with intermeshing fingers and with dump grate located at rear under fire door.

8 Ash pan to have cast iron slides and screen damper.

9 Front end arrangement to be M. M. Standard.

10 Water Gauge to be Nathan Mfg. Co's No. 273-A-2000 with lamp.

11 Gauge Cocks Nathan Mfg. Co's CA-2794.
Gauge Cocks spaced 3" apart measured vertically.

12 Discharge from Blow-off cock to be piped to same side of engine as cock operated from.

13 Cleaning hole washout plugs to be provided at corners, sides, ends of firebox, above fire door and crown sheet boiler head. also one plug in bottom of waist of boiler about 18" back of cylinder saddle and one plug in bottom of boiler about 18" ahead of throat sheet.

14 Injector on left side to be located so that fireman can operate it while standing on the engine deck.

15 Cab to have large side window openings as shown on photo. 3392.
Front cab doors to open outward and to be hinged on side next to boiler.

16 Tail pieces and supports to be of strengthened design, as tail piece on LO 34 E 2014, buckles slightly when jacking up engine.

17 Chafing plate at rear of engine to have surface 5" deep.

18 Marker lamps to have electric lights, with brackets at front of engine and rear of tender.

19 Headlight equipment to be Pyle National Electric with incandescent headlights.
Front headlight to be substantially mounted on bracket secured to smoke-box door, the floor of the bracket to be on center line of this door, bracket to be of substantial construction because the locomotive will operate over rough track.
Headlight at rear of tender to be mounted on level with top of flange of coal space, on a heavy bracket located between this flange and the water inlet. This bracket to be of substantial construction because the locomotive will operate over rough track.

26 Sander to be Leach Air Trap A-10 to sand front and back and Hand operated valves arranged to sand in front of front drivers only.

27 All frame pedestal caps to be of strap pattern.

28 Cylinder cocks to be M. D. & W. Ry. Co's standard as per Ry. Cos drawing R. R. 30.

29 Rods: All rod strap bolts to be inserted from under side with nuts on top.
Rods connecting main and intermediate drivers to have solid ends with heavy bronze bushings.

30 Grease cups to be forged on main and side rods with 1⅝" pluge, eight threads per inch.

31 All nuts on valve motion parts to be castle nuts.

32 Distance between tires of front and back driving wheels to be 53½" and all other driving wheels 53⅜".

33 Driving box grease cellars from Franklin Railway Supply Company.

34 Driving brake shoes and heads to be American Shoe & Foundry Company's "Westinghouse Type."

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-4281

Memorandum Spec'n 11204

SPECIFICATION FOR LOCOMOTIVES 10 36 E 1296

FOR Nevada Northern Railway Company

R.

Ry. Co's Class C 51 21/26 155

Gen. as Photo. 5724 Except with Baker Valve Motion

Engine Drawing No. 96

11-9-16

Gauge of Road 4' 8½" Play ⅜" except ⅞" for F & B drivers

Wheelbase, Rigid 15' 0" Driving 15' 0" Total 24' 1"

Total wheelbase, engine and tend. { Actual 58' 7½" / Limited to about 60' 0"

Curves 10 degrees

Length of Engine and Tender overall - 69' 0"

Limits, Height ----- Width -----

Weight approximate total on working order: Total 176,800 lbs.

On F. truck 21,000 lbs. Drivers 155,000 lbs. B. truck ----- lbs.

Tractive power 36,200 lbs. Ratio of adhesion 4.3

Work'g St'm Pres. 190 lbs. Service Freight

Fuel Soft Coal, run of mine

Front tube sheet to be ½" thick

Boiler Steel Thick 11/16" Bill 7993

Boiler, Diam. 70" Plan Straight Top

{Boiler st'm pres. 190 lbs. Tested to 210 lbs. steam pres. / With factor of safety of 4.93 254 lbs. water pres.

Longitud. seams (See sup. 1)

Dome, diam. 33" Pos Central

Firebox Steel Combustion chamb. None

Firebox, length 107" Width 62½" Depth F 68" B 52½"

Firebox, Tube ½" Crown ⅜" Sides ⅜" Back ⅜"

Firedoor opening One oval 13" x 12"

Water space Front 4" Sides 4" Back 4"

Water space, Front Double Riveted

Water space stays 1" diam. with 3.6" holes 1¼" deep from C.S.

Stay bolts Stay bolts of Falls Hollow Iron (1" diam.)

Radial stays ¾" diam. Sling stays Three rows of B. L. W. Expansion Stays

Button heads, how made On Ten rows

Crown bars Sole Plates ----- Above crown

Crown bolts -----

Tubes 49 ¾ in. Seamless Steel

Tubes #11 W. G. Parkesburg Iron (A/C time)

Tube ends Swaged for copper ferrules firebox ends

Number 25 / 169 Diam. 5¾" / 2" Length 14' 0"

Heating Tubes 1490 sq. ft. Combus. Chamb. ----- Total 1889 sq. ft.

Surface Tubes 1224 sq. ft. Fire Box 156 sq. ft. Fire Brick Tubes 19 sq. ft.

Grate area 46.2 sq. ft. Ratio to Heating Surface 1 : 40.9

Superheat 423 sq. ft.

Fire Brick Arch, American Arch Co's on three tubes of seamless steel, #7 B.W.G. thick 3" O.S. diameter

Grates Cast Iron finger grates (See sup.

Ash Pan, Dampers Back only

Ash Pan, Hopper type, of ¼" steel plate.

Throttle Balance Pos Dome

Dry pipe Steel

Superheater (See sup. 2)

Smokebox extension With Clean- hole and cap L. S. Only

Spark ejector-or hopper With

Netting and deflect. plates With

Exhaust nozzles Single High

Stack Straight Dia. 17" Hole in S. B., dia. 20"

Stack to give maximum draft

Safety Valves (Spec) Two Coale 3½" Open

Safety valves None with relief lever, Set to 190 pounds

Whistle Five Chamber Chime

Steam Gauge Two Iron 6½" Maker:- Ashcroft (Spec)

Steam gauge stand Iron **Clock** None

Water Gauge One B.L.W. (Ironclad) **Cab Lamps** Electric

Gauge Cocks Three Back Surface valve None

Lowest gauge cock 3½" above highest part of crown

Lubricator steam valve without separate dry pipe to dome

Blower Valve B. L. W.

Blower Pipe to be provided with a Tee outside of smokebox.

Blow off Cock One B. L. W. Standard Pos:-Front

Cleaning Plugs One plug above fire door

Firebox Corners diagonal and sides and back

Crown, Two right side, three left side and three back

Waist, One under front

Front tube sheet, One Fusible plug One

Pump None Pos. -----

Top chamb. ----- Bottom chamb. -----

Feed Cock ----- Feed pipes -----

Checks ----- Check pipes -----

Injectors (Spec) Two Nathan Monitor No. 10

Injectors, Pos. Right and Left Steam pipes Copper

Pipes, Check Iron Feed Iron Overflow Iron

Check B. L. W. Standard Pos. Right and Left

Steam Heat Consolidated System

Cab Steel plate, lined with wood

Cab boards ¼" Steel plate Nosing T-Iron

Running boards ¼" Steel plate Nosing T-Iron

Hand rail Iron Located on Boiler

Back Bumper Bar Steel Back drawbar height 30"

Pilot (See sup. 11) Pushing shoes Cast in bumper

Front Bumper Cast steel Bumper plate With

Steps (See sup. 10-12)

Front Drawhead, Center above rail 33½"

Coupler Climax M. C. B. Auto.

Signal fixtures Iron on Bumper

Classification brackets to be applied on smoke-box front.

Headlight One Round Case 18" Reflector

Headlight, Nos. on sides With H'd'l't step With

Lamp shelf None Nosing -----

Bell 92 pounds. Gollmar Air Bell Ringer

Sand Box One Diam. 31" Body Iron Painted Pipes Iron

Sander (See sup. 14)

Dome casing Iron Painted

Boiler Jacket #22 Sheet Steel PtBands Iron Style 9 and 14

Boiler Lagging Sectional Magnesia

Backhead of boiler to be lagged and jacketed

THE BALDWIN LOCOMOTIVE WORKS

N Harnick March 9 17

SPECIFICATION FOR LOCOMOTIVES 10 36 E 1296

FOR Nevada Northern Railway Company

R.

Frames Cast Steel Braces Solid

Cylinders, Diam. 21" Stroke 26"

St'm ports, Length 23.7" Width 1⅞" Bridges -----

Exh. ports, Length ----- Width ----- Valve lead ⅛"

Valve travel 6" Steam lap ⅞" Exhaust clearance -----

Eccentric crank throw 20¼" By-pass valve None

S. F. Lubr. (Spec) Nathan Six Feed Bulls Eye (see sup. 8)

Cyl'r heads Front, cast iron, back, cast steel

Cyl'r casings (See sup. 16) Head covers (See sup. 16)

St'm chest casings ----- Covers -----

St'm chest valves 10" diam. Piston Type Inside admission

Met. pkg { Piston rods / Valve stems H. G. Hammett (Spec)

Pistons (See sup. 18)

Guides Two Bar type, Steel Oil cups Needle

Crossheads Alligator Type Cast Steel

Wrist Pins Steel Rod cups Plunger (see sup. 21)

Valve Motion Baker, Royalty payable by The B.L.W.

Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All motion bolts and pins to have castellated nuts.

All threads on bolts (except staybolts) to be United States Standard.

All finished movable nuts of steel or of iron case hardened.

Wearing Bearings Magnus Metal

Driving wheels to have hub liners of Brass

Drivers, O. S. Diam. 51" Cen. diam. 44"

Wheel centres, Main, cast steel, others, cast iron

Tires Steel Held by Shrinkage and Shoulder

Tires, Flanged, Pos. All Size 3½" X 5½"

Tires, Plain, Pos. ----- Size -----

Lateral play between driving boxes and wheel hubs = 1/16" total

Driving Boxes Cast steel, with Elvin Grease Cellars

Journals, Diam. 9½" Length 10"

Springs. Make Railway Steel Spring Co's, except Six Driving Springs, B. L. W. Card S-866 may be made by B.L.W. a/c time.

Front Engine Truck Two Wheeled Swing bolster, centre bearing

To swing 3⅜" each side of cen., Cen. pin liners None

Journals, Diam. 6" Length 10" Boxes Cast Iron

Wheels, Diam. 30" Tread -----Kind Cast Iron spoke centre

Tires O.H. steel Cen. diam. 24¼"Size 2⅞" X 5½"

Tires held by Shrinkage and Shoulder

Back Engine Truck None Wheeled -----

To swing ----- each side of cen., Cen. pin liners -----

Journals, Diam. ----- Length ----- Boxes -----

Wheels, Diam. ----- Tread -----Kind -----

Tires ----- Cen. diam.----- Size -----

Tires held by -----

Brake, position On all driving and tender wheels

Operating Parts { Engine} Sch. No. 6 ET West'g. Combined Auto. and Straight Air / Eng. Tr'k. sch. -----

Foundation Parts { Drivers, sch. WN-2 American O.S. Equalized / Eng. Tr'k, sch.-----

Air pump Two 11" Pos. Both left side (See sup.

Train connections Front and Back

Train signal, sch. "L"

Tender Eight Wheeled, Drawing No. 659

Weight, with fuel and water, about 145,000 lbs.

Tank 7500 Gallons, Bill 4410

Tank water bottom type. Fuel capacity 12 tons

Tool Boxes to be built into front water legs of tank

Classification brackets to be applied on rear of tender.

Frame Steel 13" channels, with front and back bumpers of cast steel.

Front Drawbar height 29½"

Pilot None Pushing shoes Cast in rear bumper

Back drawhead, center above rail 33½"

Coupler Climax M.C.B. Auto. with B.L.W. twin spring draft gear.

Steps hand holds, etc. to conform to I.C.C. requirements

Trucks Arch Bar type, with heavy cast steel bolsters

Springs Elliptic - Railway Steel Spring Co's

Journals, Diam. 5½" Length 10"

Wheels, Diam. 33" Tread 4¼"Kind { Standard Steel Works / Rolled Steel

Tires None Cen. diam. ----- Size -----

Tires held by ----- Wheel rims 2½" thick

Safety chains Single

Brake Position On all wheels

Brake sch. No. 6 ET West'g. Auto. and Straight Air with 14" x 12" tender cylinder

List of tools, sch. 83

Photo sch. #2 Inspection B. L. W.

To be weighed Yes Material spec'ns B. L. W.

Certificate of boiler test Three copies of B.L.W. form 1036

Junior laws to 2-1-17 Shipment Own own wheels

Brass shop finish, No. 1

Machine shop finish D-165

B. L. W. Patents } Feed Pipe Strainer, patented Sept. 1, 1903 (Cast On)

Property plates None

Lettering, etc. to be Roman style, as Ry.Co's pencil sketch (herewith)

Painting: Engine, style 291 Olive Green and Aluminum

Painting: Tender, style 291 Olive Green and Aluminum

Classification mark on cab sides, C 51 21/26 155

Mark on cab sides, NEVADA NORTHERN

Mark on back of tank, N N

Mark on back of tank, 7500 GALS

Figures on sand box to be 6" brass or aluminum metal

Road Nos. Pos.	Road Nos.	Name None
F.No Plate	81	
Sand Box		
Sides of tank		
Back of tank		

SPECIFICATION FOR LOCOMOTIVES 10 36 E 1296

FOR NEVADA NORTHERN RAILWAY COMPANY

R.

1 BOILER CONSTRUCTION TO COMPLY WITH THE INTERSTATE COMMERCE COMMISSION LAWS.
BACKHEAD AND THROAT SHEET TO BE SLOPING.
LONGITUDINAL SEAMS BUTT JOINTED, DOUBLE COVERING STRIPS, SEXTUPLE RIVETED.

2 SUPERHEATER AS LOCOMOTIVE SUPERHEATER CO'S SPECIFICATION NO. 0-6658 DATED DEC. 13, 1916 (COPY ATTACHED)
SUPERHEATER TO BE SCHMIDT FIRE TUBE TYPE WITH OUTSIDE STEAM PIPE CONNECTIONS TO STEAM CHESTS.
ROYALTY PAYABLE BY THE B. L. F.

3 ADDITIONAL HAND HOLE AND CAP TO BE PROVIDED IN EACH SIDE OF SMOKE BOX FOR INSPECTION OF SUPERHEATER.

4 SMOKE BOX FRONT AND DOOR OF PRESSED STEEL, CAREFULLY FITTED

5 WASHOUT PLUGS TO BE PROVIDED AT CORNERS, SIDES AND ENDS OF FIREBOX, ABOVE FIRE BOX AND CROWN SHEET, AND FOR WASHING SHEET OF BOILER.

6 HANCOCK 3" LINE CHECKS TO BE APPLIED IN DELIVERY PIPES ABOUT 2 FEET FROM BOILER CHECKS.

7 CAB FLOOR OF SAE STEEL

8 [illegible] INSIDE OF CAB TO BE OF COPPER (see sup. 26)
[illegible] OF COPPER.
[illegible] OF COPPER 3" [illegible] DIAM. UNDER JACKET.
REMOTE [illegible] TO BE PROVIDED TO EACH PUMP.

9 [illegible] FROM [illegible] BACK OF CAB AND FROM [illegible] FRONT SIDE OF CAB.
[illegible] AND SECURED TO BOILER AND RUNNING BOARD [illegible] FURNISHED WITH SUITABLE SLIDING WINDOWS, AND WITH [illegible] TURN-UP ARMS, SEATS, CUSHIONS AND ARM RESTS FOR [illegible] AND FIREMEN.

10 FOOT BOARD OF STEEL PLATE 3/8" THICK TO BE APPLIED UNDER CAB.

11 PILOT TO BE MADE OF 7" BOILER TUBES, AS PER BLUE PRINT RECEIVED 7-1-1916

12 ENGINE TO BE FULLY EQUIPPED WITH STEPS AND GRAB IRONS TO MEET THE REQUIREMENTS OF THE INTERSTATE COMMERCE COMMISSION LAWS, BEFORE LEAVING THE WORKS.

13 HEADLIGHT EQUIPMENT TO BE PYLE NATIONAL ELECTRIC TYPE "E" WITH INCANDESCENT HEADLIGHT INSTEAD OF ARC.
DRAIN PIPE WITH VALVE FROM ELECTRIC HEADLIGHT DYNAMO TURBINE.

14 SANDER TO BE "NEVER CLOG" (Spec.) AIR, DOUBLE SANDER ALSO HAND ATTACHMENT. FRONT SAND PIPES TO SAND INTERMEDIATE DRIVERS, BACK SAND PIPES TO SAND BACK OF MAIN DRIVERS.

15 DOME CASING TO BE CUT FOR WHISTLE TO ALLOW REMOVAL OF CASING WHILE ENGINE IS UNDER STEAM.

16 CYLINDERS AND STEAM CHESTS LAGGED WITH SAME MATERIAL AS BOILER AND NEATLY CASED WITH SHEET STEEL PAINTED, WITH HEAD COVERS OF PRESSED STEEL PAINTED.

17 CYLINDER HEAD JOINTS TO BE GROUND.

18 PISTONS HEADS TO BE SOLID OF CAST IRON WITH CAST IRON PACKING RINGS.
PISTON RODS OF STEEL 3 3/4" DIAMETER.

21 MAIN RODS "I" SECTION
PARALLEL RODS RECTANGULAR SECTION, WITH SOLID ENDS.
SIDE RODS TO HAVE BRASS BUSHINGS FOR KNUCKLE JOINT PINS.

22 REVERSE LEVER TO BE PROVIDED WITH FOOT REST IN CAB.

23 DRIVING BOXES TO HAVE DEEP FLANGES.

24 FRONT ENGINE TRUCK FRAME OF CAST STEEL WITH SWING BOLSTER OF CAST STEEL.

25 ONE 1 1/4" AIR PUMP GOVERNOR TO BE PLACED ON TOP OF BOILER OUTSIDE OF CAB.
AIR PUMPS TO BE PLACED 32" CENTER TO CENTER.
BACK BRACKET TO CLEAR THROAT SHEET.
VALVE TO BE APPLIED IN STEAM PIPE NEXT TO EACH PUMP.

26 STEAM AND AIR PIPES TO GOVERNOR AND GAUGES TO BE OF COPPER.
ALL 3/8" AND 1/4" PIPES FROM DISTRIBUTING VALVE TO BE OF COPPER.

27 AIR RESERVOIRS TO BE ENAMELLED, WITH HYDROSTATIC TEST OF 210 POUNDS.
TWO MAIN AIR RESERVOIRS 20 1/2" DIAMETER, 108" LONG.

28 DOUBLE AIR RESERVOIR FOR DISTRIBUTING AIR VALVE TO BE SET FACING OUT 12" FROM CENTER TO CAB BRACKET.
Valve
BRACKETS FROM RUNNING BOARD UNDER CAB TO BE 9 1/2" LONG, MADE OF 1/2" X 2 1/2" IRON.

29 AIR BRAKE FEED VALVE TO BE LOCATED IN CAB. TOP OF UPPER FEED VALVE TO BE 32" ABOVE THE RUNNING BOARD. FEED VALVES TO BE PLACED 9" CENTER TO CENTER AND TO JUST CLEAR REVERSE LEVER WHEN IN FORWARD MOTION.

30 LOCOMOTIVE TO BE PROVIDED WITH ALL NECESSARY WRENCHES, FIRING TOOLS, HAMMERS, CHISELS, PACKING TOOLS, TWO JACK SCREWS, ONE PINCH BAR, ONE SCOOP SHOVEL, OIL CANS AND TORCH. CHISEL BAR FOR REMOVING DRIVING BOXES.

TENDER

41 TOP OF TANK WATER BOTTOM TO BE 3/8" THICK.
SHOVEL PLATE TO BE APPLIED.

42 COAL-GATES OF 1/4" SHEET STEEL, AS PER BLUEPRINT RECEIVED 9-8-16

43 TENDER TO BE FULLY EQUIPPED WITH STEPS AND GRAB IRONS TO MEET REQUIREMENTS OF THE INTERSTATE COMMERCE COMMISSION LAWS, BEFORE LEAVING THE WORKS.
STEPS AND GRAB IRONS TO BE APPLIED TO REAR CORNERS OF TENDER.

44 LADDER ON REAR OF TENDER LOCATED SO AS TO CLEAR MARKER BRACKETS.

45 TENDER BRAKE BEAMS TO BE CRECO, INSIDE HUNG.

SPECIFICATION FOR LOCOMOTIVES 10..36 E 1296

FOR NEVADA NORTHERN RAILWAY COMPANY

Specification for Type A Double Loop Superheater..SPECIFICATION 0-6658 DATED DEC. 13, 1914.....

BOILER TUBES ..168...in number.....2.....o. d.....11/4.....ft.....0.....in. over tube sheets. Tubes located between and adjacent to boiler flues are to be beaded over at front end.

BOILER FLUES .....25...in number.....5 1/2".....o. d...#9 BWG....of cold drawn seamless steel. Flues to be straight, true to gauge and wall not to vary more than one gauge from specified thickness.....Card....1106-Q

BOILER FLUE SETTING 1/4 in. radius on both edges of flue holes in fire box tube sheet and on front edge of flue holes in front tube sheet as shown on drawings, except for copper sheets. Back end to be set with copper ferrule, rolled, beaded and prossered except for copper sheets. Front end to be rolled and beaded. Rollers to have at least 5 rolls. Prosser to have at least 12 sections.....Card....1136.....

.....Card....5896.....

TUBE SHEET LAYOUT

UNITS ...25..units..1 1/2"....o. d...#9 BWG.....of seamless steel. Pipes united by return bends.

Each unit to be tested, before being placed in boiler, with water under pressure of 250 lb. per sq. in. for screwed return bends or 500 lb. per sq. in. for welded return bends.

UNIT PIPE SUPPORTS Of steel fastened securely on superheater pipes so as not to slide.....Card....10773.....

UNIT PIPE JOINT To be made in best possible manner to insure absolutely tight joints in accordance with the notation on.....Card....1043.....

UNIT CLAMP BOLT To be in accordance with requirements of Locomotive Superheater Company Material Specification No. 12.....Card....10695.....

HEADER To be of close grain cylinder iron, steam tight in every respect. Joint ring for connection to dry pipe to have flat side against header flange. Casting should be moulded with the unit joint face down to secure the best quality of metal on surface where superheater unit joints are made. Each header to have a serial number cast on in such a location as not to be removed in finishing. No patch plugs or chaplets allowed in ball joint seats. Headers must not be treated with sal ammoniac. Header casting to be tight under water pressure of 250 lb. Test pressure to be applied separately to the saturated and to the superheated steam passages, so as to insure soundness of all partition walls.....Card....10561-C.....

HEADER SUPPORTS To be securely fastened to boiler shell with rivets or turned bolts fitted in reamed holes. To be properly located so as to support the header after header has been correctly located. Header should then be secured to supports. This to be done before superheater units are put in place.....Card....1323.....

STEAM PIPE JOINT RINGS Should be of cast iron.

DEFLECTING PLATE To be constructed so as to permit easy inspection and removal of superheater units and joints. Design to be in accordance with.....Card....SEE ARRGT.....

DAMPER CYLINDER To be carefully and accurately made. Piston not to be more than 0.01 in. smaller than bore. Bearings for piston and extension to be in line. Piston to be ground and to operate freely under a pressure as low as 40 lb. per sq. in. Steam pipe to damper cylinder should be as short and free from bends as possible so as not to cause water to collect in cylinder. Pipe to be well protected against freezing.....Card....1242-A.....

DAMPER SHAFT COUNTERWEIGHT To be painted a light color to render it easily visible by the engineer.....Card....1067.....

S. H. ARRANGEMENT To be in accordance with.....Card....4929.....

TEST (FINAL) The superheater, after assembling in boiler and after steam pipes are fitted up, is to be thoroughly tested and to be tight under water pressure of at least 30% more than the working pressure of the boiler.

DAMPER	Card....1092A-D	DAMPER SHAFT LINK	Card....1070
DAMPER CYL. ARM	Card....1074	PATENT PLATE	Card....3156
DAMPER CYL. PIPE FITTING	Card....1069-A	S. H. UNIT BOLT WASHER	Card....1071
DAMPER CYL. PIPE UNION	Card....1227	S. H. UNIT CLAMP	Card....1073
DAMPER CYL. PIPING DIAGRAM	Card....	S. H. UNIT CLAMP WASHER	Card....10305
DAMPER CYL. SUPPORT	Card....	S. H. PIPE END	Card....1344
DAMPER SHAFT	Card....1068-M	S. H. PIPE BAND	Card....1988
DAMPER SHAFT ARM	Card....1065	RETURN BENDS	Card....10094
DAMPER SHAFT BEARING (O.S.)	Card....1077-B	DEFLECTING PLATE HANDLE	Card....1487
DAMPER SHAFT BEARING (I.S.)	Card....10386-N	LUBRICATOR CONNECTION	Card....3023
SPACING OF BANDS & SUPPORTS	Card....10759	DEFLECTING PLATE STUDS	Card....10809
TYPE OF RETURN BENDS	WELDED	DEFLECTING PLATE CLAMP	Card....10809-A

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-2452
Memorandum Spec'n 10329 Details as far as practicable to be same as for 10 24 ½ D 109

SPECIFICATION FOR LOCOMOTIVES 10 26 ½ D 143 Gen. as Neg. 5108

FOR Rapid City, Black Hills & Western R. R. Co. **Engine Drawing No.** 36

D. 3-3-16

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 9' 2" Driving 9' 2" Total 24' 8"
Total wheelbase, eng. and tend. { Actual 47' 1⅜" / Limited to ----

Curves 25 degrees

Limits, Height ---- Width ----
Weight (approximate) in working order, Total 111,000 lbs.
On F. tr'k 13,000 lbs., Drivers 84,000 lbs., B. tr'k 14,000 lbs.

Tractive power 20,700 lbs., Ratio of adhesion 4.05
Work'g St'm Pres. 175 lbs., Service Freight
3 **Fuel** Oil

Boiler Steel Thick ⅞" and 9/16" Bill 7732
Boiler, Diam. 54" Plan Extended Wagon top
Boiler st'm pres. 175 lbs., Tested to { 195 lbs. steam pres. / 234 lbs. water pres.
Longitud. seams Butt jointed, double covering strips.

5 **Dome,** diam. 29" Pos. Forward of Fire box

1 **Firebox** Steel Combustion chamb. None
3 Firebox, length 67⅛" Width 33⅜" Depth F. 69½" B. 66½"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back 5/16"
Firedoor opening 16" diam.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Single Riveted
2 Water space stays ⅞" diam. with 3/16" hole 1½" deep from C. S.

Radial stays 1" diam Sling stays front { Two rows of Expansion / B.L.W. Stays.
Button heads below crown on Eight central rows
Crown bars None Placed ---- above crown
Crown bolts ----

Flues None
Tubes #12 W. G. Charcoal Iron or Steel
Tube ends Swaged for copper ferrules, fire box ends.
Number 196 Diam. 2" Length 11' 10½"

Heating Surface	Flues None	Combus. Chamb. None	Total 1319⁶	
	Tubes 1210⁶	Fire Box 109⁶	Fire Brick Tubes ----	
	Grate area 15.6⁶	Ratio to Heating Surface 1 : 84.6		
	Superheater ----			

3 **Fire Brick** pavement in pan
Fire box lined with fire brick for oil burning.

Grates None
Ash Pan, Dampers Front and Back

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Smokebox extension With Cleaning hole and cap None
Spark ejector or hopper None
Netting and deflect. plates None

Exhaust nozzles Single Lew
Cleaning Pipe, with
Stack Cast Iron, Straight Dia. 16" Hole in S. B., dia. 20"

Safety Valves (not spec'd) Two Consolidated 2½"
Safety valves None with relief lever, Set to 175 pounds
Whistle Large Chime

Steam Gauge One Iron 7" MAKER:- Ashcroft (Spec)
Steam gauge stand Iron **Clock** None

Water Gauge One B.L.W. (sup. 4) **Cab Lamps** to burn oil
Gauge Cocks Three Back Surface valve None
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock Two Everlasting POS:- Right and Left
Cleaning Plugs
Firebox Corners, back ones diagonal, sides and back.
Crown, Two each side and four back
Waist, One under front.
Front tube sheet, One Fusible plug One

Pump None Pos. ----
Top chamb. ---- Bottom chamb. ----
Feed Cock ---- Feed pipes ---
Checks ---- Check pipes ----

Injector to be self acting, non lifting type.
Injectors (not spec) Two Sellers, Class K-ML No. 8½
Injectors, Pos. Right and Left Steam pipes Copper
6 Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. with stop valve Pos. Right and Left

Steam Heat None

7 **Cab** Steel

Cab boards Wood Nosing None
Running boards Wood Nosing None
Hand rail Iron Located on Boiler

8 **Back Bumper** Bar Steel Back drawbar height 34"

Pilot Wood Pushing shoes None
Front Bumper Oak Bumper plate With
Steps, hand holds, etc. to conform to I. C. C. requirements.

Front Drawhead, Center above rail (See sup. 9)
Coupler (See sup. 9)

Signal fixtures Iron on bumper

Headlight Two Round Case 16" Reflector, To burn Kerosene
Headlight, Nos. on sides With H'd'l st'p With
Lamp shelf None Nosing ----

Bell 85 pounds. Gellmar Air Bell Ringer
Sand Box (not spec) Two Diam. 28" Body Iron Ptd. Pipes Iron
Sander Leach Air Trap A-1 in each box, to sand front and rear

Dome casing Iron Ptd.

Boiler Jacket #22 Soft Steel Ptd Bands Iron Style 9
Boiler Lagging Magnesia Sectional

THE BALDWIN LOCOMOTIVE WORKS
E Kalbach May 1916
SPECIFICATION FOR LOCOMOTIVES 10 26 ½ D 143
FOR Rapid City, Black Hills & Western R. R. Co.

Frames Cast Steel Braces Solid

Cylinders, Diam. 16" Stroke 24"
St'm ports, Length 15" Width 1½" Bridges 1"
Exh. ports, Length 15" Width 2½" Valve lead ¼"
Valve travel 5½" Steam lap ⅞" Exhaust clearance ----
Eccentric crank throw 9⅜"
S. F. Lubr. Detroit Triple #22 Bulls Eye
Cyl'r heads Cast Iron; Lubr. pipes of Iron under jacket
Cyl'r casings Iron Ptd. Head covers Steel painted
St'm chest casings Iron Ptd. Covers Steel Painted
St'm chest valves Richardson Balanced, with vacuum valves
Met. pkg (PISTON RODS VALVE STEMS) U. S. (not spec)

Pistons Cast Iron rings, sprung into solid head.
Guides Steel Oil cups Needle
10 **Crossheads** Cast Steel
Wrist Pins Steel 11 Rod cups Plunger, forged on

Valve Motion Walschaerts.
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

17 13 **Drivers,** O. S. Diam. 44" Cen. diam. 38", Centres Cast Iron

Tires Steel Held by Shrinkage and Shoulder
Tires, Flanged, Pos. All Size 3" x 6"
Tires, Plain, Pos. ---- Size ----
Lateral play between driving boxes and wheel hubs = 1/16" total
Driving Boxes Cast Iron
Journals, Diam. 7" Length 8"

14 **Springs.** Make B. L. W.

Front Engine Truck Two Wheeled Swing Bolster Centre Bearing
To swing 3½" each side of cen., Cen. pin liners None
Journals, Diam. 4½" Length 7½" Boxes Cast Iron
Wheels, Diam. 26" Tread 4½" Kind Chilled Cast Iron Spoke
Tires None Cen. diam. ---- Size ----
Tires held by ----

Back Engine Truck Two Wheeled Swing Bolster Side Bearing
To swing 3½" each side of cen., Cen. pin liners None
Journals, Diam. 4½" Length 7½" Boxes Cast Iron
Wheels, Diam. 26" Tread 4½" Kind Chilled Cast Iron Spoke
Tires None Cen. diam. ---- Size ----
Tires held by ----

Brake, position On all driving and tender wheels.
Operating Parts { Engine, Sch. #6-ET West'g Combined Auto. and / Eng. Tr'k, sch. ---- } Straight Air
Foundation Parts { Drivers, sch. M-1 American O. S. Equalized / Eng. Tr'k, sch. ----
16 Air pump One 11" Pos. Left Side
Train connections Front and Back
Train signal, sch. None

11 **Tender** Eight Wheeled, Drawing No. 356
Weight, with fuel and water, about 80,000 lbs.

Tank	Oil	1800	4195
	Water	4000 Gallons, Bill	4196

Tank "U" Shape, Straight Top.

Tool Boxes Hard Wood, Top.

Frame Oak and Yellow Pine

12 Front Drawbar height 29⅝"
Pilot None Pushing shoes None
Back drawhead, center above rail (See sup. 43)
Coupler (See sup. 43)

Steps across rear, with hand rails.

Trucks Arch Bar Type with Steel bolsters.

14 Springs Elliptic B. L. W. make
Journals, Diam. 4½" Length 8"
Wheels, Diam. 33" Tread 4½" Kind Chilled Cast Iron plate
Tires ---- Cen. diam. ---- Size ----
Tires held by ----
Safety chains Single

Brake Position On all wheels.
Brake sch. #6-ET West'g Auto. and Straight air with 10" x 12" cylinder.

List of tools, sch 28 One pair of wrecking frogs.
Photo sch None Inspection B. L. W. except (See sup. 17)
To be weighed Yes Material spec'ns B. L. W.
Certificate of boiler test Three copies of B. L. W. form 1036
Junior laws to 5-1-16 Shipment On own wheels.

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. Patents	Throttle,		Patented Jan. 23, 1900 (Cast on)
	Feed Pipe Strainer,		Patented Sept. 1, 1903 (Cast on)

Property plates None

Painting: Engine, style ---- Black, No Striping
Painting: Tender, style ---- Black, No Striping

Lettering, etc. to be in silver, same as for 10 26 ½ D 109
Mark on cab sides, R. C. B. H. & W. (In letters 4" high)
Figures on sand box to be 6" high
Figures on sides and back of tank to be 8" high
Road Nos. Pos. Road Nos. Name None
F. No. Plate 51
F. Sand Box
Sides of tank
Back of tank.

SPECIFICATION FOR LOCOMOTIVES 10 26 ½ D 143

FOR Rapid City, Black Hills & Western R. R. Co.

1 Crown and side sheets of fire box in one piece.

2 All stay bolts back of frame and in other inaccessible places to be drilled for their entire length.

3 Oil burning Arrangement, Baldwin Standard with oil burner placed in front end of fire box.
Royalty, if any, payable by The B. L. W.
Knuckle joint to be located in heater pipe for heating oil in tank, between engine and tender

4 Water glass to have "Ironclad" fittings and shield, Sargent Co., Chicago.

5 Hole with 1¼" standard pipe thread to be provided in left side of dome. Hole to be plugged.

6 Squirt hose connections to be applied on left branch pipe.

7 Side cab windows to be extra large

8 Chafing block to be solid applied to engine.

9 Couplings:-two pocket draw casting with Sharon M.C.B. Auto. coupler, 32½" centre above top of rail in upper pocket, and lower pocket fitted for link and pin connections.

10 Crossheads with removable side plates on inside and outside, fitted with bronze liners.

11 Parallel Rods to have solid ends.

12 Collins graphite lubricator to be applied to front drivers.

13 Driving wheels to have bronze hub liners.

14 Springs and spring rigging to be extra heavy.
All holes in equalizers fitted with case hardened bushings and pins.

15 Air pump to be fitted with Automatic oiler on air end.

16 Air pump exhaust to be piped into cylinder saddle.

17 Chicago Office is to be advised at least two weeks before locomotive is ready for shipment so that Ry. Co. can arrange to have inspector here.

T E N D E R .

41 Headlight to be set on rear of tank so that it will not project beyond back face of tank.

42 Chafing block to be solid.

43 Coupling:- Two pocket draw casting with Sharon M. C. B. Auto. coupler 32½" centre above top of rail in upper pocket, and lower pocket fitted for link and pin connection.

44 Springs and spring rigging to be extra heavy.

THE BALDWIN LOCOMOTIVE WORKS Dup. 8 32 D 793, WITH SAME EXTRAS, EXCEPT AS OTHERWISE SPECIFIED

Memorandum Spec'n 11237

SPECIFICATION FOR LOCOMOTIVES 8 32 D 798 Gen. Bk. Photo. 4366

FOR Yosemite Valley R. R. Co. **Engine Drawing No.** 69

12-2-16

Gauge of Road 4' 8½" Play ¾" (See Sup. 27½)
Wheelbase, Right 14' 2" Driving 14' 2" Total 22' 9"
Total wheelbase, eng. and tend. (Actual 51' 1⅞" / Limited to ---

RAILS 70 POUNDS
Curves 18 DEGREES. MAXIMUM GRADE 2 %

Limits, Height --- Width ---
Weight approximate in working order, Total 143,000 POUNDS,
On F. truck 23,000 lbs. Drivers 120,000 lbs. B. truck ---- lbs.
WEIGHT GUARANTEED NOT TO EXCEED 121,000 POUNDS ON DRIVERS
Tractive power 28,600 lbs. Ratio of adhesion 4.2
Work'g St'm Pres. 190 lbs. Service PASSENGER AND FREIGHT
6 **Fuel** OIL

FRONT TUBE SHEET ½" THICK
Boiler STEEL Thick ⅝" Rivet 8013
Boiler, Diam. 61" Plan EXTENDED WAGON TOP
Boiler str'th pres. 200 lbs. To tensile str'th of 220 lbs. steam pipes.
WITH FACTOR OF SAFETY OF 4 & 257 lbs. water pipes.
1 Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS, 90 % SEAM

Dome, Diam. 29" Pos. FORWARD OF FIREBOX

Firebox STEEL Circumferential seams NONE
Firebox, Length 113-11/16" Width 41⅝" Depth F. 70" B. 63"
2 Firebox, Tube ½" Crown ½" Sides ⅜" Back ⅝"
3 Firedoor opening 13⅝" x 18"
Water space, Front 4" Sides 3½" Back 3½"
Water space, Frame DOUBLE Riveted
Water space stays ⅝" DIAM. WITH 3/8" HOLE 14" DEEP FROM OUT.
4 Radial stays 1" DIAMETER Sling stays front } TWO ROWS OF B. L. W. EXPANSION STAYS
Button heads outside crown sheet --- Crown rows
Crown bars NONE Plates --- above crown
Crown bolts ---

Flues ---
5 **Tubes** #12 U.S. CHARCOAL IRON OR STEEL
Tube ends SWAGED FOR COPPER FERRULES FIREBOX ENDS
Number 295 Diam. 2" Length 12' 7"

Heating Flues --- Combus. Chamb. --- Total 2091 ☐'
Surface Tubes 1931 ☐' Fire Box 160 ☐' Fire Brick Tubes ---
Grate area 31.1 ☐' Ratio to Heating Surface 1 : 67
Superheater ---

Fire Brick PAVEMENT IN PAN.
FIREBOX LINED WITH FIREBRICK FOR OIL BURNING

7 **Grates** NONE
8 **Ash Pan,** Dampers FRONT ONLY

Throttle BALANCE Pos. DOME
Dry pipe STEEL

Superheater NONE

9 **Smokebox** extension NONE Cleaning hole and cap NONE
Spark ejector or hopper NONE
Netting and deflect. plates NONE

10 Exhaust nozzles SINGLE LOW
CLEANING PIPE, WITH
11 Stack STRAIGHT Dia. 16" Hole in S. B., dia. 20"

Safety Valves (Spec.) TWO CROSBY 3" ENCASED
Safety valves NONE with relief lever, Set to 190 POUNDS
Whistle 1½" CHIME

Steam Gauge ONE IRON 7" MAKER: ASHCROFT (Not Spec.)
Steam gauge stand IRON **Clock** NONE

Water Gauge ONE HILTBONCO #4 XX **Cab Lamps** (SEE SUP. 13)
Gauge Cocks THREE BACK Surface valve NONE
Lowest gauge cock 3¼" above highest part of crown
Lubricator steam valve TO HAVE separate dry pipe to dome
// **Blower Valve** B. L. W.

Blow off Cock ONE EVERLASTING Pos: (SEE SUP. 14)
Cleaning Plugs
Firebox (SEE SUPPLEMENT 15)
Crown. (SEE SUPPLEMENT 15)
Waist. (SEE SUPPLEMENT 15)
Front tube sheet. NONE Fusible plug ONE

Pump NONE Pos. ---
Top chamb. --- Bottom chamb. ---
Feed Cock --- Feed pipes ---
Checks --- Check pipes ---

INJECTORS TO HAVE LEVER MOVEMENT
Injectors (Spec.) TWO OHIO, TYPE "A" No. 9
Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER
Pipes, Check IRON Feed IRON Overflow IRON
Check B. L. W. Pos. RIGHT AND LEFT

Steam Heat NONE

Cab WOOD

Cab boards WOOD Nosing NONE
Running boards WOOD Nosing NONE
Hand rail IRON Located on BOILER

Back Bumper BAR STEEL Back drawbar height 32"

Pilot WOOD Pushing shoes NONE
Front Bumper OAK Bumper plate WITH
Steps (SEE SUP. 16)

Front Drawhead, Center above rail 33½"
Coupler (SEE SUP. 17)

Signal fixtures (SEE SUP. 21)

22 **Headlight** ONE ROUND CASE 18" Reflector,
Headlight, Nos. on sides WITH H'dl't step WITH
Lamp shelf NONE Nosing ---

Bell 92 POUNDS
Sand Box ONE Diam. 31" Body IRON PAINTED Pipes IRON
Sander (Spec.) LEACH AIR TRAP A-10 TO SAND FRONT OF FRONT DRIVERS AND BACK OF REAR DRIVERS
Dome casing IRON PAINTED

Boiler Jacket #22 PLAN. STEEL Bands IRON Style 9
Boiler Lagging MAGNESIA SECTIONAL

THE BALDWIN LOCOMOTIVE WORKS

E. H. Speed May-1917

SPECIFICATION FOR LOCOMOTIVES 8 32 D 798

FOR Yosemite Valley R. R. Co.

Frames CAST STEEL Braces SOLID

Cylinders, Diam. 19" Stroke 28"
St'm ports, Length 18" Width 1⅝" Bridges 1⅜"
Exh. ports, Length 18" Width 3" Valve lead (SUP. 24)
Valve travel 5½" Steam lap ⅞" Exhaust clearance LINE AND LINE
Eccentric crank throw 5" By-pass valve ———
& Yo'Libr DETROIT TRIPLE No. 22 BULL'S EYE
Cyl'r heads CAST IRON; LUBR. PIPES OF IRON UNDER JACKET
Cyl'r casings IRON PAINTED Head covers STEEL PAINTED
St'm chest casings IRON PAINTED Covers STEEL PAINTED
St'm chest valves (SEE SUP. 23)
Mot. pkg (PISTON RODS / VALVE STEMS) UNITED STATES (not spec.)

Pistons (See sup. 26)
Guides STEEL Oil cups NEEDLE
24 **Crossheads** CAST STEEL
Wrist Pins STEEL Rod & cupsl SEE SUP. 27)

Valve Motion STEPHENSON
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O.S. Diam. 57" Cen. diam. 50" CENTERS CAST IRON
STANDARD (A/C TIRE)
Tires STEEL Held by SHRINKAGE AND SHOULDER
Tires, Flanged, Pos. FRONT AND BACK Size 3½" x 5½"
Tires, Plain, Pos. MIDDLE Size 3½" x 6½"
Lateral play between driving boxes and wheel hubs = 1/32" TOTAL
27 **Driving Boxes** CAST STEEL
Journals, Diam. 8½" Length 11"

27 **Springs,** Make B. L. W.

30 **Front Engine Truck** TWO Wheeled SWING BOLSTER
To swing 33" each side of cen., Cen. pin liners NONE
Journals, Diam. 6" Length 10" Boxes CAST IRON
Wheels, Diam. 30" Tread 4-5/8" Kind GRIFFIN CHILLED CAST IRON
Tires NONE Cen. diam. --- Size ---
Tires held by ---

Rear Engine Truck NONE Wheeled ---
To swing --- each side of cen., Cen. pin liners ---
Journals, Diam. --- Length --- Boxes ---
Wheels, Diam. --- Tread --- Kind ---
Tires --- Cen. diam. --- Size ---
Tires held by ---

31 **Brakes,** system AIR DRIVERS AND TENDER WHEELS
Operating { Engine, Sch. No. G ET WESTG. COMP. AUTO. AND STRAIGHT AIR
Pumps Eng. T'K, sch. ---
Equalization Drivers, sch. No. 2 Automatic DRIVERS EQUALIZED
Parts Eng. T'K, sch. ---
Air pump Two 9½" Pos. LEFT SIDE (SEE SUP. 31)
Train connections FRONT AND BACK
Train signal, sch. ---
All reservoirs to have hydrostatic test of 210 pounds

11 **Tender** EIGHT Wheeled, Drawing No. 365
Weight, with fuel and water, about 90,000 POUNDS
TENDER, B.L.W. STANDARD DESIGN WITH WOOD FRAME
12 **Tank** { OIL 2240 Gallons, Bill 14429
WATER 4500 14416
TANK "U" SHAPE, STRAIGHT TOP, WITH OIL TANK IN FUEL SPACE
Tool Boxes HARD WOOD, TOP OF TANK, BACK OF OIL TANK.

Frame (SEE SUP. 50)

Front Drawbar height 32"
Pilot NONE Pushing shoes NONE
Back drawhead, center above rail 33½"
Coupler TOWER M. C.B. AUTO. WITH B. L. W. TANDEM SPRING DRAFT GEAR

51 Steps, HAND HOLDS, ETC., TO CONFORM TO I. C. C. REQUIREMENTS

Trucks ARCH BAR TYPE WITH STEEL BOLSTERS

Springs ELLIPTIC, B. L. W.
Journals, Diam. 5" Length 9"
Wheels, Diam. 33" Tread 4¼" Kind GRIFFIN CHILLED CAST IRON
Tires NONE Cen. diam. --- Size ---
Tires held by ---
Safety chains SINGLE

Brake Position ON ALL WHEELS
Brake sch. #6 ET WEST'G. AUTO. AND STRAIGHT AIR WITH 12" x 12" TENDER CYLINDER
HAND BRAKE ON TENDER

33 List of tools, sch. 31 BOLTS, NUTS AND THREADS B. L. W.
Photo sch. NONE Inspection B. L. W.
To be weighed NO Material spec'ns B. L. W.
Certificate of boiler test THREE COPIES OF B. L. W. FORM 1036
Junior laws to 1-15-17 Shipment ON OWN WHEELS

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. | THROTTLE, PATENTED JAN. 23, 1900 (CAST ON)
Patents | FEED PIPE STRAINER, PATENTED SEPT. 1, 1903 (CAST ON)

Property plates NONE

Painting—Engine, style 291, OLIVE GREEN AND ALUMINUM
Painting—Tender, style 291, OLIVE GREEN AND ALUMINUM
LETTERING SAME AS FOR 8 32 D 793, EXCEPT CAST MARK, FROM TANK COLLAR
Mark on CAB PANEL, YOSEMITE VALLEY

34 Road Nos. Pos. Road Nos. Name NONE
F. No. PLATE 28
SAND BOX
TANK SIDES
BACK OF TANK

THE BALDWIN LOCOMOTIVE WORKS Dup. 8 32 D 793, WITH SAME EXTRAS, EXCEPT AS OTHERWISE SPECIFIED

Memorandum Spec'n 11237

SPECIFICATION FOR LOCOMOTIVES 8 32 D 798 Gen. as. PHOTO. 4366

FOR YOSEMITE VALLEY R. R. Co. **Engine Drawing No.** 69

12-2-16

Gauge of Road 4' 8½" Play ¾" (See Sup. 27½)
Wheelbase, Rigid 14' 2" Driving 14' 2" Total 22' 9"
Total wheelbase, engine and tend. (Actual 51' 1⅞" (Limited to ---
RAILS 70 POUNDS
Curves 18 DEGREES. MAXIMUM GRADE 2 %

Limits, Height --- Width ---
Weight approximate working order, Total 143,000 POUNDS,
On F'trk 23,000 lbs. Drivers 120,000 lbs. B'trk ---- lbs.
WEIGHT GUARANTEED NOT TO EXCEED 121,000 POUNDS ON DRIVERS
Tractive power 28,600 lbs. Ratio of adhesion 4.2
Work'g St'm Pres. 190 lbs. Service PASSENGER AND FREIGHT
6 **Fuel** OIL

FRONT TUBE SHEET ½" THICK
Boiler STEEL Thick ⅝" Rivet 8013
Boiler, Diam. 61" Type EXTENDED WAGON TOP
Boiler str'th pres. 200 lbs. To resist (1 220 lbs. flues or tubes,
WITH FACTOR OF SAFETY OF 4 5 (1 267 lbs. water pres.
1 Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS, 90 % SEAM

Dome, Diam. 24" Pos. FORWARD OF FIREBOX

Firebox STEEL Combustion chamb. NONE
Firebox, Length Top 11' 6" Width 41¼" Depth F. 70" B. 63"
2 Firebox, Tube ½" Crown ⅜" Sides ⅜" Back ⅜"
3 Firedoor opening 13½" x 18"
Water space, Front 4" Sides 3½" Back 3½"
Water space, Frame DOUBLE Riveted
Water space stays ⅝" DIAM. WITH 3/8" HOLE 14" DEEP FROM O.S.S.
4 Radial stays 1" DIAMETER Sling stays front } TWO ROWS OF B. L. W. EXPANSION STAYS
Button heads outside crown --- Vertical rows
Crown bars NONE Plan of --- above crown
Crown bolts ---

Flues ---
5 **Tubes** #12 W.G. CHARCOAL IRON OR STEEL
Tube ends SWAGED FOR COPPER FERRULES FIREBOX ENDS
Number 295 Diam. 2" Length 12' 7"

Heating Flues --- Combus. Chamb. --- Total 2091 ft²
Surface Tubes 1931 ft² Fire Box 160 ft² Fire Brick Tubes ---
Grate area 31.1 ft² Ratio to Heating Surface 1 : 67
Superheater ---

Fire Brick PAVEMENT IN PAN.
FIREBOX LINED WITH FIREBRICK FOR OIL BURNING

7 **Grates** NONE
8 **Ash Pan,** Dampers FRONT ONLY

Throttle BALANCE Pos. DOME
Dry pipe STEEL

Superheater NONE

9 **Smokebox** extension NONE Cleaning hole and cap NONE
Spark ejector or hopper NONE
Netting and deflect. plates NONE

10 Exhaust nozzles SINGLE LOW
11 CLEANING PIPE, WITH ---
12 **Stack** STRAIGHT Dia. 16" Hole in S. B., dia. 20"

Safety Valves (Spec.) TWO CROSBY 3" ENCASED
Safety valves NONE with relief lever, Set to 190 POUNDS
Whistle 1½" CHIME

Steam C
Steam gau

Water G
Gauge C
Lowest gau
Lubricator
// **Blower**

Blow off
Cleanir
Firebox
Crown,
Waist,
Front tub

Pump N
Top chamb.
Feed Cock
Checks

INJECTORS
Injectors (Spec.
Injectors, P
Pipes, Check
Check B.

Steam He

Cab WOOD

Cab boards
Running boa
Hand rail I

Back Bun

Pilot WOOD
Front Bun
Steps (Se

Front Dra
Coupler (

Signal fixture

22 **Headlight**
Headlight, Nos. on sides WITH H'dl't step WITH
Lamp shelf NONE Nosing ---

Bell 92 POUNDS
Sand Box ONE Diam. 31" Body IRON PAINTED Pipes IRON
Sander (Spec.) LEACH AIR TRAP A-10 TO SAND FRONT OF FRONT DRIVERS AND BACK OF REAR DRIVERS
Dome casing IRON PAINTED

Boiler Jacket #22 PLAN. STEEL Bands IRON Style 9
Boiler Lagging MAGNESIA SECTIONAL

NOTICE

THE PRECEDING PAGE HAS BEEN REPHOTOGRAPHED TO ASSURE THE BEST POSSIBLE LEGIBILITY. ITS IMAGE APPEARS IMMEDIATELY HEREAFTER.

SOUTHWEST MICROPUBLISHING, INC.

THE BALDWIN LOCOMOTIVE WORKS C. H. Speck May 1917

SPECIFICATION FOR LOCOMOTIVES 8 32 D 798 290

FOR YOSEMITE VALLEY R. R. Co.

Frames CAST STEEL Braces SOLID

Cylinders, Diam. 19" Stroke 28"
18" Bridges 1⅞"
3" Valve lead (SUP. 24)
Exhaust clearance LINE AND LINE
s valve ---
BULLS EYE
S OF IRON UNDER JACKET
ers STEEL PAINTED
ers STEEL PAINTED
(not spec)

Oil cups NEEDLE

(SEE SUP. 27)

and eccentric rod jaws to be
d bushings.

be United States Standard.
on case hardened.

50" CENTERS CAST IRON

NKAGE AND SHOULDER
Size 3¾" x 5½"
Size 3¾" x 6½"
el hubs - 1/32" TOTAL

th 11"

ed SWING BOLSTER
liners NONE
xes CAST IRON
GRIFFIN CHILLED CAST IRON
--- Size ---

liners ---
ings ---
d ---
--- Size ---

31½ Brake, position ALL DRIVING AND TENDER WHEELS
Operating Parts | Engine, Sch. No. 6 ET WEST'G. COMB. AUTO. AND STRAIGHT AIR | Eng. Tr'k, sch. ---
Equalization Parts | Drivers, sch. No. 2 AMERICAN OUTSIDE EQUALIZED | Eng. Tr'k, sch. ---
Air pump Two 9½" Pos. LEFT SIDE (SEE SUP. 31)
Train connections FRONT AND BACK
Train signal, sch. L
AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS

Tender EIGHT Wheeled, Drawing No. 365
Weight, with fuel and water, about 90,000 POUNDS
TENDER, B.L.W. STANDARD DESIGN WITH WOOD FRAME
Tank OIL 2240 Gallons, Bill 4429
WATER 4500 Gallons, Bill 4416
TANK "U" SHAPE, STRAIGHT TOP, WITH OIL TANK IN FUEL SPACE
Tool Boxes HARD WOOD, TOP ON TANK, BACK OF OIL TANK, B.L.W.

Frame (SEE SUP. 30)

Front Drawbar height 32"
Pilot NONE Pushing shoes NONE
Back drawhead, center above rail 33½"
Coupler TOWER M. C.B. AUTO. WITH B. L. W. TANDEM SPRING DRAFT GEAR

51 Steps, HAND HOLDS, ETC., TO CONFORM TO I. C. C. REQUIREMENTS

Trucks ARCH BAR TYPE WITH STEEL BOLSTERS

Springs ELLIPTIC, B. L. W.
Journals, Diam. 5" Length 9"
Wheels, Diam. 33" Tread 4¼" Kind GRIFFIN CHILLED CAST IRON
Tires NONE Cen. diam. --- Size ---
Tires held by ---
Safety chains SINGLE

Brake Position ON ALL WHEELS
Brake sch. #6 ET WEST'G. AUTO. AND STRAIGHT AIR WITH 12" x 12" TENDER CYLINDER
HAND BRAKE ON TENDER

33 List of tools, sch. 31 BOLTS, NUTS AND THREADS B. L. W.
Photo sch. NONE Inspection B. L. W.
To be weighed No Material spec'ns B. L. W.
Certificate of boiler test THREE COPIES OF B. L. W. FORM 1036
Junior laws to 1-15-17 Shipment ON OWN WHEELS

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. | THROTTLE, PATENTED JAN. 23, 1900 (CAST ON)
Patents | FEED PIPE STRAINER, PATENTED SEPT. 1, 1903 (CAST ON)

Property plates NONE

Painting:—Engine, style 291, OLIVE GREEN AND ALUMINUM
Painting:—Tender, style 291, OLIVE GREEN AND ALUMINUM
LETTERING SAME AS FOR 8 32 D 793, EXCEPT CAST NAME FROM TANK COLLAR
Mark on CAB PANEL, YOSEMITE VALLEY

Road Nos. Pos. F. No. PLATE Road Nos. 28 Name NONE
SAND BOX
TANK SIDES
BACK OF TANK

THE BALDWIN LOCOMOTIVE WORKS Dup. 8 32 D 793, WITH SAME EXTRAS, EXCEPT AS OTHERWISE SPECIFIED

Memorandum Sheets 11237

SPECIFICATION FOR LOCOMOTIVES 8 32 D 798

Gen. as PHOTO. 4366

FOR YOSEMITE VALLEY R. R. Co.

Engine Drawing No. 69

12-2-16

Gauge of Road 4' 8½" Rails 85# (See Sup 27½)
Wheelbase, Driving 14' 2" Rigid 14' 2" Total 22' 9"
Total engine 91' 1½" Total tender ---

RAILS 70 POUNDS
Curves DEGREES. MAXIMUM SPADE 2°6

Limits, ---
Weight 143,000 POUNDS.
On F 89,000 On T 54,000 On --- ---
WEIGHT GUARANTEED NOT TO EXCEED 121,000 POUNDS ON DRIVERS
Tractive power 29,700 Factor 4.2
Work'g St'm Pres. 210 MAXIMUM ALLOWED AND FIRST SET
6 **Fuel** OIL

FRONT TUBE SHEET ½" THICK
Boiler STEEL ---" DIA. AT FRONT RING ---" DIA. AT THROAT ---" DIA. AT BACK RING ---" DIA. AT SMOKE ARCH
---" LONG OVER TUBE SHEETS ---" LONG OVER SHELL
---" THICK AT FRONT RING ---" THICK AT THROAT ---" THICK AT BACK RING ---" THICK AT SMOKE ARCH
---" THICK AT DOME ---" THICK AT SHELL
---" THICK AT FIREBOX CROWN ---" THICK AT FIREBOX SIDES ---" THICK AT FIREBOX BACK
---" THICK AT FIREBOX TUBE SHEET ---" THICK AT FIREBOX SHELL
---" THICK AT FIREBOX THROAT ---" THICK AT FIREBOX BOTTOM
---" THICK AT FIREBOX DOOR SHEET
---" THICK AT FIREBOX FLUE SHEET
---" THICK AT FIREBOX SIDE SHEET
---" THICK AT FIREBOX BACK SHEET
---" THICK AT FIREBOX SHELL
---" THICK AT FIREBOX ARCH TUBE
---" THICK AT FIREBOX ARCH TUBE
---" THICK AT FIREBOX ARCH TUBE

1 ~~ALL RIVET HOLES TO BE COUNTERSUNK SO RIVETS WILL BE FLUSH WITH THE SHEET.~~ R.S. mcc. 1.19.17.
ALL RIVETS IN FIREBOX SEAMS TO BE $\frac{3}{4}$" AND TO BE COUNTERSUNK ON THE FIRE SIDE.

2 CROWN AND SIDE SHEETS OF ONE CONTINUOUS SHEET.

3 FIRE DOOR OPENING FORMED BY RIVETING THE INSIDE AND OUTSIDE SHEETS TOGETHER ON THE OUTSIDE.
THE FIRE DOOR (HEITZALMAN BAFFEL DOOR) TO BE OF THE ADJUSTABLE DRAFT TYPE, SO AIR CAN BE ADMITTED TO FIREBOX THROUGH THE DOOR.

4 CROWN SHEET SUPPORTED BY RADIAL STAYS, SCREWED THROUGH CROWN SHEET AND ROOF OF BOILER AND RIVETED OVER ON BOTH ENDS.
(NO BUTTON HEAD STAYS TO BE USED).
Crown stays shown on B.L.W. tracing, applied to ten central rows. 3/1/17

5 NO FLUE HOLES TO BE LESS THAN $1\frac{1}{2}$" FROM TOP OR SIDE FLANGE OF FLUE SHEET.
FLUE SPACES TO BE NOT LESS THAN 11/18"

6 OIL BURNER, ~~THOMAS, PREFERRED~~, Van Boden Ingles 2" Burner (from stock) 1/1/17 TO BE FURNISHED AND APPLIED BY THE B. L. W.
B. L. W. TO APPLY REGULATING VALVE WHERE OIL PIPE LEADS TO BURNER, AS NEAR THE BURNER AS POSSIBLE.
CONTROL LEVER LOCATED IN CAB SO IT CAN BE OPERATED BY FIREMAN LOOKING OUT OF WINDOW.
ROYALTY, IF ANY, ON OIL BURNING ARRANGEMENT, PAYABLE BY THE B. L. W.

7 OIL AND STEAM CONNECTIONS BETWEEN ENGINE AND TENDER TO BE MADE WITH McLAUGHLIN FLEXIBLE JOINTS. (see sup. 47)

8 B. L. W. IS TO USE THEIR STANDARD ASH PAN FOR OIL BURNER, TO SUIT ENGINE.

9 SMOKEBOX TO BE OF $\frac{1}{2}$" STEEL, WITHOUT HOPPER OR HAND HOLE OPENINGS.
PETTICOAT PIPE TO BE ADJUSTABLE.

10 EXHAUST NOZZLE TIPS TO BE $4\frac{3}{4}$", $4\frac{5}{8}$" AND $4\frac{1}{2}$" DIAMETER WITH THE $4\frac{3}{4}$" TIP APPLIED.

11 BLOWER PIPE TO COME FLUSH WITH TOP OF NOZZLE POT.

12 STACK TO BE 40" HIGH FROM SMOKEBOX TO TOP OF STACK.

13 CAB LIGHTS TO CONFORM TO GOVERNMENT REQUIREMENTS.
STEAM GAUGE AND WATER GLASS TO HAVE ELECTRIC LIGHTS AND ONE LIGHT TO BE LOCATED NEAR THE ENGINEER WHERE IT CAN BE USED BY HIM WITHOUT LEAVING HIS SEAT. EACH GAUGE TO HAVE LIGHT.

14 BLOW-OFF COCK LOCATED IN CENTER OF THROAT SHEET JUST ABOVE MUD RING.

15 WASHOUT PLUGS:- ONE WASHOUT PLUG ABOUT 12" BACK OF FRONT FLUE SHEET IN BELLY OF BOILER, AND ONE 24" AHEAD OF THROAT SHEET IN BELLY OF BOILER, JUST SO IT WILL MISS THE AXLE. ALSO ONE WASHOUT PLUG ABOUT 4" ABOVE FIRE DOOR AND THREE ON BOILER HEAD. AND FOUR ON EACH SIDE OF BOILER JUST ABOVE THE LEVEL OF CROWN SHEET. AND PLUGS ON EACH CORNER OF MUD RING AND ONE ON EACH SIDE OF SIDE SHEET WHERE THEY WILL BE ACCESSIBLE.

16 HAND HOLDS AND STEPS TO MEET THE REQUIREMENTS OF THE INTERSTATE SAFETY APPLIANCE LAWS.

17 COUPLERS:- TOWER M. C. B. AUTOMATIC WITH TOWER POCKET ATTACHMENT FOR PILOT BEAM, AND DRAW BAR YOKE ATTACHMENT FOR TENDER.

21 ENGINE TO BE EQUIPPED WITH ADAMS & WESTLAKE STANDARD R. R. ELECTRIC CLASSIFICATION LIGHTS AND TAIL LIGHTS, TO MEET GOVERNMENT REQUIREMENTS. (see sup. 52)
ENGINE TO HAVE BRACKETS ATTACHED TO HOLD CLASSIFICATION LIGHTS AND FLAGS. ALSO FLAG POCKETS ON PILOT.

22 HEADLIGHT EQUIPMENT TO BE PYLE NATIONAL ELECTRIC FOR ARC HEADLIGHT WITH TYPE "E" GENERATOR AND WITH ROSS SPECIAL CASE HAVING OVAL GLASS.
HEADLIGHT GENERATOR TO BE PLACED IN FRONT OF CAB AND SECURELY FASTENED TO THE BOILER.
HEADLIGHT TO BE DROPPED DOWN IN FRONT OF FRONT END JUST TO CLEAR RAIL AND DOOR AND TO BE CLOSE UP TO FRONT END.
FIGURES TO BE 4" ON EACH SIDE OF HEADLIGHT GLASS.

23 STEAM CHEST VALVES:- ALLEN RICHARDSON DOUBLE PORTED WITH RELIEF VALVES.

24 STEAM CHEST VALVES TO BE SET LINE AND LINE IN FULL FORWARD GEAR TO GIVE $\frac{3}{16}$" LEAD AND 6" CUT-OFF, AND $\frac{1}{8}$" LAP IN FULL BACKWARD GEAR TO GIVE SAME CUT-OFF.

25 PISTON HEADS TO BE SOLID AND FITTED WITH THREE (3) PACKING RINGS $\frac{3}{8}$" WIDE BY $\frac{3}{8}$"
TO HAVE DOWEL OF TOBIN BRONZE TO HOLD RINGS IN PLACE.
MIDDLE RING ON BOTTOM AND THE OTHER TWO 3" FROM CENTER, EACH SIDE OF CENTER.

26 CROSSHEADS TO BE OF THE ALLIGATOR TYPE, WITH ADJUSTABLE GIBS TOP AND BOTTOM AND SIDE PLATES.
CROSSHEAD GIBS TO BE CAST IRON WITH BABBITT RECESSES THAT EXTEND ACROSS THE SURFACE OF THE GIB AND TAKE ONE-HALF OF THE BEARING SURFACE OF THE GIB, ALTERNATING IRON AND BABBITT

27 SIDE ROD TO HAVE SOLID ENDS WITH BUSHINGS.
SIDE RODS AND BACK END OF MAIN RODS TO HAVE COMPRESSION CUPS FOR HARD GREASE.

27½ ALL TIRES TO BE SET 58½" BETWEEN FACES. 7/22/17.

28 DRIVING BOXES TO HAVE HARD BABBITT FACE NEXT TO THE HUB OF DRIVING WHEEL.

29 ALL DRIVING BOX SPRINGS TO HAVE STEEL ROLLER BEARINGS ON SADDLES.

30 ENGINE TRUCK CENTERS PIN TO BE 3" DIAMETER (INSTEAD OF $2\frac{3}{4}$" AS FOR 8 32 D 793).

31 AIR PUMPS PLACED SO THEY WILL CLEAR STAY BOLTS.
BOTH PUMPS TO WORK INDEPENDENT OF EACH OTHER.
AIR PUMP EXHAUST TO BE TAPPED INTO BOTH CYLINDER EXHAUST CHAMBERS AND TO HAVE TWO $\frac{3}{4}$" LUNKENHEIMER GLOBE VALVES EXTENDING IN FRONT OF SADDLE, SO THEY CAN BE REACHED FROM THE OUTSIDE TO DRAIN THE WATER OFF.

32 MAIN RESERVOIR TO BE WESTINGHOUSE-ENAMELLED, 40,000 CUBIC INCHES CAPACITY, LOCATED ON RUNNING BOARD OR AWAY FROM HEAT OF ENGINE.

33 TWO TYPE "B" JOHNSON WRECKING FROGS FOR 70 POUND RAILS.

34 NUMBER PLATE WITH BRASS FIGURES, ON FRONT END OF ENGINE.

35 ALL LETTERS AND FIGURES TO BE IN ALUMINUM LEAF.
FIGURES ON SAND BOX TO BE 6" (EACH SIDE)
NUMBER ON EACH SIDE AND BACK OF TENDER TO BE 16" FIGURES.

T E N D E R

41 TENDER TO HAVE SAME CAPACITIES AS 8 32 D 793.

42 TANK TO BE 8' 9" WIDE BY 21' 0" LONG BY 4' 8" DEEP, WITH ROUNDING ENDS IN FRONT ROLLED TO 12" RADIUS.
BACK CORNERS ROLLED TO 10" RADIUS.

43 TENDER TO HAVE ONE COAT OF EUREKA IRON CEMENT APPLIED TO ALL PARTS OF INSIDE OF WATER TANK BEFORE IT IS RIVETED TOGETHER.

44 OIL TANK TO HAVE $\frac{1}{2}$" RIVETS, $1\frac{1}{2}$" PITCH.

45 THE MAN HOLE OF WATER TANK TO BE 18" x 24". OPENING CROSSWISE OF TENDER WITH SUITABLE COVER WITH HANDHOLD TO LIFT IT OFF. THE MAN HOLE TO OIL TANK TO BE 18" x 24", OPENING CROSSWISE OF TANK. THE MAN HOLE TO ~~BE 18" HIGH BY 24" AT~~ HAVE SUITABLE COVER SO IT CAN BE BOLTED TIGHT WITH RUBBER GASKET TO PREVENT ANY OIL FROM LEAKING OUT UNDER 10 POUNDS PRESSURE. THE OIL MAN HOLE COVER TO BE FASTENED WITH HINGED JOINT ON BACK SIDE SO COVER WILL TURN BACK, AND ONE BOLT ON EACH SIDE AND ONE BOLT IN FRONT MADE WITH SWIVEL JOINT, SO BOLTS WILL TURN DOWN WHEN LOOSENED AND HAVE BUTTERFLY NUT ON TOP TO SCREW COVER DOWN. THE COVER TO HAVE SLOTTED HOLES IN FRONT END ON SIDE TO ALLOW BOLTS TO TURN DOWN. A BRACKET TO BE FASTENED TO TOP OF OIL TANK TO PREVENT COVER OF OIL MAN HOLE FROM DROPPING DOWN BELOW A LEVEL OF TOP OF MANHOLE. THE COVER TO TURN BACK.

46 A SUITABLE GAUGE TO BE PLACED ~~2' 6"~~ IN FRONT OF OIL MANHOLE SO THE OIL CAN BE MEASURED, AND SAME SO IT WILL NOT ALLOW THE OIL TO LEAK OUT OF TOP.

47 OIL AND STEAM CONNECTIONS BETWEEN ENGINE AND TENDER TO BE MADE WITH McLAUGHLIN FLEXIBLE JOINTS. (see sup. 47)

48 THE TENDER TO HAVE TWO WATER VALVE CONNECTIONS IN WATER TANK, ONE ON EACH SIDE.

49 PROVIDE ONE WATER VALVE COCK IN LEFT HAND SIDE OF WATER TANK AND WHERE IT CAN BE EASILY REACHED FROM THE GANGWAY.

50 TENDER FRAME OF WHITE OAK, STRONGLY BRACED.

51 TENDER TO HAVE IRON LADDER ON REAR OF TANK, ~~FASTENED TO BACK SILL AND EXTENDING ABOVE AND OVER THE COLLAR OF TANK AND RIVETED ON IN SIDE OF COLLAR WITH TWO $\frac{3}{4}$" RIVETS IN EACH SIDE.~~

52 ELECTRIC CLASSIFICATION LIGHTS TO CONFORM TO GOVERNMENT REQUIREMENTS. (see sup. 21)
TENDER TO BE EQUIPPED WITH PROPER BRACKETS FOR TAIL LIGHTS AND FLAGS.

THE BALDWIN LOCOMOTIVE WORKS Dup. 10 30 E 102, with some extras except as otherwise specified.

Memorandum Spec'n 10900

SPECIFICATION FOR LOCOMOTIVES 10 30 E 138

FOR Sierra Railway Company of California

Gen. as Neg. 1935, except wagon top boiler

Engine Drawing No. 23

3-6-16

Gauge of Road 4' 8½" Play ⅜"

Wheelbase, Rigid 12' 8" Driving 12' 2" Total 19' 8"

Total wheelbase, eng. and tend { Actual 45' 10" / Limited to ----

Rails 50 pounds per yard

Curves 27 degrees

Limits, Height---- Width ----

Weight approximate working order, Total 116,000

On F'r'k 13,000 On Drivers 103,000 lbs. B. tr'k ---- lbs.

Tractive power 26,010 lbs. Ratio of adhesion 4

Work'g St'm Pres. 180 lbs. Service Freight

Fuel Oil (See sup. 4)

Boiler Steel Thick 9/16" and ⅜" Bill 7728

Boiler, Diam. 54" Plate Wagon Top

Boiler working pres. 180 lbs. Tested to { 200 lbs. steam pres. / 240 lbs. water pres.

Long'l. seams Butt jointed, double covering stripes.

Dome, diam 29" Pos. On wagon top

3 **Firebox** Steel Combustion chamb. None

Thickness, Length 96-3/16" Width 33¼" Depth F. 66½" B. 60"

5 Firebox Tube ⅛" Crown ⅜" Sides ⅜" Back 5/16"

Firedoor opening 16" diam.

Water space, Front 4" Sides 3" Back 3"

Water space, Frame Single Rivited

6 Water space stays 1" diam. with 3/16" hole 1½" deep from C. S.

Radial stays 1½" Diam Sling stays front { Two rows of B.L.W. Expansion Stays.

Button heads below crown on Eight central rows

Crown bars None Placed --- above crown

Crown bolts ----

Flues #9 B. W. G. Seamless Steel

Tubes #12 W. G. Iron

Tube ends Swaged for copper ferrules, fire box ends.

Number	Diam.	Length
18	5⅜"	12' 0"
109	2"	

Heating Flues 302 sq. Combus. Chamb.---- Total 1117 sq.

Surface Tubes 680 Fire Box 135 sq. Fire Brick Tubes ----

Grate area 22.2 sq. Ratio to Heating Surface 1 : 60.4

Superheater 250 sq.

4 **Fire Brick** pavement in pan

4 **Grates** None

Ash Pan, Dampers Front and back

7 **Throttle** Balance Pos. Dome

8 Dry pipe Cast Iron or Steel

Superheater Schmidt fire tube type (see s.p. 9-10)

Smokebox extension With Cleaning hole and cap None

Spark ejector or hopper None

Netting and deflect. plates None

Exhaust nozzles Double, Low

steaming pipe with

Stack Straight Dia. 16" Hole in S. B., dia. 12"

Safety Valves Two Ashton 3"

Safety valves None with relief lever, Set to 180 lbs.

Whistle B. L. W. Plain

Steam Gauge One Iron 7" MAKER:- Ashcroft

Steam gauge stand Iron **Clock** None

2/ **Water Gauge** Two ~~One~~ Reflex type **Cab Lamps** Electric

Gauge Cocks Three Right Side Surface valve None

Lowest gauge cock 3¼" above highest part of crown

Lubricator steam valve to have separate dry pipe to dome

Blower Valve B. L. W.

Blow off Cock One B.L.W. POS:- Front

Cleaning Plugs

Firebox Corners, back one diagonal, and back

Crown, Two each side and two back

Waist, One under front

Front tube sheet, One Fusible plug One

Pump None Pos. ----

Top chamb.---- Bottom chamb. ----

Feed Cock ---- Feed pipes ----

Checks---- Check pipes ----

Injectors Two Monitor No. 8

Injectors, Pos. Right and Left Steam pipes Copper

Pipes, Check Iron Feed Iron Overflow Iron

Check B. L. W. Pos. Right and Left

Steam Heat None

3 **Cab** Wood

Cab boards Wood Nosing Angle Iron

Running boards Wood Nosing Angle Iron

Hand rail Iron Located on Boiler

Back Bumper Bar Steel Back drawbar height 27½"

Pilot Wood Pushing shoes at front

Front Bumper Oak Bumper plate with

Steps, hand holds, etc. to conform to I.C.C. requirements.

Front Drawhead, Center above rail 33⅛"

Coupler M. C. B. Auto.

Signal fixtures Iron on Bumper

22 **Headlight** One Round Case 18" Reflector,

Headlight, Nos. on sides With H'd'l't step With

Lamp shell None Nosing ----

Bell 92 pounds

Sand Box One Diam. 28" Body Iron Ptd. Pipes Iron

Sander Leach Air Trap A-1

Dome casing Iron painted

Boiler Jacket 22 Plain. Steel Bands Iron Style 9

Boiler Lagging Magnesia Sectional

THE BALDWIN LOCOMOTIVE WORKS

294

SPECIFICATION FOR LOCOMOTIVES 10 30 E 138

FOR Sierra Railway Company of California

Furnish one set of detail blue prints of locomotive as built.

Frames Cast Steel Braces Solid

Cylinders, Diam. 16" Stroke 22"

St'm ports, Length 20" Width 1½" Bridges ----

Exh. ports, Length ---- Width ---- Valve lead 3/16"

Valve travel 5½" Steam lap ¾" Exhaust clearance ----

Eccentric crank throw 12½"

S. F. Lubr. Detroit Five Feed #42 Bulls Eye

Cyl'r heads Cast Iron; lubr. pipes of copper under jacket

Cyl'r casings Iron Painted Head covers Steel Painted

St'm chest casings None Covers ----

St'm chest valves 9½" diam. Piston type, inside admission.

Met. pkg { PISTON ROD / VALVE STEMS } U. S.

Pistons Cast Iron rings sprung into solid head

Guides Laird type, steel Oil cups Needle

Crossheads Cast Steel

Wrist Pins Steel Rod cups Plunger

Parallel rods to have solid ends.

Valve Motion Walschaerts

Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.

All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 42" Cen. diam. 36", Centres Cast Iron

Tires Steel Held by Shrinkage and Shoulder

Tires, Flanged, Pos. Front and Back Size 3" x 5½"

Tires, Plain, Pos. Intermediate Size 3" x 6½"

Lateral play between driving boxes and wheel hubs = 1/16" total

Driving Boxes Cast Iron

Journals, Diam. 7" Length 8½"

3 **Springs.** Make B. L. W.

Front Engine Truck Two Wheeled Swing Bolster

To swing 4½" each side of cen., Cen. pin liners None

Journals, Diam. 5" Length 8" Boxes Cast Iron

Wheels, Diam. 26" Tread ---- Kind Cast Iron Spoke Centres

Tires Steel Cen. diam. 21" Size 2½" x 5½" Ex 10548-L

Tires held by Shrinkage and Shoulder

Back Engine Truck None Wheeled ---

To swing --- each side of cen., Cen. pin liners ----

Journals, Diam. ---- Length ---- Boxes ----

Wheels, Diam.---- Tread ---- Kind ----

Tires ---- Cen. diam.---- Size ----

Tires held by ----

Brake, position On all driving and tender wheels.

Operating Parts { Engine, Sch. #6-ET West'g Combined Auto. and Straight Air / Eng. Tr'k, sch. ---- }

Foundation Parts { Drivers, sch. UN-1 American O. S. Equalized / Eng. Tr'k. sch. ---- }

Air pump One 11" Pos. Left Side

Train connections Front and Back

Train signal, sch. None

Tender Eight Wheeled, Drawing No. 365

Weight, with fuel and water, about 80,000 lbs.

Tank { Oil 1000 4180 / Water 4000 Gallons. Bill 4181

Tank "U" Shape, Straight Top.

Tool Boxes Hard Wood, Top

Frame Oak & Yellow Pine

Front Drawbar height 27"

Pilot None Pushing shoes at rear

Back drawhead, center above rail 33⅛"

Coupler M. C. B. Auto.

Steps, hand holds, etc. to conform to I.C.C. requirements

Trucks, Arch Bar Type with cast steel bolster. Cross beams of channel iron

Springs Elliptic. B. L. W. make

Journals, Diam. 4½" Length 8" M. C. B. Axles, etc.

Wheels, Diam. 28" Tread 4½" Kind Chilled Cast Iron Plate

Tires None Cen. diam. ---- Size ----

Tires held by ----

Safetychains Single

Brake Position On all wheels.

Brake sch. No. 6-ET West'g Auto. and Straight Air with 10" x 12" cylinder.

List of tools, sch. 31 .

Photo sch. #2 . Inspection B. L. W.

To be weighed Yes Material spec'ns B. L. W.

Certificate of boiler test Three copies of B.L.W. form 1036 (see sup. 2)

Junior laws to 5-1-16 Shipment On own wheels.

Brass shop finish, No. 1

Machine shop finish D-165

B. L. W. Patents { Throttle, Patented Jan. 23, 1900 (Cast on) / Feed Pipe Strainer, Patented Sept. 1, 1903 (Cast on) / Steam Pipe Cover, Patented July 18, 1911 (Cast on) }

Property plates None

Painting: Engine, style 291 Olive Green and Aluminum

Painting:- Tender, style 291 Olive Green and Aluminum

Mark on tank sides SIERRA RAILWAY

Road Nos. Pos. Road Nos. Name None

F. No. Plate 20

Sand Box and

Back of tank

SPECIFICATION FOR LOCOMOTIVES 10 30 E 138

FOR Sierra Railway Company of California

1 Engine and tender to meet the requirements of the I.C.C. in effect January 1st, 1916, in all particulars.

2 Specification card, I. C. C., boiler form #4 and copies of test of material used in boiler to be furnished the Ry. Co.

3 Fire box, cab arrangement, spring rigging and fittings to be same as for Locomotive No. 18.

4 Oil burner to be placed in front end of fire box so as to do away with brick arches.
Royalty on oil burning arrangement payable by B. L. W.

5 Crown end side sheets of fire box in one piece.

6 Staybolts to be drilled to meet I. C. C. requirements. The two lower rows of staybolts on each side and on throat sheet of fire box and from fire door to mud ring to be hollow all the way through.

7 Locomotive to have a drifting throttle, that is, an auxiliary throttle valve ~~connected by a small sized pipe with engine into the nigger head and allows~~ to allow a small quantity of steam to flow through superheater pipes even when the main throttle is closed, thus preventing rear end superheater pipes from being burned out.

8 Steam pipes to have outside connection to steam chests.

9 Superheater to be as Locomotive Superheater Co's specification #0-5029 dated 3-15-16, (copy attached)
Royalty on superheater payable by B. L. W.
Superheater units to have welded ends.

10 Hand hole and cap in each side of smoke box for inspection of superheater.

21 Water gauge glass to comply with California law entitled assembly Bill No. 619, Chapter 499, as follows:-

LOCOMOTIVE REQUIREMENTS FOR STATE OF CALIFORNIA
ASSEMBLY BILL NO. 619 ----CHAPTER 499.

An act prescribing a certain kind of water glass for use on steam locomotives, providing a penalty for neglect to use such glass.

(Approved May 25, 1915)

To people of the State of California do enact as follows:-
Section 1:- Every steam locomotive used upon a railroad in this state, carrying passengers or freight for hire, shall be equipped with one or more water glasses of the type known as the "solid water glass" the same being a solid piece of glass with open flutings at the back thereof, which said flutings will permit the raising and falling of water in the boiler of said locomotive to be plainly visible from each side of the cab without the use of a reflector. The said glass shall not be less than seven inches in length and one and one quarter inches in width, and five eights of an inch in thickness.

Section 2:- Any person, firm or corporation operating any such steam locomotive which is not equipped with one or more water glasses as described in section one, shall be guilty of a misdemeanor.

Section 3:- This act shall take effect on and after January 1st, 1916.

22 Headlight equipment, Pyle National with incandescent headlight and without storage battery.

THE BALDWIN LOCOMOTIVE WORKS

SUPERHEATER SPECIFICATION FOR LOCOMOTIVES 1o 30 E 138

FOR Sierra Railway Company of California

Locomotive Superheater Company's Specification No. 0-5209 dated March 15th, 1916
Specification for Superheater with Top Header, Double Loop Arrangement.

BOILER TUBES	109 in number 3 O. D. 12 ft. 0 ins. over tube sheets. Tubes located between and adjacent to Boiler flues are to be beaded over at front end.
BOILER FLUES	18 in number 5½" O. D. #9 B.W.G. thick of cold drawn seamless steel. Flues to be straight, true to gauge and wall not to vary more than one gauge from specified thickness, as shown on Card 1906
BOILER FLUE SETTING	Radius 1/16 inch on both edges of flue holes in firebox tube sheet and on front edge of flue holes in front flue sheet as shown on drawings, except for copper sheets. Back end to be set with copper ferrules, rolled, beaded and prossered except for copper sheets. Front end to be rolled and beaded. Rollers to have at least 5 rolls. Prosser to have at least 12 sections Card 1136
TUBE SHEET LAYOUT	to be in accordance with Card 5672
S. H. UNITS	18 units 1½" O. D. #9 B.W.G. thick of seamless steel. Pipes united by cast steel return bends as shown on Card 10750-M
	Each unit to be tested, before being placed in boiler, with water under pressure of 500 pounds.
S. H. PIPE SUPPORTS	Of steel fastened securely on superheater pipes so as not to slide as shown on Card 10010
S. H. PIPE JOINT	To be made in best possible manner to insure absolutely tight joints in accordance with the notation on Card 1043
S. H. UNIT CLAMP BOLT	To be of steel having a tensile strength between 60,000 lbs. and 70,000 lbs. per sq. inch and to be as shown on Card 1086-A
S. H. HEADER	To be of close grain cylinder iron, steam tight in every respect. Joint ring for connection to dry pipe to have flat side against header flange. Casting should be moulded with the face having the superheater joints placed downward in the mould to secure the best quality of metal on surface where superheater joints are made. Each header to have a serial number cast on in such a location as not to be removed in finishing. No patch plugs allowed on ball joint seats. Headers must not be treated excessively with sal ammoniac. Header casting to be tight under water pressure of 250 lbs. Test pressure to be applied separately to the saturated and to the superheated steam passages, so as to insure soundness of all partition walls. Card 1850-C
S. H. HEADER SUPPORTS	To be securely bolted or riveted to boiler shell. To be properly located so as to support the header after header has been correctly located. Header should then be bolted to supports. This to be done before superheater units are put in place. Card 1323
ST. PIPE JOINT RINGS	Should be of cast iron.
DEFLECTING PLATE	To be constructed so as to permit easy inspection and removal of superheater units and joints. Design to be in accordance with Card See Arrngt
DAMPER CYLINDER	To be carefully and accurately made. Piston not to be more than 0.01 inch smaller than bore. Bearings for Piston and extension to be in line. Piston to be ground and to operate freely under a pressure as low as 40 lbs. per sq. in. Steam Pipe to damper cylinder should be as short and free from bends as possible so as not to cause water to collect in cylinder. Pipe to be protected against freezing. Card 1149
DAMPER SHAFT COUNTERWEIGHT	To be painted a light color to render it easily visible by the engineer Card 1067
S. H. ARRANGEMENT	To be in accordance with Card 4703
TEST (FINAL)	The Superheater, after assembling in boiler and after steam pipes are fitted up, is to be thoroughly tested and to be tight under water pressure of 250 lbs.

Name	Card	Name	Card
Damper	10754-B	Damper Shaft Link	1070
Damper Cylinder Arm	1074	Patent Plate	3156
Damper Cylinder Pipe Fitting	1069-A	S. H. Unit Bolt Washer	1071
Damper Cylinder Pipe Union	1397	S. H. Unit Clamp	1073
Damper Cylinder Piping Diagram		S. H. Unit Clamp Washer	10305
Damper Cylinder Support		S. H. Pipe End	1344
Damper Shaft	1068	S. H. Pipe Band	1988
Damper Shaft Arm	1069	Return Bends	10094
Damper Shaft Bearing (O. S.)	1148	Deflecting Plate Handle	1487
Damper Shaft Bearing (I. S.)	1375	Lubricator Connection	3023

THE BALDWIN LOCOMOTIVE WORKS AS SPECIFICATION C-1896.

Memorandum Spec'n 10231

SPECIFICATION FOR LOCOMOTIVES 10 20 D 654

FOR San Joaquin & Eastern Railroad Co.

Gen. as Nos. 4269 {Except with straight smoke stack.

Engine Drawing No. 90

J. 5-6-14

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 10' 6" Driving 10' 6" Total 20' 7"
Total wheelbase, eng. and tend. {Actual 48' 9½" / Limited to -----

Curves 25 degrees. Grades 2.4%
Rails 52 to 61 lbs.
Limits, Height ----- Width -----
Weight (approximate) in working order, Total 115,000 lbs.
On F. tr'k 25,000 lbs., Drivers 90,000 lbs., B. tr'k ----- lbs.

Tractive power 21,240 lbs., Ratio of adhesion 4.2
Work'g St'm Pres. 180 lbs., Service Passenger & Freight
Fuel Oil

Boiler Steel Thick ½" & 9/16" Bill 7244
Boiler, Diam. 54" Plan Extended Wagon Top.
Boiler st'm pres. 200 lbs., Tested to {220 lbs. steam pres. / 267 lbs. water pres.
Longitud. seams Butt jointed, double covering strips, 90% seams.

Dome, diam. 29" Pos. Forward of firebox
Crown end sides of firebox in one piece.
Firebox Steel Combustion chamb. None
Firebox, length 90 3/16" Width 33⅞" Depth F. 61⅜" B. 60½"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back 5/16"
Firedoor opening 16" diam., B. L. W. fire-door.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Single Riveted
Water space stays 1" diam. with 3/16" hole 1½" deep from O. S.

Radial stays 1½" diam. Sling stays front One I bar
Button heads below crown on Eight central rows
Crown bars None Placed ----- above crown
Crown bolts -----

Tubes #12 W. G. Charcoal Iron or Steel
Tube ends Swaged for copper rings firebox ends.
Tubes, No. 198 Diam. 2" Length 12' 3"

Heating Surface, Tubes 1261 sq Firebox 124 sq Total 1385 sq
Grate area 21.2 sq Ratio to heat'g surface, 1 : 65.3
Superheater ----- Feed-water heater -----
Reheater ----- Fire brick tubes -----

Fire Brick Pavement in pan.
Firebox lined with fire-brick for oil burning.

Grates None
Ash Pan, Depth ----- Dampers Front Only

Throttle Balance Pos. Dome
Dry pipe ~~Wrot Iron or~~ Steel

Superheater None

Smokebox extension None Cleaning hole and cap None
Spark ejector or hopper None
Netting and deflect. plates None

Exhaust nozzles Double Low
Cleaning Pipe, with.
Stack Straight Diam. 17" Hole in S.B. 20"
Install standard oil burning arrangement with A. R. C. 2" oil burner placed in front end of firebox. Oil control valve between engine and tender to have diamond opening. Oil connections between engine and tender to be McLaughlin joints.

Safety Valves (NOT SPEC) Two Consol Locked 2½"
Safety valves None with relief lever, Set to 180 lbs.
Whistle B. L. W.

Steam Gauge One Iron 7" Maker, Ashcroft (NOT SPEC)
Steam gauge stand Iron **Clock** None

Water Gauge One 9" Klinger **Cab lamps** to burn Acetylene
Gauge Cocks Three Back Surface valve None
Lowest gauge cock 3½ above highest part of crown
Lubricator steam valve to have separate dry pipe to dome.
Blower Valve B. L. W.

Blow off Cock One B. L. W. Pos:- Front.
Cleaning Plugs
Firebox Corners, back ones diagonal end back.
Crown, Three each side and two back.
Waist, One under front.
Front tube sheet, One. Fusible Plug, One.

Pump None Pos. -----
Top chamb. ----- Bottom chamb. -----
Feed cock ----- Feed pipes -----
Checks ----- Check pipes -----

Injectors (NOT SPEC) Two Monitor No. 8.
Injectors, Pos. R. and L. Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. R. and L.

Steam Heat None

Cab Wood.

Cab boards Wood Nosing None
Running boards Wood Nosing None
Hand rail Iron Located on Boiler

Back Bumper Bar Steel Back drawbar height 33½"

Pilot Wood Pushing shoes None
Front Bumper Oak Bumper plate With
Steps, handholds, etc. to conform to I. C. C. requirements.

Front Drawhead, Center above rail 33½"
Coupler M. C. B. Auto.

Flag fixtures Iron on Bumper.

Headlight One Round Case 16" Reflector, To burn Acetylene
Headlight, Nos. on sides With H'd'l'l step With
Lamp shelf None Nosing -----

Bell 92 pounds.
Sand Box One Diam. 28" Body Iron Ptd. Pipes Iron
Sander (NOT SPEC) Leach Air, trap A-1

Dome casing Iron Ptd.

Boiler Jacket {#22 Soft Steel Ptd. Bands Iron Style 9
Boiler Lagging Magnesia Sectional.

Engine J. F. Bennett June 1914

SPECIFICATION FOR LOCOMOTIVES 10 20 D 654

FOR San Joaquin & Eastern Railroad Co.

J.

Furnish to Ry. Co. one set of prints. 4/10/15

298

Frames Cast Steel Braces Solid

Cylinders, Diam. 18" Stroke 24"
St'm ports, Length 16" Width 1½" Bridges 1"
Exh. ports, Length 16" Width 2½" Valve lead 1/16"
Valve travel 5" O. S. lap ⅞" Ins. lap -----
Eccentric crank throw 5"
S. P. Lubr. Michigan Triple Bulls Eye {Iron pipes / under jacket
Cyl'r heads Cast Iron
Cyl'r casings Iron Ptd. Head covers Steel Painted
St'm chest casings Iron Painted Covers " "
St'm chest valves Richardson balanced, with vacuum valves.
Met. pkg {PISTON ROD / VALVE STEMS} U. S. (NOT SPEC)

Pistons Cast iron rings sprung into solid head.
Guides Steel Oil cups Needle
Crossheads Cast Steel, with brass bearings.
Wrist Pins Steel Rod cups Plunger
Parallel rods to have solid ends.

Valve Motion Stephenson
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 56" Cen. diam. 50" Centers Cast Iron
Driving tire on main wheel held by shrinkage only as 1830 D 654 only account of error
Tires Steel Held by Shrinkage & Shoulder.
Tires, Flanged, Pos. Front and Back Size 3"x 5½"
Tires, Plain, Pos. Middle Size 3"x 6½"
Lateral play between driving boxes and wheel hubs = 1/16" total
Driving Boxes Cast Iron
Journals, Diam. {Main 7" / Others 6½" Length 9"

Driving spring staples Wrot Iron

Springs. Make B. L. W.

Front Engine Truck Four Wheeled Swing Bolster
To swing 6½" each side of cen. Cen. pin liners None
Journals, Diam. 5" Length 10" Boxes Cast Iron
Wheels, Diam. 28" Tread ----- Kind Cast Iron Spoke Center
Tires Steel Cen. diam. 28" Size 2½"x 5½"
Tires held by Shrinkage & Shoulder.

Back Engine Truck None Wheeled -----
To swing ----- each side of cen. Cen. pin liners -----
Journals, Diam. ----- Length ----- Boxes -----
Wheels, Diam. ----- Tread ----- Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----

Brakes, position On all Driving and Tender Wheels.
Operating Parts {Engine, Sch. 6-ET, West'g. Comb. Auto. & Straight Air. / Eng. Tr'k, sch. -----
Foundation Parts {Drivers, sch. ~~ET-~~, American D. S. Equalized. / Eng. tr'k, sch. -----
Air pump One 9½" Pos. Left Side
Train connections Front and Back
Train signal, sch. L.

Tender Eight Wheeled, Drawing No. 365
Weight, with fuel and water, about 90,000 lbs.

Tank {Oil 2000 / Water 4500 Gallons, Bill 3495 4/9/14 / 2938
Tank "U" Shape, Straight Top.
Oil tank to be provided with graduated measuring rod in tube.
Tool Boxes Hard wood, top.

Frame Oak & Yellow Pine

Front drawbar height 31½"

Back drawhead, center above rail 33½"
Coupler M. C. B. Auto.

Steps, handholds, etc. to conform to I. C. C. requirements

Trucks Arch Bar, Cast Steel Bolsters.

Springs Elliptic, B. L. W.
Journals, Diam. 4½" Length 8"
Wheels, Diam. 33" Tread 4½" Kind Chilled Cast Iron Plate
Tires None Cen. diam. ---- Size----
Tires held by ----
Safety chains Single

Brake Position On All Wheels.
Brake sch. 6-ET, West'g. Auto. & Straight Air with 12"x 12" tender cylinder.

4/9/14

List of tools, sch. 31 Bolts, nuts and threads B. L. W.
Photo sch. 2 Inspection B. L. W.
To be weighed Yes Material spec'ns B. L. W.
Certificate of boiler test Three copies of B. L. W. form 611.
Junior laws to 5-20-14 Shipment On Own Wheels.

Brass shop finish, No. 1.
Machine shop finish D-165

Patent Plates {Throttle Patented Jan. 23, 1900. (Cast On) / Feed Pipe Strainer Patented Sept. 1, 1903. (Cast On)

Royalty if any on patented devices to be paid by B. L. W.

Property Plates, B. L. W. for engine and tender.

Painting:—Engine, style 291 Olive Green and Aluminum.
Painting:—Tender, style 291 " " " "

Mark on tank sides, S. J. & E. R. R.

	Road No.	Name
No. Pos.		None
F. No. Plate	201	
Sand Box		
Cab Sides		
Back of Tank		

Extras ordered through Extra Work Sept. Order No. 10-D-654 dated 5-26-14 to be shipped with Loco.

THE BALDWIN LOCOMOTIVE WORKS — As Spec'g. C-1229 (See sup. 1 etc.) Dup. of 6 38 D 39-40, same extras except where otherwise specified

Memorandum Spec'n 11177

SPECIFICATION FOR LOCOMOTIVES 6 38 D 65 and 66

FOR Bingham & Garfield Ry. Co.

Ry. Co's Class S - 51 22/26 167 - S

Gen. as Photo. 4673. Except with piston valves and outside steam pipes

Engine Drawing No. 18

M 10-21-16

Gauge of Road 4' 8½" Play ¾"

Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"

Total wheelbase, eng. and tend. Actual 44' 7½" Limited to ---

Curves ----

Limits, Height (Sup. 2 Width ---

Weight (approximate) in working order, Total 167,700 pounds

On F. tr'k --- lbs., Drivers 167,700 lbs., B. tr'k --- lbs.

Tractive power 38,820 lbs., Ratio of adhesion 4.3

Work'g St'm Pres. 185 lbs., Service Switching

Fuel Bituminous coal

16 **Boiler** Steel (Sup. 16 etc) thick ⅞" Bill 7975

Boiler, Diam. 78" Plan Straight top

16 Boiler st'm pres. 185 lbs., Tested to 222 lbs. steam pres.

With factor of safety of 4.6 247 lbs. water pres.

19 Longitud. seams Butt jointed, double covering strips

18 **Dome,** diam. 33" Pos. Central (See sup. 47)

17 **Firebox** Steel (Sup. 20) Combustion chamb. None

20 Firebox, length 120⅛" Width 42" Depth F. 79⅜" B. 77⅜"

Firebox, Tube ½" Crown ⅜" Sides ⅜" Back ⅜"

Firedoor opening 16" diam. (See sup. 21)

Water space, Front 4" Sides 3" Back 4"

Water space, Frame Double Riveted (See sup. 22)

24 Water space stays 1" diam. with 3/16" hole 1½" deep from O.S.

25 Radial stays 1⅛" diameter Sling stays front (See sup. 26)

Button heads below crown on ten central rows (See sup. 26)

Crown bars None Placed --- above crown

Crown bolts ---

Flues 0.150" M.M.W.G. cold drawn seamless steel (Sup. 31 etc.)

Tubes 0.135" M.M.W.G. cold drawn seamless steel (Sup. 31 etc.)

Tube ends (See sup. 33)

Number 28 / 194 Diam. 5½" / 2" Length 10' 6"

Heating Surface	Flues 420	Combus. Chamb. -----	Total 1689
	Tubes 1058	Fire Box 211	Fire Brick Tubes -----
Grate area 35		Ratio to Heating Surface 1 : 48.3	
Superheater 351			

Fire Brick Arch None

Grates Rocking grates of cast iron as Ry. Co's prints

Ash Pan, Dampers Front and back (See sup. 34)

35 **Throttle** Balance Pos. Dome

36 Dry pipe Wrot iron

37 **Superheater** Schmidt top header type

39 **Smokebox** extension With Cleaning hole and cap Left side only

Spark-ejector-&-hopper With

Netting and deflect. plates With

Exhaust nozzles Single high

41 **Stack** Cast iron, tapered Dia. 18" Hole in S. B. dia. 21½"

Safety Valves (spring) Three Crosby 2", One muffled (See sup. 42)

Safety valves None with relief lever, Set to 185 pounds muffled, 188 pounds open

Whistle Brass: Diameter of bell 5½", Length of bell 12⅜"

Steam Gauge One Iron 6¾" Maker: Ashton (See sup. 43)

Steam gauge stand Iron **Clock** None

45 **Water Gauge** One Klinger **Cab Lamps** (See sup. 67)

46 **Gauge Cocks** Three back Surface valve None

Lowest gauge cock 3½" above highest part of crown

Lubricator steam valve to have separate dry pipe to dome

Blower Valve Crane quick opening (See supplement 48)

Blow off Cock Two Johnstone Improved 2" Pos: (See sup. 49)

Cleaning Plugs (See sup. 50)

Firebox Corners diagonal, sides, front and back

Crown, Two each side and two back

Waist, One under front

Front tube sheet, One Fusible plug One

Pump None Pos. ---

Top chamb. --- Bottom chamb. ---

Feed Cock --- Feed pipes ---

Checks --- Check pipes ---

54 **Injectors** (spring) Two Simplex type "R" lifting No. 10

Injectors, Pos. Right and left Steam pipes Copper

Pipes, Check Iron Feed Iron Overflow Iron

Check (See supplement 56-A) Pos. Right and left

Steam Heat None

Cab Sheet steel, lined with wood (See sup. 59 etc.)

Cab boards Steel plate Nosing T-iron

Running boards Steel plate Nosing T-iron

Hand rail Iron (See sup. 62) Located on boiler

60 **Back Bumper** Bar steel Back drawbar height 30½"

Spring buffer between engine and tender (See sup. 131)

Pilot None Pushing shoes Cast in bumper

Front Bumper Cast steel (Sup. 64) Bumper plate With

Steps across front with handrail (See sup. 63)

Steps, handholds, etc., to conform to I. C. C. requirements

Front Drawhead, Center above rail 33½"

Coupler (See sup. 65)

Signal fixtures Iron on bumper

Headlight Two Round Case 18" Reflector (See sup. 66-67)

Headlight, Nos. on sides With M'dl't step With

Lamp shelf None Nosing ---

Bell 85 pounds Viloco air bell ringer

Sand Box Two Diam. 28" Body Iron painted Pipes Iron

Sander (spring) Viloco Air (See sup. 68)

Dome casing Iron painted

Boiler Jacket (See sup. 50-69) Bands Iron Style 9 and 14

Boiler Lagging Magnesia sectional (See sup. 70)

Backhead of boiler to be lagged and jacketed

SPECIFICATION FOR LOCOMOTIVES 6 38 D 65 and 66 — Furnish drawings (See sup. 9)

FOR Bingham & Garfield Ry. Co.

Frames Cast steel (See sup. 60-75) Braces Solid

77 **Cylinders,** Diam. 22" Stroke 26"

Sd'm ports, Length 23.55" Width 1-11/16" Bridges ---

Exh. ports, Length --- Width --- Valve lead ¼"

Valve travel 5⅜" Steam lap 1 3/16" Exhaust clearance ---

Eccentric crank throw 13⅜" By-pass valve None

S. P. Cyls. Nathan Five Feed Bull Eye (See sup. 79)

Cyl'r heads and valve chamber heads Cast steel

Cyl'r casings Planished iron Head covers Steel painted

St'm chest casings --- Covers ---

78 St'm chest valves 11" diam. Piston type, inside admission

Mot. pkg (piston rods, valve stems) Parton-Mitchell (Superheater type)

Pistons (See supplement 80)

Guides Two bar, steel Oil cups Hancock

Crossheads Alligator type, Cast steel (See sup. 81)

Wrist Pins (Sup. 82) Rod and Cups (See sup. 83 to 86)

Valve Motion Walschaerts (See sup. 2-87 etc.)

Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except stayBolts) to be United States Standard.

All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

91 **Drivers,** O. S. Diam. 51" Cen. diam. 44", Centers Cast steel

89 **Tires** Steel (Sup. 90) Held by Shrinkage and shoulder

Tires, Flanged, Pos. All Size 3½" x 5½"

Tires, Plain, Pos. --- Size ---

Lateral play between driving boxes and wheel hubs - 1/16" total

96 **Driving Boxes** Cast steel with Elvin grease cellars

Journals, Diam. 9" Length 12"

Springs, Make B. L. W. (See sup. 98)

Front Engine Truck None Wheeled ---

To swing --- each side of cen., Cen. pin liners ---

Journals, Diam. --- Length --- Boxes ---

Wheels, Diam. --- Tread --- Kind ---

Tires --- Cen. diam. --- Size ---

Tires held by ---

Back Engine Truck None Wheeled ---

To swing --- each side of cen., Cen. pin liners ---

Journals, Diam. --- Length --- Boxes ---

Wheels, Diam. --- Tread --- Kind ---

Tires --- Cen. diam. --- Size ---

Tires held by ---

99 **Brakes,** position On all driving and tender wheels

Operating Parts: Engine, Sch. 26 ET, West'g. combined auto. and straight air

Eng. Tr'k, sch. ---

Foundation Parts: Drivers, sch. BK-3 & BC, American O. S. Equalized

Eng. Tr'k, sch. ---

99A Air pump One 8½" Cross Compound Post left side

Train connections Front and back

Train signal, sch. None

Air Reservoirs to have hydrostatic test of 220 pounds

125 **Tender** Eight Wheeled, Drawing No. 235

Weight, with fuel and water, about 110,000 pounds

125 **Tank** 5,000 Gallons, Bill 4383

Tank "U" shape, sloping back Fuel capacity 12 tons

Tool Boxes Hardwood, Top

Frame Steel 10" channels with cast steel bumpers, front and back

Front Drawbar height 30" (See sup. 131)

Pilot None Pushing shoes Cast in back bumper

Back drawhead, center above rail 33½"

Coupler (See sup. 132)

Steps, handholds, etc., to conform to I. C. C. requirements

Steps across back with handrail on bumper (See sup. 134)

Trucks (See supplement 135 etc.)

Springs Elliptic, B. L. W.

Journals, Diam. 5" Length 9" Boxes (See sup. 137)

Wheels, Diam. 33" Tread 4½" Kind Standard Steel Works' Solid Forged Rolled Steel

Tires --- Cen. diam. --- Size ---

Tires held by --- Wheel rims 2½" thick

Safety chains Single

Brake Position On all wheels, Omit hand brake

Brake sch. 16 ET, West'g. auto. and straight air with 12" x 12" tender cylinders

Brake beams to be Creco

19 List of tools, sch. 29, except to include only one jack screw

Photo sch. 2 Inspection (See supplement 3-5)

To be weighed Yes Material spec'ns B. L. W. (See sup. 4)

Certificate of boiler test Three copies of B. L. W. form 1036

Junior laws to 11-28-16 Shipment On own wheels

Brass shop finish, No. 1

Machine shop finish D-165, except rods to be finished all over

38 **Patents** B. L. W. Throttle, Patented Jan. 23, 1900 (Cast on)

Steam Pipe Cover, Patented July 18, 1911 (Cast on)

Property plates None

11 **Painting:**—Engine, style 291, Olive Green and Aluminum

12 Painting:—Tender, style 291, Olive Green and Aluminum

Classification mark on cab sides, S-51 22/26 167 - S

Mark on cab sides, Bingham & Garfield

Mark on back of tank funnel, B. & G.

Mark on back of tank, 5000 Gals.

Road Nos. Pos.	Road Nos.	Name None
F. No. Plate	308	
F. Sand Box	309	
Sides of tank		

SPECIFICATION FOR LOCOMOTIVES 6 38 D 65 AND 66
FOR BINGHAM & GARFIELD RY. CO.

1 THIS SPECIFICATION IS INTENDED TO COVER A LOCOMOTIVE COMPLETE IN EVERY RESPECT AND READY FOR SERVICE, AND IF ANY PORTION IS NOT CLEAR, QUESTION SHOULD BE TAKEN UP WITH THE RAILWAY COMPANY BEFORE PROCEEDING AND ANY CHANGE FROM THE SPECIFICATION MUST BE AUTHORIZED IN WRITING BY THE ASST. GENERAL MANAGER.

2 PURCHASERS APPROVE RAISING BOILER, CAB AND RUNNING BOARDS 6½" MAKING TOTAL HEIGHT OF ENGINE 15' 8" IN ORDER TO ACCOMMODATE LARGER RESERVOIRS, CHANGE IN VALVE GEAR, ETC.

3 THE LOCOMOTIVE WHEN COMPLETE WILL BE ACCEPTED BY MR. LOVELL, SUBJECT TO FINAL ACCEPTANCE BY THE SUPERINTENDENT OF BINGHAM & GARFIELD RAILWAY AFTER LOCOMOTIVES HAVE BEEN DELIVERED.

4 MATERIALS TO CONFORM TO THE B. L. W. STANDARD SPECIFICATIONS.

5 ALL MATERIAL WILL BE INSPECTED AND TESTED BY MR. ALFRED LOVELL, #819 HARRISON BLDG., PHILADELPHIA, PA., AND COPIES OF MATERIAL ORDERS IN DUPLICATE WITH PRICES LEFT BLANK SHOULD BE FORWARDED TO HIM. MR. LOVELL WILL ALSO INSPECT THESE ENGINES DURING CONSTRUCTION. MR. LOVELL WILL WITNESS ALL TESTS MADE AT THE WORKS OF BUILDERS AND MAKE SURFACE INSPECTION OF ALL MATERIAL AT THAT POINT AND WILL ACCEPT COPIES OF THE LOCOMOTIVE BUILDERS' TEST REPORTS COVERING MATERIAL TESTED AT THE MILLS. CAST STEEL BUMPERS AND BOLSTERS ARE NOT SUBJECT TO TEST OR INSPECTION AT THE FOUNDRY BEFORE SHIPMENT.

6 ALL BOLT THREADS TO BE U. S. STANDARD, EXCEPT WHERE FINER THREADS ARE NECESSARY. ALL FINISHED REMOVABLE NUTS TO BE CASEHARDENED.

7 ALL PIPES CARRYING STEAM PRESSURE TO BE DOUBLE STRENGTH.

8 ALL BEARINGS ON ENGINE PROVIDED WITH SUITABLE MEANS FOR THEIR PROPER LUBRICATION.

9 B. L. W. TO FURNISH TWO (2) COMPLETE SETS OF PRINTS SHOWING ALL DETAILS AND GENERAL PLAN: ONE SET TO BE BROWN OR VAN DYKE PRINTS.

10 ENGINES TO BE PROVIDED WITH ALL NECESSARY WRENCHES, FIRING TOOLS, HAMMERS, CHISELS, PACKING TOOLS AND ONE JACK SCREW, ONE PINCH BAR, ONE SCOOP SHOVEL, OIL CANS AND TORCH.

11 ENGINE AND TENDER TO BE WELL PAINTED AND VARNISHED WITH MARKINGS AND NUMBERS AS SPECIFIED BY THE RAILWAY COMPANY.

12 LETTERING, ETC., TO BE SAME AS FOR 6 38 D 39 AND 40.
FIGURES ON FRONT NUMBER PLATE IN ALUMINUM METAL 4" HIGH AS RY. CO'S PRINT C-16, I.E., AS ASSOCIATED LINES PRINTS CA-4463.
FIGURES ON SAND BOX IN ALUMINUM METAL 6" HIGH AS CO'S PRINT, C-16, I.E., AS ASSOCIATED LINES PRINTS CA-3872 AND CA-3873.
NUMBERS ON SIDES OF HEADLIGHT IN 3" ROMAN FIGURES AS CO'S PRINT C-16, I.E., AS ASSOCIATED LINES PRINT CA-3881.
ENGINE NUMBER ON SIDES OF TANK TO BE ~~24"~~ 18" (R/C MISTAKE) 3/24/17

For Hereafter. Raise question about size of figures in road number on sides of tank — 3.22.17.

16 BOILER TO BE OF WORTH BROTHERS COMPANY'S STEEL.
BOILER SHALL PRIMARILY CONFORM WITH ALL THE REQUIREMENTS OF THE INTERSTATE COMMERCE COMMISSION. BOILER TO BE WELL DESIGNED, THOROUGHLY BRACED AND STAYED, OF BEST WORKMANSHIP AND CAPABLE OF CARRYING WITH A FACTOR OF SAFETY OF 4½, A WORKING PRESSURE OF 185 POUNDS. BOILER TO HAVE VERTICAL BACKHEAD. (SEE SUP. 2)

17 FRONT TUBE SHEET TO BE ½" THICK.
THROAT SHEET OF SUFFICIENT THICKNESS TO MAINTAIN REQUIRED SECTION AFTER FLANGING. ALL HAND FLANGED PLATES CAREFULLY ANNEALED AFTER FLANGING.

18 BOILER TO HAVE BADGE PLATES AS PER GOVERNMENT REQUIREMENTS THE B. L. W. NUMBER OF BOILER TO BE STAMPED ON DOME AS PER INTERSTATE COMMERCE COMMISSION REQUIREMENTS.

19 HORIZONTAL SEAMS BUTT JOINTED AND MULTIPLE RIVETED WITH BELT STRIPS INSIDE AND OUTSIDE AND SO DESIGNED AS TO MEET THE FACTOR OF SAFETY SPECIFIED. PLATES PLANED AT EDGES AND CAULKED BOTH INSIDE AND OUTSIDE WITH ROUND NOSE TOOL. RIVET HOLES REAMED AFTER PLATES ARE ASSEMBLED TO INSURE UNIFORM HOLES, AND SLIGHTLY COUNTERSUNK UNDER HEADS OF RIVETS. RIVETS DRIVEN BY PNEUMATIC OR HYDRAULIC PRESSURE WHEREVER POSSIBLE.

20 FIREBOX STEEL TO BE THE OTIS STEEL CO'S ACID STEEL.
FIREBOX CROWN AND SIDE SHEETS IN ONE PIECE.
ALL FIREBOX SEAMS SCARFED AS PER RAILWAY CO'S SKETCH.
ALL FIREBOX SEAMS CAULKED BOTH INSIDE AND OUTSIDE.

21 FIRE DOOR TO BE FRANKLIN PNEUMATIC, HORIZONTAL TYPE.

22 OUTSIDE AND INSIDE SURFACES OF MUD RING INCLUDING CORNERS TO BE MACHINED SMOOTH AND FITTED TO GAUGES. MUD RING CORNER RIVETS INSIDE, TO BE COUNTERSUNK. MUD RING TO BE REINFORCED AND WELL SECURED AT CORNERS.

23 ALL BOILER BRACE JAWS DROP FORGED, WITH HOLES DRILLED. ALL RIVET AND PIN HOLES IN BRACES TO BE DRILLED. ALL JAW PINS TO BE TURNED TO GIVE FULL BODY BEARING ON BOTH SIDES OF JAW AND TO BE HELD IN POSITION BY NUT, WASHER AND SPLIT KEY.

24 WATER SPACE AND RADIAL STAYS TO BE RYERSON'S ULSTER SPECIAL IRON.
STAYBOLTS SCREWED AND RIVETED TO SHEETS AND SPACED NOT OVER 4½" FROM CENTER TO CENTER. TELL TALE HOLES TO BE SLIGHTLY COUNTERSUNK.
TATE FLEXIBLE STAYS OF EWALD IRON (FLANNERY BOLT CO.) ABOUT 380 IN NUMBER LOCATED IN BREAKING ZONE.

25 STAYBOLT THREADS TO BE U. S. STANDARD, 12 THREADS PER IN.

26 CROWN SHEET SUPPORTED BY RADIAL STAYS: BODY 1-1/16" DIAM., WITH ENLARGED ENDS 1⅛" SCREWED THROUGH CROWN SHEET AND SHELL AND RIVETED OVER, EXCEPT CENTRAL ROWS WHICH WILL HAVE BUTTON HEADS UNDER CROWN SHEET, AND THE FOUR FRONT TRANSVERSE ROWS WHICH ARE B. L. W. EXPANSION STAYS.

SPECIFICATION FOR 6 38 D 65 AND 66
FOR BINGHAM & GARFIELD RAILWAY CO.

Specification for Type A Double Loop Superheater. SPECIFICATION O-6351 DATED NOVEMBER 13TH 1916.

BOILER TUBES	198 in number 2" o.d. 10 ft. 6 in. over tube sheets. Tubes located between and adjacent to boiler flues are to be headed over at front end.
BOILER FLUES	28 in number 5½" o.d. 150 of cold drawn seamless steel. Flues to be straight, true to gauge and wall not to vary more than one gauge from specified thickness. Card 10862-C
BOILER FLUE SETTING	½ in. radius on both edges of flue holes in fire box tube sheet and on front edge of flue holes in front tube sheet as shown on drawings, except for copper sheets. Back end to be set with copper ferrule, rolled, headed and prepared except for copper sheets. Front end to be rolled and headed. Rollers to have at least 5 rolls. Presser to have at least 12 sections. Card 1137
TUBE SHEET LAYOUT	Card 5872
UNITS	28 units 4½" o.d. 99 B.W.G. of seamless steel. Pipes united by return bends. Each unit to be tested, before being placed in boiler, with water under pressure of 200 lb. per sq. in. for screwed return bends or 500 lb. per sq. in. for welded return bends.
UNIT PIPE SUPPORTS	Of steel fastened securely on superheater pipes so as not to slide. Card 10773
UNIT PIPE JOINT	To be made in best possible manner to insure absolutely tight joints in accordance with the notation on. Card 1043
UNIT CLAMP BOLT	To be in accordance with requirements of Locomotive Superheater Company Material Specification No. 12. Card 10695
HEADER	To be of close grain cylinder iron, steam tight in every respect. Joint ring for connection to dry pipe to have flat side against header flange. Casting should be moulded with the unit joint face down to secure the best quality of metal on surface where superheater unit joints are made. Each header to have a serial number cast on in such a location as not to be removed in finishing. No patch plugs or chaplets allowed in ball joint seats. Headers must not be treated with sal ammoniac. Header casting to be tight under water pressure of 250 lb. Test pressure to be applied separately to the attachment and to the superheated steam passages, so as to insure soundness of all partition walls. Card 1873-C
HEADER SUPPORTS	To be securely fastened to boiler shell with rivets or turned bolts fitted in reamed holes. To be properly located so as to support the header after header has been correctly located. Header should then be secured to supports. This to be done before superheater units are put in place. Card 1323
STEAM PIPE JOINT RINGS	Should be of cast iron.
DEFLECTING PLATE	To be constructed so as to permit easy inspection and removal of superheater units and joints. Design to be in accordance with. Card SEE APPDX
DAMPER CYLINDER	To be carefully and accurately made. Piston not to be more than 0.01 in. smaller than bore. Bearings for piston and extension to be in line. Piston to be ground and to operate freely under a pressure as low as 40 lb. per sq. in. Steam pipe to damper cylinder should be as short and free from bends as possible so as not to cause water to collect in cylinder. Pipe to be well protected against freezing. Card 1149
DAMPER SHAFT COUNTERWEIGHT	To be painted a light color to render it easily visible by the engineer. Card 1067-A
S. H. ARRANGEMENT	To be in accordance with. Card 4903
TEST (FINAL)	The superheater, after assembling in boiler and after steam pipes are fitted up, is to be thoroughly tested and to be tight under water pressure of at least 30% more than the working pressure of the boiler.

DAMPER	Card 10892-B	DAMPER SHAFT LINK	Card 1070
DAMPER CYL. ARM	Card 1071	PATENT PLATE	Card 3158
DAMPER CYL. PIPE FITTING	Card	S. H. UNIT BOLT WASHER	Card 1071
DAMPER CYL. PIPE UNION	Card 1287	S. H. UNIT CLAMP	Card 1073
DAMPER CYL. PIPING DIAGRAM	Card 1509	S. H. UNIT CLAMP WASHER	Card 10305
DAMPER CYL. SUPPORT	Card	S. H. PIPE BEND	Card 1340
DAMPER SHAFT	Card 1230-A	S. H. PIPE BAND	Card 1988
DAMPER SHAFT ARM	Card 1226 AND 1230-C	RETURN BENDS	Card 10094
DAMPER SHAFT BEARING (S.S.)	Card 1223 AND 1148	DEFLECTING PLATE HANDLE	Card 1487
DAMPER SHAFT BEARING (I.S.)	Card 10306-E	LUBRICATOR CONNECTION	Card 3023
BEARING OF BANDS & SUPPORTS	Card 10759	DEFLECTING PLATE STUDS	Card 10809
TYPE OF RETURN BENDS	WELDED	DEFLECTING PLATE CLAMP	Card 10809-A

31 TUBES FROM THE NATIONAL TUBE COMPANY, EXCEPT 5½" TUBES FROM PITTSBURGH STEEL PRODUCTS CO., ACCOUNT OF ERROR FOR 6 38 D 65 AND 66 ONLY. (SEE SUP. 32)

32 IF UNABLE TO PROCURE SEAMLESS STEEL BOILER TUBES AND SUPERHEATER TUBES, SUBSTITUTE EITHER SPELLERIZED OR LAP WELDED TUBES, BUT SPELLERIZED TUBES PREFERRED IF DELIVERY OBTAINABLE.

33 TUBE SHEET LAYOUT AS LOCOMOTIVE SUPERHEATER CO'S CARD 5872
TUBE HOLES ACCURATELY BORED AND SHARP CORNERS ROUNDED OFF TO PREVENT CUTTING TUBES.
TUBE FERRULES TO BE NOT LESS THAN 40 POUND COPPER. ALL FLUES SWAGED WITH COPPER FERRULES FIREBOX ENDS. THE EDGE OF NO TUBE HOLE TO BE LESS THAN 1⅞" FROM INSIDE OF FLANGE.

34 ASH PAN TO BE OF THE SELF DUMPING TYPE, TO CONFORM TO THE I. C. C. REQUIREMENTS.
ASH PAN TO BE CONSTRUCTED OF STEEL PLATES, AND TO BE SUPPORTED FROM MUD RING.

35 THROTTLE TO BE PROVIDED WITH AUXILIARY DRIFTING VALVE.

36 STEAM PIPES TO HAVE OUTSIDE CONNECTIONS TO STEAM CHESTS.

37 SUPERHEATER AS LOCOMOTIVE SUPERHEATER CO'S SPECIFICATION NO. O-6351, DATED 11-13-16 (COPY ATTACHED)
SUPERHEATER TO BE THE LATEST TYPE AS RECOMMENDED BY THE LOCOMOTIVE SUPERHEATER COMPANY.

38 ROYALTY ON SUPERHEATER PAYABLE BY THE B. L. W.

39 HAND HOLE AND CAP TO BE PROVIDED RIGHT AND LEFT IN SMOKE BOX FOR INSPECTION OF SUPERHEATER.

40 SMOKE BOX DOOR OF PRESSED STEEL CAREFULLY FITTED.

41 SMOKE STACK TO BE DESIGNED TO SUIT FRONT END.

42 SAFETY VALVES TO BE NEW HIGH EFFICIENCY CROSBY POP VALVES AND AS CALLED FOR IN A. M. M. ASSOCIATION RECOMMENDATIONS.

43 STEAM GAUGE TO BE GRADUATED TO 300 POUNDS.

44 CONNECTION TO BE PROVIDED NEAR DOME FOR AIR AUXILIARY TEST GAUGE.

45 WATER GLASS COCKS NATHAN NO. 273-A-2000, TO TAKE [illegible] WATER GLASS 16" LONG FROM END TO END OF NIPPLES IN WATER GLASS.

46 GAUGE COCKS TO BE NATHAN 1" No. 272-A-1000.
GAUGE COCKS TO HAVE A CAST IRON DRIP.

47 SYPHON COCK TO BE 2" VALVE ON DOUBLE STRENGTH NIPPLE AT DOME.

48 BLOWER PIPE DOUBLE STRENGTH PIPE 1" DIAMETER.

49 BLOW-OFF COCKS, LOCATED ONE IN EACH SIDE OF FIREBOX, AND AS NEAR FRONT AS POSSIBLE, ARRANGED TO OPERATE, ONE FROM THE RIGHT AND ONE FROM THE LEFT SIDE OF CAB. NIPPLED OF DOUBLE STRENGTH PIPE.

50 WASHOUT PLUGS PROVIDED SO AS TO GIVE ACCESS TO ALL PARTS OF BOILER FOR THOROUGH WASH OUT. WASHOUT PLUGS WHERE APPLIED TO JACKETED SURFACES TO HAVE RAISED GUARD FLUSH WITH OUTSIDE OF JACKET.

56 INJECTOR STEAM VALVES TO BE HANCOCK.
INJECTOR CHECKS TO BE HANCOCK REVERSIBLE VERTICAL WITH STOP VALVES.
INJECTOR PIPING TO BE DOUBLE STRENGTH PIPE.

57 TANK HOSE TO BE ANACONDA WIRE WOUND, RUBBER COVERED. HOSE CLAMPS OF SIZE TO SUIT INJECTORS TO BE FOUR IN NUMBER OF SOFT STEEL GALVANIZED. (SEE SUP. 129)
TANK HOSE STRAINER TO BE OKADEE.

58 SQUIRT HOSE TO BE PROVIDED WITH BOILER CONNECTION TURNED DOWN IN CAB.

59 CAB SUBSTANTIALLY BUILT, THOROUGHLY BRACED AND SECURED TO BOILER AND RUNNING BOARDS. LARGE VENTILATOR TO BE PROVIDED IN ROOF.
STORM WINDOWS AS PER FEDERAL REQUIREMENTS ON FRONT DOORS OF CAB.
SIDE CAB WINDOWS TO SLIDE. BACK WINDOWS TO DROP.
SEATS AND ARM RESTS UPHOLSTERED IN PANTASOTE.

60 BACK FOOT PLATE TO BE 1500 POUNDS HEAVIER THAN FOR 6 38 D 39 AND 40.

61 RUNNING BOARD TO BE DROPPED AS LOW AS POSSIBLE ALONG THE LINES FOLLOWED IN BUILDING ENGINES 306, AND 307. (SEE SUP. 2)

62 HANDRAILS OF IRON, CONVENIENTLY ARRANGED AND SECURELY FASTENED. HANDRAIL ACROSS FRONT BUMPER BEAM AS REQUIRED BY I. C. C. SAFETY APPLIANCE ACT.

63 FOOT BOARDS TO BE WELL MADE AND PROPERLY SECURED.

64 FRONT BUMPER BEAM TO BE DESIGNED TO USE B. & O. SHORT SHANK COUPLER.

65 NATIONAL MALLEABLE CASTINGS CO'S EXPERIMENTAL M. C. B. "D" COUPLER OF CAST STEEL. SHANK TO BE 6" x 8" x 1[illegible]
TAIL TO BE 5" WIDE BY 9⅛" DEEP, YOKE 1¼" x 5"
WESTINGHOUSE TYPE "N" FRICTION DRAFT GEAR, ON FRONT OF [illegible]

66 HEADLIGHT EQUIPMENT TO BE PYLE NATIONAL ELECTRIC TYPE "K" WITH INCANDESCENT HEADLIGHTS. ONE DYNAMO OPERATING BOTH HEADLIGHTS.
ONE HEADLIGHT LOCATED ON CENTER OF BOILER SMOKE BOX AHEAD OF STACK, AND THE OTHER LOCATED ON REAR SLOPE OF TANK.
HEADLIGHT GLASS TO BE CONVEX HEAT-RESISTING.
SEPARATE SWITCH FOR EACH HEADLIGHT.
DYNAMO LOCATED ON BOILER DIRECTLY AHEAD OF CAB. (SUP. 70)

67 ELECTRIC LIGHTS IN CAB FOR STEAM AND AIR GAUGES, WATER GLASS, ONE BEHIND LUBRICATOR AND ONE BEHIND ENGINEER AND FIREMAN, TO ENABLE THEM TO READ ORDERS. CAB LIGHTS ON SEPARATE LINE WITH SWITCH OVERHEAD ON LEFT SIDE.

68 SANDER AND SANDER VALVES TO BE H. VISSERING AND CO'S MAKE. HAND SANDER TO BE OMITTED.

69 BOILER JACKET TO BE #22 MPG'S "A" QUALITY PLANISHED IRON.

70 STEAM PIPES TO PUMP, AND TO HEADLIGHT DYNAMO TO BE LAGGED AND THE LAGGING COVERED WITH THE CASING.

75 ENGINE FRAMES THOROUGHLY ANNEALED AND OF HEAVY DESIGN FOR MAXIMUM SERVICE. FRAMES TO BE 5" WIDE AND 43" CENTER TO CENTER. ENGINE WILL WORK TO CAPACITY A GREAT DEAL OF THE TIME. THE FRAMES TO BE THOROUGHLY BRACED TOGETHER AND TO BOILER BY SUITABLE CAST STEEL CASTINGS, AND BY EXPANSION PLATES AND PADS.

76 PEDESTALS TIED TOGETHER AT BOTTOM BY BINDERS, LUGGED AND BOLTED TO BOTTOM OF PEDESTALS.
PEDESTALS PROTECTED FROM WEAR BY CAST IRON SHOES AND ADJUSTABLE WEDGES. ~~WEDGES TO HAVE FRANKLIN AUTOMATIC ADJUSTABLE~~ B.L.W. PEDESTAL WEDGE ACCOUNT OF LIMITED CLEARANCE.

77 CYLINDER COCKS TO BE THE RY. CO'S STANDARD AS PER CO'S DRWGS.

78 VALVE CHAMBER BUSHINGS OF HUNT SPILLER IRON.

79 CYLINDER VALVES OILED FROM CAB THROUGH COPPER PIPES UNDER JACKET BY LUBRICATOR ON RIGHT SIDE. LUBRICATOR TO LUBRICATE MAIN VALVES AND STEAM END OF AIR PUMP. (SEE SUP. 100)

80 PISTON HEADS OF CAST IRON, SOLID TYPE 7¼" WIDE WITH TWO HUNT SPILLER GUN IRON RINGS 1" WIDE BY ¾" DEEP.
PISTON RODS OF BEST HAMMERED STEEL LONG ENOUGH TO ALLOW OF EXAMINING CYLINDER PACKING WITHOUT DISCONNECTING CROSSHEAD.
PISTON RODS TO BE KEYED TO CROSSHEADS.

81 CROSSHEADS, WITH REMOVABLE GIBS OF HUNT SPILLER GUN IRON.
FLANGES ON GIBS 2" HIGH.

82 WRIST PINS TO BE OF THE BEST HAMMERED OPEN HEARTH STEEL, AND TO BE FURNISHED WITH CASTLE NUTS.

83 MAIN RODS OF HAMMERED OPEN HEARTH STEEL I SECTION, FITTED WITH ADJUSTABLE BRONZE BEARINGS.

84 PARALLEL RODS OF HAMMERED OPEN HEARTH STEEL RECTANGULAR SECTION WITH BRONZE BUSHINGS.

85 LARGE FILLETS AND ROUND CORNERS ON ALL RODS.
ALL RODS BOLTS TO HAVE TAPER 3/16" PER FOOT AND FITTED WITH DOUBLE NUTS AND COTTER KEYS FLUSH WITH OUTER FACE OF NUT.
ALL KNUCKLE PINS OF HIGH CARBON STEEL, BUSHINGS OF STEEL TUBING, CASE HARDENED. CASTLE NUTS ON KNUCKLE PINS.
ALL RODS FINISHED ALL OVER.

86 RODS TO HAVE GREASE CUPS FORGED ON.

87 VALVE MOTION PINS AND BUSHINGS OF HAMMERED IRON THOROUGHLY CASE HARDENED.

88 RAGONNET POWER REVERSE GEAR TO BE APPLIED AS COVERED BY EXTRA ORDER NO. 12701 DATED DEC. 20TH 1916.

89 ONE CHICAGO FOUR FEED SIX-PINT FLANGE LUBRICATOR FROM THE OHIO INJECTOR CO., TO BE PIPED TO THE TWO FRONT AND TWO REAR DRIVING WHEEL FLANGES.

90 DRIVING TIRES TO BE LATROBE OPEN HEARTH STEEL.
TIRES TO BE SECURED BY LIP ON OUTSIDE.

91 DRIVING WHEELS TO BE SPACED 55" BETWEEN HUBS.
DRIVING WHEELS TO HAVE HUB LINERS OF BRASS.

96 DRIVING BOXES WITH BRONZE FACE FOR SHOES AND WEDGES FUSED ON BOX. BRONZE ⅜" THICK FINISHED. PROVISION TO BE MADE FOR OILING HUB FACE AND SHOE AND WEDGE FACE FROM TOP OF BOX. BOXES TO HAVE DEEP FLANGES AND LARGE CELLARS. BOXES TO BE 14½" WIDE OVER SHOES AND WEDGE FACE. SHOES AND WEDGES 6⅜" WIDE. (SEE SUP. 97)

97 WATER LINE FROM TANK TO BE PROVIDED TO POINT OVER EACH DRIVING BOX, AND TO BE PROVIDED WITH NIPPLES AND A VALVE AT EACH BOX. (SEE SUP. 130)

98 DRIVING SPRINGS OF BEST CAST STEEL, TEMPERED IN OIL, AND SECURED TO A SYSTEM OF EQUALIZING BEAMS TO INSURE THE ENGINE RIDING IN THE BEST POSSIBLE MANNER. ALL PIN HOLES IN SPRING RIGGING TO BE BUSHED. PINS AND BUSHINGS TO BE CASEHARDENED AND LUBRICATED WITH OIL AND GRAPHITE WHEN FITTED UP. FRONT CROSS EQUALIZER OF FORGED STEEL. NO JUMP WELDS ALLOWED IN SPRING RIGGING AND NO ROUND BOSSES. SPRING RIGGING AS SHOWN ON B. L. W. TRACING 33125, STYLE NO. 2.

99 AIR PUMP TO EXHAUST DIRECTLY INTO EXHAUST PASSAGE OF CYLINDER

100 AIR END OF AIR PUMP LUBRICATED BY TWO FEED SIGHT FEED LUBRICATOR: WESTINGHOUSE No. 29219, BUT WITH LEVER FEED INSTEAD OF SCREW FEED. (SEE SUP. 70-79)

101 AIR GAUGES TO BE ASHTON MAKE.
AIR GAUGE SET TO ¼" TURN TOWARD ENGINNER.

102 MAIN RESERVOIR CAPACITY NOT LESS THAN 60,000 CUBIC INCHES.
ALL RESERVOIRS ENAMELLED INSIDE AND LOCATED ON METAL BRACKETS SECURELY FASTENED. APPLY RADIATING PIPE BETWEEN PUMP AND FIRST RESERVOIR AND BETWEEN RESERVOIRS WHERE POSSIBLE.
AIR RESERVOIR TO BE LOCATED ONE UNDERNEATH BOILER AND TWO UNDER RUNNING BOARDS. (SEE SUP. 2)

103 ALL BUSHINGS AND PINS IN BRAKE RIGGING CASEHARDENED.
ALL PINS TO BE FITTED WITH COTTER KEYS.

FOR HEREAFTER:-
FRAMES TO BE REDESIGNED TO PROVIDE FOR B.L.W. REGULAR PEDESTAL WEDGE INSTEAD OF FRANKLIN ADJUSTABLE WHICH COULD NOT BE USED A/C LIMITED 9/14/17 CLEARANCE.

R.

T E N D E R .

125 TENDER AS B.L.W. TRACING 33133 APPROVED BY RY. CO.

126 TANK RECTANGULAR SHAPE, MADE OF STEEL PLATES STRONGLY RIVETED TOGETHER. TANK WELL SECURED TO TENDER FRAME.

127 COLLAR AROUND COAL SPACE TO BE FLARING. COAL RACK AROUND THREE SIDES OF COAL SPACE 17" HIGH OF 4 ROWS OF BAR IRON ⅜" X 2", SUPPORTED BY ANGLE IRON VERTICAL STRIPS.
COAL GATES OF STEEL.

128 MAN-HOLE OF THE EXTENDED TYPE, HEIGHT FROM RAIL TO TOP OF MAN-HOLE ABOUT 11' 4"

129 TANK HOSE TO BE ANACONDA WIRE WOUND, RUBBER COVERED. HOSE CLAMPS OF SIZE TO SUIT INJECTORS TO BE FOUR IN NUMBER OF SOFT STEEL GALVANIZED. (SEE SUP. 57)
TANK HOSE STRAINER TO BE OKADEE.

130 WATER LINE FROM TANK TO BE PROVIDED TO POINT OVER EACH DRIVING BOX, AND TO BE PROVIDED WITH NIPPLES AND A VALVE AT EACH BOX. (SEE SUP. 97)

131 SPRING BUFFER BETWEEN ENGINE AND TENDER.

132 NATIONAL MALLEABLE CASTINGS CO'S EXPERIMENTAL M.C.B. TYPE "D" COUPLER OF CAST STEEL. SHANK TO BE 6" X 8" X 14½" LONG. TAIL TO BE 5" WIDE BY 9⅛" DEEP, YOKE 1¼" X 5". WESTINGHOUSE TYPE "N" FRICTION DRAFT GEAR, ON REAR OF TENDER.

133 FOOT BOARDS WELL MADE AND PROPERLY SECURED TO CONFORM TO FEDERAL REQUIREMENTS AT REAR OF TENDER.
STEPS ON SLOPING BACK OF TANK AND HANDRAILS AS REQUIRED BY THE INTERSTATE COMMERCE COMMISSION. HANDRAILS OF IRON, CONVENIENTLY ARRANGED AND SECURELY FASTENED. HANDRAIL ACROSS REAR OF TENDER AS REQUIRED BY I.C.C. SAFETY APPLIANCE ACT.

135 TRUCK SIDE FRAMES TO BE VULCAN, AS AMERICAN STEEL FOUNDRIES PATTERN 6802, SKETCH 1, APPROVED BY R. R. CO.

136 TENDER TRUCK BOLSTERS TO BE HEAVY OF CAST STEEL.

137 TENDER JOURNAL BOXES TO BE NATIONAL MALLEABLE IRON.

THE BALDWIN LOCOMOTIVE WORKS Dup. 6-36 D 185 to 190 with same extras except as otherwise specified.

Memorandum Spec'n 11234

SPECIFICATION FOR LOCOMOTIVES 6 36 D 248 to 251 Gen. as Photo. 5635

FOR Utah Copper Company **Engine Drawing No.** 27

No. 11-29-16

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"
Total wheelbase, eng. and tend. {Actual ----- / Limited to -----
Rails, 65 pounds
Curves 40 degrees Grades, 4%

3 **Limits,** Height ----- Width {10' 6" except 11' 2" over Running Boards
Weight (approximate) in working order, Total 156,000 lbs.
On F. tr'k ----- lbs., Drivers 156,000 lbs., B. tr'k ----- lbs.

2 Tractive power 30500 lbs., Ratio of adhesion 5.1
Work'g St'm Pres. 170 lbs., Service Switching (see sup. 1)
Fuel Soft Coal, of fair quality

Front Tube sheet to be ½" thick
Boiler Steel Thick ⅜" Bill 7526
Boiler, Diam. 60" Plan Straight Top

Boiler st'm pres. 170 lbs., Tested to {190 lbs. steam pres. / 227 lbs. water pres.
with factor of safety of 5.4
Longitud. seams Butt jointed, double covering strips

6 **Dome,** diam. 29" Pos. Central

7 **Firebox** Steel Combustion chamb. None
Firebox, length 59-15/16" Width 66" Depth F. 60" B. 57½"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
8 Firedoor opening One Oval 13" x 18"
Water space, Front 4" Sides 3½" Back 3½"
Water space, Frame Single Riveted
Water space stays ⅞" diam. with 3/16" hole 1¼" deep from O.S.

Radial stays 1" diam. Sling stays front {Two rods of B. L. W. Expansion Stays
Button heads below crown on Eight central rows
Crown bars None Placed ----- above crown
Crown bolts -----

Flues #9 B.W.G. Seamless Steel
Tubes #12 B.W.G. Charcoal Iron or Steel
Tube ends Swaged for copper ferrules, fire box ends
Number 18 / 119 Diam. 5½" / 2" Length 13' 0"

Heating Surface	Flues 335 sq.	Combus. Chamb. -----	Total 1238 sq.	
	Tubes 804 sq.	Fire Box 99 sq.	Fire Brick Tubes -----	
Grate area 27.5 sq.	Ratio to Heating Surface 1 : 45.			
Superheater 266 sq.				

Fire Brick Arch None

Grates Rocking bars and drop plate
Ash Pan, Dampers Back only

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater (See sup. 9)

10 Smokebox extension With 10 Cleaning hole and cap R.S. Only
Front spitter or hopper With
Netting and deflector plates With

Exhaust nozzles Single - High

Stack Straight Dia. 18" Hole in S. B., dia. 19"

(Not spec) **Safety Valves** Two Coale 2½"
Safety valves None with relief lever, Set to 170 pounds
Whistle B. L. W. plain

Steam Gauge Two One Iron 7" MAKER:-Ashcroft (not spec)
Steam gauge stand Iron **Clock** None
Additional gauge to be located on back head of boiler. 4/7/17.

Water Gauge One B.L.W. (Ironclad) **Cab Lamps** Electric
Gauge Cocks Four Back Surface valve None
6 7 Lowest gauge cock 3/4" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One B. L. W. POS:-Left Side
Cleaning Plugs
Firebox Corners, back ones diagonal and front and back
Crown, Two each side and four back
Waist, One under front. One plug above fire door
Front tube sheet, One Fusible plug One

Pump None Pos. -----
Top chamb. ----- Bottom chamb. -----
Feed Cock ----- Feed pipes -----
Checks ----- Check pipes -----

(Not spec) **Injectors** Two Monitor No. 7
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. Right and Left

Steam Heat None

11 **Cab** Steel

12 Cab boards Wood Nosing None
13 Running boards Wood Nosing None
Hand rail Iron Located on Tank

Back Bumper Cast Steel

Pilot None Pushing shoes Cast in bumper
Front Bumper Cast Steel Bumper plate None
Steps across front and rear, with hand rails.
Steps, hand holds, etc. to conform to I.C.C. requirements
23 **F. & B Drawhead,** Center above rail 33½"
Coupler Simplex M. C. B. Auto.

Signal fixtures None

24 **Headlight** Two Round Case 18" Reflector
Headlight, Nos. on sides With H'dl't step With
Lamp shelf None Nosing -----

Bell 92 pounds
Sand Box Two Diam. 28" Body Iron Painted Pipes Iron
Sander (Not spec) Leach Air, Trap A-1 in each box, to sand front and rear

Dome casing Iron Painted

Boiler Jacket #22 Soft Steel Pt'd Bands Iron Style 9
Boiler Lagging Magnesia sectional

Frames Cast Steel Braces Solid

Cylinders, Diam. 21" Stroke 24"
St'm ports, Length 20⅝" Width 1½" Bridges -----
Exh. ports, Length ----- Width ----- Valve lead 1/32 ABE 3/16/17. 22 Full Gyration
Valve travel 5½" Steam lap ⅞" ABE 3/16/17. Exhaust clearance -----
Eccentric crank throw 4" By-pass valve None
S. F. Lubr. Detroit five feed #42 Bulls Eye
Cyl'r heads Cast Iron; Lubr. pipes of Iron under jacket
Cyl'r casings Iron Ptd. Head covers Steel Painted
St'm chest casings ----- Covers -----
St'm chest valves 12" diam. Piston type
Met. pkg {Piston rods / Valve stems} United States (not spec)

Pistons Cast Iron rings sprung into solid head
Guides Steel Oil cups Needle
Crossheads Cast Steel
Wrist Pins Steel Rod cups Grease Cups on all rods
25 Parallel rods to have solid ends

26 **Valve Motion** Stephenson
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 50" Cen. diam. 44"
27 Wheel Centres:- Main Cast Steel, Other cast iron
Tires Standard Steel Held by Shrinkage and Shoulder
Tires, Flanged, Pos. All Size 3" x 5½"
Tires, Plain, Pos. None Size -----
Lateral play between driving boxes and wheel hubs - {⅛" F & B / 1/16" Main} Total
Driving Boxes Cast Steel
28 **Journals,** Diam. 9" Length 12"

Springs. Make Standard Steel Works of Vanadium Steel

Front Engine Truck None Wheeled -----
To swing -----each side of cen., Cen. pin liners -----
Journals, Diam. ----- Length ----- Boxes -----
Wheels, Diam. ----- Tread -----Kind -----
Tires ----- Cen. diam. -----Size -----
Tires held by -----

Back Engine Truck None Wheeled -----
To swing -----each side of cen., Cen. pin liners -----
Journals, Diam. ----- Length ----- Boxes -----
Wheels, Diam. ----- Tread -----Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----

29. **Brake,** position On all drivers (no tender)
30. Operating Parts {Engine, Sch. No. 6 ET West'g. Combined Auto. and Eng. Tr'k, sch. ----- Straight Air
31. Foundation Parts {Drivers, sch. WM-3 American O. S. Equalized / Eng. Tr'k, sch. -----
Air pump One 8½" Cross Compound POS:-Left Side
Train connections Front and Back
Train signal, sch. None

Tender None Wheeled, Drawing No. -----
Weight, with fuel and water, about -----
Tank 2000 Gallons, Bill 4010
FUEL BOX (See sup. 16)

Tool Boxes -----

Frame -----

Front Drawbar height -----
Pilot -----a Pushing shoes -----
Back drawhead, center above rail -----
Coupler -----

Steps -----

Trucks -----

Springs -----
Journals, Diam. -----Length -----
Wheels, Diam. ----- Tread ----- Kind -----
Tires ----- Cen. diam. -----Size -----
Tires held by -----
Safety chains -----

Brake Position -----
Brake sch. -----

13 14 List of tools, sch. 29
Photo sch. None Inspection (See sup. 4)
To be weighed No Material spec'ns B. L. W.
Certificate of boiler test Three copies of B.L.W. form 1036
Junior laws to 1-15-17 Shipment On own wheels (See sup. 3

Brass shop finish, No. 1
Machine shop finish D-165

15 B. L. W. Patents {Throttle Patented Jan. 3, 1900 (Cast On) / Steam Pipe Cover, Patented July 18, 1911 (Cast On)

Property plates, None

Lettering etc. to be same as for 6-36 D 185 etc. except mark on Cab to be as spec'd. Lettering in Aluminum Leaf except figures on sand box to be of Brass, Roman style, 6" high.
Painting: Engine, style ----- Black, no striping
Painting:—Tender, style -----
Painting to conform to Ry. Co's specification (herewith)

Mark on Cab sides, Utah Copper Co. {KEEP
Mark on both ends of front and back bumpers {OFF
Front number plate to have Roman figures 4" high.
Road Nos. Pos. Road Nos. Name None
F. No. Plate 77 to 80
F. Sand Box
Tank Sides
Back of fuel box

SPECIFICATION FOR LOCOMOTIVES 6 36 D 248 TO 251

FOR UTAH COPPER COMPANY

Specification for Type A Double Loop Superheater. SPECIFICATION B4-060-D, DATED DEC. 8, 1916

BOILER TUBES	119 in number 2" o. d. 13 ft. 0 in. over tube sheets. Tubes located between and adjacent to boiler flues are to be beaded over at front end.
BOILER FLUES	18 in number 5½" o. d #9 BWG of cold drawn seamless steel. Flues to be straight, true to gauge and wall not to vary more than one gauge from specified thickness. Card 1524-B
BOILER FLUE SETTING	¼ in. radius on both edges of flue holes in fire box tube sheet and on front edge of flue holes in front tube sheet as shown on drawings, except for copper sheets. Back end to be set with copper ferrule, rolled, beaded and prossered except for copper sheets. Front end to be rolled and beaded. Rollers to have at least 5 rolls. Prosser to have at least 12 sections. Card 1137
TUBE SHEET LAYOUT	Card 5530
UNITS	18 units 1½" o. d #9 BWG of seamless steel. Pipes united by return bends. Each unit to be tested, before being placed in boiler, with water under pressure of 250 lb. per sq. in. for screwed return bends or 500 lb. per sq. in. for welded return bends.
UNIT PIPE SUPPORTS	Of steel fastened securely on superheater pipes so as not to slide. Card 10773
UNIT PIPE JOINT	To be made in best possible manner to insure absolutely tight joints in accordance with the notation on. Card 1043
UNIT CLAMP BOLT	To be in accordance with requirements of Locomotive Superheater Company Material Specification No. 12. Card 10695
HEADER	To be of close grain cylinder iron, steam tight in every respect. Joint ring for connection to dry pipe to have flat side against header flange. Casting should be moulded with the unit joint face down to secure the best quality of metal on surface where superheater unit joints are made. Each header to have a serial number cast on in such a location as not to be removed in finishing. No patch plugs or chaplets allowed in ball joint seats. Headers must not be treated with sal ammoniac. Header casting to be tight under water pressure of 250 lb. Test pressure to be applied separately to the saturated and to the superheated steam passages, so as to insure soundness of all partition walls. Card 10203-B
HEADER SUPPORTS	To be securely fastened to boiler shell with rivets or turned bolts fitted in reamed holes. To be properly located so as to support the header after header has been correctly located. Header should then be secured to supports. This to be done before superheater units are put in place. Card 1323
STEAM PIPE JOINT RINGS	Should be of cast iron.
DEFLECTING PLATE	To be constructed so as to permit easy inspection and removal of superheater units and joints. Design to be in accordance with. Card 10531
DAMPER CYLINDER	To be carefully and accurately made. Piston not to be more than 0.01 in. smaller than bore. Bearings for piston and extension to be in line. Piston to be ground and to operate freely under a preasure as low as 40 lb. per sq. in. Steam pipe to damper cylinder should be as short and free from bends as possible so as not to cause water to collect in cylinder. Pipe to be well protected against freezing. Card 1149
DAMPER SHAFT COUNTERWEIGHT	To be painted a light color to render it easily visible by the engineer. Card 1067-A
S. H. ARRANGEMENT	To be in accordance with. Card 14556
TEST (FINAL)	The superheater, after assembling in boiler and after steam pipes are fitted up, is to be thoroughly tested and to be tight under water pressure of at least 30% more than the working pressure of the boiler.

DAMPER	Card	DAMPER SHAFT LINK	Card 10419-B
DAMPER CYL. ARM	Card 10348-L	PATENT PLATE	Card 3158
DAMPER CYL. PIPE FITTING	Card 10552-A	S. H. UNIT BOLT WASHER	Card 1071
DAMPER CYL. PIPE UNION	Card 1069-A	S. H. UNIT CLAMP	Card 1073
DAMPER CYL. PIPING DIAGRAM	Card	S. H. UNIT CLAMP WASHER	Card 10305
DAMPER CYL. SUPPORT	Card 1503	S. H. PIPE END	Card 1344
DAMPER SHAFT	Card 10553-A	S. H. PIPE BAND	Card 1988
DAMPER SHAFT ARM	Card 1235-H	RETURN BENDS	Card 10094
DAMPER SHAFT BEARING (O.S.)	Card 10552 & 1234-C	DEFLECTING PLATE HANDLE	Card 1487
DAMPER SHAFT BEARING (I.S.)	Card 1223	LUBRICATOR CONNECTIONS	Card 3023
SPACING OF BANDS & SUPPORTS	Card 10386-Q	DEFLECTING PLATE STUDS	Card
TYPE OF RETURN BENDS	Card 10759	DEFLECTING PLATE CLAMP	Card
	WELDED		

SPECIFICATION FOR LOCOMOTIVES 6 36 D 248 TO 251

FOR UTAH COPPER COMPANY

R.

309

1 LOCOMOTIVE TO WORK AT ELEVATION OF 7000 FEET ABOVE SEA LEVEL AND WHERE THERE IS WINTER PRACTICALLY NINE MONTHS OF THE YEAR.

2 LOCOMOTIVE TO HAUL TWELVE EMPTY GONDOLA CARS WEIGHING 44,000 LBS. EACH, UP A STRAIGHT 4% GRADE.

3 WIDTH OF CARS OVER GRAB HANDLES IS 10' 6"
IF THERE SHOULD PROVE TO BE ANY OBJECTION DURING SHIPMENT TO THE WIDTH OF THESE ENGINES, THE RUNNING BOARDS MAY BE DETACHED, AND APPLIED AFTER DELIVERY OF LOCOMOTIVES.

4 LOCOMOTIVES TO BE INSPECTED BY MR. LOVELL. FURNISH TO HIM COPIES OF ORDERS IN DUPLICATE, COVERING THE PRINCIPAL ITEMS OF MATERIALS USUALLY TESTED.
THE RY. CO. RESERVES THE RIGHT TO PLACE AS MANY INSPECTORS AS MAY BE DEEMED NECESSARY AT THE B. L. W., WHO ARE TO HAVE FREE ACCESS AT ALL TIMES TO ALL DRAWINGS AND WORK, THAT THEY MAY SEE THAT THE PROVISIONS OF SPECIFICATION ARE COMPLIED WITH IN EVERY RESPECT. ANY MATERIAL OR DETAILS WHICH DO NOT CONFORM TO THE SPECIFICATIONS WILL BE REJECTED AND MUST BE REPLACED BY THE B. L. W., ALL EXPENSE IN CONNECTION HEREWITH MUST BE BORNE BY THE B. L. W.

5 THE B. L. W. MUST GUARANTEE THE RY. CO. AGAINST LOSS THRU SUITS, ROYALTIES OR CLAIMS OF ANY KIND WHATSOEVER ON PATENTED ARTICLES OR MATERIAL FURNISHED BY THE B. L. W.

6 STEAM DOME TO BE ARRANGED FOR OPERATION OVER 4% GRADES, WITH ENGINE RUNNING IN EITHER DIRECTION.

7 CROWN SHEET TO BE ARRANGED TO HAVE ENOUGH WATER OVER SAME FOR OPERATION OVER 4% GRADES, WITH ENGINE RUNNING IN EITHER DIRECTION.

8 FIRE DOOR FRAME TO HAVE AMPLE SHOVEL PLATE TO PROTECT BOILER SHEET SEAMS.

9 SUPERHEATER AS LOCOMOTIVE SUPERHEATER CO'S SPECIFICATION No. B-4-060-D DATED 12-8-16 (COPY ATTACHED)
SUPERHEATER, SCHMIDT TYPE, CONNECTING WITH TOP HEADER IN SMOKE BOX, AND HAVING OUTSIDE STEAM PIPE CONNECTIONS TO VALVE CHAMBER.
ROYALTY ON SUPERHEATER TO BE PAID BY THE B. L. W.

10 HAND HOLE AND CAP TO BE APPLIED ON RIGHT SIDE OF SMOKE BOX, AND A 3" PLUG IN L. S. FOR INSPECTION OF SUPERHEATER.

11 CAB DOORS TO BE CHANGED TO CONFORM TO RY.CO'S BLUE PRINT SKETCH RECEIVED 12-2-16 (HEREWITH)

12 CAB FLOOR TO BE COVERED WITH STEEL, ¼" THICK
CAB TO BE PROVIDED WITH DROP SEATS ON BOTH SIDES.

13 TWO SHEET STEEL TOOL BOXES, OR OIL CUPBOARDS, 20" X 20" X 24", TO BE LOCATED UNDER RUNNING BOARD, AS CONVENIENTLY AS POSSIBLE, AND TO BE PROVIDED WITH PADLOCK STAPLES.

14 ONE MOVABLE TOOL BOX, 8" X 8" X 18", MADE OF SHEET STEEL 1/16" THICK, PROVIDED WITH PADLOCK STAPLE, AND TO HAVE HANDLE FOR CARRYING.

15 COAL BOX LOCATED ON REAR EXTENSION OF ENGINE FRAME, BACK OF CAB. FUEL CAPACITY THREE TONS. (See Sup. 21)

21 FLUE CLEANING HOLE, 12" DIAMETER, THROUGH COAL SPACE AS SHOWN ON SKETCH ON THE REVERSE SIDE OF PAGE 2 OF LIST OF DETAILS ACCOMPANYING RAILWAY COMPANY'S LETTER DATED JUNE 8, 1915, FILE 1960.

22 TANKS RECTANGULAR SHAPE, LOCATED AT SIDES OF BOILER, AND ARRANGED WITH RUNNING BOARDS ON OUTSIDE OF CAB AND TANK SO THAT ENGINEMAN CAN REACH SMOKE BOX AND STEAM CHESTS FROM CAB.
SIDE TANKS, TO HAVE CENTRAL FILLING HOLE AS SHOWN ON RY.CO'S BLUE PRINT SKETCH RECEIVED 12-2-16 (HEREWITH)
TANK FUNNEL AS B.L.W. CARD 644
~~EQUALIZING PIPE UNDER TANKS TO BE MADE LARGER THAN 4".~~ 4/4/17.
SIDE TANKS HAVE BEEN SPECIFIED INSTEAD OF SADDLE TANK, IN ORDER TO KEEP CENTRE OF GRAVITY LOW.

23 COUPLERS TO BE APPLIED WITH SWING CENTERING DEVICE, IF FEASIBLE, AND TO BE ARRANGED TO PROPERLY SWING WHEN COUPLED TO CARS HAVING 21' 6" BETWEEN CENTRE PIN CENTRES, AND 3' 3" OVERHANG TO CAR BODY.

24 HEADLIGHT TO BE ELECTRIC, SIMILAR TO WEST'G. ELECTRIC 1-KW HEADLIGHT EQUIPMENT TO BE PYLE NATIONAL ELECTRIC, TYPE "K"

25 MAIN RODS TO BE CONNECTED TO REAR PAIR OF DRIVERS.

26 ALL RUNNING GEAR AND MOTION WORK TO BE DUPLICATE OF 6-34 D 570-571, AS NEARLY AS POSSIBLE.

27 DRIVING WHEELS TO HAVE BRASS HUB LINERS.

28 DRIVING AXLES OF STANDARD HAMMERED STEEL.

29 MAIN AIR RESERVOIRS TO BE AS LARGE AS POSSIBLE AND TO BE ENAMELLED INSIDE AND OUTSIDE.
AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 LBS.

30 LOCOMOTIVE TO BE USED TO OPERATE DUMP CARS BY AIR; MAIN RESERVOIR CAPACITY TO BE AS LARGE AS POSSIBLE.

31 DETROIT SELF CLOSING TYPE LUBRICATOR AS WEST'G. AIR BRAKE CO'S CUT NO. 10852 TO BE PROVIDED FOR THE AIR PUMP AIR CYLINDER.

FOR HEREAFTER:-
Spread radial stays so that 3½" dry pipe can be applied to steam valve stand. R.S.McC. 5.11.17.

THE BALDWIN LOCOMOTIVE WORKS AS SPECIFICATION C-3094

Memorandum Spec'n 10274

SPECIFICATION FOR LOCOMOTIVES 8 20 D 157. Gen. as Neg. 3727

FOR (Receiver) Gould Southwestern Railway Co. **Engine Drawing No.** 28

J. 7-28-14

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 10' 4" Driving 10' 4" Total 16' 6"
Total wheelbase, eng. and tend. {Actual 38' 2½" / Limited to -----
Rails 45 and 56 pounds.
Curves 12 degrees. **Grades** 1½% compensated.

Limits, Height ----- Width -----
Weight (approximate) in working order, Total 52,000 lbs.
On F. tr'k 10,000 lbs., Drivers 42,000 lbs., B tr'k ----- lbs.

Tractive power 9850 lbs., Ratio of adhesion 4.3
Work'g St'm Pres. 160 lbs., Service **Passenger & Freight**
Fuel Soft Coal

★**Boiler** Steel Thick ½" Bill 7298
Boiler, Diam. 40" Plan **Wagon Top**
★Boiler st'm pres. 180 lbs., Tested to {200 lbs. steam pres. / 240 lbs. water pres.
Longitud. seams **Butt jointed, double covering strips.**

Dome, diam. 23½" Pos. **Forward of Firebox.**

Firebox Steel Combustion chamb. **None**
Firebox, length 41 3/16" Width 37⅛" Depth F. 52⅜" B. 52⅜"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening **16" diameter.**
Water space, Front 3½" Sides 2½" Back 2½"
Water space, Frame **Single** Riveted
Water space stays **1" diam. with 3/16" hole 1½" deep from O. S.**

Radial stays 1⅛" diam. Sling stays front **One 1 bar**
Button heads below crown on **Six** central rows
Crown bars **None** Placed----- above crown
Crown bolts -----

Tubes #12 W. G. Charcoal Iron or Steel.
Tube ends **Swaged for copper rings firebox ends.**
Tubes, No. 100 Diam. 2" Length 8' 1½"

Heating Surface, Tubes 420^{sq} Firebox 57^{sq} Total 477^{sq}
Grate area 10.7^{sq} Ratio to heat'g surface, 1 : 45
Superheater ----- Feed-water heater -----
Reheater ----- Fire brick tubes -----

Fire Brick arch on studs.

Grates Rocking bars and drop plate
Ash Pan, Depth 9" Dampers **Front and Back**

Throttle Balance Pos. **Dome**
Dry pipe **Wrot Iron or Steel**

Superheater None

Smokebox extension **With** Cleaning hole and cap **L. S. Only**
Spark ~~arrester~~ hopper **With**
Netting and deflect. plates **With**

Exhaust nozzles **Double High**
Stack to be shorter, if possible, than Neg. 3727.(8 20 D 143)
Stack Cast Iron, Straight Diam. 13" Hole in S.B. 15"
Lines to comply with the I. C. C. requirements. Boiler to be built for the requirements of January 1915, Ry. Co. states their understanding is that this calls for a factor of safety of 5.

Safety Valves (not spec) Two Ceale 1½"
Safety valves None with relief lever, Set to **160 lbs.**
Whistle B. L. W.

Steam Gauge One Iron 7" Maker, Ashcroft (not spec)
Steam gauge stand **Iron** **Clock None**

Water Gauge One B.L.W.(Ironclad) **Cab lamps to burn oil.**
Gauge Cocks Three Back Surface valve **None**
Lowest gauge cock 3" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome.
Blower Valve B. L. W.

Blow off Cock One B. L. W. Pos:- Front.
Cleaning Plugs
Firebox **Corners and back**
Crown. **Two left side, one right side and two back.**
Waist. **One under front**
Front tube sheet. **One.** **Fusible Plug, One.**

Pump None Pos -----
Top chamb. ----- Bottom chamb. -----.
Feed cock ----- Feed pipes -----
Checks ----- Check pipes-----

Injectors (not spec) Two Monitor No. 5
Injectors, Pos. **R. and L.** Steam pipes **Copper**
Pipes, Check **Iron** Feed **Iron** Overflow **Iron**
Check **B. L. W.** Pos. **R. and L.**

Steam Heat None

Cab Wood

Cab boards **Wood** Nosing **None**
Running boards **Wood** Nosing **None**
Hand rail **Iron** Located on **Boiler**

Back Bumper Bar Steel Back drawbar height 25½"

Pilot Wood Pushing shoes **None**
Front Bumper Oak Bumper plate **With**
★**Steps, handholds, etc. to conform to I. C. C. requirements**

★**Front Drawhead,** Center above rail 33½"
★**Coupler** M. C. B. Automatic

Flag fixtures **Iron on Bumper**

Headlight One Round Case 14" Reflector, To burn **Kerosene**
Headlight, Nos. on sides **With** H'd'l't step **None**
Lamp shelf **None** Nosing -----

Bell 65 pounds.
Sand Box One Diam. 23" Body **Iron Ptd.** Pipes **Iron**
Sander **Hand**

Dome casing **Iron Painted**

Boiler Jacket {#22 Soft Steel Ptd. Bands **Iron** Style 9
Boiler Lagging Magnesia Sectional

THE BALDWIN LOCOMOTIVE WORKS

Engine R. E. McTaggart Aug. 19-14

SPECIFICATION FOR LOCOMOTIVES 8 20 D 157.

FOR (Receivers) Gould Southwestern Ry. Co.

J.

Frames Cast Steel Braces **Solid**

Cylinders, Diam. 13" Stroke 18"
St'm ports, Length 10" Width 1" Bridges ⅞"
Exh. ports, Length 10" Width 2" Valve lead 1/16"
Valve travel 4½" O. S. lap ⅝" Ins. lap -----
Eccentric ~~crank~~ throw 3½"
S. F. Lubr. (not spec) **Michigan Triple Bulls Eye** {Iron pipes under jacket
Cyl'r heads **Cast Iron**
Cyl'r casings **Iron Ptd.** Head covers **Steel Painted**
St'm chest casings **Iron Ptd.** Covers " "
St'm chest valves **Balanced with vacuum valves.**
Met. pkg. {PISTON RODS VALVE STEMS **UNITED STATES** (not spec)

Pistons Cast iron rings sprung into solid head.
Guides Steel Oil cups **Needle**
Crossheads Cast Steel
Wrist Pins Steel Rod cups **Plunger**
Parallel rods to have solid ends.

Valve Motion Stephenson
{Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 42" Cen. diam. 36" **Centers Cast Iron**

Tires Steel Held by **Shrinkage & Shoulder**
Tires, Flanged, Pos. **Front and Back** Size 3"x 5½"
Tires, Plain, Pos. **Middle** Size 3"x 6½"
Lateral play between driving boxes and wheel hubs - **1/32"** total
Driving Boxes Cast Iron
Journals, Diam. {Main 5½" Others 5" Length 9"

Driving spring staples **Wrot Iron**

Springs. Make **B. L. W.**

Front Engine Truck Two Wheeled **Swing Bolster**
To swing 4½" each side of cen. Cen. pin liners **None**
Journals, Diam. 4½" Length 7½" Boxes **Cast Iron**
Wheels, Diam. 24" Tread 4½" Kind **Chilled Cast Iron Plate**
Tires ----- Cen. diam. ---- Size ----
Tires held by ----

Back Engine Truck None Wheeled ----
To swing ---- each side of cen. Cen. pin liners -----
Journals, Diam. ---- Length ----- Boxes -----
Wheels, Diam. ----- Tread ---- Kind -----
Tires ----- Cen. diam. ---- Size-----
Tires held by-----

Brake, position **On all Driving and Tender Wheels.**
Operating Parts {Engine, Sch. A-1, **West'g. Auto. Air.** / Eng. Tr'k, sch. -----
Foundation Parts {Drivers, sch. WM-1, **American G. S. Equalized.** / Eng. tr'k, sch. -----
Air pump **One 9½"** Pos. **L. S.**
Train connections **Front and Back**
Train signal, sch. -----

Tender to be similar to Neg. 3969 (8 20 D 145)
Tender Eight Wheeled, Drawing No. 358.
Weight, with fuel and water, about **44,000 lbs.**

Tank 2000 Gallons, Bill 2783
Tank "U" Shape, Straight Top. Fuel Cap. 6 tons.

Tool Boxes **Hard Wood, top.**

Frame Oak and Yellow Pine

Front drawbar height 21½"

Back drawhead, center above rail 33½"
Coupler M. C. B. Automatic

Steps, handholds, etc. to conform to I. C. C. requirements

Trucks Arch Bar, **Wood Bolster. (Sandwich Type)**

Springs **Elliptic, B. L. W.**
Journals, Diam. 3½" Length 7"
Wheels, Diam. 28" Tread 4½" Kind **Chilled Cast Iron Plate**
Tires ----- Cen. diam. ----- Size-----
Tires held by-----
Safety chains **Single**

Brake Position **On All Wheels.**
Brake sch. **HK-812, West'g. Autp. Air.**

List of tools, sch. **26** Bolts, nuts and threads **B. L. W.**
Photo sch. **2** Inspection **B. L. W. except see ✱ below.**
To be weighed **Yes** Material specs **B. L. W.**
Certificate of boiler test **Three copies of B. L. W. form 611.**
Junior laws to **7-30-14** Shipment **On Own Wheels.**

Brass shop finish, No. **1.**
Machine shop finish **D-165**

Patent {**Throttle** Patented **Jan. 23, 1900. (Cast On)**
Plates {**Feed Pipe Strainer** Patented **Sept, 1, 1903. (Cast On)**

Property plates **B. L. W. for engine and tender.**

Painting:—Engine, style **291** **Olive Green and Aluminum**
Painting:—Tender, style **291** " " " "

Mark on cab panels. G. S. W. RY.
Mark on tank sides, **GOULD SOUTH WESTERN RY.**
Mark on back of tank above road number, 2000 GALLONS
Road number on back of tank to be of large size.

No. Pos.	Road No.	Name None
F. No. Plate		
Sand Box		
Back of Tank		

✱{**Sty. Hy. Lr. Locomotive Boilers for the Ry. Co., Gould, Arkansas** to be suitable for use when tested to 200# to be ready for shipment, on the completed engine to the test pump.

8/21/14.

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-1850 modified in pencil, on B. L. W. form herewith.

Memorandum Spec'n 10220. Minor details to be same as for 8 28 D 297.

SPECIFICATION FOR LOCOMOTIVES 8 26 D 196. Gen. as Neg. 4104 {Except with straight stack and omit wood rack from tank.

FOR The New Park and Fawn Grove Railroad. **Engine Drawing No.** 40

J. 4-22-14

Gauge of Road 4' 8½" Play ½"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 18' 0"
Total wheelbase, eng. and tend. {Actual 42' 10½" / Limited to -----

Curves 10 degrees on main line, 19 degrees on "Y"
Grades 2%. Rails 65 pounds.
Limits, Height ----- Width -----
Weight approximate - in working order, Total 89,400 lbs.
On F. tr'k 14,000 lbs. Drivers 75,400 lbs., B. tr'k ----- lbs.

Tractive power 19,580 lbs., Ratio of adhesion 3.85
Work'g St'm Pres. 180 lbs., Service Pass. and Freight
Fuel Soft Coal

Boiler Steel Thick ⅜" & 11/16" Bill 7227
Boiler, Diam. 54" Plan Extended wagon Top.
Boiler st'm pres. 180 lbs., Tested to {200 lbs. steam pres. / 240 lbs. water pres.
Longitud. seams Butt jointed, double covering strips.
Dome cap to be ground in instead of copper gaskets.
Dome, diam. 29" Pos. Forward of firebox.

Firebox Steel Combustion chamb. None
Firebox, length 70 3/16" Width 33⅜" Depth F. 61" B. 60"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diameter.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Single Riveted
Water space stays 1" diam. with 3/16" hole 1½" deep from O. S.

Radial stays 1⅛" diam. Sling stays front One 1 bar
Button heads below crown on Eight central rows
Crown bars None Placed ----- above crown
Crown bolts -----

Tubes #12 W. G. Charcoal Iron
Tube ends Swaged for copper rings firebox ends.
Tubes, No. 211 Diam. 2" Length 9' 0"

Heating Surface, Tubes 985.6 Firebox 102.6 Total 1087.6
Grate area 16.3 Ratio to heat'g surface, 1 : 66.8
Superheater ----- Feed-water heater -----
Reheater ----- Fire brick tubes -----

Fire Brick arch None

Grates Rocking bars and drop plate.
Ash Pan, Depth 19" Dampers Front and Back

Apply brass bushing on throttle stem.
Throttle Balance Pos. Dome
Dry pipe ~~Cast Iron or~~ Steel

Superheater None

Smokebox extension With Cleaning hole and cap L. S. Only
Spark ~~nettings~~ hopper With
Netting and deflect. plates With

Exhaust nozzles Double High

Stack Straight Diam. 16" Hole in S.B. 19½"

Safety Valves (not spec) Two Coale 2½"
Safety valves None with relief lever, Set to 180 lbs.
Whistle Chime

Steam Gauge One Iron 7" Baker, Ashcroft (not spec)
Steam gauge stand Iron **Clock** None

Water Gauge One Klinger type **Cab lamps** to burn oil.
Gauge Cocks Three Back Surface valve None
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve to have seperate dry pipe to dome.
Blower Valve B. L. W.

Blow off Cock One Homestead. Pos:- Front.
Cleaning Plugs
Firebox Corners, back ones diagonal and sides.
Crown, Two each side and two back.
Waist, One under front.
Front tube sheet, One. Fusible Plug, One.

Pump None Pos.-----
Top chamb. ----- Bottom chamb. -----
Feed cock ----- Feed pipes -----
Checks ----- Check pipes -----

Injectors (not spec) Two Sellers Improved No. 7½
Injectors, Pos. R. and L. Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. R. and L.

Steam Heat None

Cab Wood. Ventilator in cab roof.
Provide one large and one small window in cabsides.

Cab boards Wood Nosing None
Running boards Wood Nosing None
Hand rail Iron Located on Boiler

Back Bumper Bar Steel Back drawbar height ~~33~~ 33" (as per "1714")
Spring bumper between engine and tender with large radius casting.
Apply plate liner back of front bumper.
Pilot Wood Pushing shoes None
Front Bumper Oak Bumper plate With
Steps, handholds, etc. to conform to I. C. C. requirements.

Front Drawhead, Center above rail 33½"
Coupler M. C. B. Auto.

Flag fixtures Iron on Bumper.

Headlight One Round Case 16" Reflector, To burn Kerosene
Headlight, Nos. on sides With H'dl't step ~~None~~ With
Lamp shelf None Nosing -----

Bell 85 pounds.
Sand Box (not spec) One Diam. 28" Body Iron Ptd. Pipes Iron
Sander (not spec) Leach Air, trap A-10, to sand front of front and back of main drivers.
Dome casing Iron Painted

Boiler Jacket {#22 Soft Steel Ptd. Bands Iron Style 9
Boiler Lagging B. L. W. Plastic Magnesia (from stock)

THE BALDWIN LOCOMOTIVE WORKS

Engine B. N. Reily June 1914

SPECIFICATION FOR LOCOMOTIVES 8 26 D 196.

FOR The New Park and Fawn Grove Railroad.

J.

313

Frames Cast Steel Braces Solid

Cylinders, Diam. 16" Stroke 24"
St'm ports, Length 15" Width 1½" Bridges 1"
Exh. ports, Length 15" Width 2½" Valve lead 1/16"
Valve travel 5" O. S. lap ¾" Ins. lap -----
Eccentric ~~crank~~ throw 4⅝"
S. F. Lubr. (not spec) DETROIT ~~Triple~~ Bulls Eye {Iron pipes under jacket
Cyl'r heads Cast Iron
Cyl'r casings Iron Ptd. Head covers Steel Pointed
St'm chest casings Iron Ptd. Covers " "
St'm chest valves Richardson balanced, with vacuum valves.
Met. pkg: PISTON RODS VALVE STEMS U. S. (not spec) ~~to crossheads as B.L.W. card 28 Hooper~~
* Crosshead as Ry. Co's pencil sketch dated April 21, 1914.
Pistons Cast iron rings sprung into solid head.
Guides Single Bar Type, Steel Oil cups Needle
* **Crossheads** Cast Steel, with removable brass gibs.
Wrist Pins Steel Rod cups Grease cups for all rods.
Conn. and parallel rods with straps, keys and brasses.

Valve Motion Stephenson
{Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 48" Cen. diam. 42" Centers Cast Iron.
Collins Flange Lubricator for front driving wheels.
Tires Steel Held by Shrinkage & Shoulder.
Tires, Flanged, Pos. Front and Back Size 3"x 5½"
Tires, Plain, Pos. Middle Size 3"x 6½"
Lateral play between driving boxes and wheel hubs - 1/16" total
Driving Boxes ~~Cast Iron~~ Steel
Journals, Diam. 7" Length 8"

Driving spring staples Wrot Iron
Springs to be extra heavy.
Springs, Make B. L. W.

Front Engine Truck Two Wheeled Swing Bolster {Center Bearing
To swing 3" each side of cen. Cen. pin liners None
Journals, Diam. 4½" Length 7½" Boxes Cast Iron
Wheels, Diam. 28" Tread 4½" Kind Chilled Cast Iron Spoke
Tires ----- Cen. diam. ----- Size -----
Tires held by -----

Back Engine Truck None Wheeled -----
To swing ----- each side of cen. Cen. pin liners -----
Journals, Diam. ----- Length ----- Boxes -----
Wheels, Diam. ----- Tread ---- Kind -----
Tires ----- Cen. diam. ---- Size ----
Tires held by -----

Brake, position On all Driving and Tender Wheels.
Operating Parts {Engine, Sch. 6-ET, West'g. Comb. Auto. & Straight Air.
Foundation Parts {Drivers, sch. WM-1, American Outside Equalized. / Eng. tr'k, sch. -----
Air pump One 9½" Pos. Left Side
Train connections Front and Back
Train signal, sch. None
Driver brake shoes of cast steel.

Tender Eight Wheeled, Drawing No. 406
Weight, with fuel and water, about 60,000 lbs.

Tank 3000 Gallons, Bill 3642
Tank "U" Shape, Straight Top. Fuel Cap. 6 tons.

Tool Boxes of Hard Wood, top.

Frame Steel 8" channels.

Front drawbar height 31½"
Spring bumper between engine and tender with large radius casting.
Back drawhead, center above rail 33½"
Coupler M. C. B. Auto.

Steps, handholds, etc. to conform to I. C. C. requirements.

Trucks Arch Bar Type, Cast Steel Bolsters.

Springs Elliptic, Extra Heavy. B. L. W.
Journals, Diam. 4½" Length 8"
Wheels, Diam. 30" Tread 4½" Kind Chilled Cast Iron Plate
Tires ----- Cen. diam. ----- Size -----
Tires held by -----
Safety chains Single

Brake Position On All Wheels.
Brake sch. 6-ET, West'g. Auto. & Straight Air with 10"x 12" tender cylinder.
Tender brake shoes of cast steel.

List of tools, sch. 26 Bolts, nuts and threads B. L. W.
Photo sch. 2 Inspection B. L. W. except see * below.
To be weighed Yes Material spec'ns B. L. W.
Certificate of boiler test Three copies of B. L. W. form 611.
Junior laws to 5-1-14 Shipment On Own Wheels. Under Steam. 7/8/14

Brass shop finish, No. 1.
Machine shop finish D-165

Patent Plates {Throttle Jan. 23, 1900. (Cast On) / Feed Pipe Strainer Sept. 1, 1903. (Cast On)

Property plates B. L. W. for engine and tender.

Painting:—Engine, style 291 Olive Green and Gold
Painting:—Tender, style 291 " " " "

Lettering, etc. to be in Gold Leaf.
Mark on tank sides, NEW PARK AND FAWN GROVE R. R.

No. Pos. Road No. Name None
F. No. Plate 2
Sand Box
Cab Sides
Back of Tank.

* {When loco. is in Erecting Shop, Co. will send man to inspect it.
Notify J. C. Wiley, General Manager, New Park, Pa. when to send man here.
Co. wants to have Mr. Williams, Inspector, here when the under frame is being bolted together in Erecting Shop.

THE BALDWIN LOCOMOTIVE WORKS AS SPEC'N C-2994

Memorandum Spec'n 10624

SPECIFICATION FOR LOCOMOTIVES 8 30 D 681

FOR The Garden City Western Railway Company

Gen. as Neg. 4241

Engine Drawing No. 78

8. 25. 15

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 11' 6" Driving 11' 6" Total 19' 4"
Total wheelbase, eng. and tend. {Actual 45' 8" / Limited to -----
Rails, 70 pounds
Curves -----

Limits, Height ----- Width -----
Weight approximate, in working order, Total 109,000 lbs.
On F. truck 15,000 lbs. Drivers 94,000 lbs. B. truck ----- lbs.

Tractive power 23,330 lbs. Ratio of adhesion 4.05
Work'g St'm Pres. 180 lbs., Service Freight
Fuel Oil
Oil Burning arrangement, B.L.W. Standard with burner in front of fire box. Royalty, if any, payable by The B. L. W.
Boiler Steel Thick 9/16" & 5/8" Bill 7513
Boiler, Diam. 54" Plan Extended Wagon top
Boiler stm pres. 180 lbs., Tested to {200 lbs. steam pres. / 240 lbs. water pres.
Longitud. seams Butt jointed double covering strips

Dome, diam. 29" Pos. Forward of fire box

Firebox Steel Combustion chamb. None
Firebox, length 89-15/16" Width 33⅜" Depth F. 59⅜" B. 55⅝"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back 5/16"
Firedoor opening 16" diam., Crown and sides in one piece
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Single Riveted
Water space stays ⅝" diam. with 3/16" hole 1½" deep from O. S.

Radial stays 1" diam. Sling stays front {Two rows of B.L.W. Expansion stays.
Button heads below crown on Eight central rows
Crown bars None Placed ---- above crown
Crown bolts -----

Tubes #12 W. G. Charcoal Iron or Steel
Tube ends Swaged for copper ferrules, fire box ends.
Tubes, No. 200 Diam. 2" Length 11' 0"

Heating Surface, Tubes 1143.8 sq Firebox 118.9 sq Total 1262.7 sq
Grate area 20.7 sq Ratio to heat'g surface 1 : 61
Superheater ----- Feed-water heater -----
Reheater ----- Fire brick tubes -----

Fire Brick ---- pavement in pan
Fire box to be lined with fire brick for oil burning.

Grates None
Ash Pan, Depth 8¾" Dampers Front only

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Smokebox extension None Cleaning hole and cap None
Spark ejector or hopper None
Netting and deflect. plates None

Exhaust nozzles Double low
Cleaning Pipe,- With
Stack Straight Diam. 16" Hole in S.B. 23"

Safety Valves (Spec) Two Consolidated 2½"
Safety valves None with relief lever, Set to 180 pounds
Whistle B. L. W. plain

Steam Gauge One Iron 7" MAKER:- Ashcroft (NOT spec)
Steam gauge stand Iron **Clock** None

Water Gauge One B.L.W. (Ironclad) **Cab lamps** Electric
Gauge Cocks Three Back Surface valve None
Lowest gauge cock 3 1/4" above highest part of crown
Lubricator steam valve without separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One B. L. W. POS:- Front
Cleaning Plugs
Firebox Corners, DIAGONAL and Back
Crown, Three each side and two back
Waist, One under front
Front tube sheet, One FUSIBLE PLUG:- One

Pump None Pos. -----
Top chamb. ----- Bottom chamb. -----
Feed cock ----- Feed pipes -----
Checks ----- Check pipes -----

Injectors (Spec) Two Simplex No. 7
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. Right and Left
OKADEE TANK HOSE COUPLINGS.
Steam Heat None

Cab Steel, lined with wood

Cab boards Steel Nosing T-Iron
Running boards Steel Nosing T-Iron
Hand rail Iron Located on Boiler

Back Bumper Bar Steel Back drawbar height 31"

Pilot Wood Pushing shoes None
Front Bumper Oak Bumper plate With
Steps, hand holds, etc., to conform to I. C. C. requirements

Front Drawhead, Center above rail 33½"
Coupler, Simplex M. C. B. Auto.

Flag fixtures Iron on bumper

Headlights:- Pyle National Electric,
Headlight Two Round Case 18" Reflector,
Headlight, Nos. on sides With H'dl't stop With
Lamp shelf Iron Nosing T Iron

Bell 92 pounds
Sand Box Two Diam. 28" Body Iron Painted Pipes Iron
Sander, (NOT spec) Leach Air Trap A-1, to sand front and rear

Dome casing Iron Painted

Boiler Jacket #22 Plan. Steel Bands Iron Style 9
Boiler Lagging Magnesia Sectional.

THE BALDWIN LOCOMOTIVE WORKS

Engine H. J. Smith Sept 1915

SPECIFICATION FOR LOCOMOTIVES 8 30 D 681

FOR The Garden City Western Railway Co.

315

Frames Cast Steel Braces Solid

Cylinders, Diam. 18" Stroke 24"
St'm ports, Length 16" Width 1½" Bridges 1"
Exh. ports, Length 16" Width 2½" Valve lead 3/16"
Valve travel 5" O. S. lap ⅞" Ins. lap -----
Eccentric crank throw 10⅜"
S. F. Lubr. (Spec) Nathan triple Bulls Eye {Iron pipes under jacket
Cyl'r heads Cast Iron
Cyl'r casings Iron Ptd. Head covers Steel painted
St'm chest casings Iron Ptd. Covers Steel painted
St'm chest valves Richardson balanced, with vacuum valves
Met. pkg {Piston rods / Valve stems U. S. (NOT spec)

Pistons Cast Iron rings sprung into solid head
Guides Laird type, Steel Oil cups Needle
Crossheads Cast Steel
Wrist Pins Steel Rod cups Plunger
Parallel rods to have solid ends.

Valve Motion Walschaerts
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 51" Cen. diam. 44", Centres Cast Iron

Tires Steel Held by Shrinkage and Shoulder
Tires, Flanged, Pos. Front and Back Size 3½" x 5½"
Tires, Plain, Pos. Middle Size 3½" x 6½"
Lateral play between driving boxes and wheel hubs 1/16" total
Driving Boxes Steeled Cast Iron
Journals, Diam. 7½" Length 8½"

Driving spring staples Wrot Iron

Springs. Make B. L. W.

Front Engine Truck Two Wheeled Swing bolster, Centre Bearing
To swing 3" each side of cen. Cen. pin liners None
Journals, Diam. 5" Length 10" Boxes Cast Iron
Wheels, Diam. 28" Tread ---- Kind Cast Iron Spoke Centers
Tires Steel Cen. diam. 28" Size 2½" x 5½"
Tires held by Shrinkage and Shoulder

Back Engine Truck None Wheeled -----
To swing ---- each side of cen. Cen. pin liners -----
Journals, Diam. ----- Length ------ Boxes -----
Wheels, Diam. ----- Tread ---- Kind -----
Tires ------ Cen. diam. ----- Size -----
Tires held by -----

Brake, position On all driving and tender wheels.
Operating Parts {Engine, Sch. #6-ET West'g Combined Auto and Eng. Tr'k, sch. ----- Straight air.
Foundation Parts {Drivers, sch. WM-1 American D.S. Equalized. Eng. tr'k, sch. -----
Air pump One - 9½" Pos. Left Side
Train connections Front and back
Train signal, sch. None

Tender Eight Wheeled, Drawing No. 918
Weight, with fuel and water, about 80,000 lbs.
Tank {Oil 1800 4006 / Water 4000 Gallons, Bill 4002
Tank "U" shape, Straight Top, with separate oil tank in fuel space arranged for easy removal for change to coal fuel.
Tool Boxes of Hard Wood, Top

Frame Steel, 8" and 10" Channels,

Front drawbar height 30⅞"

Back drawhead, center above rail 33½"
Coupler Simplex M. C. B. Auto.

Pilot of wood, at rear
Steps, hand holds, etc., to conform to I. C. C. requirements.

Trucks Arch bar type with steel bolster

Springs Elliptic, B. L. W. make
Journals, Diam. 4½" Length 8"
Wheels, Diam. 30" Tread 4½" Kind Chilled Cast Iron Plate
Tires None Cen. diam. ---- Size ----
Tires held by -----
Safety chains Single

Brake Position On all wheels.
Brake sch. #6-ET West'g Auto. and Straight Air with 10" x 12" tender cylinder.

List of tools, sch. 31 Bolts, nuts and threads B. L. W.
Photo sch. #2 Inspection B. L. W.
To be weighed No Material spec'ns B. L. W.
Certificate of boiler test Three copies of B. L. W. form 611
Junior laws to 9.1.15. Shipment On own wheels.

Brass shop finish, No. 1
Machine shop finish D-165

Patent Plates } **Throttle,** Patented Jan. 23, 1900 (Cast on)

Property plates B. L. W. for engine and tender.

Painting:—Engine, style 291, Olive Green and Aluminum
Painting:—Tender, style 291, Olive Green and Aluminum

Mark on tank sides, GARDEN CITY WESTERN RAILWAY COMPANY

No. Pos. Road No. Name None
F. No. Plate 25
F. Sand Box
Cab panels.
Back of tank

THE BALDWIN LOCOMOTIVE WORKS Dup. 8 30 D 669-670 with same extras except as otherwise specified.

Memorandum Spec'n 10850

SPECIFICATION FOR LOCOMOTIVES 8 30 D 663 - 664 Con. as Neg. 4341

FOR Jonesboro, Lake City & Eastern R. R. Co. 1-17-16. Engine Drawing No. 84.

8

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 11' 6" Driving 11' 6" Total 19' 4"
Total wheelbase, eng. and tend. {Actual 46' 3" / Limited to -----

Curves -----

Limits, Height ----- Width -----
Weight (approximate) in working order, Total 111,500 lbs.
On F. tr'k 15,500 lbs., Drivers 96,000 lbs., B. tr'k ----- lbs.

Tractive power 23,790 lbs., Ratio of adhesion 4.
Work'g St'm Pres. 180 lbs., Service Freight.
Fuel Soft Coal.

Boiler Steel Thick 9/16" & ⅝" Bill 7685.
Boiler, Diam. 54" Plan Extended Wagon Top.
Boiler st'm pres. 180 lbs., Tested to {200 lbs. steam pres. / 240 lbs. water pres.
Longitud. seams Butt jointed, double covering strips.

Dome, diam. 29" Pos. Forward of fire box.

Firebox Steel Combustion chamb. None.
Firebox, length 89-15/16" Width 33⅜" Depth F. 64½" B. 60½"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diameter.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Single Riveted
Water space stays ⅜" diam. with 3/16" hole 1⅜" deep from O. S.

Radial stays 1" diam. Sling stays front {Two rows of B.L.W. Expansion stays.
Button heads below crown on Eight central rows
Crown bars None. Placed ----- above crown
Crown bolts -----

Flues 5½" # 9 B. W. G. Seamless Steel.
Tubes 2" #12 W. G. Charcoal Iron.
Tube ends Swaged for copper ferrules fire box ends.
Number 18 / 113 Diam. 5⅜" / 2" Length 10' 7"

Heating Surface: Flues 266 sq. ft. Combus. Chamb. None Total 1015 sq. ft.
Tubes 621 sq. ft. Fire Box 128 sq. ft. Fire Brick Tubes -----
Grate area 20.8 sq. ft. Ratio to Heating Surface 1 : 48.8
Superheater 218 sq. ft.

Fire Brick Arch, None.

Grates Rocking bars and drop plate.
Ash Pan, Dampers Front and Back.

Throttle Balance Pos. Dome.
Dry pipe Steel

Superheater (See sup.1)

Smoke box door of pressed steel.
Smokebox extension With Cleaning hole and cap L.S. only.
Spark ejector or hopper With
Netting and deflect. plates With

Exhaust nozzles Single high.

Stack Straight. Dia. 16" Hole in S. B., dia. 18"

(not spec) **Safety Valves** Two Consolidated 2½"
Safety valves, None with relief lever, Set to 180 lbs.
Whistle B. L. W. plain.

Steam Gauge One Iron 7" Ashcroft. (not spec)
Steam gauge stand Iron **Clock** None.
Water gauge to have Carbery shield.
Water Gauge One B. L. W. **Cab Lamps** Electric.
Gauge Cocks Three Back. Surface valve None
Lowest gauge cock 2½" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One B.L.W. POS:-Front.
Cleaning Plugs
Firebox Corners, diagonal and back.
Crown, Three each side and two back.
Waist, .One under front.
Front tube sheet, One Fusible plug One.

Pump None Pos. -----
Top chamb. ----- Bottom chamb. -----
Feed Cock ----- Feed pipes -----
Checks ----- Check pipes -----

(not spec) **Injectors** Two Monitor. No. 8
Injectors, Pos. Right and Left. Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. Right and Left

Steam Heat None.

Cab Steel, lined with wood.

Cab boards Steel Nosing T-Iron.
Running boards Steel Nosing T-Iron.
Hand rail Iron Located on Boiler.

Back Bumper Steel Back drawbar height 30½"

Pilot Wood Pushing shoes None.
Front Bumper Oak Bumper plate With
Steps, hand holds, etc. to conform to I.C.C. requirements.

Front Drawhead, Center above rail 32½"
Coupler Simplex M. C. B. Automatic.

Signal fixtures Iron on bumper.

Headlight Equipment to be Pyle National Electric.
Headlight One Round Case 18" Reflector,
Headlight, Nos. on sides With H'd'l't step With
Lamp shelf None. Nosing -----

Bell 92 pounds.
Sand Box Two Diam. 28" Body Iron Painted. Pipes Iron
Sander (not spec) Leach Air Trap A-1, in each box to sand front and rear.

Dome casing Iron Painted.

Boiler Jacketing Soft Steel Ptd. Bands Iron Style 9
Boiler Lagging Magnesia sectional.

THE BALDWIN LOCOMOTIVE WORKS E.C. Gardner April 1911

SPECIFICATION FOR LOCOMOTIVES 8 30 D 663-664. 317

FOR Jonesboro, Lake City & Eastern R. R. Co.

8

1 **Frames** Cast Steel Braces Solid.

Cylinders, Diam. 18" Stroke 24"
St'm ports, Length 22" Width 1½" Bridges -----
Exh. ports, Length ----- Width ----- Valve lead ⅛"
Valve travel 5½" Steam lap ⅞" Exhaust clearance -----
Eccentric crank throw 11-5/16"
S. F. Lubr. (not spec) Detroit Five Feed Bulls Eye.
Cyl'r heads Cast Iron; Lubr. pipes of Iron under jacket.
Cyl'r casings Iron Ptd. Head covers Steel Painted.
St'm chest casings Iron Ptd. Covers Steel Painted.
St'm chest valves 9½" Diameter Piston Type.
Met. pkg {PISTON RODS / VALVE STEMS} UNITED STATES. (not spec)

Pistons Cast Iron rings sprung into solid head.
Guides Steel Oil cups Needle.
Crossheads Cast Steel
Wrist Pins Steel Rod cups Plunger.
Parallel rods to have solid ends.

Valve Motion Walschaerts.
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 50" Cen. diam. 44" Centres Cast Iron.

Tires Steel Held by Shrinkage and Shoulder.
Tires, Flanged, Pos. All Size 3" x 5½"
Tires, Plain, Pos. ----- Size -----
Lateral play between driving boxes and wheel hubs - 1/16" total.
Driving Boxes Steel Cast Iron.
Journals, Diam. 7½" Length 8½"

Springs. Make Railway Steel Spring Co's.

Front Engine Truck Two Wheeled Swing Bolster.
To swing 3" each side of cen., Cen. pin liners None.
Journals, Diam. 5" Length 10" Boxes Cast Iron.
Wheels, Diam. 28" Tread -----Kind Cast Iron spoke center.
Tires Steel Cen. diam. 23" Size 2½" x 5½"
Tires held by Shrinkage and Shoulder.

Back Engine Truck None Wheeled -----
To swing -----each side of cen., Cen. pin liners -----
Journals, Diam. -----Length ----- Boxes -----
Wheels, Diam. ----- Tread -----Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----

Brake, position All Driving and Tender wheels.
Operating Parts {Engine, Sch. A-1 Westinghouse Automatic Air. / Eng. Tr'k, sch. -----}
Foundation Parts {Drivers, sch. UM-1 American C. S. Equalized. / Eng. Tr'k, sch. -----}
6 Air pump Two 9½" Pos. Both Left Side.
Train connections Front and Back.
Train signal, sch. None.

Tender Eight Wheeled, Drawing No. 438.
Weight, with fuel and water, about 80,000 lbs.

Tank 4,000 Gallons, Bill 414C.
Tank "U" Shape, straight top. Fuel capacity 6 tons.

Tool Boxes Hard Wood, top.

Frame Steel 10" Channels.

16 Front Drawbar height 28"
Pilot None. Pushing shoes None.
Back drawhead, center above rail 33½"
Coupler Simplex M. C. B. Automatic.

Steps, hand holds, etc. to conform to I. C. C. Requirements.

17/18 **Trucks** Arch Bar type with Steel Bolsters.

Springs Elliptic. Railway Steel Spring Co's make.
Journals, Diam. 4½" Length 8"
Wheels, Diam. 30" Tread 4½" Kind Chilled cast iron plate.
Tires ----- Cen. diam. ----- Size -----
Tires held by -----
Safety chains Single.

Brake Position On all wheels.
Brake sch. PL-1012 Westinghouse Automatic Air.

List of tools, sch. 29
Photo sch. #2 Inspection B. L. W.
To be weighed Yes. Material spec'ns B. L. W.
Certificate of boiler test Three copies of B.L.W. form 1036.
Junior laws to -3-7-16. Shipment On own wheels.

Brass shop finish, No. 1
Machine shop finish D-165.

B. L. W. Patents {Throttle, Patented Jan. 23, 1900 (Cast On) / Feed Pipe Strainer, Patented Sep. 1, 1903 (Cast On) / Steam Pipe Cover, Patented July 18, 1911 (Cast On)}

Property plates B. L. W. for engine and tender.

Painting: Engine, style 291 Olive Green and Aluminum.
Painting:—Tender, style 291 Olive Green and Aluminum.
Lettering, etc. to be in Silver Leaf, same style as Ry. Co's two photos, furnished to show marking for 8-30 D 669-670.
Mark on cab sides J. L. C. & E.
Mark ib back of tank 4000 GALLONS.

Road Nos. Pos.	Road Nos.	Name None.
F.No Plate	34	
F.Sand Box	35	
Sides of tank.		
Back of tank.		

SPECIFICATION FOR LOCOMOTIVES S 30 D 682-684

FOR Jonesboro, Lake City & Eastern R. R. Co.

No.

1 Superheater as Loco. Superheater Co's Spec'n No.P-1091, dated 3-9-16.
Royalty on Superheater payable by B.L.W.
Superheater, Schmidt top header type with outside steam pipe connections to steam chest.
Company wishes us to confer with the Locomotive Superheater Co. as to the best design of Superheater to apply and to make arrangements with the Superheater Co. so that an expert may be on the ground when the engines are put into service and their men instructed as to the proper handling and care of same.
Superheater units to be welded.

2 Additional hand hole and cap to be applied in each side of smoke box for inspection of superheater.

3 Front end arrangement to be Master Mechanics Self Cleaning type.

4 Deck plates of cast steel to overcome trouble of breakage experienced with previous engines. The road is rough and the running gear, frames, springs etc., must be streng.

5 Chafing plates on engine of cast steel with a long sweep face, at least 12" in vertical height.
The separable chafing plate and adjustable wedge furnished with previous engines not desired.

6 Air pumps to be so arranged that one or the other or both may be used.

T E N D E R .

16 Chafing plates of cast steel with a long sweep face, at least 12" in vertical height.
The separable chafing plate and adjustable wedge furnished with previous engines not desired.

17 The road is rough and the running gear, frames, spring, etc. must be strong.

18 Tender trucks to have separable cast steel center plates, previous engines gave trouble with failure of cast iron plates.

THE BALDWIN LOCOMOTIVE WORKS

SUPERHEATER SPECIFICATION FOR LOCOMOTIVES S 30 D 682-684. 319

FOR Jonesboro, Lake City & Eastern R. R. Co.

No.

Locomotive Superheater Company's Specification No. P-1091 dated March 9, 1916.
Specification for Superheater with Top Header, Double Loop Arrangement.

BOILER TUBES 113 in number 2 O. D. 10 ft. 7 ins. over tube sheets. Tubes located between and adjacent to Boiler flues are to be beaded over at front end.

BOILER FLUES 18 in number 5½ O. D. #9 BWG thick of cold drawn seamless steel. Flues to be straight, true to gauge and wall not to vary more than one gauge from specified thickness, as shown on Card 10360-Q

BOILER FLUE SETTING Radius 1/16 inch on both edges of flue holes in firebox tube sheet and on front edge of flue holes in front flue sheet as shown on drawings, except for copper sheets. Back end to be set with copper ferrules, rolled, beaded and prossered except for copper sheets. Front end to be rolled and beaded. Rollers to have at least 5 rolls. Prosser to have at least 12 sections Card 1136

TUBE SHEET LAYOUT to be in accordance with Card 5655

S. H. UNITS 18 units 1½ O. D. #9 BWG thick of seamless steel. Pipes united by cast steel return bends as shown on Card 10735-S
Each unit to be tested, before being placed in boiler, with water under pressure of 500 pounds.

S. H. PIPE SUPPORTS Of steel fastened securely on superheater pipes so as not to slide as shown on Card 10010

S. H. PIPE JOINT To be made in best possible manner to insure absolutely tight joints in accordance with the notation on Card 1043

S. H. UNIT CLAMP BOLT To be of steel having a tensile strength between 60,000 lbs, and 70,000 lbs. per sq. inch and to be as shown on Card 1086-A

S. H. HEADER To be of close grain cylinder iron, steam tight in every respect. Joint ring for connection to dry pipe to have flat side against header flange. Casting should be moulded with the face having the superheater joints placed downward in the mould to secure the best quality of metal on surface where superheater joints are made. Each header to have a serial number cast on in such a location as not to be removed in finishing. No patch plugs allowed on ball joint seats. Headers must not be treated excessively with sal ammoniac. Header casting to be tight under water pressure of 250 lbs. Test pressure to be applied separately to the saturated and to the superheated steam passages, so as to insure soundness of all partition walls. Card 1850

S. H. HEADER SUPPORTS To be securely bolted or riveted to boiler shell. To be properly located so as to support the header after header has been correctly located. Header should then be bolted to supports. This to be done before superheater units are put in place. Card 1323

ST. PIPE JOINT RINGS Should be of cast iron.

DEFLECTING PLATE To be constructed so as to permit easy inspection and removal of superheater units and joints. Design to be in accordance with Card See Arrgt.

DAMPER CYLINDER To be carefully and accurately made. Piston not to be more than 0.01 inch smaller than bore. Bearings for Piston and extension to be in line. Piston to be ground and to operate freely under a pressure as low as 40 lbs. per sq. in. Steam Pipe to damper cylinder should be as short and free from bends as possible so as not to cause water to collect in cylinder. Pipe to be protected against freezing. Card 1149

DAMPER SHAFT COUNTERWEIGHT To be painted a light color to render it easily visible by the engineer Card 1067

S. H. ARRANGEMENT To be in accordance with Card 4685

TEST (FINAL) The Superheater, after assembling in boiler and after steam pipes are fitted up, is to be thoroughly tested and to be tight under water pressure of 250 lbs.

Name	Card	Name	Card
Damper	10733-L	Damper Shaft Link	1070
Damper Cylinder Arm	1074	Patent Plate	3156
Damper Cylinder Pipe Fitting	1069-A	S. H. Unit Bolt Washer	1071
Damper Cylinder Pipe Union	1287	S. H. Unit Clamp	1073
Damper Cylinder Piping Diagram		S. H. Unit Clamp Washer	10305
Damper Cylinder Support		S. H. Pipe End	1344
Damper Shaft	1068	S. H. Pipe Band	1988
Damper Shaft Arm	1065	Return Bends	10094
Damper Shaft Bearing (O. S.)	1148	Deflecting Plate Handle	1487
Damper Shaft Bearing (I. S.)	1275-G	Lubricator Connection	3023.

THE BALDWIN LOCOMOTIVE WORKS — As Specn C-3632. Details as far as practicable to be same as for 10 22 D 84.

Manufacturing Specn 10922.

SPECIFICATION FOR LOCOMOTIVES — S 20 C 46. — Con. as Req. 1449.

FOR Tuscarora Valley Railroad Company. — 3-27-16. — Engine Drawing No. 17.

R.

Gauge of Road 3' 0" Play 5/8"
Wheelbase, Rigid 8' 2" Driving 8' 2" Total 21' 2"
Total wheelbase, eng. and tend. { Actual 40' 6" / Limited to -----
Rails, 30 to 70 lbs.
Curves 25 degrees. **Grades,** 3%.

Limits, Height ----- Width -----
Weight (approximate) in working order, Total 58,500 lbs.
On F. tr'k 22,000 lbs., Drivers 36,500 lbs. B. tr'k ----- lbs.

Tractive power 9400 lbs. Ratio of adhesion 3.8
Work'g St'm Pres. 160 lbs. Service Pass. & Freight.
Fuel Soft Coal.

Boiler Steel Thick 7/16" and 1/2" Bill 7747
Boiler, Diam. 44" Plan Wagon Top.
Boiler st'm pres. 180 lbs., Tested to { 200 lbs. steam pres. / 240 lbs. water pres.
Longitud. seams Butt jointed, double covering strips.
Dome hole in boiler to be as large as possible.
Dome, diam. 25" Pos. Forward of firebox.

Firebox Steel Combustion chamb. None.
Firebox, length 59-3/16" Width 24 1/8" Depth F. 55 1/2" B. 54"
Firebox, Tube 1/2" Crown 3/8" Sides 5/16" Back 5/16"
Firedoor opening 16" diam.
Water space, Front 3 1/2" Sides 2 1/2" Back 2 1/2"
Water space, Frame Single. Riveted
Water space stays 7/8" diam. with 3/16" hole 1 1/4" deep from C. S.
Radial stays 1" diam. Sling stays front { Two rows of B. L. W. Expansion Stays.
Button heads below crown on Six central rows
Crown bars None. Placed ----- above crown.
Crown bolts -----

Flues None.
Tubes #12 W. G. Charcoal Iron or Steel.
Tube ends Swaged for copper ferrules, firebox ends.
Number 121 Diam. 2" Length 10' 6"

Heating Surface Flues None. Combus. Chamb. None. Total 739 sq. ft.
Tubes 580 sq. ft. Fire Box 73 sq. ft. Fire Brick Tubes -----
Grate area 10.1 sq. ft. Ratio to Heating Surface 1 : 72.6
Superheater -----

Fire Brick Arch On Studs.

Grates Rocking bars and drop plate.
Ash Pan, Dampers Front and back.

Throttle Balance Pos. Dome.
Dry pipe Steel

Superheater None.

Smokebox extension With Cleaning hole and cap L.S. only.
Spark deflector or hopper With
Netting and deflect. plates With

Diaphragm Double high.

Stack Straight. Dia. 13" Hole in S. H. dia. 14"

Safety Valves (Spec.) Two Coale 2" same as for 10 22 D 84.
Safety valves None with relief lever. Set to 150 lbs.
Whistle Chime.

Steam Gauge One Iron 7" MAKER:-Ashcroft. (Not spec.)
Steam gauge stand Iron **Clock** None.

Water Gauge One B.L.W.(Ironclad) **Cab Lamps** to burn Oil.
Gauge Cocks Three Back Surface valve None
Lowest gauge cock 3" above highest part of crown
Lubricator steam valve without separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One B. L. W. POS:-Left Side.
Cleaning Plugs
Firebox Corners, back ones diagonal and right side.
Crown, Two each side and two back
Waist, One under front
Front tube sheet, One Fusible plug None

Pump None. Pos. -----
Top chamb. ----- Bottom chamb. -----
Feed Cock ----- Feed pipes -----
Checks ----- Check pipes -----

Injector to be same as for 10 22 D 84.
Injectors (Spec.) Two Hancock Lever Type. No. 5
Injectors, Pos. Right and Left. Steam pipes Copper.
Pipes, Check Iron Feed Iron Overflow Iron.
Check B. L. W. Pos. Right and Left.

Steam Heat None.

Cab Wood.
Cab Side windows to provide two-thirds open space.

Cab boards Wood Nosing None.
Running boards Wood Nosing None.
Hand rail Iron Located on Boiler.

Back Bumper Bar Steel Back drawbar height 28 1/2"

Pilot Wood Pushing shoes None.
Front Bumper Oak. Bumper plate With
Steps, hand holds etc. to conform to I.C.C. requirements.

Front Drawhead, Center above rail 26"
Coupler Climax, three quarter size M.C.B.Auto.

Signal fixtures Iron on bumper.

Headlight One Round Cast 14" Reflector To burn Kerosene.
Headlight Nos. on sides With Light step With
Lamp shelf None. Nosing -----

Bell 85 pounds.
Sand Box (Not Spec.) One Diam. 22" Body Iron Painted Pipes Iron.
Sander Leach Air Trap A-10 To sand front and back.

Dome casing Iron Painted.

Boiler Jacket #22 Soft Steel Pl. Bands Iron Style 3
Boiler Lagging Magnesia sectional.

THE BALDWIN LOCOMOTIVE WORKS — June 1916 — 321

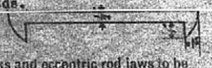
SPECIFICATION FOR LOCOMOTIVES — S 20 C 46.

FOR Tuscarora Valley Railroad Company.

R.

Frames Cast Steel Braces Solid.
Cyl'r. Cocks to be same as for 10 22 D 84.
Cylinders, Diam. 13" Stroke 18"
St'm ports, Length 12" Width 1" Bridges 1/2"
Exh. ports, Length 12" Width 2" Valve lead 1/16"
Valve travel 4 1/2" Steam lap 11/16" Exhaust clearance -----
Eccentric crank throw 4 1/2"
S. F. Lubr. Nathan Triple Sulle Eye to be furnished by R.R.Co.
Cyl'r heads Cast Iron; Lubr. pipes of Iron under jacket.
Cyl'r casings Iron Ptd. Head covers Steel Painted.
St'm chest casings Iron Ptd. Covers Steel Painted.
St'm chest valves Richardson Balanced, with vacuum valves.
Met. pkg (PISTON ROD / VALVE STEM) UNITED STATES.

Pistons Cast Iron rings sprung into solid head.
Guides Steel Oil cups Needle.
Crossheads Cast Steel, with removable brass gibs.
Wrist Pins Steel Rod cups Plunger.
Parallel Rods to have solid ends.
Crosshead Gibs as sketch



Valve Motion Stephenson.
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 44" Cen. diam. 38" Centres Cast Iron.
Tire flanges to be 1" x 1"
Tires Steel Held by Shrinkage and Shoulder.
Tires, Flanged, Pos. All Size 3" x 5"
Tires, Plain, Pos. ----- Size -----
Lateral play between driving boxes and wheel hubs 1/32" total.
Driving Boxes Cast Iron.
Journals, Diam. 6" Length 7"
Special attention to be given to springs, making them stronger if necessary, as springs in five of previous locos. have broken.
Springs. Make- B. L. W.

Front Engine Truck Four Wheeled Swing Bolster.
To swing 32" each side of cen. Cen. pin liners None.
Journals, Diam. 5" Length 7" Boxes Cast Iron
Wheels, Diam. 22" Tread 3" Kind Chilled Cast Iron plate.
Tires ----- Cen. diam. ----- Size -----
Tires held by ----- Wheel flanges to be 1" x 1"

Back Engine Truck None. Wheeled -----
To swing -----each side of cen. Cen. pin liners -----
Journals, Diam. ----- Length ----- Boxes -----
Wheels, Diam. ----- Tread ----- Kind -----
Tires ----- Cen. diam. ----- Size-----
Tires held by -----

Brake, position On All driving and tender wheels.
Operating Engine, Sch. #6 ET West'g. Combined Auto. and Straight Air
Parts Eng. Trk. sch. -----
Foundation Drivers sch. #T-1 American C. S. Equalized.
Parts Eng. Trk. sch. -----
Air pump One 8" Pos. Left Side.
Train connections Front and Back.
Train signal sch. None
Brake Shoes to be same as for 10 22 D 84.

Tender Eight Wheeled, Drawing No. 575
Weight, with fuel and water, about 30,000 lbs.

Tank 1500 Gallons, Bill 4192
Tank "U" shape, straight top. Fuel Capacity 3 Tons.

Tool Boxes Hard Wood, Top.

Frame Oak and Yellow Pine.

Front Drawbar height 25 3/8"
Pilot None. Pushing shoes None.
Back drawhead, center above rail 26"
Coupler Climax, three-quarter size M.C.B.Automatic.

Steps, hand holds etc. to conform to I.C.C. requirements.

Trucks Arch Bar type, with Wood Bolsters.

Springs Elliptic. B.L.W.
Journals, Diam. 3" Length 5 1/2"
Wheels, Diam. 26" Tread 3 1/2" Kind Chilled Cast Iron Plate.
Tires ----- Cen. diam. -----Size -----
Tires held by -----
Safety chains Single.

Brake Position On all wheels.
Brake sch. #6 ET West'g. Auto. and Straight Air with 8" x 12" tender cylinder.

List of tools, sch. 26
Photo sch. #2 Inspection B. L. W.
To be weighed Yes. Material specns B. L. W.
Certificate of boiler test Three copies of B.L.W. form 1636.
Junior laws to 5-31-16. Shipment On Car.

Brass shop finish, No. 1
Machine shop finish D-155.

Patents { B. L. W. Throttle, Patented Jan. 23, 1900 (Cast On) / Feed Pipe Strainer, Patented Sept. 1, 1903 (Cast On)

Property plates B. L. W. for Engine and Tender.

Painting: Engine, style 29] Olive Green and Aluminum.
Painting Tender, style 29] Olive Green and Aluminum.

Mark on Tank Sides TUSCARORA VALLEY

Road Nos. Pos. Road Nos. Name None.
F. No Plate 3
Sand Box
Sides of Cab.
Back of tank.

THE BALDWIN LOCOMOTIVE WORKS As Specn C-4286.

Memorandum Spec'n 10617

SPECIFICATION FOR LOCOMOTIVES 10 22 D 84. Gen. as Print from Erecting Card 6790.

FOR Tuscarora Valley Railroad Company, Engine Drawing No. 10

12-22-14.

Gauge of Road 3' 0" Play 1"
Wheelbase, Rigid 10' 11" Driving 10' 11" Total 19' 5"
Total wheelbase, eng. and tend. {Actual 43'9½" (A.A.N. 2.27.15.) Limited to ----
Rails 30 lbs to 70 lbs.
Curves 25 degrees on grade of 3% uncompensated.

Limits, Height ---- Width ----
Weight (approximate) in working order, Total 67500 lbs.
On F. tr'k 15000 lbs., Drivers 52500 lbs., B. tr'k ---- lbs.

Tractive power 12100 lbs., Ratio of adhesion 4.3
Work'g St'm Pres. 160 lbs., Service Passenger and freight
Fuel Soft Coal

Boiler Steel Thick ½" & 9/16" Bill 7377
Boiler, Diam. 46" Plan Extended wagon top.
Boiler st'm pres. 180 lbs., Tested to {200 lbs. steam pres. 240 lbs. water pres.
Longitud. seams Butt jointed, double covering stripe.

Dome, diam. 28" Pos. Forward of fire box.

Firebox Steel Combustion chamb. None
Firebox, length 70 15/16" Width 24½" Depth F. 48⅝" B. 40⅜"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diam.
Water space, Front 2½" Sides 2½" Back 2½"
Water space, Frame Single Riveted
Water space stays ⅞" diam. with 3/16" hole 1½" deep from O.S.
Radial stays 1" diam. Sling stays front {Two rows of Tate Expansion stays.
Button heads below crown on Six central rows
Crown bars None Placed ---- above crown ----
Crown bolts ----

Tubes #12 W.G. Charcoal Iron or Steel
Tube ends Swaged for copper rings fire box ends.
Tubes, No. 133 Diam. 2" Length 10' 8⅜"

Heating Surface, Tubes 1738.6 Firebox 57.9 Total 1796.5
Grate area 11.88 Ratio to heat'g surface, 1 : 87
Superheater ---- Feed-water heater ----
Reheater ---- Fire brick tubes ----

Fire Brick arch On studs.

Grates Rocking bars and drop plate.
Ash Pan, Depth F. 15" B. 21" Dampers Front and Back

Throttle Balance Pos. Dome
Dry pipe Cast-iron or steel.

Superheater None

Smokebox extension With Cleaning hole and cap L.S. only
Spark ejector-or-hopper With
Netting and deflect. plates With

Exhaust nozzles Double high

Stack Straight, Diam. 18" Hole in S.B. 16"

Safety Valves (Not Spec) Two, Consle, 2"
Safety valves None with relief lever, Set to 160 lbs.
Whistle Chime

Steam Gauge One, Iron, 7" Maker, Ashcroft. (Not Spec)
Steam gauge stand Iron **Clock** None

Water Gauge One, B.L.W. (Ironclad) **Cab lamps** to burn Oil.
Gauge Cocks Three, back. Surface valve None
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome.
Blower Valve B.L.W.

Blow off Cock One, B.L.W. Pos. L.S.
Cleaning Plugs
Firebox Corners, back ones diagonal and R.S.
Crown, Two each side and two back.
Waist, One under front
Front tube sheet, One. Fusible Plug, None

Pump None Pos. ----
Top chamb. ---- Bottom chamb. ----
Feed cock ---- Feed pipes ----
Checks ---- Check pipes ----

Injectors (Spec) Two Hancock, Lever Type No. 5.
Injectors, Pos. R. and L. Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B.L.W. Pos. R. and L.

Steam Heat None

Cab Wood
Cab side windows to provide two thirds open space.

Cab boards Wood Nosing None
Running boards Wood Nosing None
Hand rail Iron Located on Boiler

Back Bumper Bar Steel Back drawbar height 23⅛"

Pilot Wood Pushing shoes None
Front Bumper Oak Bumper plate With
Steps, handholds, etc., to conform to L.C.C. requirements.

Front Drawhead, Center above rail 26"
Coupler Climax three-quarter size, M.C.B. Auto.

Flag fixtures Iron on bumper.

Headlight One, Round Case, 14" Reflector, To burn Kerosene.
Headlight, Nos. on sides With H'd'l't step With
Lamp shelf None Nosing ----
Bell to be located between stack and front sand box.
Bell 65 pounds.
Sand Box Two Diam. 24" Body Iron painted. Pipes Iron.
Sander Hand, to sand front of forward and back of rear drivers

Dome casing Iron, painted.
Boiler Jacket {#22 Soft Steel Pld. Bands Iron Style 0
Boiler Lagging Magnesia sections).

THE BALDWIN LOCOMOTIVE WORKS

Engine J. H. Keen Jan 1915

SPECIFICATION FOR LOCOMOTIVES 10 22 D 84

FOR Tuscarora Valley Railroad Co.

323

Frames Cast steel Braces Solid

Cylinders, Diam. 14" Stroke 20"
St'm ports, Length 13" Width 1⅜" Bridges 1"
Exh. ports, Length 13" Width 2½" Valve lead 1/16"
Valve travel 5" O. S. lap ⅞" Ins. lap ----
Eccentric ~~rink~~ throw 5"
S. F. Lubr. (Not Spec) Michigan Triple Bulls Eye {Iron pipes under jacket.
Cyl'r heads Cast Iron
Cyl'r casings Iron, painted. Head covers Steel, painted.
St'm chest casings Iron, painted. Covers Steel, painted.
St'm chest valves Richardson Balanced, with vacuum valves.
Met. pkg {Piston rods Valve stems U. S. (Not Spec)

Pistons Cast iron rings sprung into solid head.
Guides Steel Oil cups Needle.
Crossheads Cast steel, with removable brass gibs.
Wrist Pins Steel Rod cups Plunger, forged on all rods
Parallel rods to have solid ends.

Valve Motion Stephenson.
{Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B.L.W.

Drivers, O. S. Diam. 44" Cen. diam. 38", Centres cast iron.
Tire flange to be 1" x 1".
Tires Steel Held by Shrinkage and shoulder
Tires, Flanged, Pos. Front and back Size 3" x 5"
Tires, Plain, Pos. Middle Size 3" x 6"
Lateral play between driving boxes and wheel hubs = 1/32" total
Driving Boxes Cast Iron
Journals, Diam. 6" Length 7"

Driving spring staples Wrot iron.

Springs. Make B.L.W.

Front Engine Truck Four Wheeled Swing bolster
To swing 1¼" each side of cen. Cen. pin liners None
Journals, Diam. 4" Length 6½" Boxes Cast iron.
Wheels, Diam. 24" Tread 2⅜" Kind Chilled cast iron plate
Tires None Cen. diam. ---- Size ----
Tires held by ---- Wheel flanges to be 1" x 1"

Back Engine Truck None Wheeled ----
To swing ---- each side of cen. Cen. pin liners ----
Journals, Diam. ---- Length ---- Boxes ----
Wheels, Diam. ---- Tread ---- Kind ----
Tires ---- Cen. diam. ---- Size ----
Tires held by ----

Brake, position On all driving and tender wheels.
Operating Parts {Engine, Sch. 6-ET Westg. Combined Auto and Eng. Tr'k, sch. ---- Straight air.
Foundation Parts {Drivers, sch. UM-1, American outside equalized. Eng. tr'k, sch. ----
Air pump One, 8". Pos. L.S.
Train connections Front and back.
Train signal, sch. None

(Mr. J. M. Blair, Pres., Tuscarora Bank, Blairs Mills, Pa., is to be advised in ample time for him to have R.R.Co's Inspector Master Mechanic come here to examine the locomotive before it leaves the works.) WAIVED.

Tender Eight Wheeled, Drawing No. 282
Weight, with fuel and water, about 44000 lbs.

Tank 2200 Gallons, Bill 2907
Tank "U" shape, straight top. Fuel Capacity, 5 tons.

Tool Boxes of hard wood, Top.

Frame Oak and Yellow Pine.

Front drawbar height 23⅛"

Back drawhead, center above rail 26"
Coupler Climax, three-quarter size, M.C.B. Auto.

Steps, handholds, etc., to conform to L.C.C. requirements.

Trucks Arch bar type; wood bolster.

Springs Elliptic, B.L.W.
Journals, Diam. 3¾" Length 7"
Wheels, Diam. 28" Tread 3⅜" Kind Chilled cast iron plate.
Tires None Cen. diam. ---- Size ----
Tires held by ---- Wheel flanges 1" x 1".
Safety chains Single

Brake Position On all wheels.
Brake sch. 6-ET, Westg. Auto and Straight air with 8" x 12" tender cylinder.

List of tools, sch. 26 Bolts, nuts and threads B.L.W.
Photo sch. None Inspection B.L.W.
To be weighed Yes. Material spec'ns B.L.W.
Certificate of boiler test Three copies of B.L.W. form 611.
Junior laws to 1.9.15. Shipment On car.

Brass shop finish, No. 1.
Machine shop finish D-165.

Patent Plates {Throttle, patented Jan. 23, 1900, (Cast on). Feed pipe strainer, patented Sept 1, 1903 (Cast On)

Property plates B.L.W. for engine and tender.

Painting:—Engine, style 29, Olive green and aluminum.
Painting:—Tender, style 29, Olive green and aluminum.

Mark on tank sides, TUSCARORA VALLEY R.R. in small letters, and T.V.R.R. in large letters, arranged as shown on R.R.Co's sketch, herewith.

No. Pos.	Road No.	Name, None.
F. No. Plate	2	
F. Sand Box		
Back of tank		

THE BALDWIN LOCOMOTIVE WORKS AS SPECIFICATION B-0035

Memorandum Spec'n 10689

SPECIFICATION FOR LOCOMOTIVES 8 30 C 698 — Gen. as Neg. 5184

FOR ~~Midland-Pennsylvania-Railroad-Co.~~ — **Engine Drawing No.** 74

J. M. MITCHKUN & CO. FOR TOLEDO - DETROIT R. R. 7-22-14

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 8' 6" Driving 8' 6" Total 22' 7"
Total wheelbase, eng. and tend. { Actual 49' 0" / Limited to -----

Curves -----

Limits, Height ----- Width -----
Weight (approximate) in working order, Total 113,000 lbs.
On F. tr'k 37,000 lbs., Drivers 76,000 lbs., B. tr'k ----- lbs.

Tractive power 18,460 lbs., Ratio of adhesion 4.1
Work'g St'm Pres. 190 lbs., Service **Passenger**
Fuel Soft Coal

Boiler Steel Thick 9/16" & ⅝" Bill 4476
Boiler, Diam. 58" Plan **Extended Wagon Top**
Boiler st'm pres. 190 lbs., Tested to { 210 lbs. steam pres. / 254 lbs. water pres.
Longitud. seams **Butt jointed, double covering stripe.**

Dome, diam. 27½" Pos. **Forward of Firebox.**

Firebox Steel Combustion chamb. **None**
Firebox, length 90" Width 41⅛" Depth F. 65-9/16" B. 55-11/16"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back ⅜"
Firedoor opening 16" diameter
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Single Riveted
Water space stays 1" diam. with 7/16" hole 1½" deep from O.S.

Radial stays 1½" diam. Sling stays front One I bar
Button heads below crown on Eight central rows
Crown bars None Placed ----- above crown
Crown bolts -----

Tubes 12 W. G. Charcoal Iron
Tube ends **Swaged for copper rings firebox ends.**
Tubes, No. 267 Diam. 2" Length 11' 7⅛"

Heating Surface, Tubes 1613.5 Firebox 126.5 Total 1740
Grate area 28 Ratio to heat'g surface, 1 : 66
Superheater ----- Feed-water heater -----
Reheater ----- Fire brick tubes -----

Fire Brick arch on studs

Grates Rocking bars and drop plate.
Ash Pan, Depth F. 25½" B. 33½" Dampers ~~Front and Back~~ Front only
Ash pan to conform to I. C. C. requirements.

Throttle Balance Pos. Dome
Dry pipe **Wrot iron or steel.**

Superheater None

Smokebox extension With Cleaning hole and cap L. S. Only
Spark ejector ~~equipment~~ operated by steam to deliver to R. S.
Netting and deflect. plates With

Exhaust nozzles Double High

Stack Straight Diam. 13½" Hole in S.B. 21½"

(Not Spec.)
Safety Valves Two Consolidated 2½"
Safety valves None with relief lever, Set to 190 lbs.
Whistle B. L. W.

Steam Gauge One Iron 7" Maker, Ashcroft (Not Spec.)
Steam gauge stand Iron Clock None

Water Gauge One Reflex Cab lamps to burn Kerosene.
Gauge Cocks Three Back Surface valve None
Lowest gauge cock 3" above highest part of crown.
Lubricator steam valve to have separate dry pipe to dome.
Blower Valve B. L. W.

Blow off Cock One B. L. W. Pos.- Front.
Cleaning Plugs
Firebox Corners diagonal and back.
Crown, Two R. S., Three L. S. and two back.
Waist, One under front.
Front tube sheet, One. Fusible Plug, Gas.

Pump None
Top chamb. ----- Pos. -----
Feed cock ----- Bottom chamb. -----
Checks ----- Feed pipes -----
Check pipes -----

Injectors (Spec.) Two Sellers No. 8½
Injectors, Pos. R. and L. Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. R. and L.

Steam Heat Safety Car Heating & Lighting Co's system

Cab Wood

Cab boards Wood Nosing None
Running boards Wood Nosing None
Hand rail Iron Located on Boiler

Back Bumper Bar Steel Back drawbar height 37½"

Pilot Wood Pushing shoes None
Front Bumper Oak Bumper plate With
Steps, handholds, etc. to conform to I. C. C. requirements

Front Drawhead, Center above rail 33½"
Coupler Jenney M. C. B. Automatic.

Flag fixtures Iron on bumper.

Headlight Two Round Cone 16" Reflector, To burn Kerosene
Headlight, Nos. on sides With H'dl't step With
Lamp shelf None Nosing -----

Bell 92 pounds. Gollmer air bell ringer.
Sand Box One Diam. 28" Body Iron Ptd. Pipes Iron
Sander (Not Spec.) Leach air, type A-1

Dome casing Iron Painted

Boiler Jacket { #22 Soft Steel Plt. Bands Iron Style 8
Boiler Lagging Keystone Sectional

THE BALDWIN LOCOMOTIVE WORKS
Engine J. E. Hancock Oct 1914
SPECIFICATION FOR LOCOMOTIVES 8 30 C 698
FOR ~~Midland-Pennsylvania-Railroad-Co.~~
J. M. MITCHKUN & CO. FOR TOLEDO - DETROIT R. R.

Frames Cast Steel Braces Solid

Cylinders, Diam. 18" Stroke 24"
St'm ports, Length 16" Width 1½" Bridges 1"
Exh. ports, Length 16" Width 2½" Valve lead 3/32
Valve travel 5½" O. S. lap ¾" Ins. lap -----
Eccentric cranks throw 5"
(Not Spec.) S. F. Lubr. Michigan Triple Bull's Eye { Iron pipes under jacket
Cyl'r heads Cast Iron
Cyl'r casings Iron Ptd. Head covers Steel Painted
St'm chest casings Iron Ptd. Covers " "
St'm chest valves Richardson balanced, with vacuum valves.
Met. pkg { PISTON ROD / VALVE STEMS UNITED STATES (Not Spec.)

Pistons Cast iron rings sprung into solid head.
Guides Steel Oil cups Needle
Crossheads Cast Steel
Wrist Pins Steel Rod cups Needle
Parallel rods to have solid ends.

Valve Motion Stephenson
{ Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 68" Cen. diam. 62" Centers Cast Iron.

Tires Steel Held by Shrinkage & Shoulder.
Tires, Flanged, Pos. ALL Size 3"x 5½"
Tires, Plain, Pos. ------- Size -------
Lateral play between driving boxes and wheel hubs - 1/32" total
Driving Boxes Steeled Cast Iron, with Elvin lubricators.
Journals, Diam. 8" Length 10"

Driving spring staples Wrot Iron.

Springs. Make B. L. W.

Front Engine Truck Four Wheeled Swing Bolster
To swing 2⅜" each side of cen. Cen. pin liners None
Journals, Diam. 5½" Length 10" Boxes Cast Iron
Wheels, Diam. 30" Tread ---- Kind Cast Iron Spoke Center
Tires Steel Cen. diam. 25" Size 2½"x 5½"
Tires held by Shrinkage & Shoulder.

Back Engine Truck None Wheeled -----
To swing ---- each side of cen. Cen. pin liners -----
Journals, Diam. ----- Length ----- Boxes -----
Wheels, Diam. ----- Tread ----- Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----

Brake, position On all Driving and Tender Wheels.
Operating Parts { Engine, Sch. A-1, West'g. Auto Air. / Eng. Tr'k, sch. -----
Foundation Parts { Drivers, sch. WY-2, American O. S. Equalized. / Eng. tr'k, sch. -----
Air pump One 9½" Pos. Left Side
Train connections Front and Back
Train signal, sch. J.

Tender Eight Wheeled, Drawing No. 365
Weight, with fuel and water, about 80,000 lbs.

Tank 4000 Gallons, Bill 2865
Tank "U" Shape, Straight Top. Fuel Cap. 6 tons.

Tool Boxes Hardwood, top.

Frame Oak and Yellow Pine

Front drawbar height 33⅛"

Back drawhead, center above rail 33½"
Coupler Jenney M. C. B. Automatic.

Pilot, Of Wood at rear.
Steps, handholds, etc. to conform to I. C. C. requirements.

Trucks Arch Bar, Steel Bolster.

Springs Elliptic, B. L. W.
Journals, Diam. 4½" Length 8"
Wheels, Diam. 33" Tread 4½" Kind Chilled Cast Iron Plate
Tires ----- Cen. diam. ----- Size -----
Tires held by -----
Safety chains Single

Brake Position On All Wheels.
Brake sch. PK-1012, West'g. Auto. Air, quick action.
8 30 C 698 SOLD TO M. MITCHKUN & CO. FOR TOLEDO-DETROIT R.R WITH CHANGES INDICATED BY * ORDERED THROUGH EXTRA WORK DEPARTMENT, ORDER NO. 10768 DATED 12-15-15. 12-14-15

List of tools, sch. 29 Bolts, nuts and threads B. L. W.
Photo sch. None Inspection B. L. W.
To be weighed No Material spec'ns B. L. W.
Certificate of boiler test Three copies of B. L. W. form 611.
Junior laws to 8-15-11 Shipment On Own Wheels.

Brass shop finish, No. 1.
Machine shop finish D-165.

Patent Plates	Dome	590867	Sept. 28, 1897. (Brass Plate)
	Boiler Seam	701777	June 3, 1902. (Brass Plate)
	Throttle	Patented	Jan. 23, 1900. (Cast On)
	Feed Pipe Strainer	Patented	Sept. 1, 1903. (Cast On)

* Property plates None B. L. W. FOR ENGINE AND TENDER

* **Painting:**—Engine, style ----- Black, No Striping.
Painting:—Tender, style ----- " " "

* Lettering, etc. in aluminum leaf.
~~Mark on tank sides, MIDLAND PENNSYLVANIA~~
* MARK ON TANK SIDES, TOLEDO - DETROIT R. R.

* No. Pos. * Road No. Name None
F. No. Plate 16
Sand Box
Back of tank.

HEREAFTER:- RAISE QUESTION AS TO DESIGN OF ASH PAN WHETHER TWO HOPPERS COULD NOT BE USED INSTEAD OF THREE (SEE 8 30 C 699 R.R.C. 1-5-16 Mfg.

THE BALDWIN LOCOMOTIVE WORKS AS SPEC'N C-3291

Memorandum Spec'n 10811

SPECIFICATION FOR LOCOMOTIVES 10 26 ½ D 141

FOR Tavares & Gulf Railroad Co.

Gen. as 5108 Except with Radley & Hunter Stack

Engine Drawing No. 33

12-16-15

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 10' 0" Driving 10' 0" Total 26' 0"
Total wheelbase, eng. and tend. { Actual 49' 10½" / Limited to ----

Rails 40 lbs.
Curves 14 degrees Grades 3½%

Limits, Height ---- Width ----
Weight (approximate in working order, Total 103,000 lbs.
On F. tr'k 13,000 lbs., Drivers 77,000 lbs., B. tr'k 13,000 lbs.

Tractive power 18,200 lbs., Ratio of adhesion 4.3
Work'g St'm Pres. 160 lbs., Service Passenger and Freight
Fuel Wood

Boiler Steel Thick ⅞" and 9/16" Bill 7619
Boiler, Diam. 52" Plan Extended Wagon Top
Boiler st'm pres. 180 lbs., Tested to { 200 lbs. steam pres. / 240 lbs. water pres.
Longitud. seams Butt jointed, double covering strips.

Dome, diam. 29" Pos. Forward of fire box

Firebox Steel Combustion chamb. None
Firebox, length 69-7/16" Width 34⅜" Depth F. 70" B. 67½"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diam.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Single Riveted
Water space stays ⅝" diam. with 3/16" hole 1½" deep from O. S.

Radial stays 1" diam. Sling stays front { Two rows of B.L.W. Expansion Stays.
Button heads below crown on Eight central rows
Crown bars None Placed ---- above crown
Crown bolts----
Furnace bearers to have 1½" holes drilled opposite staybolts. 4/27/16

Flues None
Tubes #12 W. G. Charcoal Iron
Tube ends Swaged for copper ferrules, fire box ends.
Number 178 Diam. 2" Length 13' 6½"

Heating Surface	Flues None	Combus. Chamb. None	Total 1366 sq. ft.
	Tubes 1254 sq. ft.	Fire Box 112 sq. ft.	Fire Brick Tubes----
Grate area 16.6 sq. ft.	Ratio to Heating Surface 1 : 82		
Superheater----			

Fire Brick ARCH None

Grates Plain bars and dead plates
Ash Pan, Dampers Front and Back

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Smokebox extension None Cleaning hole and cap None
Spark ejector or hopper None
Netting and deflect. plates None

Exhaust nozzles Double Lew
Cleaning Pipe, With
Stack Radley & Hunter Dia. 16" Hole in S. B., dia. 16½"

Safety Valves (Spec.) Two Star 3", One muffled
Safety valves None with relief lever, Set to { 160 lbs. muffled / 165 lbs. open
Whistle Chime

Steam Gauge One Iron 7" MAKER:- Star (spec)
Steam gauge stand Iron **Clock** None

Water Gauge One B.L.W. (Ironclad) **Cab Lamps** Electric (one each side)
Gauge Cocks Three Back Surface valve None
Lowest gauge cock 2½" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One Crane 2" (to use stock) POS:- Left Side
Cleaning Plugs
Firebox Corners, right side, front and back
Crown, Two each side and two back
Waist, One under front
Front tube sheet, One Fusible plug One

Pump None Pos. ----
Top chamb. ---- Bottom chamb. ----
Feed Cock ---- Feed pipes --
Checks ---- Check pipes ----

Injectors (Spec.) Two Sellers Class "P" No. 8½
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check Sellers Comb. main check and stop valve POS:- R. and L.

Steam Heat None
Cab light to be provided in usual position outside of centre of back board of cab. 4/27/16
Cab Steel Trap Ventilator in cab roof.
Large side cab windows to provide about two thirds open space.

Cab boards Steel Nosing T-Iron
Running boards Steel Nosing T-Iron
Hand rail Iron Located on Boiler

Back Bumper Bar Steel Back drawbar height 24"

Pilot Wood Pushing shoes None
Front Bumper Oak Bumper plate with
Steps, hand holds, etc. to conform to I.C.C. requirements.

Front Drawhead, Center above rail 32½"
Coupler M. C. B. Standard Automatic.

Signal fixtures Iron on bumper.

Headlight equipment, Pyle National Electric,
Headlight One Round Case 18" Reflector.
Headlight, Nos. on sides With H'd'l't step None
Lamp shelf None Nosing ---

Bell 65 pounds.
Sand Box Two Diam. 28" Body Iron Ptd. Pipes Iron
Sander (Spec.) Pettees Air in each box, to sand front and rear.

Dome casing Iron Painted

Boiler Jacket #22 Soft Steel Ptd Bands Iron Style 9
Boiler Lagging Magnesia Sectional

THE BALDWIN LOCOMOTIVE WORKS
E. C. Gunderson Feb. 1916

SPECIFICATION FOR LOCOMOTIVES 10 26 ½ D 141

FOR Tavares & Gulf Railroad Co.

Frames Cast Steel Braces Solid
Frames of extra heavy section for rough track
Cylinders, Diam. 15" Stroke 24"
St'm ports, Length 15" Width 1¼" Bridges 1"
Exh. ports, Length 15" Width 2½" Valve lead 3/16"
Valve travel 5½" Steam lap ½" Exhaust clearance ----
Eccentric crank throw 8 15/32"
S. P. Lubr. Detroit Triple #22 Bulls Eye.
Cyl'r heads Cast Iron; Lubr. pipes of iron under jacket
Cyl'r casings Iron Ptd. Head covers Steel Painted
St'm chest casings Iron Ptd. Covers Steel Painted
St'm chest valves Richardson Balanced, with vacuum valves
Met. pkg { Piston Rods / Valve Stems } U. S. (Spec.)

Pistons Cast iron rings sprung into solid head
Guides Steel Oil cups Adjustable Needle
Crossheads Cast Steel
Wrist Pins Steel Rod cups Plunger, forged on rods.
Parallel rods to have solid ends.

Valve Motion Walschaerts.
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W., except Bearings for driving and tender boxes to be of Damascus Bronze
Drivers, O. S. Diam. 46" Cen. diam. 40" Centres Cast Iron

Tires Steel Held by Shrinkage and shoulder
Tires, Flanged, Pos. All Size 3" x 5½"
Tires, Plain, Pos. None Size ----
Lateral play between driving boxes and wheel hubs- 1/16" total
Driving Boxes Cast steel with babbitted hub faces
Journals, Diam. 7" Length 8"

Springs. Make B. L. W.

Front Engine Truck Two Wheeled Swing Bolster
To swing 2½" each side of cen., Cen. pin liners None
Journals, Diam. 4½" Length 7½" Boxes Cast Iron
Wheels, Diam. 28" Tread 4½" Kind Chilled Cast Iron Spoke
Tires None Cen. diam.---- Size----
Tires held by ----

Back Engine Truck Two Wheeled Cushion Rear End Suspension type.
To swing 2½" each side of cen., Cen. pin liners None
Journals, Diam. 4½" Length 7½" Boxes Cast Iron
Wheels, Diam. 28" Tread 4½" Kind Chilled Cast Iron Spoke
Tires None Cen. diam.---- Size----
Tires held by ----

Brakes, position On all driving and tender wheels.
Operating Parts { Engine, Sch. #6-ET West'g Combined Auto. and Straight Air / Eng. Tr'k, sch.---- }
Foundation Parts { Drivers, sch. BL-1 American O. S. Equalized / Eng. Tr'k, sch. ---- }
Air pump One - 9½" Pos. Left Side
Train connections Front and Back
Train signal, sch. None

Tender Eight Wheeled, Drawing No. 918
Weight, with fuel and water, about 80,000 lbs.

Tank 4,000 Gallons, Bill 4096
Tank "U" Shape, straight top. Fuel Capacity 2½ Cords
Tender of the long low design. Fuel rack around top of tank
Tool Boxes Hard wood, top.

Frame Steel 8" and 10" Channels.

Front Drawbar height 30½"
Pilot None Pushing shoes None
Back drawhead, center above rail 33½"
Coupler M. C. B. Standard Automatic.

Steps, hand holds, etc. to conform to I. C. C. requirements.

Trucks Arch Bar type with Steel bolsters.

Springs Elliptic. B. L. W. make
Journals, Diam. 4½" Length 8"
Wheels, Diam. 33" Tread 4½" Kind Chilled Cast Iron Plate
Tires None Cen. diam.---- Size----
Tires held by ----
Safety chains Single

Brake Position On all wheels.
Brake sch. #6-ET West'g Auto. and Straight air with 10" x 12" tender cylinder.

List of tools, sch. 27
Photo sch. None Inspection by Alfred Lovell
To be weighed Yes Material spec'ns B. L. W.
Certificate of boiler test Three copies of B.L.W. form 1036
Junior laws to 1-25-16 Shipment On own wheels.

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. Patents { Throttle, Patented Jan. 23, 1900 (Cast on) / Feed Pipe Strainer, Patented Sept. 1, 1903 (Cast on) / Back Engine truck, 1,095,929 May 5, 1914 (Brass Plate) }

Property plates None

Painting: Engine, style 291 Olive Green and Aluminum
Painting—Tender, style 291 Olive Green and Aluminum

Mark on cab sides, T. & G. R. R.
Mark on tank sides, TAVARES & GULF

Road Nos. Pos. Road Nos. Name None
F. No. Plate 100
Dome and
Back of tank.

Herewith copy of letter of Dec. 6th, 1915 addressed to our Richmond office by J. R. Peebles, Gen'l Mgr., and details mentioned therein are to be followed.

29

10-26/4 ⑤ 141

THE BALDWIN LOCOMOTIVE WORKS AS SPEC'N C- 2817

Memorandum Spec'n 10499

SPECIFICATION FOR LOCOMOTIVES S 23 D 796

FOR Texas State Railroad

Gen. as Neg. 3984

7.12.15

Engine Drawing No. 72

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 12' 0" Driving 12' 0" Total 20' 3"
Total wheelbase, eng. and tend. { Actual 49' 4½" / Limited to -----

Curves -----

Limits, Height ----- Width -----
Weight (approximate) in working order, Total 122,000 lbs.
On F. tr'k 18,000 lbs., Drivers 104,000 lbs., B. tr'k ----- lbs.

Tractive power 24,500 lbs., Ratio of adhesion 4.2
Work'g St'm Pres. 180 lbs., Service Freight
Fuel Soft Coal

Boiler Steel Thick 9/16" Bill 7493
Boiler, Diam. 58" Plan Extended Wagon top
Boiler st'm pres. 180 lbs., Tested to { 200 lbs. steam pres. / 240 lbs. water pres.
Longitud. seams Butt jointed, double covering stripe, 90% seam

Dome, diam. 29" Pos. Forward of fire box

Firebox Steel Combustion chamb. None
Firebox, length 89-15/16" Width 41⅜" Depth F. 63½" B. 61"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diam.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Single Riveted
Water space stays 7/8" diam. with 3/16" hole 1½" Deep from O.S.
Flexible Stays:- 350 Tate in breaking zone.
Radial stays 1" diam. Sling stays front { Two rows of B. L. W. Expansion Stays
* Button heads below crown on Four central rows
Crown bars None Placed ----- above crown
Crown bolts -----
* Button head stays to have nuts screwed down tight on top of sheet

Tubes #12 W. G. Charcoal Iron or Steel
Tube ends Swaged for copper rings at fire box ends
Tubes, No. 244 Diam. 2" Length 11' 9"

Heating Surface, Tubes 1490sq Firebox 133sq Total 1623sq
Grate area 26sq Ratio to heat'g surface, 1 : 62
Superheater ----- Feed-water heater -----
Reheater ----- Fire brick tubes -----

Fire Brick arch None

Grates Rocking bars and drop plate
Ash Pan, Depth 28" Dampers Front and back

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Safety Valves (not spec'd) Two Coale, 2½"
Safety valves None with relief lever, Set to 180 pounds
Whistle B. L. W. plain

Steam Gauge One Iron 7" MAKER:-Ashcroft (not spec'd)
Steam gauge stand Iron **Clock** None

Water Gauge One B.L.W. (Ironclad) **Cab lamps** Electric
Gauge Cocks Three - Back Surface valve None
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome.
Blower Valve B. L. W.

Blow off Cock One B. L. W. POS:- Front
Cleaning Plugs
Firebox Corners, Diagonal
Crown, Two Right Side, 3 left side and two back
Waist, One under front
Front tube sheet, One FUSIBLE PLUG:- One

Pump None Pos. -----
Top chamb. ----- Bottom chamb. -----
Feed cock ----- Feed pipes -----
Checks ----- Check pipes -----

Injectors (not spec'd) Two Monitor No. 8
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check Sellers double with stop valve Pos. Top of boiler
Two 3½" globe valves on injector branch pipes, wheel on handle
Steam Heat None

Cab Steel

Cab boards Wood Nosing None
Running boards Wood Nosing None
Hand rail Iron Located on Boiler

Back Bumper bar Steel Back drawbar height 38"

Pilot Wood Pushing shoes None
Front Bumper Oak Bumper plate With
Steps, hand holds, etc. to conform to I.C.C. requirements

Front Drawhead, Center above rail 33½"
Coupler, M. C. B. auto.

Flag fixtures Iron on bumper

Headlight:- Pyle National Electric
Headlight One Round Case 16" Reflector, To burn -----
Headlight, Nos. on sides With H'd'l step With
Lamp shelf None Nosing -----

Bell 93 pounds
Sand Box One Diam. 28" Body Iron Frd. Pipes Iron
Sander Leach Air, Trap Act.

Dome casing Iron painted

Boiler Jacket gun Plate, steel Bands Iron Style 8
Boiler Lagging Magnesia Sectional

THE BALDWIN LOCOMOTIVE WORKS
Engineer J. F. Neale Aug 1912
SPECIFICATION FOR LOCOMOTIVES S 23 D 796
FOR Texas State Railroad

Frames Cast Steel Braces Solid

Cylinders, Diam. 19" Stroke 24"
St'm ports, Length 20⅜" Width 1¼" Bridges 3⅜"
Exh. ports, Length ----- Width ----- Valve lead 3/16"
Valve travel 5⅜" Stm. lap ⅞" Exh lap -----
Eccentric crank throw 10⅜"
S. P. Lubr. (not spec'd) Michigan Triple Sulle Sys { Iron pipes / under jacket
Cyl'r heads Cast Iron
Cyl'r casings Iron Painted Head covers Steel Painted
St'm chest casings ----- Covers -----
St'm chest valves 9½" Diam. Piston type, Inside admission
Met. pkg (not spec'd) United States (not spec'd)

Pistons Cast iron rings sprung into solid head
Rod Steel Oil cups Needle
Crossheads Cast Steel
Wrist Pins Steel Rod caps Plunger
Parallel rods to have solid ends.

Valve Motion Walschaerts
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 56" Cen. diam. 48" Centres Cast Iron
Wheel centres to have Bronze hub liners.
Tires Steel Held by Shrinkage and Shoulder
Tires, Flanged, Pos. Front and Back Size 3" x 5½"
Tires, Plain, Pos. Middle Size 3" x 6½"
Lateral play between driving boxes and wheel hubs - 1/16" total
Driving Boxes Cast Steel
Journals, Diam. 8" Length 8½"

Driving spring staples Wrot Iron

Springs, Make B. L. W.

Front Engine Truck Two Wheeled Swing Helster, { centre / bearing
To swing 4" each side of cen. Cen. pin liners None
Journals, Diam. 5" Length 8½" Boxes Cast Iron
Wheels, Diam. 28" Tread ----- Kind Cast Iron Spoke Centres
Tires Steel Cen. diam. 23" Size 2½" x 5½"
Tires held by Shrinkage and Shoulder

Back Engine Truck None Wheeled -----
To swing ----- each side of cen. Cen. pin liners -----
Journals, Diam. ----- Length ----- Boxes -----
Wheels, Diam ----- Tread ----- Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----

Brake, position On all driving and tender wheels.
Operating Parts { Engine, Sch. No. 6-ET West'g Combined Auto. and / Eng. Tr'k, sch. ----- Straight Air
Foundation Parts { Drivers, sch. EM-2 American C. S. Equalised / Eng. tr'k, sch. -----
Air pump Two 9½". Pos. Both on Left Side
Train connections Front and back
Train signal, sch. None

Tender Eight Wheeled, Drawing No. 435
Weight, with fuel and water, about 100,000 lbs.

Tank 5,000 Gallons, Bill 3561
Tank "U" shape, straight top. FUEL CAP. 8 tons.

Tool Boxes of wood, Top

Frame Steel, 10" channels.

Front drawbar height 32"

Back drawhead, center above rail 33½"
Coupler M. C. B. Auto.

Steps, hand holds, etc. to conform to I. C. C. requirements

Trucks Arch Bar type with Cast Steel bolsters.

Springs Elliptic. B. L. W.
Journals, Diam. 5" Length 9"
Wheels, Diam. 33" Tread 4½" Kind Chilled Cast Iron Plate
Tires None Cen. diam. ----- Size -----
Tires held by -----
Safety chains Single

Brake Position On all wheels.
Brake sch. No. 6 ET West'g Auto. and Straight Air with 13" x 12" tender cylinder.

List of tools, sch. 29 Bolts, nuts and threads B. L. W.
Photo sch. 2 Inspection B. L. W.
To be weighed Yes Material spec'ns B. L. W.
Certificate of boiler test Three copies of B. L. W. form 611
Junior laws to 8.4.15 Shipment On own wheels

* Brass shop finish, No. 1
Machine shop finish D-165
* Particular attention to be given to general lines, finish, striping, lettering, etc. as this will be more of an exhibition locomotive

Patent { Throttle, Patented Jan. 23, 1900 (Cast on)
Plates { Feed Pipe Strainer, Patented Sept. 1, 1903 (Cast on)

Property plates None

Painting:—Engine, style 291 Olive Green and Aluminum
Painting:- Tender, style 291 Olive Green and Aluminum

* Mark on cab Panel, T. S. R. R.
Mark on tank collar, TEXAS STATE RAILROAD

Road numbers on tank sides to be of large size
No. Pos. Road No. Name None
F. No. Plate 7
Sand Box
Sides of tank

THE BALDWIN LOCOMOTIVE WORKS Dup. 10-26½ D 111 WITH SAME EXTRAS EXCEPT AS OTHERWISE SPECIFIED.

Memorandum Spec'n 11241

SPECIFICATION FOR LOCOMOTIVES 10 26½ D 146

FOR TEXAS, OKLAHOMA & EASTERN RAILROAD COMPANY

R.

12-7-16 Engine Drawing No. 37

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 10' 0" Driving 10' 0" Total 26' 0"
Total wheelbase, eng. and tend. { Actual 47' 3" / Limited to ——
RAILS, 56 POUNDS PER YARD. ROUGH TRACK
Curves 30 DEGREES

Limits, Height —— Width ——
Weight (approximate) in working order, Total 104,500 LBS.
On F. tr'k 13,000 lbs., Drivers 77,500 lbs., B. tr'k 14,000 lbs.

Tractive power 20,200 lbs., Ratio of adhesion 3.8
Work'g St'm Pres. 180 lbs., Service FREIGHT AND SWITCHING
1 **Fuel** OIL

FRONT TUBE SHEET TO BE ½" THICK
Boiler STEEL Thick ½" & 9/16" Bill 6326
Boiler, Diam. 52" Plan EXTENDED WAGON TOP
Boiler st'm pres. 180 lbs., Tested to { 200 lbs. steam pres. / 240 lbs. water pres.
WITH FACTOR OF SAFETY OF 4.9
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS

Dome, diam. 29" Pos. FORWARD OF FIRE BOX

1 ~~Firebox~~ STEEL Combustion chamb. None
Firebox, length 69-7/16" Width 34 1/16" Depth F. 70" B. 67½"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back 5/16"
Firedoor opening 16" DIAM. CROWN AND SIDES IN ONE PIECE
Water space, Front 4" Sides 3" Back 3"
Water space, Frame SINGLE Riveted
Water space stays ⅞" DIAM. WITH 3/16" HOLES 1¼" DEEP FROM O.S.

Radial stays 1" DIAM. Sling stays front { TWO ROWS OF B. L. W. EXPANSION STAYS
Button heads below crown on EIGHT central rows
Crown bars NONE Placed ——— above crown
Crown bolts ———

Flues ———
Tubes #12 W. G. CHARCOAL IRON OR STEEL
Tube ends SWAGED FOR COPPER FERRULES FIRE BOX ENDS
Number 178 Diam. 2" Length 13' 6½"

Heating Surface	Flues ———	Combus. Chamb. ———	Total 1368 sq. ft.
	Tubes 1254 sq. ft.	Fire Box 112 sq. ft.	Fire Brick Tubes ———
Grate area 16.6 sq. ft.		Ratio to Heating Surface 1 : 82	
Superheater ———			

Fire Brick ARCH, NONE
FIREBOX LINED WITH FIRE BRICK
FIRE BRICK PAVEMENT IN ASH PAN
1 **Grates** NONE
Ash Pan, Dampers FRONT ONLY

Throttle BALANCE Pos. DOME
Dry pipe STEEL

Superheater NONE

Smokebox extension WITH Cleaning hole and cap NONE
Spark ejector or hopper NONE
Netting and deflect. plates NONE

Exhaust nozzles DOUBLE, LOW
CLEANING PIPE, WITH
Drum STRAIGHT Dia. 16" Hole in S. B., dia. 18"

Safety Valves (Spec) TWO CROSBY 2½"
Safety valves NONE with relief lever, Set to 180 POUNDS
Whistle B. L. W. PLAIN

5 **Steam Gauge** ONE IRON 7" MAKER:—ASHCROFT (NOT Spec)
Steam gauge stand IRON Clock NONE

Water Gauge ONE B.L.W. (IRONCLAD) **Cab Lamps** ELECTRIC (SPEC. 2)
Gauge Cocks THREE BACK Surface valve NONE
Lowest gauge cock 3" above highest part of crown
Lubricator steam valve WITHOUT separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock ONE BRIDLE, POS:—LEFT SIDE
Cleaning Plugs
Firebox CORNERS, RIGHT SIDE, FRONT AND BACK
Crown, TWO EACH SIDE AND TWO BACK
Waist, ONE UNDER FRONT
Front tube sheet, ONE Fusible plug ONE

Pump NONE Pos. ———
Top chamb. ——— Bottom chamb. ———
Feed Cock ——— Feed pipes ———
Checks ——— Check pipes ———

INJECTORS SELF ACTION TYPE SUITABLE FOR HOT WATER
3 **Injectors** TWO SELLERS, CLASS "K" (Spec) No. 7½
Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER
Pipes, Check IRON Feed IRON Overflow IRON
Check B. L. W. Pos. RIGHT AND LEFT

Steam Heat NONE

1 **Cab** STEEL, LINED WITH WOOD, VENTILATOR IN CAB ROOF

Cab boards WOOD Nosing ANGLE IRON
Running boards WOOD Nosing NONE
Hand rail IRON Located on BOILER

1 **Back Bumper** BAR STEEL Back drawbar height 34"

Pilot WOOD Pushing shoes NONE
Front Bumper OAK Bumper plate WITH
5 **Steps,** HAND HOLDS, ETC. TO CONFORM TO I.C.C. REQUIREMENTS

Front Drawhead, Center above rail 33½"
5 **Coupler** SHARON M. C. B. AUTO. WITH 13" FACE

Signal fixtures IRON ON BUMPER

HEADLIGHT EQUIPMENT TO BE AMERICAN ELECTRIC WITH ARC HEADLIGHT.
Headlight ONE ROUND CAGE 18" Reflector R.S.nec 5/11/17.
Headlight, Nos. on sides WITH H'dl't step NONE
Lamp shelf NONE Nosing ———

Bell 85 POUNDS
6 **Sand Box** (NOT Spec) TWO Diam. 28" Body IRON PAINTED Pipes IRON
Sander LEACH AIR TRAP A-1, TO SAND FRONT AND BACK

Dome casing IRON PAINTED

1 **Boiler Jacket** #22 PLAN. STEEL Bands IRON Style 9 AND 14
1 **Boiler Lagging** MAGNESIA SECTIONAL
BACKHEAD OF BOILER TO BE LAGGED AND JACKETED

THE BALDWIN LOCOMOTIVE WORKS
SPECIFICATIONS FOR LOCOMOTIVES 10 26½ D 146
W. E. Moore June 1917 3321

SPECIFICATION FOR LOCOMOTIVES 10 26½ D 146

FOR TEXAS, OKLAHOMA & EASTERN RAILROAD COMPANY

R.

FUEL BURNER TO BE "BEST TYPE"

Frames CAST STEEL Braces SOLID

Cylinders, Diam. 16" Stroke 24"
St'm ports, Length 15" Width 1¼" Bridges 1"
Exh. ports, Length 15" Width 2½" Valve lead 3/16"
Valve travel 5¼" Steam lap ⅞" Exhaust clearance ———
Eccentric crank throw 9½" By-pass valve NONE
S. F. Lubr. (Spec) NATHAN TRIPLE #9 BULLS EYE
Cyl'r heads CAST IRON; LUBR. PIPES OF IRON UNDER JACKET
Cyl'r casings IRON PTD. Head covers STEEL PAINTED
St'm chest casings IRON PTD. Covers STEEL PAINTED
St'm chest valves RICHARDSON BALANCED, WITH VACUUM VALVES
Met. pkg { PISTON RODS / VALVE STEMS } JEROME (Spec)

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD
Guides STEEL Oil cups NEEDLE
Crossheads CAST STEEL WITH BRASS BEARINGS.
Wrist Pins STEEL Rod cups GREASE CUPS FORGED ON
PARALLEL RODS TO HAVE SOLID ENDS

8 **Valve Motion** WALSCHAERTS
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.
DRIVING WHEELS WITHOUT HUB LINERS
Drivers, O. S. Diam. 46" Cen. diam. 40" CENTERS CAST IRON

Tires STEEL Held by SHRINKAGE AND SHOULDER
Tires, Flanged, Pos. ALL Size 3" X 5½"
Tires, Plain, Pos. ——— Size ———
Lateral play between driving boxes and wheel hubs — 1/16" TOTAL
Driving Boxes CAST IRON, FITTED WITH OIL CELLARS
Journals, Diam. 7" Length 8"

10 **Springs.** Make B. L. W.

Front Engine Truck TWO Wheeled SWING BOLSTER, CEN. BEARING
To swing 5" each side of cen., Cen. pin liners NONE
9 Journals, Diam. 4½" Length 7½" Boxes CAST IRON
Wheels, Diam. 28" Tread 1¼" Kind CHILLED CAST IRON PLATE
Tires NONE Cen. diam. ——— Size ———
Tires held by ———

10 **Back Engine Truck** TWO Wheeled SWING BOLSTER, SIDE BEARING
To swing 5½" each side of cen., Cen. pin liners NONE
9 Journals, Diam. 4½" Length 7½" Boxes CAST IRON
Wheels, Diam. 28" Tread 1¼" Kind CHILLED CAST IRON PLATE
Tires NONE Cen. diam. ——— Size ———
Tires held by ———

Brake, position ON ALL DRIVING AND TENDER WHEELS
Operating Parts { Engine, Sch. No. 6 ET, WEST'G. COMBINED AUTO. AND STRAIGHT AIR / Eng. Tr'k, sch. ———
Foundation Parts { Drivers, sch. WM-1 AMERICAN OUTSIDE EQUALIZED / Eng. Tr'k, sch. ———
Air pump ONE 9½" Pos. LEFT SIDE
Train connections FRONT AND BACK
Train signal, sch. NONE
AIR RESERVOIR TO HAVE HYDROSTATIC TEST OF 210 LBS. 9/14/17.
CERTIFICATES DATED MAR. 5TH 1917 COVERING TEST OF RESERVOIR NOS. 9167-9168 FURNISHED BY WEST'G. AIR BRAKE CO., ARE FILED IN MAIN OFFICE. FILE No. 13109

20 **Tender** EIGHT Wheeled, Drawing No. 724
Weight, with fuel and water, about 60,000 POUNDS

21 **Tank** { OIL 1500 Gallons, Bill 3350 / WATER 3000 4427
TANK "U" SHAPE, STRAIGHT TOP

Tool Boxes HARD WOOD, TOP AND BACK

Frame STEEL 8" CHANNELS

24 Front Drawbar height 31"
20 Pilot NONE Pushing shoes NONE
Back drawhead, center above rail 33½"
Coupler SHARON M. C. B. AUTO. WITH 13" FACE

30 Steps, HAND HOLDS, ETC. TO CONFORM TO I.C.C. REQUIREMENTS

31 **Trucks** ARCH BAR TYPE WITH CAST STEEL BOLSTER
SIDE BEARINGS ON BOTH TRUCKS
Springs ELLIPTIC. B. L. W. MAKE
Journals, Diam. 3¾" Length 7"
Wheels, Diam. 33" Tread 4½" Kind CHILLED CAST IRON PLATE
Tires NONE Cen. diam. ——— Size ———
Tires held by ———
Safety chains DOUBLE

Brake Position ON ALL WHEELS
Brake sch. No. 6 ET-WEST'G. AUTO. AND STRAIGHT AIR WITH 10" X 12" TENDER CYLINDER

List of tools. sch. 28, TWO ALEXANDER RERAILERS FOR 60 POUND RAIL
Photo sch. #2 Inspection B. L. W.
To be weighed YES Material spec'ns B. L. W.
Certificate of boiler test THREE COPIES OF B.L.W. FORM 1036
Junior laws to 4-1-17 Shipment ON OWN WHEELS

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. Patents: FEED PIPE STRAINER, PATENTED SEPT. 1, 1903 (CAST ON)

Property plates B. L. W. FOR ENGINE AND TENDER

Painting:—Engine, style 291, OLIVE GREEN AND GOLD
Painting:—Tender, style 291, OLIVE GREEN AND GOLD

LETTERING, ETC., TO BE SAME STYLE AS FOR 12-3¼ E 20
Mark on SIDES OF CAB, D. & E.
MARK ON SIDES OF TANK COLLAR, D. & E.

Road Nos. Pos.	Road Nos.	Name NONE
F. No. PLATE	207	
DOME		
SIDES OF TANK		
BACK OF TANK		

SPECIFICATION FOR LOCOMOTIVES 10 26½ D 146

FOR TEXAS, OKLAHOMA & EASTERN RAILROAD COMPANY

R.

1 OIL BURNER TO BE "BEST TYPE" PLACED IN FRONT OF FIRE BOX, AND OMIT THE FIRE BRICK ARCH.

2 INCANDESCENT LIGHTS TO BE PROVIDED IN CAB FOR GAUGES AND FIREDECK.

3 SYPHON VALVE IN RIGHT SIDE OF CAB (SEE SUP 27) McLAUGHLIN FLEXIBLE METALLIC CONNECTION BETWEEN ENGINE AND STEAM-SYPHON, LOCATED ON TENDER. (SEE SUP. 28)

4 FACE OF WEDGE ON CHAFING BLOCK ON ENGINE TO BE 10" X 18" AND CHAFING BLOCK ON TENDER TO BE 8" X 10" (SEE SUP 29)

5 LOCOMOTIVE TO CONFORM TO ALL I. C. C. REQUIREMENTS FOR BOTH SWITCHING AND ROAD SERVICE.

6 SAND PIPES TO BE LARGE, SAME AS FOR 10-26½ D 107 AND 111.

7 BOILER LAGGING AND JACKET NOT TO BE APPLIED OVER STAY BOLTS OUTSIDE OF CAB. THESE BOLTS ARE TO BE LEFT EXPOSED. BOILER HEAD JACKETING IN CAB TO BE APPLIED IN SECTIONS SO AS TO BE READILY REMOVABLE FOR INSPECTION OF STAY BOLTS.

8 VALVE GEAR TO BE DESIGNED TO GIVE MAXIMUM CLEARANCE ABOVE RAIL AND TO BE COMPACT AS POSSIBLE.

9 FRONT AND BACK TRUCK JOURNALS TO BE EQUIPPED FOR OIL INSTEAD OF FOR GREASE LUBRICATORS.

10 EQUALIZING LINK CONNECTIONS TO BACK TRUCK TO BE ARRANGED TO GIVE LIBERAL VERTICAL PLAY FOR ROUGH TRACK. FULCRUM CASTING FOR EQUALIZER TO BACK TRUCK TO BE MADE OF CAST STEEL.

TENDER

26 TENDER TO BE SAME SHAPE AS FOR 10-26½ D 107, 110 AND 111, AND TO BE DUPLICATE OF 10-26½ D 111, EXCEPT AS OTHERWISE SPEC'D.

27 SYPHON TO BE MADE BY LIMA LOCOMOTIVE & MACHINERY COMPANY, HAVING 4" SUCTION (RY.CO. TO PROVIDE HOSE FOR SYPHON) SYPHON TO BE LOCATED UNDER TENDER, BETWEEN THE TRUCKS JUST INSIDE OF OUTSIDE SILL. DISCHARGE PIPE TO BE FLARED THROUGH BOTTOM SHEET OF TANK UP THROUGH THE TOP SHEET AND BACK DOWN THROUGH THE TOP SHEET IN ORDER TO PREVENT WATER SPLASHING BACK OUT THROUGH SYPHON.

28 McLAUGHLIN FLEXIBLE METALLIC CONNECTION BETWEEN ENGINE AND STEAM SYPHON, LOCATED ON TENDER (SEE SUP. 3)

29 FACE OF WEDGE ON CHAFING BLOCK ON ENGINE TO BE 10" X 18" AND CHAFING BLOCK ON TENDER TO BE 8" X 10" (SEE SUP. 4)

30 OMIT PILOT ON REAR OF TENDER AND APPLY FOOT BOARD AND HAND RAIL.

31 TENDER TRUCKS TO HAVE INSIDE HUNG BRAKES, WITH PARTICULAR ATTENTION TO BRAKE GEAR TO PREVENT LOCKING OF SHOES AGAINST WHEELS WHEN SHOE IS WORN DOWN AND WITH MAXIMUM CLEARANCE ABOVE RAIL AND TIES.

FOR HEREAFTER:-

Apply a Cast Steel crosstie on pedestal leg for transverse frame bracing instead of the forged crosstie and plate construction. R.S.Mec 5.11.17

Springs to be strengthened - see letter 6/7/17 from Wm. M. Deal, J.R.C.- 6.20.17.

THE BALDWIN LOCOMOTIVE WORKS Dup. 10 26 D 140, with some entries
Memorandum Spec'n 16648 Except as otherwise specified.

SPECIFICATION FOR LOCOMOTIVES 10 26 D 142 - 143

FOR Sugar Land Ry. Co. Engine Drawing No. 37

R. 1-12-16.

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 21' 3"
Total wheelbase, eng. and tend. {Actual 50' 7" / Limited to ——

Curves ——

Limits, Height —— Width ——
Weight (approximate) in working order, Total 110,000 lbs.
On F. tr'k 25,000 lbs., Drivers 85,000 lbs., B. tr'k —— lbs.

Tractive power 18,950 lbs., Ratio of adhesion 4.48
Work'g St'm Pres. 180 lbs., Service Passenger and Freight.
Fuel Oil
Oil burner placed in front of fire box. Royalty, if any, on oil burning arrangement payable by B. L. W.
Boiler Steel Thick ½" and ⅝" RH 7668
Boiler, Diam. 52" Plan Extended Wagon Top
Boiler st'm pres. 180 lbs., Tested to {200 lbs. steam pres. / 240 lbs. water pres.
Longitud. seams Butt jointed, double covering strips.

Dome, diam. 29" Pos. Forward of fire box.

Firebox Steel Combustion chamb. None
Firebox, length 85-3/16" Width 39⅜" Depth F. 64⅝" B. 62⅝"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back 5/16"
Firedoor opening 16" diam. Crown and sides in one piece.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Single Riveted
Water space stays ⅝" diam. with 3/16" hole 1⅛" deep from O.S.
Water space stays of Ulster special staybolt iron.
Radial stays 1" diam. Sling stays front {Two rows of B. L. W. Expansion Stays.
Button heads below crown on six central rows
Crown bars None Placed —— above crown
Crown bolts ——

{Flues None
Tubes #12 W. G. Charcoal Iron or Steel.
Tube ends Swaged for copper ferrules, firebox ends.
Number 198 Diam. 2" Length 12' 4"
Particular attention to be given to Tube setting and boiler work as Co. had trouble in this respect with 10 26 D 1161

Heating Surface	Flues None	Combus. Chamb. None	Total 1428⁰	
	Tubes 1315⁰	Fire Box 128⁰	Fire Brick Tubes ——	
Grate area 19.7⁰	Ratio to Heating Surface 1 : 73			
Superheater ——				

Fire Brick pavement in Pan.
Fire box lined with fire brick for oil burning.

Grates None.
Ash Pan, Dampers None.

Throttle Balance Pos. Dome.
Dry pipe Steel

Superheater None

Smoke box to be extended to provide for coal fuel.
Smokebox extension With Cleaning hole and cap L.S. only.
Spark ejector or hopper With
Netting and deflect. plates None.

Exhaust nozzles Double Leg.
Cleaning pipes With
Stack Straight Dia. 17" Hole in S. B. dia. 17½"
Stack to be exactly same as for 10 26 D 116.

Safety Valves (not spec.) Two Consolidated 2½"
Safety valves None with relief lever, Set to 180 lbs.
Whistle B. L. W. plain.

Steam Gauge One Iron 7" Maker:-Ashcroft. (not spec.)
Steam gauge stand Iron **Clock** None.

Water Gauge One Klinger **Cab Lamps** Electric.
Gauge Cocks Three Back Surface valve None
Lowest gauge cock 3" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One B. L. W. Pos:-Front
Cleaning Plugs
Firebox Corners, diagonal, sides and back.
Crown, Three each side and two back.
Waist, One under front.
Front tube sheet, Two Fusible plug One

Pump None Pos. ——
Top chamb. —— Bottom chamb. ——
Feed Cock —— Feed pipes ——
Checks —— Check pipes ——

Injectors (not spec.) Two Hancock Type "A" No. 7
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. Right and Left.
R.R.Co. report to exhibit check of Engine riding on drawing from Test Room. Yes plans and prescription sheets of Feed Water Heater

Steam Heat None

Cab Steel.

Cab boards Wood Nosing None
Running boards Wood Nosing None
Hand rail Iron Located on Boiler.

Back Bumper Bar Steel Back drawbar height 32½"
Pilot braced with iron, with pilot knife as Ry. Co's sketch received, February 4th 1916.
★**Pilot** Wood Pushing shoes None
Front Bumper Oak Bumper plate With
★**Steps**, hand holds etc., to conform to I. C. C. requirements.

Front Drawhead, Center above rail 33½"
Coupler M. C. B. Automatic.
Safety appliances to meet requirements of the I. C. C. Commission which became effective Jan. 1, 1916.
Signal fixtures Iron on bumper.

Headlight equipment, Pyle National Electric.
Headlight One Round Case 18" Reflector.
Headlight, Nos. on sides With H'd'l't step With
Lamp shelf None Nosing ——

Bell 85 pounds.
Sand Box One Diam. 28" Body Iron Painted. Pipes Iron
Sander Leach Air A & D combination to sand front and rear.

Dome casing Iron Painted.

Boiler Jacket #22 Soft Steel Pt. Bands Iron Style 9
Boiler Lagging Magnesia Sectional.

THE BALDWIN LOCOMOTIVE WORKS
E. H. Kalbach March 1916
SPECIFICATION FOR LOCOMOTIVES 10 26 D 142 - 143
FOR Sugar Land Ry. Co.

Frames Steel Braces Solid

Cylinders, Diam. 19" Stroke 24"
Sl'm ports, Length 16" Width 1½" Bridges 1"
Exh. ports, Length 16" Width 2½" Valve lead 2/16"
Valve travel 5" Steam lap ⅞" Exhaust clearance ——
Eccentric crank throw 10⅝"
S. P. Lubr. Detroit Triple #22 Bulls Eye.
Cyl'r heads Cast Iron Lubr. pipes of copper under jacket.
Cyl'r casings Iron Pt'd. Head covers Steel Painted.
St'm chest casings Iron Pt'd. Covers Steel Painted.
St'm chest valves Richardson balanced with vacuum valves.
Met. pkg {PISTON RODS / VALVE STEMS} UNITED STATES. (not spec.)

Pistons Cast Iron rings sprung into solid head.
Guides Steel Oil cups Needle.
Crossheads Cast Steel
Wrist Pins Steel Rod cups Plunger
Parallel Rods to have solid ends.

Valve Motion Walschaerts.
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of Iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 56" Cen. diam. 50" Centres Cast Iron

Tires Steel Held by Shrinkage & Shoulder
Tires, Flanged, Pos. All Size 3" x 6½"
Tires, Plain, Pos. None Size ——
Lateral play between driving boxes and wheel hubs - 1/16" total.
Driving Boxes Cast Steel with brass hub liners.
Journals, Diam. 7" Length 8"

Springs. Make B. L. W.

Front Engine Truck Four Wheeled Swing Bolster.
To swing 4½" each side of cen., Cen. pin liners None.
Journals, Diam. 4½" Length 8" Boxes Cast Iron
Wheels, Diam. 28" Tread —— Kind Cast Iron Spoke centers.
Tires Steel Cen. diam. 28" Size 3½" x 6½"
Tires held by Shrinkage and Shoulder
BACK ENGINE TRUCK None

✱ D. J. Louis Jr., Secy. to W. J. Wayte, Incorporated No. 1 Liberty Street, New York City is to be notified three or four days in advance of the time the boilers are ready for inspection. We are also to telegraph St. Louis office about two weeks in advance of the date of shipment of locos. so they can arrange to have Mr. W. T. Eldridge come here to look the locomotives over before they leave these works.

Brake, position On all driving and tender wheels.
Operating Parts | Engine, Sch. #6 ET-West'g Combined Auto. and Eng. Tr'k, sch—— Straight Air
Foundation Parts | Drivers, sch. Wi-1 American O. S. Equalized. Eng. Tr'k, sch——
Air pump Cos - 9½" Pos. Left Side.
Train connections Front and Back.
Train signal, sch. L

★ One of the locos.is to be used in switching service temporarily. Equip same with foot board at front of engine and rear of tender. Pilot for front of engine however, is to be provided, all necessary holes to be drilled for its application, and loaded on tender of the loco. to go forward when loco. is shipped. When loco. is put in Road service, Ry.Co. will remove step on front of engine and apply the pilot.

Tender Eight Wheeled, Drawing No. 435
Weight, with fuel and water, about 90,000 lbs.
Tender to be of long low design.
Tank {Oil 2000 Gallons, Bill 4128 / Water 4500 4127
Tank "U" shape, straight top.

Tool Boxes of hard wood, Top.
Frame to have steel plate end beams at front and rear.
Frame Steel 10" Channels. Underframe of tender to be same design and construction as for 10 26 ½ D 140.
Front Drawbar height 32½"
Pilot None Pushing shoes None
Back drawhead, center above rail 33½"
Coupler M. C. B. Automatic.

Steps, hand holds etc. to conform to I. C. C. requirements.

Trucks Arch Bar type with steel bolster.

Springs Elliptic. B. L. W. make.
Journals, Diam. 4½" Length 8"
Wheels, Diam. 33" Tread 4½" Kind Chilled Cast Iron plate.
Tires —— Cen. diam. —— Size ——
Tires held by ——
Safety chains Single.

Brake Position On all wheels.
Brake sch. #6 ET-West'g Auto. and Straight Air with 10" x 12" tender cylinder.

List of tools, sch. 31
Photo sch. 2 Inspection (See note ✱) and ✱
To be weighed Yes. Material spec'ns B. L. W.
Certificate of boiler test Three copies of B.L.W. form 1036.
Junior laws to 3-1-16. Shipment On own wheels. (see note ★)

Brass shop finish, No. 1
Machine shop finish D-165.

✱ Boiler to be inspected by the Hartford Steam Boiler Inspection and Insurance Co. 3-21-16.

B. L. W Patents {Throttle, Patented Jan. 23, 1900 (Cast On) / Feed Pipe Strainer, Patented Sept. 1, 1903 (Cast On)

Property plates B. L. W. for engine and tender.

Painting:—Engine, style 291 Olive Green and Aluminum.
Painting:—Tender, style 291 Olive Green and Aluminum.

Mark on cab sides, S. L. RY.

Road Nos. Pos.	Road Nos.	Name None
F. No Plate	6	
Sand Box	7	
Sides of tank.		
Back of tank.		

THE BALDWIN LOCOMOTIVE WORKS AS SPECIFICATION 0-3785

Memorandum Spec'n 10488

SPECIFICATION FOR LOCOMOTIVES 10 30 D 655

FOR Red River & Gulf Railroad Company

Gen. as Nos. 4269 {Except to have two sand boxes and wood rack on tank

Engine Drawing No. 68

6.14.15

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 11' 4" Driving 11' 4" Total 22' 2"
Total wheelbase, eng. and tend. {Actual 51' 1" / Limited to -----
Rails 45 and 60 pounds
Curves -----

Limits, Height ----- Width -----
Weight (approximate) in working order, Total 127,000 lbs.
On F. tr'k 28,000 lbs., Drivers 99,000 lbs., B. tr'k ----- lbs.

Tractive power 24,790 lbs., Ratio of adhesion 3.99
Work'g St'm Pres. 180 lbs., Service Freight
Fuel Wood

Locomotive to meet all I.C.C. requirements for main line work
Boiler Steel Thick ⅜" & 11/16" Bill 7468
Boiler, Diam. 58" Plan Extended Wagon Top
Boiler st'm pres. 200 lbs., Tested to {220 lbs. steam pres. / 267 lbs. water pres.
Longitud. seams Butt jointed, double covering strips

Dome, diam. 29" Pos. Forward of fire box

Firebox Steel Combustion chamb. None
Firebox, length 95-15/16" Width 33⅜" Depth F. 67⅜" B. 54⅜"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diameter
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Single Riveted
⊙ Water space stays ⅜" diam. with 3/16" hole 1½" deep from O. S.

Radial stays 1" diam. Sling stays front {Two Rows of B.L.W. Expansion Stays
Button heads below crown on Eight central rows
Crown bars None Placed ----- above crown
Crown bolts -----
⊙ All bearer pads, etc. to be applied so that stay bolts can be inspected without removing.
Tubes #11 W. G. Charcoal Iron or Steel
Tube ends Swaged for copper rings fire box ends.
Tubes, No. 260 Diam. 2" Length 13' 1"
Tubes to have ⅜" spacing.

Heating Surface, Tubes 1770^{sq} Firebox 146^{sq} Total 1916^{sq}
Grate area 22.2^{sq} Ratio to heat'g surface, 1 : 86.3

⊙ Hollow stay bolts to be applied where the engine frames interfere with inspection of same

Fire Brick arch None
△ Provision to be made so that R.R.Co. can change to Coal burning rocking grates. Furnish and apply levers and rigging for operating Rocking Grates, but do not furnish the grates.
Grates Plain Bars and dead plates, for Wood.
Ash Pan, Depth F.17", B.28" Dampers Front and Back

Throttle Balance Pos. Dome
Dry pipe Wrot Iron or Steel

Superheater None
△ Smoke box to be extended so loco. can be changed to burn coal but do not furnish high exhaust nor netting, etc. for coal.
Smokebox extension Ith Cleaning hole and cap L. S. only
Spark ejector or hopper With
Netting and deflect. plates None

Exhaust nozzles Double - Low
Cleaning pipe, - With
Stack Bailey & Hunter Diam. 18" Hole in S.B. 19½"

Safety Valves (NOT SPEC) Two Coale, 3½"
Safety valves None with relief lever, Set to 180 lbs.
Whistle B. L. W.

Steam Gauge One Iron, 7" MAKER:- Ashcroft (NOT SPEC)
Steam gauge stand Iron **Clock** None

Water Gauge One B.L.W. (Ironclad) **Cab lamps** Electric
Gauge Cocks Three - Back Surface valve None
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome.
Blower Valve B. L. W.

Blow off Cock One Crane 2" (to use stock) POS:- Front
Cleaning Plugs
Firebox Corners, back ones diagonal, and back
Crown, Two each side and three back
Waist, One under front
Front tube sheet, Two **FUSIBLE PLUG:-** One

Pump None Pos. -----
Top chamb. ----- Bottom chamb. -----
Feed cock ----- Feed pipes -----
Checks ----- Check pipes -----

Injectors (NOT SPEC) Two Monitor No. 9
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. Right and Left

Steam Heat None

Cab, Steel, lined with wood
Cab to be large and roomy

Cab boards Steel Nosing T-Iron
Running boards Steel Nosing T-Iron
Hand rail Iron Located on Boiler

Back Bumper Bar Steel Back drawbar height 33½"
☆ Chafing plates between Eng. and Tend. to be given special attention for operation on rough track
Pilot Wood Pushing shoes None
Front Bumper Oak Bumper plate With
Steps, hand holds, etc., to conform to I. C. C. requirements.
Coupler, - M.C.B. Auto. with knuckle as deep as possible, i.e. 15" having slot for use with link and pin 32⅝" centre above rail. Slot to be exceptionally wide to accommodate as large a coupling bar as possible without weakening the knuckle.

Flag fixtures Iron on bumper
Headlight Equipment:- Pyle National Electric with switches conveniently located in cab to control same.
Headlight Two Round Case 16" Reflector, To burn -----
Headlight, Nos. on sides With H'd'l't step With
Lamp shelf None Nosing -----

Bell 92 pounds
Sand Box Two Diam. 28" Body Iron Painted Pipes Iron
Sander {(NOT SPEC) Leach Air. Trap A-1, in each box to sand front and rear

Dome casing Iron Painted
Boiler Jacket {#22 Soft Steel Painted Bands Iron Style 9
Boiler Lagging Magnesia Sectional
Lagging over stay bolts to be removable.

THE BALDWIN LOCOMOTIVE WORKS
Engine J. S. Bird
SPECIFICATION FOR LOCOMOTIVES 10 30 D 655
FOR Red River & Gulf Railroad Co.

✱ **Frames** Cast Steel Braces Solid
Frames to be extra heavy for hard service
Cylinders, Diam. 18" Stroke 26"
St'm ports, Length 16" Width 1½" Bridges 1"
Exh. ports, Length 16" Width 2½" Valve lead ⅛"
Valve travel 5" O. S. lap ⅞" Ins. lap -----
Eccentric crank throw 11½"
S. F. Lubr. (NOT SPEC) Michigan Triple Bull's Eye {Iron pipes under jacket
Cyl'r heads Cast Iron
Cyl'r casings Iron Ptd. Head covers Steel Painted
St'm chest casings Iron Ptd. Covers Steel painted
St'm chest valves Richardson Balanced, with Vacuum Valves
Met. pkg {PISTON ROD / VALVE STEMS} U. S. (NOT SPEC)

Pistons Cast Iron rings sprung into solid head
Guides Steel Oil cups Needle
Crossheads Cast Steel
Wrist Pins Steel Rod cups Plunger forged on
Parallel rods to have solid ends.

Valve Motion Baker gear
{Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.
✱ Wheel clearance to be ample to prevent rubbing O.S. of firebox and frames when engine has worn to limit of lateral motion.
All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 52" Cen. diam. 44" Centres Cast Iron

Tires Steel Held by Shrinkage and Shoulder
Tires, Plain, Pos. Front and Rear Size 4" x 5½"
Tires, Plain, Pos. Middle Size 4" x 6½"
Lateral play between driving boxes and wheel hubs - 1/16" total
Driving Boxes Cast Steel
Journals, Diam. 8½" Length 8½"

Driving spring staples Wrot Iron
✱ Spring and Equal Beams to be extra heavy for hard service.
Springs, Make B. L. W.

Front Engine Truck Four Wheeled Swing Bolster
To swing 3" each side of cen. Cen. pin liners None
Journals, Diam. 5" Length 10" Boxes Cast Iron
Wheels, Diam. 28" Tread 4 11/16" Kind Rolled Steel
Tires None Cen. diam. ----- Size -----
Tires held by ----- Wheel Rims 2½" thick

Back Engine Truck None Wheeled -----
To swing ----- each side of cen. Cen. pin liners -----
Journals, Diam. ----- Length ----- Boxes -----
Wheels, Diam. ----- Tread ----- Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----

Brake, position On all driving and tender wheels.
Operating Parts {Engine, Sch. #6 ET West'g Combined Auto. and / Eng. Tr'k, sch. ----- \ Straight Air
Foundation Parts {Drivers, sch. WA-1 American O. S. Equalised / Eng. tr'k, sch. -----
Air pump One - 9½" Pos. Left Side
Train connections Front and Back
Train signal, sch. None

Tender Eight Wheeled, Drawing No. 918
Weight, with fuel and water, about 90,000 lbs.
Tender to be of long low type.
Tank 4500 Gallons, Bill 3837
Tank "U" shape, Straight Top. Fuel Cap. 3½ cords
Wood rack around top of tank
Tool Boxes Hard Wood, Top.
Frame:- Steel 8" and 10" Channels.
Front drawbar height:- 32½" (See ☆ on previous page)
Coupler:- M.C.B. Auto. with knuckle as deep as possible, i.e. 15", having slot for use with link and pin, 32⅝" centre above rail. Slot to be exceptionally wide to accommodate as large a coupling bar as possible without weakening the knuckle.
Draft rigging to be made extra heavy with standard drawhead springs, etc. to absorb shock and to withstand hard service.

Steps, hand holds, etc. to conform to I. C. C. requirements.
Steps across rear with hand rail
Trucks, Arch Bar Type with Cast Steel Bolsters
Springs to be extra heavy for hard service.
Springs Elliptic. B. L. W.
Journals, Diam. 5" Length 9"
Wheels, Diam. 33" Tread 4½" Kind Chilled Cast Iron Plate
Tires None Cen. diam. ----- Size -----
Tires held by -----
Safety chains Single

Brake Position On all wheels.
Brake sch. #6 ET West'g Auto. and straight Air with 12" x 12" tender cylinder.

One pair Johnson Wrecking Frogs, suitable for 60 pound rails.
Brake Shoes, sch. 30 Bolts, nuts and threads B. L. W.
Photo sch. 2 Inspection B. L. W. except (See (@) below)
To be weighed Yes Material spec'ns B. L. W.
Certificate of boiler test Three copies of B. L. W. form 611
Junior laws to 6.15.15 Shipment On own wheels.

Brass shop finish, No. 1
Machine shop finish D-165

Patent Plates {Throttle, Patented Jan. 23, 1900 (Cast on) / Feed Pipe Strainer, Patented Sept. 1, 1903 (Cast on)

Property plates B.L.W for engine and tender.

Painting:—Engine, style 291 Olive Green and Aluminum
Painting:—Tender, style 291 Olive Green and Aluminum

Lettering, etc. to be same style as for 10 30 D 631, Photo. 4269
Mark on tank sides, RED RIVER AND GULF R. R. CO.

No. Pos.	Road No.	Name None
F. No. Plate	102	
F. Sand Box		
Cab Sides		
Back of Tank		

(@) Boiler to be inspected by Hartford Steam Boiler Inspection and Insurance Co.

THE BALDWIN LOCOMOTIVE WORKS As Sped'n C-3748
Memorandum Spec'n 10966 AS MANY PARTS AS PRACTICABLE TO BE INTERCHANGEABLE WITH 10 30 D 525.

SPECIFICATION FOR LOCOMOTIVES 10 30 D 658

FOR Oregon, Short Line & Pacific Railway Company.
R.

5-12-16. Gen. as Photo. 5053 WITH OUTSIDE STEAM PIPES.

Engine Drawing No. 92

Gauge of Road 4' 8½" Play 3/8"
Wheelbase, Rigid 11' 4" Driving 11' 4" Total 21' 7"
Total wheelbase, eng. and tend. { Actual 51' 2" / Limited to ——
RAILS 56 LBS.
Curves ——

Limits, Height —— Width ——
Weight (approximate) in working order, Total 126,000 LBS.
On F. tr'k 28,000 lbs., Drivers 98,000 lbs., B. tr'k —— lbs.

Tractive power 22,000 lbs., Ratio of adhesion 4.45
Work'g St'm Pres. 190 lbs., Service PASSENGER AND FREIGHT
Fuel SOFT COAL.

Boiler STEEL Thick 3/8" AND 1 1/16" Bill 7841
Boiler, Diam. 58" Plan EXTENDED WAGON TOP.
Boiler st'm pres. 200 lbs., Tested to { 220 lbs. steam pres. / 267 lbs. water pres.
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS.

1/L **Dome,** diam. 33" Pos. CENTRAL.

Firebox STEEL Combustion chamb. NONE.
Firebox, length 76-3/16" Width 42 3/8" Depth F. 59 1/2" B. 58 1/4"
Firebox, Tube 1/2" Crown 3/8" Sides 5/16" Back 5/16"
Firedoor opening 16" DIAM.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame SINGLE Riveted
Water space stays 7/8" DIAM. WITH 3/16" HOLES 1 1/4" DEEP FROM O. S.
WATER SPACE STAYS OF FALLS HOLLOW HOLLOW IRON.
Radial stays 1" DIAM. Sling stays front { TWO ROWS OF B.L.W. EXPANSION STAYS.
Button heads below crown on EIGHT central rows
Crown bars NONE. Placed —— above crown
Crown bolts ——

Flues #9 W. G. STEEL.
Tubes #12 W. G. SEAMLESS STEEL.
Tube ends SEAGED FOR COPPER FERRULES, FIREBOX ENDS.
Number 20 / 135 Diam. 5 3/8" / 2" Length 12' 6"

Heating Surface			
	Flues 349 sq. ft.	Combus. Chamb. ——	Total 1339 sq. ft.
	Tubes 819	Fire Box 108	Fire Brick Tubes ——
Grate area 22.3		Ratio to Heating Surface 1 : 59.9	
Superheater 299			

Fire Brick ARCH ——.

Grates ROCKING BARS WITH DUMP GRATE. (SEE SUP. 3)
Ash Pan, Dampers FRONT AND BACK. (SEE SUP. 4)

2 **Throttle** CHANGING SHAKER Pos. DOME.
Dry pipe STEEL.

Superheater SCHMIDT TYPE. (SEE SUP. 7-8)

7A Superheater extension WITH Cleaning hole and cap RIGHT AND LEFT.
Spark-arrester hopper WITH
Netting and deflect. plates WITH (SEE SUP. 9)

Exhaust nozzles SINGLE NOZ.

9 Stack CAST IRON, STRAIGHT Dia. 16" Hole in B. P. Dia. 15"

(Spec.) **Safety Valves** TWO CONSOLIDATED 3" MUFFLED
Safety valves NONE with relief lever, Set to 190 POUNDS.
Whistle CRANE

Steam Gauge ONE IRON 7" (Not Spec.) MAKER: ASHCROFT (SEE SUP. 10)
Steam gauge stand IRON Clock NONE

Water Gauge ONE (SEE SUP. 11-23) Cab Lamps ELECTRIC.
23 **Gauge Cocks** THREE BACK Surface valve NONE
Lowest gauge cock 3" above highest part of crown
Lubricator steam valve TO HAVE separate dry pipe to dome
Blower Valve (SEE SUP. 15-22-23)

Blow off Cock TWO SPHERO. POS. ONE UNDER FRONT OF WAIST AND ONE IN THROAT.
Cleaning Plugs
Firebox CORNERS, THROAT, SIDES AND BACK. (SEE SUP. 12)
Crown, TWO EACH SIDE AND TWO BACK.
Waist, NONE
Front tube sheet, ONE Fusible plug (SUP. 13)

Pump NONE. Pos. ——
Top chamb. —— Bottom chamb. ——
Feed Cock —— Feed pipes ——
Checks —— Check pipes ——

16 (Spec.) **Injectors** TWO HANCOCK, TYPE "A" No. 8
21 Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER.
Pipes, Check IRON Feed IRON Overflow IRON
Check B.L.W. REVERSIBLE WITH STOP VALVE, RIGHT AND LEFT.

Steam Heat NONE

Cab STEEL, LINED WITH WOOD (SEE SUP. 24 ETC.)

Cab boards WOOD Nosing T-IRON
Running boards WOOD (SEE SUP. 26) Nosing T-IRON
Hand rail IRON Located on BOILER.

27 **Rear Bumper** OAK STEEL Back drawbar height 34"

28 **Pilot** NONE Pushing shoes AT REAR.
Front Bumper OAK Bumper plate WITH
29 **Steps,** HAND HOLDS ETC. TO CONFORM TO I.C.C. REQUIREMENTS.

Front Drawhead, Center above rail 33½"
Coupler TOWER M. C. B. AUTOMATIC.

Signal fixtures FROM ON HAND. (SEE SUP. 31)

31 **Headlights** ROUND CASE 18" Reflector, To burn ——
Headlight, Nos. on sides WITH H'd'l's also WITH
Lamp shelf NONE Nosing ——

Bell OF BRASS, 92 POUNDS.
Sand Box ONE Diam. 31" Body IRON PAINTED Pipes IRON
Sander LEACH AIR BRAKE TYPE K-10 FOR SANDING IN EITHER DIRECTION.
Dome casing IRON PAINTED

Roller Journals 7½" Main Rods, Finished IRON Style 9 and 10
Roller Bearings HARRISON SPHERICAL.
32 Basic NUMBER OF BOILER TO BE LARGER AND VARIATION.

THE BALDWIN LOCOMOTIVE WORKS
E. Hawley Sept 19th

SPECIFICATION FOR LOCOMOTIVES 10 30 D 658

FOR Oregon, Short Line & Pacific Railway Company.
R.

339

FURNISH TWO SETS OF BLUE PRINTS.

Frames CAST STEEL. Braces SOLID

Cylinders, Diam. 18" Stroke 24"
St'm ports, Length 2 3/8" Width 1 3/8" Bridges ——
Exh. ports, Length —— Width —— Valve lead 1/4"
Valve travel 5 1/2" Steam lap 1" Exhaust clearance ——
Eccentric crank throw 13 1/2" By-pass valve ——
S. F. Lubr. DETROIT FIVE FEED #42 BULLS EYE.
Cyl'r heads CAST IRON; LUBR. PIPES OF IRON UNDER JACKET.
Cyl'r casings IRON PTD. Head covers STEEL PAINTED
St'm chest castings —— Covers ——
St'm chest valves 9 1/2" DIAM. PISTON TYPE.
Met. pkg { PISTON RODS / VALVE STEMS } UNITED STATES (Spec.)

35 **Pistons** CAST IRON RINGS SPRUNG INTO SOLID HEAD
Guides STEEL (SEE SUP. 34) Oil cups NEEDLE
Crossheads CAST STEEL WITH BRASS BEARINGS.
Wrist Pins STEEL Rod cups (SEE SUP 35)
PARALLEL RODS TO HAVE SOLID ENDS.

Valve Motion WALSCHAERTS
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 57" Cen. diam. 50" CENTRES CAST STEEL.

Tires STEEL Held by SHRINKAGE AND SHOULDER.
Tires, Flanged, Pos. ALL Size 3 1/2" x 5 1/2"
Tires, Plain, Pos. NONE Size ——
Lateral play between driving boxes and wheel hubs — 1/16" TOTAL.
Driving Boxes STEELED CAST IRON
Journals, Diam. 8" Length 9"

Springs. Make B. L. W.

Front Engine Truck FOUR Wheeled SWING BOLSTER, CENTER BEARING.
To swing 2 3/8" each side of cen., Cen. pin liners NONE
Journals, Diam. 5" Length 10" Boxes CAST IRON.
Wheels, Diam. 28" Tread —— Kind CAST IRON SPOKE CENTER.
Tires STEEL Cen. diam. 23" Size 2 1/2" x 5 1/2"
Tires held by SHRINKAGE AND SHOULDER.

Back Engine Truck NONE Wheeled ——
To swing —— each side of cen., Cen. pin liners ——
Journals, Diam. —— Length —— Boxes ——
Wheels, Diam. —— Tread —— Kind ——
Tires —— Cen. diam. —— Size ——
Tires held by ——

36 **Brakes,** position ON ALL DRIVING AND TENDER WHEELS.
Operating Parts — Engine, Sch. #6 ET WEST'G. COMBINED AUTO. AND STRAIGHT AIR
Eng. Tr'k, sch. ——
Foundation Parts — Drivers, sch. W-1 AMERICAN O. S. EQUALIZED.
Eng. Tr'k, sch. ——
Air pump ONE 9 1/2" Pos. LEFT SIDE (SEE SUP. 23-22)
Train connections FRONT AND BACK
Train signal, sch. "L"

50 **Tender** EIGHT Wheeled, Drawing No. 435
Weight, with fuel and water, about 100,000 LBS.

50 **Tank** 5,000 Gallons, Bill 4292
TANK "U" SHAPE, STRAIGHT TOP. FUEL CAPACITY 10 TONS.

Tool Boxes OF STEEL, TOP.

54 **Frame** STEEL 10" CHANNELS.

27 Front Drawbar height 31 3/4"
Pilot NONE Pushing shoes AT REAR.
Back drawhead, center above rail 33½"
Coupler TOWER M. C. B. AUTOMATIC.

Steps, HAND HOLDS ETC. TO CONFORM TO I.C.C. REQUIREMENTS.

Trucks ARCH BAR TYPE WITH STEEL BOLSTERS.

Springs TRIPLE ELLIPTIC. B.L.W.
Journals, Diam. 5" Length 9"
Wheels, Diam 33" Tread 4 1/2" Kind SOLID FORGED ROLLED STEEL.
Tires BONE. Cen. diam. —— Size ——
Tires held by —— WHEEL RIMS 2 1/2" THICK.
Safety chains (SEE SUP. 61)

Brake Position ON ALL WHEELS.
Brake sch. #6 ET WEST'G. AUTO. AND STRAIGHT AIR WITH 12" x 12". TENDER CYLINDER.

List of tools, sch. 29 ONE PAIR WRECKING FROGS.
Photo sch. #2 Inspection B. L. W.
To be weighed YES Material spec'ns B. L. W.
Certificate of boiler test THREE COPIES OF B.L.W. FORM 1036.
Junior laws to 8-4-16. Shipment ON OWN WHEELS.

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. Patents { FEED PIPE STRAINER, PATENTED SEPT. 1, 1903 (CAST ON) / STEAM PIPE COVER, PATENTED JULY 18, 1913 (CAST ON)

Property plates B.L.W. FOR ENGINE AND TENDER.

Painting: —Engine, style { 346 EXCEPT OMIT STRIPE FROM TANK COLLAR — } OLIVE GREEN AND ALUMINUM
Painting:—Tender, style { } OLIVE GREEN AND ALUMINUM
TANK TO HAVE STRIPE AROUND SIDES AND BACK AT TOP AND BOTTOM.
LETTERING ETC. IN PLAIN ROMAN TYPE.
Mark on TANK SIDES, R - S PACIFIC

Road Nos. Pos.	Road Nos.	Name NONE.
F. NO PLATE	3	
SAND BOX		
CAB SIDES		
BACK OF TANK.		

SPECIFICATION FOR LOCOMOTIVES 10 30 D 658

FOR ROSCOE, SNYDER & PACIFIC RAILWAY COMPANY

1 OMIT AUXILIARY DOME AND PROVIDE MAIN DOME, made LARGE ENOUGH FOR MAN TO ENTER BOILER WITHOUT REMOVING THROTTLE WORK.

2 THROTTLE VALVE TO HAVE DRIFTING VALVE.

3 GRATE SUPPORTS ON WATER LEG OF 10 30 D 525 WERE DESIGNED SO THAT HOT COAL AND CINDERS LODGED BEHIND THEM AND BURNED HOLES IN SIDE SHEETS. The SUPPORTS ON NEW LOCOMOTIVE TO BE DESIGNED TO ALLOW COALS TO DROP THROUGH OR TO PREVENT THEM FROM ENTERING.
DUMP GRATE TO BE PROVIDED AT BACK OF FIRE BOX ONLY.

4 ASH PAN TO HAVE IMPROVED SLIDING DUMP ARRANGEMENT (SEE Sup. 17)

5 SUPERHEATER TO CONNECT WITH TOP HEADER IN SMOKE BOX AND TO HAVE OUTSIDE STEAM PIPE CONNECTIONS TO VALVE CHAMBER. ROYALTY ON SUPERHEATER PAYABLE BY THE B. L. W. SUPERHEATER AS LOCOMOTIVE SUPERHEATER CO'S SPEC'N #P-1178 DATED 7-12-16. (COPY ATTACHED)

6 HAND HOLE AND CAP TO BE APPLIED IN EACH SIDE OF SMOKE BOX FOR INSPECTION OF SUPERHEATER.

7 SMOKE BOX FRONT OF STEEL, FLANGED TYPE, WITH INCLINED PLATE LINER AT BOTTOM TO PROTECT THE FRONT SMOKE BOX DOOR OF STEEL.

8 FRONT END ARRANGEMENT TO BE SELF CLEANING TYPE.
SPECIAL ATTENTION TO BE GIVEN TO DESIGN OF FRONT END ARRANGEMENT.

9 STACK AND DRAFT ARRANGEMENT OF LATEST DESIGN.

10 STEAM GAUGE TO BE LOCATED WHERE FIREMAN CAN SEE IT WHILE ATTENDING FIRE. ON 10 30 D 525 THE LOCATION OF GAUGE MAKES IT NECESSARY FOR FIREMAN TO GET UP ON HIS SIDE OF BOILER TO SEE THE GAUGE.

11 WATER GAUGE TO BE OLD STYLE WITH IRONCLAD PROTECTOR. GLASS IN GAUGE PROTECTORS TO BE 8" LONG.

12 ONE CLEANING PLUG TO BE LOCATED IN EACH SIDE OF FIREBOX BETWEEN DRIVERS AND UP AS CLOSE TO THE RUNNING BOARD AS POSSIBLE TO PERMIT OF THE USE OF SAME.

13 FUSIBLE PLUG HOLE TO BE PROVIDED BUT TO HAVE SOLID PLUG APPLIED.

14 PROVIDE A 1" SERVICE VALVE IN FRONT OF DOME, SAME AS FOR 10 30 D 525.

15 BLOWER CONNECTION IN SMOKE BOX TO BE ~~HANCOCK OR SIMILAR~~ B.L.W. with a T fitting ~~TYPE, IN OTHER WORDS THE SMOKE BOX CONNECTION TO BE SEPARATE FROM THE EXH~~ in the pipe for round nose connection) - 9.13.16.

16 FEED WATER PIPES FROM INJECTORS TO BOILER TO BE HEAVIER THAN FOR 10 30 D 525, AND TO BE EQUIPPED WITH INTERMEDIATE CHECKS BETWEEN THE INJECTOR AND THE BOILER CHECK, IN ADDITION TO THE REVERSIBLE CHECKS AND STOP VALVE SPECIFIED. SHAPE OF THE PIPE TO BE THE SAME AS FOR 10 30 D 525, OMITTING THE GOOSE NECK SHOWN ON PHOTO. 5053 (10 32 D 1100)

17 ANGLE IRON FROM WHICH ASH PAN IS SUSPENDED, TO BE PLACED ON OUTSIDE OF PAN AT BOTTOM, ONE LEG OF ANGLE IRON EXTENDING HORIZONTALLY FROM PAN AND FLUSH WITH BOTTOM EDGE, THE SLIDES SUSPENDED FROM THIS BY APPLYING STRAPS OR LUGS TO SLIDE, AND TURNING THEM OVER THE PROJECTING LEG OF ANGLE IRON.

21 SQUIRT HOSE CONNECTION TO LEAD FROM BRANCH PIPE ON FIREMAN'S SIDE.

22 DRAIN COCKS TO BE PROVIDED ON PUMP AND BLOWER LINE, TO LEAD FROM ELBOW AT SMOKE BOX OR NEAR SMOKE BOX.

23 DRAIN PIPE FROM PUMP, GAUGE COCKS, WATER GLASS, PUMP AND BLOWER LINES TO BE ARRANGED TO RUN DOWN INSIDE OF FRAME TO INSURE DRAINAGE CLEARING THE RIGGING.

24 STEAM VALVE STAND STEM TO BE (E.H. (1)/9/16) MADE OF BRASS.

25 CAB TO BE 120" WIDE WITH VENTILATOR IN ROOF.
CAB ROOF AND WINDOWS TO BE OF LATEST DESIGN.
CAB TO BE OF DESIGN SHOWN BY PHOTO. 5053 (10 32 D 1100) WITH REGARD TO STYLE OF WINDOWS AND WITH A SMALL ENGINEER'S LOCKER FOR CLOTHES, BACK OF SEAT.

26 RUNNING BOARDS TO BE ARRANGED SO THAT MAN CAN STEP AROUND PUMP CONVENIENTLY. COMPANY CLAIMS THIS IS ALMOST IMPOSSIBLE ON 10 30 D 525.

27 ECONOMY RADIAL BUFFER TO BE APPLIED BETWEEN ENGINE AND TENDER.

28 PILOT TO BE LOCATED 5" ABOVE RAIL.

29 PILOT STEP TO HAVE RIB AROUND EDGE ON THREE SIDES FOR SAFETY TREAD.

30 COMBINATION CLASSIFICATION LAMP AND FLAG BRACKETS TO BE A CASTING WITH THE FLAG RING AND SLOT FOR HOLDING THE LAMPS SIMILAR TO THE STANDARD TYPE OF ADAMS & WESTLAKE FIXTURES.

31 HEADLIGHT EQUIPMENT TO BE PYLE INCANDESCENT SIX VOLT LIGHTING, WITH STEAM TURBINE GENERATOR.

32 LAGGING TO BE OMITTED FROM FIRE BOX IN FRONT OF CAB, AS SHOWN ON PHOTO. 5336 (10 34 D 1136)

33 PISTON RODS TO BE KEYED TO CROSSHEADS.

34 GUIDES TO HAVE U. S. INDESTRUCTABLE OIL CUPS.

35 ALL RODS TO BE "I" SECTION.
MAIN ROD FRONT END TO HAVE IMPROVED METHOD OF LINING OR KEYING UP BRASS.
COMPLAINT ON MAIN ROD BRASSES FOR 10 30 D 525 DUE TO TROUBLE CAUSED BY BEARING BETWEEN KEY AND BRASS BEING TOO NARROW AND IN DRIVING KEY TO TAKE UP PLAY, BRASS WOULD SPRING OPEN, TOP AND BOTTOM. (See Sup. 38)
MAIN AND SIDE RODS TO HAVE IMPROVED STYLE GREASE CUPS.

36 AIR RESERVOIRS LOCATED UNDER FRONT PART OF RUNNING BOARD.

37 CENTRIFUGAL DIRT COLLECTOR TO BE APPLIED IN TRAIN LINE; AIR PIPES TO BE HUNG SO THEY WILL DRAIN ON TENDER.

38 BLOCK BETWEEN GEDGE KEY AND THE BRASS TO BE MADE 3½" WIDE VERTICALLY INSTEAD OF 2½", WITHOUT IMPAIRING THE STRENGTH OF THE STUB.

THE BALDWIN LOCOMOTIVE WORKS

SUPERHEATER SPECIFICATION FOR LOCOMOTIVES 10 30 D 658

FOR ROSCOE, SNYDER & PACIFIC RAILWAY COMPANY.

Locomotive Superheater Company's Specification No. P1178 dated JULY 12TH 1916.

Specification for Superheater with Top Header, Double Loop Arrangement.

BOILER TUBES	135 in number 2" O. D. 12 ft. 6 ins. over tube sheets. Tubes located between and adjacent to Boiler flues are to be beaded over at front end.
BOILER FLUES	20 in number 5½" O. D. #9 BWG thick of cold drawn seamless steel. Flues to be straight, true to gauge and wall not to vary more than one gauge from specified thickness, as shown on Card 10812-E
BOILER FLUE SETTING	Radius 1/16 inch on both edges of flue holes in firebox tube sheet and on front edge of flue holes in front flue sheet as shown on drawings, except for copper sheets. Back end to be set with copper ferrules, rolled, beaded and prossered except for copper sheets. Front end to be rolled and beaded. Rollers to have at least 5 rolls. Prosser to have at least 12 sections Card 1136 Card 5771
TUBE SHEET LAYOUT	to be in accordance with
S. H. UNITS	20 units 1½" O. D. #9 BWG thick of seamless steel. Pipes united by cast steel return bends as shown on Card SEE ARRGT. Each unit to be tested, before being placed in boiler, with water under pressure of 500 pounds.
S. H. PIPE SUPPORTS	Of steel fastened securely on superheater pipes so as not to slide as shown on Card 10773
S. H. PIPE JOINT	To be made in best possible manner to insure absolutely tight joints in accordance with the notation on Card 1052
S. H. UNIT CLAMP BOLT	XXXX

SPECIFICATION FOR LOCO
FOR ROSCOE, SNYDE

1 OMIT AUXILIARY DOME AN
MAN TO ENTER BOILER WI

2 THROTTLE VALVE TO HAVE

3 GRATE SUPPORTS ON BATH
SO THAT HOT COAL AND
BURNED HOLES IN SIDE
TO BE DESIGNED TO ALL
VENT THEM FROM ENTERI
DUMP GRATE TO BE PROV

4 ASH PAN TO HAVE IMPRO

5 SUPERHEATER TO CONNEC
TO HAVE OUTSIDE STEAM
ROYALTY ON SUPERHEATE
SUPERHEATER AS LOCOMO
DATED 7-12-16. (COPY

6 HAND HOLE AND CAP TO
FOR INSPECTION OF SUP

7 SMOKE BOX FRONT OF BT
LINER AT BOTTOM TO PR
STEEL.

8 FRONT END ARRANGEMENT
SPECIAL ATTENTION TO
RANGEMENT.

9 STACK AND DRAFT ARRAN

10 STEAM GAUGE TO BE LOC
ATTENDING FIRE. / ON
MAKES IT NECESSARY FO
BOILER TO SEE THE GA

11 WATER GAUGE TO BE OLE
GLASS IN GAUGE PROTEC

12 ONE CLEANING PLUG TO
BETWEEN DRIVERS AND
POSSIBLE TO PERMIT O

13 FUSIBLE PLUG HOLE TO
APPLIED.

14 PROVIDE A 1" SERVICE
10 30 D 525.

15 BLOWER CONNECTION IN
~~PIPE IN OTHER WORDS~~
~~AND THE PIPE TO BE BOUND~~
~~GRADE FROM THE CAB~~

16 FEED WATER PIPES FRO
THAN FOR 10 30 D 525.
DIATE CHECKS BETWEEN
IN ADDITION TO THE R
SPECIFIED. SHAPE OF
10 30 D 525 OMITTING
(10 32 D 1100)

17 ANGLE IRON FROM WHICH
ON OUTSIDE OF PAN AT
ING HORIZONTALLY FROM
GLIDES SUSPENDED FROM
GLIDE, AND TURNING TH
IRON.

SPECIFICATION FOR LOCOMOTIVES 10 30 D 658
FOR ROSCOE, SNYDER & PACIFIC RAILWAY COMPANY.

341

T E N D E R.

1 TANK TO BE 120" WIDE.

2 REAR END OF COAL SPACE TO BE CHANGED AT THE FLOOR TO PROVIDE A MORE OR LESS GRAVITY SLOPE, ELIMINATING THE SQUARE POCKET NOW ON 10 30 D 525.

3 COAL BOARD IN REAR OF FUEL SPACE TO BE OF STEEL PLATE LOCATED ABOUT 12" BACK OF COAL HOLE.

4 COAL GATES TO BE IRON, TO SWING ON HINGES AND TO CLOSE SECURELY.
GATE FRAME TO BE PROVIDED WITH A STEEL PLATE ABOUT 14" WIDE BY 4' 0" LONG, TO RUN BACK ALONG THE COAL SPACE ON EACH SIDE, AND ACT AS A PROTECTION PLATE TO KEEP COAL OFF THE TOOL BOXES AND TOP OF TANK AT THIS POINT.
THIS PLATE TO BE RIVETED TO THE FRAME AND ALSO TO THE TANK OR SUPPORTED FROM SAME BY BRACKETS. B. L. W. TO FURNISH SOME STANDARD ARRANGEMENT AND SEND COMPANY A PRINT.

5 TANK TO HAVE TWO 1" DRAIN PIPES, FOR OVERFLOW. PIPES TO BE PLACED SO AS TO DRAIN BETWEE BACK AXLE AND TRUCK BOLSTER AS NEAR THE SIDES OF TANK AS PRACTICABLE.

6 TANK VALVE TO BE OLD STYLE LUNSTROM SYPHON TO TAKE WATER FROM BOTTOM OF TANK AND CARRY IT TO TOP AND RETURN TO THE HOSE.

7 TRACKING PANS TO BE CARRIED UNDER TENDER FRAME AND HOUSED IN A STEEL BOX ON LEFT SIDE.

8 TANK FLOOR TO BE WOOD WITH ANGLE IRON BINDER ON SIDES ONLY EXTENDING BETWEEN END BUMPERS MOULDING.

9 SERVICE VALVE ON TENDER TO BE A NIPPLE, ELL AND 1" GLOBE VALVE INSTEAD OF ARRANGEMENT FURNISHED ON 10 30 D 525, WHICH PROJECTED TOO FAR OUT FROM SIDE OF TENDER.

10 CONNECTION TO BE PROVIDED IN CENTER OF BACK END OF TANK 12" ABOVE THE BUMPER FOR 2" PIPE.
THIS HOLE TO BE TAPPED AND FITTED WITH A FLANGE AND PLUG.

11 LADDER TO BE PLACED ON BACK OF TENDER ON LEFT SIDE OF CENTER.

12 TENDER TRUCKS TO BE EQUIPPED WITH FOUR SAFETY CHAINS TO EACH TRUCK, ONE CHAIN AT EACH CORNER.

THE BALDWIN LOCOMOTIVE WORKS AS SPECIFICATION B-6004

Memorandum Spec'n 10229

SPECIFICATION FOR LOCOMOTIVES 10 32 D 1100, 1101 & 1144

Gen. as Neg. 3400, except with Walschaerts Valve gear.

FOR Tampa & Gulf Coast R. R. Co.

Engine Drawing No. 111

J. 5-4-14

Gauge of Road 4' 8½" Play ⅜".
Wheelbase, Rigid 13' 0" Driving 13' 0" Total 24' 2"
Total wheelbase, eng. and tend. {Actual 52' 8½" / Limited to -----

Curves -----

Limits, Height ----- Width -----
Weight (approximate) in working order, Total 132,000 lbs.
On F. tr'k 34,000 lbs., Drivers 98,000 lbs., B. tr'k ----- lbs.

Tractive power 23,800 lbs., Ratio of adhesion 4.12
Work'g St'm Pres. 185 lbs., Service Passenger & Freight
Fuel Soft Coal

Boiler Steel Thick 9/16" & ⅝" Bill 7243
Boiler, Diam. 58" Plan Extended Wagon Top.
Boiler st'm pres. 200 lbs., Tested to {220 lbs. steam pres. / 267 lbs. water pres.
Longitud. seams {Butt jointed, double covering strips, sextuple riveted, 90% seam.

Dome, diam. 29" Pos. Forward of Firebox

Firebox Steel Combustion chamb. None
Firebox, length 107 15/16" Width 42⅜" Depth F. 67" B. 58½"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diameter
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Double Riveted
Water space stays 1" diam. with 3/16" hole 1¼" deep from O. S.
Flexible staybolts are not required.
Radial stays 1⅛" diam. Sling stays front One I bar
Button heads below crown on Six central rows
Crown bars None - Placed ----- above crown
Crown bolts -----

Tubes All W. C. Shelby Steel
Tube ends Swaged for copper rings firebox ends.
Tubes, No 244 Diam. 2" Length 14' 1"

Heating Surface, Tubes 1788 sq Firebox 149 sq Total 1937 sq
Grate area 31.6 sq Ratio to heat'g surface, 1 : 61
Superheater ----- Feed-water heater -----
Reheater ----- Fire brick tubes -----

Fire Brick arch None

Grates, Atlantic Coast Line standard.
Grates Rocking, table grates.
Ash Pan, Depth F. 24½" B. 31" Dampers Front and Back 6/23/14

Throttle Balance Pos. Dome
Dry pipe ~~Cast Iron or Steel~~

Superheater None

Smokebox, A. C. L. standard self cleaning arrangement.
Smokebox extension With Cleaning hole and cap L. S. only
Spark ejector or hopper None
Netting and deflect. plates With

Exhaust nozzles Double High

Stack Cast Iron, straight Diam. 16" Hole in S.B. 20½"

Safety Valves (Spec) Three Ster 2½", One Muffled.
Safety valves None with relief lever, Set to {185 lbs. muffled. / 188 lbs. open.
Whistle Chime

Steam Gauge One Iron 7" Maker, Ster. (Spec)
Steam gauge stand Iron **Clock** None

Water Gauge One Reflex #4 **Cab lamps** Electric
Gauge Cocks Three Back Surface valve None
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome.
Blower Valve B. L. W.

Blow off Cock One Crane 2" Pos:- Front.
Cleaning Plugs
Firebox Corners diagonal, sides and back.
Crown, Two each side and two back.
Waist, One under front.
Front tube sheet, One. **Fusible Plug,** One.

Pump None Pos. -----
Top chamb. ----- Bottom chamb. -----
Feed cock ----- Feed pipes -----
Checks ----- Check pipes -----

Injectors (Spec) Two Sellers, Class "K" No. 9½
Injectors, Pos. R. and L. Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check Sellers Combined Main Check and Stop Valves. Pos. R. and L.

Steam Heat Gold system

Cab Steel. Ventilator in cab roof.

Cab boards Wood Nosing None
Running boards Wood Nosing None
Hand rail Iron Located on Boiler
Tail bar to be double, ie., one on top of main frame and one underneath.
Back Bumper Bar Steel Back drawbar height 32½"

Pilot, Atlantic Coast Line new standard design.
Pilot Wood Pushing shoes None
Front Bumper Oak Bumper plate With
Steps, handholds, etc. to conform to I. C. C. requirements

Front Drawhead, Center above rail 33½"
Coupler Tower M. C. B. Auto.

Flag fixtures Iron on Bumper.
Headlight to be American Electric, Model "D"
Headlight case to be Dressel.
Headlight One Round Case 16" Reflector, To burn -----
Headlight, Nos. on sides With H'd'l't step With
Lamp shelf None Nosing -----

Bell 92 pounds.
Sand Box One Diam. 28" Body Iron Ptd. Pipes Iron
Sander (Spec) Wetters, double air.

Dome casing Iron Painted.

Boiler Jacket {#22 Planished Steel Bands Iron Style 9
Boiler Lagging Magnesia Sectional.
Jacket to be cut at staybolt lines, ie., Jacket over staybolts to be removable.

THE BALDWIN LOCOMOTIVE WORKS

Engine A. J. Stratton June 1914

SPECIFICATION FOR LOCOMOTIVES 10 32 D 1100, 1101 & 1144. 3143

FOR Tampa & Gulf Coast R. R. Co. Furnish one set of prints.

J.

Frames .40 carbon cast steel Braces Solid
Frames, made by the Penn Steel Castings Co., Chester, Pa.
Frames with single front rail.
Cylinders, Diam. 19" Stroke 26"
St'm ports, Length 28.94" Width 1½" Bridges 1⅜"
Exh. ports, Length 28.94" Width 3" Val've lead ¼"
Valve travel 5½" STM lap 1" Exh Clear. 1/16"
Eccentric crank throw 15½"
S. P. Lubr. Detroit Triple (Spec) #22 Bulls Eye
Cyl'r heads Cast Iron
Cyl'r casings Iron Ptd. Head covers Steel Painted
St'm chest casings ----- Covers -----
St'm chest valves Piston type 12" diam. with inside admission.
Met. pkg {PISTON RODS / VALVE STEMS} UNITED STATES, King Type. (Spec)
Piston rods of steel, ground and bolted to crossheads.
Pistons Cast iron rings sprung into solid head.
Guides Steel of A.C.L. Ry. type Oil cups Needle
Crossheads Cast Steel, A. C. L. Ry. type.
Wrist Pins Steel Rod cups Plunger Forged On.
All rods "I" section. Parallel rods with solid ends.

Valve Motion Walschaerts
{Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.
All valve motion parts to have split keys.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings Damascus Bronze.

Drivers, O. S. Diam. 62" Cen. diam. 56" Centers Cast Steel
Driving wheels to be fitted with bronze hub liners.
Tires Steel Held by Shrinkage & Shoulder.
Tires, Flanged, Pos. ALL Size 3"x 5½"
Tires, Plain, Pos. -------- Size --------
Lateral play between driving boxes and wheel hubs- 1/16" total
Driving Boxes Cast Steel
Journals, Diam. {Main 8½" / Others 8" Length 9"

Driving spring staples Wrot Iron

Springs. Make B. L. W.

Front Engine Truck Four Wheeled Swing Bolster
To swing 2½" each side of cen. Cen. pin liners None
Journals, Diam. 5" Length 10" Boxes Cast Iron
Wheels, Diam. 30" Tread ---- Kind Cast iron spoke center.
Tires Steel Cen. diam. 25" Size 2½"x 5½"
Tires held by Shrinkage & Shoulder

Back Engine Truck None Wheeled -----
To swing ----- each side of cen. Cen. pin liners-----
Journals, Diam. ----- Length ----- Boxes -----
Wheels, Diam. ----- Tread ----- Kind -----
Tires ----- Cen. diam.----- Size -----
Tires held by -----

Brake, position On all driving and tender wheels.
Operating Parts {Engine, Sch. 6-ET, West'g. Comb. Auto. & Straight Air.
Eng. Tr'k, sch. -----
Foundation Parts {Drivers, sch. WE-1, American Outside Equalized.
Eng. tr'k, sch. -----
Air pump One 9½" Pos. Left Side
Train connections Front and Back
Train signal, sch. L
Air pump located forward of firebox, to avoid taking down for staybolt inspection and test. Johns-Manville Packing on air pump. Air reservoirs located under front extension of running boards.

Tender Eight Wheeled, Drawing No. 435
Weight, with fuel and water, about 120,000 lbs.

Tank 6000 Gallons, Bill 3825
Tank "U" Shape, Straight Top, Fuel Capacity 10 tons.
Tank rivets 9/16" diam., pitch 1½"
Tool Boxes Hard Wood, top.

Frame Steel 10" channels.

Front drawbar height 35"

Back drawhead, center above rail 33½"
Coupler Tower M. C. B. Auto.

Steps, handholds, etc. to conform to I. C. C. requirements.

Trucks Arch Bar, Cast Steel Bolster.

Springs Elliptic, B. L. W.
Journals, Diam. 5" Length 9"
Wheels, Diam. 33" Tread 4½" Kind {Double plate, Chilled Cast Iron.
Tires ----- Cen. diam.----- Size -----
Tires held by -----
Safety chains Single

Brake Position On All Wheels.
Brake sch. 6-ET, West'g. Auto. and Straight Air with 12"x 12" tender cylinder.
Tender to be Atlantic Coast Line standard design, duplicate of that furnished the Rockingham R. R. Class 10 32 D 1102.

List of tools, sch. 29 Bolts, nuts and threads B. L. W.
Photo sch. 2 Inspection B. L. W.
To be weighed Yes Material spec'ns B. L. W.
Certificate of boiler test Three copies of B. L. W. form 611.
Junior laws to 5-1-14 Shipment On Own Wheels.

Brass shop finish, No. 1.
Machine shop finish D-165

Patent Plates {Throttle Patented Jan. 23, 1900. (Cast On)
Feed Pipe Strainer Patented Sept. 1, 1903. (Cast On)

Property plates B.L.W. for Engine and Tender 6/9/14

Paintings—Engine, style 291 Olive Green and Gold
Painting:—Tender, style 291 " " " "
Mark on cab sides under windows in 3" block letters } ORANGE BELT ROUTE
Mark on tank sides, TAMPA & GULF COAST In 8" Roman letters.

Numbers to be 8" on cab sides and 10" on back of tank.
No. Pos. Road No. Name None
F. No. Plate 17 to 19
Cab Sides
Back of Tank

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-3357.

Memorandum Spec'n 10839

SPECIFICATION FOR LOCOMOTIVES 10 32 D 1159 Gen. as 4357 with fire box placed over frames.

FOR Mississippi Eastern Railway Co. 1-10-16. **Engine Drawing No.** 116.

R.

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 11' 4" Driving 11' 4" Total 23' 10"
Total wheelbase, eng. and tend. { Actual 52' 3½" / Limited to -----
Rails, 56 lbs.
Curves 12 and 16 degrees. Grade:-2½%.

Limits, Height ----- Width -----
Weight (approximate) in working order, Total 132,000 lbs.
On F. tr'k 30,000 lbs., Drivers 102,000 lbs., B. tr'k ----- lbs.

Tractive power 25,200 lbs., Ratio of adhesion 4.1
Work'g St'm Pres. 180 lbs., Service Freight
Fuel Soft Coal.

Boiler Steel Thick ⅜" & 11/16" Bill 7677.
Boiler, Diam. 60" Plan Extended Wagon Top.
Boiler st'm pres. 200 lbs., Tested to { 220 lbs. steam pres. / 267 lbs. water pres.
Longitud. seams Butt jointed, double covering strips.

Dome, diam. 29" Pos. Forward of fire box.

Firebox Steel Combustion chamb. None.
Firebox, length 107-7/16" Width 42⅜" Depth F. 63½" B. 60"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diam.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Double Riveted
Water space stays ⅝" diam. with 3/16" holes 1½" deep from O. S.
B. L. W. Flexible Staybolts about 300 in breaking zone.
Radial stays 1" diam. Sling stays front { Two rows of B. L. W. Expansion stays.
Button heads below crown on Eight central rows
Crown bars None Placed ----- above crown
Crown bolts -----

Flues None.
Tubes #12 W. G. Charcoal Iron.
Tube ends Swaged for copper ferrules, fire box ends.
Number 268 Diam. 2" Length 12' 10⅝"

Heating Surface	Flues None	Combus. Chamb. None	Total 1940⁵⁰	
	Tubes 1799⁵⁰	Fire Box 141⁰⁰	Fire Brick Tubes -----	
Grate area 31.5⁰⁰	Ratio to Heating Surface 1 : 61.6			
Superheater -----				

Fire Brick Arch on studs.

Grates Rocking bars and drop plate.
Ash Pan, Dampers Front and Back.
Ash pan to be of steel with hopper and sliding bottom that may be easily dumped.
Throttle Balance Pos. Dome.
Dry Pipe Steel

Superheater None.

Smokebox extension With Cleaning hole and cap L.S. only.
Spark arrester or hopper With
Netting and deflect. plates With

Exhaust nozzles Double high.

Stack Straight Dia. 16" Hole in S. B. dia. 29½"

(not space)
Safety Valves Two Coale 3"
Safety valves None with relief lever, Set to 180 lbs.
Whistle B. L. W. plain.

Steam Gauge One Iron 7" Maker:-Ashcroft. (not space)
Steam gauge stc. Iron **Clock** None.
Water gauge to have suitable drain.
Water Gauge One Reflex **Cab Lamps** Electric.
Gauge Cocks Heavy, three back. Surface valve Nom:
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One B. L. W. Pos:-Front.
Cleaning Plugs
Firebox Corners, Back ones diagonal and back.
Crown, Two each side and four back.
Waist, One under front.
Front tube sheet, One Fusible plug One

Pump None Pos. -----
Top chamb. ----- Bottom chamb. -----
Feed Cock ----- Feed pipes -----
Checks ----- Check pipes -----

Injectors Two Chic. No. 9
Injectors, Pos. Right and Left. Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron.
Check B. L. W. Pos. Right and Left.

Steam Heat None.

Cab Steel.
Cab to be provided with three lamps.

Cab boards Steel Nosing T-Iron.
Running boards Steel Nosing T-Iron.
Hand rail Iron Located on Boiler.

Back Bumper Bar Steel. Back drawbar height 34½"

Pilot Wood Pushing shoes None.
Front Bumper Oak Bumper plate With
Steps, hand holds etc. to conform to I. C. C. requirements.

Front Drawhead, Center above rail 33½"
Coupler M. C. B. Automatic.

Signal fixtures Iron on bumper.
Headlight Equipment, Pyle National Electric, Type "S" with Electric Bulls Eye 8" diam. on tender.
Headlight One Round Case 18" Reflector, To burn -----
Headlight, Nos. on sides With H'dl't step With
Lamp shelf None. Nosing -----

Bell 92 pounds. Gollmar Air Bell Ringer.
Sand Box One Diam. 22" Body Iron Ptd. Pipes Iron
Sander Leach Air, Trap A-10 with branch pipes to sand front and rear of driving wheels.
Dome casing Iron Painted.

Boiler Jacket #22 Plan. Steel Bands Iron Style 9
Boiler Lagging Magnesia sectional.

THE BALDWIN LOCOMOTIVE WORKS

April 1916

SPECIFICATION FOR LOCOMOTIVES 10 32 D 1159

FOR Mississippi Eastern Railway Co.

R.

345

Frames Cast Steel. Braces Solid.

Cylinders, Diam. 19" Stroke 26"
St'm ports, Length 16" Width 1½" Bridges 1⅛"
Exh. ports, Length 16" Width 2⅛" Valve lead 3/16"
Valve travel 5⅛" Steam lap 1" Exhaust clearance -----
Eccentric crank throw 10-15/16"
S. F. Lubr. Michigan Triple Bulls Eye.
Cyl'r heads Cast Iron; Lubr. pipes of Iron under jacket.
Cyl'r casings Iron Ptd. Head covers Steel Painted.
St'm chest casings Iron Ptd. Covers Steel Painted.
St'm chest valves Richardson balanced, with vacuum valves.
Met. pkg { PISTON RODS / VALVE STEMS UNITED STATES. (not spec.)

Pistons Cast iron rings sprung into solid head.
Guides Steel Oil cups Needle.
Crossheads Cast Steel.
Wrist Pins Steel Rod cups Grease cups forged on.
Parallel Rods to have solid ends.

Valve Motion Walschaerts.
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 57" Cen. diam. 50" Centres Cast Steel.

Tires Steel Held by Shrinkage and Shoulder.
Tires, Flanged, Pos. All Size 3½" x 5½"
Tires, Plain, Pos. None. Size -----
Lateral play between driving boxes and wheel hubs = 1/10" total.
Driving Boxes Cast Steel.
Journals, Diam. 8" Length 9"

Equalizing beams of wrot Steel
Springs. Make B. L. W.

Front Engine Truck Four Wheeled Swing Bolster.
To swing 2½" each side of cen., Cen. pin liners None.
Journals, Diam. 5" Length 10" Boxes Cast Iron.
Wheels, Diam. 28" Tread -----Kind Cast Iron spoke centre.
Tires Steel Cen. diam. 23" Size 2½" x 5½"
Tires held by Shrinkage and Shoulder.

Back Engine Truck None Wheeled -----
To swing -----each side of cen., Cen. pin liners -----
Journals, Diam.----- Length ----- Boxes -----
Wheels, Diam. ----- Tread -----Kind -----
Tires ----- Cen. diam.------ Size -----
Tires held by -----

Brake, position On all driving and tender wheels.
Operating Parts { Engine, Sch. #6 ET West'g. Combined Auto. and / Eng. Tr'k, sch. ----- Straight Air.
Foundation Parts { Drivers, sch. UK-2 American O. S. Equalized. / Eng. Tr'k, sch. -----
Air pump One - 9½" Pos. Left Side.
Train connections Front and Back.
Train signal, sch. None.

Tender Eight Wheeled. Drawing No. 435.
Weight, with fuel and water, about 90,000 lbs.
Tank to be of long and low construction.
Tank 4500 Gallons, Bill 4129
Tank "U" Shape, straight Top. Fuel Capacity 8 tons.

Tool Boxes of hard Wood.

Frame Steel 10" Channels.

Front Drawbar height 32⅛"
Pilot None Pushing shoes None.
Back drawhead, center above rail 33½"
Coupler M. C. B. Automatic.

Steps, hand holds etc. to conform to I. C. C. requirements.

Trucks Side frames of cast steel with cast steel bolsters.

Springs Elliptic. B.L.W. make.
Journals, Diam. 5" Length 9"
Wheels. Diam. 33" Tread 4½" Kind Chilled Cast Iron plate.
Tires ----- Cen. diam. ----- Size------
Tires held by -----
Safety chains Single.

Brake Position On all wheels.
Brake sch. #6 ET West'g. Auto. and Straight Air with 12" x 12" tender cylinder.

List of tools, sch. 29
Photo sch. #2 Inspection ~~B. L. W.~~ (see note below).
To be weighed Yes. Material spec'ns B. L. W.
Certificate of boiler test Three copies of B.L.W. form 1036.
Junior laws to 3-7-16. ~~Shipment~~ On own wheels.

Brass shop finish, No. 1
Machine shop finish D-165.
Particular attention to be paid to making locomotive look attractive.

B. L. W. Patents { Throttle, Patented Jan. 23, 1900 (Cast On) / Feed Pipe Strainer, Patented Sept. 1, 1903 (Cast On)

Property plates B. L. W. for engine and tender.

Painting: Engine, style 291 Olive Green and Aluminum.
Painting:--Tender, style 291 Olive Green and Aluminum.

Mark on cab sides, M. E. Ry. Co.

Figures on sides and back of tank to be of large size.
Road Nos. Pos. Road Nos. Name None.
F.No Plate 303
Sand box
Sides of tank
Back of tank.

BOILER TO BE INSPECTED
~~Inspection~~ by the Fidelity & Casualty Co. of New York
1/1/16

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-3597. Details as far as practicable to be same as for 10 36 D 614 - 615.

Memorandum Spec'n 10958

SPECIFICATION FOR LOCOMOTIVES 10 38 D 192 - 193. Gen. as Photo. 4822 Except with Southern Valve Gear and with outside steam pipe

FOR Louisiana & Arkansas Ry. Co. 4-25-16. Engine Drawing No. 17

R.

Gauge of Road 4' 8½" Play {See sup. 71 for Drivers. ⅛" for Eng. truck and tender.

72 Wheelbase, Rigid 14' 10" Driving 14' 10" Total 25' 6"

Total wheelbase, eng. and tend. {Actual 61' 10¼" / Limited to 62' 0"

Curves and Grades (See sup. 1 - 2)

Limits, Height ——— Width ———

Weight (approximate) in working order, Total 194,000 lbs.

On F. tr'k 41,000 lbs., Drivers 153,000 lbs., B. tr'k ——— lbs.

Tractive power 38,400 lbs., Ratio of adhesion 4.

Work'g St'm Pres. 190 lbs., Service Freight.

Fuel Soft Coal.

---

10 Boiler Steel Thick 1/16" and 2" Bill 7813 (Boiler Bill 7863 Hereafter)

Boiler, Diam. 68" Plan Ext. Wagon Top.

10 Boiler st'm pres. 210 lbs., Tested to {230 lbs. steam pres. / 280 lbs. water pres.

Longitud. seams Butt jointed, double covering strips.

11 12 Dome, diam. 29" Pos. Forward of firebox.

Firebox Steel Combustion chamb. None.

Firebox, length 120-1/16" Width 41" Depth F. 74¼" B. 60¾"

Firebox, Tube 5/16" Crown 5/16" Sides 5/16" Back 5/16"

Firedoor opening 16" diam. Crown and sides in one piece.

Water space, Front 4" Sides 3½" Back 4"

Water space, Frame Double Riveted

13 Water space stays 1" diam. with 3/16" holes 1¼" deep from O. S.

Radial stays 1⅛" diam. Sling stays front {Two rows of B. L. W. Expansion Stays.

Button heads below crown on Ten central rows

Crown bars None. Placed ——— above crown

Crown bolts ———

Flues #9 W. G. Steel.

Tubes #11 W. G. Spellerized Steel, National Tube Co.

Tube ends Swaged for copper ferrules firebox ends.

Number 30 / 204 Diam. 2" Length 15' 3⅛"

Heating Surface: Flues 640 sq. ft. Combus. Chamb. None. Total 2449 sq. ft.
Tubes 1621 sq. ft. Fire Box 188 sq. ft. Fire Brick Tubes ———
Grate area 34.2 sq. ft. Ratio to Heating Surface 1 : 71.6
Superheater 548 sq. ft.

Fire Brick Arch None.

Grates None. (See sup. 14 - 15)

Ash Pan, Dampers Front and Back. (See sup. 16)

Throttle Balance Pos. Dome.

Dry pipe Steel.

Superheater (See sup. 17)

19 Smokebox extension, With Cleaning hole and cap None (See sup. 18)

Spark ejector or hopper None.

Netting and deflect. plates With (See sup. 19)

Exhaust nozzles Single Lor (See sup. 20)

21 Blast, Cast iron tapered. Dia. 17⅜" Hole in S. B., dia. 18½"

Safety Valves (spec) Three Crosby 3" Two muffled.

Safety valves None with relief lever, Set to {190 lbs. muffled. / 193 lbs. open.

Whistle B. L. W. (See sup. 22)

Steam Gauge One Iron 7" Makers-Ashton. (spec)

Steam gauge stand Iron Clock None.

23 31 Water Gauge One B.L.W. (Ironclad) Cab Lamps (See sup. 40)

Gauge Cocks Three Back. Surface valve None

Lowest gauge cock ¾" above highest part of crown

Lubricator steam valve without separate dry pipe to dome

Blower Valve B. L. W.

Blow off Cock One Johnstone 1½" Pos. Front.

Cleaning Plugs

Firebox Corners, back ones diagonal, sides and back.

Crown, Three each side and three back.

Waist, One under front.

Front tube sheet, Two Fusible plug One

Pump None. Pos. ———

Top chamb. ——— Bottom chamb. ———

Feed Cock ——— Feed pipes ———

Checks ——— Check pipes ———

37 Injectors Two Ohio. No. 10

Injectors, Pos. Right and Left (Sup. 32) Steam pipes Copper.

Pipes, Check Iron Feed Iron Overflow Iron.

Check Sellers, style GH Pos. Top of boiler.

Steam Heat None.

Cab Steel, lined with wood. (See sup. 34)

Cab boards Steel Nosing Tee Iron.

Running boards Steel (sup. 35) Nosing Tee Iron.

Hand rail Iron Located on Boiler.

36 Back Bumper Wrought Iron. Back drawbar height 32½"

Pilot Wood (See sup 37) Pushing shoes None.

Front Bumper Cast Steel (sup. 54) Bumper plate With

Steps (See sup. 38)

Front Drawhead, Center above rail 33½"

Coupler Simplex M.C.B. Auto. Ry. Co's Std., from the American Steel Foundries. (See sup. 38-39)

Signal fixtures Iron on bumper.

Headlight One Round Case 18" Reflector, (See sup. 40 - 41)

Headlight, Nos. on sides With H'd'l't step With

Lamp shelf Iron. Nosing Angle Iron.

Bell 92 pounds. Simplicity Air Bell Ringer.

Sand Box One Diam. 31" Body Iron Painted. Pipes Iron.

Sander Leach Air Trap #10 delivering sand to front of front drivers and back of main drivers. (See sup. 42)

Dome casing Iron Painted.

Boiler Jacket #22 Plain. Steel. Bands Iron. Style 9 and 14

Boiler Lagging Magnesia optional.

Back head of boiler to be lagged and jacketed. (Sup. 43)

THE BALDWIN LOCOMOTIVE WORKS

J. A. Pfeiffer July 19 1916

SPECIFICATION FOR LOCOMOTIVES 10 38 D 192 - 193.

FOR Louisiana & Arkansas Ry. Co.

R.

347

Frames Cast Steel (See sup. 51 &c) Braces Solid.

55 Cylinders, Diam. 22" Stroke 28"

St'm ports, Length 25" Width 1½" Bridges 1¾"

Exh. ports, Length 25" Width 3" Valve lead ⅛"

Valve travel 6" Steam lap 1" Exhaust clearance ———

Eccentric crank throw 23" By-pass valve None.

S. F. Lubr. Nathan Six Feed Bulls Eye.

Cyl'r heads (See sup. 55) Lubr. pipes of iron under jacket.

Cyl'r casings Iron Ptd. Head covers Steel Painted.

St'm chest casings ——— Covers ———

St'm chest valves 12" diam. Piston Type, inside admission.

Met. pkg {Piston rods / Valve stems} (spec) U.S. King Type. (See sup. 56)

Pistons (See sup. (See sup. 56 - 57)

Guides Two Bar Type Steel, (sup. 58) Oil cups (See sup. 58)

Crossheads Alligator type cast steel. (See sup. 59)

Wrist Pins Steel Rod cups (See sup. 60 - 61)

Valve Motion Southern. (See sup. 62 - 63)

Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.

All finished movable nuts of steel or of iron case hardened.

Wearing Bearings (See sup. 64 - 114)

72 Drivers, O. S. Diam. 57" Cen. diam. 50" Centres Cast Steel.

71 Tires Steel Held by Shrinkage and Shoulder.

Tires, Flanged, Pos. All Size 3½" x 5½"

Tires, Plain, Pos. ——— Size ———

Lateral play between driving boxes and wheel hubs — 1/16" total.

Driving Boxes Cast Steel. (See sup. 75)

Journals, Diam. 9½" Length 12"

Springs. Make American Steel Foundries. (See sup. 76)

77 Front Engine Truck Four Wheeled Rigid Bolster Cen. Bearing.

To swing ——— each side of cen., Cen. pin liners ———

Journals, Diam. 6½" Length 11" Boxes Cast Iron.

Wheels, Diam. 30" Tread ——— Kind Cast Iron Spoke Centre.

Tires Steel Cen. diam. 25" Size 2½" x 5½"

Tires held by Bolted Type Fastening.

Back Engine Truck None. Wheeled ———

To swing ——— each side of cen., Cen. pin liners ———

Journals, Diam. ——— Length ——— Boxes ———

Wheels, Diam. ——— Tread ——— Kind ———

Tires ——— Cen. diam. ——— Size ———

Tires held by ———

78 Brake, position On all driving and tender wheels.

79 Operating Parts: Engine, Sch. 96 ET West'g. Combined Auto. and Straight Air; Eng. Tr'k, sch. ———

Foundation Parts: Drivers, sch. M-3-BC American O. S. Equalized.; Eng. Tr'k, sch. ———

Air pump Two 9½" Pos. Right and Left. (See sup. 78)

Train connections Front and Back.

Train signal, sch. None.

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101 Tender Eight Wheeled, Drawing No. 610.

Weight, with fuel and water, about 130,000 lbs.

Tender of the long low design.

101 Tank 7,000 Gallons, Bill 4247.

Tank "U" shape, straight top with hopper type coal space.

Fuel capacity 14 tons.

Tool Boxes Wood and Iron (See sup. 104)

Frame Steel 12" channels. (See sup. 108, etc)

Frame to be Baldwin Built-up type.

Front Drawbar height 30¼" (See sup. 109)

Pilot None. Pushing shoes None.

Back drawhead, center above rail 33½"

Coupler Simplex M.C.B. Auto. Ry. Co's Std. from American Steel Foundries, with Farlow draft gear.

Steps (See sup. 110)

Trucks (See sup. 111, etc).

112 Springs Semi-elliptic. Makers-American Steel Foundries

Journals, Diam. 5½" Length 10" Boxes (See sup. 113)

Wheels, Diam. 33" Tread ——— Kind Cast Iron Spoke centre.

Tires Steel Cen. diam. 28" Size 2½" x 5½"

Tires held by Bolted type fastening.

Safety chains Double.

Brake Position On all wheels.

Brake sch. #6 ET West'g. Auto. and Straight Air with 14" x 12" tender cylinder. (See sup. 115)

List of tools, sch. 29

Photo sch. #2 Inspection B. L. W.

To be weighed Yes. Material spec'ns B. L. W.

Certificate of boiler test Three copies of B.L.W. form 1036.

Junior laws to 7-24-16. Shipment On own wheels.

Brass shop finish, No. 1

Machine shop finish D-165.

B. L. W. Patents: Throttle, Patented Jan. 23, 1900 (Cast On); Feed Pipe Strainer, Patented Sept. 1, 1903 (Cast On); Steam Pipe Cover, Patented July 18, 1911 (Cast On)

Property plates None.

3 Painting:—Engine, style 215 Olive Green and Aluminum.

Painting:—Tender, style 215 Olive Green and Aluminum.

Lettering and striping to be same as for 10 36 D 614-615.

Mark on cab sides, L. & A. in 5" Roman letters below windows.

Mark on back of tank: Water 7000 gallons; Coal 14 tons

Front number plate Ry. Co's standard with 3½" figures.

Road Nos. Pos.	Road Nos.	Name None
F. No Plate	500	
Sand Box	501	
Sides of tank.		
Back of tank.		

SPECIFICATION FOR LOCOMOTIVES 10 38 D 192 - 193.

FOR LOUISIANA & ARKANSAS RAILWAY CO.

1 CURVES 4 DEGREES, WITH RAILS 75 POUNDS PER YARD, ON MAIN LINE. CURVES 12 DEGREES ON "Y" TRACKS, WITH RAILS 60 POUNDS PER YARD ON SIDINGS.

2 GRADES 1%.

3 PAINT AND VARNISH OF MURPHY VARNISH CO'S MAKE. "STAY-BRIGHT" OR A GRAPHITE PAINT TO BE USED FOR SMOKE BOX, FIRE BOX AND ASH PAN.

10 ~~MONOGRAM~~ PRESSURE PLATE TO BE FASTENED DIRECT TO BACK BOILER HEAD, EXTENSION STUDS BEING OMITTED AND SUFFICIENT BOILER LAGGING CUT AWAY TO SHOW PLATE PLAINLY TO CONFORM TO GOVERNMENT REQUIREMENTS. (Verbal R.S.M.C.) 7/6/16

11 DOME TO BE ONE PIECE TYPE.
DOME CAP JOINT TO BE MADE WITH COPPER RING.

12 AUXILIARY DOME FOR SAFETY VALVES AND WHISTLES.

13 FLEXIBLE STAYBOLTS, TATE, 350 IN NUMBER, LOCATED IN BREAKING ZONES OF FIRE BOX.

14 COAL PUSHER, RYAN JOHNSTON HORIZONTAL TYPE ON TENDER.

15 ENGINES TO BE FURNISHED WITHOUT GRATES OR SIDE BARS, BUT TO HAVE THE DUMP AND SHAKER RIGGING OF SAME CONSTRUCTION AS FOR 10 36 D 614 - 615.

16 ENGINES TO BE FURNISHED WITHOUT THE LOWER ASH PAN, UPPER ASH PAN TO BE SAME CONSTRUCTION AS FOR 10 36 D 614-615, AND TO BE APPLIED BY THE B.L.W.

17 SUPERHEATER, SCHMIDT TYPE, PLACED IN 5 3/8" TUBES CONNECTING WITH TOP HEADER IN SMOKE BOX, AND WITH OUTSIDE STEAM PIPE CONNECTIONS TO VALVE CHAMBERS.
ROYALTY ON SUPERHEATER PAYABLE BY THE B.L.W.
SUPERHEATER AS LOCOMOTIVE SUPERHEATER CO'S SPECIFICATION NO. P-1161. DATED JUNE 14, 1916. (COPY ATTACHED).

18 HAND HOLE AND CAP TO BE PROVIDED RIGHT AND LEFT IN SMOKE BOX FOR INSPECTION OF SUPERHEATER.

19 SMOKE BOX TO BE MADE IN ONE CONTINUOUS SHEET.
FRONT END ARRANGEMENT, MASTER MECHANICS STANDARD SELF CLEANING TYPE.
SMOKE BOX TO HAVE PERFORATED PLATES WITH 3/16" X 1 1/2" OPENINGS HIT AND MISS SIDEWAYS.

20 EXHAUST TO HAVE GROUND JOINT, AND BE SECURED TO CYLINDERS BY SIX 7/8" STUDS.

21 SMOKE STACK TO HAVE SEPARATE CAST IRON SADDLE.

22 WHISTLE RIGGING TO BE PROVIDED IN CAB.

23 DRAIN COCK TO WATER GLASS TO BE GLOBE VALVE, NOT A PLUG COCK.

31 GAUGE COCKS TO BE NATHAN NEVER-LEAK.
GAUGE COCKS OF BEST GRADE AND OF A TYPE WHICH CAN BE CLEANED UNDER STEAM.

32 BOTH INJECTORS LOCATED INSIDE OF CAB, WITH WASTE PIPE COUPLED TO INJECTORS BY UNIONS.

33 COAL SPRINKLER TO BE NATHAN, COLD WATER TYPE.

34 CAB TO BE ROOMY WITH LARGE VENTILATOR IN CAB ROOF.
CAB TO BE BOLTED TO RUNNING BOARDS WITH 3/4" BOLTS HAVING DOUBLE HEXAGON NUTS.
~~CAB BRACKETS OF CAST STEEL.~~ (Verbal M.S.M.C. 7/6/16
CAB ARCH OF STEEL.
ADJUSTABLE DROP SEAT FOR ENGINEER, WITH CUSHION BACK.
TWO WINDOWS ON EACH SIDE OF CAB, BOTH TO SLIDE AHEAD, GIVING A LARGE OPENING. DOORS IN FRONT OF CAB, DROP SASH IN BACK.

35 SPACE BETWEEN INSIDE EDGE OF RUNNING BOARDS AND BOILER JACKET TO BE FILLED IN TIGHTLY WITH PLATES BOLTED TO BRACKETS.

36 SPRING BUFFER BETWEEN ENGINE AND TENDER.
WEDGES BETWEEN ENGINE AND TENDER OF CAST STEEL.
CHAFING CASTING BETWEEN ENGINE AND TENDER TO BE LIBERAL.

37 WOODEN SLATS IN PILOT TO EXTEND FULL LENGTH TO TOP OF BUMPER BEAM.
PILOT BRACE AT CENTER TO BE NOT LESS THAN 2 1/2" ROUND IRON EXTENDING FROM PILOT NOSE BACK TO THE CYLINDER SADDLE.

38 COUPLERS, STEPS, HAND HOLDS AND LADDERS TO BE APPLIED AS REQUIRED BY THE INTERSTATE COMMERCE COMMISSION.

39 PILOT COUPLER FITTING IN POCKET CASTING FASTENED DIRECTLY TO BUMPER.

40 CAB TO BE WIRED AND FITTED WITH LAMP FOR STEAM GAUGE, WATER GAUGE ENGINEER'S SEAT, AND ROOF OF CAB OUTSIDE OF DOOR OVER DECK.
ENGINEER'S LIGHT TO HAVE CUT-OUT SOCKET.

41 HEADLIGHT EQUIPMENT TO BE PYLE NATIONAL ELECTRIC TYPE-E WITH ARC LAMP AND HOUSING SAME AS FOR PREVIOUS LOCOS.
HEADLIGHT AND DYNAMO TO BE PLACED IN FRONT OF SMOKE STACK.
HEADLIGHT THROTTLE PLACED INSIDE OF CAB, AND OUTSIDE THROTTLE ALSO PROVIDED AT HEADLIGHT TURBINE. DRAIN PIPES PROVIDED FOR STEAM PIPES TO TURBINE. ALSO ONE TURBINE HEADLIGHT TURBINE EXHAUST PIPE TO RUN UP OUTSIDE OF STACK.

42 RAIL WASHER COCK TO BE PLACED IN BACKHEAD OF BOILER BELOW WATER LINE AND ACCESSIBLE TO ENGINEER, WITH 1/4" PIPES LEADING FROM COCK TO RAIL BACK OF REAR DRIVERS, TO WASH SAND FROM RAILS.

43 LAGGING AND JACKETING ON BOTH SIDES AND BACK HEAD OF FIRE-BOX APPLIED SO IT CAN BE READILY REMOVED IN SECTIONS FOR INSPECTION PURPOSES.
BOILER JACKET OVER STAYBOLTS TO BE MADE IN SECTIONS SO IT CAN BE READILY REMOVED.

THE BALDWIN LOCOMOTIVE WORKS

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SUPERHEATER SPECIFICATION FOR LOCOMOTIVES 10 38 D 192 - 193.

FOR R. LOUISIANA & ARKANSAS RAILWAY CO.

Locomotive Superheater Company's Specification No. P-1161 dated JUNE 14TH 1916.
Specification for Superheater with Top Header, Double Loop Arrangement.

BOILER TUBES 204 in number 2" O. D. 15 ft. 3/8 ins. over tube sheets. Tubes located between and adjacent to Boiler flues are to be beaded over at front end.

BOILER FLUES 30 in number 5 3/8" O. D. #9 BWG thick of cold drawn seamless steel. Flues to be straight, true to gauge and wall not to vary more than one gauge from specified thickness, as shown on Card 10812

BOILER FLUE SETTING Radius 1/16 inch on both edges of flue holes in firebox tube sheet and on front edge of flue holes in front flue sheet as shown on drawings, except for copper sheets. Back end to be set with copper ferrules, rolled, beaded and prossered except for copper sheets. Front end to be rolled and beaded. Rollers to have at least 5 rolls. Prosser to have at least 12 sections Card 1136

TUBE SHEET LAYOUT to be in accordance with Card 5764

S. H. UNITS 30 units 1 1/2" O. D. #9 BWG thick of seamless steel. Pipes united by cast steel return bends as shown on Card SEE ARRGT.
Each unit to be tested, before being placed in boiler, with water under pressure of 500 pounds.

S. H. PIPE SUPPORTS Of steel fastened securely on superheater pipes so as not to slide as shown on Card 10773

S. H. PIPE JOINT To be made in best possible manner to insure absolutely tight joints in accordance with the notation on Card 1043

S. H. UNIT CLAMP BOLT ~~To be of steel having a tensile strength between 60,000 lbs. and 70,000 lbs. per sq. inch and to be as shown on~~ IN ACCORDANCE WITH MATERIAL SPECIFICATION #12. Card 10695

S. H. HEADER To be of close grain cylinder iron, steam tight in every respect. Joint ring for connection to dry pipe to have flat side against header flange. Casting should be moulded with the face having the superheater joints placed downward in the mould to secure the best quality of metal on surface where superheater joints are made. Each header to have a serial number cast on in such a location as not to be removed in finishing. No patch plugs allowed on ball joint seats. Headers must not be treated excessively with sal ammoniac. Header casting to be tight under water pressure of 250 lbs. Test pressure to be applied separately to the saturated and to the superheated steam passages, so as to insure soundness of all partition walls. Card 10021-E

S. H. HEADER SUPPORTS To be securely bolted or riveted to boiler shell. To be properly located so as to support the header after header has been correctly located. Header should then be bolted to supports. This to be done before superheater units are put in place. Card 1323

ST. PIPE JOINT RINGS Should be of cast iron.

DEFLECTING PLATE To be constructed so as to permit easy inspection and removal of superheater units and joints. Design to be in accordance with Card SEE ARRGT.

DAMPER CYLINDER To be carefully and accurately made. Piston not to be more than 0.01 inch smaller than bore. Bearings for Piston and extension to be in line. Piston to be ground and to operate freely under a pressure as low as 40 lbs. per sq. in. Steam Pipe to damper cylinder should be as short and free from bends as possible so as not to cause water to collect in cylinder. Pipe to be protected against freezing. Card 1149

DAMPER SHAFT COUNTERWEIGHT To be painted a light color to render it easily visible by the engineer Card 1067

S. H. ARRANGEMENT To be in accordance with Card 4784

TEST (FINAL) The Superheater, after assembling in boiler and after steam pipes are fitted up, is to be thoroughly tested and to be tight under water pressure of 250 lbs.

Name	Card	Name	Card
Damper	10766-V	Damper Shaft Link	1070
Damper Cylinder Arm	1074	Patent Plate	3156
Damper Cylinder Pipe Fitting	1069-A	S. H. Unit Bolt Washer	1071
Damper Cylinder Pipe Union	1287	S. H. Unit Clamp	1073
Damper Cylinder Piping Diagram		S. H. Unit Clamp Washer	10305
Damper Cylinder Support		S. H. Pipe End	1344
Damper Shaft	1068	S. H. Pipe Band	1988
Damper Shaft Arm	1065	Return Bends	10094
Damper Shaft Bearing (O. S.)	1148	Deflecting Plate Handle	1487
Damper Shaft Bearing (I. S.)	1275-G	Lubricator Connection	3023
		SPACING OF BANDS AND SUPPORTS CARD	10759

SUPERHEATER UNITS TO HAVE WELDED RETURN BENDS.

57 ENGINE FRAMES OF HEAVY CONSTRUCTION WITH DOUBLE FRONT RAILS AT CYLINDERS.

58 PEDESTAL CAPS WITH AT LEAST TWO BOLTS AT EACH END.
PEDESTAL CAP BOLTS NOT TO BE LOCATED IN FILLETS.
~~STUDS TO HAVE DOUBLE NUTS TOP AND BOTTOM ON MAIN PEDESTAL CAPS, INSTEAD OF INVERTED BOLTS.~~ VERBAL J.A.F. 8/26/16

59 BACK FOOT PLATE, OR DECK PLATE, OF CAST STEEL, ~~ARRANGED~~ BOLTED TO BOTH RAILS OF FRAME ~~SO AS TO APPLY AT LEAST TWO KEYS~~ ON EACH SIDE TO PREVENT. WORKING BETWEEN BACK PART OF FRAME. (PREVIOUS ENGINES HAVE STRIPPED BOLTS AT THIS PLACE.)

60 FRONT BUMPER OF ENGINE TO BE REINFORCED BY STRONG STEEL CASTING BETWEEN FRAMES AND EXTENDING OUTSIDE OF SAME, AFFORDING INCREASED PROTECTION FOR CYLINDERS.
BUMPER BRACE DESIGNED SO THAT WOODEN BUMPER BEAM CAN BE APPLIED IN AN EMERGENCY.
FRONT RAIL BRACE, FILLER CASTING AND BRACE FOR BUMPER BEAM OF CAST STEEL AS PER RY.CO'S SKETCH.

61 CYLINDERS TO BE BOLTED TOGETHER AND TO SMOKE BOX BY DOUBLE ROW OF BOLTS.
CYLINDER AND VALVE BUSHINGS TO BE OF HUNT SPILLER GUN METAL IRON.
CYLINDER AND STEAM CHEST HEADS TO BE OF CAST IRON AT FRONT, AND OF CAST STEEL AT REAR.

62 PISTON RODS AND VALVE STEM GLANDS TO HAVE HANCOCK MALLEABLE IRON OIL CUPS.

63 PISTON HEADS OF SOLID CAST STEEL, WITH CAST IRON WEARING SURFACE AND WITH CAST IRON PACKING RINGS SPRUNG IN.
PISTON RODS TO BE KEYED TO CROSSHEADS.
PISTON RODS TO HAVE ENLARGED ENDS FOR CROSSHEAD FITS.

64 GUIDES TO BE OF SUCH A LENGTH THAT PACKING RINGS CAN BE APPLIED WITHOUT DISCONNECTING PISTON ROD FROM CROSSHEAD.
HANCOCK MALLEABLE IRON NEEDLE FEED OIL CUPS LOCATED IN CENTER OF GUIDES.

65 CROSSHEADS TO HAVE GIBS OF CAST IRON, BABBITTED, WITH LIPS ON THE ENDS.
CROSSHEADS TO HAVE TWO RECESSES, TOP AND BOTTOM, AND GIBS WITH LIPS TO ENGAGE SAME, THESE BEING IN ADDITION TO THE LIPS ON THE ENDS OF THE GIBS.

66 CONNECTING RODS, MAIN "I" SECTION WITH BOLTS, WEDGES AND BRASSES.
BACK END TO BE FORKED TYPE WITH WEDGE IN FRONT OF PIN.
COTTER TO BE SECURED TO ALL PINS SO THAT THEY WILL BE ACCESSIBLE FROM THE OUTSIDE.
PARALLEL RODS TO BE "I" SECTION WITH SOLID ENDS.
SIDE ROD BOTTOM ENDS TO HAVE LUGS FORGED ON FOR KEEPERS, (Front side rod brass to be held by a key instead of set screw on account of shop error.

67 GREASE CUPS FORGED ON RODS.
GREASE CUPS TAPPED 1-15/16" DIAMETER WITH TEN THREADS, AND THREADED AT THE BOTTOM.

68 ROYALTY ON VALVE MOTION PAYABLE BY THE B.L.W.

69 VALVE GEAR TO BE FITTED WITH CASTELLATED NUTS.
GREASE CUPS APPLIED TO VALVE GEAR WHERE PRACTICABLE.

70 ALL WEARING BEARINGS ON ENGINE AND TENDER TO BE OF TIGER BRONZE FROM THE MORE-JONES BRASS & METAL CO.

71 DRIVING WHEEL TIRES TO BE SET AS FOLLOWS:-

FRONT PAIR	52-1 5/16"
MIDDLE PAIR	53"
BACK PAIR	53"

72 DRIVING WHEELS TO BE SPACED 89" CENTER TO CENTER.

73 DRIVING WHEELS CENTRES TO HAVE CAST IRON HUB LINERS.

74 DRIVING BOXES TO BE FACED WITH BRASS NEXT TO WHEEL HUBS.
BOXES TO BE MADE WITH SUFFICIENT METAL AT TOP TO ALLOW PLANING OF SHOE AND WEDGE FACES. BOXES TO BE FITTED WITH FRANKLIN GREASE GELLARD.

75 DRIVING AXLES OF STANDARD STEEL WORKS HEAT TREATED STEEL.
DRIVING AXLE WHEEL FITS SAME DIAMETER AS JOURNALS, EXCEPT MAIN AXLE WHEEL FIT TO BE 1" LARGER THAN JOURNALS.

76 SPRING RIGGING AMPLY STRONG FOR ROUGH SERVICE. NO COIL SPRING TO BE USED IN EQUALIZER ARRANGEMENT.
ALL SPRING EQUALIZERS AND THEIR STANDS TO BE BUSHED WITH A HARDENED BUSHING.
SPRING EQUALIZER TO HAVE HIGH HEEL ALLOWING AT LEAST 8" FROM TOP OF EQUALIZERS TO BOTTOM OF HEEL. CORNERS OF HEEL TO BE ROUNDED OFF TO ALLOW THE EQUALIZERS TO ROCK FREELY.
HEELS ON BACK DRIVING BOX EQUALIZERS TO BE 2" HIGH, AND SLIGHTLY ROUNDED AT THE BOTTOM.
ALL SPRING HANGER PINS TO BE HARDENED.
SPRINGS TO BE ARRANGED SO THAT SADDLES ARE PROVIDED WITH 1" ROCKER ROLLER.

77 ENGINE TRUCK TO HAVE HEAVY FRAME, AND LIBERAL FILLETS AT ALL CORNERS OF FRAME AND PEDESTAL JAWS. ENGINE TRUCK CENTER PIN CASTING TO BE LIPPED TO ENGAGE THE CYLINDER SADDLE.

78 AIR PUMPS TO BE FITTED WITH U.S.KING TYPE METALLIC PACKING WITH ROD SWAB AND OIL CUPS.
AIR PUMPS TO BE PLACED BETWEEN RUNNING BOARDS.
AIR PUMP EXHAUST TO BE PIPED INTO EXHAUST CAVITY UNDER THE CYLINDER SADDLE.

79 AIR RESERVOIRS TO BE WEST'S. ENAMELLED.
BRAKE HANGERS TO BE BUSHED AND ALL PINS AND HANGERS TO BE CASE HARDENED, SCH. BC.
ENGINES TO HAVE ALL MAIN RESERVOIRS UNDER FRONT RUNNING BOARDS, SAME AS ON ENGINES BUILT FOR SOUTHERN RAILWAY BY B. L. W. (ROAD NO.1348, CLASS 12 42 ½ D 120). NO AIR DRUMS TO BE APPLIED OVER STAYBOLTS ON ACCOUNT OF FEDERAL INSPECTION.

SPECIFICATION FOR LOCOMOTIVES 10 38 D 192 - 193.
FOR LOUISIANA & ARKANSAS RAILWAY CO.

TENDER.

101 ALL PLATES IN TANK TO BE 5/16" THICK.

102 COAL PUSHER, RYAN-JOHNSTON HORIZONTAL TYPE ON TENDER.
ROYALTY ON COAL PUSHER PAYABLE BY THE B. L. W.

103 HIGH COAL GATES OF STEEL.

104 TOOL BOXES:-TWO IRON BOXES ON TOP OF TANK, AND ALSO ONE HARD WOODEN TOOL BOX, RY.CO'S STANDARD, ACROSS TANK ON BACK BUMPER BEAM.

105 TANK TO BE FITTED WITH TWO DRAIN HOLES IN FRONT OF MAN HOLE WITH PIPES RUNNING THROUGH TANK PLATES, BOTH THE TOP AND BOTTOM PLATES BEING REINFORCED AT THESE POINTS.

106 TANK VALVES, LINDSTROM WITH 2" GLOBE VALVE IN SYPHON WELL FOR DRAINING TANK.

107 TANK HOSE, PEERLESS, 3" DIAMETER.

108 TENDER FRAME CENTER PINS AND TRUCK CENTER PLATES TO BE MADE SEPARABLE.

109 SPRING BUFFER BETWEEN ENGINE AND TENDER.
WEDGE BETWEEN ENGINE AND TENDER OF CAST STEEL.
CHAFING CASTING BETWEEN ENGINE AND TENDER TO BE LIBERAL.

110 STEPS, HANDHOLDS, LADDERS TO BE APPLIED TO TENDER AS REQUIRED BY THE INTERSTATE COMMERCE COMMISSION.

111 TENDER TRUCKS, B. L. W. ALL METAL FORGED EQUALIZED PEDESTAL TYPE.
TRUCK BOLSTER TO BE OF CAST STEEL. (SIMPLEX BOLSTER NOT REQUIRED).

112 SPRING RIGGING TO BE MADE AMPLY STRONG FOR ROUGH SERVICE

113 TENDER JOURNAL BOXES TO BE SYMINGTON.

114 ALL WEARING BEARINGS ON TENDER TO BE OF TIGER BRONZE FROM THE MORE-JONES BRASS & METAL CO.

115 TENDER BRAKE BEAMS TO BE SIMPLEX TRUSS BEAMS.

THE BALDWIN LOCOMOTIVE WORKS As Specfn C-1936.

Memorandum Spec'n 17053

SPECIFICATION FOR LOCOMOTIVES 12 36 ½ E 7. (EXCEPT TO HAVE PISTON VALVES, OUTSIDE STEAM PIPES, VANDER-BILT TYPE TANK, ALSO TO OMIT AUXILIARY DOME.)

FOR TREMONT & GULF RAILWAY COMPANY.

Gen. as PHOTO-5777

Engine Drawing No. 5

3 - 14 - 17. (Specl)

Gauge of Road 4'8½" Play ¾" EXCEPT ⅞" FOR F & B DRIVERS.

Wheelbase, Rigid 14' 6" Driving 14' 6" Total 30' 7"

Total wheelbase, eng. and tend. { Actual 62' 3" / Limited to - - -

Curves No. 7 TURNOUTS ON MAIN LINE : 461 FEET RADIUS.

Limits, Height - - - Width - - -

Weight (approximate) in working order, Total 182,500 POUNDS.

On F. tr'k 15000 lbs., Drivers 140000 lbs., B. tr'k 27500 lbs.

WEIGHT LIMITED.

Tractive power 33,400 lbs.. Ratio of adhesion 4.2

Work'g St'm Pres. 185 lbs., Service FREIGHT

Fuel SOFT COAL

FRONT TUBE SHEET TO BE ½" THICK.

Boiler STEEL Thick 11/16" Bill 8126

Boiler, Diam. 66" Plan STRAIGHT TOP.

Boiler st'm pres. 200 lbs., Tested to { 220 lbs. steam pres. / 267 lbs. water pres.

WITH FACTOR OF SAFETY OF 4.6

Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS.

Dome, diam. 29" Pos CENTRAL

Firebox STEEL Combustion chamb. NONE

Firebox, length 90½" Width 66½" Depth F. 69½" B. 58½"

Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"

Firedoor opening ONE OVAL 13" X 18"

Water space, Front 4" Sides 3½" Back 3½"

Water space, Frame DOUBLE Riveted

Water space stays ⅞" DIAM. WITH 3/16" HOLES, 1¼" DEEP FROM O.S.

Radial stays 1" DIAM. Sling stays front { TWO ROWS OF B. L. W. EXPANSION STAYS.

Button heads below crown on EIGHT central rows

Crown bars NONE Placed - - - above crown

Crown bolts - - -

Flues #9 W. G. SEAMLESS STEEL. (SUP. 1-5)

Tubes #11 W. G. CHARCOAL IRON OR STEEL (SUP 1-5)

Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.

Number 24 157 Diam. 5½" 2" Length 18' 6"

Heating Surface	Flues 622⁰	Combus. Chamb. - - -	Total 2299⁰
	Tubes 1511⁰	Fire Box 147⁰	Fire Brick Tubes 16⁰

Grate area 41.5⁰ Ratio to Heating Surface 1 : 55.4

Superheater 518⁰

Fire Brick ARCH, AMERICAN ON THREE TUBES.

3" O. S. DIAM 3/16" THICK OF SEAMLESS STEEL.

Grates ROCKING BARS AND DROP PLATE (SUP 6)

Ash Pan, Dampers FRONT AND BACK.

Throttle BALANCE Pos. DOME

Dry pipe STEEL.

Superheater (SUP 8-9)

Smokebox extension WITH Cleaning hole and cap NONE

Spark arrestor or hopper NONE

Netting and deflect. plates WITH (SUP 10)

Exhaust nozzles SINGLE HIGH.

Stack CAST IRON Dia. 18" Hole in S. B., dia. 21½"

STACK TO BE BODY LEG TYPE.

Safety Valves TWO CROSBY, 2½"

Safety valves NONE with relief lever, Set to 185 POUNDS.

Whistle CHIME

Steam Gauge ONE IRON 7" IMPROVED MAKER's. CROSBY (Specl)

Steam gauge stand IRON **Clock** NONE

Water Gauge ONE (SUP 11) **Cab Lamps** ELECTRIC

12 **Gauge Cocks** THREE BACK Surface valve NONE

Lowest gauge cock 3½" above highest part of crown

Lubricator steam valve WITHOUT separate dry pipe to dome

Blower Valve B. L. W.

13 **Blow off Cock** ONE BORDO POS:- FRONT

Cleaning Plugs ONE PLUG ABOVE FIRE DOOR.

Firebox CORNERS DIAGONAL AND SIDES

Crown, TWO EACH SIDE AND TWO BACK.

Waist, ONE UNDER FRONT

Front tube sheet, NONE Fusible plug NONE

Pump NONE Pos. - - - -

Top chamb. - - - - Bottom chamb. - - - -

Feed Cock - - - - Feed pipes - - - - - -

Checks - - - - - - Check pipes - - - - -

14 (Specl) **Injectors** TWO SELLERS IMPROVED, CLASS "M" No. 9

Injectors, Pos. RIGHT & LEFT. Steam pipes COPPER

Pipes, Check (SUP. 15) Feed (SUP 15) Overflow IRON

Check SELLERS DUPLEX, WITH STOP VALVE Pos. TOP OF BOILER.

Steam Heat NONE

17 **Cab** STEEL, LINED WITH WOOD.

CAB APRON TO BE ROUGHENED.

Cab boards STEEL. Nosing T-IRON

Running boards STEEL Nosing T-IRON

Hand rail IRON Located on BOILER.

18/19 **Back Bumper** BAR STEEL Back drawbar height 33½"

Pilot WOOD Pushing shoes AT FRONT

Front Bumper OAK. Bumper plate WITH

2 **Steps** HAND HOLDS ETC. TO CONFORM TO I. C. C. REQUIREMENTS.

Front Drawhead, Center above rail 33½"

Coupler TOWER, M. C. B. AUTO.

Signal fixtures IRON ON BUMPERS.

26 **Headlight** ONE ROUND CASE 18" Reflector.

Headlight, Nos. on sides WITH H'd'l't step WITH

Lamp shelf NONE Nosing ——

Bell 32 POUNDS

Sand Box TWO Diam. 31" Body IRON P'TD. Pipes IRON

20 (Specl) Sander STEPHEN AIR. IN EACH BOX TO SAND FRONT AND BACK.

Dome casing IRON PAINTED.

21 **Boiler Jacket** #22 PLAIN STEEL Bands IRON Style 9 & 11

Boiler Lagging MAGNESIA SECTIONAL

BACK HEAD OF BOILER TO BE LAGGED AND JACKETED.

THE BALDWIN LOCOMOTIVE WORKS

6-10m. Sheik Sept mt to Nov mt 17. 353

SPECIFICATION FOR LOCOMOTIVES 12 36 ½ E 7.

FOR TREMONT & GULF RAILWAY COMPANY.

Frames CAST STEEL Braces SOLID

28 **Cylinders,** Diam. 21" Stroke 26"

St'm ports, Length 25" Width 1⅞" Bridges - - -

Exh. ports, Length - - - Width - - - Valve lead ¼"

Valve travel 5¾" Steam lap ⅞" Exhaust clearance - - -

Eccentric crank throw 1 5/16" By-pass valve NONE

S. P. Lubr. NATHAN IMPROVED FIVE FEED BULL'S EYE (SUP. 29) (Specl)

Cyl'r heads FRONT CAST IRON, BACK CAST STEEL

Cyl'r casings IRON P'TD Head covers STEEL PAINTED.

St'm chest casings - - - Covers - - -

St'm chest valves 11" DIAMETER. BALANCED PISTON TYPE.

Met. pkg { PISTON RODS / VALVE STEMS } U. S. IMPROVED. (Specl)

30 **Pistons** CAST IRON RINGS SPRUNG INTO SOLID HEAD.

Guides STEEL. Oil cups NEEDLE

Crossheads CAST STEEL (SUP 31)

32 **Wrist Pins** STEEL 33 Rod cups PLUNGER, FORGED ON.

Valve Motion WALSCHAERTS.

Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.

All finished movable nuts of steel or of iron case hardened.

Wearing Bearings MORE-JONES BRASS & METAL Co's.

36 **Drivers,** O. S. Diam. 54" Cen. diam. 48", CENTERS CAST STEEL.

Tires STEEL (SUP 34) Held by SHRINKAGE AND SHOULDER.

Tires, Flanged, Pos. ALL Size 3" x 5½"

Tires, Plain, Pos. NONE Size - - -

Lateral play between driving boxes and wheel hubs = 1/16" TOTAL.

36 **Driving Boxes** CAST STEEL, WITH ELVIN LUBRICATORS.

Journals, Diam. { MAIN 9" / OTHERS 8½" Length 10"

Springs. Make B. L. W.

Front Engine Truck TWO Wheeled SWING BOLSTER CENTER BEARING.

To swing 3½" each side of cen., Cen. pin liners NONE.

Journals, Diam. 5½" Length 10" Boxes CAST IRON.

Wheels, Diam. 30" Tread - - Kind CAST IRON SPOKE CENTER.

Tires STEEL (SUP 34) Cen. diam. 25" Size 2½" x 5½"

Tires held by SHRINKAGE AND SHOULDER.

FRONT ENGINE TRUCK WHEELS WITHOUT HUB LINERS.

Back Engine Truck TWO Wheeled OUTSIDE BEARING TYPE.

To swing 3" each side of cen., Cen. pin liners NONE

Journals, Diam. 6" Length 11" Boxes CAST STEEL

Wheels, Diam. 36" Tread - - Kind CAST IRON SPOKE CENTER.

Tires STEEL (SUP. 34) Cen. diam. 31" Size 2½" x 5½"

Tires held by SHRINKAGE AND SHOULDER.

BACK ENGINE TRUCK WHEELS TO HAVE HUB LINERS OF BRASS.

37½ **Brake,** position ON ALL DRIVING AND TENDER WHEELS.

Operating Parts { Engine, Sch. No. 6-ET WEST'G. COMBINED AUTO. AND / Eng. Tr'k, sch. 26 - - - STRAIGHT AIR.

Foundation Parts { Drivers, sch. WH-2, AMERICAN O. S. EQUALIZED. / Eng. Tr'k, sch. - - -

Air pump TWO 9½" Pos. BOTH LEFT SIDE (SUP 37)

Train connections FRONT AND BACK.

Train signal, sch. NONE

AIR RESERVOIR TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

CERTIFICATES DATED JUNE 6TH 1917 COVERING TEST OF RESERVOIR NOS. 12927 - 12935 INC. FURNISHED BY WEST'G. AIR BRAKE CO. ARE FILED IN MAIN OFFICE'S FILE No. 129

Tender EIGHT Wheeled, Drawing No. 698

Weight, with fuel and water, about 126,500 POUNDS.

VANDERBILT TENDER, Nos. 2465.

Tank 6000 Gallons. Bill 4522

TANK, CYLINDRICAL TYPE. FUEL CAPACITY, 14 TONS.

Tool Boxes TO BE BUILT IN TANK.

TENDER TO BE ALL STEEL CONSTRUCTION.

Frame STEEL ANGLES.

18/19 Front Drawbar height 32⅜"

Pilot NONE Pushing shoes AT REAR

Back drawhead, center above rail 33½"

Coupler TOWER, M. C. B. AUTO. WITH FARLOW TWIN SPRING DRAFT GEAR.

2 Steps HAND HOLDS ETC., TO CONFORM TO I. C. C. REQUIREMENTS.

Trucks ARCH BAR TYPE, EXTRA HEAVY.

TRUCKS TO HAVE "DIAMOND" FRAME.

Springs ELLIPTIC. B. L. W.

Journals, Diam. 5" Length 9"

Wheels, Diam. 33" Tread 4¼" Kind CHILLED CAST IRON PLATE.

Tires NONE. Cen. diam. - - - Size - - -

Tires held by - - -

Safety chains ~~SINGLE~~ NONE

Brake Position ON ALL WHEELS.

Brake sch. No. 6-ET WESTINGHOUSE AUTO. AND STRAIGHT AIR WITH 12" X 12" CYLINDER.

List of tools, sch. 29

Photo sch. 2 Inspection (SUP. 1)

To be weighed YES. Material spec'ns B. L. W.

Certificate of boiler test THREE COPIES OF B.L.W. FORM 1036.

Junior laws to 8-1-17 Shipment ON OWN WHEELS.

Brass shop finish, No. 1

Machine shop finish D-165.

B. L. W. Patents { BACK ENG. TRUCK, 1060499, PAR. 29, 1913. (BRASS PLATE) / SPRING CLIP, PATENTED, JANUARY 2, 1912. (CAST ON.)

Property plates B. L. W. FOR ENGINE AND TENDER.

RODS AND TIRES TO BE PAINTED GRAY.

Painting:—Engine, style ----- BLACK, NO STRIPING.

Painting:—Tender, style ----- BLACK, NO STRIPING.

LETTERING ETC. TO BE IN ALUMINUM, SAME AS FOR 10 32 D 1143.

MARK ON CAB PANEL AND ON BACK COLLAR OF TANK, T. & G. RY.

Mark on SIDES OF TANK COLLAR, TREMONT & GULF RY.

MARK ON BACK OF TANK ABOVE NUMBER, 6000 GALS.

NUMBERS ON TANK TO BE IN LARGE FIGURES.

Road Nos. Pos.	Road Nos.	Name NONE
F. No. PLATE	30	
F. SAND BOX.		
SIDES OF TANK.		
BACK OF TANK.		

SPECIFICATION FOR LOCOMOTIVES 12 36 ¼ E 7.

FOR TREMONT & GULF RAILWAY COMPANY.

Specification for Type A Double Loop Superheater. SPECIFICATION No. 0-760½ DATED MAY 7, 1917.

BOILER TUBES	157 in number 2 o. d. 18 ft. 6 in. over tube sheets. Tubes located between and adjacent to boiler flues are to be beaded over at front end.
BOILER FLUES	24 in number 5½ o. d. #9 BWG of cold drawn seamless steel. Flues to be straight, true to gauge and wall not to vary more than one gauge from specified thickness. Card 1409-A
BOILER FLUE SETTING	½ in. radius on both edges of flue holes in fire box tube sheet and on front edge of flue holes in front tube sheet as shown on drawings, except for copper sheets. Back end to be set with copper ferrule, rolled, beaded and prossered except for copper sheets. Front end to be rolled and beaded. Rollers to have at least 5 rolls. Prosser to have at least 12 sections. Card 1136
TUBE SHEET LAYOUT	Card 5000A
UNITS	24 units 1½ o. d. #9 B.W.G. of seamless steel. Pipes united by return bends. Each unit to be tested, before being placed in boiler, with water under pressure of 250 lb. per sq. in. for screwed return bends or 500 lb. per sq. in. for welded return bends.
UNIT PIPE SUPPORTS	Of steel fastened securely on superheater pipes so as not to slide. Card 10773
UNIT PIPE JOINT	To be made in best possible manner to insure absolutely tight joints in accordance with the notation on Card 1043
UNIT CLAMP BOLT	To be in accordance with requirements of Locomotive Superheater Company Material Specification No. 12 Card 10695
HEADER	To be of close grain cylinder iron, steam tight in every respect. Joint ring for connection to dry pipe to have flat side against header flange. Casting should be moulded with the unit joint face down to secure the best quality of metal on surface where superheater unit joints are made. Each header to have a serial number cast on in such a location as not to be removed in finishing. No patch plugs or chaplets allowed in ball joint seats. Headers must not be treated with sal ammoniac. Header casting to be tight under water pressure of 250 lb. Test pressure to be applied separately to the saturated and to the superheated steam passages, so as to insure soundness of all partition walls. Card 10466
HEADER SUPPORTS	To be securely fastened to boiler shell with rivets or turned bolts fitted in reamed holes. To be properly located so as to support the header after header has been correctly located. Header should then be secured to supports. This to be done before superheater units are put in place. Card 1323
STEAM PIPE JOINT RINGS	Should be of cast iron.
DEFLECTING PLATE	To be constructed so as to permit easy inspection and removal of superheater units and joints. Design to be in accordance with Card SEE APPEN.
DAMPER CYLINDER	To be carefully and accurately made. Piston not to be more than 0.01 in. smaller than bore. Bearings for piston and extension to be in line. Piston to be ground and to operate freely under a pressure as low as 40 lb. per sq. in. Steam pipe to damper cylinder should be as short and free from bends as possible so as not to cause water to collect in cylinder. Pipe to be well protected against freezing. Card 1149
DAMPER SHAFT COUNTERWEIGHT	To be painted a light color to render it easily visible by the engineer Card 1067
S. H. ARRANGEMENT	To be in accordance with Card 10007-A
TEST (FINAL)	The superheater, after assembling in boiler and after steam pipes are fitted up, is to be thoroughly tested and to be tight under water pressure of at least 30% more than the working pressure of the boiler.

DAMPER	Card 10977-B	DAMPER SHAFT LINK	Card 1070
DAMPER CYL. ARM	Card 1074	PATENT PLATE	Card 3159
DAMPER CYL. PIPE FITTING	Card 1068-A	S. H. UNIT BOLT WASHER	Card 1071
DAMPER CYL. PIPE UNION	Card 1297	S. H. UNIT CLAMP	Card 1073
DAMPER CYL. PIPING DIAGRAM	Card	S. H. UNIT CLAMP WASHER	Card 10305
DAMPER CYL. SUPPORT	Card	S. H. PIPE END	Card 1301
DAMPER SHAFT	Card 1065	S. H. PIPE BAND	Card 1300
DAMPER SHAFT ARM	Card 1069	RETURN BENDS	Card 10300
DAMPER SHAFT BEARING (O.S.)	Card 1148	DEFLECTING PLATE HANDLE	Card 1457
DAMPER SHAFT BEARING (I.S.)	Card 10386-A	LUBRICATOR CONNECTION	Card 3023
SPACING OF BANDS & SUPPORTS	Card 10792	DEFLECTING PLATE STUDS	Card 10809
TYPE OF RETURN BENDS	CAST STEEL.	DEFLECTING PLATE CLAMP	Card 10809-A

1 BOILER PLATES AND TUBES TO BE INSPECTED BY R. W. HUNT & CO. AT POINT OF MANUFACTURE.
+ SEND TO THEM COPIES OF ORDERS FOR THESE MATERIALS.
LOCO. WILL BE INSPECTED AT THESE WORKS BY MR. LYMAN.

2 ENGINE AND TENDER TO MEET THE RULES OF INSPECTION AND TEST AS REQUIRED BY THE INTERSTATE COMMERCE COMMISSION GOVERNING THE RATING LOCOMOTIVE.

3 ALL IRON PIPING SUBJECT TO BOILER PRESSURE TO BE OF DOUBLE STRENGTH PIPE.

4 FLEXIBLE STAYBOLTS TO BE TATE, OF EWALD IRON, ABOUT 300 IN NUMBER, LOCATED IN BREAKING ZONE.

5 + TUBES (2" AND 5½") FROM THE NATIONAL TUBE COMPANY.

6 GRATES TO HAVE ⅜" OPENING BETWEEN FINGERS.

7 ASH PAN TO BE SELF-CLEANING TYPE.
ASH PAN TO HAVE OPENING EQUAL TO 14% OF GRATE AREA OR ABOUT 100% OF FLUE AREA.

8 SUPERHEATER TO BE SCHMIDT TYPE, CONNECTING WITH TOP HEADER IN SMOKE BOX AND WITH OUTSIDE STEAM PIPE CONNECTIONS TO VALVE CHAMBERS.
+ ROYALTY ON SUPERHEATER PAYABLE BY THE B. L. W. SUPERHEATER AS LOCOMOTIVE SUPERHEATER CO'S. SPECIFICATION No. 0-760½ DATED MAY 7TH, 1917. COPY ATTACHED.

9 HAND HOLE AND CAP IN EACH SIDE OF SMOKE BOX FOR INSPECTION OF SUPERHEATER.

10 FRONT END ARRANGEMENT TO BE M.M. SELF CLEANING TYPE.

11 WATER GAUGE TO HAVE E. S. E. COCKS AND IRONCLAD GUARD.

12 GAUGE COCKS TO BE NATHAN TYPE A-1000.

13 BLOW-OFF COCK TO BE OMITTED FROM UNDER WAIST OF BOILER AND ONE 2½" PLUG APPLIED FOR WASHING OUT. THE BOILER SHEET TO BE REINFORCED FOR PLUG.

14 BOILER SHEET TO BE REINFORCED WHERE INJECTOR CHECK EXTENSION PIPES ENTER INTO BOILER.

15 INJECTOR CHECK AND FEED PIPES TO BE OF DOUBLE STRENGTH IRON PIPE.

16 INJECTOR FEED WATER STRAINERS TO BE SELLERS.

17 STEAM VALVES IN CAB TO HAVE EXTENSION HANDLES WHERE NECESSARY.

18 CAB APRON TO BE ROUGHENED.

19 CHAFING CASTING OF STEEL BETWEEN ENGINE AND TENDER.

20 WATER PIPES TO BE PROVIDED TO WASH SAND FROM BEHIND REAR DRIVERS.

21 HEADLIGHT EQUIPMENT TO BE PYLE NATIONAL ELECTRIC WITH + NITROGEN FILMENT LAMP.

27 BOILER LAGGING AND JACKET NOT TO BE APPLIED OVER STAYBOLTS THAT HAVE TELL-TALE HOLES DRILLED IN THEM, AND THE FLEXIBLE STAYS OUTSIDE OF CAB. BOILER HEAD INSIDE OF CAB TO BE COVERED WITH LAGGING AND JACKET IN SECTIONS, READILY REMOVABLE.

28 CYLINDER COCKS TO BE WATERTOWN AUTOMATIC.

29 LUBRICATOR TO HAVE SPECIAL CONDENSER, TYPE No. 177
+ LUBRICATOR PIPES OF IRON UNDER JACKET.

30 PISTON RODS TO BE KEYED TO CROSSHEAD.

31 CROSSHEADS TO HAVE CAST IRON SHOE WITH BABBITT STRIPS INSTEAD OF BRASS SHOES OR BRASS GIB ARRANGEMENT.

32 WRIST PIN COLLARS TO BE SECURED TO PINS AS SHOWN ON B. L. W. TRACING 31230 APPROVED.

33 MAIN RODS TO BE FLUTED, OTHERS RECTANGULAR SECTION.
PARALLEL RODS TO HAVE SOLID ENDS.

34 DRIVING AND FRONT AND BACK TRUCK TIRES TO BE OF HARD + GRADE STEEL.

35 DRIVING WHEELS TO HAVE CAST IRON HUB LINERS COUNTERSUNK INTO WHEELS AND SECURED BY RIVETS.

36 DRIVING BOXES TO HAVE BRASS HUB LINER COUNTERSUNK INTO BOXES AND SECURED BY RIVETS.

37 AIR-PUMP EXHAUST TO BE LOCATED ON OUTSIDE BEHIND SMOKE-STACK AND TO BE MUFFLED.

38 OMIT THE REGULAR TYPE AIR STRAINER PC. 12659 SUPPLIED WITH PUMP AND USE INSTEAD, SUCTION STRAINER PC. #54780.

39 AIR RESERVOIRS TO BE ENAMELLED.

40 + BRAKE WORK TO HAVE CASEHARDENED BUSHINGS AND PINS.

THE BALDWIN LOCOMOTIVE WORKS 'Bo Book'n C-3923. SIGHT OR HORIZONTAL SPR'G.

Specification No. 11165

SPECIFICATION FOR LOCOMOTIVES 10 32 E 133

FOR Louisiana & Pacific Railway Company

6-17-16

Gen. as Photo. 5902 — Equipped with one sand box and Nathan's Sight Feed Lubricator, Model 7DP Outside Engineer No. 8

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 14' 0" Driving 14' 0" Total 21' 8"
Total wheelbase, eng. and tend. { Actual 51'-1½" V.C. Limited to ——

Curves ——

Limits, Height —— Width ——
Weight (approximate) in working order, Total 129,000 lbs.
On F. tr'k 14,000 lbs., Drivers 115,000 lbs., B. tr'k —— lbs.

Tractive power 29,500 lbs., Ratio of adhesion 3.9
Work'g St'm Pres. 200 lbs., Service FREIGHT
Fuel OIL
OIL BURNING ARRANGEMENT, B.L.W. STANDARD WITH BURNER PLACED IN FRONT OF FIRE BOX. ROYALTY, IF ANY, PAYABLE BY THE B. L. W.
Boiler STEEL Thick ⅞" Bill 7856
Boiler, Diam. 54" Plan EXTENDED WAGON TOP
Boiler st'm pres. 200 lbs., Tested to { 220 lbs. steam pres. / 267 lbs. water pres.
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS.

Dome, diam. 29" Pos FORWARD OF FIRE BOX

Firebox STEEL Combustion chamb. NONE
Firebox, length 96-3/16" Width 41½" Depth F. 63⅛" B. 61⅛"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back 5/16"
Firedoor opening 16" DIAM. CROWN AND SIDE SHEETS IN ONE PIECE
Water space, Front 4" Sides 3½" Back 3½"
Water space, Frame SINGLE Riveted
Water space stays ⅞" DIAM. WITH 3/16" HOLES 1½" DEEP FROM O.S.
FALLS HOLLOW, HOLLOW STAYBOLTS, 508 IN NUMBER IN LOWER PART OF FIREBOX.
Radial stays 1" DIAM. Sling stays front TWO ROWS OF B. L. W. EXPANSION STAYS
Button heads below crown on Sloping sheet, central rows Vert. sheets
Crown bars NONE Placed above crown
Crown bolts ——

Flues ——
Tubes #11 W. G. CHARCOAL IRON (2 on account of time; #12 W.G. hereafter 4/16/16)
Tube ends SUNGED FOR COPPER FERRULES, FIRE BOX ENDS
Number 184 Diam. 2¼" Length 13' 10"

Heating Surface	Flues ——	Combus. Chamb. ——	Total 1622 sq. ft.
	Tubes 1490 sq. ft.	Fire Box 132 sq. ft.	Fire Brick Tubes ——
Grate area	27.5 sq. ft.	Ratio to Heating Surface 1 : 59	
Superheater	——		

FIRE BOX LINED WITH FIRE BRICK FOR OIL BURNING
Fire Brick ARCH TO SUIT OIL BURNING ARRANGEMENT
FIRE BRICK PAVEMENT 4½ PAN.

Grates NONE
Ash Pan, Dampers FRONT
PAN SUSPENDED FROM MUD RING INSTEAD OF FROM SIDE SHEETS.

Throttle BALANCE Pos. DOME
Dry pipe STEEL

Superheater NONE

Superheater extension WITH Cleaning hole and cap NONE
Spark arrester or hopper NONE
Washing and deflector plates NONE

Exhaust nozzle DOUBLE LIP
Changeable Tablets WITH
Nozzle Stationary Dia. 18" Hole in S. B. dia. 13½"
Pilot to have steel base. ——

(Over)

Safety Valves TWO CROSBY 3"
Safety valves Notes with relief lever, Set to 200 pounds
Whistle B. L. W. PLAIN

Steam Gauge CAB. Lens 7" MAKER: Ashcroft (non-spec) Check None
Steam gauge stand IRON

Water Gauge ONE ELNA #5 CAB. Lamps ELECTRIC
Gauge Cocks THREE BACK Surface valve NONE
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve TO HAVE separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock ONE B. L. W. POS'N Front
Cleaning Plugs
Firebox CORNERS, DIAGONAL AND BACK
Crown, THREE EACH SIDE AND TWO BACK
Waist, ONE UNDER FRONT
Front tube sheet, TWO Fusible plug ONE

Pump NONE Pos. ——
Top chamb. —— Bottom chamb. ——
Feed Cock —— Feed pipes ——
Checks —— Check pipes ——
BOILER FEED WATER PIPES TO BE PROVIDED WITH FLANGING, DOUBLE STRENGTH SWING CHECK VALVES JUST BACK OF THE BOILER HEADS
Injectors TWO MONITOR IMPROVED (non-spec) No. ——
Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER
Pipes, Check IRON Feed IRON Overflow IRON
Check B. L. W. Pos. RIGHT AND LEFT
Steam Heat NONE

Cab STEEL

Cab boards WOOD Nosing IRON
Running boards WOOD Nosing IRON
Hand rail IRON Located on BOILER

Back Bumper BAR STEEL Back drawbar height 31½"
SPRING BUFFER TO BE APPLIED BETWEEN ENGINE AND TENDER
PILOT TO BE OF THE SHORT STEP TYPE
Pilot WOOD Pushing shoes CAST IN BUMPER.
Front Bumper CAST STEEL Bumper plate WITH
Steps, HAND HOLDS ETC. TO CONFORM TO I.C.C. REQUIREMENTS

Front Drawhead, Center above rail 33½" AND 25"
Coupler M.C.B. AUTO. 33½" CENTRE ABOVE TOP OF RAIL, ALSO COUPLER FOR LOGGING CARS, 25" CENTRE ABOVE TOP OF RAIL.

Signal fixtures IRON OR BRONZE

HEADLIGHT EQUIPMENT TO BE PYLE NATIONAL ELECTRIC.
Headlight Cab. Mount CAST 18" Reflector, To turn ——
Headlight, Nos. on sides NONE Hdlt stay WITH
Lamp shelf NONE Nosing ——

Bell 92 pounds.
Sand Box CAB Diam. 25" Body IRON PAINTED Pipes IRON
Sander LEACH AIR TRAP A-1

Dome casing IRON PAINTED

Number Indicators PLATE, STEEL, Bands IRON Discs 9
Shelter Engineer SPHERICAL SECTIONAL

THE BALDWIN LOCOMOTIVE WORKS
Specification No. 11165
SPECIFICATION FOR LOCOMOTIVES 10 32 E 133
FOR Louisiana & Pacific Railway Company.

Frames CAST STEEL Braces SOLID

Cylinders, Diam. 19" Stroke 24"
St'm ports, Length 16" Width 1½" Bridges 1½" Valve lead ¼ 3/32 1/8 1/8 H.P.
Exh. ports, Length 16" Width 2½" Valve lead ¼ 3/32 1/8 1/8 H.P.
Valve travel 4½" Int. Steam lap 1" Exhaust clearance ——
Eccentric crank throw 8" By-pass valve NONE
S. P. Lubr. ELNA TRIPLE BULLS EYE, TWO QUART CAPACITY
Cyl'r heads CAST IRON Cover pieces of iron under jacket. 9-22-16
Cyl'r casings IRON PTD. Head covers STEEL PAINTED
St'm chest casings IRON PTD. Covers STEEL PAINTED
St'm chest valves ALLEN BALANCED, WITH VACUUM VALVES
Met. pkg. (Piston rings, valve stems) UNITED STATES (non-spec)

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD.
Guides STEEL Oil cups NEEDLE
Crossheads CAST STEEL, WITH BRASS BEARINGS
Wrist Pins STEEL Rod cups (see note ✱ below)
PARALLEL RODS TO HAVE SOLID ENDS

Valve Motion WALSCHAERTS
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.
✱ RODS TO BE GALENA HARD GREASE CUPS FORCED ON, WITH FEATHERS SECURED WITH SUITABLE LOCK OR JAM NUTS.
All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 50" Cen. diam. 44" CENTRES CAST IRON

Tires STEEL Held by SHRINKAGE AND SHOULDER
Tires, Flanged, Pos. FRONT AND BACK Size 3" x 5½"
Tires, Plain, Pos. INTERMEDIATE Size 3" x 6½"
Lateral play between driving boxes and wheel hubs — 1/16" TOTAL
Driving Boxes CAST STEEL
Main Pins, Diam. MAIN 7" Length 8½"
Others 7"

Springs, Make B. L. W.

Front Engine Truck, Two Wheeled SWING BOLSTER CENTER BEARING
To swing 2½" each side of cen., Cen. pin liners NONE
Journals, Diam. 5" Length 9" Boxes CAST IRON
Wheels, Diam. 30" Tread —— Kind CAST IRON SPOKE CENTRE.
Tires STEEL Cen. diam. 25" Size 2½" x 5/8"
Tires held by SHRINKAGE AND SHOULDER.

Back Engine Truck, NONE Wheeled ——
To swing —— each side of cen., Cen. pin liners ——
Journals, Diam. —— Length —— Boxes ——
Wheels, Diam. —— Tread —— Kind ——
Tires —— Cen. diam. —— Size ——
Tires held by ——

Brakes, position ON ALL DRIVING AND TENDER WHEELS.

Operating Parts	Engine, Sch. #6 ET West'g. Combined Auto. and Eng. Tr'k, sch. ——	STRAIGHT AIR
Foundation Parts	Drivers, sch. Mk-I AMERICAN O.S. EQUALIZED Eng. Tr'k, sch. ——	

Air pump Two 9½" Pos. BOTH LEFT SIDE
Train connections FRONT AND BACK
Train signal, sch. None
Arm Reservoirs to be West'g. ENAMELLED.

Cert. Fire Box dated 8-10-16 for fire box of Locomotive No. 1165 also one for Tender No. 1166 to be furnished by the W. & L. Co. See Mechanical Dept. File 3223 for 1916

Tender EIGHT Wheeled, Drawing No. 435
Weight, with fuel and water, about 90,000 LBS.

Tank { OIL 2600 Gallons, Bill 4288 / WATER 4500 4276
TANK "U" SHAPE, STRAIGHT TOP.

Tool Boxes OF HARD WOOD, TOP.

Frame STEEL 10" CHANNELS
SPRING BUFFER TO BE APPLIED BETWEEN ENGINE AND TENDER.
Front Drawbar height 29½"
Pilot NONE Pushing shoes NONE AT REAR. 10-29-16.
Back drawhead, center above rail 33½" AND 25"
Coupler M.C.B. AUTO. 33½" CENTRE ABOVE TOP OF RAIL, ALSO CAST IRON COUPLER FOR LOGGING CARS, 25" CENTRE ABOVE TOP OF RAIL.

Steps, HAND HOLDS ETC. TO CONFORM TO I.C.C. REQUIREMENTS.

Trucks ARCH BAR TYPE WITH STEEL BOLSTERS.
TENDER TRUCKS OF STEEL, 80,000 LBS. CAPACITY.
Springs ELLIPTIC - B. L. W. MAKE.
Journals, Diam. 5" Length 9"
Wheels, Diam. 33" Tread 4½" Kind CHILLED CAST IRON PLATE.
Tires NONE Cen. diam. —— Size ——
Tires held by ——
Safety chains SINGLE

Brake Position ON ALL WHEELS.
Brake sch. #6 ET West'g. AUTO. AND STRAIGHT AIR WITH 10" x 12" CYLINDER.

PUSH POLE, SWITCH ROPE, AND TWO WRECKING FROGS TO BE FURNISHED.
List of tools, sch. 31
Photo sch. #2 Inspection B. L. W.
To be weighed YES Material spec'ns B. L. W.
Certificate of boiler test THREE COPIES OF B.L.W. FORM 1036.
Junior jaws to 8-16-16 Shipment ON OWN WHEELS

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. Patents | THROTTLE, PATENTED JAN. 23, 1900 (CAST ON) / FEED PIPE STRAINER, PATENTED SEPT. 1, 1903 (CAST ON)

Property plates B. L. W. FOR ENGINE AND TENDER.

Painting:—Engine, style 291 OLIVE GREEN AND ALUMINUM.
Painting:—Tender, style 291 OLIVE GREEN AND ALUMINUM

LETTERING ETC. TO BE SAME AS FOR 10 32 E 101
Mark on CAB PANEL, L. & P.
MARK ON BACKS OF TANK COLLAR, LOUISIANA & PACIFIC

Road Nos. Pos.	Road Nos.	Name NONE
F. No PLATE	252	
SAND BOX		
SIDES OF TANK		
BACK OF TANK		

Memorandum Specn. 1112

SPECIFICATION FOR LOCOMOTIVES 12 36 4 D 8 and 9

FOR Mississippi River & Bonne Terre Ry. Engine Recording No.

7-31-16

Gauge of Road 4' 8½" Play 2"

Wheelbase, Right 12' 0" Driving 12' 0" Total 30' 10"

Total wheelbase, eng. and tend. { Actual 56' 4" / Limited to 56' 4" (SEE SUP. 7)

RAILS 75 TO 90 POUNDS

CURVES 12 DEGREES (SEE SUPPLEMENT 2)

Limits, Height 15'0" TO TOP OF STACK Width 10' 3"

Weights (approximate) In working order, Total 189,000 POUNDS

On F. truck 36,000 lbs., Drivers 120,000 lbs., B. truck 33,000 lbs.

WEIGHT LIMITED (SEE SUPPLEMENT 3)

Tractive power 29,000 lbs., Ratio of adhesion 4.14

Work'g St'm Pres. 190 lbs., Service PASSENGER

Fuel ILLINOIS BITUMINOUS COAL

Boiler STEEL (SUP. 21) Thick ⅜" AND 11/16" III 7926

Boiler, Diam. 64" Plan EXTENDED WAGON TOP

Boiler st'm pres. 200 lbs., Tested to { 220 / 267 } lbs. steam pres. / lbs. water pres.

Longitud. seams BUTT JOINTED DOUBLE COVERING STRIPS, QUINTUPLE RIVETED

Dome, diam. 29" Pos. FORWARD OF FIRE BOX

Firebox STEEL (SUP. 23) Combustion chamb. NONE

Firebox, length 96⅛" Width 66¼" Depth F. 67" B. 72⅝"

Firebox, Tube ½" Crown ⅜" Sides ⅜" Back ⅜"

Firedoor opening OVAL 13" x 18"

Water space, Front 4" Sides 4" Back 4"

Water space, Frame DOUBLE Riveted

Water space stays ⅞" DIAM. WITH 3⅛" HOLES 1½" DEEP FROM O.S.

Radial stays 1" DIAMETER Sling stays front THREE ROWS OF B.L.W. EXPANSION STAYS

Button heads below crown on SIX central rows

Crown bars NONE Placed ---- above crown

Crown bolts ----

Flues # 9 W.G. STEEL

Tubes #12 W.G. CHARCOAL IRON OR STEEL

Tube ends SHAGED FOR COPPER FERRULES, FIREBOX ENDS

Number 194 Diam. 2" Length 19' 0"

Heating Surface: Flues 639 sq ft, Combus. Chamb. ---- Total 3417 sq ft; Tubes 1624 sq ft, Fire Box 154 sq ft, Fire Brick Tubes ----

Grate area 44.3 sq ft Ratio to Heating Surface 1 : 94.6

Superheater 598 sq ft

Fire Brick Arch, None

Cleaning Plugs ONE PLUG ABOVE FIRE DOOR

Firebox CORNERS BRACED.

Crown TWO EACH SIDE AND FOUR BACK.

Waist ONE SMOOTH FRONT AND ONE BRACED BACK.

Front tube sheet, ONE

Pumps None

Top chamb. ----

Feed Cock ----

Clacks ----

Injectors TWO NATIONAL

Injectors, Pos. RIGHT AND LEFT

Pipes, Check - Lead

Check, B. L. W.

Pos. Right and Left

Stokers None. SAFETY CAB HEATERS & EXHAUSTER CO'S STEAM HEATING REGULATOR

Grate, Style

Ash pan, Dampers, Back

Throttle Balanced Pos. Dome

Dry pipe, STEEL

Superheater Schmidt (SEE SUPPLEMENT 27)

Smokebox extension WITH Cleaning hole and cap LEFT SIDE ONLY

Spark ejector WITH, TO DELIVER TO LEFT SIDE

Netting and deflect. plates WITH

Exhaust nozzles SINGLE, MIDDLE

Blast STRAIGHT Dia. 21" Area to S. A. 22½

Cylinders, Diam. 21" Stroke 26"

Valves, Kind PISTON Diam. 12" Outside admission

Valve travel 6" Steam lap 1" Bridges ----

Exhaust clearance ⅛" Width ---- Valve lead ¼"

Bore of steam pipes 14" By-pass valve NONE

Guides, Style NATHAN FIVE FEED BULLS EYE

Cyl. heads CAST STEEL, LUGS, PIPES OF IRON UNDER JACKET

Cyl. casings IRON PAINTED Head covers STEEL PAINTED

Steam chest casings ---- Covers ----

Steam chest valves 11" DIAM. PISTON TYPE, INSIDE ADMISSION

Mot. pin ---- JERMOE EDWARDS

Frames CAST STEEL (SUP. 30) Bronze SOLID

Thickness, Diam. 2" Width 4" Bridges ----

Engine truck, Length 26.95" Width ---- Valve lead ¼"

Driving wheel, Length ---- Width ---- Exhaust clearance ⅛"

Engine truck wheel, Diam. 36" Steam lap 1" By-pass valve NONE

Driving wheel, Diam. 73" Steam lap 1¼" Exhaust clearance ⅛"

Engine truck, Kind RADIAL Diam. 36" Weight on 1,000 lbs.

Driving, Kind RIGID Diam. 73" Weight on 120,000 lbs.

Trailing, Kind RADIAL Diam. 44" Weight on 33,000 lbs.

Engine truck brgs. CAST STEEL WITH RENEWABLE BRASS LINERS

Driving brgs. CAST STEEL WITH RENEWABLE BRASS LINERS

Trailing brgs. CAST STEEL WITH RENEWABLE BRASS LINERS

Engine truck wheels, Material CAST STEEL

Driving wheels, Material CAST STEEL

Trailing wheels, Material CAST STEEL

Engine truck wheels, Tires SOLID

Driving wheels, Tires SOLID

Trailing wheels, Tires SOLID

Engine truck wheels, Centers CAST STEEL

Driving wheels, Centers CAST STEEL

Trailing wheels, Centers CAST STEEL

Engine truck wheels, Counterbalance ----

Driving wheels, Counterbalance CAST IN WHEEL

Trailing wheels, Counterbalance ----

Engine truck wheels, Weight on ---- lbs.

Driving wheels, Weight on 120,000 lbs.

Trailing wheels, Weight on ---- lbs.

Engine truck, Journals, Diam. ---- Length ----

Driving, Journals, Diam. 9" Length 12"

Trailing, Journals, Diam. ---- Length ----

Engine truck, Boxes ----

Driving, Boxes CAST STEEL

Trailing, Boxes ----

Engine truck, Wedges ----

Driving, Wedges CAST STEEL

Trailing, Wedges ----

Engine truck, Tread ---- Kind ----

Driving, Tread 2½" Kind CAST FROM BOXES CENTERS

Trailing, Tread ---- Kind ----

Engine truck, Axles ----

Driving, Axles STEEL

Trailing, Axles ----

THE AMERICAN LOCOMOTIVE COMPANY, Successor to Rogers Locomotive Works, Manufacturers' Agents

Specification No. 11126

SPECIFICATION FOR LOCOMOTIVES 12 36 4-6-0 and 9

For B. & O. R. R. Co's Class

Road Mississippi River & Bonne Terre Ry. Run of B.L.W. Tractive Power Catalog and

Engine Drawing No. 3

7-31-16

Gauge of Road 4' 8½" Play ⅜"

Wheelbase, Rigid 12' 0" Driving 12' 0" Total 30' 10"

Total wheelbase, eng. and tend. {Actual 56' 4" / Limited to 56' 4" (See sup. 5)

RAILS 75 TO 90 POUNDS

CURVES 12 DEGREES (See Supplement 2)

Limits, Height 15'0" TO TOP OF STACK Width 10' 3"

Weight (Approximate) in working order, Total 169,000 pounds

On F. tr'k 36,000 lbs., Drivers 120,000 lbs., R. tr'k 33,000 lbs.

WEIGHT LIMITED (See Supplement 3)

Tractive power 29,000 lbs., Ratio of adhesion 4.14

Work'g St'm Pres. 190 lbs., Service PASSENGER

Fuel ILLINOIS BITUMINOUS COAL

Boiler Steel (Sup. 21) Thick ⅜" AND 11/16" Ctr. 7926

Boiler, Diam. 64" Plan EXTENDED WAGON TOP

Boiler st'm pres. 200 lbs., Tested to { 220 / 267 } lbs. steam / water pres.

Longitud. seams BUTT JOINTED DOUBLE COVERING STRIPS, BOTH RIVETED

Dome, diam. 29" Pos. FORWARD OF FIRE BOX

Firebox Steel (Sup. 23) Combustion chamb. NONE

Firebox, length 96⅛" Width 66⅛" Depth F. 67" B. 59⅛"

Firebox, Tube ½" Crown ⅜" Sides ⅜" Back ⅜"

Firedoor opening OVAL 13" x 18"

Water space, Front 4" Sides 4" Back 4"

Water space, Frame DOUBLE Riveted

Water space stays ⅜" DIAM. WITH 3/16" HOLES 1½" DEEP FROM O.S.

Radial stays 1" DIAMETER Sling stays front 3 THREE ROWS OF B.L.W. EXPANSION STAYS

Button heads below crown on SIX central rows

Crown bars NONE Placed —— above crown

Crown bolts ——

Flues # 9 W.G. STEEL

Tubes #12 W.G. CHARCOAL IRON OR STEEL

Tube ends: SHAGED FOR COPPER FERRULES, FIREBOX ENDS

Number 284 / 164 Diam. 2⅝" / 2" Length 19' 0"

Heating Surface	Flues 639 sq. ft.	Combus. Chamb. ——	Total 2417 sq. ft.
	Tubes 1624 sq. ft.	Fire Box 154 sq. ft.	Fire Brick Tubes ——
Grate area 46.3 sq. ft.		Ratio to Heating Surface 1 : 94.6	
Superheater 558 sq. ft.			

Fire Brick Arch. NONE

Grates ROCKING

Ash Pan, Dampers BACK

Throttle BALANCED Pos. DOME

Dry pipe STEEL

Superheater SCHMIDT (See supplement 27)

Smokebox extension MESH Cleaning hole and cap LEFT SIDE ONLY

Spark ejector —— Wire, TO BE LIVERED TO LEFT SIDE

Netting and deflect. plates WIRE

Smokebox saddles STEEL, RIVETED

Stack STRAIGHT Dia. 21" Height to S. S. No. 23½"

Safety Valves TWIN CROSBY-TYPE 3", ONE SUPPLIED

Relief valves RAISED with relief lever, Set to 190 pounds

Whistle Crosby, CHIME WITH BELL, BOWL SHAPE, DOUBLE BOWL

Steam Gauges One, 4 face 7" MAKERS Ashcroft (spec.)

Steam gauge stand Iron Check Make

Water Gauge One B.L.W. (TUBULAR) Cab Lamps ELECTRIC

Gauge Cocks THREE WAY Surface valve NONE

Lowest gauge cock 3½" above highest part of crown

Lubricator steam valve BETWEEN separate dry pipe to dome

Blower Valve B. L. W.

Blow off Cock One Ry. Co's STEEL, Pos. FRONT

Cleaning Plugs ONE PLUG ABOVE FIRE DOOR

Firebox Corners DIAGONAL

Crown TWO EACH SIDE AND FOUR BACK

Waist ONE UNDER FRONT AND ONE UNDER BACK

Front tube sheet ONE Fusible plug ONE

Pumps NONE Pos. ——

Top chamb. —— Bottom chamb. ——

Feed Cock —— Feed pipe ——

Checks —— Check pipe ——

Injectors TWO NATIONAL FOR BOILER PRESSURE OF 200 LBS.

Injectors, Pos. RIGHT AND LEFT Steam pipes Copper

Pipes, Check IRON Feed IRON Overflow IRON

Check B. L. W. Pos. RIGHT AND LEFT

Blower Hose SAFETY CAB HEATING & LIGHTING CO'S WITH MASON REGULATOR

Cab Steel STEEL

Cab boards STEEL Roofs T-IRON

Running boards STEEL Nailing T-IRON

Hand rail IRON Located on BOILER

Deck Sanding BAY STEEL Rack drawbar height 20½"

Floor STEEL (Sup. 32) Flooring STEEL PLATE TO MODIFY

Front Bumper CAST STEEL (Sup. 33) Bumper plate WITH

Steps, HAND HOLDS, ETC., TO CONFORM TO I. C. C. REQUIREMENTS

Front Drawhead, Center above rail 34½"

Coupler SHARON STEEL M.C.B. AUTO. FROM NATIONAL MALLEABLE & STEEL CASTINGS COMPANY.

Signal fixtures FROM THE BUFFER

Headlights, One MARS, CLASS 10 Reflector

Headlight, Nos. on sides 10 IN 4" FIGURES WITH BLACK BACK

Lamp chain —— Wiring ——

Bell 92 POUNDS Trimmed AIR WHEN SHIPPED

Sand Box One Diam. 31" Body IRON Painted

Sander LEACH DOUBLE, AIR 10MM A-10

Dome casing IRON PAINTED

Jacket #22 PLAIN STEEL Boiler Lagging

Jacket Lagging MAGNESIA MASTIC

THE AMERICAN LOCOMOTIVE COMPANY, Successor to Rogers Locomotive Works, Manufacturers' Agents

Specification No. 11126

SPECIFICATION FOR LOCOMOTIVES 12 36 4-6-0 and 9

For B. & O. R. R. Co's Class

Road Mississippi River & Bonne Terre Ry. Run of B.L.W. Tractive Power Catalog and

Engine Drawing No. 3

7-31-16

Frames Cast STEEL (Sup. 41) Ga. Braces SOLID

Cylinders, Diam. 21" Stroke 26"

Stm ports, Length 26.55" Width 1⅜" Bridges ——

Exh. ports, Length —— Width —— Valve lead ¼"

Valve travel 6" Steam lap 1" Exhaust clearance ⅛"

Eccentric crank throw 1⅛" By-pass valve NONE

S. R. Link NATHAN FIVE FEED BULL'S EYE

Cyl. heads CAST IRON Lubr. PIPES OF IRON UNDER JACKET

Cyl. casings IRON PAINTED Head covers STEEL PAINTED

Stm chest casings —— Covers ——

Stm chest valves 11" DIAM. PISTON TYPE, INSIDE ADMISSION

Met. pkg. JEROME EDWARDS (Spec.)

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD

Guides, Steel Oil cups NEEDLE

Crossheads CAST STEEL WITH BABBITTED BEARINGS (NO GIBS)

Wrist Pins STEEL Rod cups (See Sup. 44)

Valve Motion WALSCHAERTS

Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard. All finished movable nuts of steel or of iron case hardened.

Wearing Bearings TIGER BRONZE FROM MOSS-JONES EXCEPT SIDE, END TRUCK BRASSES OR B.L.W. METAL (M/C MACHINE).

Drivers, O. S. Diam. 64" Cen. diam. 58" CENTERS CAST STEEL

Tires LATROBE STEEL Held by SHRINKAGE AND SHOULDER

Tires, Flanged, Pos. FRONT AND BACK Size 3" x 5⅞"

Tires, Plain, Pos. MIDDLE Size 3" x 6⅛"

Lateral play between driving boxes and wheel hubs — ⅛" TOTAL

Driving Boxes CAST STEEL WITH ELVIN LUBRICATORS

Journals, Diam. 9" Length 11"

Springs, Make RAILWAY STEEL SPRING COMPANY'S

Front Engine Truck Four Wheeled SWING BOLSTER

To swing 2½" each side of cen., Cen. pin liners NONE

Journals, Diam. 5½" Length 10" Boxes CAST IRON

Wheels, Diam. 30" Tread —— Kind CAST FROM SCORE CENTERS

Tires STEEL Cen. diam. 25" Size 2½" x 5½"

Tires held by BOLTED TYPE FASTENING

Back Engine Truck Two Wheeled OUTSIDE BEARING TYPE

To swing 3" each side of cen., Cen. pin liners NONE

Journals, Diam. 7½" Length 12" Boxes CAST STEEL

Wheels, Diam. 40" Tread —— Kind CAST FROM SCORE CENTERS

Tires STEEL Cen. diam. 35" Size 2½" x 5½"

Tires held by BOLTED TYPE FASTENING

Brakes, position ON ALL DRIVING AND TENDER WHEELS

Operating { Engine Sch. 85 ET WEST'G. COMBINED AUTO. AND

Parts { Eng. Tr'k sch. —— STRAIGHT AIR

Foundation { Drivers, sch. 84-2 B-C AMERICAN O.S. EQUALIZED

Parts { Eng. Tr'k, sch. ——

Air pump Two 9½" Pos. BOTH ON LEFT SIDE

Train connections FRONT AND BACK

Train signal, sch. "L"

Hand brake SAME

Brake shoes AMERICAN BRAKE SHOES

ALL RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS

Tender Eight Wheeled, Drawing No. 435

Weight, with fuel and water, about 100,000 POUNDS

Tank 5000 Gallons, Bill A-332

TANK RECTANGULAR TYPE WITH WATER BOTTOMS. FUEL CAPACITY 10 TO 12 TONS

Tool Boxes STEEL, TOP

Frame STEEL 10" CHANNEL

Front Drawbar height 32"

Pilot NONE Pushing shoes NONE

Back drawhead, center above rail 34½"

Coupler SHARON STEEL M.C.B. AUTO. FROM NATIONAL MALLEABLE CASTINGS CO., WITH 5" x 7" SHANK AND WITH MINER FRICTION DRAFT GEAR.

Steps, HAND HOLDS, ETC., TO CONFORM TO I. C. C. REQUIREMENTS

Trucks ARCH BAR TYPE WITH STEEL BOLSTERS

Springs ELLIPTIC RAILWAY STEEL SPRING CO'S MAKE

Journals, Diam. 5" Length 9"

Wheels, Diam. 33" Tread 1¼" Kind SOLID FORGED ROLLED STEEL

Tires NONE Cen. diam. —— Size ——

Tires held by ——

Safety chains SINGLE

Brake Position ON ALL WHEELS

Brake sch. 85 ET WEST'G. AUTO. AND STRAIGHT AIR WITH 12" x 12" TENDER CYLINDER.

AMERICAN BRAKE SHOES

List of tools, sch. 29

Photo sch. #2 Inspection (See Supplement 1)

To be weighed YES Material spec'ns B. L. W.

Certificate of boiler test THREE COPIES OF B. L. W. FORM 1036

Junior laws to 9-15-16 Shipment ON OWN WHEELS

Brass shop finish, No. 1

Machine shop finish D-160, EXCEPT CYLINDER HEAD COVERS AND STEAM CHEST COVERS TO BE PAINTED

B. L. W. Patents: THROTTLE, JAN. 23, 1900 (CAST ON); FEED PIPE STRAINER, PATENTED SEPT. 1, 1903 (CAST ON); STEAM PIPE COVER, JULY 18, 1911 (CAST ON); BACK ENGINE TRUCK, 1060499 APR. 29, 1913 (BRASS PLATE)

Property plates NONE

Painting, Engine, style ——BLACK, NO STRIPING

Painting, Tender, style ——BLACK, NO STRIPING

Mark on TANK SIDES, M. K. & B. T.

Mark on BACK OF TANK, Y&MV R'Y 5000 GALLS TONS 10

Road Nos. Pos.	Road Nos.	Pos.	Road Nos.
F. W. Pl.	30		
Sand Box	31		
Cab sides			

SPECIFICATION FOR LOCOMOTIVES 12 35 ½ D 8 AND 9

FOR Mississippi River & Bonne Terre Railway

1 Inspection by R. W. Hunt & Co. Send to them copies of orders in duplicate for boiler and firebox steel, tubes, couplings and springs so they can arrange to make the inspection at the manufacturers' plants.

2 Maximum grade 1.8 %.
Sharpest curve on maximum grade 8 degrees.
Curves are not compensated on grades.

3 Limit of weight per axle preferably 26 tons account rails but positively 28 tons account of bridges.

4 Clearance diagram as pencil sketch on back of data sheet accompanying letter dated May 25th, 1916 from Ry. Co. in letter file 1112, except that back engine truck may project beyond the clearance limits as shown on B. L. W. tracing 32715.

5 Total length of engine and tender to be kept as short as practicable.

6 Locomotives to haul 300 net tons at 28 miles per hour up a 1.8 % grade.

7 All Royalties payable by The B. L. W.

8 Locomotive to conform to all United States Safety requirements in every particular, such as grab irons, hand railings, steps, clearances, application of piping, wiring of lights, etc., also all State of Missouri appliances.

9 We are requested to give particular attention to the appearance of these locomotives and to the finishing of the running gear. Company is desirous of having two showy locomotives.

10 Lettering etc., to be in gold leaf as Ry. Co's pencil sketch (herewith) The mark on sides of tank to be located in center.

21 Outer plates of throat sheet and back head to be ... Front head sheet 7/16" thick.
Boiler pressure for safety to be not less than ...

27 Auxiliary dome for safety valves and for ...

23 Fire box material of Firebox Ooze steel throughout.
Crown sheet to be in two sheets.

24 Water space stayboltsof Parallel Hollow Iron.
No flexible stayboltsto be used in water space if possible to avoid it. Wherever stayboltsare countersunk on outside, have bolt on the inside open.

25 Tubes to be electrically welded at fire box end.

26 Grates and bearing bars, Pitt Cole style, in two sections.

27 Superheater as Locomotive Superheater Co's specification No. P-1170-B, dated Sept. 10th, 1916 (copy attached).
Superheater connecting with top header in smoke box, and with outside steam pipe connections to valve chambers.
Royalty on superheater payable by B. L. W.

28 Hand hole and cap to be provided in each side of smoke box for inspection of superheater.

29 Ohio safety valve to be provided.

30 Fountain 1½ gas for all steam connections.

31 Spring buffer between engine and tender from the Commonwealth Devices Corporation.

32 Pilot from Commonwealth Steel Company.

33 Front bumper from Commonwealth Steel Company.

34 Headlight equipment to be Pyle National Electric type J 61 with 2½ K. W. generator, and with all necessary wiring, etc. Headlight to have 150 watt Nitrogen lamp to conform to the latest I. C. C. rulings on headlights for road engines. Generator to be placed next to cab.

35 Boiler jacket to be Deeses Patented type, not painted. Backhead of boiler not to be covered.

Specification No. P-1170-Superheater. September 10th, 1916.

Superheater Company's Specification for Locomotives ... Mississippi River & Bonne Terre Railway.

Superheater Units

Tubes ... in number 2" O.D. 19 B.W.G. ... iron over tube sheets. Tubes ... between and ... to Boiler Plate ... to be headed over at front end. ... in number 5" O.D. 9/32 B.W.G. ... of cold drawn seamless steel. Flues to be straight, free to gauge and well cut, to vary more than one gauge from specified thickness, ... Card 1106-A

Flue Sheet Staybolts

Radius ¼ inch on both sides of flue holes in firebox tube sheet and on front edge of flue holes in front flue sheet as shown on drawings, except for copper sheets. Back end to be set with copper ferrules, rolled, headed and prepared ... for copper sheets. Front end to be rolled and headed. Flatters to have at least 6 rolls. Prepare to have at least 12 ... Card 1138
... to be in accordance with. Card 5817

Superheater Units

24 units 1½" O.D. 99 B.W.G. ... of stainless steel. Flues united by ... and return bends.

Each unit to be tested before being placed in boiler, with water under pressure of ... pounds. Card 1068
Of steel Pressed accurately on superheater plans so as not to allow ... as shown on ... Card 1071-A
To be made in best possible manner to insure absolutely tight joints in accordance with the ... solution on ... Card 1045

... To be of close grain cylinder iron, steam tight in every respect. ... joint ring for connection to ... pipe to be ... and ... to ... Casing should be supplied with the face having the ... joints pressed downward in the mould to secure the best quality of metal on surface ... where superheater joints are made. Each header to have a serial number cast on in such a ... as not to be removed in finishing. No patch plugs allowed on ball joint seats. Headers ... not be treated successively with sal ammoniac. Header casting to be tight under water ... of 250 lbs. Test pressure to be applied successively to the saturated and to the superheated ... Card 1070-A
... to be ... 24 hours ... of all ... work. ... Card 1383
To be securely ... to be properly located so as to support the headers ... after headers ... Header should then be ... ments. This to be done before superheater units are put in place. Card 1323
Should be of cast iron.
To be constructed so as to permit easy inspection and removal of superheater units and joints. Card See Assmt.
Design to be in accordance with
To be carefully and accurately made. Plugs not to be more than 0.01 inch smaller than bore. Bushings for Plugs and stayrods to be in line. Plugs to be ground and to operate freely under a pressure as low as 40 lbs. per sq. in. Steam Pipe to damper cylinder should be as short and free from bends as possible so as not to cause water to collect in cylinder. Pipe to be protected against freezing. Card 1149
To be painted a light color to render it easily visible by the engineer Card 1067
To be in accordance with Card 1039
The Superheater after assembling in boiler and after steam pipes are fitted up, is to be thoroughly ... and ... to ... under water pressure of at least ... Card 1070

Name	Card	Name	Card
Cylinder	1072-A	Header Drain Lugs	1070
Damper Cylinder Pipe	1074	Packing Plate	3156
Damper Cylinder Pipe Fitting	1076-A	S. H. Unit Bolt Washer	1071
Damper Cylinder Pipe Union	1287	S. H. Unit Clamp	1073
Damper Cylinder Piping Diagram		S. H. Unit Clamp Washer	10305
Damper Cylinder Support		S. H. Pipe End	1340
Cylinder Studs	1068	S. H. Pipe Bend	1069
Superheater Unit	1065	Return Bends	10099
Piston Rod Packing (O. S.)	1148	Connecting Pipe Header	1067
Piston Rod Packing (I. S.)	1275-C	Expansion Connection	3003
Piston and Valve & Stemwire	10759	Installation Plate Stays	10809
		Installation Plate Clamp	10809-A

Superheater Units to have Nelson Return Bends.

SPECIFICATION FOR LOCOMOTIVES 12 35 & D 8 AND 9

FOR MISSISSIPPI RIVER & BONNE TERRE RAILWAY

11 ENGINE FRAMES TO BE EXTRA HEAVY THROUGHOUT.
ENGINE FRAMES TO BE DESIGNED TO WITHSTAND ROUGH USAGE AND CONSIDERABLE LATERAL THRUST, WHICH WILL BE CONTINUALLY IN EVIDENCE DUE TO THE FACT THAT THE ROAD IS ALL CURVES, THERE BEING ONLY ONE TANGENT WHICH IS A MILE LONG.
FRAMES TO CONFORM TO M. M. RULES, ADDING ABOUT 1000 POUNDS ON DRIVING WHEELS.

12 PISTON ROD TO BE BOLTED TO CROSSHEADS BY NUT.

13 CROSSHEAD TO BE ALLIGATOR, ONE PIECE TYPE WITH BABBITT LINER SIMILAR TO FIG. 844 IN LOCOMOTIVE DICTIONARY OF 1916.

14 CONNECTING RODS TO HAVE TRIPLE BOLTED STRAPS WITH KEY.
PARALLEL RODS TO HAVE SOLID ENDS.
ALL RODS TO HAVE GREASE CUPS WELDED ON.

15 CHICAGO FLANGE OILER TO BE APPLIED TO FRONT DRIVING WHEELS.

16 DRIVING WHEELS TO HAVE CAST IRON HUB PLATES.
DRIVING BOXES TO HAVE HUB FACES BABBITTED.

17 FRONT AND BACK ENGINE TRUCK WHEELS FROM RAILWAY STEEL SPRING COMPANY

18 AIR RESERVOIRS TO BE ENAMELLED.
FURNISH TWO ENAMELLED RESERVOIRS UNDER RUNNING BOARDS, WITH RADIATING COIL OF AMPLE SIZE.
ENGINE BRAKES TO BE BUSHED WITH CASE-HARDENED PINS.

TENDER

56 TENDER TO CONFORM TO THE FOLLOWING LIMITS.
HEIGHT, 11' 0" WIDTH, 9' 10"
HEIGHT TO TOP OF FILLING HOLE, 11' 0"
HEIGHT ABOVE RAIL FOR COALING 9' 6".

57 TENDER TO BE ALL STEEL CONSTRUCTION.
FRONT AND BACK BUMPERS OF STRUCTURAL STEEL AS B. L. W. TRACING 32629.

58 SPRING BUFFER BETWEEN ENGINE AND TENDER FROM ECONOMY DEVICES CORPORATION.

59 JOURNAL BOXES OF MALLEABLE IRON.

60 CLASSIFICATION LAMPS ON TENDER TO BE WIRED FOR ELECTRIC LIGHTS.

THE BALDWIN LOCOMOTIVE WORKS — AS SPEC'S C-3091 where not otherwise specified to be duplicate of S 36 E 43.

Memorandum Spec'n 10593

SPECIFICATION FOR LOCOMOTIVES S 36 E 43 — Con. on Atchison straight key basis.

FOR The Ironton Railroad Co. — Engine Drawing No. 6

11-30-15

Gauge of Road 4' 8½" — Play ½"
Wheelbase, Rigid 15' 0" — Driving 15' 0" — Total 15' 0"
Total wheelbase, eng. and tend. — (Actual 48' 11".
(Limited to -----

Curves -----

Limits, Height ----- Width -----
Weight (approximate) in working order, Total 163,000 lbs.
On F. tr'k ----- Drivers 163,000 lbs., B. tr'k -----

Tractive power 37,040 lbs., Ratio of adhesion 4.4
Work'g St'm Pres. 180 lbs., Service Switching
Fuel Soft Coal

Boiler Steel — Thick 11/16" — Bill 7608
Boiler, Diam. 68" — Plan Straight Top
Boiler st'm pres. 180 lbs., Tested to { 200 lbs. steam pres / 240 lbs. water pres
Longitud. seams Butt jointed, double covering strips.
(See Ex. Order 31475-A.)

Dome, diam. 33" — Pos. Central
Dome hole in boiler sheet to be enlarged for easy entrance.
Firebox Steel — Combustion chamb. None
Firebox, length 114" — Width 42½" — Depth F. 70½" B. 68½"
Firebox, Tube ½" — Crown 7/16" — Sides ⅜" — Back ⅜"
Firedoor opening 16" diam.
Water space, Front 4" — Sides 3" — Back 4"
Water space, Frame Double — Riveted
Water space stays 1" Diam. with 7/16" hole 1½" deep from O. S.
Flexible stay bolts, B.L.W. about 350, located in breaking zone.
Radial stays 1½" diam — Sling stays front { Three rows of B.L.W. Expansion stays.
Button heads below crown on Eight central rows
Crown bars None — Placed ---- above crown
Crown bolts ----

Flues None
Tubes #12 W. G. Charcoal Iron
Tube ends Swaged for copper ferrules, firebox ends.
Number 274 — Diam. 2" — Length 14' 2"
Tubes to have ¾" spaces

Heating Surface	Flues None	Combus. Chamb. None	Total 2185 sq. ft.	
	Tubes 2020 sq. ft.	Fire Box 165 sq. ft.	Fire Brick Tubes ----	
Grate area 33.6 sq. ft.	Ratio to Heating Surface 1 : 64			
Superheater ----				

Fire Brick None

Grates Rocking Bars and drop plate
Ash Pan, Dampers Front and back
Ash pan to be Hopper type, self dumping.

Throttle Balance — Pos. Dome
Dry pipe Iron

Superheater None

Smokebox extension With — Cleaning hole and cap L.S. only
Spark cinder-ee hopper With
Netting and deflect. plates With, Netting to be 2½ mesh

Exhaust nozzles Double High

Stack Straight — Dia. 18" — Hole in S. B., dia. 21½"

Safety Valves (spec.) Two Consolidated 6"
Safety valves None with relief lever, Set to 180 pounds
Whistle B. L. W. plain

Steam Gauge One Iron 7" — MAKER:- Ashcroft (not spec.)
Steam gauge stand Iron — **Clock** None
Glass Water Gauge to be Ashcroft Prismatic No. 5
Water Gauge One — **Cab Lamps** to burn oil
Gauge Cocks Three Right Side — Surface valve None
Lowest gauge cock 2½" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.
Gauge cocks to be Nunn-Evans.
Blow off Cock One B.L.W. — POS:- Front
Cleaning Plugs
Firebox Corners diagonal, sides and back
Crown, Three each side and two back
Waist, One under front
Front tube sheet, Two — Fusible plug One
Plugs to be located to make top of crown sheet accessible.

Pump None — Pos. ----
Top chamb.---- — Bottom chamb. ----
Feed Cock ---- — Feed pipes----
Checks ---- — Check pipes ----

Sellers hose screens to be provided between engine and tender
Injectors (Spec.) Two Sellers — No. 10½
Injectors, Pos. Both Right Side — Steam pipes Copper
Pipes, Check Iron — Feed Iron — Overflow Iron
Check Combined main check and stop valve — POS:- R. and L.
Injector check to be Sellers.- flange type, bolted to boiler
Steam Heat None

Cab Wood
Sheet iron from back of cab to backhead of boiler.

Cab boards Wood — Nosing None
Running boards Wood — Nosing None
Hand rail Iron — Located on Boiler

Back Bumper Bar Steel — Back drawbar height 20½"

Pilot None — Pushing shoes at front
Front Bumper Oak — Bumper plate None
Steps across front with hand rail

Front Drawhead, Center above rail 33½"
Coupler Tower M. C. B. Auto.

Signal fixtures Iron on bumper

(See Ex. 10116-1920 - Elec. Head light for tender)
Headlight Two Round Case 16" — Reflector, To burn Kerosene
Headlight, Nos. on sides With — Pilot step With
Lamp shelf None — Nosing ------

Bell 92 pounds
Sand Box (Spec.) Two Diam. 31" Body Iron Ptd. — Pipes Iron
Sander Leach Air Trap A-1, in each box to sand front end main

Dome casing Iron Painted
Boiler Jacket #28 Soft Steel Ptd. — Bands Iron — Style 9 and 14
Boiler Lagging Magnesia Sectional
Back head of boiler to be lagged and jacketed.

THE BALDWIN LOCOMOTIVE WORKS — G. P. Stoddard — Spec'n

SPECIFICATION FOR LOCOMOTIVES S 36 E 43 — Sht.

FOR The Ironton R. R. Co.

Frames Cast Steel — Braces Solid
Cylinder necks to be furnished by Bp. Co.
Cylinders, Diam. 22" — Stroke 26"
St'm ports, Length 18" — Width 1½" — Bridges 1¾"
Exh. ports, Length 18" — Width 3" — Valve lead 1/16"
Valve travel 5¾" — Steam lap ⅞" — Exhaust clearance -----
Eccentric angle throw 45° — By-pass valve None
S. P. Lubr. Detroit Triple Fit Ball Eye
Cyl'r heads Cast Iron — Lubr. pipes of Iron under jacket
Cyl'r casings Iron Ptd. — Head covers Steel Painted
St'm chest casings Iron Ptd. — Covers Steel Painted
St'm chest valves Richardson Balanced, with vacuum valves
Met. pkg (narrow rings, wide strips) U. S. (not spec.)

Pistons Cast Iron rings sprung into cast head
Rod Steel — Oil cups Needle
Crossheads "Alligator" type Cast Steel
Wrist Pins Steel — Rod caps Plunger
Crosshead Gibs to be cast steel, dove-tailed on face and sides for babbits. Dove-tails to be about 2½" apart.
Valve Motion Stephenson
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.
Parallel rods to have solid ends.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Working Bearings B. L. W.

Drivers, O. S. Diam. 51" — Cen. diam. 44", Centres Cast Steel
Front and back driving wheel tires of Canadian Steel.
Tires Steel — Held by Shrinkage and Shoulder
Tires, Flanged, Pos. All — Size 2¾" x 5½"
Tires, Plain, Pos. None — Size -----
Lateral play between driving boxes and wheel hubs— 1/16" total
Driving Boxes Cast Steel
Journals, Diam. 9" — Length 12"

Equalizing beam fulcrum reinforced for pin bearings.
Springs, Make B. L. W.

Front Engine Truck None — Wheels -----

RADIAL ENGINE TRUCK None

Bored hub liners ½" thick in wheels, extending from axle to outside of driving boxes, to be provided. Hub liners to be held by six bolts extending through hub of wheel center.
Center line of bolts on circle 18" to 14" diameter.

Tender Eight Wheeled, Drawing No. 488
Weight, with fuel and water about 100,000 lbs.
Tender to be of long low design
Tank 5,000 — Gallons, Bill 2903
Tank "U" Shape, straight top. — Fuel Cap. 12 tons
Tank funnel to be oblong, about 18" x 32"
Tool Boxes of Hard Wood, Top

Frame Steel 10" Channels.

Front Drawbar height 33½"
Pilot None — Pushing shoes at rear
Back drawhead, center above rail 33½"
Coupler Tower M. C. B. Auto.

Steps, hand holds, etc., to conform to I. C. C. requirements
Steps across rear with hand rail

Trucks Arch bar type with steel bolsters.

Springs Elliptic. — B. L. W. make
Journals, Diam. 5" — Length 9"
Wheels, Diam. 33" — Tread 4½" Kind Chilled cast iron plate
Tires None — Cen. diam. --- — Size ----
Tires held by ----
Safety chains Single

Brake Position On all wheels.
Brake sch. NL-1212 and SUB West'g Auto. and Straight Air.

List of tools, sch. 29
Photo sch. None — Inspection B. L. W.
To be weighed Yes — Material spec'ns B. L. W.
Certificate of boiler test Three copies of B. L. W. form 1054
Junior laws to 12-1-15 — Shipment On own wheels.

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. Patents — Throttle, Patented Jan. 23, 1900 (Cast on)

Property plates None

Painting: Engine, style 291 Olive Green and Yellow
Painting:- Tender, style 291 Olive Green and Yellow
Lettering, etc. to be in Chrome Yellow

Mark on tank sides, IRONTON RAILROAD (In 7" letters)
Road number to be applied in 6" figures on cast iron, in 7" figures on cab and in 12" figures on back of tank

Final Stn. Pos.	Final Nos.	Name None
F. Nu. Plate	25	
F. Head Nos		
Cab sides		
Back of tank		

Brake position On all driving and tender wheels.
Operating Parts — Engine, Sch. 4-1 and NBL West'g Auto. and Straight Air — Eng. Tr'k, sch. -----
Foundation Parts — Driver, sch. Wood — American C. S. Equalized — Eng. Tr'k, sch. -----
Airpump Two - 9½" Pos. Both Left Side
Train connections Front and Back
Train signal, sch. None
Straight air brake valve, S-3-A, with driver brake valve and bracket.

THE BALDWIN LOCOMOTIVE WORKS As Spec. C-2550

Memorandum Spec'n 10488

SPECIFICATION FOR LOCOMOTIVES 10 32 E 127 Con. as Neg. 4313 Except with two sand boxes

FOR Mount Hope Mineral Railroad Company 3.27.15 Engine Drawing No. 20.

Gauge of Road 4' 8½" Play ¾" except 7/8" for F.&B. drivers
Wheelbase, Rigid 13' 6" Driving 13'6" Total 22'0"
Total wheelbase, eng. and tend. {Actual 49'2" (ca. 5/15/15) / Limited to -----
Rails 70 lbs.
Curves 26 degrees. Maximum grade 4%
Limits, Height {15'0" to top of stack Width 10'4" over cab boards
Weight (approximate) in working order, Total 140,000 lbs.
On F. tr'k 16,000 lbs., Drivers 124,000 lbs., B. tr'k ----- lbs.

Tractive power 30900 lbs., Ratio of adhesion 4.1
Work'g St'm Pres. 190 lbs., Service Passenger and Freight
Fuel Soft Coal

Boiler Steel Thick 11/16" Bill 7H29
Boiler, Diam. 64" Plan Straight Top
Boiler st'm pres. 200 lbs., Tested to {220 lbs. steam pres. / 267 lbs. water pres.
Longitud. seams Butt jointed, double covering strips

Dome, diam. 29" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 102-11/16" Width 41⅜" Depth F. 66½" B. 63¼"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diameter
Water space, Front 4" Sides 3½" Back 3½"
Water space, Frame Double Riveted
Water space stays ⅞" diam. with 3/16" hole 1½" deep from O.S.
Flexible staybolts, 334, American 15/16" diam. in breaking zone.
Radial stays 1" diam. Sling stays front {Two rows of Tate / Expansion stays
Button heads below crown on Eight central rows
Crown bars None Placed ----- above crown
Crown bolts -----

Tubes #12 W. G. Charcoal Iron
Tube ends Swaged for copper rings firebox ends.
Tubes, No. 250 Diam. 2" Length 13' 5"

Heating Surface, Tubes 1745" Firebox 144" Total 1889" (1911.6)
Grate area 29.5" Ratio to heat'g surface, 1 : 64
Superheater ----- Feed-water heater -----
Reheater ----- Fire brick tubes ----- 12.6"

Fire Brick arch On Studs Security Sectional on two tubes of seamless steel, 3" O.S. diam. 3/16" thick.

Grates Dump in connection with rocker grates
Ash Pan, Depth 31" Dampers Front and back None (Rejec. 5.11.15)

Throttle pipe to come out at side of dome.
Throttle Balance Pos. Dome
Dry pipe Cast Iron or Steel

Superheater None

Smokebox extension With Cleaning hole and cap L.S. only
Spark ejector or hopper With
Netting and deflect. plates With

Exhaust nozzles Double, - High

Stack Straight Diam. 18" Hole in S.S. 21½"

Safety Valves (NOT Spare) Two Coale, 3"
Safety valves None with relief lever, Set to 190 pounds
Whistle Chime

Steam Gauge One Iron, 7" Maker:- Ashcroft (NOT spare)
Steam gauge stand Iron **Clock** None
Gauge cocks to be Eynon-Evans
Water Gauge One Klinger **Cab lamps** To burn oil
Gauge Cocks Three - Back Surface valve None
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome.
Blower Valve B. L. W.
Blow off cock to have brass body
Blow off Cock One,- Everlasting, 1½" Pos:- L. S. near throat
Cleaning Plugs
Firebox Corners, back ones diagonal, sides and back
Crown, Two R. S., three L. S. and two back
Waist, One under front
Front tube sheet, One Fusible Plug:- One

Pump None Pos. -----
Top chamb. ----- Bottom chamb. -----
Feed cock ----- Feed pipes -----
Checks ----- Check pipes -----

Injectors (Spare) Two Sellers, Class "H" No. 9½
Injectors. Pos. R. and L. Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check Sellers combined check and stop valves. Pos:- R. and L.
Apply Shrocomp cock in feed line, for washing out boiler
Steam Heat Consolidated system {STEAM HEAT CONNS. TO FRONT END FURNISHED THRO. EX. VAL. DEPT. CHI. HOSE. 4/4/15
Three-way cock furnished by Ry. Co. to be placed in injector check pipe midway between cab and check, on left side. 5.5.15.
Cab Steel. Roof lined with wood.
Sliding doors at back. Doors of wood.

Cab boards Steel Nosing T-Iron
Running boards Steel Nosing T-Iron
Hand rail Iron Located on Boiler

Back Bumper Bar Steel Back drawbar height 30½"

Pilot Iron Pushing shoes None
Front Bumper Pressed Steel Bumper plate With.
Steps, hand holds, etc., to conform to I. C. C. requirements

Front Drawhead, Center above rail 32½"
Coupler M.C.B. Auto. with spring draft rigging

Flag fixtures Iron on bumper

Headlight Two Round Case 18" (to use stock) Reflector, To burn Kerosene
Headlight, Nos. on sides With H'dl't step With
Lamp shelf None Nosing -----

Bell 92 pounds. Gollmar pneumatic bell ringer
Sand Box Two Diam. 28" Body Iron ptd. Pipes Iron
Sander, (not Spare) Leach Air Trap A-1 and hand in each box

Dome casing Iron ptd.
#22 Soft
Boiler Jacket Steel ptd. Bands Iron Style 9
Boiler Lagging Magnesia Sectional

THE BALDWIN LOCOMOTIVE WORKS
Engine 10 Oletaka May 1915
SPECIFICATION FOR LOCOMOTIVES 10 32 E 127
FOR Mount Hope Mineral Railroad Co.

Frames Cast Steel Braces Solid
Cylinder Cocks to be Eynon-Evans
Cylinders, Diam. 19" Stroke 26"
St'm ports, Length 16" Width 1½" Bridges 1½"
Exh. ports, Length 16" Width 2½" Valve lead ⅛"
Valve travel 5¼" O. S. lap ⅞" Ins. lap -----
Eccentric crank throw 10⅜"
S. F. Lubr. (spec) Detroit Triple #22 Bull's Eye {Iron Pipes under jacket
Cyl'r heads Cast Iron
Cyl'r casings Iron painted Head covers Steel painted
St'm chest casings Iron painted Covers Steel painted
St'm chest valves Balanced, with vacuum valves
Met. pkg {PISTON ROD / VALVE STEMS} U. S., King type (NOT spare)

Pistons Cast iron rings sprung into solid heads
Guides Steel Oil cups {Hammett {To use stock. / Nick feed {
Crossheads Cast Steel
Wrist Pins Steel Rod cups Plunger
Par. Rods to have solid ends.

Valve Motion Walschaerts
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.
Reverse lever to have multiple tooth latch

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 50" Cen. diam. 44" Centers Cast Iron
* **Detroit flange lubricator** (PENDULUM TYPE AUTOMATIC Style) for front and back driving wheels.
Tires Steel Held by Shrinkage and Shoulder
Tires, Flanged, Pos. All Size 3" x 5½"
Tires, Plain, Pos. ----- Size -----
Lateral play between driving boxes and wheel hubs - 1/16" total
Driving Boxes Steeled Cast Iron
Journals, Diam. 8" Length 9"

Driving spring staples Wrot Iron
Equalizing Beams of Cast Steel.
Springs. Make B. L. W.

Front Engine Truck Two Wheeled Swing bolster
To swing 4½" each side of cen. Cen. pin liners None
Journals, Diam. 5" Length 9" Boxes Cast Iron
Wheels, Diam. 28" Tread ---- Kind Cast Iron spoke center
Tires Steel Cen. diam. 23" Size 2½" x 5½"
Tires held by Shrinkage and Shoulder

Back Engine Truck None Wheeled -----
To swing ----- each side of cen. Cen. pin liners -----
Journals, Diam. ---- Length ----- Boxes ----
Wheels, Diam. ---- Tread ---- Kind -----
Tires ----- Cen. diam. ---- Size -----
Tires held by -----

Brake, position On all driving and tender wheels
Operating Parts {Engine, Sch. #6 ET. Westg. Combined Auto. and Eng. Tr'k, sch. ----- straight air
Foundation Parts {Drivers, sch. WH-1 American O.S. Equalized Eng. tr'k, sch. -----
Air pump One 11" Pos. L. S.
Train connections Front and Back
Train signal, sch. L

Tender Eight Wheeled, Drawing No. 921
Weight, with fuel and water, about 70,000 pounds

Tank 3500 Gallons, Bill 3766
Tand "U" shape, straight top. Fuel Capacity 6 tons

Tool Boxes Hard wood, Top.

Frame Steel 8" channels

Front drawbar height 29 6/8"

Back drawhead, center above rail 33½"
Coupler M.C.B. Auto. with spring draft rigging

Steps, hand holds, etc., to conform to I. C. C. Requirements
Steps, across rear, with handrail

Trucks Arch Bar type, Cast Steel Bolster

Springs Elliptic. B. L. W.
Journals, Diam. 4½" Length 8"
Wheels, Diam. 33" Tread ---- Kind Cast Iron plate center
Tires Steel Cen. diam. 28" Size 2½" x 5½"
Tires held by Shrinkage and Shoulder
Safety chains Single

Brake Position On all wheels.
Brake sch. #6 ET Westg. Auto. and straight air with 10" x 12" tender cylinder

List of tools, sch. 29 Bolts, nuts and threads B.L.W
Photo sch. 2 Inspection B.L.W. (See * below)
To be weighed Yes Material specifications B. L. W.
Certificate of boiler test Three copies of B.L.W. form 611
Junior laws to 4.1.15. Shipment On own wheels (see * below)

Brass shop finish, No. 1
Machine shop finish D-165

Patent } Throttle Patented Jan. 23, 1900 (cast on)
Plates } Feed Pipe Strainer Patented Sept. 1, 1909 (cast on)

Property plates B. L. W. for engine and tender

Painting:—Engine, style 291 Olive Green and Aluminum
Painting:—Tender, style 291 Olive Green and Aluminum

Mark on tank sides, MOUNT HOPE MINERAL

No. Pos.	Road No.	Name None
F. No. Plate	3	
F. Sand Box		
Cab Sides		
Back of tank		

* Advise Mr. J. S. Stillman, Secretary, when we are about to assemble locomotive so his Master Mechanic, Mr. Talen, may come here to inspect.

* Detroit Lubricator Co. is to be advised when we shall be ready to apply Pendulum type automatic flange lubricator so they can arrange to have representative here to superintend installation. 5.5.15.

THE BALDWIN LOCOMOTIVE WORKS as Spec'n 0-3570

Memorandum Spec'n 10932

SPECIFICATION FOR LOCOMOTIVES 10 30 D 656-657

Con. to Reg. 3585 {Except with 70" drivers, inspector, two sand domes, and Allen valve type crossheads.

FOR Tennessee, Alabama & Georgia R. R. Co. 3-29-16 **Engine Drawing No.** 91

R.

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 14' 0" Driving 14' 0" Total 24' 4"
Total wheelbase, eng. and tend. {Actual 52' 7" / Limited to ------

Curves 8 degrees. **Grades,** 1.6%

Limits, Height ------ Width ------
Weight (approximate) in working order, Total 134,500 lbs.
On F. tr'k 31,000 lbs., Drivers 103,500 lbs., B. tr'k ----- lbs.

Tractive power 24,790 lbs., Ratio of adhesion 4.1
Work'g St'm Pres. 180 lbs., Service **Pass. and Freight.**
Fuel Soft Coal.

Boiler Steel Thick 9/16" and ⅜" Bill 7758
Boiler, Diam. 58" Plan **Extended Wagon Top.**
Boiler st'm pres. 200 lbs., Tested to {220 lbs. steam pres. / 267 lbs. water pres.
Longitud. seams **Butt jointed, double covering strips.**

Dome, diam. 29" Pos. **Forward of fire box.**

Firebox Steel Combustion chamb **None.**
Firebox length 107-1 5/16" Width 42⅜" Depth F. 67" B. 58½"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diam.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame **Single** Riveted
Water space stays ⅞" diam. with 3/16" hole 1½" deep from C. S.

Radial stays 1" diam. Sling stays front {Two rows of B. L. W. Expansion Stays.
Button heads below crown on **Six** central rows
Crown bars **None.** Placed ----- above crown
Crown bolts -----

Tubes of steel preferred by R. R. Co.
Tubes #12 W. G. Charcoal Iron or Steel.
Tube ends **Swaged for copper ferrules, fire box ends.**
Number 244 Diam. 2" Length 14' 1"

Heating Surface Flues **None** Combus. Chamb. **None** Total 1938□
Tubes 1788□ Fire Box 150□ Fire Brick Tubes -----
Grate area 31.7□ Ratio to Heating Surface 1 : 61.2
Superheater -----

Fire Brick Arch on studs.

Grates Rocking bars and drop plate.
Ash Pan, Dampers **Front and back.**

Throttle **Balance.** Pos. **Dome.**
Dry pipe **Steel**

Superheater **None.**

Smokebox extension **With** Cleaning hole and cap **Left Side only.**
Spark arrester or hopper **With**
Netting and deflect. plates **With**

Exhaust nozzles **Double High.**

Stack **Straight** Dia. 18" Hole in S. B. dia. 19½"
Stack to be of same type as shown on B.L.W. Photo. 5482, 10-[illegible]

Safety Valves (Ramsbottom) **Two Consolidated 2½"**
Safety valves **None** with relief lever; Set to 180 lbs.
Whistle **B. L. W. plain.**

Steam Gauge **One Iron 7"** **BAKER-Ashcroft.** (Ramsbottom)
Steam gauge stand **Iron** **Clock None.**

Water Gauge **One B.L.W.(Ironclad)** **Cab Lamps** to burn oil.
Gauge Cocks **Three Back.** Surface valve **None**
Lowest gauge cock 2½" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve **B. L. W.**

Blow off Cock **One B. L. W.** POS:-Front.
Cleaning Plugs
Firebox **Corners diagonal, sides and back.**
Crown **Two each side and two back.**
Waist, **One under front.**
Front tube sheet, **One** Fusible plug **One**

Pump **None** Pos. -----
Top chamb. ----- Bottom chamb. -----
Feed Cock ----- Feed pipes -----
Checks ----- Check pipes -----

Injectors (Ramsbottom) **Two Monitor** No. 9
Injectors, Pos. **Right and Left** Steam pipes **Copper.**
Pipes, Check **Iron** Feed **Iron** Overflow **Iron.**
Check **B. L. W.** Pos. **Right and Left.**

Steam Heat Standard Heating & Ventilating Co's system.

Cab **Steel**

Cab boards **Wood** Nosing **None.**
Running boards **Wood** Nosing **None.**
Hand rail **Iron** Located on **Boiler.**

Back Bumper **Bar Steel** Back drawbar height 31½"

Pilot **Wood** Pushing shoes **None.**
Front Bumper **Oak** Bumper plate **With**
Steps, hand holds etc. to conform to I.C.C. requirements.

Front Drawhead, Center above rail 33½"
Coupler **M. C. B. Auto.**
Couplers and pockets to be Sharon latest design.
Pocket to have extended bottom floor for carrying coupler.
Signal fixtures **Iron** on bumper.
Headlight to be Star Std. Armored #7-A heavy type, from Star Headlight & Lantern Co. Inc. Rochester N.Y. as shown on P.9 of cat. #8
Headlight One Round Case 23" Reflector, To burn **Kerosene.**
Headlight, Nos. on sides **With** H'd'l't step **With**
Lamp shelf **None.** Nosing -----

Bell **92** pounds. **Gollmar Air Bell Ringer.**
Sand Box **Two** Diam. **28"** Body **Iron Painted** Pipes **Iron**
Sander (Leaflet) **Flexering Trap AL-101 Single Air,** in each box, to sand front and rear.
Dome casing **Iron Painted.**

Boiler Jacket #22 Soft Steel Ptd Bands **Iron** Style 9
Boiler Lagging Magnesia sectional.

Frames **Steel** Bronze **Solid**

Cylinders, Diam. 18" Stroke 28"
St'm ports, Length 18" Width 1¾" Bridges 1"
Exh. ports, Length 18" Width 3½" Valve lead ¼"
Valve travel 5½" Steam lap 1" Exhaust clearance -----
Eccentric crank throw 11-1/16"
S. P. Lubr. **Nicholson Triple Sight Eye.**
Cyl'r heads **Cast Iron;** Lugs, **pipes** of **iron** under jacket.
Cyl'r casings **Iron Ptd.** Lagged **Steel Painted.**
St'm chest casings **Iron Ptd.** Covers **Steel Painted.**
St'm chest valves **Richardson Balanced, with vacuum valves.**
Met. pkg {valve rods **UNITED STATES.**

Pistons **Of the built up cast iron gull ring follower plate type.**
Cylinder **Steel** Oil cups {Manning, Maxwell & Moore.
Crossheads **"Alligator" type Cast Steel**
Wrist Pins **Steel** Rod caps **Plunger.**
Parallel rods to have straps, keys and brasses.
Provide oil cups for pistons.
Valves, Motion **Walschaerts.**
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except stayboltz) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings **B. L. W.**

Drivers, O. S. Diam. **52"** Cen. diam. **46"** **Centers Cast Iron.**

Tires **Steel** Held by **Shrinkage and Shoulder.**
Tires, Flanged, Pos. **All** Size **3" x 5½"**
Tires, Plain, Pos. ----- Size -----
Lateral play between driving boxes and wheel hubs = 1/16" total.

Driving Boxes **Steeled Cast Iron.**
Journals, Diam. {Main **8½"** Length **8"** / Others **8"**
Franklin driving box lubricators for solid grease.

Springs, Make **B. L. W.**

Front Engine Truck **Four**-Wheeled **Swing bolster.**
To swing **3½"** each side of cen. Cen. pin liners **None.**
Journals, Diam. **5"** Length **10"** Boxes **Cast Iron.**
Wheels, Diam. **28"** Tread -----Kind **Cast Iron Spoke Centre.**
Tires **Steel** Cen. diam. **23"** Size **2½" x 5½"**
Tires held by **Shrinkage and Shoulder.**

Back Engine Truck **None** Wheeled -----
To swing -----each side of cen., Cen. pin liners -----
Journals, Diam. -----Length----- Boxes -----
Wheels, Diam. ----- Tread -----Kind -----
Tires----- Cen. diam.----- Size -----
Tires held by -----

Brake, position **On all driving &tender wheels.**
Operating Parts {Engine, Sch. **#6 ET West'g. Combined Auto. and Straight Air** / Eng. Tr'k, sch. -----
Foundation Parts {Drivers, sch. **BK-2 American O. S. Equalized.** / Eng. Tr'k, sch. -----
Air pump **Two 9½"** Pos. **Left Side.**
Train connections **Front and rear.**
Train signal, sch. **None.**
Air pumps to be piped to work in combination with each other.
Combination brake shoes and heads from **American Brake Shoe & Fdy Co.**

Tender **Eight** Wheeled, Drawing No. **635**
Weight, with fuel and water, about **90,000 lbs.**
Tender to be a standard design
Tank **4500** Gallons, Bill **#2218**
Tank **"U" Shape, Straight Top.** **Fuel capacity 10 tons.**
Tank coping to be cut away at back as shown on photo. 8244, 10-[illegible]
Tool Boxes **in** hard wood, Top.

Frame **Steel 10" Channels.**

Front Drawbar height **33½"**
Pilot **None** Pushing shoes **None.**
Back drawhead, center above rail **33½"**
Coupler **M. C. B. Auto.**
Couplers and pockets to be Sharon latest design. Pocket to have an extended floor for carrying couplers.
Steps, hand holds etc. to conform to I.C.C. requirements.

Trucks **Arch Bar type with cast steel bolsters.**

Springs **Elliptic. B.L.W.**
Journals, Diam. **5"** Length **9"**
Wheels, Diam. **33"** Tread **4½"** Kind **Chilled Cast Iron plate.**
Tires ----- Cen. diam.----- Size -----
Tires held by -----
Safety chains **Single.**

Brake Position **On all wheels.**
Brake sch. **#6 ET West'g. Auto. and Straight Air with 10" x 12" tender cylinder.**

Be sure to take a photograph of one of these locos.
List of tools, sch. **29**
Photo sch. **#2** Inspection **B. L. W.** (see * below)
To be weighed **Yes.** Material specns **B. L. W.**
Certificate of boiler test **Three copies of B. L. W. form 1036.**
Junior laws to **5-1-16.** Shipment **On own wheels.**

Brass shop finish, No. **1**
Machine shop finish **D-165.**

B. L. W. Patents {**Throttle,** **Patented Jan. 23, 1900 (Cast On)** / **Feed Pipe Strainer, Patented Sept. 1, 1903 (Cast On)**

Property plates **as R. R. Co. Std'd, of the usual size for engine and tender to read as follows:**

AMERICAN EQUIPMENT CO.
OWNER
LEASED TO
TENNESSEE, ALABAMA & GEORGIA R.R. CO.

Painting: Engine, style **291 Olive Green and Color.**
Painting:--Tender, style **291 Olive Green and Color.**
Lettering and numbers same style as Photo. 5482, 10-34 E 2043, in yellow paint, of shade as close as possible to gold leaf.
Mark on tank sides, **TENNESSEE, ALABAMA & GEORGIA**

Road Nos. Pos.	Road Nos.	Name **None.**
F.No Plate	6	
F.Sand Box	9	
Cab panel		
Back of tank.		

* Special attention to be given to design of engine which is to run rough service on very poor track, especially to the spring gear and rigging between engine and tender, as well as frame, spring rigging, and other working parts.
R. R. Co. will request that B.L.W. for inspection, and also give special attention to these features.

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-1670, Details as far as practicable same as on 10 26 D 318, 319.

Memorandum Spec'n 10230

SPECIFICATION FOR LOCOMOTIVES 10 28 D 140 & 141. Gen. as Neg. 4306

FOR Georgia Coast & Piedmont Railroad Co. **Engine Drawing No.** 36

J. 5-5-14

Gauge of Road 4' 8½" Play ½"
Wheelbase, Rigid 11' 4" Driving 11' 4" Total 21' 5"
Total wheelbase, eng. and tend. (Actual 49' 7½" (Limited to -----

Curves -----
Grades 6½% for 1000 ft., other grades 1% to 3%
Limits, Height ----- Width -----
Weight approximate in working order, Total 115,000 lbs.
On F. tr'k 28,000 lbs., Drivers 87,000 lbs., B. tr'k ----- lbs.

Tractive power 20,530 lbs., Ratio of adhesion 4.23
Work'g St'm Pres. 180 lbs., Service Freight
Fuel Soft Coal

Boiler Steel Thick 9/16" Bill 7238
Boiler, Diam. 54" Plan Extended Wagon Top.
Boiler st'm pres. 180 lbs., Tested to { 200 lbs. steam pres. / 240 lbs. water pres.
Longitud. seams Butt jointed, double covering strips.

Dome, diam. 29" Pos. Forward of Firebox

Firebox Steel Combustion chamb. None
Firebox, length 90 3/16" Width 33" Depth F. 65¾" B. 55"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diameter
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Single Riveted
Water space stays 1" diam. with 3/16" hole 1½" deep from O. S.

Radial stays 1⅛" diam. Sling stays front One 1 bar
Button heads below crown on Eight central rows
Crown bars None Placed ----- above crown
Crown bolts -----

Tubes #12 W. G. Charcoal Iron
Tube ends Swaged for copper rings firebox ends.
Tubes, No. 198 Diam. 2" Length 12' 3"

Heating Surface, Tubes 1261⁶ Firebox 121⁶ Total 1382⁶
Grate area 20.6⁶ Ratio to heat'g surface, 1 : 67
Superheater ----- Feed-water heater -----
Reheater ----- Fire brick tubes -----

Fire Brick arch None

Grates Rocking table grates
Ash Pan, Depth F. 20" B. 29" Dampers Front and Back
Ash pan to be arranged to be cleaned from cab.
Throttle stem to be fitted with brass sleeve.
Throttle Balence Pos. Dome
Dry pipe Wrot Iron or Steel

Superheater None

Smokebox extension With Cleaning hole and cap L. S. only
Spark ~~arrester~~ hopper With
Netting and deflect. plates With

Exhaust nozzles Double High

Stack Cast Iron, straight Diam. 16" Hole in S.B. 15"

Safety Valves (Spec) Two Ster 2½", One Muffled.
Safety valves None with relief lever, Set to {180 lbs. Muffled. / 183 lbs. Open
Whistle Chime

Steam Gauge One Iron 7" **Maker,** Ster (Spec)
Steam gauge stand Iron **Clock** None

Water Gauge { One Pendenhall / Water Column
Gauge Cocks Three Back Surface valve None **Cab lamps** Electric

Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome.
Blower Valve B. L. W.
Blow-off cocks to be operated from cab.
Blow off Cock Two B. L. W. Pos: {ONE IN THROAT AND ONE UNDER WRIST NEAR THROAT. 5.29.14.

Cleaning Plugs
Firebox Corners diagonal and back
Crown, Three each side and two back
Waist, One under front.
Front tube sheet, One. Fusible Plug, One.

Pump None Pos. -----
Top chamb. ----- Bottom chamb.-----
Feed cock ----- Feed pipes -----
Checks ----- Check pipes -----

Injectors (Spec) Two Sellers, class "N" No. 9½
Injectors, Pos. R. and L. Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check Sellers G-H top checks. Pos. Top of boiler
Sellers feed water strainer.
Steam Heat Consolidated System

Cab Steel. Ventilator in cab roof.

Cab boards Steel Nosing T-Iron
Running boards Steel Nosing T-Iron
Hand rail Iron Located on Boiler

Back Bumper Bar Steel Back drawbar height 34½"

Pilot Wood Pushing shoes None
Front Bumper Oak Bumper plate With
Steps, handholds, etc. to conform to I. C. C. requirements.

Front Drawhead, Center above rail 33½"
Coupler M. C. B. Auto.

Flag fixtures Iron on Bumper.
Signal lamp bracket located as indicated on Photo. red 5-15-14
Headlight equipment Pyle National Electric with Dressel Case
Headlight One Round Case 16" Reflector, To burn -----
Headlight, Nos. on sides With H'd'l't step With
Lamp shelf None Nosing -----

Bell 85 pounds.
Sand Box One Diam. 28" Body Iron Ptd. Pipes Iron
Sander (Vert-Spec) Leach Air, trap A-1

Dome casing Iron Ptd.

Boiler Jacket #22 Plan. Steel Bands Iron Style 9
Boiler Lagging Magnesia Sectional.

THE BALDWIN LOCOMOTIVE WORKS

Engine N. Schert June 1914

SPECIFICATION FOR LOCOMOTIVES 10 28 D 140 & 141.

FOR Georgia Coast & Piedmont R. R. Co.

J.

Frames Cast Steel Braces Solid
Cylinders from 16" pattern.
Cylinders, Diam. 17" Stroke 26"
St'm ports, Length 16" Width 1½" Bridges 1"
Exh. ports, Length 16" Width 2½" Valve lead ⅛"
Valve travel 4⅝" O. S. lap ⅞" Ins. lap -----
Eccentric crank throw 10⅜"
S. P. Lubr. Detroit Triple #22 Bulls Eye (Spec) (Iron pipes under jacket
Cyl'r heads Cast Iron
Cyl'r casings Iron Ptd. Head covers Steel Painted
St'm chest casings Iron Ptd. Covers " "
St'm chest valves Richardson balanced, with vacuum valves.
Met. pkg { CROSS HEAD STEAM / HEAD STEAM } U. S. (Not Spec)

Pistons Cast iron rings sprung into solid head.
Guides Steel Oil cups Needle
Crossheads "Alligator" type, Cast Steel
Wrist Pins Steel Rod cups Compression cups forged on.
Parallel rods to have solid ends.
Crosshead gibs to be attached same as for 10 26 D 318, 319.
Valve Motion Walschaerts
{Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings Damascus Bronze

Drivers, O. S. Diam. 56" Cen. diam. 50" Centers Cast Iron
Brass hub liners on all driving wheels.
Tires Steel Held by Shrinkage & Shoulder
Tires, Flanged, Pos. All. Size 3"x 5½"
Tires, Plain, Pos. ------- Size -------
Lateral play between driving boxes and wheel hubs— 1/16" total
Driving Boxes Cast Steel
Journals, Diam. {Main 7" / Others 6½" Length 9"

Driving spring staples Wrot Iron
Equaliser hanger to pass through instead of stand-post on frame.
Springs. Make B. L. W.

Front Engine Truck Four Wheeled Swing Bolster
To swing 2½" each side of cen. Cen. pin liners None
Journals, Diam. 5" Length 10" Boxes Cast Iron
Wheels, Diam. 28" Tread 4½" Kind Chilled Cast Iron Spoke
Tires ----- Cen. diam. -----Size -----
Tires held by-----

Back Engine Truck None Wheeled -----
To swing----- each side of cen. Cen. pin liners -----
Journals, Diam.----- Length ----- Boxes -----
Wheels, Diam. ----- Tread ----- Kind -----
Tires ----- Cen. diam.----- Size -----
Tires held by -----

Brake, position On all Driving and Tender Wheels.
Operating Parts { Engine, Sch. A-1, West'g. Auto. Air. / Eng. Tr'k, sch. -----
Foundation Parts { Drivers, sch. WM-1, American O. S. Equalized. / Eng. tr'k, sch. -----
Air pump One 9½" Pos. Left Side
Train connections Front and Back
Train signal, sch. J

Tender Eight Wheeled, Drawing No. 425
Weight, with fuel and water, about 90,000 lbs.

Tank 4500 Gallons, Bill 2945
Tank "U" Shape, straight top. Fuel Cap. 6 tons.

Tool Boxes Hard Wood, top.

Frame Steel 10" channels.

Front drawbar height 33"

Back drawhead, center above rail 33½"
Coupler M. C. B. Auto.

Steps, handholds, etc. to conform to I. C. C. requirements.

Trucks Arch Bar, Steel Bolsters.

Springs Elliptic, B. L. W.
Journals, Diam. 4½" Length 8"
Wheels, Diam. 33" Tread 4½" Kind Chilled Cast Iron Plate
Tires ----- Cen. diam.----- Size -----
Tires held by -----
Safety chains Single

Brake Position On All Wheels.
Brake sch. UL-1012, Westinghouse Auto. Air.

~~For Hereafter. Foot Plate to be of cast steel, and front portion which carries weight of boiler to be reinforced with ribs. See blue print of Foot Plate 2689 attached to Co's letter 2.14.15 showing how casting failed.~~ File 1177 R.S.McC. 6.17.15.

List of tools, sch. 26 Bolts, nuts and threads B. L. W.
Photo sch. 2 Inspection B. L. W.
To be weighed Yes Material spec'ns B. L. W.
Certificate of boiler test Three copies of B. L. W. form 611.
Junior laws to 5-15-14 Shipment On Own Wheels.

Brass shop finish, No.1.
Machine shop finish D-165

Patent Plates } Throttle Patented Jan. 23, 1900. (Cast On)
~~Feed Pipe Strainer Patented Sept. 1, 1903. (Cast On)~~

Property plates B. L. W. for engine and tender.

Painting:—Engine, style 291 Olive Green and GOLD. 6/16/15
Painting:—Tender, style 291 " " " " " "

Lettering, etc. to be same as for 10 26 D 318 &c.
Mark on tank sides, GEORGIA COAST & PIEDMONT

No. Pos. Road No. Name None
F. No. Plate 70 5/16/15
Sand Box 71
Cab Sides
Side coller of tank.
Back of Tank

THE BALDWIN LOCOMOTIVE WORKS As Built No. D-372

Memorandum Spec'n 17012

SPECIFICATION FOR LOCOMOTIVES 10 22 D 86

FOR Surry, Sussex & Southampton Railway

R.

1-17-17

Cyl. and Valves Heavy Pacific, except 83½, except with Southern Valve Motion

Engine Drawing No. 15

Gauge of Road 3' 0" Play ⅜"

Wheelbase, Rigid 10' 11" Driving 10' 11" Total 19' 5"

Total wheelbase, eng. and tend. { Actual 41' 6½" / Limited to ——

Curves ——

1 **Limits,** Height —— Width ——

Weight (approximate) in working order, Total 70,000 pounds

On F. tr'k 15,000 lbs., Drivers 55,000 lbs., B. tr'k —— lbs.

Tractive power 12,900 lbs., Ratio of adhesion 4.26

Work'g St'm Pres. 175 lbs., Service Passenger and Freight

Fuel Soft Coal

Front tube sheet to be ½" thick

2 **Boiler** Steel Thick ½" and 9/16" Bill 8137

4 Boiler, Diam. 46" Plan Extended Wagon Top

Boiler st'm pres. 180 lbs., Tested to { 200 lbs. steam pres. / 240 lbs. water pres.

with factor of safety of 5.5

Longitud. seams Butt jointed, double covering strips

3 **Dome,** diam. 25" Pos. Forward of fire box

2 **Firebox** Steel Combustion chamb. None

Firebox, length 70-15/16" Width 23½" Depth F. 48¾" B. 40¾"

Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"

Firedoor opening 16" diam.

Water space, Front 3½" Sides 2½" Back 2½"

Water space, Frame Single Riveted

Water space stays ⅝" diam. with 3/16" holes 1¼" deep from O.S.

Radial stays 1" diam. Sling stays front { Two rods of B. L. W. Expansion stays

Button heads below crown on Six central rows

Crown bars None Placed —— above crown

Crown bolts ——

Flues ——

Tubes #12 W. G. Charcoal Iron

Tube ends Swaged for copper ferrules, fire box ends

Number 132 Diam. 2" Length 10' 8¼"

Heating Surface Flues —— Combus. Chamb. —— Total 804⁰

Tubes 733⁰ Fire Box 71⁰ Fire Brick Tubes ——

Grate area 11.6⁰ Ratio to Heating Surface 1 : 69.4

Superheater ——

Fire Brick Arch, On Studs

Grates Rocking Bars and Drop plate

Ash Pan, Dampers Front and Back

Throttle Balance Pos. Dome

Dry pipe Wrot Iron (preferred)

Superheater None

Smokebox extension With Cleaning hole and cap L. S. Only

Spark ejector or hopper With, to deliver Right Side

Perforated Plate and Heating and deflect. plates With

Exhaust nozzles Double High

Stack Cast Iron, Straight Dia. 14" Hole in S. B., dia. 21½"

Safety Valves (Spec) Two Crosby 2" Embased

Safety valves None with relief lever, Set to 175 pounds

Whistle Chime, on side of dome (Indicate if on top)

Steam Gauge One 6 Iron 7" MAKER:—Ashcroft (not spec)

Steam gauge stand Iron **Clock** None

Water Gauge None **Cab Lamps** to burn oil

Gauge Cocks Three - Back Surface valve None

Lowest gauge cock 3" above highest part of crown

Lubricator steam valve to have separate dry pipe to dome

Blower Valve B. L. W.

Blow off Cock One B. L. W. POS:—Left Side

Cleaning Plugs

Firebox Corners, back ones diagonal and right side

Crown, Two each side and two back

Waist, One under front

Front tube sheet, One Fusible plug One

Pump None Pos. ——

Top chamb. —— Bottom chamb. ——

Feed Cock —— Feed pipes ——

Checks —— Check pipes ——

Injectors (not spec) Two Sellers, Class N-1887 No. 6½

Injectors, Pos. Right and Left Steam pipes Copper

Pipes, Check Iron Feed Iron Overflow Iron

Check B. L. W. Pos. Right and Left

Steam Heat None

5 **Cab** Steel

Cab boards Sheet Iron Nosing T-Iron

Running boards Sheet Iron Nosing T-Iron

Hand rail Iron Located on Boiler

Back Bumper Bar Steel Back drawbar height 25¾"

Pilot Wood Pushing shoes None

Front Bumper Oak Bumper plate With

Steps None

Front Drawhead, Center above rail 24"

Coupler Cast Iron Drawhead, as Ry.Co's sketch.

Signal fixtures Iron on bumper

6 **Headlight** One Round Case 18" Reflector, To burn Kerosene

Headlight, Nos. on sides None H'dl't step With

Lamp shelf None Nosing ——

Bell 85 pounds

Sand Box One Diam. 28" Body Iron Painted Pipes Iron

Sander (See sup. 7)

Dome casing Iron Painted

Boiler Jacket #22 Soft Steel PtBands Iron Style 9

Boiler Lagging Magnesia sectional

8 **Frames** Cast Steel Braces Solid

10 **Cylinders,** Diam. 14" Stroke 20"

St'm ports, Length 13" Width 1⅜" Bridges 1"

Exh. ports, Length 13" Width 2½" Valve lead ⅛"

Valve travel 4½" Steam lap ⅞" Exhaust clearance ——

Eccentric crank throw 16" By-pass valve None

S. F. Lubr. (Spec) Detroit Double No. 12 Bulls Eye

12 Cyl'r heads Cast Iron; Lubr. pipes of Iron under jacket

Cyl'r casings Iron Ptd. Head covers Steel Painted

St'm chest casings Iron Ptd. Covers Steel Painted

St'm chest valves Richardson Balanced, with vacuum valves

Met. pkg { Piston rods / Valve stems U. S. King type (not spec)

Pistons Cast Iron rings sprung into solid head

12 **Guides** Laird type steel Oil cups Needle

Crossheads Cast Steel with bronze sliding blocks

Wrist Pins Steel Rod cups Plunger (See sup. 13)

13 Parallel Rods to have straps, keys and braces

Valve Motion Southern, royalty payable by B. L. W.

Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.

All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Driving Wheels to have hub liners of Bronze

Drivers, O. S. Diam. 45" Cen. diam. 42" Centers, cast iron

Tires Steel Held by Shrinkage Only

Tires, Flanged, Pos. Front and Back Size 1½" X 5"

Tires, Plain, Pos. Middle Size 1½" X 5½"

Lateral play between driving boxes and wheel hubs = 1/32" total

14 15 **Driving Boxes** Cast Steel

Journals, Diam. 6" Length 7-3/16"

16 17 **Springs.** Make B. L. W.

Front Engine Truck Four Wheeled Swing bolster, centre bearing

To swing 3¼" each side of cen., Cen. pin liners None

Journals, Diam. 4" Length 6½" Boxes Cast Iron

Wheels, Diam. 24" Tread 3¾" Kind Chilled Cast Iron Spoke

Tires None Cen. diam. —— Size ——

Tires held by ——

Engine Truck Wheels without hub liners

Back Engine Truck None Wheeled ——

To swing —— each side of cen., Cen. pin liners ——

Journals, Diam. —— Length —— Boxes ——

Wheels, Diam. —— Tread —— Kind ——

Tires —— Cen. diam. —— Size ——

Tires held by ——

Brake, position On all driving wheels only (not on tender)

Operating Parts { Engine, Sch. U-5 B. L. W. Steam / Eng. Tr'k, sch. ——

Foundation Parts { Drivers, sch. U-5 B. L. W. / Eng. Tr'k, sch. ——

Air pump —— Pos. ——

Train connections ——

Train signal, sch. None

Separate lubricator for steam brake valve

Tender Eight Wheeled, Drawing No. 346

Weight, with fuel and water, about 36,000 pounds

30 **Tank** 1800 Gallons, Bill 4477

Tank "U" shape, straight top. Fuel capacity 4 tons

Tool Boxes of hard wood, Top

31 **Frame** Steel 6" Channels

Front Drawbar height 25⅞"

Pilot None Pushing shoes None

Back drawhead, center above rail 24"

Coupler Cast Iron Drawhead as Ry.Co's sketch

Steps Front only

Trucks Arch Bar type with cast steel bolsters

32 Springs Elliptic. B. L. W.

Journals, Diam. 3½" Length 6"

Wheels, Diam. 26" Tread 3¾" Kind Chilled Cast Iron Plate

Tires None Cen. diam. —— Size ——

Tires held by ——

Safety chains Single

Brake Position None

Brake sch. None

List of tools, sch. 26

Photo sch. #2 Inspection B. L. W.

To be weighed Yes Material spec'ns B. L. W.

Certificate of boiler test Three copies of B.L.W. form 1036

Junior laws to 2-15-17 Shipment On Cars

Brass shop finish, No. 1

Machine shop finish D-165

Patents Feed Pipe Strainer, Patented Sept. 1, 1903 (Cast On

Property plates None

Painting:—Engine, style —— Black, without striping

Painting:—Tender, style —— Black, without striping

5/28/ Lettering etc. to be in yellow.

Mark on tank sides, S. S. & S.

Road Nos. Pos. Road Nos. Name None

F.No. Plate 16

Sand Box

Cab Sides

Back of Tank

SPECIFICATION FOR LOCOMOTIVES 10 22 D 86

FOR SURRY, SUSSEX & SOUTHAMPTON RAILWAY

R.

373

1 RAILS, 40 LBS., 35 LBS., AND SOME 25 LBS., SUPPORTED BY OAK TIES - 18 TIES TO EVERY 30 FEET OF RAIL.

2 CURVE BETWEEN CYLINDER OF BOILER AND LEGS OF FIREBOX TO BE STRAIGHTENED AS MUCH AS POSSIBLE.
OUTER SHELL OF FIREBOX TO BE 1" NARROWER THAN FRAME ON ENGINE.

3 ~~[illegible]~~ B. L. W. 1½" SYPHON ANGLE VALVE TO BE APPLIED TO FRONT OF DOME JUST ABOVE THE CASING MOLDING, WITH THE SECTION OF THE STRAIGHT PART OF THE DOME CASING, CUT OUT UNDER VALVE. VALVE TO BE ABOUT 4" FROM CASING.

4 BOILER TO BE REINFORCED AT INJECTOR CHECK VALVES.

5 CAB INSIDE ARRANGEMENT TO BE AS NEARLY AS PRACTICABLE, SAME AS LOCOMOTIVE No.2, CLASS 10-12/24 D 1 (SINGLE EXPANSION CYLINDERS APPLIED 1915)

6. HEADLIGHT TO BE DRESSEL CASE, No. 256, HIGH POWER TYPE WITH MANGIN MIRROR, AS SHOWN ON DRESSEL LEAFLET ~~[illegible]~~

7 SANDER TO BE OPERATED BY ROD FROM CAB WITH SINGLE SAND PIPE TO FRONT OF FRONT DRIVING WHEELS.

8 FRAMES TO BE PLACED 28" CENTER TO CENTER.

9 FRAMES TO HAVE DOUBLE FRONT RAILS WITH LUGS FOR GUIDE YOKE FORGED ON SAME.
ALL POINTS OF FRAMES CROSSED BY SPRING HANGERS TO BE MADE 1½" DEEPER THAN FOR PREVIOUS LOCOMOTIVE.

10 CYLINDERS TO BE BOLTED TO BOILERS WITH TWO ROWS OF BOLTS AS SHOWN ON B. L. W. CARD 7020.

11 CYLINDER COCKS TO BE AUTOMATIC MADE BY DIAMOND SPECIALTY CO., PHILADELPHIA.

12 LUGS TO BE CAST ON BACK CYLINDER HEADS, TO HOLD GUIDE BARS.

13 RODS:- MAIN BRASS TO BE ADJUSTED WITH TWO SET SCREWS ⅞" DIAMETER, AGAINST LINERS 1" THICK, INSTEAD OF KEYS.
PARALLEL ROD FRONT AND BACK BRASSES TO BE ADJUSTED SAME WAY. PARALLEL ROD - MAIN BRASS TO BE ADJUSTED WITH KEYS.
OIL CUPS TO BE FORGED ON ROD STRAPS, CUPS NOT MILLED ROUND.

14 DRIVING BOXES - SPRING SADDLES TO HAVE WIDE BOTTOM WITH ROLLER TOPS FOR SPRING SEATS.
SADDLES TO BE 8" WIDE AT BOTTOM.

15 LINERS TO BE APPLIED IN EQUALIZING POCKETS IN TOP OF BACK DRIVING BOXES.

16 NO HOLES TO BE APPLIED AT TOP-RAIL. BACK FRAME FOR SPRING HANGERS. IF POSSIBLE, USE SPRINGS THAT WILL INTERCHANGE WITH BACK SPRINGS OF LOCOMOTIVE 14, B.L.W.No. 21236, CLASS - 10-22 E 31.

17 SPRING PLATES TO BE 1/16" THICKER THAN STANDARD FOR THIS TYPE OF LOCOMOTIVE.

T E N D E R

30 TANK OUTSIDE SHEETS 3/16" THICK BRACED WITH VERTICAL ANGLES ⅞" X 2", PLACED 3 FEET ON CENTERS. INSIDE SHEET 5/16" THICK WITH HORIZONTAL ANGLE IN CENTER.
BRACE RODS TO BE APPLIED FROM OUTSIDE TO INSIDE ANGLES

31 TENDER FRAME AS B.L.W. CARD 4690 EXCEPT TO HAVE PLATE BUMPERS INSTEAD OF ROUND CORNERS AND TO HAVE DRAWHEAD BRACED BY CONNECTING PLATE EXTENDED TO REAR BOLSTER,

32 TENDER SPRINGS TO BE HEAVY - USE FIBRE STRESS OF 60,000 LBS.

THE BALDWIN LOCOMOTIVE WORKS Ag Spec's C-1106
Supp. 10 26 D 329-330 WITH SAME EXTRAS EXCEPT WHERE OTHERWISE SPEC'D.

Memorandum Spec'n 11162

SPECIFICATION FOR LOCOMOTIVES 10 26 D 332 Gen. Ex Photo. 5718

FOR East Tennessee & Western North Carolina Railroad Co. 10-3-16 **Engine Drawing No.** 61

R.

Gauge of Road 3' 0" Play 3/8"
Wheelbase, Rigid 10' 0" Driving 10' 0" Total 19' 6"
Total wheelbase, eng. and tend. { Actual 46'0" / Limited to ----

Curves 30 degrees Grades, 4%
Clearance limitations to be same as for 10 26 D 329 etc.
Limits, Height ---- Width ----
Weight (approximate) in working order, Total 98,800 lbs.
On F. tr'k 18,750 lbs., Drivers 80,050 lbs., B. tr'k ---- lbs.
Weight on drivers not to be less than 75,000 lbs.
Tractive power 19,100 lbs., Ratio of adhesion 4.2
Work'g St'm Pres. 180 lbs., Service Passenger and Freight
Fuel Soft Coal

Front tube sheet 1/2" thick
1 **Boiler** Steel Thick 11/16" Bill 7593
Boiler, Diam. 54" Plan Extended Wagon Top
Boiler st'm pres. 200 lbs., Tested to { 220 lbs. steam pres. / 267 lbs. water pres.
with factor of safety of 5.3
Longitud. seams Butt jointed, double covering strips

2 **Dome,** diam. 29" Pos. Forward of fire box

Firebox Steel Combustion chamb. None
Firebox, length 95-15/16" Width 23 3/8" Depth F. 51 3/8" B. 47 1/8"
Firebox, Tube 1/2" Crown 3/8" Sides 5/16" Back 5/16"
Firedoor opening 16" diam.
Water space, Front 3 1/2" Sides 2 1/2" Back 2 1/2"
Water space, Frame Single Riveted
3 Water space stays 15/16" diam. with 3/16" hole 1 1/2" deep from O.S.

Radial stays 1" diam. Sling stays front } Two rods of B. L. W. Expansion Stays
Button heads below crown on Eight central rows
Crown bars None Placed ---- above crown
Crown bolts ----

Flues None
Tubes #12 W. G. Charcoal Iron
Tube ends Swaged for copper ferrules, firebox ends
Number 188 Diam. 2" Length 12' 1 3/8"

Heating Surface	Flues None	Combus. Chamb. None	Total 1303 sq.
	Tubes 1187 sq.	Fire Box 116 sq.	Fire Brick Tubes ----
Grate area 15.5 sq.	Ratio to Heating Surface 1 : 84		
Superheater ----			

Fire Brick Arch, None

Grates Rocking Bars and Drop Plate
5 **Ash Pan,** Dampers None

Throttle valve sleeve to be of brass
Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

6 **Smokebox** extension With Cleaning hole and cap None
Spark ejector or hopper None
Netting and deflect. plates With

Exhaust nozzles Simple High

Stack 7 Straight Dia. 15" Hole in S. B., dia. 16"

(Spec)
Safety Valves Two Consolidated 2 1/2", one muffled
Safety valves None with relief lever, Set to 180 lbs. muffled / 183 lbs. open
Whistle Chime

Steam Gauge One Iron 7" MAKER:-Ashcroft (Spec)
Steam gauge stand Iron Clock None

8 **Water Gauge** One Klinger. 9 **Cab Lamps** Electric
10 **Gauge Cocks** Three (Sup. Surface valve None
Lowest gauge cock 3 1/2" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One Chime 2" (from stock) Pos:-Front
7 **Cleaning Plugs** One filling plug in top of boiler
Firebox Corners diagonal, and sides
Crown, Two each side and two back
Waist, One under front
Front tube sheet, Two Fusible plug One
One plug each side ahead of each injector check.
Cleaning plugs to be same as for 10 26 D 329 etc.
Pump None Pos. ----
Top chamb. ---- Bottom chamb. ----
Feed Cock ---- Feed pipes ----
Checks ---- Check pipes ----

11 (Spec) **Injectors** Two Sellers Improved Class "N" No. 7 1/2
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron (Sup. 11)
Check (See Sup. 12) Pos. Right and Left

Steam Heat Consolidated System.

13 **Cab** Steel

15 Cab boards Iron Nosing Angle Iron
16 Running boards Iron Nosing Angle Iron
Hand rail Iron Located on Boiler

Back Bumper Bar Steel Back drawbar height 28 1/2"

17 **Pilot** Wood Pushing shoes None
Front Bumper Oak Bumper plate With
18 **Steps,** Hand holds, etc. to conform to I.C.C. requirements

Front Drawhead, Center above rail 28"
Coupler Climax Auto. with flexible head

Signal fixtures Iron on bumper.
Headlight Equipment to be Pyle National Electric, Type "E" with incandescent headlights.
Headlight One Round Case 18" Reflector,
Headlight, Nos. on sides With H'd'l't step With
Lamp shelf None Nosing ----

Bell 85 pounds Gollmar Air Bell Ringer
Sand Box One Diam. 28" Body Iron Painted Pipes Iron
Sander (not shown) Leach Air A and D combination

Dome casing Iron Painted

Boiler Jacket #22 Plain Steel Bands Iron Style 9
19 **Boiler Lagging** Magnesia sectional

THE BALDWIN LOCOMOTIVE WORKS
Jan 1917

SPECIFICATION FOR LOCOMOTIVES 10 26 D 332 375

FOR East Tennessee & Western North Carolina Railroad Co.

R.

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21 **Frames** Cast Steel Braces Solid

Cylinders, Diam. 16" Stroke 22"
St'm ports, Length 14" Width 1 1/2" Bridges 1"
Exh. ports, Length 14" Width 2 1/2" Valve lead 3/16"
Valve travel 5" Steam lap 7/8" Exhaust clearance ----
Eccentric crank throw 9-5/16" By-pass valve None
26 S. F. Lubr. Detroit Triple #22 Bulls Eye
Cyl'r heads Cast Iron; Lubr. pipes of copper under jacket
Cyl'r casings Iron Painted Head covers Steel Painted
St'm chest casings Iron Pntd. Covers Steel Painted
St'm chest valves Richardson Balanced, with vacuum valves
Met. pkg { Piston rod / Valve stems } Jerome (Spec)

27 **Pistons** Cast Iron rings sprung into solid head
Guides Steel Oil cups Needle
Crossheads Cast Steel
Wrist Pins Steel Rod cups Needle, forged on rods
28-29

30 **Valve Motion** Walschaerts
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

32 **Drivers,** O. S. Diam. 45" Cen. diam. 38", Centres Cast Iron

31 **Tires** Hard Steel Held by Shrinkage and Shoulder
Tires, Flanged, Pos. Front and Back Size 3 1/2" X 5 1/2"
Tires, Plain, Pos. Middle Size 3 1/2" X 6"
Lateral play between driving boxes and wheel hubs- 1/16" total
Driving Boxes Cast Steel
Journals, Diam. 7" Length 7"

Springs, Make Railway Steel Spring Co's.

Front Engine Truck, Type Wheeled Swing bolster, Centre bearing
To swing 3" each side of cen. Cen. pin liners None
Journals, Diam. 6" Length 6" Boxes Cast Iron
Wheels, Diam. 24" Tread ---- Kind Cast Iron Spoke Centre
Tires Steel Cen. diam. 19" Size 2 1/2" X 5"
Tires held by Shrinkage and Shoulder

Back Engine Truck, Type ---- Wheels ----
To swing ---- each side of cen. Cen. pin liners ----
Journals, Diam. ---- Length ---- Boxes ----
Wheels, Diam. ---- Tread ---- Kind ----
Tires ---- Cen. diam. ----
Tires held by ----

33 L34 **Brakes,** position On all driving and trailing wheels
Operating Parts { Engine, Sch. A-1 and SM8 West's. Auto. and Eng. Tr'k, sch. ---- Straight Air.
Foundation Parts { Drivers, sch. SM-1 American O. S. Equalized / Eng. Tr'k, sch. ----
Air pump One - 9 1/2" Pos. Left Side
Train connections Front and Back
Train signal, sch. ----
Air reservoir to have hydrostatic test of 210 lbs.

40 **Tender** Eight Wheeled, Drawing No. 824
Weight, with fuel and water, about 60,000 lbs.

40 **Tank** 3,000 Gallons, Bill 323
Tank "U" shape, straight top. Fuel capacity 4 tons.
Tank to project 2 1/2" beyond tender frame floor
Tool Boxes Hard wood with iron lids. Pos:-Top of tank

Frame Steel 8" channels
Chafing casting on tender to be 12" deep, with large radius.
Front Drawbar height 28" Tender wedge block of cast steel
Pilot None Pushing shoes None
Back drawhead, center above rail 28"
Coupler Climax Auto. with flexible head

41 42 Steps, Hand holds, etc. to conform to I.C.C. requirements

Trucks Arch bar type with cast steel bolsters.

Springs Elliptic. Railway Steel Spring Co's make
Journals, Diam. 4" Length 7" Journal boxes, Symington
43 Wheels, Diam. 28" Tread ---- Kind Cast Iron plate centre
Tires Steel Cen. diam. 23" Size 2 1/2" X 5"
Tires held by Shrinkage and Shoulder
Safety chains Single

44 **Brake** Position On all wheels
Brake sch. PK-1012 and SM8 West's. Auto. and Straight Air.
Hand brake on right side of tender.

List of tools, sch. 26.
Photo sch. None Inspection B. L. W. (except see sup. 28-31)
To be weighed No Material spec'ns B. L. W.
Certificate of boiler test Three copies of B. L. W. form 1036
Junior laws to 10-1-16 Shipment On Car

Brass shop finish, No. 1
Machine shop finish D-160, except cylinder head covers and steam chest covers to be painted.

B. L. W. Patents } Feed Pipe Strainer, Patented Sept. 1, 1903 (Cast On)

Property plates None

Painting:—Engine, style ---- Olive Green, no striping
Painting:—Tender, style ---- Olive Green, no striping

Lettering; etc. in gold leaf same as for 10 26 D 329 etc.
Mark on Cab panel, E. T. & W. N. C. R. R.
No lettering or numbers on tank

Road Nos. Pos.	Road Nos.	Name None
F.No Plate	12	
Sand Box		
Cab Panel		

SPECIFICATION FOR LOCOMOTIVES 10 26 D 332

FOR East Tennessee & Western North Carolina Railroad Co.

R.

1 Locomotive to be built to meet all the I.C.C. requirements

2 Dome to be provided with large opening to permit a man to enter.

3 Flexible staybolts, American, 255 in breaking zone.

4 Furnace bearer to have holes drilled over staybolts so that tell tale holes may be seen.

5 Ash Pan to be self cleaning type.

6 Smoke box extension to be separate from smoke box sheet. Front end arrangement to be self cleaning type.

7 All boiler connections to be applied with graphite to prevent corroding. (See sup. 25)

8 Water gauge to be applied on right side of back head.

9 Electric lamp to be applied under hood of cab to light firing deck.

10 Gauge cocks to be placed on back head of boiler. (not on side)

11 Sellers injector to interchange with Monitor No.7, located inside of cab with overflow pipes into ash pan.
Injector on left side to be located same distance from front of cab as the injector on the right side.
Injector feed pipes to be bent to an angle to avoid breaking hose. Hose and feed pipe coupling to have strainers, and not in pipe.

12 Injector check to be Sellers Class "K" main check and stop. Reinforcing plates to be provided where injector check is attached.

13 Mr. Geo. W. Hardin, V.P. & Supt., is to be advised two days before we are ready to apply the cab fixtures so he can arrange to send his M. M., Mr. Allison to make supervision.

14 Rain shield to be applied around cab side windows similar to shield on P. R. R. locomotives.

15 Cab apron to be made of button plate.
The cab board is not to project beyond the cab. (Sup. 16)

16 Front of cab board to rest on bracket at front of firebox rear of running board to be jointed just ahead of the same bracket. The running boards to be 17" wide and arranged so that engineman can see valve motion from cab.

17 Opening in pilot for coupler to be 24" wide.

18 Steps about 27" long with a 4" foot board at inner edge, to be placed back of front bumper on each side of loco.

19 Lagging over staybolts to be removable, but not in frames.

20 Jacket on top and sides of fire box to be hooked over so as to facilitate removal when necessary.

21 Frame splice to be made with 7/8" bolts to make frame as strong as possible.
Frame pedestal bolts to have two nuts and cotters.

25 All steam pipe, cylinder and steam chest bolts to be applied with graphite to prevent corroding. (Sup. 7)

26 Cylinder lubricator to have oil control valve, and to have pipes located on back side of steam chest next to boiler.

27 Piston rods to be keyed to crossheads.

28 Main rod to have wedge instead of key.

29 Parallel rods to have solid ends.

30 Reverse lever to have multiple latch, similar to B.L.W. card 1483.

31 Flange oiler Detroit Four Feed Pendulum type to be furnished by Railroad Co. and applied by The B. L. W. Feeds to run to front and back drivers.
Advise Detroit Lubricator Co. three days in advance of our being ready to apply flange lubricators.

32 Driving wheels,- all to have hub liners of Bronze.

33 Engineers straight air valve S-3-A to be applied
Air pump piston rod to have hemp packing.
Air pump exhaust to be piped into cylinder saddle.
Air reservoir to be 18" diam.
~~Brake cylinder to be 10" diam.~~ 10½

34 Driver brake shoes to be American Brake Shoe & Foundry Co's centre lug Perfecto Type pattern G-1261.

FOR HEREAFTER, Please note:- 3/10/17.
Sling support for Dry pipe was too long
Cab handles to be changed so as not to strike the tender front bumper when on curves.
Tender wheel flanges were too thin and did not comply with Standard measurements.
Driving Boxes ordered of cast iron by mistake.
See report dated 2-5-17 from O.A. Alexander, File No.
Hereafter Change Driving Boxes to be of Cast Steel and provide hub liners of Brass on Driving Wheels R.P.McC. 5/11/17

TENDER

40 Tank cock to be located on the inside of ~~left~~ right hand water leg about 12" from the floor. 4/15/17

41 Foot boards to be applied across rear of tender with hand rails.

42 Loco. to meet all I. C. C. requirements

43 The tender wheels to be of standard section. The I.C.C. Inspector has called attention to insufficient flanges on wheels for 10 26 D 329 - 330.

44 Brake beams to be made of 5" "I" section, 43" overall, 39" centres, and fitted with Christie heads No.22, made by the Pennsylvania Brake Beam Co.

45 Shroud sheet of tank to extend to back of fuel space 2/7/17.

THE BALDWIN LOCOMOTIVE WORKS As Spec'd, C-4019
Memorandum Spec'n 11215 | Dup. 10-36 E 1130, WITH SAME EXTRAS EXCEPT WHERE OTHERWISE SPECIFIED

SPECIFICATION FOR LOCOMOTIVES 10 36 E 1297

Gen. as PHOTO. 5405 | EXCEPT WITH ONE BAND BOX AND OMITTING REAR HEADLIGHT

FOR WEST VIRGINIA NORTHERN RAILROAD COMPANY

Engine Drawing No. 97

R. 11-16-16

Gauge of Road 4' 8½" Play ⅞" EXCEPT 1" FOR F & B DRIVERS
Wheelbase, Rigid 12' 6" Driving 12' 6" Total 20' 5"
Total wheelbase, eng. and tend. { Actual 49' 0" / Limited to ——

Curves 32 DEGREES

Limits, Height 14' 8" Width ——
Weight (approximate) in working order, Total 152,000 POUNDS
On F. tr'k 17,000 lbs., Drivers 135,000 lbs., B. tr'k —— lbs.

Tractive power 37160 lbs., Ratio of adhesion 3.6
Work'g St'm Pres. 190 lbs., Service FREIGHT
Fuel SOFT COAL

1 FRONT TUBE SHEET TO BE ½" THICK
Boiler STEEL Thick 11/16" Bill 8014
2 Boiler, Diam. 72" Plan STRAIGHT TOP
Boiler st'm pres. 190 lbs., Tested to { 210 lbs. steam pres. / 254 lbs. water pres.
WITH FACTOR OF SAFETY OF 4.6
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS

3 **Dome,** diam. 33" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE
Firebox, length 95-15/16" Width 42" Depth F. 68¼" B. 63¾"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
4 Firedoor opening OVAL, 16" X 20"
Water space, Front 4" Sides 3" Back 3"
Water space, Frame SINGLE Riveted
6 Water space stays ⅞" DIAM. WITH 3/16" HOLE 1¼" DEEP FROM O. S.

Radial stays 1" DIAM. Sling stays front { TWO ROWS OF B. L. W. EXPANSION STAYS
Button heads below crown on TEN central rows
Crown bars NONE Placed —— above crown
Crown bolts ——

Flues NONE
Tubes #12 W. G. CHARCOAL IRON
Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS
Number 306 Diam. 2" Length 12' 3⅝"

Heating Surface | Flues —— Combus. Chamb. —— Total 2112 sq ft
Tubes 1959 sq ft Fire Box 153 sq ft Fire Brick Tubes ——
Grate area 28 sq ft Ratio to Heating Surface 1 : 75.5
Superheater ——

Fire Brick ARCH NONE

7 **Grates** ROCKING BARS AND DROP PLATE
8 **Ash Pan,** Dampers FRONT AND BACK
ASH PAN TO HAVE NETTING UNDER DAMPERS

Throttle BALANCE Pos. DOME
Dry pipe STEEL

Superheater NONE

9 **Smokebox** extension WITH Cleaning hole and cap RIGHT AND LEFT
10 Spark ejector ~~or hopper~~ WITH, TO DELIVER TO RIGHT SIDE
Netting and deflect. plates WITH

Exhaust nozzles SINGLE, LOW
CLEANING PIPE, WITH
Stack CAST IRON, STRAIGHT Dia. 18" Hole in S. B., dia. 18½"
STACK TO BE SAME STYLE AS FOR 10-36 E 823 AND 997

Safety Valves (SPEC) TWO AMERICAN 3", AS B. L. W. CARD 257.
Safety valves NONE with relief lever, Set to { 1190 LBS. / 1195 LBS.
Whistle HANCOCK 6" CHIME

11 **Steam Gauge** ONE IRON 7" MAKER:—ASHCROFT (NOT SPEC)
Steam gauge stand IRON **Clock** NONE

Water Gauge ONE (SEE SUP. 12) **Cab Lamps** ELECTRIC
Gauge Cocks THREE R. S. Surface valve NONE
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve TO HAVE separate dry pipe to dome
13 **Blower Valve** ONE B. L. W.

14 **Blow off Cock** ONE B. L. W. POS:—FRONT
Cleaning Plugs ONE PLUG IN TOP OF BACK HEAD
Firebox CORNERS, SIDES AND BACK
Crown, THREE EACH SIDE AND FOUR BACK
Waist, ONE UNDER FRONT
Front tube sheet, TWO Fusible plug NONE

Pump NONE Pos. ——
Top chamb. —— Bottom chamb. ——
Feed Cock —— Feed pipes ——
Checks —— Check pipes ——

15 to 17 **Injectors** (SPEC) TWO HANCOCK, TYPE A No. 10
Injectors, Pos. BOTH RIGHT SIDE Steam pipes COPPER
Pipes, Check COPPER Feed IRON Overflow IRON
Check B. L. W. Pos. BOTH RIGHT SIDE

Steam Heat CONSOLIDATED SYSTEM

18 **Cab** STEEL, LINED WITH WOOD VENTILATOR IN CAB ROOF

Cab boards STEEL Nosing T-IRON
Running boards STEEL (SUP. 26) Nosing T-IRON
Hand rail IRON Located on BOILER

19 **Back Bumper** BAR STEEL Back drawbar height 28⅝"

27 **Pilot** STEEL Pushing shoes CAST IN BUMPER
28 **Front Bumper** CAST STEEL Bumper plate WITH
29 **Steps,** HAND HOLDS, ETC. TO CONFORM TO I.C.C. REQUIREMENTS

Front Drawhead, Center above rail 33½"
Coupler M. C. B. AUTO.

Signal fixtures IRON ON BUMPER

HEADLIGHT TO BE PYLE ELECTRIC TYPE K, INCANDESCENT.
Headlight ONE ROUND CASE 18" Reflector,
Headlight, Nos. on sides WITH H'dl't step WITH
Lamp shelf NONE Nosing ——

Bell 92 POUNDS. GOLLMAR AIR BELL RINGER
Sand Box ONE Diam. 31" Body IRON PAINTED Pipes IRON
Sander (SPEC) LEACH AIR, TRAP D-2 DOUBLE TO SAND FRONT AND BACK

Dome casing IRON PAINTED

Boiler Jacket #22 SOFT STEEL PTD Bands IRON. Style 9
30 **Boiler Lagging** MAGNESIA SECTIONAL

THE BALDWIN LOCOMOTIVE WORKS
N. P. Shelmerdine April 1917

SPECIFICATION FOR LOCOMOTIVES 10 36 E 1297

FOR WEST VIRGINIA NORTHERN RAILROAD COMPANY

R.

378

31 **Frames** CAST STEEL Braces SOLID

32 **Cylinders,** Diam. 21" Stroke 24"
St'm ports, Length 19" Width 1⅝" Bridges 1⅜"
Exh. ports, Length 19" Width 3" Valve lead ¼"
Valve travel 5½" Steam lap ⅞" Exhaust clearance ——
Eccentric crank throw 10-3/16" By-pass valve NONE
33 S. F. Lubr. (SPEC) DETROIT TRIPLE No. 22 BULLS EYE
34 Cyl'r heads CAST STEEL; LUBR. PIPES OF COPPER UNDER JACKET
Cyl'r casings IRON PTD. Head covers STEEL PAINTED
St'm chest casings IRON PTD. Covers STEEL PAINTED
St'm chest valves BALANCED WITH VACUUM VALVES
Met. pkg { PISTON ROD / VALVE STEMS } UNITED STATES KING TYPE (NOT SPEC)

35 **Pistons** CAST IRON RINGS SPRUNG INTO SOLID HEAD
35 **Guides** STEEL Oil cups NEEDLE
36 **Crossheads** ALLIGATOR TYPE, CAST STEEL
37 **Wrist Pins** STEEL 38 Rod cups GREASE CUPS FORGED ON

Valve Motion WALSCHAERTS, OF MODERN DESIGN
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

41 **Drivers,** O. S. Diam. 46" Cen. diam. 40" CENTERS CAST STEEL

40 **Tires** STEEL Held by SHRINKAGE AND SHOULDER
Tires, Flanged, Pos. FRONT, INTER. AND BACK Size 3" X 5½"
Tires, Plain, Pos. MAIN Size 3" X 6½"
Lateral play between driving boxes and wheel hubs = 1/16" TOTAL
42 **Driving Boxes** STEELED CAST IRON
Journals, Diam. 8" Length 10"

Springs. Make B. L. W. (SEE SUP. 43)

44 **Front Engine Truck** TWO Wheeled SWING BOLSTER CENTER BEARING
To swing 5⅜" each side of cen., Cen. pin liners NONE
Journals, Diam. 5" Length 8" Boxes CAST IRON
Wheels, Diam. 28" Tread —— Kind CAST IRON SPOKE CENTRES
Tires STEEL Cen. diam. 23" Size 2½" X 5½"
Tires held by SHRINKAGE AND SHOULDER

Back Engine Truck NONE Wheeled ——
To swing ——each side of cen., Cen. pin liners ——
Journals, Diam. —— Length —— Boxes ——
Wheels, Diam. —— Tread —— Kind ——
Tires —— Cen. diam. —— Size ——
Tires held by ——

51 **Brake,** position ON ALL DRIVING AND TENDER WHEELS
to 55 Operating Parts { Engine, Sch. A-1 & SMA WEST'G. AUTO. AND / Eng. Tr'k, sch. —— STRAIGHT AIR
Foundation Parts { Drivers, sch. WN-2 AMERICAN O. S. EQUALIZED / Eng. Tr'k, sch. ——
Air pump ONE 11" Pos. LEFT SIDE, AHEAD OF FIRE BOX
Train connections FRONT AND BACK
Train signal, sch. J

71 **Tender** EIGHT Wheeled, Drawing No. 435
Weight, with fuel and water, about 100,000 POUNDS

Tank 5000 Gallons, Bill 4413
TANK RECTANGULAR SHAPED FUEL CAPACITY 10 TONS

Tool Boxes OF HARD WOOD, TOP

80 **Frame** STEEL 10" CHANNELS, WITH FRONT AND BACK BUMPERS OF CAST STEEL
71 Front Drawbar height 29½"
Pilot NONE Pushing shoes CAST IN BACK BUMPER
80 Back drawhead, center above rail 33½"
Coupler M. C. B. AUTOMATIC

Steps TO BE PLACED AT BACK END OF TENDER

79 **Trucks** ARCH BAR TYPE WITH CAST STEEL BOLSTERS

Springs ELLIPTIC B. L. W.
Journals, Diam. 5" Length 9" M.C.B. AXLE BOX, BRASS, ETC.
Wheels, Diam. 30" Tread 4½" Kind CHILLED CAST IRON PLATE
Tires NONE Cen. diam. —— Size ——
Tires held by ——
Safety chains SINGLE

Brake Position ON ALL WHEELS
Brake sch. PK-1212 & SMB WEST'G. AUTO. AND STRAIGHT AIR

List of tools, sch. 29
Photo sch. NONE Inspection B.L.W. (EXCEPT SEE SUP. 1)
To be weighed YES Material spec'ns B. L. W.
Certificate of boiler test THREE COPIES OF B.L.W. FORM 1036
Junior laws to 3-24-17 Shipment ON OWN WHEELS

Brass shop finish, No. 1
4/20/17 Machine shop finish D-~~358~~ 165

B. L. W. Patents { FEED PIPE STRAINER, PATENTED SEPT. 1, 1903 (CAST ON)

Property plates NONE

Painting:—Engine, style 291 OLIVE GREEN AND YELLOW
Painting:—Tender, style 291 OLIVE GREEN AND YELLOW

Mark on TANK SIDES, WEST VIRGINIA NORTHERN

Road Nos. Pos.	Road Nos.	Name NONE
P. No PLATE	11	
CAB SIDES		
BACK OF TANK		

1 BOILER TO BE INSPECTED BY THE HARTFORD STEAM BOILER INSPECTION AND INSURANCE CO.
MR. HANST OF THE W.VA.N.R.R. CO. IS TO BE ADVISED WHEN BOILER IS READY FOR THE STEAM AND WATER TESTS. NOTIFY F.WOOLLVEN WHEN HE SHOULD BE ADVISED.

2 BOILER DIAMETER TO BE INCREASED 4" (I.E.FROM 68" TO 72") WITH THE SAME NUMBER OF TUBES SPACED ACCORDINGLY.

3 DOME TO BE ARRANGED SO THAT A MAN CAN ENTER BOILER WITHOUT REMOVING THROTTLE PIPE.
THROTTLE PIPE TO BE OVAL.

4 FIREDOOR TO BE HORIZONTAL SLIDING TYPE, AS B.L.W. CARD 468.

5 FURNACE BEARER CLAMPS TO BE REINFORCED.

6 FLEXIBLE STAYS TO BE TATE 1" DIAM. OF EWALD IRON, 250 IN BREAKING ZONE OF SIDE SHEETS AND TWO ROWS IN EACH SIDE OF THROAT SHEET.

7 GRATES TO BE SAME AS FOR 10-36 E 823 & 997

8 ASH PAN TO BE MADE HEAVIER AND TO BE PROVIDED WITH CAST STEEL HOPPERS AND SLIDES.
ASH PAN AS PRINT 23902, AND SLIDE WORK AS PRINT 23903.- APPROVED. 3 30 17.

9 SMOKE BOX FRONT AND DOOR TO BE SAME DESIGN AS FOR B. & O. MALLET TYPE LOCOS.= 18 46/76 EE 1 TO 15

10 FRONT END ARRANGEMENT TO BE M.M. STANDARD SELF CLEANING TYPE, SAME AS SHOWN ON B.L.W. DEFLECTING PLATE CARD 2164, EXCEPT NETTING TO BE 2½ X 2½ MESH.

11 STEAM TEST GAUGE COCK TO BE SAME AS FURNISHED ON EXTRA ORDER NO. 6544 DATED 7-8-13 FOR 10-36 E 823 & 997.

12 WATER GAUGE TO BE KLINGER REFLEX B-5 ON RIGHT SIDE

13 TWO VALVES IN BLOWER PIPE, ONE ON TOP OF BOILER AND ONE AT FIRE DOOR, ALSO THRE-WAY COCK PLACED 7 FEET FROM SMOKE BOX. THREAD ON OUTLET OF THREE-WAY COCK ON BLOWER PIPE TO BE ¾" PIPE TAP.

14 BLOW OFF COCK TO HAVE BODY CLOSED AT BOTTOM AND PLUG PACKED ON TOP.

15 INJECTORS TO BE PLACED OUTSIDE OF CAB AS CONVENIENT AS POSSIBLE FOR ENGINEER.
INJECTOR OVERFLOW NOT TO BE PIPED INTO ASH PAN.

16 PORTEOUS NO. 10 FIRE EXTINGUISHER AS FURNISHED BY THE EDNA BRASS MFG. CO., 525-533 READING ROAD, CINCINNATI, OHIO TO BE CONNECTED TO CHECK PIPE OF THE LOWER INJECTOR.

17 SPRINKLING HOSE FROM INJECTOR TO BE PROVIDED.

18 WATER SPOUTING TO BE PLACED ON SIDE OF CAB OVER WINDOW INSTEAD OF ON ROOF.
CAB FRONT DOOR TO HAVE CLEAR VISION WINDOWS.
FLOOR INSIDE OF CAB TO BEL LINED WITH WOOD.
SEE THAT TANK DOES NOT INTERFERE WITH CAB WHEN ROUNDING CURVES.

19 CHAFING CASTING OF CAST STEEL BETWEEN ENGINE AND TENDER.
DRAWBAR BETWEEN ENGINE AND TENDER TO BE HEAVY
SAFETY BARS BETWEEN ENGINE AND TENDER (INSTEAD OF CHAINS)

26 RUNNING BOARDS TO BE MADE IN SECTIONS SO PORTIONS CAN BE REMOVED EASILY.

27 PILOT TO BE REMOVABLE WITHOUT INTERFERING WITH DRAWHEAD.
BOTTOM OF PILOT TO BE 6" FROM TOP OF RAIL.

28 FRONT BUMPER KNEES TO BE EXTRA HEAVY.

29 STEPS TO BE APPLIED RIGHT AND LEFT, ON BACK OF FRONT BUMPER.

30 JACKET ON SIDES OF FIRE BOX TO BE APPLIED IN SECTIONS, SECURED WITH TAP BOLTS, SO SAME CAN BE REMOVED TO RENEW STAYBOLTS WHEN NECESSARY.

31 FRAMES OF PREVIOUS LOCOMOTIVE ARE BREAKING WHERE SHOWN IN RED ON BLUE PRINT OF FRAME, B.L.W. CARD 5873 (HEREWITH) FRAMES FOR NEW LOCOMOTIVE TO BE STRENGTHENED AT THIS POINT.

32 CYLINDER EXHAUST PASSAGES TO BE PROVIDED WITH DRAIN COCKS.

33 CYLINDER LUBRICATOR TO HAVE CUT OFF VALVE.

34 STEAM CHEST AND CAPS TO BE OF CAST STEEL.

35 GUIDE LUGS TO BE CAST SOLID WITH CYLINDER HEADS.

36 CROSSHEADS TO BE SIMILAR TO 10-36 E 823 & 997, AND TO HAVE GIBS OF SAME TYPE.

37 DUST GUARDS TO BE PLACED ON GUIDE BEAMS TO COVER OIL BOXES FOR VALVE-RODS.

38 INTERMEDIATE AND BACK WRIST PINS TO HAVE TWO NUTS, THE BACK WRIST PINS TO HAVE THE NUTS ON THE OUTSIDE.

39 FRONT CONNECTION OF SIDE RODS AND MAIN ROD BACK END TO HAVE WEDGE SHAPED KEYS WITH BOLT THROUGH WEDGE AND JAM NUT.
SIDE RODS TO HAVE SOLID ENDS, EXCEPT SIDE RODS FRONT STUBS TO HAVE STRAP AND KEY.

40 FLANGE LUBRICATOR-DETROIT PENDULUM TYPE, TO BE APPLIED TO FRONT AND BACK DRIVING WHEELS

41 DRIVING WHEEL CENTERS TO HAVE HUB LINERS OF PLATE STEEL CASE HARDENED PRESSED INTO WHEELS.

42 DRIVING BOXES TO HAVE BRASS HUB FACE AND JOURNAL BEARING CAST IN THE BOXES. THE JOURNAL BEARING AND HUB FACE BEING CAST IN BOX AT ONE TIME.

43 SPRINGS AND SPRING RIGGING TO BE HEAVIER.
DRIVING SPRING STAPLES TO BE OF CAST STEEL, INTERCHANGEABLE WITH THOSE ON COMPANY'S PREVIOUS ENGINES.
FORWARD EQUALIZING BEAM CENTER HOLE TO HAVE CASE HARDENED STEEL BUSHING. FORWARD EQUALIZING BEAM FULCRUM TO HAVE CASE HARDENED STEEL BUSHING.
FORWARD EQUAL BEAM TO HAVE SAFETY STRAP ON ENGINE TRUCK.
BACK EQUALIZING SPRING FULCRUM OF CAST STEEL, WITH BOSSES TO PROVIDE MORE WEARING SURFACE FOR PIN.

44 FRONT ENGINE TRUCK TO BE SAME AS FOR 10-36 E 823 & 997.
ENGINE TRUCK WHEELS TO BE B.L.W. STANDARD WITHOUT HUB LINERS.

45 PLATE THAT COVERS ENGINE TRUCK TO BE DRILLED SO THAT HANGERS AND PINS CAN BE OILED FROM THE TOP.

51 AIR PUMP TO BE PLACED ON SIDE OF BOILER SO THAT AIR END WILL COME THROUGH RUNNING BOARD IN ORDER THAT BOTTOM CYLINDER HEAD AND AIR VALVE CAN BE REMOVED WITHOUT REMOVING PUMP FROM ENGINE.

52 MAIN RESERVOIR TO BE LOCATED UNDER RUNNING BOARDS AWAY FROM FIRE BOX, TO HAVE HYDROSTATIC TEST OF 210 LBS.

53 STRAIGHT AIR VALVE TO BE LOCATED IN FRONT OF ENGINEER'S SEAT

54 AIR BRAKE CYLINDER TO BE ARRANGED SO REAR DRIVING TIRES CAN BE REPLACED WITHOUT REMOVING CYLINDERS.

55 DRIVING BRAKE HANGERS TO BE SAME AS FOR 10-36 E 823 & 997.
BRAKE BELL CRANK FULCRUM TO BE REDESIGNED SO THAT IT WILL NOT WORK LOOSE.
DRIVING BRAKE SHOES AND HEADS TO BE CAST SEPARATE.

TENDER.

71 TANK TO HAVE VERTICAL T IRONS ON SIDES, AND TO HAVE DASH PLATES FASTENED TO TOP AND SIDES OF TANK ONLY.

72 DRAIN PIPES THROUGH TANK, RIGHT AND LEFT.

73 SEE THAT TANK DOES NOT INTERFERE WITH CAB WHEN ROUNDING CURVES.

74 CHAFING CASTING OF CAST STEEL BETWEEN ENGINE AND TENDER. WEDGE BLOCK 14" LONG ON TENDER, TO PREVENT TENDER FRONT BUMPER FROM STRIKING ENGINE BACK BUMPER WHEN ON CURVES.

75 DRAWBAR BETWEEN ENGINE AND TENDER TO BE HEAVY.

76 SAFETY BARS BETWEEN ENGINE AND TENDER (INSTEAD OF CHAINS)

77 HOOKS ON RIGHT SIDE OF TENDER TO CARRY ROPE, AND ON LEFT SIDE OF TENDER TO CARRY PUSH POLE.

78 PUSH POLE TO BE PROVIDED.

79 TRUCK CROSSBEAMS OF CHANNEL IRON.

80 FLANGE ON TENDER WEDGE BOX TO BE MADE HEAVIER AS BOX BREAKS WHERE FLANGE RESTS ON BACK BUMPER.

FOR HEREAFTER:-
Connecting Rod Cups arranged for oil lubrication.
Holes 1½" diam. to be drilled through furnace bearers so that staybolts will not be covered.
Raise question about applying a brace to prevent brake bell crank fulcrum from working loose.
Air pump exhaust to be piped into cylinder saddle.
Letter of H. Hanst, dated May 12, 1917. File 410.

For Hereafter R.S.McC. 5.16.17.
Engine Frames to be properly braced at pedestals with vertical cast steel crosstie.
Improved Valve Motion design. Reverse Shaft and Reverse Lever. R.S.McC 5-29-18

For Hereafter and Extras: Engine Truck King Bolt to be special type similar to bolt furnished on Extra Order No. 5197-1927 for Loco No. 9 (10-36 E 823)
See letter 9-9-27 from J.J. Matheson, Purch. Agent W.V.N.R.R. Co.

THE BALDWIN LOCOMOTIVE WORKS — As Spec'n 0-3483.
Memorandum Spec'n 10383 — Details as far as practicable to be same as on Ry. Co's engines 10 38 E 3634 - 3635.

SPECIFICATION FOR LOCOMOTIVES 10 40 E 174 - 175 — Gen. as Neg. 4670, except with Baker Valve Gestion

FOR Coal and Coke Ry. Co. — **Engine Drawing No.** 9

2-21-16

Gauge of Road 4' 8½" — Play ⅝" except 1" for front and back drivers.
Wheelbase, Rigid 14' 3" — Driving 14' 3" — Total 23' 3"
Total wheelbase, eng. and tend — Actual 55' 10" — Limited to ----
Grades, Maximum 86 feet to the mile
Curves on Main line 16 degrees, on Branch lines 22 degrees.

Limits, Height (See sup. 2) — Width 10' 6" over cab.
Weight (approximate) in working order, Total 202,000 lbs.
On F. tr'k 24,000 lbs. Drivers 178,000 lbs. B. tr'k ---- lbs.

Tractive power 46,000 lbs. Ratio of adhesion 3.87
Work'g St'm Pres. 190 lbs. Service Freight
Fuel Soft Coal

11 **Boiler** Steel — Thick 11/16" and ¾" Bill 7717
Boiler, Diam. 72" — Plan Extended Wagon top
Boiler st'm press 200 lbs. — Tested to 220 lbs. steam pres. / 267 lbs. water pres.
Longitud. seams Butt jointed, double covering strips, 90% seam

12/13 **Dome,** diam. 33" — Pos. Forward of Firebox

Firebox Steel — Combustion chamb None
Firebox, length 105" — Width 71½" Depth F. 78" B. 64⅛"
Firebox, Tube ½" — Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening One oval 16" x 20" with swing door
Water space, Front 4" — Sides 3½" Back 3½"
Water space, Frame Double — Riveted
Water space stays ⅝" diam. (See sup. 14-15)

Radial stays 1" diam. — Sling stays front } Three rows of b.L.W. Expansion Stays.
Button heads below crown on Twelve central rows
Crown bars None — Placed ---- above crown
Crown bolts ----

Flues #9 B. W. G. Seamless Steel
Tubes #11 W. G. National Spellerized Steel or Charcoal Iron
Tube ends Swaged for copper ferrules, fire box ends.
Number 32 / 228 — Diam. 5⅝" / 2" — Length 13' 10"

Heating Surface — Flues 619d — Combus. Chamb. ---- — Total 2473d
Tubes 1642d — Fire Box 184d — Fire Brick Tubes 28d
Grate area 52.3d — Ratio to Heating Surface 1 : 47.6
Superheater 526d

16 **Fire Brick** Arch, American, on four tubes, 3" O.S.diam. of steel 3 5/16" thick

Grates (See sup. 21)
22 **Ash Pan,** Dampers None

23 **Throttle** Balance — Pos. Dome
24 Dry pipe Steel
25 **Superheater** Schmidt

26 **Smokebox** extension With — Cleaning hole and cap None
Spark ejector or hopper None
Netting and deflect. plates With
27 Exhaust nozzles Single.- Low
Stack Straight — Dia. 18" - Hole in S. B. dia. 19"
Stack to have a steel base, and to have a bead on top.

Safety Valves (Spec) Two Ashton 6" — 3½" diam. One muffled
Safety valves None with relief lever, Set to 190 lbs. muffled / 195 lbs. Open
Whistle Large deep toned (See sup. 13)

Steam Gauge One Iron 7" — MAKER:- Ashton (Spec)
Steam gauge stand Iron — **Clock** None

Water Gauge (See sup. 29) — 30 **Cab Lamps** Electric
30 **Gauge Cocks** Four Right Side — Surface valve None
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve without separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock (See sup. 31)
32 **Cleaning Plugs** One plug above fire door
Firebox Corners diagonal, sides and back
Crown, Two right side, three left side and four back
Waist, (See sup. 32)
Front tube sheet, One — Fusible plug One

Pump None — Pos. ----
Top chamb. ---- — Bottom chamb. ----
Feed Cock ---- — Feed pipes ----
Checks ---- — Check pipes ----

33 **Injectors** (Spec) Two Sellers Class "N" — No. 10½
Injectors, Pos. (See sup. 33) — Steam pipes Copper
Pipes, Check Copper — Feed Copper — Overflow Iron
Check (See sup. 34) — Pos. Right and left

Steam Heat None

Cab Steel (See sup. 42-43)

Cab boards Steel — Nosing T-Iron
Running boards Steel — Nosing T-Iron
Hand rail Iron — Located on Boiler

44 **Back Bumper** Bar Steel — Back drawbar height 33"

45 **Pilot** Hand Wood — Pushing shoes Cast in bumper
46 **Front Bumper** Cast Steel — Bumper plate With
47 **Steps,** hand holds, etc. to conform to I. C. C. requirements

Front Drawhead, Center above rail 33⅛"
48 **Coupler** Simplex M. C. B. Auto. Steel, with 5" x 7" shank

49 Signal fixtures Iron on bumper, P. R. R. style

50/53 **Headlight** One (See sup. 50) — Reflector,
Headlight, Nos. on sides With — H'd'l't step With
Lamp shell Steel Plate — Nosing None

Bell 92 pounds — Bell ringer, Gollmar air
51 **Sand Box** One Diam. 35" Body Iron Ptd. — Pipes Iron
Sanders Leach Air Trap A-10 double, to sand front of front and back of third drivers.
52 Dome casing Iron Painted

Boiler Jacket #22 Plain Steel — Bands 1/16" Steel — Style 9 and 14
Boiler Lagging Keasby and Mattison 85% magnesia Sectional
Back head of boiler to be lagged and jacketed.

THE BALDWIN LOCOMOTIVE WORKS — 46 Gardner — May 1916 — 3891

SPECIFICATION FOR LOCOMOTIVES 10 40 E 174 - 175 — Furnish Prints (See sup. 7)

FOR Coal & Coke Ry. Co.

61 **Frames** Cast Steel — Braces Solid

63 **Cylinders,** Diam. 23" — Stroke 28"
St'm ports, Length 26½" — Width 1½" — Bridges ----
Exh. ports, Length ---- — Width ---- — Valve lead 3/16"
Valve travel 6½" — Steam lap 1" — Exhaust clearance ----
Eccentric crank throw 20½"
65 S. F. Lubr. (Spec) Nathan Five Feed Bulls Eye
Cyl'r heads Front of Cast Iron, Back of Cast Steel
Cyl'r casings 1/16" Iron Ptd — Head covers Pressed Steel Painted
66 St'm chest casings ---- — Covers ----
67 St'm chest valves 11" Diam. Piston Type, inside admission.
Met. pkg (PISTON RODS / VALVE STEMS) U. S. King Type. (Spec)

Pistons (See sup. 68)
69 **Guides** Steel — Oil cups Needle
Crossheads Cast Steel
Wrist Pins (See sup. 70) — Rod and cups (See sup. 71-72)

Valve Motion Baker (See sup. 73)
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings Damascus Bronze

81 **Drivers,** O. S. Diam. 52" — Cen. diam. 44" — Centers of Cast Steel

74/82 **Tires** Steel — Held by Shrinkage and Shoulder
Tires, Flanged, Pos. All — Size 4" x 5½"
Tires, Plain, Pos. None — Size ----
75 Lateral play between driving boxes and wheel hubs = 1/16" total
76 **Driving Boxes** Cast Steel
77 **Journals,** Diam. Main 10" — Length 12" / Others 9"

Springs. Make (See sup. 83)

Front Engine Truck Two — Wheeled Swing Bolster Center Bearing
To swing 4⅜" each side of cen., Cen. pin liners None
84 Journals, Diam. 6" — Length 10" — Boxes Cast Iron
Wheels, Diam. 30" — Tread ---- Kind Cast Iron Spoke Center
Tires Steel — Cen. diam. 25" — Size 2½" x 5½"
Tires held by Shrinkage and Shoulder

Back Engine Truck None — Wheeled ----
To swing ---- each side of cen., Cen. pin liners ----
Journals, Diam. ---- — Length ---- — Boxes ----
Wheels, Diam. ---- — Tread ---- Kind ----
Tires ---- — Cen. diam. ---- — Size ----
Tires held by ----

85 **Brake,** position On all driving and tender wheels.
90 Operating Parts — Engine, Sch. #6-ET West'g Combined Auto. and Eng. Tr'k, sch. ---- Straight Air
Foundation Parts — Drivers, sch. UM-3 American O. S. Equalized / Eng. Tr'k, sch. ----
86 Air pump Two 9½" Pos. Left Side
Train connections Front and Back
Train signal, sch. None

101 **Tender** Eight Wheeled, Drawing No. 610
Weight, with fuel and water, about 131,000 lbs.

101 **Tank** 7,000 Gallons, Bill 4160
Tank Water Bottom Type — Fuel Capacity 17 tons.

Tool Boxes (See sup. 104)

104 **Frame** Open hearth Steel 12" channels.

107 Front Drawbar height 32⅝"
Pilot None — Pushing shoes at back
Back drawhead, center above rail 33⅛"
108 **Coupler** Simplex M. C. B. Auto. Steel Freight coupler with 5" x 7" shank.

107/110 Steps, hand holds, etc. to conform to I. C. C. requirements.

111 **Trucks** B. L. W. equalized type with Cast Steel Bolsters.

Springs Half Elliptic. (See sup. 112)
113 Journals, Diam. 5½" — Length 10"
115 Wheels Diam. 33" — Tread 4¼" — Kind Standard Solid Forged / Rolled Steel (a/c time)
Tires None — Cen. diam. ---- — Size ----
Tires helt by --- — Wheel Rims 2½" thick
Safety chains Single

Brake Position On all wheels.
116 Brake sch. #6-ET West'g Auto. and Straight Air with 12" x 12" cylinder.

6 List of tools, sch. 20
Photo sch. #2 — Inspection B. L. W
To be weighed Yes — Material spec'ns B. L. W.
Certificate of boiler test Three copies of B. L. W. form 1036
Junior laws to 5-1-16 — Shipment On own wheels. (See sup. 5-16)

Brass shop finish, No. 1
Machine shop finish D-106, Except main rod to be painted in channel and finished on edge, and injector check pipe finished

B. L. W. Patents — Throttle, Patented, Jan. 23, 1900 (Cast on) / Steam Pipe Cover, Patented July 18, 1911 (Cast on)

Property plates B. L. W. for engine and tender

Painting:—Engine, style ---- Black, No Striping
Painting:—Tender, style ---- Black, No Striping

Mark on cab sides, C. & C. RY. In 5" letters 4/21/16
Mark on tank sides, COAL & COKE RY.
Mark on back of tank 7000 GALLONS
Road No's on sides of cab in 18" figures under mark. 4/20/16
Road Nos. Pos. — Road Nos. — Name None
F. No. Plate — 80
Sand Box — 81
Cab sides
~~below tanks~~ 4/20/16
~~Back of tank~~

SPECIFICATION FOR LOCOMOTIVES 10 40 E 174 - 175

FOR Coal & Coke Ry. Co.

1 Send orders for parts Ry. Co. is to furnish free to I. N. Kelbaugh, S. M. P., Gassaway, W. Va. (See sup.47-49-50-85-105, 110-62)

2 Limit of height 15' 6" to top of stack, sand box and dome. Height of cab eaves above rail and height of cab board above frame same as engines 70 to 75, B. L. W. class 10 38 E 3688- 3689, 3647-3646, 3654-3655.

3 All wearing parts made of steel or wrot iron, thoroughly casehardened.

4 All wrot iron and steel pipes fitted with Kewanee unions where any unions are used.

5 Galena Oil to be used for initial lubrication.

6 The following list of tools and equipment to be furnished.
1 Heavy pinch bar with steel point and heel.
1 Complete set of wrenches to fit all nuts.
1 18" Stillson Wrench
2 Monkey Wrenches (High Grade), 12" and 15"
1 Machinist's hammer
1 Soft Hammer
3 Cold Chisels (Two flat and one cape)
1 Long Spout oil can
2 One Gallon oil cans
1 Half Gallon cylinder oil can
1 Poker
1 Scraper
1 Hook
1 Scoop shovel.

7 Full set of detail blue prints for use in making repairs to be furnished the Ry. Co.

11 Boiler to have sloping back head.
Boiler built for 200 pounds pressure, and stamped accordingly on the boiler back head, although the working pressure is lower.

12 Dome of the one piece type of hydraulic forged steel.

13 Provide auxiliary dome for safety valves and whistle.

14 Waterspace and radial stays of the best grade of staybolt iron. Whitworth threads on all staybolts.
All rigid staybolts with 3/16" hole 1¼" deep from the outside, to indicate when broken in service. Threads to be turned off these rigid staybolts between sheets.

15 Staybolts, Tate flexible, about 450 in number, located in breaking zone of fire box, and drilled from the inside. Radial stays having central rows with heads below crown sheet as far as practicable.

16 Two sets fire brick ordered through Extra Work Department Order No. 2664 dated 4-8-14 to be shipped with locomotives.

21 Grates to be supported by eight brackets studded to water space frame same as for Ry. Co's locomotives 10 38 E 3654-3655. Grates of rocking type, in two sections with center bearing and each section in three rocking parts.
Drop grates omitted, grates to be similar to those on engines 10 38 E 3654-3655.

22 Ash pan, Hopper type of heavy plate, with sides having as abrupt angles as practicable. Ash pan to have tight joints at the bottom to prevent dropping of ashes along the lines. Ash pan same as on 10 38 E 3654-3655, except bottom frame sections and swing doors to be of steel castings instead of gray iron.

23 Throttle crank and lever arranged to have less movement of handle in cab.
Throttle to be so located in dome as to admit entrance of inspector to boiler without removal of valve and its bon.
Pilot valve in throttle.

24 Steam pipes of the outside type.

25 Superheater as Locomotive Superheater Co's specification No. O-5241, dated March 23, 1916. (Copy attached)
Royalty on superheater payable by B. L. W.
Superheater units to have welded ends.

26 Smoke box arrangement same as on 10 38 E 3654-3655. Royalty if any, payable by Ry. Co.

27 Cleaning hole and cap to be applied right and left for inspection of superheater.

28 Ample space to be provided around exhaust pipes to admit of free exit of sparks, and to expediate removal, rejointing and replacing of pipes.

29 Water gauge, Mauger #4 Reflex.

30 Gauge cocks to have drip to ash pan.

31 Blow off cock, one Everlasting, with Pitts and Kitts semi-brass screw end placed on throat sheet near mud ring.

32 Ample number of cleaning plugs to be provided to insure free cleaning of boiler, crown sheet, and waterlegs.
One plug under front waist sheet of boiler, with a brass pad riveted to the boiler shell, with heavy boss extending outside of boiler lagging, the interior being threaded for plug.
Same design of pads as for injector checks.

33 One injector on right side of the back head with delivery pipe running to check on the left side of boiler, and one injector on the right side of boiler inside of cab, with delivery pipes running to check on the right side of boiler.
Injector overflows to be closed that is, pipes connected tight to injector having the bottom turned in to throw the water between the rails instead of being turned out.

34 Injector check, Sellers with stop valve.
Heavy brass pad, as Ry. Co's print 258 to be riveted to the boiler shell in which to screw injector checks, instead of screwing same into boiler itself, boss extending through the lagging and jacket.
Boiler checks to be applied with swivel elbow connection for branch pipes.

35 Feed water hose screen or strainer, Sellers between engine and tender.

THE BALDWIN LOCOMOTIVE WORKS

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SUPERHEATER SPECIFICATION FOR LOCOMOTIVES 10 40 E 174 - 175

FOR Coal & Coke Ry. Co.

Locomotive Superheater Company's Specification No. O-5241 dated March 22nd, 1916
Specification for Superheater with Top Header, Double Loop Arrangement.

BOILER TUBES 228 in number 2" O. D. 13 ft. 10 ins. over tube sheets. Tubes located between and adjacent to Boiler flues are to be beaded over at front end.

BOILER FLUES 32 in number 5½" O. D. #9 B.W.G. thick of cold drawn seamless steel. Flues to be straight, true to gauge and wall not to vary more than one gauge from specified thickness, as shown on Card 10360-V

BOILER FLUE SETTING Radius ½ inch on both edges of flue holes in firebox tube sheet and on front edge of flue holes in front flue sheet as shown on drawings, except for copper sheets. Back end to be set with copper ferrules, rolled, beaded and prossered except for copper sheets. Front end to be rolled and beaded. Rollers to have at least 5 rolls. Prosser to have at least 12 sections Card 1136 to be in accordance with Card 5677

TUBE SHEET LAYOUT
S. H. UNITS 32 units 1½" O. D. #9 B.W.G. thick of seamless steel. Pipes united by cast steel return bends as shown on Card 10750-Y
Each unit to be tested, before being placed in boiler, with water under pressure of 500 pounds

S. H. PIPE SUPPORTS Of steel fastened securely on superheater pipes so as not to slide as shown on Card 10010

S. H. PIPE JOINT To be made in best possible manner to insure absolutely tight joints in accordance with the notation on Card 1043

S. H. UNIT CLAMP BOLT To be of steel having a tensile strength between 60,000 lbs. and 70,000 lbs. per sq. inch and to be as shown on Card 1086-A

S. H. HEADER To be of close grain cylinder iron, steam tight in every respect. Joint ring for connection to dry pipe to have flat side against header flange. Casting should be moulded with the face having the superheater joints placed downward in the mould to secure the best quality of metal on surface where superheater joints are made. Each header to have a serial number cast on in such a location as not to be removed in finishing. No patch plugs allowed on ball joint seats. Headers must not be treated excessively with sal ammoniac. Header casting to be tight under water pressure of 250 lbs. Test pressure to be applied separately to the saturated and to the superheated steam passages, so as to insure soundness of all partition walls. Card 10017-C

S. H. HEADER SUPPORTS To be securely bolted or riveted to boiler shell. To be properly located so as to support the header after header has been correctly located. Header should then be bolted to supports. This to be done before superheater units are put in place. Card 1323

ST. PIPE JOINT RINGS Should be of cast iron.

DEFLECTING PLATE To be constructed so as to permit easy inspection and removal of superheater units and joints. Design to be in accordance with Card See Arrgt.

DAMPER CYLINDER To be carefully and accurately made. Piston not to be more than 0.01 inch smaller than bore. Bearings for Piston and extension to be in line. Piston to be ground and to operate freely under a pressure as low as 40 lbs. per sq. in. Steam Pipe to damper cylinder should be as short and free from bends as possible so as not to cause water to collect in cylinder. Pipe to be protected against freezing. Card 1149

DAMPER SHAFT COUNTERWEIGHT To be painted a light color to render it easily visible by the engineer Card 1067

S. H. ARRANGEMENT To be in accordance with Card 4718

TEST (FINAL) The Superheater, after assembling in boiler and after steam pipes are fitted up, is to be thoroughly tested and to be tight under water pressure of 250 lbs.

Name	Card	Name	Card
Damper	10766-A	Damper Shaft Link	1070
Damper Cylinder Arm	1074	Patent Plate	3156
Damper Cylinder Pipe Fitting	1069-A	S. H. Unit Bolt Washer	1071
Damper Cylinder Pipe Union	1287	S. H. Unit Clamp	1073
Damper Cylinder Piping Diagram		S. H. Unit Clamp Washer	1036.5
Damper Cylinder Support		S. H. Pipe End	1344
Damper Shaft	1068	S. H. Pipe Band	1983
Damper Shaft Arm	1065	Return Bends	10094
Damper Shaft Bearing (O. S.)	1148	Deflecting Plate Handle	1487
Damper Shaft Bearing (I. S.)	1275	Lubricator Connection	3023

Superheater units to have welded return bends.

41 Fuel Sprinkler to be applied on left side of engine.

42 Width of cab over body 10' 4", extreme width 10' 6".
Trap ventilator in cab roof, directly over fire door, through which to pass a rope or chain to lift engine with crane.
Large size cab windows to afford about two-thirds open space.

43 Brackets supporting running boards, rear end to be of plates, and structural shapes.

44 Tail bar trussed or made heavier, to permit engine being jacked up by jacks under ends.

45 Pilot to be carefully braced with iron.
Round bars on pilot (rock knockers) made to reach slightly below the lowest member of the valve gear, applied to end of sill and pilot. Rock knocker to be secured to front of sill.

46 Front bumper from the Commonwealth Steel Co.
Coupler opening in front bumper to be 7" high.

47 STEPS TO BE B.L.W. STANDARD AT FRONT, FOR 1714 & 175 ONLY. Steps of malleable iron front of locomotive to be furnished free these works by Ry. Co. Wrot supports to be furnished by B. L. W. These steps are to be applied on rear of front bumper slightly higher above the rail than the rock knockers. (See sup 1) 7-18-16. FOR HEREAFTER.

48 Front coupler to have side swing of 3⅛" each side of center.
Draft gear to be applied at front of engine in connection with cast steel bumper and front deck casting. Harvey spring friction draft gear suggested.
Liner 1½" thick to be placed above the shank of the coupler, and the coupler supports to be so arranged that the liner can be placed below the coupler when adjustment in height is necessary.

49 Classification lamps, Ry. Co's standard. ELECTRIC (E.G.G. 7-18-16)
Marker lamps (two electric, Ry. Co's standard)
Classification and marker lamps to be furnished by Ry. Co.
Signal lamp fixtures on engine and tender to be furnished by Ry. Co. (See sup. 1)
Signal lamp brackets to be located on smoke box.
Flag holders to be furnished by B.L.W. and located on hand rail.

50 Headlight case with 14" reflector and electric equipment to be furnished by Ry. Co. and applied by B. L. W. (See sup. 1)
Headlight, Type "K" Pyle National Incandescent, wired for and equipped with required number of cab and signal lamps.
Headlight location same as on 10 38 E 3654-3655.
Ry. Co. prefers generator located next to cab if possible.

51 Sand box capacity to be increased about 25%. Make box larger diameter and same height as dome.
Front sander to be combination air and hand sander.

52 Dome casing to have pressed steel top and bottom rings.

53 Three electric lamps to be applied in cab, one for water gauge, one for steam gauge and one reading lamp.
One electric lamp to be located in center of back board of cab.

54 Frames of ample dimensions, thoroughly secured to the cylinders and boiler and braced one with the other, latter made easy considering valve motion specified.
Frame to be extended back of fire box sufficiently to apply deck plate of minimum practicable length.
Deck plate of cast steel.
Engine frames to have increased sections.

55 Shoes and wedges of cast steel.

56 Double row of saddle bolts on outside flange of cylinders.

57 Cylinders and valve chambers bushed with Hunt Spiller gun iron.
Cylinder cocks, B. L. W. type, to blow out.
Cylinder cocks to be provided with guard.
Cylinder cocks to throw water on ground as far as possible from rails.

58 Lubricator pipes of copper under jacket.

59 Cylinders and steam chests to be lagged with same material as boiler.

60 Steam chest valves to be as small as is consistent with good practice.
(Supl) Valve yoke case hardened where it passes through metallic packing.
Steam chest valve rings of Hunt Spiller Gun Iron.

61 Piston heads solid, of cast iron with Hunt Spiller Gun Iron rings.
Piston rods to be keyed to crossheads.

62 Crossheads of the "Laird Type, with pin arrangement as on 10 38 E 3654-3655, and with grease plug and pin.

63 Wrist pins of the best grade of open hearth steel.
Second and back crank pins to be threaded at end using castle nuts to secure washers instead of bolts passing through pin with nut on the inner side.

64 Connecting rods solid forged with female section on front and back ends.
Main rods "I" section, front end to be solid, strap bolts in back end to be inserted from the bottom with nuts on top.
Back end of main rods to be forked.
Compression grease cups to be forged solid on back end of main rod and fitted with ½" plug.

65 Parallel rods to have solid ends.
Jaws of knuckle joints to be placed in front and back side rods.
Sponge cups forged solid on all side rods.

66 Royalty on valve motion payable by The B. L. W.

67 Driving tires from the Railway Steel Spring Co.

68 Instead of Tracy sheet play on front and back driving wheels to be ¼" more than on the two intermediate pairs.

69 Driving boxes similar to Ry. Co's print 206-A.
Brass face on wedge and gib face of driving boxes in accordance with B. L. W. driving box card 2-16.
Elvin grease collars in all driving boxes.

70 Driving axles of the best open hearth steel.

71 Driving wheels to have brass liners pressed into the hub in the faces of wheels, but liners to cover the entire face of hub and to be secured with countersunk grease screw rivets. 7-5-16

72 Flange oilers, Detroit Pendulum type to be applied to front and rear of driving wheels.
Flange oilers to be furnished by Ry. Co. (See sup. 1)

73 Springs, Pittsburgh Spring & Steel Co's make, to be used throughout engine and tender.

74 Front engine truck axles of the best grade of open hearth steel.

75 Air brake equipment, Westinghouse - American, to be furnished by Ry. Co. (See sup. 1)

76 Air pumps to be placed on left side, forward of fire box, to clear stays. Air pump exhaust connected with exhaust cavity of cylinder saddle.
United States King Type Metallic packing for air pumps.

77 Main air reservoirs three in number, two placed horizontally under cylinder section of running board, and the other between frames. Air reservoir between frames to be shortened 2" so as not to interfere with spring rigging.

78 Air gauges, Ashton Valve Co's make.

79 Brake valves, levers, etc. located as conveniently as possible in the cab, the brake valves so located as to be reached when the engineer is looking out of the window.

80 Peffecto driving brake shoes from the American Brake Shoe & Foundry Co.

HEREAFTER: Add ½" to thickness through crown of each half bearing of back end main rod brass as the brasses on Ry. Co's engines 70 and 75, 10 38 E 3654, etc., developed weakness on account of the brass being too thin through the crown. 6/20/16

Hereafter - Cast iron Smoke stack Guide Knee be made larger with two bolts to support the Guide. The bolt nearer the Guide bearer to be located so that the nut can be tightened with a wrench. See Trac.
Verbal M. Holbrook R. S. to C. 5.11.17. # 34380

TENDER.

101 All tank sheets other than shovelling sheet to be ¼", the shoveling sheet being ⅝".
Sides of coal space to be braced to prevent spreading.
Apply dash plates in tank to prevent side splashing.
Coal supply to be increased from 14 to 17 tons by moving coal board back to within 24" of the water funnel, and increasing collar 6" in height, instead of lengthening tank.

102 Coal gate of ⅜" chain, 4" centers, permanently secured to right side with hook on left side.

103 Man hole in tank, oval shape, 30" x 15", ends radial, raised 12" above top of tank.

104 Tool boxes of sheet steel, fitted with locks and duplicate keys, and opening from front end.

105 Combination flag and lamp holders furnished free by Ry. Co., riveted to body of tank 6" below top and 18" inside the outer edge in order to clear the radial corners. (Sup. 1)
Marker lamps on tender to be wired for electric lights.

106 Tender frame to be made amply strong with 12" channels, similar to B. L. W. card 4143.
Web of center channels of tender frame not less than ⅜" thick.
Tender frame center pins of cast steel.

107 Tender front draw casting of cast steel.

108 Draft gear, heaviest type of Cardwell Type "C" to be applied as engines are subjected to very severe service. Yoke to be 5" x 1¼".

109 Ladder and hand hold on rear of tender.

110 STEPS TO BE B.L.W. STANDARD BETWEEN ENG. & TEND. FOR 1714-175 ONLY. Steps of malleable iron for front of tender to be furnished free these works by Ry. Co. Wrot supports furnished by B.L.W. FOR HEREAFTER 7-18-16. Handles at front and rear of tender to be furnished by B.L.W.
Steps at rear of tender to be stirrup straps to conform to the I. C. C. requirements. (See sup. 1)

111 Side bearings with clearance not to exceed ¼" each side between bearings. Ry. Co. does not use front bearings.

112 Springs, Pittsburgh Spring & Steel Co's make, to be used throughout engine and tender.
Tender springs, of a capacity 10% greater than usually designed for tenders of like capacity and service.

113 Tender axles of best open hearth steel.

114 Tender journal boxes, Symington (a/c time) with dust proof lids and Harrison dust guards. Boxes to be packed with high grade wool waste, and saturated with Galena Car Oil. Journal box wedges drop forged.

115 Tender journal bearings of Damascus bronze.

116 Tender brake beams, Hercules #108 from the Simplex Railway Appliance Co. Brake beams hung from tender truck bolster.
Tender brake to be hung between wheels.
Steel back tender brake shoes from the American Brake Shoe & Foundry Co.

THE BALDWIN LOCOMOTIVE WORKS — Duplicate of 10 36 E 1287. Same Extras except as otherwise Specified

Memorandum Spec'n 10981

SPECIFICATION FOR LOCOMOTIVES 10 36 E 1295. — Gen. as Neg. 2170

FOR Ligonier Valley Railroad Co. — **Engine Drawing No.** 93

R. — 2/21/16

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 15' 4" Driving 15' 4" Total 23' 8"
Total wheelbase, eng. and tend. { Actual 56' 8⅞" / Limited to -----

Curves -----

Limits, Height ----- Width -----
Weight (approximate) in working order, Total 178,000 lbs.
On F. tr'k 19,000 lbs., Drivers 159,000 lbs., B. tr'k ----- lbs.

Tractive power 38,200 lbs., Ratio of adhesion 4.1
Work'g St'm Pres. 200 lbs., Service Freight
Fuel Soft Coal

Boiler Steel Thick 13/16" Bill 7077
Boiler, Diam. 74" Plan Straight Top
Boiler st'm pres. 200 lbs., Tested to { 220 lbs. steam pres. / 267 lbs. water pres.
Longitud. seams Butt jointed, double covering strips.

1 **Dome,** diam. 33" Pos. Central.

Firebox Steel Combustion chamb. None
Firebox, length 101⅞" Width 65⅞" Depth F. 73½" B. 64⅜"
Firebox, Tube ½" Crown ⅞" Sides 5/16" Back ⅜"
Firedoor opening One oval, 16" x 20"
Water space, Front 4" Sides 4" Back 4"
Water space, Frame Double Riveted
2 Water space stays 1" diam. with 3/16" hole 1½" deep from O.S.

Radial stays 1¼" diam. Sling stays front { Two rows of B. L. W. Expansion Stays.
Button heads below crown on Ten central rows
Crown bars None Placed ----- above crown
Crown bolts -----

Flues None
Tubes #11 W. G. Seamless Steel.
Tube ends Swaged for copper ferrules firebox ends.
Number 268 Diam. 2¼" Length 14' 6"

Heating Surface			
	Flues None	Combus. Chamb. None	Total 2478.2
	Tubes 2276	Fire Box 178	Fire Brick Tubes 24.2
Grate area 45.6	Ratio to Heating Surface 1 : 52.6		
Superheater -----			

Fire Brick Arch Security, on four tubes (iron or steel) 3" O.S. diameter, .18" thick.

Grates Rocking bars and drop plate.
20 **Ash Pan,** Dampers Front and Back.
Provide 5" air space between end ring and ash pan.

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Superheater extension With Cleaning hole and cap L. S. only.
Spark arrester or hopper With
Netting and deflect. plates With

Exhaust nozzles Single - High

3 Stack Cast Iron, Straight Dia. 18" Hole in S. B. dia. 24"

Safety Valves (Not Spec.) Two Consolidated 3½" Ruffled type.
Safety valves None with relief lever, Set to 200 lbs.
28 **Whistle** B. L. W. Plain.

Steam Gauge One Iron 7" Maker:-Ashcroft. (Not Spec.)
Steam gauge stand Iron **Clock** None

Water Gauge One (See sup. 4) **Cab Lamps** to burn oil
Gauge Cocks Three - Back Surface valve None
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One B. L. W. Pos.:-Front
Cleaning Plugs One Plug above fire-door.
Firebox Corners diagonal, sides and back.
Crown, Two Right side, three left side and four back.
Waist, One under front.
Front tube sheet, Two Fusible plug None

Pump None Pos. -----
Top chamb----- Bottom chamb. -----
Feed Cock ----- Feed pipes -----
Checks ----- Check pipes -----

6 **Injectors** (Spec.) Two Hancock, type "A" No. 10
Injectors, Pos. (See sup. 6) Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron (Sup. 6)
7 Check B. L. W. Pos. Backhead.

Steam Heat None.

8 **Cab** Steel, lined with wood, Ventilator in cab roof.
25 Cab to have curtain.

Cab boards Steel Nosing T-Iron
9 Running boards Steel Nosing T-Iron
Hand rail Iron, to be continuous Located on Boiler.

10 **Back Bumper** Bar Steel Back drawbar height 31"

Pilot to be similar to Pennsylvania Railroad style
Pilot Steel Pushing shoes Cast in front bumper.
Front Bumper Cast Steel Bumper plate 3/4"
Steps, hand holds, etc. to conform to I. C. C. requirements.

Front Drawhead, Center above rail 33½"
11 **Coupler** Tower #305 M. C. B. Auto., with side flexibility.

12 Signal fixtures Iron on bumper.

Headlight Gay Round Case 23" Reflector, to burn - Kerosene
Headlight, Nos. on sides Black Pilot step With
Lamp shelf None Nosing -----

13 **Bell** 75 pounds.
Sand Box One Diam. 31" Body Iron Painted. Pipes Iron
Sander (Not Spec.) Leach Air, Trap A-10
Sander valve located below cab window within easy reach of Eng'r.
Dome casing Iron Painted.

14 **Boiler Jacket** #22 Plain. Steel Bands Iron Side 9 and 10.
Boiler Lagging Mountain Sectional.
Back head of boiler to be lagged and jacketed.

THE BALDWIN LOCOMOTIVE WORKS — 6 N. Desk — May 1916.

SPECIFICATION FOR LOCOMOTIVES 10 36 E 1295 — 288

FOR Ligonier Valley Railroad Co.

R.

Frames Cast Steel Braces Solid

11 **Cylinders,** Diam. 21" Stroke 28"
St'm ports, Length 19" Width 1¾" Bridges 1⅛"
Exh. ports, Length 19" Width 2¾" Valve lead 3/16"
Valve travel 5⅜" Steam lap 1" Exhaust clearance -----
Eccentric crank throw 10⅝"
S. F. Lubr. Detroit Triple #22-A Bulls Eye.
Cyl'r heads Cast Iron; Lubr. pipes of Copper under jacket.
Cyl'r casings Iron Ptd. Head covers Steel Painted.
St'm chest casings Iron Ptd. Covers Steel Painted.
St'm chest valves Balanced, with vacuum valves.
Met. pkg { Piston Rods / Valve Stems } UNITED STATES. (Not Spec.)

Pistons Cast Iron rings sprung into solid head.
Guides Steel Oil cups Needle.
15 **Crossheads** Cast Steel.
Wrist Pins Steel Rod cups Grease Cups.
16 17 **Parallel Rods** to have solid ends.

Valve Motion Walschaerts Improved.
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.
Reverse lever located alongside fire box.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

20 **Drivers,** O. S. Diam. 55" Cen. diam. 48" Centres Cast Steel.

Tires Steel Held by Shrinkage and Shoulder.
Tires, Flanged, Pos. Front and Back. Size 3½" x 5½"
Tires, Plain, Pos. Intermediate (Am. only) Size 3½" x 6½"
Lateral play between driving boxes and wheel hubs - 1/16" total.
Driving Boxes Steeled Cast Iron
Journals, Diam. { Main 9" / Others 9" } Length 10"

18 Special attention to be paid to the driving springs.
19 **Springs,** Make B. L. W.

Front Engine Truck Two Wheeled Swing Bolster.
To swing 4½° each side of cen., Cen. pin liners None
Journals, Diam. 5½" Length 10" Boxes Cast Iron
Wheels, Diam. 33" Tread 4½" Kind Solid forged rolled steel.
Tires None Cen. diam. ----- Size -----
Tires held by ----- Wheel Rims 2½" thick.

Back Engine Truck None Wheeled -----
To swing -----each side of cen., Cen. pin liners -----
Journals, Diam. ----- Length ----- Boxes -----
Wheels, Diam. ----- Tread ----- Kind -----
Tires ----- Cen. diam. ----- Size -----
Tires held by -----

Brakes, position On all driving and Tender wheels.
Operating Parts: Engine, Sch. #6 ET West'g Combined Auto. and Straight Air; Eng. Tr'k, sch. -----
Foundation Parts: Drivers, sch. BK-3, American O. S. Equalized; Eng. Tr'k, sch. -----
Air pump - Two - 9½" Pos. Left Side
Train connections Front and Back.
Train signal, sch. L.
Brake shoes from the American Brake Shoe & Fdy. Co.
Air pump exhaust to be piped into cylinder saddle.

Tender Eight Wheeled, Drawing No. 610
Weight, with fuel and water, about 126,000 lbs.

Tank 7,000 Gallons. Bill 4159
60 Tank Water Bottom Type. Fuel Capacity 12 tons.

Tool Boxes Steel, located on top of tank at rear.

Frame Steel 12" Channels.

Front Drawbar height 30"
Pilot None Pushing shoes Cast in back bumper.
Back drawhead, center above rail 33½"
Coupler Tower K. C. B. Auto. with side flexibility with Westinghouse Friction Draft Gear.

Steps, P.R.R. Pattern for front and back.
Tender steps are to be flush with side of tank.
Trucks Arch Bar type with Steel Bolster.
Truck Channel Bar to be laid flat.
Springs Elliptic, B. L. W. make.
Journals, Diam. 5½" Length 10"
Wheels, Diam. 33" Tread 4½" Kind Solid Forged Rolled Steel.
Tires ----- Cen. diam. ----- Size -----
Tires held by ----- Wheel rims 2½" thick.
Safety chains Single.

Brake Position On all wheels.
61 Brake sch. #6 ET West'g Auto. and Straight Air with 14" x 12" tender cylinder.

List of tools, sch. 29
Photo sch. None Inspection B. L. W. (See sup. 21-22)
To be weighed No. Material spec'ns B. L. W.
Certificate of boiler test Three copies of B.L.W. form 1036.
Junior laws to 10-12-15. Shipment On own wheels, under steam.

Brass shop finish, No. 1
Machine shop finish D-165.

B. L. W. Patents: Throttle, Patented Jan. 23, 1900 (Cast On); Feed Pipe Strainer, Patented Sept. 1, 1903 (Cast On)

Property plates None

Painting:— Engine, style 291, Olive Green and Yellow.
Painting:— Tender, style 291, Olive Green and Yellow.
Tank to be painted on inside.
Marking to be same as for 10 36 E 1266 & 1287.
Mark on tank sides, LIGONIER (Penna. R. R. Style)

Road Nos. Pos.	Road Nos.	Name None
F. No Plate	19	
Sand Box		
Cab sides		
Back of tank		

FOR Ligonier Valley Railroad Co.

1 Dome of Open Hearth Steel, pressed out in one piece.

2 Tate Flexible staybolts, about 450 in number, around breaking zone in boiler, and also in backhead and throat. Staybolts behind pads, etc., to be of Falls Hollow Iron.

3 Smoke stack extension to be made of cast iron.

4 Water glass to be tubular type with B.L.W. fittings and with Celco guard. Water Gauge to be Klinger and Globe valve and pipe to be provided for water gauge. 5/6/16

5 Gauge cock drip pan to be same as for 10 36 E 1266.

6 Injectors located on backhead similar to Penna. R. R. engines, and to be in easy access to engineer, and fireman.
Overflow pipe to turn in instead of out, as on present locomotives.

7 Injector checks and piping to be same as for 10 36 E 1266.

8 Small spout to be provided in the gutter of the cab roof at the back end.

9 Holes to be drilled in running boards, outside of cab to allow the water to drain through.

10 Chafing casting of cast steel with large radius, on rear of engine, with spring buffer of cast steel on front of tender. Buffer to have double springs.

11 Front drawhead to be secured to bumper by 1¼" bolts.

12 Flag and lamp brackets, P. R. R. style on front bumper and on smoke box front. (not on sides of smoke box).

13 Bell to be arranged so that it can be operated by both the engineer and the fireman.

14 Cylinder exhaust ports to be provided with ¾" valves.

15 Crosshead wrist pin to have grease plug.

16 Front end of main rod where it connects with crosshead, to be same as for 10 36 E 1287.

17 Stub brasses, to extend through rod about ¾" so as to bear against wheel instead of the rod bearing.

18 Driving springs to be heavier.

19 Driving springs; use 65,000 pound steel.

20 Back drivers to have more clearance. They are cutting into ash pan.

21 Engine and tender to be built in accordance with Bulletin #70 of the M. C. B. with particular reference to ash pans, testing of air reservoirs, location of gauges, piping in cab, cab apron, coupling chains between engine and tender, spring bumper between engine and tender, stamping on piston rods, engineer's lamp in use, stamping on axles, stamping on wrist pins, pilots, engine trucks, tender frame, feed water tank, tender trucks.

22 Locomotive must not be shipped until Mr. W.V. Hyland, Gen'l Superintendent has been here to make inspection.

23 Jacket on fire box to be made with a hooked flange at top of staybolts. 3/29/16

27 Drop seat instead of seat box in right side of cab. "

28 Whistle to have lever arranged for operation from cab-sash. Whistle to have rope to Engr side. 4/6 "

TENDER.

51 False decking in front of tank to be of steel plate, properly braced.
Tender floor and firing deck of engine to be level.

52 Coal gate to be of the four door type, made of steel.

53 Tender bumpers at front and back, of cast steel.

54 Ladder at back of tender.

55 Rope carrier on each side of tender frame.

56 Flag and lamp brackets on rear of tender, Penna. R.R. Style.

57 Tender truck centre plate of cast steel.

58 Tender brake shoes from the American Brake Shoe & Foundry Co.

59 Chafing casting of cast steel with large radius, on rear of engine, with spring buffer of cast steel on front of tender,
Buffer to have double springs.

60 Water cock in tank to be placed on side instead of over steps. 4/6

61 Brake wheel shaft to be screw cut so that it will not cause any leaks in tank where shaft passes through on frame. 4/6
Boiler tubes 2" diam. to be applied to water bottom of tank for brake shaft casing to prevent leakage where tank shafts on frame. 4/6

THE BALDWIN LOCOMOTIVE WORKS Dup. 10 - 36 E 1288, WITH SAME EXTRAS, EXCEPT AS OTHERWISE SPECIFIED.

Memorandum Spec'n 11256

SPECIFICATION FOR LOCOMOTIVES 10 - 36 E 1348

FOR COLUMBIA, NEWBERRY & LAURENS R.R. Co.

12-29-16

Gen. as Photo. 5724

Engine Drawing No. 99

Gauge of Road 4'8½" Play ⅜" EXCEPT 7/16" FOR F. AND B. DRIVERS

Wheelbase, Rigid 15'3" Driving 15'3" Total 23'4"

Total wheelbase, eng. and tend. { Actual 53'4" / Limited to ------

RAILS, 56 POUNDS, 16 TIES TO RAIL

Curves 8 DEGREES

Limits. Height ---- Width SAME AS FOR 10-32 D 1130

Weight approximate on working order. Total 160,000 POUNDS.

On F. tr'k 20,000 lbs.. Drivers 140000 lbs.. B. tr'k ---- lbs.

WEIGHT LIMITED (SEE SUP 2)

Tractive power 34800 lbs.. Ratio of adhesion 4.

Work'g St'm Pres. 200 lbs.. Service FREIGHT

Fuel SOFT COAL

FRONT TUBE SHEET TO BE ½" THICK

Boiler STEEL Thick 11/16" Bill 8153

Boiler, Diam. 66" Plan STRAIGHT TOP.

Boiler st'm pres. 200 lbs.. Tested to { 220 lbs. steam pres. / 267 lbs. water pres.

WITH FACTOR OF SAFETY OF 5

Longitud. seams (SEE SUP. 4)

Dome, diam. 33" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE

Firebox, length 84-3/16" Width 60½" Depth F. 62½" B. 49¼"

Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"

Firedoor opening ONE OVAL 13" x 13"

Water space, Front 4" Sides 4" Back 4"

Water space, Frame SINGLE Riveted

Water space stays 7/8" DIAM. WITH 3/16" HOLES 1¼" DEEP FROM OUTSIDE.

Radial stays 1" DIAM. Sling stays front { TWO ROWS OF B.L.W. EXPANSION STAYS.

Button heads below crown on EIGHT central rows

Crown bars NONE Placed ----- above crown ------

Crown bolts NONE

Flues 69 W.G. SEAMLESS STEEL

Tubes 211 W.G. SEAMLESS STEEL

Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.

Number 24 / 152 Diam. 5⅜" / 2" Length 14'6"

Heating Surface Flues 487.0 Combus. Chamb. —— Total 1753.0

Tubes 1147.0 Fire Box 119.0 Fire Brick Tubes ——

Grate area 35.1 Ratio to Heating Surface 1 : 50

Superheater 397.0

Fire Brick NONE (SEE SUP 7)

Grates ROCKING TABLE TYPE, RY. CO'S. PATTERN

Ash Pan, Dampers AT BACK

THROTTLE TO BE PROVIDED WITH AUXILIARY DRIFTING VALVE

Throttle BALANCE Pos. DOME

Dry pipe STEEL

Superheater SCHMIDT

Smokebox extension WITH Cleaning hole and cap L.S. ONLY

Spark arrester-on hopper WITH

Netting and deflect. plates WITH

Exhaust nozzles SINGLE HIGH

Blast CAST IRON STRAIGHT Dia. 16" Hole in S. B., dia. 22"

Safety Valves (spec) THREE STAR 2½", ONE MUFFLED

Safety valves NONE with relief lever, Set to { 200 LBS. MUFFLED / 203 LBS. OPEN

Whistle PLAIN FREIGHT

Steam Gauge ONE IRON 7" MAKER:- STAR (spec)

Steam gauge stand IRON **Clock** NONE

Water Gauge ONE KLINGER TYPE **Cab Lamps** ELECTRIC

Gauge Cocks THREE BACK Surface valve NONE

Lowest gauge cock 3½" above highest part of crown

Lubricator steam valve TO HAVE separate dry pipe to dome

Blower Valve B.L.W. (SEE SUP 29)

Blow off Cock ONE EVERLASTING 2" POS:- FRONT

Cleaning Plugs

Firebox CORNERS DIAGONAL, SIDES AND BACK

Crown, TWO EACH SIDE AND FOUR BACK

Waist, ONE UNDER FRONT

Front tube sheet. TWO Fusible plug ONE.

Pump ----- Pos.-----

Top chamb.----- Bottom chamb. -----

Feed Cock ----- Feed pipes ------

Checks ----- Check pipes -----

Injectors TWO SELLERS TYPE "M" (spec) No. 9½

Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER

Pipes, Check IRON Feed IRON Overflow IRON

Check (SEE SUP 13) Pos. TOP OF BOILER

Steam Heat CONSOLIDATED SYSTEM

Cab IRON VENTILATOR IN CAB ROOF.

Cab boards IRON Nosing T-IRON

Running boards IRON Nosing T-IRON

Hand rail IRON Located on BOILER

Back Bumper BAR STEEL Back drawbar height 33½"

Pilot WOOD Pushing shoes NONE

Front Bumper OAK Bumper plate WITH

Steps, HAND HOLDS, ETC. TO CONFORM TO I.C.C. REQUIREMENTS.

Front Drawhead, Center above rail 33½"

Coupler SHARON M.C.B. AUTO.

Signal fixtures IRON ON BUMPER

Headlight ONE ROUND CASE 18" Reflector,

Headlight, Nos. on sides WITH H'dl't steps WITH

Lamp shell NONE Nosing ------

Bell 92 POUNDS GOLMAR AIR BELL RINGER

Sand Box ONE Diam. 28" Body IRON PAINTED Pipes IRON

Sanders LEACH AIR DOUBLE, TRAP A-10 TO SAND FRONT OF FRONT AND BACK OF MAIN DRIVERS.

Dome casing IRON. PAINTED

Boiler Jacket #22 PLAIN STEEL Bands IRON Style 9

Boiler Lagging MAGNESIA SECTIONAL.

THE BALDWIN LOCOMOTIVE WORKS

6 Cancels June 1917

SPECIFICATION FOR LOCOMOTIVES 10 36 E 1348

FOR COLUMBIA, NEWBERRY & LAURENS R.R. Co.

Frames CAST STEEL (SEE SUP 26,27) Braces SOLID

Cylinders, Diam. 21" Stroke 26"

St'm ports, Length 25" Width 1½" Bridges -----

Exh. ports, Length ---- Width ---- Valve lead 4"

Valve travel 5½" Steam lap 1" Exhaust clearance -----

Eccentric crank throw 15" By-pass valve (SEE SUP. 41)

S. F. Lubr. DETROIT FIVE FEED No. 42 BULLS EYE.

Cyl'r heads CAST STEEL; LUBR. PIPES OF IRON UNDER JACKET.

Cyl'r casings IRON PTD. Head covers STEEL PAINTED

St'm chest casings ----- Covers ------

St'm chest valves 10" DIAM. PISTON TYPE

Met. pkg. { PISTON RODS / VALVE STEMS U.S. KING TYPE (not spec)

Pistons RINGS SPRUNG INTO SOLID HEAD. (SEE SUP. 31)

Guides STEEL, RY. CO'S. PATTERN Oil cups HANCOCK NEEDLE

Crossheads CAST STEEL (SEE SUP 32 - 33)

Wrist Pins STEEL Rod cups PLUNGER, FORGED ON

Valve Motion WALSCHAERTS

Links, sliding blocks, pins, lifting links and eccentric rod pins to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.

All finished movable nuts of steel or of iron case hardened

Wearing Bearings DAMASCUS BRONZE

DRIVING WHEELS WITHOUT HUB LINERS (SEE SUP. 36)

Drivers, O. S. Diam. 56" Cen. diam. 50" CENTRES CAST STEEL

Tires STEEL Held by SHRINKAGE AND SHOULDER

Tires, Flanged, Pos. ALL Size 3" x 5½"

Tires, Plain, Pos. NONE Size -----

Lateral play between driving boxes and wheel hubs { F. & B. ½" TOTAL / OTHERS 1/32" TOTAL

Driving Boxes CAST STEEL

Journals, Diam { MAIN 8½" Length 12" / OTHERS 8" 10"

Springs. Make B.L.W.

Front Engine Truck Two Wheeled SWING BOLSTER

To swing 3½" each side of cen., Cen. pin liners NONE

Journals, Diam. 5½" Length 10" Boxes CAST IRON

Wheels, Diam. 30" Tread ---, Kind CAST IRON SPOKE CENTRES

Tires STEEL Cen. diam. 25" Size 2½" x 5½"

Tires held by SHRINKAGE AND SHOULDER

ENGINE TRUCK WITHOUT HUB LINERS.

Back Engine Truck NONE Wheeled

To swing ---- each side of cen., Cen. pin liners -----

Journals, Diam. ---- Length --- Boxes -----

Wheels, Diam. --- Tread --- Kind ------

Tires ------ Cen. diam. Size

Tires held by -------

Brake, position ON ALL DRIVING AND TENDER WHEELS.

Operating { Engine, Sch. No. 6-ET, WEST'G. COMBINED AUTO. AND STRAIGHT AIR.

Parts { Eng. Tr'k, sch. -----

Foundation { Drivers, sch. M-2 AMERICAN O.S. EQUALIZED.

Parts { Eng. Tr'k, sch. ----------

Air pump Two - 9½" Pos. BOTH LEFT SIDE

Train connections FRONT AND BACK

Train signal, sch. L.

CERTIFICATES DATED JUNE 5TH 1917 COVERING TEST OF RESERVOIR Nos. 12869 TO 12878 INCL. FURNISHED BY WEST'G. AIR BRAKE CO., ARE FILED IN MAIN OFFICE, FILE No. 662

Tender EIGHT Wheeled, Drawing No. 610

Weight, with fuel and water, about 120,000 LBS.

Tank 6000 Gallons. Bill 4457

TANK WATER BOTTOM TYPE. FUEL CAPACITY, 10 TONS.

WATER HOLE IN TANK TO BE OBLONG, 30" LONG.

Tool Boxes OF HARD WOOD TOP

Frame STEEL 12" CHANNELS.

CAST STEEL BUFFER AS RY. CO'S. PRINT BETWEEN ENGINE AND TENDER.

Front Drawbar height 31½"

Pilot NONE Pushing shoes NONE

Back drawhead, center above rail 33½"

Coupler SHARON M.C.B. AUTO. WITH MINER FRICTION DRAFT GEAR.

STEP FRAMES TO BE OF WROUGHT IRON, WITH WOODEN TREADS.

Steps, HAND HOLDS ETC. TO CONFORM TO I.C.C. REQUIREMENTS.

Trucks ARCH BAR TYPE WITH CAST STEEL BOLSTERS.

EDWARDS TENDER SIDE BEARINGS AS RY. CO'S. SKETCH.

Springs ELLIPTIC B.L.W. MAKE.

Journals, Diam. 5" Length 9"

Wheels, Diam. 33" Tread 4½" Kind CHILLED CAST IRON LATES

Tires NONE Cen. diam. --- Size ---

Tires held by -------

Safety chains SINGLE

Brake Position ON ALL WHEELS

Brake sch. No. 6-ET, WEST'G. AUTO AND STRAIGHT AIR, WITH 12" x 12" TENDER CYLINDER

List of tools, sch. 29

Photo sch. NONE Inspection B.L.W.

To be weighed YES Material specifications B.L.W. (SEE SUP

Certificate of boiler test THREE COPIES OF B.L.W. FORM 1036

Junior laws to 4-2-17 Shipment ON OWN WHEELS (SEE SUP * BELOW

Brass shop finish D-1

Machine shop finish D-165

B. L. W. FEED PIPE STRAINER, PATENTED SEPT. 1, 1903 (CAST ON)

Patents STEAM PIPE COVER, PATENTED JULY 18, 1911 (CAST ON)

Property plates NONE

Painting: Engine, style 291 OLIVE GREEN AND COLOR

Painting: Tender, style 291 OLIVE GREEN AND COLOR

LETTERING, ETC. TO BE APPLIED IN GOLD PAINT.

LETTERING, ETC TO BE SAME AS FOR 10 - 36 E 1288.

Mark on CAB PANELS, C. N. & L.

Road Nos. Pos. F. No. PLATE / SAND BOX / SIDES OF TANK / BACK OF TANK

Road Nos. 22

Name NONE

* EXTRAS ORDERED THROUGH EXTRA WORK DEPT. ORDER No. 158 DATED 1-3-17 TO BE SHIPPED WITH LOCO.

CLASS 10 - 36 E 1348

FOR COLUMBIA, NEWBERRY & LAURENS R. R. CO.

Specification for Type A Double Loop Superheater. SPECIFICATION NO. O-7407-DATED APRIL 5TH, 1917.

BOILER TUBES	152 in number 2 o. d 14 ft 6 in. over tube sheets. Tubes located between and adjacent to boiler flues are to be beaded over at front end.	
BOILER FLUES	24 in number 5 3/8 o. d #9 B.W.G. Best cold drawn seamless steel. Flues to be straight, true to gauge and wall not to vary more than one gauge from specified thickness	Card. 1106-S
BOILER FLUE SETTING	½ in. radius on both edges of flue holes in fire box tube sheet and on front edge of flue holes in front tube sheet as shown on drawings, except for copper sheets. Back end to be set with copper ferrule, rolled, beaded and prossered except for copper sheets. Front end to be rolled and beaded. Rollers to have at least 5 rolls. Prosser to have at least 12 sections	Card. 1136
TUBE SHEET LAYOUT	24 12 #9 B.W.G.	Card. 5983
UNITS	units o. d of seamless steel. Pipes united by return bends. Each unit to be tested, before being placed in boiler, with water under pressure of 250 lb. per sq. in. for screwed return bends or 500 lb. per sq. in. for welded return bends.	
UNIT PIPE SUPPORTS	Of steel fastened securely on superheater pipes so as not to slide	Card. 10773
UNIT PIPE JOINT	To be made in best possible manner to insure absolutely tight joints in accordance with the notation on	Card. 1043
UNIT CLAMP BOLT	To be in accordance with requirements of Locomotive Superheater Company Material Specification No. 12	Card. 10695
HEADER	To be of close grain cylinder iron, steam tight in every respect. Joint ring for connection to dry pipe to have flat side against header flange. Casting should be moulded with the unit joint face down to secure the best quality of metal on surface where superheater unit joints are made. Each header to have a serial number cast on in such a location as not to be removed in finishing. No patch plugs or chaplets allowed in ball joint seats. Header must not be treated with sal ammoniac. Header casting to be tight under water pressure of 250 lb. Test pressure to be applied separately to the saturated and to the superheated steam passages, so as to insure soundness of all partition walls	Card. 10466
HEADER SUPPORTS	To be securely fastened to boiler shell with rivets or turned bolts fitted in reamed holes. To be properly located so as to support the header after header has been correctly located. Header should then be secured to supports. This to be done before superheater units are put in place	Card. 1323
STEAM PIPE JOINT RINGS	Should be of cast iron.	
DEFLECTING PLATE	To be constructed so as to permit easy inspection and removal of superheater units and joints. Design to be in accordance with	Card. SEE ARRGT.
DAMPER CYLINDER	To be carefully and accurately made. Piston not to be more than 0.01 in. smaller than bore. Bearings for piston rod extension to be in line. Pistons to be ground and to operate freely under a pressure as low as 40 lb. per sq. in. Steam pipe to damper cylinder should be as short and free from bends as possible so as not to cause water to collect in cylinder. Pipe to be well protected against freezing	Card. 1149
DAMPER SHAFT COUNTERWEIGHT	To be painted a light color to render it easily visible by the engineer	Card. 1067
S. H. ARRANGEMENT	To be in accordance with	Card. 40007
TEST (FINAL	The superheater, after assembling in boiler and after steam pipes are fitted up, is to be thoroughly tested and to be tight under water pressure of at least 30% more than the working pressure of the boiler.	

DAMPER	Card. 10977-B	DAMPER SHAFT LINK	Card. 1070
DAMPER CYL. ARM	Card. 1074	PATENT PLATE	Card. 3159
DAMPER CYL. PIPE FITTING	Card. 1069-A	S. H. UNIT BOLT WASHER	Card. 1071
DAMPER CYL. PIPE UNION	Card. 1287	S. H. UNIT CLAMP	Card. 1073
DAMPER CYL. PIPING DIAGRAM	Card.	S. H. UNIT CLAMP WASHER	Card. 10309
DAMPER CYL. SUPPORT	Card.	S. H. PIPE END	Card. 1304
DAMPER SHAFT	Card. 1068	S. H. PIPE BAND	Card. 1965
DAMPER SHAFT ARM	Card. 1069	RETURN BENDS	Card. 10300
DAMPER SHAFT BEARING (O.S.)	Card. 1148	DEFLECTING PLATE HANDLE	Card. 1097
DAMPER SHAFT BEARING (I.S.)	Card. 10306-Q	LUBRICATOR CONNECTION	Card. 3023
SPACING OF BANDS & SUPPORTS	Card. 10792	DEFLECTING PLATE STUDS	Card. 10305
TYPE OF RETURN BENDS	CAST STEEL	DEFLECTING PLATE CLASP	Card. 10305-B

SPECIFICATION FOR LOCOMOTIVES 10 36 E 1348
FOR COLUMBIA, NEWBERRY & LAURENS R. R. CO.
B.

1 DISTANCE FROM CENTER OF RAIL TO NEAREST PLATFORM IS 5' 6".

2 WEIGHT ON DRIVING WHEELS LIMITED TO 140,000 POUNDS.

3 BACK HEAD OF BOILER TO BE SLOPED 15 DEGREES, WHICH MOVES THROTTLE LEVER FORWARD 15" AND ALLOWES MOVING REVERSE LEVER FORWARD 12". (SEE SUP. 15)

4 LONGITUDINAL SEAMS BUTT JOINTED, DOUBLE COVERING STRIPS, SEXTUPLE RIVETED, 90% SEAM.

5 DOME COVERING IN TOP OF BOILER TO BE SUFFICIENTLY LARGE FOR MAN TO ENTER WITHOUT BAKING DOWN STAND PIPE.

6 FLEXIBLE STAYBOLTS, PENNSYLVANIA TYPE, ABOUT 280 IN NUMBER LOCATED IN BREAKING ZONE.

7 PROVISION TO BE MADE FOR FUTURE APPLICATION OF FIRE BRICK ARCH ON TUBES.

8 ROCKING GRATES IN FOUR SECTIONS, NO DROP PLATE.

9 ASH PAN TO HAVE 2" OPENING BETWEEN THE MUD RING AND THE PAN. ASH PAN TO HAVE SINGLE HOPPER WITH ROUNDED BOTTOM SIMILAR TO B.L.W. CARD 4491, WITH BLOWER TO CLEAN ASH PAN. ASH PAN BLOWER TO BE FURNISHED AND TO BE ARRANGED TO BLOW FROM THE FRONT END OF THE ASH PAN SO THAT IT WILL CLEAN THE ENTIRE SURFACE. (ON 10 36 E 1288 THIS DOES NOT OCCUR)

10 SUPERHEATER AS LOCO. SUPERHEATER CO'S. SPEC'N NO. O-7407 DATED APRIL 5-1917 COPY ATTACHED.
SUPERHEATER TO HAVE OUTSIDE STEAM PIPE CONNECTIONS TO STEAM CHESTS.
ROYALTY ON SUPERHEATER PAYABLE BY THE B.L.W.

11 ADDITIONAL HAND HOLE AND CAP IN EACH SIDE OF SMOKE BOX FOR INSPECTION OF SUPERHEATER.

12 MASTER MECHANICS ASSOCIATION IMPROVED FRONT END ARRANGEMENT

13 SELLERS COMBINED MAIN TOP CHECK WITH STOP VALVES.

14 CAB TO BE MADE 6" HIGHER, AND TO HAVE THE UPPER WINDOW GUIDES SECURED TO THE TOP SILL OF THE CAB WHICH WILL RAISE THE HEIGHT OF THE WINDOWS ABOUT 10". (SEE SUP. 15)
CAB TO HAVE LARGE SIDE WINDOWS. (SEE SUP 15)

15 SLOPING BACKHEAD OF BOILER, CAB SIDE WINDOWS, AND REVISED ENGINEER'S SEAT WITH NEW POSITION OF REVERSE LEVER AS SHOWN ON BACKHEAD ARRANGEMENT. B.L.W. TRACING 34187 IS APPROVED.

16 CAB DECK UNDER THE FIRE DOOR TO BE COVERED WITH STEEL PLATE ¼" THICK.

17 FOOT PLATE OF CAST STEEL.

18 CHAFING CASTING ON REAR OF ENGINE (BETWEEN ENGINE AND TENDER) TO BE OF CAST STEEL OR CHILLED CAST IRON IN ONE PIECE WITH 8" FACE, NO ADJUSTING WEDGE TO BE USED.

19 PILOT OT BE IN ACCORDANCE WITH NEW A. C. L. STANDARD DESIGN.

20 HEADLIGHT, DRESSEL, FITTED WITH PYLE-NATIONAL INCANDESCENT EQUIPMENT, TYPE "K".

21 SANDER TO BE EQUIPPED LOWER IN BOX THAN FOR PREVIOUS LOCO. 10 36 E 1288.

26 FRAMES TO BE IN ACCORDANCE WITH A. S. T. M. SPECIFICATIONS FOR HARD CASTINGS, AND THE CARBON IS TO BE ABOUT .40.
FRAMES FROM THE PENN. STEEL CASTINGS CO., CHESTER, PA.
(FRAMES TO BE B.L.W. SPECN A/C MISTAKE FOR 1348 ONLY)
FRAME LUGS IN PEDESTAL CAPS 1½" LONG.
FRAMES TO HAVE SINGLE FRONT RAILS.

27 PEDESTAL WEDGE BOLTS TO HAVE LARGER BODY UNDER HEAD I E, 1" DIAM.

28 CYLINDERS AND VALVE CHAMBERS TO BE BUSHED WITH HUNT SPILLER IRON.

29 OKADEE DRAIN VALVES TO BE PROVIDED AS FOLLOWS:-
ONE IN EACH AIR PUMP EXHAUST, ONE IN EACH EXHAUST UNDER CYLINDER SADDLE AND ONE IN BLOWER PIPE.

30 STEAM CHEST VALVES TO HAVE HUNT SPILLER RINGS.

31 PISTONS AND RINGS TO BE HUNT SPILLER IRON.
PISTON RODS TO BE BOLTED TO CROSSHEAD.

32 CROSS HEAD AS A. C. L. PATTERN WITH HUNT SPILLER GUN IRON CROSSHEAD SHOES.

33 CROSSHEAD PINS, KNUCKLE PINS, AND VALVE MOTION PINS TO HAVE TAPER OF ⅛" IN 13".

34 ALL RODS, "I" SECTION.
MAIN RODS TO HAVE FORKED ENDS.
MAIN ROD FRONT END AS AM. LOCO. CO'S. PRINT 722-S-41390.
PARALLEL RODS TO HAVE SOLID ENDS.

35 MAIN WRIST PINS TO BE MADE LARGER TO SUIT THE INCREASED PRESSURE.

36 DRIVING BOXES TO HAVE EDWARDS LATERAL PLATES, SECURED BY A BOLT TO TOP OF DRIVING BOX AS RY. CO'S. SKETCH RECEIVED NOV. 29TH, 1915.

37 AIR PUMP TO BE LOCATED FORWARD OF FIREBOX TO FACILITATE STAY BOLT INSPECTION.
AIR PUMP TO HAVE JOHNS-MANVILLE PACKING.
AIR PUMP EXHAUST TO BE PIPED INTO BOTTOM OF CYLINDER SADDLE. (SEE SUP. 29)

38 AIR RESERVOIRS TO HAVE LARGE CAPACITY, AND TO HAVE HYDROSTATIC TEST OF 210 POUNDS.
AIR RESERVOIRS LOCATED UNDER FRONT SECTIONS OF RUNNING BOARDS.

39 BRAKE SHOES TO BE APPLIED TO REAR OF DRIVERS.

40 ROAD NUMBERS TO BE PLACED ON SIDES AND BACK OF TANK IN LARGE FIGURES ABOUT 8" HIGH AND IN SMALLER FIGURES ON SIDES OF SAND BOX AND ON SIDES OF HEADLIGHT AND FRONT NUMBER PLATE.

41 BY-PASS VALVES TO BE FURNISHED BY THE RY. CO. AND APPLIED BY THE B.L.W.

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-5618.
Memorandum Spec'n 10321.
SPECIFICATION FOR LOCOMOTIVES 10 32 E 131. Gen. Sp Neg. 5405.
FOR Ouelde & Western Railroad Company. 3-24-16. Engine Drawing No. 20
L.

Gauge of Road 4' 8½" Play ⅜" except {⅝" for Front and Back drivers.
Wheelbase, Rigid 13' 6" Driving 13' 6" Total 22' 0"
Total wheelbase, eng. and tend. {Actual 58' 8½" / Limited to ——

Curves 20 degrees. **Grade,** 4%.

Limits, Height —— Width ——
Weight (approximate) in working order, Total 142,000 lbs.
On F. tr'k 16,000 lbs., Drivers 126,000 lbs., B. tr'k —— lbs.

Tractive power 30,320 lbs., Ratio of adhesion 4.1
Work'g St'm Pres. 190 lbs., Service **Pass. and Freight.**
Fuel Soft Coal.

Boiler Steel Thick 11/16" Bill 7444.
Boiler, Diam. 64" Plan **Straight Top.**
Boiler st'm pres. 200 lbs., Tested to {220 lbs. steam pres. / 267 lbs. water pres.
Longitud. seams **Butt jointed, double covering strips.**

Dome, diam. 29" Pos **Central.**

Firebox Steel Combustion chamb. **None.**
Firebox, length 102-11/16" Width 41⅜" Depth F. 66½" B. 63½"
Firebox, Tube ⅜" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening **16" diam. Door to be Franklin operated by Air.**
Water space, Front 4" Sides 3½" Back 3½"
Water space, Frame **Single** Riveted
Water space stays ⅞" diam. with 3/16" hole 1½" deep from O. S.

Radial stays 1" diam. Sling stays front {**Two rows of B. L. W. Expansion Stays.**
Button heads below crown on **Eight** central rows
Crown bars **None.** Placed —— above crown
Crown bolts ——

{Flues **None.**
{**Tubes** #12 W. G. Charcoal Iron or Steel.
{Tube ends **Swaged for copper ferrules fire box ends.**
{Number 250 Diam. 2" Length 13' 5"

Heating Surface	Flues **None.**	Combus. Chamb. **None.**	Total 1939 sq. ft.
	Tubes 1745 sq. ft.	Fire Box 146 sq. ft.	Fire Brick Tubes ——
Grate area	29.5 sq. ft.	Ratio to Heating Surface 1 : 64	
Superheater	———		

Fire Brick Arch On Studs.

Grates Rocking Bars and Drop plate.
Ash Pan, Dampers **None.**

Throttle Balance Pos. **Dome.**
Dry pipe **Steel**

Superheater None.

Smokebox extension **With** Cleaning hole and cap **L.E. only.**
Spark arrester in hopper **With**
Netting and deflect. plates **With**

Exhaust nozzles **Double High.**

Blast **Straight** Dia. 18" Hole in S. S., dia. 21½"

Safety Valves (not spec) **Two Consolidated 3"**
Safety valves **None** with relief lever, Set to 190 lbs.
Whistle B. L. W. plain.

Steam Gauge **One Iron 7"** **Maker:-Ashcroft.** (not spec)
Steam gauge stand **Iron** **Clock None.**

Water Gauge **One B.L.W.(Ironclad) Cab Lamps to burn oil.**
Gauge Cocks **Three Back.** Surface valve **None**
Lowest gauge cock 2½" above highest part of crown
Lubricator steam valve **to have** separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock **One Crane 2" (to use stock)** **FOR:-Left Side.**
Cleaning Plugs
Firebox **Corners,** back **ends diagonal,** sides and back.
Crown, **Two Right Side, Three Left Side and two back.**
Waist, **One under Front.**
Front tube sheet, **One.** Fusible plug **One.**

Pump None. Pos ——
Top chamb. —— Bottom chamb. ——
Feed Cock —— Feed pipes ——
Checks —— Check pipes ——

Injectors (Spec) **Two Sellers, Class "E"** No. 9
Injectors, Pos. **Right and Left.** Steam pipes **Copper**
Pipes, Check **Iron** Feed **Iron** Overflow **Iron.**
Check **B. L. W.** Pos. **Right and Left.**

Steam Heat Consolidated System.

Cab Steel

Cab boards **Steel** Nosing **T-Iron.**
Running boards **Steel** Nosing **T-Iron.**
Hand rail **Iron** Located on **Boiler.**

Back Bumper Bar Steel. Back drawbar height, 30½"

Pilot Wood Pushing shoes **None.**
Front Bumper Oak Bumper plate **With**
Steps, hand holds etc. **to conform to I.C.C. requirements.**

Front Drawhead, Center above rail 34½"
Coupler M. C. B. Automatic.

Signal fixtures **Iron on bumper.**

Headlight **One Round Case 18"** Reflector, **To burn Kerosene.**
Headlight, Nos. on sides **With** H'd'l step **With**
Lamp shelf **None.** Nosing ——

Bell 92 pounds.
Sand Box (not spec) **Two** Diam. **28"** Body **Iron Painted.** Pipes **Iron.**
Sander **Leach Air Trap Act** in each box, to sand front and back.

Dome casing **Iron Painted.**

Boiler Jacket #28 Soft Steel Pat. Bands **Iron** Style **9**
Boiler Lagging Magnesia sectional.

THE BALDWIN LOCOMOTIVE WORKS
H. O. Hutton August 1916
SPECIFICATION FOR LOCOMOTIVES 10 32 E 131.
FOR Ouelde & Western Railroad Company.
L.

Frames Cast Steel Braces Solid

Cylinders, Diam. 19" Stroke 26"
St'm ports, Length 16" Width 1½" Bridges 1½"
Exh. ports, Length 16" Width 3½" Valve lead ¼"
Valve travel 5½" Steam lap 1" Exhaust clearance ——
Eccentric crank throw 10"
S. P. Lubr. **Detroit Triple #22 Bulls Eye.**
Cyl'r heads **Cast Iron;** Lubr. pipes of Iron under jacket.
Cyl'r casings **Iron Ptd.** Head covers **Steel Painted.**
St'm chest casings **Iron Ptd.** Covers **Steel Painted.**
St'm chest valves **Richardson Balanced, with vacuum valves.**
Met. pkg {PISTON ROD / VALVE STEMS} **UNITED STATES.** (not spec)

Pistons Cast Iron rings sprung into solid head.
Guides Steel Oil cups {**Detroit wick feed** (to use stock)
Crossheads Cast Steel.
Wrist Pins Steel Rod cups **Plunger.**
Parallel Rods to have solid ends.

Valve Motion Walschaerts.
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.
* Chicago Flange Oilers with four feeder furnished on Extra Order 7350 dated 7-27-16 in replace two feed oiler returned. 9-20-17.
Wearing Bearings B. L. W.

Drivers, O. S. Diam. 50" Cen. diam. 44" Centres Cast Steel.
* **Chicago Flange oilers to be applied to front pair of drivers.**
Tires Steel Held by **Shrinkage and Shoulder.**
Tires, Flanged, Pos. All Size 3" x 5½"
Tires, Plain, Pos. —— Size ——
Lateral play between driving boxes and wheel hubs — 1/16" total.
Driving Boxes Cast Steel
Journals, Diam. 8" Length 9"

Springs. Make **B. L. W.**

Front Engine Truck Two Wheeled **Swing Bolster.**
To swing 4½" each side of cen., Cen. pin liners **None.**
Journals, Diam. 5" Length 9" Boxes Cast Iron.
Wheels, Diam. 28" Tread —— Kind **Cast Iron Spoke Centre.**
Tires **Steel** Cen. diam. 28" Size 2½" x 5½"
Tires held by **Shrinkage and Shoulder.**

Back Engine Truck None. Wheeled ——
To swing ——each side of cen., Cen. pin liners ——
Journals, Diam. —— Length —— Boxes ——
Wheels, Diam. —— Tread —— Kind ——
Tires —— Cen. diam. —— Size ——
Tires held by ——

Brake, position **On all driving and tender wheels.**
Operating Parts | Engine, Sch. **#6 ET West'g. Combined Auto. and** Eng. Tr'k, sch. —— **Straight Air.**
Foundation Parts | Driver, sch. **UC-A Janeiro O.S. Equalized.** Eng. Tr'k, sch. ——
Air pump **Two 9½"** Pos. **Left Side.**
Train connections **Front and Back.**
Train signal, sch. **"B"**

Tender Eight Wheeled, Drawing No. **435.**
Weight, with fuel and water, about **100,000 lbs.**

Tank 5,000 Gallons, Bill **4201**
Tank "U" shape, straight Top. Fuel capacity 10 Tons.

Tool Boxes **Hard Wood, Top.**

Frame Steel 10" Channels.

Front Drawbar height 29½"
Pilot **None.** Pushing shoes **None.**
Back drawhead, center above rail 32½"
Coupler M. C. B. Automatic.

Steps, **hand holds etc. to conform to I.C.C. requirements.**

Trucks Arch Bar Type with Cast Steel Bolsters.

Springs **Elliptic. B.L.W.**
Journals, Diam. 5" Length 9"
Wheels, Diam. 33" Tread 4½" Kind **Chilled Cast Iron plate.**
Tires **None.** Cen. diam. —— Size ——
Tires held by ——
Safety chains **Single.**

Brake Position **On all wheels.**
Brake sch. **#6 ET West'g. Auto. and Straight Air with 12" x 12" tender cylinder.**

List of tools, sch. 29 Signature 5949
Photo sch. #2 Inspection **B. L. W.**
To be weighed **No.** Material spec'ns **B. L. W.**
Certificate of boiler test **Three copies of B.L.W. form 1036.**
Junior laws to **4-1-16.** Shipment **On own wheels.**

Brass shop finish, No. **1**
Machine shop finish **D-165.**

Patents {B. L. W. **Throttle , Patented Jan. 23, 1900 (Cast On)**
{**Feed Pipe Strainer, Patented Sept. 1, 1903 (Cast On)**

Property plates **B.L.W. for Engine and Tender.**

Painting:- Engine, style **201 Olive Green and Aluminum.**
Painting:- Tender, style **201 Olive Green and Aluminum.**

Lettering, etc. to be same style as Photo. 5405 (10 32 E 131).
Mark on cab panels, **O. & W.**
Mark on tank sides, **OWEGA & WESTERN**

Road Nos. Pos.	Road Nos.	Name None.
F.No Plate	20	
F.Sand Box		
Cab panels.		
Back of tank.		

* arrangement to be provided same as for C. W. O. & W. P. for washing sand from track. This arrangement to consist of a pipe running down back of each rear driving wheel for playing water on the track to wash off sand ahead of the wheels and tracks. The pipes are to be equipped with valves so that the water can be shut off when necessary.

THE BALDWIN LOCOMOTIVE WORKS

Memorandum Spec'n 11129

SPECIFICATION FOR LOCOMOTIVES

FOR Susquehanna & New York R. R. Co.

R.

As Spec'n C-1065
Sup. 10 38 E 3690, EXCEPT WHERE OTHERWISE SPECIFIED.
10 10 E 176

8-8-16

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 15' 8" Driving 15' 8" Total 24' 1"
Total wheelbase, eng. and tend. {Actual 55' 5½" / Limited to 55' 6½"

Curves ——

Limits, Height 14' 8" Width ——
Weight (approximate) in working order, Total 211,500 lbs.
On F. tr'k 17,500 lbs. Drivers 194,000 lbs., B. tr'k —— lbs.

Tractive power 45500 lbs., Ratio of adhesion 4.26
Work'g St'm Pres. 185 lbs., Service FREIGHT
Fuel SOFT COAL

Boiler STEEL Thick 13/16" Bill 6687
Boiler, Diam. 80" Plan STRAIGHT TOP
Boiler st'm pres. 200 lbs., Tested to {220 lbs. steam pres. / 267 lbs. water pres.
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS SEXTUPLE RIVETED
Dome, diam. 33" Pos. CENTRAL
AUXILIARY DOME FOR SAFETY VALVES AND WHISTLE
Firebox STEEL Combustion chamb. NONE
Firebox, length 108" Width 66" Depth F. 75" B. 69½"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back ⅜"
Firedoor opening ONE OVAL 16" X 20"
Water space, Front 5" Sides 4" Back 4"
Water space, Frame DOUBLE Riveted
Water space stays 1" DIAM. WITH 3/16" HOLES 1½" DEEP FROM O. S.

Radial stays 1⅛" DIAM. Sling stays front {THREE ROWS OF B.L.W. EXPANSION STAYS
Button heads below crown on TEN central rows
Crown bars NONE Placed ——— above crown
Crown bolts ——

Flues #9 W. G. STEEL
Tubes #11 W. G. CHARCOAL IRON
Tube ends SWAGED FOR COPPER FERRULES, FIREBOX ENDS.
Number 36 / 287 Diam. 2" Length 14' 5"

Heating Surface	Flues 726 sq. ft.	Combus. Chamb. ——	Total 2726 sq. ft.
	Tubes 1776 sq. ft.	Fire Box 193 sq. ft.	Fire Brick Tubes 29 sq. ft.
Grate area 49.5 sq. ft.		Ratio to Heating Surface 1 : 55	
Superheater 628 sq. ft.			

Fire Brick ARCH ON FOUR TUBES OF #7 W. G. SEAMLESS STEEL 3" OUTSIDE DIAMETER

Grates ROCKING BARS WITH DROP PLATE AT BACK OF FIRE BOX.
Ash Pan, Dampers NONE (SEE SUPPLEMENT 6)

Throttle BALANCE Pos. DOME
Dry pipe STEEL

Superheater SCHMIDT TYPE (SEE SUPPLEMENT 7 - 8)

Smoke Box FRONT AND DOOR OF CAST IRON
Smokebox extension WITH Cleaning hole and cap (SEE SUP. 8)
Spark ejector or hopper NONE
Netting and deflect. plates WITH
FRONT END ARRANGEMENT TO BE SELF CLEANING TYPE.
Exhaust nozzle SINGLE HIGH

Stack STRAIGHT Dia. 18" Hole in S. B., dia. 23"

Safety Valves TWO ASHTON 3½" (Spec.) BRASS
Safety valves NONE with relief lever, Set to 175 lbs.
Whistle B. L. W. BRASS
STEAM GAUGE TO BE ASHTON IMPROVED, WITH DOUBLE SPRING.
Steam Gauge ONE IRON 7" MARCH (SEE ABOVE)
Steam gauge stand IRON Cherry Arm
WATER GAUGE JERBOUSEK BROS. BRASS
Water Gauge (SEE ABOVE.) Sight Reducing ELECTRIC
Gauge Cocks THREE BACK Bottom Valve Blow
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve TO HAVE separate dry pipe to dome
Blower Valve STAR 1" BRASS VALVE, WITH RENEWABLE SEATS.

Blow off Cock ONE BONCO, POS.-LEFT SIDE
Cleaning Plugs ONE PLUG ABOVE FIRE DOOR.
Firebox CORNERS DIAGONAL, SIDES, FRONT AND BACK
Crown, THREE EACH SIDE AND TWO BACK
Waist, ONE UNDER FRONT
Front tube sheet, ONE Fusible plug ONE

Pump NONE Pos. ——
Top chamb. —— Bottom chamb. ——
Feed Cock —— Feed pipes ——
Checks —— Check pipes ——

INJECTOR ANGLE STEAM VALVE TO BE SELLERS (Spec.)
Injectors TWO SELLERS IMPROVED CLASS "N" NO. 10½
Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER
Pipes, Check IRON Feed IRON Overflow IRON
Check (SEE SUP. 12) Pos. (SEE SUP. 12)

Steam Heat NONE

Cab STEEL, LINED WITH WOOD (SEE SUP. 13 TO 16)

Cab boards STEEL Nosing T-Iron
Running boards STEEL Nosing T-Iron
Hand rail IRON Located on BOILER

Back Bumper BAR STEEL Back drawbar height 29"

Pilot STEEL, SHORT TYPE Pushing shoes CAST IN BUMPER
Front Bumper CAST STEEL Bumper plate WITH
Steps, HAND HOLDS ETC. TO CONFORM TO I.C.C. REQUIREMENTS

Front Drawhead, Center above rail 33½"
Coupler SHARON M.C.B. AUTO. SHORT SHANK WITH EXTENDED FLOOR POCKET TO PREVENT DROPPING.

Signal fixtures IRON ON BUMPER

Headlight ONE ROUND CASE 15" Reflector, (SEE SUP. 18)
Headlight, Pos. on sides WITH PYLE plug WITH
Lamp shell NONE Nosing ——

Bell 85 pounds COLUMAN AIR BELL RINGER
Sand Box One Diam. 29" Body IRON PAINTED Pipes IRON
Sander LEACH AIR DOUBLE TRAP A-10 AND HAND TO BAND FRONT OF FRONT AND BACK OF MAIN DRIVING WHEELS.
Dome casing IRON PAINTED

Shelter Jacket #22 PLAN. STEEL Bands IRON Style 9 AND 14
Shelter Lagging MAGNESIA SECTIONAL
BACK HEAD ON BOILER TO BE LAGGED AND JACKETED

THE BALDWIN LOCOMOTIVE WORKS
C.W. Foach 8-8-1916

SPECIFICATION FOR LOCOMOTIVES 10 10 E 176

FOR Susquehanna & New York R. R. Co.

R.

Frames CAST STEEL Braces SOLID

Cylinders, Diam. 23" Stroke 28"
St'm ports, Length 30" Width 1⅞" Bridges 3½"
Exh. ports, Length —— Width —— Valve lead ⅛"
Valve travel 6½" Steam lap 1" Exhaust clearance ——
Eccentric crank throw 15-7/16" By-pass valve NONE
S. F. Lubr. DETROIT FIVE FEED No. 42 BULLS EYE (SUP. 19 - 31) (Spec.)
Cyl'r heads CAST IRON; LUBR. PIPES OF IRON UNDER JACKET.
Cyl'r casings IRON PTD. Head covers STEEL PAINTED
St'm chest casings —— Covers ——
St'm chest valves 13" DIAM. PISTON TYPE CLEASIDE ADMISSION
Met. pkg {PISTON RODS / VALVE STEMS} UNITED STATES KING TYPE (Not Spec)
PISTON RODS KEYED TO CROSSHEADS.
Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD.
Guides STEEL (SUP. 2 - 20 Oil cups NEEDLE
Crossheads ALLIGATOR CAST STEEL (SEE SUP. 2 - 21)
Wrist Pins STEEL Rod cups (SEE SUP. 26)

Valve Motion HALSCHAERTS
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 51" Cen. diam. 44" CENTERS CAST STEEL (A&C TIME)
Tires STD. STEEL Held by SHRINKAGE AND SHOULDER
Tires, Flanged, Pos. FRONT AND BACK Size 3½" X 5½"
Tires, Plain, Pos. INTERMEDIATE Size 3½" X 6½"
Lateral play between driving boxes and wheel hubs 1/32" TOTAL
Driving Boxes CAST STEEL WITH OIL CELLARS.
Journals, Diam. {MAIN 10" / OTHERS 9"} Length 12"

Springs. Make RAILWAY STEEL SPRING CO. (SUP. 29)

Front Engine Truck TWO Wheeled SWING BOLSTER CENTER BEARING
To swing 3½" each side of cen., Cen. pin liners NONE
Journals, Diam. 6" Length 12" Boxes CAST STEEL
Wheels, Diam. 30" Tread 4½" Kind DAVIS CAST STEEL
Tires NONE Cen. diam. —— Size ——
Tires held by ——

Back Engine Truck NONE Wheeled ——
To swing —— each side of cen.; Cen. pin liners ——
Journals, Diam. —— Length —— Boxes ——
Wheels, Diam. —— Tread —— Kind ——
Tires —— Cen. diam. —— Size ——
Tires held by ——

Brake, position ON ALL DRIVING AND TENDER WHEELS.
Operating Parts: Engine, Sch. 96 ET WEST'G. COMBINED AUTO. AND STRAIGHT AIR; Eng. Tr'k, sch. ——
Foundation Parts: Drivers sch. MN-3 AMERICAN O.S. EQUALIZED; Eng. Tr'k, sch. ——
Air pump ONE 11" Pos. LEFT SIDE (SEE SUP. 31) W.H. 7-17
Train connections FRONT AND BACK
Train signal, sch. NONE
Air reservoir to have hydrostatic test of 210 lbs. 4/17

Tender EIGHT Wheeled, Drawing No. 610
Weight, with fuel and water, about 115,000 LBS.

Tank 6,000 Gallons, Bill 3518
TANK "U" SHAPE, STRAIGHT TOP. FUEL CAPACITY 10 TONS.

Tool Boxes HARD WOOD, TOP.

Frame STEEL 12" CHANNELS (SEE SUP. 2 - 37 - 40)

Front Drawbar height 28⅜" (SEE SUP. 38)
Pilot NONE Pushing shoes CAST IN BUMPER
Back drawhead, center above rail 33½"
Coupler SHARON M.C.B. AUTO. AND MINER SPRING DRAFT GEAR

Steps, HAND HOLDS ETC. TO CONFORM TO I.C.C. REQUIREMENTS.

Trucks CAST STEEL SIDE FRAMES WITH STEEL BOLSTER. (SUP. 2-40-41)

Springs ELLIPTIC. RAILWAY STEEL SPRING CO'S MAKE
Journals, Diam. 5" Length 9"
Wheels, Diam. 33" Tread 4½" Kind DAVIS CAST STEEL
Tires NONE Cen. diam. —— Size ——
Tires held by ——
Safety chains SINGLE

Brake Position ON ALL WHEELS
Brake sch. #6 ET WEST'G. AUTO. AND STRAIGHT AIR WITH 12" X 12" CYLINDER.

List of tools, sch. 29
Photo sch. #2 Inspection B. L. W. (EXCEPT SEE * BELOW)
To be weighed YES Material spec'ns B. L. W.
Certificate of boiler test THREE COPIES OF B.L.W. FORM 1036 (SUP. 3)
Junior laws to 10-3-16 Shipment ON OWN WHEELS UNDER STEAM. 1/3/17

Brass shop finish, No. 1
Machine shop finish D-165

Patents B. L. W. THROTTLE, PATENTED JAN. 23, 1903 (CAST ON)
STEAM PIPE COVER, PATENTED JULY 18, 1911 (CAST ON)

Property plates NONE

Painting: Engine, style —— BLACK, NO STRIPING
Painting: Tender, style —— BLACK, NO STRIPING

LETTERING ETC. IN ALUMINUM SAME AS FOR 10 38 E 3690
Mark on TANK SIDES, ~~SUSQUEHANNA & NEW YORK~~ SUSQUEHANNA & NEW YORK 1/16

Road Nos. Pos. Road Nos. Name NONE
F. No Plate 116
Cab Panel
Sides of tank collar
Back of tank

* MR. F. WOOLLVEN IS TO BE ADVISED 48 HOURS BEFORE LOCO. IS READY FOR SHIPMENT SO THAT HE MAY GET THE PRESIDENT OF THE R. R. CO. HERE TO MAKE INSPECTION BEFORE IT IS SHIPPED. 1/3/17

SPECIFICATION FOR LOCOMOTIVES 10 40 E 175

FOR SUSQUEHANNA & NEW YORK R. R. CO.

B.

1 ✓ LOCOMOTIVE AND TENDER TO COMPLY WITH THE I.C.C. "REGULATIONS FOR INSPECTING AND TESTING LOCOMOTIVES AND TENDERS" AND "SAFETY APPLIANCE STANDARDS."

2 GRIP LOCK NUTS TO BE APPLIED TO PIPE CLAMPS, RUNNING BOARDS, DRAFT GEAR, FRAME PEDESTAL CAPS, GUIDES, CROSSHEAD GIBS, STUB BOLTS, ENGINE TRUCK, TENDER FRAME AND TENDER TRUCKS.
WRIST PINS AND BACK END OF MAIN ROD TO HAVE DOUBLE NUTS WITHOUT GRIP NUTS.

3 ✓ BOILER TESTS TO COMPLY WITH THE "REGULATIONS FOR INSPECTING TESTING AND WASHING LOCOMOTIVE BOILERS," AS REQUIRED BY THE STATE OF NEW YORK, AND ADOPTED AUGUST 30, 1907.

4 ✓ FLEXIBLE STAYBOLTS ABOUT 450 AMERICAN, OF EBALD IRON, TO BE APPLIED IN THE BREAKING ZONE.

5 TUBE SHEET LAYOUT TO BE AS LOCO. SUPER. CO'S PT. 5811

6 ✓ ASH-PAN, HOPPER TYPE WITH CAST IRON FRAMES AND SLIDES, OPERATIVE FROM CAB. PANS TO HAVE HEAVIER CAST IRON FRAMES AND MORE SLOPE TO FORWARD END THAN FOR 10 38 E 3690, SO ASHES WILL NOT COLLECT BETWEEN GRATES AND PAN NEXT TO THROAT SHEET.

7 ✓ SUPERHEATER, TO CONNECT WITH TOP HEADER IN SMOKE BOX, WITH OUTSIDE STEAM PIPE CONNECTIONS TO VALVE CHAMBERS.
SUPERHEATER TO BE AS LOCOMOTIVE SUPERHEATER CO'S SPECIFICATION NO. P-450-C DATED, 8-31-16.
ROYALTY ON SUPERHEATER PAYABLE BY B. L. W.

8 ✓ MAND HOLE AND CAP TO BE PROVIDED IN SMOKE BOX RIGHT AND LEFT, FOR INSPECTION OF SUPERHEATER.

9 GAUGE COCKS TO BE EVNON & EVANS.

10 ✓ BLOW-OFF COCK TO BE ASBESTOS PACKED AND HAVE IRON BODY.
✓ BLOW-OFF COCK TO BE OPERATED FROM RUNNING BOARD.

11 ✓ CLEANING HOLES IN BACK HEAD TO BE LOCATED AWAY FROM TURRET SO THEY WILL BE ACCESSIBLE. HOLES IN BACK HEAD OF 10 36 E 3690 ARE LOCATED UNDER TURRET AND WRENCH CANNOT BE PUT ON THE PLUGS.

12 ✓ INJECTOR CHECK TO BE SELLERS DUPLEX MAIN CHECK AND STOP
✓ VALVE ON TOP OF BOILER WITH JENKINS BROS. SWING CHECK
✓ VALVE IN BRANCH PIPES. CHECK TO HAVE FLANGE CONNECTION TO BOILER.
✓ FEED PIPE STRAINER TO BE SELLERS.

13 ✓ ALL STEAM PIPES INSIDE OF CAB TO BE COVERED WITH A THIN COATING OF ASBESTOS AND WRAPPED WITH LIGHT DUCK.

14 ✓ TWO BRACES, 1" DIAMETER TO BE APPLIED FROM BOILER HEAD TO BACK END OF CAB.

15 ✓ DROP SPRING SEAT TO BE APPLIED ON ENGINEER'S SIDE OF CAB.

16 ✓ CAB FLOOR TO BE OF WOOD OVER THE STEEL CAB BOARDS

17 ✓ ECONOMY RADIAL BUFFER TO BE PROVIDED BETWEEN ENGINE AND TENDER, WITH TENDER CHAFING CASTING OF STEEL. (SUP. 38)
ENGINE END OF DRAWBAR BETWEEN ENGINE AND TENDER TO HAVE THE PIN BE REMOVABLE FROM TOP SAME AS FOR 10 38 E 3690

18 ✓ HEADLIGHT EQUIPMENT TO BE PYLE NATIONAL ELECTRIC INCANDESCENT TO SUIT I.C.C. REQUIREMENTS FOR ROAD ENGINES.
HEADLIGHT TO HAVE NUMBER PLATES PLACED ON SIDES SO LIGHT WILL SHOW THROUGH.

19 ✓ LUBRICATOR THROTTLE TO BE STAR BRASS VALVE WITH REMOVABLE SEATS. LUBRICATOR WITH DETROIT AUTOMATIC STEAM CHEST PLUGS.

20 ✓ GUIDES TO HAVE HOLES IN SIDES SO OIL WILL FLOW TO SIDES OF CROSSHEAD GIBS. (SEE SUPPLEMENT 2)

21 ✓ CROSSHEAD TO HAVE SHOES OF CAST STEEL, LINED WITH BABBITT. (SUP. 2)

22 PARALLEL RODS TO HAVE SOLID ENDS. (SEE SUP. 2)
PARALLEL RODS TO HAVE RAISED ENDS FOR GREASE AND TO HAVE PLUG AND LOCK NUT. CUPS ARE NOT TO BE THE ROUND MACHINED CUP AS FURNISHED WITH 10 38 E 3690.

23 ✓ FLANGE OILERS TO BE DETROIT LUBRICATOR CO'S BALL TYPE, APPLIED TO FRONT DRIVING WHEEL FLANGES.

24 ✓ DRIVING WHEELS TO HAVE HUB LINERS OF BRASS CAST SOLID ON HUBS OF ALL WHEELS.

25 ✓ SPRING GEAR TO HAVE SPOOLS IN ALL PLATE SPRINGS AND SEATS.
SOLID STRAP HANGERS WITH SLOT IN TOP END FOR GIB, AND WITH BOSS AND BUSHINGS ON BOTTOM END WITH PIN.
DRIVING SPRING LINKS EACH SIDE OF SPRINGS AS SHOWN ON EQUALIZING BEAM (B.L.W.) CARD 3708.
PINS AND BUSHINGS TO BE CASE HARDENED, AND HOLES IN ALL EQUALIZERS TO BE BUSHED WITH CASE HARDENED BUSHINGS.

30 ✓ FRONT ENGINE TRUCK WHEELS TO HAVE BEARING SURFACE OF HUBS LARGE ENOUGH TO COVER ENTIRE FACE OF ENGINE TRUCK JOURNAL BOX.

31 ✓ AIR PUMP THROTTLE TO BE STAR BRASS VALVE WITH REMOVABLE SEATS.
✓ AIR CYLINDER LUBRICATOR TO BE DETROIT.
✓ AIR GAUGE TO BE ASHTON IMPROVED DUPLEX.
✓ STEAM COMPRESSOR GOVERNOR TO BE DUPLEX.

TENDER

36 ✓ TANK TO BE MADE OF STEEL; TOP, BOTTOM AND INSIDE PLATES TO BE 5/16" THICK AND OUTSIDE AND BACK PLATES TO BE ¼" ELEVATED SIDES ON TOP OF TANK TO ACT AS COAL BOARDS, SAME AS FOR CO'S ENGINE 115, B.L.W. CLASS 10 38 E 3690.

37 ✓ TENDER END SILLS OF STEEL.
✓ TENDER BACK BUMPER OF CAST STEEL.

38 ✓ ECONOMY RADIAL BUFFER TO BE PROVIDED BETWEEN ENGINE AND TENDER WITH TENDER CHAFING CASTING OF STEEL. (SUP. 17)
TENDER AND OF DRAWBAR BETWEEN ENGINE AND TENDER TO HAVE THE DRAWBAR PIN HELD IN PLACE BY A PLATE BOLTED TO UNDER SIDE OF DRAWBAR CASTING SO PIN MAY BE REMOVED WITHOUT DISTURBING SHOVELING SHEET.

39 ✓ TENDER COUPLER TO HAVE EXTENDED HEAD TO GIVE PROPER CLEARANCE FROM INSIDE FACE OF KNUCKLE TO END SILL.

40 ✓ TENDER CENTER PLATES OF STEEL

41 ✓ TRUCKS TO BE OF STRONG DESIGN, SUBSTANTIALLY BUILT (NO ARCH BARS).
✓ TENDER TRUCK SIDE FRAMES TO BE ANDREWS AS MANUFACTURED BY THE AMERICAN STEEL FOUNDRY COMPANY.

THE BALDWIN LOCOMOTIVE WORKS

SUPERHEATER SPECIFICATION FOR LOCOMOTIVES 10 40 E 176

FOR SUSQUEHANNA & NEW YORK R. R. CO.

Locomotive Superheater Company's Specification No. P-450-C dated AUGUST 31, 1916.

Specification for Superheater with Top Header, Double Loop Arrangement.

BOILER TUBES 237 in number 2" O. D. 14 ft. 5 ins. over tube sheets. Tubes located between and adjacent to Boiler flues are to be beaded over at front end.

BOILER FLUES 36 in number 5½" O. D. #9 BWG thick of cold drawn seamless steel. Flues to be straight, true to gauge and wall not to vary more than one gauge from specified thickness, as shown on Card 1409-B

BOILER FLUE SETTING Radius 1/8 inch on both edges of flue holes in firebox tube sheet and on front edge of flue holes in front flue sheet as shown on drawings, except for copper sheets. Back end to be set with copper ferrules, rolled, beaded and pressered except for copper sheets. Front end to be rolled and beaded. Rollers to have at least 5 rolls. Prosser to have at least 12 sections Card 1136

TUBE SHEET LAYOUT to be in accordance with Card 5811

S. H. UNITS 36 units 1½" O. D. #9 BWG thick of seamless steel. Pipes united by ~~cast steel~~ return bends

Each unit to be tested, before being placed in boiler, with water under pressure of 500 pounds.

S. H. PIPE SUPPORTS Of steel fastened securely on superheater pipes so as not to slide as shown on Card 10773

S. H. PIPE JOINT To be made in best possible manner to insure absolutely tight joints in accordance with the notation on Card 1043

S. H. UNIT CLAMP BOLT ~~To be of steel having a tensile strength between 60,000 lbs. and 70,000 lbs. per sq. inch and to be as shown on~~ to be in accordance with Loco. Super. Co's material Specn. #12. Card 10695

S. H. HEADER To be of close grain cylinder iron, steam tight in every respect. Joint ring for connection to dry pipe to have flat side against header flange. Casting should be moulded with the face having the superheater joints placed downward in the mould to secure the best quality of metal on surface where superheater joints are made. Each header to have a serial number cast on in such a location as not to be removed in finishing. No patch plugs or chaplets allowed on ball joint seats. Headers must not be treated ~~excessively~~ with sal ammoniac. Header casting to be tight under water pressure of 250 lbs. Test pressure to be applied separately to the saturated and to the superheated steam passages, so as to insure soundness of all partition walls. Card 10246-A

S. H. HEADER SUPPORTS To be securely ~~bolted or riveted to boiler shell~~ fastened to boiler shell with rivets or forged bolts fitted or ~~reamed~~ turned holes. To be properly located so as to support the header after header has been correctly located. Header should then be ~~bolted~~ reamed to supports. This to be done before superheater units are put in place. Card 1323

ST. PIPE JOINT RINGS Should be of cast iron.

DEFLECTING PLATE To be constructed so as to permit easy inspection and removal of superheater units and joints. Design to be in accordance with Card See Arrgt.

DAMPER CYLINDER To be carefully and accurately made. Piston not to be more than 0.01 inch smaller than bore. Bearings for Piston and extension to be in line. Piston to be ground and to operate freely under a pressure as low as 40 lbs. per sq. in. Steam Pipe to damper cylinder should be as short and free from bends as possible so as not to cause water to collect in cylinder. Pipe to be protected against freezing. Card 1149

DAMPER SHAFT COUNTERWEIGHT To be painted a light color to render it easily visible by the engineer Card 1067

S. H. ARRANGEMENT To be in accordance with Card 4849

TEST (FINAL) The Superheater, after assembling in boiler and after steam pipes are fitted up, is to be thoroughly tested and to be tight under water pressure of ~~250 lbs~~ at least 30% more than the working pressure of the boiler

Name	Card	Name	Card
Damper	10824-T	Damper Shaft Link	1070
Damper Cylinder Arm	1074	Patent Plate	3156
Damper Cylinder Pipe Fitting	1069-A	S. H. Unit Bolt Washer	1071
Damper Cylinder Pipe Union	1287	S. H. Unit Clamp	1073
Damper Cylinder Piping Diagram		S. H. Unit Clamp Washer	10305
Damper Cylinder Support		S. H. Pipe End	1344
Damper Shaft	1068	S. H. Pipe Band	1988
Damper Shaft Arm	1065	Return Bends	10094
Damper Shaft Bearing (O. S.)	1148	Deflecting Plate Handle	1487
Damper Shaft Bearing (I. S.)	1275	Lubricator Connection	3023
Spacing of Bands & Supports	10759	Deflecting Plate Studs	10809
		Deflecting Plate Clamp	10809-A

SUPERHEATER UNITS TO HAVE WELDED RETURN BENDS.

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-4331

Memorandum Spec'n 11161

SPECIFICATION FOR LOCOMOTIVES 10 32 D 1165

FOR Tuckerton Railroad Company

R.

9-29-16 Gen. as Photo. 5872 Engine Drawing No. 119

Gauge of Road 4' 8½". Play ⅝".

Wheelbase, Rigid 11' 4" Driving 11' 4" Total 21' 10"

Total wheelbase, eng. and tend. { Actual 48' 9½" / Limited to 49' 0"

Rails, 60 and 80 pounds. Turntable 52' 3" long

Curves 11 degrees.

Limits, Height & Width not to be greater than for 8-30 C 682

Weight (approximate, in working order, Total 138,000 lbs.

On F. tr'k 31,000 lbs., Drivers 107,000 lbs., B. tr'k ----- lbs.

Tractive power 24,500 lbs., Ratio of adhesion 4.3

Work'g St'm Pres. 190 lbs., Service Passenger & Freight

Fuel Soft Coal

Total length of Engine and Tender, including wheel spacing and distribution of weight, as shown on B.L.W. tracing 32918

Boiler Steel Thick ⅜" & 11/16" Bill 7981

Boiler, Diam. 60" Plan Ext. Wagon Top

Front tube sheet ½" thick.

Boiler st'm pres 200 lbs., Tested to { 220 lbs. steam pres. / 267 lbs. water pres.

with factor of safety of 4.6

Longitud. seams Butt jointed, double covering strips

Dome, diam. 29" Pos. Forward of firebox

Firebox Steel Combustion chamb. None

Firebox, length 107-7/16" Width 42⅜" Depth F. 63½" B. 60"

Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"

Firedoor opening 16" diam.

Water space, Front 4" Sides 3" Back 3"

Water space, Frame Single Riveted

Water space stays ⅜" diam. with 3/16" holes, 1¼" deep from O.S.

Flexible Stay Bolts,-500 American of Ewald Iron in breaking zone

Radial stays 1" diam. Sling stays front { Two rows of B.L.W. Expansion Stays

Button heads below crown on Eight central rows

Crown bars None Placed ----- above crown

Crown bolts -----

Boiler pads to have holes drilled for examination of stays.

Flues -----

Tubes #12 W. G. Charcoal Iron or Steel

Tube ends Swaged for copper ferrules firebox ends.

Number 268 Diam. 2" Length 12' 10¼"

Heating Surface	Flues -----	Combus. Chamb. -----	Total 1940
	Tubes 1792	Fire Box 148	Fire Brick Tubes -----
Grate area 31.5	Ratio to Heating Surface 1 : 61.6		
Superheater -----			

Fire Brick Arch, None

Grates Rocking bars and drop plate

Ash Pan, Dampers Front and back

Throttle Balance Pos. Dome

Dry pipe Steel

Superheater None

Smokebox extension With Cleaning hole and cap Left side only

Spark ejector or hopper With

Netting and deflect. plates With

Exhaust nozzles Double high

Stack Cast Iron, Straight Dia. 16" Hole in S. B., dia. 20½"

Safety Valves (not spec) Two Consolidated 3"

Safety valves None with relief lever, Set to 190 pounds

Whistle Chime

Steam Gauge One Iron 7" MAKER:-Ashcroft (not spec)

Steam gauge stand Iron **Clock** None

Water Gauge One B.L.W. (Ironclad) **Cab Lamps** to burn oil

Gauge Cocks Three Back Surface valve None

Lowest gauge cock 3½" above highest part of crown.

Lubricator steam valve to have separate dry pipe to dome

Blower Valve B. L. W.

Blow off Cock One B.L.W. POS:- Front of fire box

Cleaning Plugs One filling plug in top centre of boiler

Firebox Corners, back ones diagonal and back

Crown, Two each side and four back

Waist, One under front

Front tube sheet, One Fusible plug None

Pump None Pos. -----

Top chamb. ----- Bottom chamb. -----

Feed Cock ----- Feed pipes -----

Checks ----- Check pipes -----

Injectors (Spec) Two Sellers, Class "N" No. 10½

Injectors, Pos. Right and Left Steam pipes Copper

Pipes, Check Iron Feed Iron Overflow Iron

Check B. L. W. Pos. Right and Left

Steam Heat Consolidated System

Gauge cocks and all cab valves to have handles that do not burn, but not to be of fibre.

Cab Steel, with curtain between Engine and Tender.

Cab can be lower than for 8-30 C 682.

Cab boards Wood Nosing None

Running boards Wood Nosing None

Hand rail Iron Located on Boiler

Back Bumper Bar Steel Back drawbar height 37¼"

Pilot to be short same as for P.R.R. Class D-16-8 locos.

Pilot Wood Pushing shoes None

Front Bumper Oak Bumper plate With

Steps, Hand holds etc. to conform to I.C.C. requirements.

Front Drawhead, Center above rail 33½"

Coupler M. C. B. Automatic

Signal fixtures Iron on bumper

Headlight One Round Case 23" Reflector, To burn Kerosene

Headlight, Nos. on sides With H'd'l't step With

Lamp shell None Nosing -----

Bell 92 pounds

Sand Box One Diam. 28" Body Iron Painted Pipes Iron

Sander (Not spec) Leach Air, Trap A-1

Dome casing Iron Painted

Boiler Jacket #22 Soft Steel Pt Bands Iron Style 9 and 14

Boiler Lagging Magnesia sectional

Backhead of boiler to be lagged and jacketed.

THE BALDWIN LOCOMOTIVE WORKS M.K. Knight Dec. 1916

SPECIFICATION FOR LOCOMOTIVES 10 32 D 1165

FOR Tuckerton Railroad Company

R.

Frames Cast Steel Braces Solid

Cylinders, Diam. 19" Stroke 26"

St'm ports, Length 16" Width 1¼" Bridges 1¼"

Exh. ports, Length 16" Width 2½" Valve lead 3/16"

Valve travel 5½" Steam lap ⅞" Exhaust clearance -----

Eccentric crank throw 10-15/16 By-pass valve None

S. F. Lubr. (Spec) Detroit Triple #22 Bulls Eye

Cyl'r heads Cast Iron; Lubr. pipes of Iron under jacket

Cyl'r casings Iron Ptd. Head covers Steel Painted

St'm chest casings Iron Ptd. Covers Steel Painted

St'm chest valves Richardson Balanced with vacuum valves

Met. pkg { Piston rods / Valve stems } United States. (not spec)

Pistons Cast Iron rings sprung into solid head

Guides Steel Oil cups Needle

Crossheads Cast Steel

Wrist Pins Steel Rod cups Grease Cups.

Parallel Rods to have solid ends

Valve Motion Walschaerts

Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.

All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Driving wheels to have hub liners of Bronze

Drivers, O. S. Diam. 62" Cen. diam. 56" Centres Cast Steel

Tires Steel Held by Shrinkage and Shoulder

Tires, Flanged, Pos. All Size 3" X 5½"

Tires, Plain, Pos. ----- Size -----

Lateral play between driving boxes and wheel hubs = 1/10" total

Driving Boxes Steeled Cast Iron

Journals, Diam. 8" Length 9"

Springs. Make B. L. W.

Front Engine Truck Four Wheeled Swing Bolster

To swing 2½" each side of cen., Cen. pin liners None

Journals, Diam. 5" Length 10" Boxes Cast Iron

Wheels, Diam. 28" Tread -----Kind Cast Iron Spoke Centre

Tires Steel Cen. diam. 23" Size 2½" X 5½"

Tires held by Shrinkage and Shoulder

Engine truck wheels without hub liners

Back Engine Truck None Wheeled -----

To swing -----each side of cen., Cen. pin liners -----

Journals, Diam. ----- Length -----Boxes -----

Wheels, Diam. ----- Tread----- Kind -----

Tires ----- Cen. diam. ----- Size -----

Tires held by -----

Brake, position On all driving and tender wheels

Operating Parts	Engine, Sch. #6 ET West'g. Combined Auto. and	
	Eng. Tr'k, sch. -----	Straight Air
Foundation Parts	Drivers, sch. UA-2 American O.S. Equalized	
	Eng. Tr'k, sch. -----	

Air pump One 9½" Pos. Left Side

Train connections Front and Back

Train signal, sch. "L"

Air pump exhaust to be piped into cylinder saddle

Air reservoir to have hydrostatic testof 210 lbs.

Tender Eight Wheeled, Drawing No. 918

Weight, with fuel and water, about 100,000 lbs.

Tank 5,000 Gallons. Bill 4392

Tank "U" shape, straight top. Fuel capacity 7 tons.

Tank funnel to be 18" X 36", not over 9' 8" above rail.

Tool Boxes Hard Wood, top.

Curtain to be provided between Engine and Tender

Frame Steel 10" & 8" Channels

Front Drawbar height 34"

Pilot None Pushing shoes None

Back drawhead, center above rail 33½"

Coupler M. C. B. Auto.

Steps, Hand holds, etc. to conform to I.C.C. requirements

Trucks Arch Bar type with Cast Steel Bolster

Springs Elliptic. B. L. W.

Journals, Diam. 5" Length 9"

Wheels, Diam. 30" Tread 4¼" Kind Chilled Cast Iron plate

Tires ----- Cen. diam. ----- Size -----

Tires held by -----

Safety chains Single

Brake Position On all wheels.

Brake sch. #6 ET West'g. Auto. and Straight Air with 12" X 12" cyl.

Tender as B.L.W. tracing 32863 approved, except tank to have collar on sides, beyond fuel board and on back, cut down to 3" in height. Tank funnel to be 4" high.

List of tools, sch. 29

Photo sch. #2 Inspection B. L. W. Except see * below.

To be weighed Yes Material spec'ns B. L. W.

Certificate of boiler test Three copies of B.L.W. form 1036

Junior laws to 11-1-16 Shipment { On own wheels / Under steam } Except see * below.

Brass shop finish, No. 1

Machine shop finish D-165

(Stack etc. covered on Extra Order 10268 dated 10-9-16 to be shipped with locomotive. 2-9-17

B. L. W. Patents { Throttle, Patented Jan. 23, 1900 (Cast On) / Feed Pipe Strainer, Patented Sept. 1, 1903 (Cast On) }

Property plates None

Painting:—Engine, style ----- Black, no striping

Painting:—Tender, style ----- Black, no striping

Lettering, etc. to be in aluminum, similar to 8 30 C 682

Mark on tank sides, Tuckerton Railroad

Road Nos. Pos.	Road Nos.	Name None
F. No Plate	7	
Sand Box		
Back of tank		

* Mr. John C. Price, G.M. Tuckerton, N.J. is to be advised two days in advance of time that locomotive is ready for shipment so that he may come here with one of his Engineers to go over the details of the locomotive before it leaves the shops. 2-9-17

THE BALDWIN LOCOMOTIVE WORKS — As Spec'n C-3737
Details as far as possible to be interchangeable with those on (Co's Locos. 12-14) Class 12 34½ E 38-39
Memorandum Spec'n 10963
SPECIFICATION FOR LOCOMOTIVES 12 34 ½ D 52. — Gen. as B. L. W. tracing 31504.
FOR Raritan River Railroad Company. — **Engine Drawing No.** 6
M — 4-28-16.

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 11' 8" Driving 11' 8" Total 30' 3"
Total wheelbase, eng. and tend. Actual 61' 11¾" Limited to ----
Main line 12 miles long. Sand and gravel ballast.
Curves 16 and 20 degrees #6 frogs.
Grades, 1½%, not compensated Rails, 80 lbs.
Limits, Height 16' 0" Width ----
Weight approximate in working order, Total 172,000 lbs.
On F'trk 33,000 lbs. Drivers 110,000 B'trk 29,000 lbs.
Weight on drivers may be increased to 112,000 lbs.
Tractive power 26,100 lbs. Ratio of adhesion 4.2
Work'g St'm Pres. 180 lbs. Service Passenger
Fuel Soft Coal

Boiler Steel Thick ⅜" Bill 7815
Boiler, Diam. 62" Plan Straight top
Boiler st'm pres. 200 lbs. Tested to 220 lbs. steam pres. / 267 lbs. water pres.
Longitud. seams (see sup. 1)

2 **Dome,** diam. 29" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 96-3/16" Width 66½" Depth F 65½" B 64"
Firebox Tube ½" Crown ⅜" Sides ⅜" Back 5/16"
Firedoor opening One oval 16" x 20"
Water space, Front 4" Sides 3½" Back 3½"
Water space, Frame Double Riveted
3 Water space stays 1" diam. with 3/16" hole 1¼" deep from O.S.
Radial stays 1" diam. Sling stays front } Two rows of B. L. W. expansion stays.
Button heads below crown on Eight central rows
Crown bars None Placed --- above crown
Crown bolts ---

Flues —
4 **Tubes** #11 W.G. Parkesburgh charcoal iron.
Tube ends Swaged for copper ferrules, fire box ends.
Number 262 Diam. 2" Length 19' 6"

Heating Flues --- Combus. Chamb. --- Total 2829.8 □'
Surface Tubes 2664 □' Fire Box 147 □' Fire Brick Tubes 18.8 □'
Grate area 44.3 □' Ratio to Heating Surface 1 : 63.8
Superheater ----

Fire Brick Arch "Security" on three tubes 3" diam of 3/16" thick steel.

5 **Grates** Rocking bars and drop plate.
Ash Pan, Dampers None

6 **Throttle** Balance Pos. Dome
Dry pipe Steel

Superheater None

Smokebox extension With Cleaning hole and cap L.S. only
Spark-arrester-or hopper With
Netting and deflect. plates With

Exhaust nozzles Double high

7 **Stack** Cast iron straight Dia. 18" Hole in S. B., dia. 21½"

Safety Valves (not Spec) Two Coale 3½" muffled.
Safety valves None with relief lever, Set to 180 pounds.
Whistle Same as for 10 34 E 2008.

8 **Steam Gauge** Two iron 7" MAKER:- Ashcroft. (not spec)
Steam gauge stand Iron
Clock None

Water Gauge One (see sup. 9) **Cab Lamps** Dressel to burn oil.
Gauge Cocks Three back Surface valve None
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve To have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One Hancock. Pos:, Left side
Cleaning Plugs One plug above fire door.
Firebox corners, diagonal, sides, front and back
Crown, two each side and two back
Waist, two under, one front and one near throat.
Front tube sheet, two Fusible plug one
Plenty of cleaning plugs to be provided.

Pump None Pos. ---
Top chamb. --- Bottom chamb. ---
Feed Cock --- Feed pipes ---
Checks --- Check pipes ---

10 **Injectors** (Spec) Two Hancock No. 10
Injectors, Pos. Right and left Steam pipes Copper
Pipes, Check Iron Feed Copper Overflow Iron
Check (see sup. 10) Pos. Right and left

Steam Heat Consolidated system, same as for 12 34½ E 37-39 with connections to front and rear.

12 **Cab** Steel, lined with wood
Cab curtain on rear of cab.

Cab boards Steel Nosing T-iron
Running boards Steel Nosing T-iron
Hand rail Iron Located on boiler

13 **Back Bumper** Bar steel Back drawbar height 33"

14 **Pilot** Wood Pushing shoes Cast in front bumper
Front Bumper Cast steel Bumper plate With
Steps, hand holds, etc., to conform to I.C.C. requirements.

Front Drawhead, Center above rail 33½"
Coupler Simplex M. C. B. Automatic of cast steel.

15 Signal fixtures Iron on bumper.

16 **Headlight** Two round case 18" Reflector, To burn Kerosene
Headlight, Nos. on sides With H'dl't step With
Lamp shelf None Nosing ----

Bell 92 pounds. Golmar air bell ringer.
17 **Sand Box** (Cast iron) Two. Diam. 31" Body Iron painted Pipes Iron
Sander Leach air trap A-1, in each box to sand front and rear.

Dome casing Iron, painted

Boiler Jacket #22 plan. steel Bands Iron Style 9 and 14
Boiler Lagging Magnesia sectional
Backhead of boiler to be lagged and jacketed.

THE BALDWIN LOCOMOTIVE WORKS
C. H. Kalbach — Jr. copy
SPECIFICATION FOR LOCOMOTIVES 12 34 ½ D 52
FOR Raritan River Railroad Company

Furnish to A. A. Co. one set of prints covering wearing parts. Six prints of parts it is likely to order. 10-12-16

Frames Cast steel Braces Solid

18 **Cylinders,** Diam. 20" Stroke 26"
St'm ports, Length 19" Width 1⅞" Bridges 1⅞"
Exh. ports, Length 19" Width 3" Valve lead ¼"
Valve travel 5½" Steam lap ⅞" Exhaust clearance 1⅛"
Eccentric crank throw 11-13/16"
19 S. F. Lubr. Detroit triple #22 bulls eye
Cyl'r heads Cast steel (front and back)
Cyl'r casings Iron painted Head covers Steel, painted
St'm chest casings Iron painted Covers Steel, painted
St'm chest valves Richardson balanced, with vacuum valves
Met. pkg (Piston rods / Valve stems) U. S. King type (not spec)

Pistons (see sup. 20)
Guides Steel Oil cups Needle
Crossheads Cast steel (see sup. 21)
Wrist Pins Steel 22 Rod cups Grease cups forged on

26 **Valve Motion** Walschaerts.
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

27 **Drivers,** O. S. Diam. 61" Cen. diam. 54" centers cast steel

Tires Steel Held by Shrinkage and shoulder
Tires, Flanged, Pos. Front and back Size 3½" x 5½"
Tires, Plain, Pos. Middle Size 3½" x 6½"
Lateral play between driving boxes and wheel hubs — 1/16" total
28 **Driving Boxes** Cast steel
Journals, Diam. Main 9" / Others 8½" Length 10"

30 **Springs.** Make B. L. W.

31 **Front Engine Truck** Four Wheeled Swing bolster center bearing
To swing 3½" each side of cen., Cen. pin liners None
Journals, Diam. 5½" Length 10" Boxes Cast steel
32 Wheels, Diam. 30" Tread --- Kind Cast iron spoke center
Tires Steel Cen. diam. 25" Size 2½" x 5½"
Tires held by Shrinkage and shoulder

Back Engine Truck Two Wheeled Rushton inside bearing
To swing 3½" each side of cen., Cen. pin liners None
Journals, Diam. 6" Length 11" Boxes Cast steel
Wheels, Diam. 36" Tread ---Kind Cast iron spoke center
Tires Steel Cen. diam. 31" Size 2½" x 5½"
Tires held by Shrinkage and shoulder

33 **Brakes,** position On all driving and tender wheels.
Operating / Engine, Sch. #6 ET West'g combined auto. and straight air
Parts / Eng. Trk, sch. ---
Foundation / Drivers, sch. WM-2 American O. S. Equalized.
Parts / Eng. Trk, sch. ---
33 Air pump Two 9½" Pos. Left side ahead of fire box
Train connections Front and back
Train signal, sch. "E"

Drawings showing the foundation and equipment for engine and tender to be submitted for approval to Chief Engineer, Mr. [illegible]

Tender Eight Wheeled Drawing No. 610
Weight, with fuel and water, about 130,000 pounds

40 **Tank** 7,000 Gallons, Bill 4047
Tank "U" shaped straight top, with sloping bosom
Fuel capacity 12 tons.
43 Tool Boxes Steel, top

47 **Frame** Steel 12" channels

51 Front Drawbar height 32½"
Pilot None Pushing shoes (see sup. 48)
Back drawhead, center above rail 33½"
Coupler Simplex M. C. B. Auto. of cast steel with Farlow draft gear.

52 Steps, hand holds, etc., to conform to I. C. C. requirements.

Trucks Arch bar type of heavy design, with cast steel bolsters

Springs Elliptic. B. L. W. make
Journals, Diam. 5½" Length 10"
53 Wheels, Diam. 33" Tread 4½" Kind Rolled steel
Tires None Cen. diam. --- Size ---
Tires held by --- Wheel rims 2½" thick.
Safety chains Single

Brake Position On all wheels. Omit hand brake.
Brake sch. #6 ET West'g. Auto. and straight air with 12" x 12" tender cylinder.

List of tools, sch. 29 Bolts, nuts and threads B. L. W.
Photo sch. #2 Inspection B. L. W. (sup. 56)
To be weighed Yes Material spec'ns B. L. W.
Certificate of boiler test three copies of B. L. W. form 1036.
Junior laws to 7-25-16. Shipment on own wheels, under steam

Brass shop finish, No. 1
Machine shop finish D-165.

B. L. W. Patents: Throttle, Pant'd. Jan. 23, 1900 (Cast on); Feed pipe strainer, Pant'd. Sep. 1, 1903 (Cast on); Back engine truck, 645834, Mar. 30, 1900 (Brass plate)

Property plates None

Painting:—Engine, style—Black, no striping
Painting:—Tender, style —Black, no striping

Lettering, etc., to be in Gold.
Mark on tank sides, Raritan River

Road Nos. Pos. — Road Nos. — Name None
F. No. Plate — 15
F. Sand Box
Cab sides
Back of tank.

SPECIFICATION FOR LOCOMOTIVES 12 34 ¼ D 52

FOR RARITAN RIVER RAILROAD COMPANY

1 LONGITUDINAL SEAMS TO BE BUTT JOINTED WITH DOUBLE COVERING STRIPS, QUINTUPLE RIVETED.

2 AUXILIARY DOME FOR SAFETY VALVES AND WHISTLE AND FOR INSPECTION PURPOSES.

3 FLEXIBLE STAYBOLTS, AMERICAN, MADE OF EWALD IRON, 700, LOCATED IN BREAKING ZONE.

4 ~~TUBES TO BE WELDED, PROGRESS OF FROM TUBE SHEET.~~
Tubes to be set in accordance with B.L.W. practice and welded to tube sheet at back end. 4/46

5 GRATES TO BE SAME AS FOR 12 34 ¼ E 37 TO 39.
AMPLE CLEARANCE TO BE PROVIDED BETWEEN ENDS OF GRATE FINGERS AND THE BODY OF THE ADJACENT BAR.

6 THROTTLE TO BE RUSHTON TYPE WITH AUXILIARY VALVE.

7 STACK TO BE SAME AS SHOWN ON PHOTO. 4773.

8 THE ADDITIONAL STEAM GAUGE TO BE APPLIED ON THE BACK HEAD OF THE BOILER.

9 WATER GAUGE TO BE KLINGER B-4 TYPE.
WATER GAUGE TO BE PROVIDED WITH KLINGER FITTINGS AND STUFFING BOX.

10 INJECTOR CHECK TO BE HANCOCK COMBINED MAIN CHECK WITH STOP VALVES.

11 CAB HOSE AND VALVE TO BE CONNECTED TO LEFT INJECTOR DELIVERY PIPE FOR WETTING COAL.

12 CAB ARRANGEMENT TO HAVE ENCLOSURE.
CAB FRONT DOORS TO BE EQUIPPED WITH CLEAR VISION WINDOWS.
BACK OF CAB TO HAVE DOORS INSTEAD OF DROP SASH AND FIRING DECK IS TO BE ENCLOSED BY A REMOVABLE SHEET STEEL SHIELD.

13 RADIAL SPRING BUFFER BETWEEN ENGINE AND TENDER TO BE LOCATED ON TENDER AND TO HAVE A LARGE RADIUS.

14 PILOT TO BE SAME AS FOR 10 34 E 2008.

15 DRESSEL CLASSIFICATION LAMPS FOR FRONT OF ENGINE.

16 HEADLIGHT TO BE SAME TYPE AND DESIGN AS FOR PREVIOUS LOCOMOTIVES, I. E., DRESSEL.

17 SAND BOX AND DOME CASING HELMET SHAPED, SIMILAR TO PHOTO. 4773.

18 CYLINDER WALLS TO BE HEAVY.
CYLINDER COCKS TO BE PLACED AT ANGLE OF 45 DEGREES.

19 LUBRICATOR PIPES OF COPPER UNDER JACKET.

20 PISTON HEADS OF CAST STEEL WITH BULL RING FITTED WITH APPROVED FORM OF STEAM PACKING.

21 CROSSHEAD GIBS OF BRONZE, SAME DESIGN AS FOR 10 34 E 2008.
CROSSHEAD TO HAVE REMOVABLE PLATE INSIDE AND OUTSIDE.
CROSSHEAD WRIST PINS TO HAVE FORGED CUPS FOR GREASE.

22 MAIN RODS OF THE FORKED END TYPE, SAME AS P.R.R. H-6 ENGINES.
PARALLEL RODS TO HAVE SOLID ENDS, WITH HEAVY BUSHINGS, ~~END TURNED THROUGH FRONT~~ And ½". Collar ⅛" wide next to wheel hub 4/46
SPECIAL ATTENTION TO BE PAID TO RODS SO THAT THE COUNTERBALANCE DOES NOT STRIKE THEM.

26 MACHINERY TO BE BUILT FOR 200 LBS. WORKING PRESSURE.

27 ALL DRIVING WHEELS TO HAVE BRONZE HUB LINERS.

28 DRIVING BOXES NOT TO BE BABBITTED.
DRIVING BOXES TO BE PROVIDED WITH WASTE OIL CELLARS.

29 DRIVING BOXES, AXLES, WEDGES, BEARINGS AND MINOR PARTS WHERE POSSIBLE TO BE MADE INTERCHANGEABLE WITH 12 34 ¼ E 37 - 39

30 DRIVING SPRINGS TO BE HEAVY.
SPRING LINKS AND PINS TO BE HEAVY.

31 SPECIAL ATTENTION TO BE PAID TO THE DESIGN OF FRONT ENGINE TRUCK SO THAT IT DOES NOT STRIKE ENGINE FRAME.

32 FRONT ENGINE TRUCK WHEELS AND AXLES TO BE SAME AS FOR 12 34 ¼ E 37 TO 39.
ENGINE TRUCK WHEELS TO INTERCHANGE WITH THOSE ON PRESENT ENGINES.

33 AIR PUMP EXHAUST TO BE PIPED INTO CYLINDER SADDLE.

34 BRAKE HANGERS TO BE HUNG BETWEEN THE DRIVERS, NOT OUTSIDE OF TIRES.

36 MR. HIMMELBERGER IS TO BE NOTIFIED TWO DAYS BEFORE LOCOMOTIVES ARE READY FOR SHIPMENT SO THAT HIS MASTER MECHANIC, MR. STEWART, CAN COME HERE TO MAKE INSPECTION.

TENDER

40 TENDER TO BE DUPLICATE OF 12 34 ¼ E 37.

41 COPING AROUND TOP OF TANK ABOUT 12" HIGH, SIMILAR TO PHOTO. 4773.
RAILING AROUND TOP OF TANK AT REAR, ABOUT 12" HIGH.

42 TANK FUNNEL TO BE OBLONG, AND TO BE 16" HIGH.

43 STEEL BOX ON TOP OF TANK AT REAR TO HOLD LANTERNS, ETC.
BOX TO BE SAME SIZE AS FOR 12 34 ¼ E 37.

44 LADDER TO BE PLACED ON REAR OF TANK.

45 DRESSEL HEADLIGHT TO BE LOCATED ON TOP OF TENDER, LEFT HAND SIDE AT BACK.

46 DRESSEL TAIL LAMPS FOR REAR OF TENDER.

47 FRONT AND BACK BUMPERS OF CAST STEEL.

48 PUSHING SHOES TO BE CAST IN REAR BUMPER.

49 PUSH POLE TO BE LOCATED ON RIGHT SIDE OF TENDER.

50 SWITCHING ROPE TO BE SAME AS FOR 12 34 ¼ E 37.

51 RADIAL SPRING BUFFER BETWEEN ENGINE AND TENDER TO BE LOCATED ON TENDER, AND TO HAVE A LARGE RADIUS.

52 TWO STEPS WITH PIPE HAND RAIL ACROSS REAR.

53 TENDER WHEELS TO BE DUPLICATE OF THOSE ON PREVIOUS LOCOMOTIVES.

THE BALDWIN LOCOMOTIVE WORKS As Specification C-3524 (See Sup. 1)

Memorandum Spec'n 10866

SPECIFICATION FOR LOCOMOTIVES 12 34 ¼ E 41

FOR The East Broad Top Railroad and Coal Company.

1-31-16

Gen. as shop print from B.L.W. tracing 30986

Engine Drawing No. 17

Gauge of Road 3' 0" Play ⅜"
Wheelbase, Rigid 13' 6" Driving 13' 6" Total 28' 8"
Total wheelbase, eng. and tend. Actual 54' 8" / Limited to -----
Grades: - 2½% **Rails:**-60 lbs. per yard.
Curves 17 degrees on Main Line, 23 degrees on Y's

Limits, Height 12' 10" Width 9' 0"
Weight (approximate) in working order, Total 163,000 lbs.
On F. tr'k 11,000 lbs.. Drivers 134,000 lbs.. B. tr'k 18,000 lbs.

Tractive power 30,600 lbs.. Ratio of adhesion 4.37
Work'g St'm Pres. 180 lbs.. Service Freight
Fuel Soft Coal.

7794 FOR HEREAFTER

6 **Boiler** Steel Thick ⅞" Bill 7771
Boiler, Diam. 66" Plan Straight Top.
7 Boiler st'm pres. 200 lbs.. Tested to 220 lbs. steam pres. / 267 lbs. water pres.
Longitud. seams Butt jointed, double covering strips.

8 **Dome,** diam. 29" Pos. Central.

10 **Firebox** Steel Combustion chamb. None
Firebox, length 101 11/16" Width 60" Depth F. 62 ⅛" B. 51½"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
10 Firedoor opening 16" diameter
Water space, Front 3½" Sides 3" Back 3"
Water space, Frame Double Riveted
Water space stays ⅞" diam. (See Sup. 11)

12 Radial stays 1" diam. Sling stays front Two rows of B.L.W. expansion stays
Button heads below crown on eight central rows
Crown bars None Placed ----- above crown
Crown bolts -----

13 Flues #9 B.W.G. Seamless Steel
Tubes #11 W.G. ~~Hot-Rolled Steel~~ Cold Drawn Seamless Steel
Tube ends Swaged for copper ferrules firebox ends. 4/27/16
Number 42 / 149 Diam. 5⅜" / 5" Length 17' 6"

Heating Surface	Flues 539	Combus. Chamb. ——	Total	2020
	Tubes 1340	Fire Box 141	Fire Brick Tubes	----
Grate area 42.5		Ratio to Heating Surface 1 : 47.6		
Superheater 465				

Fire Brick arch None

14 **Grates** Rocking bars with drop plate (See sup. 14)
21 **Ash Pan,** Dampers None

Throttle Balance Pos. Dome
22 Dry pipe Steel

Superheater (See sup. 23)

Smokebox extension With Cleaning hole and cap L.S. only
Spark arrester-hopper (See sup. 24)
Netting and deflect. plates With

Exhaust nozzles Single High

Smoke Stack Iron Straight - Dia. 18" Hole in S. B. dia. 20"
Stack to have extension and for cleaning pipe.

26 **Safety Valves** (not spec) Two Consolidated 3"
Safety valves None with relief lever, Set to 180 lbs.
Whistle (See sup. 27)

28 **Steam Gauge** One Iron 7" Maker: -Ashcroft (spec)
Steam gauge stand Iron **Clock** None

29 **Water Gauge** One Ashcroft Prismatic
Gauge Cocks Three back
30 **Cab Lamps** to burn oil
Surface valve None
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
31 **Blower Valve** B. L. W.

Blow off Cock Two (See sup. 32)
Cleaning Plugs
Firebox Corners diagonal, front and back
Crown, Two each side and two back
Waist, One under front.
Front tube sheet, Two Fusible plug One

Pump None Pos. -----
Top chamb. ----- Bottom chamb. -----
Feed Cock ----- Feed pipes -----
Checks ----- Check pipes -----

33 (spec) **Injectors** Two Hancock No. 8
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B.L.W. Pos Right and Left

Steam Heat None

34 35 **Cab** Steel

Cab boards Wood Nosing Angle Iron
Running boards Wood Nosing Angle Iron
Hand rail Iron Located on Boiler

42 43 **Back Bumper** Bar Steel Back drawbar height 24"

44 **Pilot** Wood, short pattern Pushing shoes None
Front Bumper Oak Bumper plate With
Steps (See sup. 44)

Front Drawhead, Center above rail 26"
Coupler Climax three-quarter size automatic coupler of cast steel

Signal fixtures Iron on bumper

Headlight to be Schroeder.
Headlight One Round Case 16" Reflector, To burn Kerosene
Headlight, Nos. on sides With H'd'l step With
Lamp shelf None Nosing -----

Bell 92 pounds. Bell Ringer (See sup. 45)
45 (spec) **Sand Box** Two Diam. 31" Body Iron Ptd. Pipes Iron
Sander Leach Air, trap A-1, in each box to sand front of forward drivers and back of rear drivers
Dome casing Iron Painted.

47 **Boiler Jacket** #22 Plan. Steel Bands Iron Style 9
Boiler Lagging Magnesia Sectional.
Lagging over ~~e~~ylinders to be removable.

53 Frames Cast Steel Braces Solid

56 **Cylinders,** Diam. 20" Stroke 24"
Sl'm ports, Length 20.63" Width 1¼" Bridges -----
Exh. ports, Length ----- Width ----- Valve lead ⅛"
Valve travel 5½" Steam lap ⅞" Exhaust clearance -----
Eccentric crank throw 20"
57 S. P. Lubr. Detroit Triple #22 Bulls Eye (See sup. 57)
Cyl'r heads Cast Iron
Cyl'r casings Iron Ptd. Head covers Steel Painted.
Sl'm chest casings ----- Covers -----
Slide valves 4½" diam. Piston Type.
Met. pkg UNITED STATES KING TYPE (spec)

59 **Pistons** Cast iron rings sprung into solid head.
60 **Guides** C. H. Steel Oil cups
61 **Crossheads** Cast Steel
Wrist Pins Steel Rod cups (See sup. 63)

Valve Motion Southern
Links, sliding blocks, pins, lifting links and eccentric rod laws to be well case hardened or to have hardened bushings.

All threads on bolts (except stayboltz) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

72 **Drivers,** O. S. Diam. 48" Cen. diam. 42" Centres Cast Iron

Tires Hard Steel Held by Shrinkage and Shoulder.
Tires Flanged, Pos. Front and Back. Size 3" x 5"
Tires, Plain, Pos. Intermediate Size 3" x 6"
Lateral play between driving boxes and wheel hubs 1/16" total
Driving Boxes Cast Steel (See sup. 72)
Journals, Diam. 8½" Length 8"

Springs, Make B. L. W.

Front Engine Truck Two Wheeled Swing Bolster Center Bearing
Traverse 4" each side of cen. Cen. pin liners None
Journals, Diam. 5" Length 9" Boxes Cast Iron
Wheels, Diam. 36" Tread ---- Kind Centers, Cast Iron Spoke
Tires Steel Cen. diam. 19" Size 2½" x 5"
Tires held by Shrinkage and Shoulder.

Back Engine Truck Two Wheeled Baldwin Radial C.S.Bearing
Traverse 4" each side of cen. Cen. pin liners None
Journals, Diam. 5" Length 9" Boxes Cast Steel
Wheels, Diam. 36" Tread ---- Kind Centers, Cast Iron Spoke
Tires Steel Cen. diam. 21" Size 2½" x 6"
Tires held by Shrinkage and Shoulder.

74 **Brake,** position On all Driving and Tender Wheels.
Operating Engine sch. #6-ET, West'g. Combined Auto. and Straight Air
Parts Eng. Tr'k sch. -----
Foundation Drivers, sch. #K-2 American C.S. Equalized
Parts Eng. Tr'k sch. -----
Air pump Two 9½" Pos. Both on Left Side.
Train connections Front and Back.
Train signal, sch. None

Tender Eight Wheeled, Drawing No. 720
Weight, with fuel and water, about 80,000 lbs.

Tank 4,000 Gallons. Bill 4199
90 Tank "U" shape, Straight Top. Fuel Capacity 7 tons.

Tool Boxes Hard Wood, Top.
Tender floor boards to be spaced about 1" apart
Frame Steel 8" Channels.
Frame same as for 12 32 ¼ E 12 with wood floor.
92 Front Drawbar height 23⅝"
93 Pilot None Pushing shoes None
Back drawhead, center above rail 26"
Coupler Climax three-quarter size automatic coupler of cast steel.

Steps (See sup. 94)
Side bearings on both front and back tender trucks.
95 **Trucks** Vulcan Trucks with Cast Steel Bolsters.

Springs Elliptic. B. L. W. make
96 Journals, Diam. 4½" Length 8"
Wheels, Diam. 26" Tread ---- Kind Centers Cast Iron spoke
Tires Steel Cen. diam. 21" Size 2½" x 5"
Tires held by Shrinkage and Shoulder.
Safety chains Single.

97 **Brake** Position On all wheels.
Brake sch. #6-ET West'g. Auto. and Straight Air with 10" x 12" tender cylinder.
Brake shaft to pass through end of tank, to be out of way of the fireman.
Furnish two Johnson replacers for 60 pound rails.
List of tools, sch. #29
Photo sch. #2 Inspection (See sup. 6)
To be weighed Yes Material spec'ns B. L. W.
Certificate of boiler test (See sup. 7)
Junior laws to 4-7-16 Shipment On Car (See sup. 8)

Brass shop finish, No. 1
Machine shop finish D-165

B. L. W. Patents	Throttle	Pat.	Jan. 23, 1900 (Cast On)
	Feed Pipe Strainer	Pat.	Sept. 1, 1903 (Cast On)
	Steam Pipe Cover	Pat.	July 18, 1911 (Cast On)
	Back Engine Truck	645,834	Mar. 20, 1900 (Name Plate)

Property plates None

Painting: Engine, style -----Olive Green, No striping.
Painting: Tender, style -----Olive Green, No Striping.
Lettering, etc., in light chrome yellow (Orange) same as for 12 32 ¼ E 12. Figures 5" on dome, 10" on cab sides and 12" x 18" on back of tank. Letters on tank sides to be 12"
Mark on tank sides E. B. T.

Road Nos. Pos. Road No. Name None
F. No. Plate 16
Dome
Cab Sides
Back of Tank.

Hereafter Cylinder Cock Rigging to be applied as per Drawing No. 30986

SPECIFICATION FOR LOCOMOTIVES 12 32 ½ E 12.

For The Penn Brass Top Railroad and Coal Company.

4

1 Details, as far as practicable, to be the same as on Engine 15, Class 12-32 ½ E 12.

2 Locomotive and tender to be built to latest Interstate Commerce requirements.

3 The axles, wrist pins, piston rods shall have the date of application, original diameter, and kind of material stamped on the end.

4 All piping subject to boiler steam pressure to be double strength and to have extra heavy fittings.

5 Engine and tender to be loaded on car on their own wheels.

6 Boiler to be inspected during process of building. Company to be notified two days before boiler is ready for inspection so as to have representative present.

7 Boiler and machinery to be built to stand 200 lbs. pressure. Provide boiler inspection certificate to Penna. State requirements, in addition to the requirements of the Interstate Commerce Commission, i.e., furnish three copies of B. L. W. form 1036.

8 Dome one piece type.
Baldwin dome construction, with throttle valve to be same as for 12 32 ½ E 12, except provide drifting valve.

9 Auxiliary dome not required.
Manhole and cover to be applied in top of boiler for inspection.

10 Firebox to be made as deep as possible. Crown and side sheets to be in three pieces.
Fire-door opening to be formed by flanging outward and riveting together the inner and outer sheets. Fire-door and fire-door hole flanging, same style as for 12 32 ½ E 12.
Distance between top of fire-door and crown sheet to be about 6".

11 Staybolts (except Tate) to be Falls Hollow hollow staybolt
(See Sup. 15)
Flexible staybolts, Tate, about 200 in number, at sides of fire-box, and at throat, same as on Engine 15, Class 12-32 ½ E 12. Also Tate flexible staybolts to be placed in three rows from bottom of mud ring on sides, and three rows on sides from each end of fire-box; this will require about 201 additional bolts per locomotive.

12 Staybolts along the center of crown sheet to have heads under the sheet.

13 Tubes not to be safe ended.
Tubes to be swaged not over 2", light ferrules to be used. Tubes (2" and 5½") to be electrically welded in the fire-box tube sheet.

14 Grate bars to rock in four sections and to have drop plate at front and rear.
Grates to have center frame of cast steel.

15 Use Hollow Space Solid stay bolts with drill hole drilled from outside. Drill used on this loco. by contractor. For Hreaften use Falls Hollow Bolts.

21 Ash pan of the self dumping hopper type, with hopper as near air tight as possible. Air space between ash pan and mud ring large enough to provide all air necessary for combustion.
Dampers to be omitted.
The ash-pans on previous engines are so constructed that the ashes will not drop to the bottom; this condition allows the ashes to come in contact with grate bars and rest bars so that they heat and bend and become distorted. Special attention to be paid to designing of ash-pan.
Ash-pan shall be so constructed as to clear the rail not less than 2½" when tires are worn to scrap limit.

22 Steam pipes to cylinders to be of the outside type.

23 Superheater as Locomotive Superheater Co's Spec'n No. C-5316, dated March 22, 1916 (copy attached).
Royalty on superheater payable by B. L. W.
Superheater units to have welded return bends.

24 Smokebox door same as for 12 32 ½ E 12.
Front of pressed steel 1" thick. Door to be held by clamps.
Spark ejector operated by steam to deliver to right side of engine, same style as for 12 32 ½ E 12.

25 Cleaning hole and cap to be applied right and left in smoke box for inspection of superheater.

26 Safety valves to be applied in side of dome.

27 One Hancock 6½" chime whistle, to be connected to right side of dome, with suitable angle valve.

28 Steam gauge to have double spring arrangement.

29 Water gauge to be located on right side, in front of engineer.
On present engines water glass obstructs the engineer in the front of the cab, it should be located close to the boiler.

30 Additional cab lamp for use of Engineer in reading orders. This lamp to be so constructed that it can be darkened after Engineer has read his orders.

31 Blower valve fitting placed near center of boiler.

32 Blow-off cocks to be Hancock Binary 1½" latest type with double steel discs located one right and one left, near front end of firebox.

33 Injectors to be placed in front and outside of cab.
Checks with front cocks, Baldwin B type, operated from cab.

34 Bridge pipe through which the throttle stem passes to be made large enough to take Schaeffer throttle, blower valves, and air pump throttle. All steam valves and pipe work to be placed ahead and outside of cab. (See Sup. 15)
As little pipe work as possible to be placed over jacket in cab so staybolts can be easily inspected and repaired.
All pipe work in staybolt zone to be so placed that it will not be necessary to remove it when changing staybolts.

35 Cab to have two small windows and one large window on each side, the large window to be in the middle, 36" x 24", the sash being made in halves, arranged to slide each side of center. Cab roof with well rounded corners.
Ventilator in roof.
Cab made as roomy as possible.

36 Cab to be provided with storm window constructed so as to be convenient for Engineer when seated.

THE BALDWIN LOCOMOTIVE WORKS

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SUPERHEATER SPECIFICATION FOR LOCOMOTIVES 12 32 ½ E 12

For The Penn Brass Top Railroad and Coal Company.

Locomotive Superheater Company's Specification No. C-5316 dated March 22, 1916.
Specification for Superheater with Top Headers, Double Loop Arrangement.

BOILER TUBES	147 in number 2" O. D. 11' 6" ins. over tube sheets. Tubes located between and adjacent to boiler flues are to be beaded over at front end.
BOILER FLUES	24 in number 5½" O. D. ⅜ thick of cold drawn seamless steel. Flues to be straight, true to gauge and must not be more than one gauge from specified thickness, as shown on Card 1469-A
BOILER FLUE SETTING	Radius ⅛ inch on both edges of flue holes in firebox tube sheet and on front edge of flue holes in front flue sheet as shown on drawings, except for copper sheets. Back end to be set with copper ferrules, rolled, beaded and prossered except for copper sheets. Front end to be rolled and beaded. Rollers to have at least 5 rolls. Prosser to have at least 12 sections Card 1456
TUBE SHEET LAYOUT S. H. UNITS	to be in accordance with Card 5691 12 units ½ O. D. ⅝ thick of seamless steel. Pipes united by cast steel return bends as shown on Card 10789-D
	Each unit to be tested, before being placed in boiler, with water under pressure of 500 pounds.
S. H. PIPE SUPPORTS	Of steel fastened securely on superheater pipes so as not to slide as shown on Card 10000
S. H. PIPE JOINT	To be made in best possible manner to insure absolutely tight joints in accordance with the practice of Card 1043
S. H. UNIT CLAMP BOLT	To be of steel having a tensile strength between 60,000 lbs. and 70,000 lbs. per sq. inch and to be as shown on Card 1086-A
S. H. HEADER	To be of close grain cylinder iron, steam tight in every respect. Joint ring for connection to dry pipe to have flat side against header flange. Casting should be moulded with the face having the superheater joints placed downward in the mould to secure the best quality of metal on surface where superheater joints are made. Each header to have a serial number cast on in such a location as not to be removed in finishing. No patch plugs allowed on ball joint seats. Headers must not be treated excessively with sal ammoniac. Header casting to be tight under water pressure of 250 lbs. Test pressure to be applied separately to the saturated and to the superheated steam passages, so as to insure soundness of all partition walls. Card 1942-D
S. H. HEADER SUPPORTS	To be securely bolted or riveted to boiler shell. To be properly located so as to support the header after header has been correctly located. Header should then be bolted to supports. This to be done before superheater units are put in place. Card 1323
ST. PIPE JOINT RINGS	Should be of cast iron.
DEFLECTING PLATE	To be constructed so as to permit easy inspection and removal of superheater units and joints.
DAMPER CYLINDER	Design to be in accordance with Card See A rrgt. To be carefully and accurately made. Piston not to be more than 0.01 inch smaller than bore. Bearings for Piston and extension to be in line. Piston to be ground and to operate freely under a pressure as low as 40 lbs. per sq. in. Steam Pipe to damper cylinder should be as short and free from bends as possible so as not to cause water to collect in cylinder. Pipe to be protected against freezing. Card 1242-A
DAMPER SHAFT COUNTERWEIGHT	To be painted a light color to render it easily visible by the engineer Card 1067
S. H. ARRANGEMENT	To be in accordance with Card 4715-A
TEST (FINAL)	The Superheater, after assembling in boiler and after steam pipes are fitted thereto to be thoroughly tested and to be tight under water pressure of 250 lbs.

Name	Card	Name	Card
Damper	10734-K	Damper Shaft Link	1070
Damper Cylinder Arm	1074	Patent Plate	3156
Damper Cylinder Pipe Fitting	1069-A	S. H. Unit Bolt Washer	1071
Damper Cylinder Pipe Union	1287	S. H. Unit Clamp	1073
Damper Cylinder Piping Diagram		S. H. Unit Clamp Washer	10305
Damper Cylinder Support		S. H. Pipe End	1346
Damper Shaft	1068	S. H. Pipe Band	1988
Damper Shaft Arm	1065	Return Bends	10094
Damper Shaft Bearing (O. S.)	1076-1077	Deflecting Plate Handle	1497
Damper Shaft Bearing (I. S.)	1075-D	Lubricator Connection	3028

SPECIFICATION FOR LOCOMOTIVES 12 34 ½ E 12.

For the Penn Areed Top Railroad and Coal Company.

1 Details, as far as practicable, to be the same as on Engine 15, Class 12-32 ½ E 12.

2 Locomotive and tender to be built to latest Interstate Commerce requirements.

3 The axles, wrist pins, piston rods shall have the date of application, original diameter, and kind of material stamped on the end.

4 All piping subject to boiler steam pressure to be double strength and to have extra heavy fittings.

5 Engine and tender to be loaded on car on their own wheels.

6 Boiler to be inspected during process of building. Company to be notified two days before boiler is ready for inspection so as to have representative present.

7 Boiler and machinery to be built to stand 200 lbs. pressure. Provide boiler inspection certificate to Penna. State requirements, in addition to the requirements of the Interstate Commerce Commission, i.e., furnish three copies of B. L. W. form 1036.

8 Dome one piece type.
Baldwin dome construction, with throttle valve to be same as for 12 32 ½ E 12, except provide drifting valve.

9 Auxiliary dome not required.
Manhole and cover to be applied in top of boiler for inspection.

10 Firebox to be made as deep as possible. Crown and side sheets to be in three pieces.
Fire-door opening to be formed by flanging outward and riveting together the inner and outer sheets. Fire-door and fire-door hole flanging, same style as for 12 32 ½ E 12.
Distance between top of fire-door and crown sheet to be about 6".

11 Staybolts (except Tate) to be ~~Selle Hollow Hollow staybolt~~ Tate (see amp 15)
Flexible staybolts, Tate, about 200 in number, at sides of fire-box, and at throat, same as on Engine 15, Class 12-32 ½ E 12. Also Tate flexible staybolts to be placed in three rows from bottom of mud ring on sides, and these rows on sides from each end of fire-box; this will require about 204 additional bolts per locomotive.

12 Staybolts along the center of crown sheet to have heads under the sheet.

13 Tubes not to be safe ended.
Tubes to be swaged not over ⅛", light ferrules to be used. Tubes (2" and 5½") to be electrically welded in the fire-box tube sheet.

14 Grate bars to rock in four sections and to have drop plate at front and rear.
Grates to have center frame of cast steel.

15 Arch tubes, solid stay bolts with hill tak holes drilled from outside. Drive used on this loco. by ~~attached~~ Hereafter use Tate Hollow Hollows

21 Ash pan of the self dumping hopper type, with hopper as near air tight as possible. Air space between ash pan and mud ring large enough to provide all air necessary for combustion.
Dampers to be omitted.
The ash-pans on previous engines are so constructed that the ashes will not drop to the bottom; this condition allows the ashes to come in contact with grate bars and rest bars so that they heat and bend and become distorted. Special attention to be paid to designing of ash-pan.
Ash-pan shall be so constructed as to clear the rail not less than 2½" when tires are worn to scrap limit.

22 Steam pipes to cylinders to be of the outside type.

23 Superheater as Locomotive Superheater Co's Spec'n-No.0-3319, dated March 22, 1916 (copy attached).
Royalty on superheater payable by B. L. W.
Superheater units to have welded return bends.

24 Smokebox door same as for 12 32 ½ E 12.
Front of pressed steel ½" thick. Door to be hung by clamps. Spark ejector operated by steam to deliver to right side of engine, same style as for 12 32 ½ E 12.

25 Cleaning hole and cap to be applied right and left in smoke box for inspection of superheater.

26 Safety valves to be applied in side of dome.

27 One Hancock 6" whistle, to be connected to right side of dome, with suitable angle valve.

28 Steam gauge to have double spring arms, movement.

29 Water gauge to be located on right side, in front of engineer.
On present engines water glass obstructs the fireman in the front of the cab; it should be shorter glass to the boiler.

30 Additional cab lamp for use of Engineer in reading orders; this lamp to be so constructed that it can be darkened after Engineer has read his orders.

31 Blower valve fitting placed near center of boiler.

32 Blow-off cocks to be Hancock Binary 1½" Detach type with double steel discs located one right and one left, near front end of firebox.

33 Injectors to be placed in front and outside of cab.
Checks with front cocks, Sellers 8 type, operated from cab.

34 Bridge pipe through which the throttle rise passes to be made large enough to take Schaffer throttle, blower valve, and air pump throttle. All steam valves and pipe work to be placed ahead and outside of cab. (see amp 35)
As little pipe work as possible to be placed over jacket.
In cab so staybolts can be easily inspected and repaired.
All pipe work in staybolt zone to be so placed that it will not be necessary to remove it when changing staybolts.

35 Cab to have two small windows and one large window on each side, the large window to be in the middle, 30" x 34", the seam being made in halves, arranged to ride each side of center. Cab roof with well rounded corners.
Ventilator in roof.
Cab made as roomy as possible.

36 Cab to be provided with storm window constructed so as to be convenient for Engineer when seated.

SPECIFICATION FOR LOCOMOTIVES 12 34 ½ E 12.

For the Penn Areed Top Railroad and Coal Company.

Locomotive Superheater Company's Specification No. 0-3319 dated March 22, 1916.

Application for Superheater with Top Header, Double Loop Arrangement.

BOILER TUBES	147 in number 2" O. D. 11' ft. 8 ins. over tube sheets. Tubes located between and adjacent to Boiler flues are to be beaded over at front end.	
BOILER FLUES	22 in number 5½" O. D. #9 B.W.G. thick of cold drawn seamless steel. Flues to be straight, true to gauge and wall not to vary more than one gauge from specified thickness.	
BOILER FLUE SETTING	as shown on	Card 1409-A
	Radius ⅛ inch on both edges of flue holes in firebox tube sheet and on front edge of flue holes in front flue sheet as shown on drawings, except for copper sheets. Back end to be set with copper ferrules, rolled, beaded and prossered except for copper sheets. Front end to be rolled and beaded. Rollers to have at least 9 rolls. Prosser to have at least 12 sections	Card 1136
TUBE SHEET LAYOUT	to be in accordance with	Card 5691
S. H. UNITS	22 units ½" O. D. 7 ft. 6" thick of seamless steel. Pipes united by cast steel return bends as shown on	Card 10769-T
	Each unit to be tested, before being placed in boiler, with water under pressure of 500 pounds.	
S. H. PIPE SUPPORTS	Of steel fastened securely on superheater pipes so as not to slide as shown on	Card 10010
S. H. PIPE JOINTS	To be made in best possible manner to insure absolutely tight joints in accordance with the	Card 1043
S. H. UNIT CLAMP BOLT	notation on	Card 1086-A
	To be of steel having a tensile strength between 60,000 lbs. and 70,000 lbs. per sq. inch and to be as shown on	
S. H. HEADER	To be of close grain cylinder iron, steam tight in every respect. Joint ring for connection to dry pipe to have flat side against header flange. Casting should be moulded with the face having the superheater joints placed downward in the mould to secure the best quality of metal on surface where superheater joints are made. Each header to have a serial number cast on in such a location as not to be removed in finishing. No patch plugs allowed on ball joint seats. Headers must not be treated excessively with salt ammoniac. Header casting to be tight under water pressure of 250 lbs. Test pressure to be applied separately to the saturated and to the superheated steam passages, so as to insure soundness of all partition walls.	Card 1942-D
S. H. HEADER SUPPORTS	To be securely bolted or riveted to boiler shell. To be properly located so as to support the header after header has been correctly located. Header should then be bolted to supports. This to be done before superheater units are put in place.	Card 1323
ST. PIPE JOINT RINGS	Should be of cast iron.	
DEFLECTING PLATE	To be constructed so as to permit easy inspection and removal of superheater units and joints.	
DAMPER CYLINDER	Design to be in accordance with	Card See A rngt.
	To be carefully and accurately made. Piston not to be more than 0.01 inch smaller than bore. Bearings for Piston and extension to be in line. Piston to be ground and to operate freely under a pressure as low as 40 lbs. per sq. in. Steam Pipe to damper cylinder should be as short and free from bends as possible so as not to cause water to collect in cylinder. Pipe to be protected against freezing.	Card 1242-A 7/2/16
DAMPER SHAFT COUNTERWEIGHT	To be painted a light color to render it easily visible by the engineer	Card 1087
S. H. ARRANGEMENT	To be in accordance with	Card 4715-A 7/12/16
TEST (FINAL)	The Superheater, after assembling in boiler and after steam pipes are fitted up, is to be thoroughly tested and to be tight under water pressure of 250 lbs.	

Name	Card	Name	Card
Damper	10754-A	Damper Shaft Link	1070
Damper Cylinder Arm	1074	Patent Plate	3156
Damper Cylinder Pipe Fitting	1069-A	S. H. Unit Bolt Washer	1071
Damper Cylinder Pipe Union	1228	S. H. Unit Clamp	1073
Damper Cylinder Piping Diagram		S. H. Unit Clamp Washer	10305
Damper Cylinder Support		S. H. Pipe End	1344
Damper Shaft	1066	S. H. Pipe Band	1988
Damper Shaft Arm	1065	Return Bends	10094
Damper Shaft Bearing (O. S.)	1076-1077 7/2/16	Deflecting Plate Handle	1497
Damper Shaft Bearing (I. S.)	1075-D	Lubricator Connection	3023

41 P. [illegible] must clear the rail 6" when the springs are down.

42 Spring buffer between engine and tender located on tender.

43 Cab apron between engine and tender to be roughened in order to secure footing.

44 All steps, grab irons, uncoupling levers and ash pans to conform to the requirements of both the Penna. State Railroad and the Interstate Commerce Commission.

45 Gollmer Improved Auto. Bell Ringer.

46 Sand boxes to be larger in diameter than for 12-32 [illegible] 19. Front sand box and bell placed ahead of dome, with bell ahead of sand box. Arrange equal spaces between stack, bell, sand boxes, dome and cab, using largest outside diameter for measuring.

47 Driver brakes to be applied over sidecrolls so that it can be removed in sections without damage to jacket or removal of any of the injector pipes or other piping.

77 Royalty on valve motion payable by B. L. W.
Oil cups to be forged solid on motion work.

72 Apply Ragonnet Reverse gear as covered on Extra Order 4364 dated 5-3-16.

73 Driving wheel centers to have large hub bearing surface inside. Brass hub liners on all driving boxes attached to the boxes and not to the wheel centers.

74 Main air reservoirs to be Westinghouse enamelled.
Provide extra large air reservoir capacity.
Furnish West'g. Air Drum Cocks (instead of B.L.W.)
The air reservoirs on present engines are located so that it is impossible to get at the ash-pan to clean it. They should be moved forward underneath the running boards.

75 Foundation brake gear shall be so constructed as to clear the rail not less than 2½" when tires are worn to scrap limit.

T E N D E R .

90 Tank funnel to be oval, about 14" x 30".
Apply two drain pipes in rear of tank, near funnel.

91 Tender coupler should be put on with six 1½" bolts instead of with four 1" bolts.

92 Spring buffer between engine and tender located on tender.

93 Cab apron between engine and tender to be roughened in order to secure footing.

94 Step and handrail at each corner of tender.
All steps, grab irons, uncoupling levers, etc. to conform to the requirements of the Penna. State Railroad and the Interstate Commerce Commission.

95 Provide clearance of 3½" between bottom of tender truck side frame and the top of rail.

96 Journals M.C.B. Standard with McCord Malleable Iron journal boxes.

97 Foundation brake gear shall be so constructed as to clear the rail not less than 2½" when tires are worn to scrap limit.

98 Measurements for gauge on tender wheels as B.L.W. Tracing 38.290. 2/7/16

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-3216.

Memorandum Spec'n 10696

SPECIFICATION FOR LOCOMOTIVES 10 46 E 92 to 94, 95.

FOR { Lake Superior and Ishpeming Ry. Co. for 92 to 94. / Munising, Marquette & Southeastern Railway Co. for 95.

Gen. as B.L.W. tracing 29770

Engine Drawing No. 6

12-1-15.

Gauge of Road 4' 8½" Play ½" except ⅞" for F. & B. Drivers

Wheelbase, Rigid 16' 0" Driving 16' 0" Total 25' 0"

Total wheelbase, eng. and tend. { Actual 60' 11½" / Limited to Turntable 65' 0"

Curves 5 degrees. **Grades,** 1.63%

Limits, Height 15' 6" Width 10' 6"

Weight (approximate) in working order, Total 288,000 lbs.

On F. tr'k 30,000 lbs., Drivers 238,000 lbs., B. tr'k ----- lbs.

Tractive power 55,900 lbs., Ratio of adhesion 4.26

Work'g St'm Pres. 185 lbs., Service **Freight**

Fuel Soft Coal.

Boiler Steel Thick 15/16" Bill 7674

Boiler, Diam. 88" Plan Straight top.

Boiler st'm pres. 200 lbs., Tested to { 220 lbs. steam pres. / 267 lbs. water pres.

Longitud. seams (See sup. 7)

Dome, diam. 33" Pos. Central.

Firebox Otis Steel Combustion chamb. None.

Firebox, length 108⅞" Width 78⅛" Depth F. 84" B. 66½"

Firebox, Tube ½" Crown 7/16" Sides ⅜" Back ⅜"

Firedoor opening One Oval 13" x 18", Franklin pneumatic #6. door.

Water space, Front 5" Sides 4½" Back 4½"

Water space, Frame Double Riveted

Water space stays 1" diam. with 3/16" holes 1½" deep from O.S.

Radial stays 1½" diam. Sling stays front { Three rows of B.L.W. Expansion Stays.

Button heads below crown on Twelve central rows

Crown bars None Placed ----- above crown

Crown bolts -----

Flues #9 B.W.G. Seamless Steel.

Tubes #11 W. G. Charcoal Iron.

Tube ends Swaged for copper ferrules, firebox ends.

Number 308 Diam. 2" Length 15' 6"

Heating Surface	Flues 976 sq. ft.	Combus. Chamb. None	Total 3643.2 sq. ft.	
	Tubes 2422 sq. ft.	Fire Box 216 sq. ft.	Fire Brick Tubes 29.2	
Grate area 38.7 sq. ft.	Ratio to Heating Surface 1 : 62			
Superheater 644 sq. ft.				

Fire Brick Arch, American on four tubes, 3" outside diam.

Grates Rocking bars and drop plate.

Ash Pan, Dampers None.

Ash pan to be hopper style, self cleaning.

Air openings of ash pan to be covered with netting.

Throttle Balance Pos. Dome.

Dry pipe Steel

Superheater (See sup. 10)

Smokebox extension With Cleaning hole and cap L.S. only.

Spark arresting hopper With

Netting and dirlies, plates With

Exhaust nozzles Single high.

Stack Steel, Straight Dia. 18" Hole in S. B. dia. 24"

Safety Valves Two Coale 3½" Muffled.

Safety valves None with relief lever, Set to 185 lbs.

Whistle B. L. W. plain.

Steam Gauge One Iron 7", Baker:-Ashcroft. (spec)

Steam gauge stand Iron **Clock** None.

Water Gauge One B.L.W.(Ironclad) **Cab Lamps** to burn oil.

Gauge Cocks Three Back. Surface valve None

Lowest gauge cock 2½" above highest part of crown

Lubricator steam valve without separate dry pipe to dome

Blower Valve B. L. W.

Blow off Cock One B. L. W. Pos:-Front

Cleaning Plugs

Firebox Corners diagonal.

Crown, Three Right Side, two Left Side and four, Back.

Waist, One under front.

Front tube sheet, One Fusible plug None

Pump None Pos. -----

Top chamb. ----- Bottom chamb. -----

Feed Cock ----- Feed pipes -----

Checks ----- Check pipes -----

Injectors Two Nathan (See sup. 14) No. 13

Injectors, Pos. Right and Left Steam pipes Copper

Pipes, Check Iron Feed Iron Overflow Iron

Check Nathan Double Type "S" Pos. Top of boiler.

Hose strainers to be Baldwin with swing cover.

Steam Heat None

Coal Sprinkler to be Baldwin.

Cab Steel

Cab boards Steel Nosing T-Iron

Running boards Steel Nosing T-Iron

Hand rail Iron Located on Boiler.

Back Bumper Bar Steel Back drawbar height 29½"

Radial buffer, Economy, applied between engine and tender.

Pilot Wood Pushing shoes Cast to wrapper.

Front Bumper Cast Steel Bumper plate Wood

Steps, hand holds etc. to conform to L. C. C. requirements.

Front Drawhead, Center above rail 33½"

Coupler Sharon M.C.B. Auto. with adjustable pocket.

Signal fixtures Iron on bumper.

Headlight to be "Star" 16" account of mistake

Headlight One Round Case with Reflector, To burn Kerosene.

Headlight, Pos. on sides With Hdlt step With

Lamp shelf None Nosing -----

Bell 92 pounds. Gollmar Air Bell Ringer.

Sand Box One, Diam. 50" Body Iron #14. Pipes Iron

Sander Leach Air Trap A-10

Sander to send front of front drivers and back of main drivers.

Dome casing Iron Painted.

Boiler Jacket for Flue Steel Bands Iron Style 9 and 14.

Boiler Lagging Magnesia Sectional.

Backhead of boiler to be lagged and jacketed.

THE BALDWIN LOCOMOTIVE WORKS

L. A. Pfaff

March 1916

SPECIFICATION FOR LOCOMOTIVES 10 46 E 92 to 94, 95.

FOR { Lake Superior and Ishpeming Ry. Co. for 92 to 94. / Munising, Marquette & Southeastern Railway Co. for 95.

469

Frames Cast Steel Braces Solid

Cylinders, Diam. 28" Stroke 30"

St'm ports, Length 32½" Width 1-13/16" Bridges 3⅜"

Exh. ports, Length ----- Width ----- Valve lead ⅛"

Valve travel 6½" Steam lap 1-1/16" Exhaust clearance ----

Eccentric crank throw 8½"

S. & F. Lubr. Nathan Five Feed Bulls Eye.

Cyl'r heads Cast Steel, Front and Back.

Cyl'r casings Iron Ptd. Head covers Steel Painted.

St'm chest casings ----- Covers -----

St'm chest valves 14" diam. Piston Type.

Met. pkg { PISTON RODS / VALVE STEMS } UNITED STATE KING TYPE.

Pistons (See sup. 3a)

Cuckoo Steel Oil cups Needle.

Crossheads Cast Steel

Wrist Pins Steel Rod and cups, (See sup. 3)

Parallel Rods to have solid ends.

Valve Motion Baker

Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.

All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

Drivers, O. S. Diam. 57" Cen. diam. 50" Centres Cast Steel

Tires Steel Held by Shrinkage and Shoulder.

Tires, Flanged, Pos. All Size 3½" x 5½"

Tires, Plain, Pos. ----- Size -----

Lateral play between driving boxes and wheel hubs—(See sup. 6)

Driving Boxes Cast Steel

Journals, Diam. 11" Length 13"

Springs. Make Crucible Steel Co. of America.

Front Engine Truck Two Wheeled Swing Bolster Centre Bearing.

To swing 3" each side of cen., Cen. pin liners None

Journals, Diam. 6½" Length 12" Boxes Cast Iron

Wheels, Diam. 30" Tread -----Kind Cast Iron Spoke center.

Tires Steel Cen. diam. 29" Size 3½" x 5½"

Tires held by Shrinkage and Shoulder.

Back Engine Truck None Wheeled -----

To swing ----- each side of cen., Cen. pin liners -----

Journals, Diam. ----- Length ----- Boxes -----

Wheels, Diam. -----Tread -----Kind -----

Tires ----- Cen. diam. ----- Size -----

Tires held by -----

Brakes Position On all driving and tender wheels.

Cylinders { Engine, Sch. #6 ET West'g Combined Auto. and / Eng. Trk. sch. ----- Straight Air

Foundation { Drivers, sch. UH-3-20 American C.S. Equalized. / Eng. Trk. sch. -----

Air pump One 8½" Gross Compound WAB;-(See sup. 5)

Train connections Front and back.

Train signal, sch. None.

Double Independent Pilot valve for air through driver brake (See sup. 7)

Tender Eight Wheeled, Drawing No. 896

Weight, with fuel and water, about 167,000 lbs., Empty about 70,000 lbs.

Tank 8500 Gallons, Bill 41C3

Tank Water Bottom Type. Fuel Capacity 13 tons.

Tool Boxes Hard Wood, Top.

Frame Steel 13" Channels.

Front Drawbar height 29½"

Pilot None Pushing shoes None.

Back drawhead, center above rail 33½"

Coupler Sharon M.C.B. auto. with 9½" butt with Naco knuckle and lock and with 5" x 7" shank and Cardwell Friction Draft Gear.

Steps, hand holds, etc. to conform to L. C. C. requirements.

Trucks Arch Bar type, with Cast Steel Bolsters.

Springs Elliptic. Maker:-Crucible Steel Co. of America.

Journals, Diam. 6" Length 11"

Wheels, Diam. 33" Tread 4½" Kind Cast Iron

Tires ----- Cen. diam. ----- Size -----

Tires held by -----

Safety chains Single.

Brake Position On all wheels.

Brake sch. #6 ET West'g Auto. and Straight Air with 12" x 12" tender cylinder. (See sup. 6-61 to 79)

List of tools, sch. 29

Photo sch. #2 for (10 HL 92-94) Inspection (See sup. 1-3-79)

To be weighed Yes. Material spec'ns B. L. W.

Certificate of boiler test Three copies of B.L.W. form 1036.

Junior laws to 2-1-16 Shipment On own wheels.

Brass shop finish, No. 1

Machine shop finish D-165.

B. L. W. Patents

Throttle	Patented Jan. 29, 1900	(Cast On)
Feed Pipe Strainer,	Patented Sept. 1, 1903	(Cast On)
Steam Pipe Cover ,	Patented July 18, 1911	(Cast On)

Property plates B.L.W. for engine and tender.

Painting:—Engine, style 291 Olive Green and Aluminum

Painting:—Tender, style 291 Olive Green and Aluminum

Mark on tank sides, L. S. & I. for 92 to 94.

Mark on tank sides, M. M. & S. E. for 95.

Mark on back of tank 8500 GALLONS

Road Nos. Pos.	Road Nos.	Name Name
F.No Plate	18 to 20 for 92 to 94.	
Sand Box	44 for 95.	
Cab Sides		
Back of tank		

SPECIFICATION FOR LOCOMOTIVES 10 46 B 92 to 94, 95.
FOR Lake Superior and Ishpeming Ry. Co. for 92 to 94
Munising, Marquette & Southeastern Railway Co. for 95

1 Locomotives to be built in the best, most substantial and workmanlike manner according to the true intent and meaning of the specifications which are intended to include everything requisite to the proper building of the engine notwithstanding that everything required is not particularly mentioned in the inquiry. (see sup. sh)

2 The Royalty on the Baker Valve gear as well as all other royalties on parts covered by the specifications to be paid by the B. L. W.

3 Inspection by Alfred Lovell.
Notify Mr. Richmond one week before locomotives go into Erecting Shop so he can come here to inspect same.

4 Construction of engine and tender to conform in all respects to the latest Interstate Commerce Commission requirements, for safety appliances and boiler inspection

5 Total length of Engine and Tender from front of Pilot to back end of Draw Casting will be 71' 6".

6 Boiler waist plates 15/16" thick.
Boiler outside sheet over fire-box 9/16" thick.
Boiler outside sheet back 1/2" thick.
Boiler throat sheet 15/16" thick.
Boiler smoke-box sheet 3/8" thick.

7 All longitudinal seams butt jointed, double covering strips, sextuple riveted, 90% seam.

8 Omit auxiliary dome.
Safety valves to be screwed directly into top of boiler and whistle to be placed on side of main dome.
Throttle in main dome to be arranged to permit entrance into boiler for inspection.

9 Water space and radial staybolts of Ewald Tennessee Charcoal Iron.
Spacing of stays 4" center to center.

10 Superheater as Loco. Superheater Co's specification P-724-B, dated Jan. 5-1916. (Copy attached).
Superheater, Schmidt type, placed in 5 3/8" tubes, connecting with top header in smokebox, and with outside steam pipe connection to valve chambers.
Royalty payable by the B. L. W.

11 Additional hand hole and cap to be applied in each side of smokebox for inspection of superheater.

13 Smoke box equipped with Ludge-Slater front end arrangement: royalty payable by The B. L. W.
Smoke box netting as sample herewith.
Spark Arrester as Mudge Slater print No. 4092 11 Snowden 9/13/16

14 Nathan Simplex type MW Non-Lifting injector on left side.
Nathem Lifting injector on right side outside of cab, with extension into cab for lever on injector, and water valve to be conveniently located for operating.
Injector steam valves to be B. L. W. regular.

15 Cab roof and sides lined with wood to bottom of window sills. Provide clear vision cab window to conform to the M.C.B. requirements.

16 Wood floor in cab 1 1/2" thick.
Provide footboard below the cab floor on sides of firebox. A.F. Wife

17 Headlight located on smokebox front just above the door.

18 Boiler head lagging provided with 6" openings with doors for the purpose of inspection and replacing staybolts.

26 Engine Frames:- Top rail to be 5 1/2" x 6", and bottom frame rail to be 5 1/2" x 4"
Frame pedestal cap bolts, to have double nuts.

27 Cylinders to be bushed with Hunt Spiller Iron.
Steam chest valve bushing to be Hunt Spiller Iron.

28 Lubricator to be five pint capacity.
Lubricator pipes of Copper (Brass) placed under jacket.

29 Cylinders to be equipped with Nathan Automatic Vacuum Breaker, Steam pipe to vacuum breaker to be covered. Verbal Recpt. Request Mr. Lovell 9/16.

30 Piston Heads of cast iron with packing rings of Hunt Spiller Iron.

31 Grease cups forged on back end of main and side rods.
Collar on front end of side rods to be screwed into pins as well as bolted.

32 Baldwin Power Reverse gear, to be applied.
Power reverse to be operated either by air or steam.
Reverse gear covered by Extra Order 1544, dated 2-10-16.

33 Driving tires from Standard Steel Works.

34 Driving wheels to have hub liners of cast iron.

35 Driving boxes to be equipped with bearings of Bronze, B. L. W. regular, and Franklin Grease Cellars.

36 Front and back driving boxes to have 3/16" lateral play, main and intermediate driving boxes to have 1/8" lateral play.
For Hereafter: Raise question about brass or iron hub liners. These locos. gave much trouble from over heated journals during transit. Geo. F.R. Jr. 9/16

TENDER.

51 Tank plates:- Top, 5/16", bottom 3/16", outside 3/8", inside 5/16".

52 Radial buffer, Economy, applied between engine and tender.

53 Truck Spring plank channel; 15" channel, 45 pounds.
Trucks equipped with Wood's Tip Roller Side Bearings.
Arch bars 2" x 6" top; 2" x 6" bottom truss; and 3/4" x 6" bottom tie bar.
Column posts 2"; and journal box bolts 1 1/8".

54 Tender journal boxes National with C-S-5-B lids

55 Tender wheels, 840 pounds, National Car Wheel Co's make.

56 Braking power of tender to be 70% of light weight, based on 50 lbs. brake cylinder pressure.
Brake beam levers not to exceed 4 to 1 proportion.
Cylinder levers 22" out-to-out holes.
Tender cylinder push rod 27" center of lever hole to end.
Strength of Foundation Brake Rigging, and height of beams, to conform to M.C.B. Standards and recommended practice for high speed brake.
Brake beams to be Hercules #1084 with brake beam heads of design to suit height of beams and spaced 60" centers.

THE BALDWIN LOCOMOTIVE WORKS

SUPERHEATER SPECIFICATION FOR LOCOMOTIVES 10 46 B 92 to 94, 95.
FOR Lake Superior and Ishpeming Ry. Co. for 92 to 94.
Munising, Marquette & Southeastern Railway Co. for 95.

Locomotive Superheater Company's Specification No. P-724-B dated Jan. 5, 1916.
Specification for Superheater with Top Header, Double Loop Arrangement.

BOILER TUBES	220 in number 2 O. D. 15 ft. 6 ins. over tube sheets. Tubes located between and adjacent to Boiler flues are to be beaded over at front end.
BOILER FLUES	45 in number 6 O. D. #9 BWG thick of cold drawn seamless steel. Flues to be straight, true to gauge and wall not to vary more than one gauge from specified thickness, as shown on Card 1033-L
BOILER FLUE SETTING	Radius 1/8 inch on both edges of flue holes in firebox tube sheet and on front edge of flue holes in front flue sheet as shown on drawings, except for copper sheets. Back end to be set with copper ferrules, rolled, beaded and prossered except for copper sheets. Front end to be rolled and beaded. Rollers to have at least 5 rolls. Prosser to have at least 12 sections Card 1136
TUBE SHEET LAYOUT	to be in accordance with Card 5621
S. H. UNITS	45 units 1 1/2 O. D. #9 BWG thick of seamless steel. Pipes united by cast steel return bends as shown on Card 10688-H
	Each unit to be tested, before being placed in boiler, with water under pressure of 250 pounds.
S. H. PIPE SUPPORTS	Of steel fastened securely on superheater pipes so as not to slide as shown on Card 1001C
S. H. PIPE JOINT	To be made in best possible manner to insure absolutely tight joints in accordance with the notation on Card 1043
S. H. UNIT CLAMP BOLT	To be of steel having a tensile strength between 60,000 lbs. and 70,000 lbs. per sq. inch and to be as shown on Card 1086-A
S. H. HEADER	To be of close grain cylinder iron, steam tight in every respect. Joint ring for connection to dry pipe to have flat side against header flange. Casting should be moulded with the face having the superheater joints placed downward in the mould to secure the best quality of metal on surface where superheater joints are made. Each header to have a serial number cast on in such a location as not to be removed in finishing. No patch plugs allowed on ball joint seats. Headers must not be treated excessively with sal ammoniac. Header casting to be tight under water pressure of 250 lbs. Test pressure to be applied separately to the saturated and to the superheated steam passages, so as to insure soundness of all partition walls. Card 1725-C
S. H. HEADER SUPPORTS	To be securely bolted or riveted to boiler shell. To be properly located so as to support the header after header has been correctly located. Header should then be bolted to supports. This to be done before superheater units are put in place. Card 1323
ST. PIPE JOINT RINGS	Should be of cast iron.
DEFLECTING PLATE	To be constructed so as to permit easy inspection and removal of superheater units and joints. Design to be in accordance with Card 1C700
DAMPER CYLINDER	To be carefully and accurately made. Piston not to be more than 0.01 inch smaller than bore. Bearings for Piston and extension to be in line. Piston to be ground and to operate freely under a pressure as low as 40 lbs. per sq. in. Steam Pipe to damper cylinder should be as short and free from bends as possible so as not to cause water to collect in cylinder. Pipe to be protected against freezing. Card 1149
DAMPER SHAFT COUNTERWEIGHT	To be painted a light color to render it easily visible by the engineer Card 1C67
S. H. ARRANGEMENT	To be in accordance with Card 4648
TEST (FINAL)	The Superheater, after assembling in boiler and after steam pipes are fitted up, is to be thoroughly tested and to be tight under water pressure of 250 lbs.

Name	Card	Name	Card
Damper	10670-V	Damper Shaft Link	1070
Damper Cylinder Arm	1074	Patent Plate	3156
Damper Cylinder Pipe Fitting	1069-A	S. H. Unit Bolt Washer	1071
Damper Cylinder Pipe Union	1287	S. H. Unit Clamp	1073
Damper Cylinder Piping Diagram		S. H. Unit Clamp Washer	1072
Damper Cylinder Support		S. H. Pipe End	1346
Damper Shaft	1068-B	S. H. Pipe Band	1988
Damper Shaft Arm	1065	Return Bends	10094
Damper Shaft Bearing (O. S.)	1148	Deflecting Plate Handle	
Damper Shaft Bearing (I. S.)	1275-B	Lubricator Connection	2033

SPECIFICATION FOR LOCO
FOR Lake Superior and
Ishpeming, Marquet

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paid by the B. L. W.

3 Inspection by Alfred I
Notify Mr. Richmond or
Erecting Shop so he ca

4 Construction of engine
respects to the latest
requirements, for safe

5 Total length of Engine
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6 Boiler waist plates 15
Boiler outside sheet c
Boiler outside sheet b
Boiler throat sheet 15
Boiler smoke-box sheet

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with extension into cab
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Injector steam valves to

15 Cab roof and sides lined
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16 Wood floor in cab 1¼" th
Boards fastened below

17 Headlight located on sm

Back boiler head lagging
for the purpose of ins

SPECIFICATION FOR LOCOMOTIVES 10 45 E 92 to 94, 95.
FOR Lake Superior and Ishpeming Ry. Co. for 92 to 94.
Ishpeming, Marquette & Southeastern Railway Co. for 95.

FC.NO.

61 One set of Nicol's Air Brake Sch.6D ET, plain cap.
1 - Distributing Valve Drain Cock.....19454
1 - 8½" C/C/ Compressor.....39668
2 or more Westinghouse Enamelled Main Reservoirs having combined capacity of not less than 75,000 cu. ins. Sizes to be specified by Locomotive Builder, each with one ¾" Reservoir Drain Cock.....7716
1 - Tender Drain Cup (Side Opening Closed) with ¾" Drain Cock.....31576
1 - 12" tender brake cylinder (Provided light weight of tender is between 51000 and 73000 pounds; if 73000 pounds or more use 14" cylinders.
3 - ¼ Expander Rings in all Driver and Tender Brake Cylinders.
Pipe fittings for compressor discharge pipes, connecting pipe and brake pipe to be Extra Quality Pipe Fittings, as listed in WestinghousenPublication No. 9021, or Crane Co's Special Tested Air Brake Fittings, as listed on Page 65 of Crane Company's Special Railroad Catalogue No. 42-B, October, 1913.
1 - Set American Brake Co's Driver Brake Sch. WH-3, (Weight on Drivers approximately 238,000 lbs.) with Schedule BC, comprenending bushing hangers and case hardening pins and other wearing parts.
Driver brake shoes on back side of drivers.
Brake drivers 5C per cent. on 5C lbs. orake cylinder pressure.

62 Locate the 8½" C/C/ Compresser on left side, forward of staybolts, low enough not to obstruct view ahead, so it can be removed without lifting over any obstructions and so that air cylinder caps, cages and lower heads can be easily removed. Attach by strong cast bracket, well fitted and substantially secured to boiler, and with true bearing for compressor lugs, including provision at lower lugs to take weight off from bolts.

63 Air pump steam valve to be located Vertically in steam turret convenient for manipulation from right side of cab, extending stem, if necessary, so that handle can be reached easily, bracing stem substantially close to handle.

64 Connect SF-5 governor to air compressor in usual position and as directed under "PIPING".

65 Main reservoirs to be located forward of staybolts and high enough to clear tops of driving wheels. Attach to boiler by substantial cast brackets, with draw straps, and secure running boards to tops of these brackets.

66 Distributing valve and reservoir to be located so as to avoid any considerable heat to valve and so that it will be accessible for removal and replacement; if practicable, to be crosswise of running board with valve outward. Attach by substantial bracket, deep enough and so located as to provide 12" wrench clearance for each of the four nuts attaching valve to reservoir.

67 Brake valves to be located in convenient position for use from usual position of Engineer when braking. Feed and reducing valves to be so located in cab as to prevent extremes of temperature and to be accessible for adjustment, cleaning and replacement. If right hand bracket wanted for either, to facilitate piping, Locomotive Builders to advise W. A. B. Co. before material is shipped.

71 Air gauges to be Hancock Ashcroft. Steel gauges not to be furnished as gauges will be replaced by cast iron gauges. Air gauges to be located a short distance from the brake valves, near right side of boiler and low enough to enable the Engineer to read them easily from his usual position when braking and without entirely loosing sight of the track ahead. Provide a separate lamp for these gauges. Locate it so as not to obstruct view of the gauges and so the lamp's rays will not be reflected in the Engineer's eyes.

72 Remove all fins, and hammer and blow out all pipes before erection. Avoid unnecessary joints and clasp every pipe so it cannot vibrate. Clamps to be strong and well designed and to have jam nuts. Piping to be air tight.
Locate all pipes except those for sander and pump governor so they will be well away from contact with boiler.

73 Connection from main lubricator to be tapped into steam pipe between main steam valve and governor.
Oil pipes to compressor air cylinders to be located in lagging immediately under jacket, not against boiler, emerging from the jacket adjacent to the top of the compressor center piece.

74 Steam pipe to compressor to be 1". This pipe outside of cab to be wrapped with Asbestos felt and covered with heavy duck, sewed and painted. metal bands. Where exposed with good sectional lagging enclosed by metal bands.
No depressions in steam or oil pipes to form pockets where oil will collect.

75 To prevent freezing of brake apparatus air must be cooled before leaving last main reservoir. To insure this make compressor discharge pipe 35 ft. to 40 ft. long and connect to rear end of left main reservoir. Within ten feet of the compressor bring its discharge pipe to sufficient height to thereafter slope gradually so as to drain with the flow of air to reservoir. Pipe must not run back along firebox, under cab.
Connect forward ends of two main reservoirs by 35 to 40 feet of 1" pipe. From left reservoir run directly under and away from contact with boiler, place a plugged tee at lowest point and rise directly as practicable to sufficient height to thereafter slope gradually in direction to drain with flow of air. Locate cooling sections of this and discherge pipes outside of main reservoirs (not between same and boiler) and above horizontal center lines of their reservoirs, securing substantially to running boards.

76 Use copper tubing for air connections to compressor governor, to air gauge, and for pipes 2, 3 and 4, as shown on Page 11 of W. A. B. Co's Instruction Pamphlet No. 5032 of June 1913, and of sizes there shown.

77 Locate brake pipe cut-out cock at pilot so that it can be reached easily when coupling hose.

78 Brake pipes terminals to be M. C. B. Standard.

79 Installation of all Westinghouse equipment subject to W. A. B. Co's inspection.

80 Sufficient holes suitably spaced in each Tender dead lever hand slack adjuster to fully compensate for shoe wear and, if steel or steel tired wheels, for tire turning. With new shoes and wheels, make lengths of rods such that, with all slack let out, a full brake application from 80 lbs. pressure will give between 5" and 6" piston travel.

81 Locate tender drain cup in an easily accessible position in brake pipe, just inside of rear end sill if practicable.

THE BALDWIN LOCOMOTIVE WORKS Dup. of 10 32 D 1103 WITH SAME EXTRAS EXCEPT AS OTHERWISE SPECIFIED.

Memorandum Ord'r 11179

SPECIFICATION FOR LOCOMOTIVES 10 32 D 1166

FOR Escanaba & Lake Superior Railroad Co.

10-19-16 Engine Drawing No. 118

No.

Gauge of Road 4' 8½" Play ⅝"
Wheelbase, Rigid 13' 4" Driving 13' 4" Total 24' 9"
Total wheelbase, eng. and tend. {Actual 43' 11½" / Limited to ——
RAILS, 60 POUNDS PER YARD
CURVES ——

Limits, Height —— Width ——
Weight (approximate) in working order, Total 142,500 LBS.
On F. tr'k 34,500 lbs., Drivers 108,000 lbs., B. tr'k —— lbs.

Tractive power 24,800 lbs., Ratio of adhesion 4.3
Work'g St'm Pres. 180 lbs., Service PASSENGER AND FREIGHT
Fuel SOFT COAL

FRONT TUBE SHEET TO BE ½" THICK
1st **Boiler** STEEL Thick ⅜" AND 1 1/16 Bill 7957
Boiler, Diam. 60" Plan EXTENDED WAGON TOP
Boiler st'm pres. 180 lbs. Tested to {200 lbs. steam pres. / 240 lbs. water pres.
WITH FACTOR OF SAFETY OF 5.06
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS

1 **Dome,** diam. 33" Pos. FORWARD OF FIRE BOX

Firebox STEEL Combustion chamb. NONE
Firebox, length 100-3/16" Width 42" Depth F 60 3/4" B. 57½"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back 5/16"
2 Firedoor opening 16" DIAM. CROWN AND SIDES IN ONE SHEET
Water space, Front 4" Sides 3" Back 3"
Water space, Frame DOUBLE Riveted
4 Water space stays ⅞" DIAM. WITH 3/16" HOLES 1¼" DEEP FROM O.S.

Radial stays 1" DIAM. Sling stays front {TWO ROWS OF B. L. W. EXPANSION STAYS
Button heads below crown on SIX central rows
Crown bars NONE Placed —— above crown
Crown bolts NONE

Flues #9 W. G. SEAMLESS STEEL
Tubes #12 W. G. CHARCOAL IRON
Tube ends SAGED FOR COPPER FERRULES FIREBOX ENDS
Number 22 / 138 Diam. 5⅜" / 2" Length 14' 0"

Heating Surface				
	Flues 431.0	Combus. Chamb. ——	Total	1590.0
	Tubes 1006.0	Fire Box 139.0	Fire Brick Tubes	14.0
Grate area 29.2		Ratio to Heating Surface 1 :		54.5
Superheater 337.0				

Fire Brick ARCH, AMERICAN, ON TWO TUBES OF SEAMLESS STEEL 3" OUTSIDE DIAM. .18" THICK.

5 **Grates** ROCKING BARS AND DROP PLATE
6 **Ash Pan,** Dampers NONE

17 **Throttle** THROTTLE Pos. DOME
Dry pipe WROT IRON OR STEEL

Superheater (SEE SUPPLEMENT 8)

9 Smokebox extension WITH 9 Cleaning hole and cap L. S. ONLY
Steel shallow hopper WITH
Spk. deflecting and deflect. plates WITH
Exhaust nozzles DOUBLE HIGH

Safety Valves (Spec) TWO ASHTON 3" IMPROVED
Safety valves NONE with relief lever, Set to 180 pounds
Whistle B. L. W. PLAIN

Steam Gauge ONE IRON 7" ASHCROFT (Spec)
Steam gauge stand IRON Check NONE

Water Gauge ONE B.L.W. (SEE SUP. 13) Cab Lamps ELECTRIC
13 **Gauge Cocks** THREE SAGE Surface valve NONE
14 Lowest gauge cock 4" above highest part of crown
Lubricator steam valve TO HAVE separate dry pipe to dome
19 **Blower Valve** B. L. W.

Blow off Cock TWO OHIO 88 (SEE SUP. 16)
Cleaning Plugs
Firebox CORNERS, BACK ONES DIAGONAL AND SIDES AND BACK
Crown, TWO RIGHT SIDE, THREE LEFT SIDE, AND FOUR BACK
Waist, ONE UNDER FRONT (SEE SUP. 16)
Front tube sheet, (SUP 16) Fusible plug ONE

Pump NONE Pos. ——
Top chamb. —— Bottom chamb. ——
Feed Cock —— Feed pipes ——
Checks —— Check pipes ——

17 **Injectors** (Spec) TWO SELLERS IMPROVED, TYPE "B" No. 9½
19 Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER
Pipes, Check IRON Feed IRON Overflows IRON
Check (SEE SUP. 17) Pos. (SEE SUP. 17)

Steam Heat NONE

26 **Cab** WOOD VENTILATOR IN END ROOF
CAB TO HAVE HALF DECK

Cab boards WOOD Nosing NONE
Running boards WOOD Nosing NONE
Hand rail IRON Located on BOILER

Back Bumper BAR STEEL Back drawbar height 35½"

Pilot WOOD Pushing shoes NONE
Front Bumper OAK Bumper plate NONE
27 **Steps,** HAND HOLDS, ETC. TO CONFORM TO I.C.C. REQUIREMENTS

Front Drawhead, Center above rail 33½"
Coupler A. C. B. AUTOMATIC WITH NATIONAL EXTENDED FRONT COUPLER POCKET

Signal fixtures IRON OR STEEL

28 **Headlight** ONE ROUND CASE 16" Reflector,
Headlight, Nos. on sides WITH H'd'l't stop WITH
Lamp shelf NONE Nosing ——

Bell 92 POUNDS COLUMBIA ART BELL RINGER
Bell Yoke TWO Diam. 31" Body IRON Fittings Pipes IRON
Safety Valves ASH TRAP A-1, TO HAND FRONT OF FRONT AND BACK OF BACK VALVES.
Dome casing IRON PAINTED

27 Boiler Jacket #22 PLAIN STEEL Bands IRON Style 9 AND 12
Boiler Lagging ENGINEER OPTIONAL

Sand Box Pos. ——
Sand pipes ——
Sanding gear ——

Bell Ringer ——
Bell Cord ——

Whistle Cord ——

Cab Fittings ——

Cab Seats ——

Cab Curtains ——

Cab Windows ——

Deflecting Plates ——

Cab Aprons ——

Floor ——

Gangway ——

Spark Arrester ——

Tool Boxes ——

Jacking Pads ——

Jacks ——

Flange Oilers ——

Flange Lubricators ——

Wheel Guards ——

Miscellaneous ——

Engine Numbers ——

Builder's Plates ——

Classification Lights ——

Classification Marker ——

Classification Flags ——

Classification Whistle ——

Classification Bell ——

Classification Gong ——

Classification Cards ——

Classification Lamps ——

Classification Time Table ——

Classification Rules ——

Classification Register ——

Classification Slip ——

Classification Slip Holder ——

Classification Slip Case ——

Classification Slip Case Holder ——

Classification Slip Case Key ——

Classification Slip Case Lock ——

Classification Slip Case Hinge ——

Classification Slip Case Handle ——

Classification Slip Case Latch ——

Classification Slip Case Catch ——

Classification Slip Case Strap ——

Classification Slip Case Buckle ——

Classification Slip Case Tongue ——

Classification Slip Case Loop ——

Classification Slip Case Eye ——

Classification Slip Case Ring ——

Classification Slip Case Chain ——

Classification Slip Case Swivel ——

Classification Slip Case Snap ——

Classification Slip Case Hook ——

Classification Slip Case Eyelet ——

Classification Slip Case Grommet ——

Classification Slip Case Rivet ——

Classification Slip Case Screw ——

Classification Slip Case Nut ——

Classification Slip Case Washer ——

Classification Slip Case Spring ——

Classification Slip Case Pin ——

Classification Slip Case Cotter

SPECIFICATION FOR LOCOMOTIVES 10 32 D 1166

FOR ESCANABA & LAKE SUPERIOR RAILROAD COMPANY

1 DOME AND THROTTLE TO BE AS B.L.W. TRACING 33066 (see sup. 17)
MAN-HOLE TO BE OMITTED

2 FIRE DOOR TO BE FRANKLIN AUTOMATIC BUTTERFLY TYPE.

3 COMPANY STATES THAT CONSIDERABLE TROUBLE HAS BEEN EXPERIENCED WITH STUDS BREAKING AND WORKING LOOSE IN SHEETS OUTSIDE OF BOILER WHICH HOLD EXPANSION BUCKLES, AND ASK THAT THESE BE REINFORCED OR OTHERWISE REMEDIED.

4 ALL STAY-BOLTS BEHIND BUCKLES, GRATE BARS AND BRICK ARCHES TO BE HOLLOW.

5 DUMP GRATES TO REST ON TOP OF ASH PAN WITH STAND OR LEG.

6 ASH PAN OF LATEST DESIGN WITH AIR OPENINGS IN EACH SIDE; AND MOST CONVENIENT AUTOMATIC TYPE AND TO CONFORM TO THE I. C. C. REQUIREMENTS.

7 THROTTLE TO BE LOCATED SAME AS FOR 10 32 D 1118 (see sup. 1)
THROTTLE LEVER TO BE IN SAME LOCATION ON BACKHEAD OF BOILER AS FOR 10 32 D 1118

8 SUPERHEATER AS LOCO. SUPERHEATER CO'S SPEC'N. NO. O-6350, DATED NOV. 9TH 1916. COPY ATTACHED.
SUPERHEATER SCHMIDT TYPE, WITH OUTSIDE STEAM PIPE CONNECTIONS. ROYALTY ON SUPERHEATER PAYABLE BY THE B. L. W.

9 HAND HOLE AND CAP IN EACH SIDE OF SMOKE BOX FOR INSPECTION OF SUPERHEATER.

10 FRONT END TO BE EQUIPPED WITH R.R.CO'S STANDARD NETTING.

11 ALL OPENINGS IN BOILER TO BE FOR PIPE TAP.

12 WATER GAUGE GLASS TO HAVE SARGENT & CO'S PROTECTOR.

13 GAUGE COCKS TO BE LEE'S PATENT.

14 LOWEST GAUGE COCK AND THE LOWEST READING OF THE WATER GLASS TO BE NOT LESS THAN 3½" (4" PREFERRED) ABOVE THE HIGHEST PART OF THE CROWN SHEET.

15 BLOW OFF COCKS, ONE TO BE PLACED IN LEG OF BOILER, 2" FROM MUD RING, AND ONE TO BE PLACED IN BELLY OF BOILER HALF WAY BETWEEN FRONT TUBE SHEET AND THROAT SHEET, AS NEAR AS WILL PERMIT. BRASS 2" WASHOUT PLUG TO BE APPLIED HALF WAY BETWEEN FRONT TUBE SHEET AND THE BELLY BLOW OFF COCK.

16 FOUR PLUGS IN FRONT TUBE SHEET, TWO EACH SIDE OF EXHAUST PIPE UNDERNEATH DIAPHRAGM.

17 SELLERS COMBINATION MAIN CHECK AND STOP VALVE LATEST IMPROVED TYPE PLACED ON TOP OF BOILER.
USE JENKINS PLAIN CHECK BETWEEN MAIN CHECK AND INJECTOR WITHOUT HINGE VALVE, FOR LINE CHECKS.
SUCTION PIPES OF INJECTOR TO BE ENLARGED TO 2½" AND TO BE PLACED OUT FAR ENOUGH SO THAT TANK HOSE WILL NOT CHAFE ON TENDER WHEELS.
TANK HOSE TO BE CORRUGATED, 42" LONG, R.R. CO'S STANDARD
FEED WATER STRAINERS TO BE SELLERS.

18 SYPHON AND CONNECTIONS SAME AS 10 32 D 1103 AND 1118, ATTACHED TO LEFT SIDE OF DOME.
ENGINE FITTED WITH CONNECTION FOR SYPHON, TO BE PLACED ON LEFT HAND SIDE SO AS TO PERMIT TANK HOSE BEING COUPLED TO EITHER SYPHON OR INJECTOR.

19 BLOWER, INJECTOR AND PUMP THROTTLE STEAM PIPES TO BE CONNECTED TO TURRET, WITH MAIN VALVE AT BOILER.

26 CAB TO HAVE CLEAR-VISION WINDOW IN FRONT TO CONFORM WITH I.C.C. REQUIREMENTS.
CAB TO BE FURNISHED WITH FULL LENGTH SEAT FOR FIREMAN, AND WITH SHORT SEAT WITH BACK FOR ENGINEER. ENGINEER'S SEAT TO BE LOCATED CONVENIENT FOR OPERATING LOCOMOTIVE.

27 STEPS TO BE AS SHOWN ON B.L.W. PHOTO. 2993

28 HEADLIGHT EQUIPMENT TO BE PYLE NATIONAL ELECTRIC TYPE K INCANDESCENT HEADLIGHT.
HEADLIGHT DYNAMO TO BE LOCATED DIRECTLY IN BACK OF HEADLIGHT WITH EXHAUST CARRIED UP IN FRONT OF SMOKE STACK.

29 BACKHEAD OF BOILER LAGGED AND JACKETED DOWN TO FIRE DOOR HOLE. WHERE STAYBOLTS COME BEHIND LAGGING, THE LAGGING SHOULD HAVE OPENINGS TO PERMIT TESTING AND REMOVING WHEN NECESSARY.

30 PEDESTAL CAP BINDERS TO BE LUGGED AND BOLTED

31 CYLINDERS TO BE BORED AND FITTED WITH BUSHINGS.

32 CROSSHEAD TO BE SAME AS FOR 10 32 D 1103.

33 MAIN ROD BACK END TO HAVE THREE BOLTS AND TO HAVE WEDGES TO KEY UP IN ROD BRASSES.
PARALLEL RODS TO HAVE STRAPS, KEYS AND BRASSES.
STUB KEYS TO BE THE SAME AS FOR 10 32 D 1103 AND 1118.
MIDDLE CONNECTION TO HAVE THREE BOLTS.
GREASE CUPS OF CAST STEEL, R. R. CO'S PATTERN FOR ENDS OF MAIN ROD AND ALL SIDE RODS.

34 ALL SET SCREWS FOR RODS OR FOR PARTS OF LOCOMOTIVE WHERE SET SCREWS ARE REQUIRED, TO HAVE U. S. STANDARD THREAD.

35 REVERSE LEVER QUADRANT TO BE IN SAME LOCATION AS FOR 10 32 D 1103.

36 CHICAGO FLANGE OILERS FOR FRONT DRIVING TIRES.

37 EQUALIZING BEAM PINS TO BE CASE HARDENED.
COMPANY SUGGESTS THAT THE DRIVING SPRINGS BETWEEN THE MAIN AND BACK DRIVERS BE OF 7/16" STEEL INSTEAD OF ½" SAME AS FOR 10 32 D 1118, BUT THEY WISH US TO HAVE SOME LATITUDE IN DESIGNING THE SPRINGS, THE UNDERSTANDING BEING THAT THEY DESIRE AS EASY A RIDING ENGINE AS CAN BE HAD WITH DUE REGARD TO STRENGTH OF SPRINGS. CO. REPORT THAT 10 32 D 1103 IS RIDING HARD.
SPRINGS FOR BACK OF EQUALIZERS TO BE SEMI-ELLIPTIC, SAME AS FOR 10 32 D 1103.

38 HOLES TO BE DRILLED IN EQUALIZERS SO THAT SHOES AND WEDGES CAN BE OILED PROPERLY.

39 DRIVING WHEELS TO HAVE HUB LINERS OF BRONZE. OMIT LINERS FROM DRIVING BOXES.

40 DRIVING BOXES ALL TO HAVE FRANKLIN GREASE CELLARS. FRANKLIN HUB OILERS TO BE OMITTED.
DRIVING BOXES TO HAVE TWO HOLES ½" DIAM. DRILLED FROM LOWEST POINT OF CAVITIES TO OUTSIDE OF DRIVING BOX LINER FOR OILING THE HUBS IN PLACE OF THE FRANKLIN HUB OILERS.
A PIECE OF WIRE WOUND WITH CANDLE WICKING TO BE INSERTED IN HOLES TO PREVENT CLOGGING. WIRE TO BE BENT ON END TO PREVENT SAME BEING DRAWN THROUGH BY WHEEL.
CAVITIES AT TOP OF DRIVING BOXES TO HAVE OIL HOLES TO LUBRICATE SHOES AND WEDGES.

B. L. W. CLASS 10 32 D 1166

FOR ESCANABA & LAKE SUPERIOR RAILROAD CO.

Specification for Type A Double Loop Superheater SPECIFICATION O-6350, DATED NOVEMBER 9TH, 1916.

BOILER TUBES	138 in number 2" o. d. 14' ft. 0 in. over tube sheets. Tubes located between and adjacent to boiler flues are to be headed over at front end.	
BOILER FLUES	22 in number 5½" o. d. #9 B.W.G. of cold drawn seamless steel. Flues to be straight, true to gauge and wall not to vary more than one gauge from specified thickness.	Card 1106-Q
BOILER FLUE SETTING	½ in. radius on both edges of flue holes in fire box tube sheet and on front edge of flue holes in front tube sheet as shown on drawings, except for copper sheets. Back end to be set with copper ferrule, rolled, beaded and prosserized except for copper sheets. Front end to be rolled and beaded. Rollers to have at least 5 rolls. Prosser to have at least 12 sections.	Card 1136
TUBE SHEET LAYOUT		Card 5891
UNITS	22 units 1½" o. d. #9 B.W.G. of seamless steel. Pipes united by return bends. Each unit to be tested, before being placed in boiler, with water under pressure of 250 lb. per sq. in. for screwed return bends or 500 lb. per sq. in. for welded return bends.	
UNIT PIPE SUPPORTS	Of steel fastened securely on superheater pipes so as not to slide.	Card 10773
UNIT PIPE JOINT	To be made in best possible manner to insure absolutely tight joints in accordance with the notation on	Card 1043
UNIT CLAMP BOLT	To be in accordance with requirements of Locomotive Superheater Co's Material Specification No. 12.	Card 10695
HEADER	To be of close grain cylinder iron, steam tight in every respect. Joint ring for connection to dry pipe to have flat side against header flange. Casting should be moulded with the unit joint face down to secure the best quality of metal on surface where superheater unit joints are made. Each header to have a serial number cast on in such a location as not to be removed in finishing. No patch plugs or chaplets allowed in ball joint seats. Headers must not be treated with sal ammoniac. Header casting to be tight under water pressure of 250 lb. Test pressure to be applied separately to the saturated and to the superheated steam passages, so as to insure soundness of all partition walls.	Card 10647-A
HEADER SUPPORTS	To be securely fastened to boiler shell with rivets or turned bolts fitted in reamed holes. To be properly located so as to support the header after header has been correctly located. Header should then be secured to supports. This to be done before superheater units are put in place	Card 1323
STEAM PIPE JOINT RINGS	Should be of cast iron.	
DEFLECTING PLATE	To be constructed so as to permit easy inspection and removal of superheater units and joints. Design to be in accordance with	Card SEE ARRGT.
DAMPER CYLINDER	To be carefully and accurately made. Piston not to be more than 0.01 in. smaller than bore. Bearings for piston and extension to be in line. Piston to be ground and to operate freely under a pressure as low as 40 lb. per sq. in. Steam pipe to damper cylinder should be as short and free from bends as possible so as not to cause water to collect in cylinder. Pipe to be well protected against freezing.	Card
DAMPER SHAFT COUNTERWEIGHT	To be painted a light color to render it easily visible by the engineer.	Card
S. H. ARRANGEMENT	To be in accordance with	Card 4922
TEST (FINAL)	The superheater, after assembling in boiler and after steam pipes are fitted up, is to be thoroughly tested and to be tight under water pressure of at least 30% more than the working pressure of the boiler.	

DAMPER	Card 10923 AND 10923-A	DAMPER SHAFT LINK	Card 10419-L
DAMPER CYL. ELL	Card	PATENT PLATE	Card 3156
DAMPER CYL. PIPE FITTING	Card 1069-A	S. H. UNIT BOLT WASHER	Card 1071
DAMPER CYL. PIPE UNION	Card 1257	S. H. UNIT CLAMP	Card 1073
DAMPER CYL. PIPING DIAGRAM	Card	S. H. UNIT CLAMP WASHER	Card 10305
DAMPER CYL. SUPPORT	Card	S. H. PIPE END	Card 1344
DAMPER SHAFT	Card	S. H. PIPE BAND	Card 1988
DAMPER SHAFT ARM	Card 1246	RETURN BENDS	Card 10094
DAMPER SHAFT BEARING (O.S.)	Card	DEFLECTING PLATE HANDLE	Card 1487
DAMPER SHAFT BEARING (I.S.)	Card 10936-R AND 1066	LUBRICATOR CONNECTION	Card 3023
SPACING OF BANDS & SUPPORTS	Card 10759	DEFLECTING PLATE STUDS	Card 10809
TYPE OF RETURN BENDS	WELDED	DEFLECTING PLATE CLAMP	Card 10809-A

41 ENGINE TRUCK WHEELS TO HAVE SAME GENERAL DIMENSIONS AS FOR 10 32 D 1118 AND 1103 SO THAT THEY WILL INTERCHANGE AS A WHOLE.

42 TWO MAIN AIR RESERVOIRS OF AMPLE CAPACITY.
AIR RESERVOIRS TO BE WEST'G. ENAMELLED.

43 PUMP GOVERNOR TO BE DUPLEX.
BRAKE VALVE TO BE G-6 WITH S-3-A STRAIGHT AIR BRAKE VALVE.
BRAKE VALVE TO BE LOCATED WHERE IT CAN BE OPERATED CONVENIENTLY IN STANDING POSITION, WHEN BACKING UP.
BRASS SINGLE POINTER 5" STRAIGHT AIR GAUGE TO BE APPLIED.

44 TRAIN LINE PIPE LEADING TO FRONT END OF ENGINE TO BE PLACED ON LEFT SIDE TO ALLOW MORE CONVENIENT COUPLING WITH CARS.

TENDER.

56 TANK TO HAVE SLOPING BOSOM WITH SLOPE ARRANGED SAME AS FOR RY.CO'S LOCO. No. 6 B. L. W. CLASS 10 34 E 1996.
TANK COAL PIT TO BE SLOPED SUFFICIENTLY TO KEEP COAL IN FRONT END OF TENDER.
TENDER TO BE EQUIPPED WITH SIDE AND REAR COAL PACKS.

57 BACK OF TENDER TO BE FITTED WITH DRAIN PIPES SO THAT TANK WILL NOT BE FLOODED WHEN TAKING WATER.

58 TANK HOSE TO BE CORRUGATED, 42" LONG, R.R.CO'S STANDARD. (SEE SUP'T)

59 LONGITUDINAL CHANNELS TO BE RIVETED TO END CHANNELS ON TANK WITH ANGLES.

60 STEPS TO BE AS SHOWN ON B.L.W. NEGATIVE 2993.

61 NATIONAL TENDER JOURNAL BOXES.

62 BRAKE HOSE AND COUPLING TO BE SPECIAL, PIECE 4892.

THE BALDWIN LOCOMOTIVE WORKS As Sup'n-6-3710
Information Sheet 1-1920 Cyls. 18 3/4 x 12 except as otherwise specified.

SPECIFICATION FOR LOCOMOTIVES 12 34 1/4 E 44 Gen. as Photo-3397 except with overhung stack.

FOR Peninsular Railway Company. 5-19-16. Engine Drawing No. 19

R.

Gauge of Road 4' 8½" Play ⅞"
Wheelbase, Rigid 13' 1" Driving 13' 1" Total 27' 0"
Total wheelbase, eng. and tend. (Actual 49' 6" / Limited to 49' 6")
Turntable 50 feet long.
Curves 20 degrees **Grades,** 6%

Limits, Height —— Width ——
Weight (approximate in working order, Total 174,000 lbs.
On F. tr'k 18,000 lbs., Drivers 134,000 lbs., B. tr'k, 22,000 lbs.

Tractive power 33,350 lbs., Ratio of adhesion 4.
Work'g St'm Pres. 160 lbs., Service Freight
Fuel Oil (See sup. 8)

14 **Boiler** Steel Thick ⅜" Bill 7835
Boiler, Diam. 74" Plan Straight Top.
Boiler st'm pres. 180 lbs., Tested to (200 lbs. steam pres. / 240 lbs. water pres.
Longitud. seams Butt jointed, double covering strips.

3 **Dome,** diam. 33" Pos. Central.

4 5 **Firebox** Steel Combustion chamb. None.
Firebox, length 114" Width 41" Depth F. 74½" B. 69⅛"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back 5/16"
Firedoor opening One Oval 16" x 20" (see sup. 6)
Water space, Front 4" Sides 3½" Back 3½"
Water space, Frame Single Riveted
6 Water space stays ⅞" diam. with 3/16" hole 1¼" deep from O.S.

Radial stays 1" diam. Sling stays front {Three rows of B.L.W. Expansion Stays.
Button heads below crown on Eight central rows
Crown bars None. Placed —— above crown
Crown bolts ——

Flues None.
7 Tubes #11 W. G. Charcoal Iron or Steel.
Tube ends Swaged for copper ferrules, fire box ends.
Number 350 Diam. 2" Length 15' 0"

Heating Surface	Flues None.	Combus. Chamb. None	Total 2917 □'
	Tubes 2734 □'	Fire Box 183 □'	Fire Brick Tubes ——
Grate area 32.5 □'		Ratio to Heating Surface 1 : 89.7	
Superheater ——			

Fire Brick to suit oil burning arrangement.
7 Fire box lined with fire brick for oil burning.
Fire brick pavement in pan.
8 **Grates** None.
10 **Ash Pan,** Dampers Front only.

Throttle Rushton Balanced Pos. Dome.
Dry pipe Steel.

Superheater None.

Blower extension with Cleaning hole and cap None.
Spark plates or Rapper None.
Netting and deflect. plates None.

Exhaust nozzles Single, Lor
Diamond Stack, Wide
Smoke Stack Taper, Straight Dia. 18" Hole in S. B., dia. 21½"

Safety Valves (Ashcroft) Two Consolidated 3½"
Safety valves None with relief lever, Set to 160 lbs.
Whistle Chime.

Steam Gauge One Iron 7" Makers—Ashcroft. (Spec.)
Steam gauge stand Iron **Clock** None.

Water Gauge One (See sup. 11) **Cab Lamps** to burn Acetylene.
Gauge Cocks Four Back. Surface valve None.
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One B. L. W. Pos.—Front.
Cleaning Plugs
Firebox Corners back ones diagonal, sides and back.
Crown, Two each side and four back.
Waist, One under front.
Front tube sheet, Two Fusible plug One.

Pump None. Pos. ——
Top chamb. —— Bottom chamb. ——
Feed Cock —— Feed pipes ——
Checks —— Check pipes ——

Injectors (Spec.) Two Hancock Type "A" No. 9
Injectors, Pos. R. and L. outside of Cab Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
12 13 Check B. L. W. Pos. Right and Left.

Steam Heat None.

14 **Cab** Steel, lined with wood. Ventilator in cab roof.

Cab boards Steel Nosing Iron
Running boards Steel Nosing Iron
Hand rail Iron Located on Boiler.

15 **Back Bumper** Bar Steel Back drawbar height 32½"

Pilot Wood Pushing shoes None.
Front Bumper Oak Bumper plate With
Steps, hand holds, etc. to conform to I.C.C. requirements.

Front Drawhead, Center above rail 33½"
Coupler M. C. B. Automatic.

Signal fixtures Iron on bumper.

Headlight Two Round Case 16" Reflector, To burn Acetylene.
Headlight, Nos. on sides With Draft stop With
Lamp shelf None. Heating ——

Bell 92 pounds.
Sand Box Two Diam. 31" Body Iron Painted Pipes Iron
Sander Leach Asst. Trap A-1 in each box to have front and rear.

Dome casing Iron Painted.

Boiler Jacket #22 Plain Steel Bands Iron Style 9
Boiler Lagging Magnesia Sectional.

THE BALDWIN LOCOMOTIVE WORKS Aug. 1916.
H. E. Rudolph
SPECIFICATION FOR LOCOMOTIVES 12 34 1/4 E 44 418
FOR Peninsular Railway Company.
R.

30 **Frames** Cast Steel Braces Solid

Cylinders, Diam. 20½" Stroke 28"
St'm ports, Length 16" Width 1⅝" Bridges 1⅜"
Exh. ports, Length 16" Width 3" Valve lead ——
Valve travel 5½" Steam lap ⅞" Exhaust clearance ——
Eccentric-crank throw 4⅜" By-pass valve None.
16 S. F. Lubr. Detroit Triple #22 Bulls Eye.
Cyl'r heads Cast Iron; Lubr. pipes of iron under jacket.
Cyl'r casings Iron Ptd. Head covers Steel Painted.
St'm chest casings Iron Ptd. Covers Steel Painted.
St'm chest valves Richardson Balanced, with vacuum valves.
Met. pkg (Piston rods / Valve stems) United States (Hot spec.) (Multi-Angular 4-6-16)

Pistons (See sup. 17)
Guides Laird Type, Steel Oil cups Needle.
Crossheads Cast Steel with Bronze bearings.
Wrist Pins Steel Rod and cups (See sup. 18-19)

17 **Valve Motion** Stephenson.
25 Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.

All threads on bolts (except staybolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.

28 **Drivers,** O. S. Diam. 48" Cen. diam. 41"
Wheel Centers:—Main Cast Steel, Others Cast Iron.
24 **Tires** Steel Held by Shrinkage and Shoulder.
27 Tires, Flanged, Pos. Front and Back. Size 3½" x 5½"
Tires, Plain, Pos. - Intermediate Size 3½" x 6½"
Lateral play between driving boxes and wheel hubs — ⅛" total.
29 **Driving Boxes** Cast Steel
Journals, Diam. (Main 9" Length 10" / Others 8½")

30 **Springs.** Make Standard Steel Works.

Front Engine Truck Two Wheeled Swing Bolster Center Bearing
To swing 3½" each side of cen., Cen. pin liners None.
Journals, Diam. 6" Length 10" Boxes Cast Iron.
Wheels, Diam. 28" Tread —— Kind Cast Iron Spoke Centre.
26 Tires Steel Cen. diam. 23" Size 2½" x 5½"
Tires held by Bolted type fastening.

Back Engine Truck Two Wheeled Rushton Radial Type.
To swing 4½" each side of cen., Cen. pin liners None.
Journals, Diam. 6" Length 10" Boxes Cast Iron.
Wheels, Diam. 36" Tread —— Kind Cast Iron spoke centre.
26 Tires Steel Cen. diam. 31" Size 2½" x 5½"
Tires held by Bolsed type fastening.

31 **Brake,** position On all driving and tender wheels.
32 Operating / Parts: Engine, Sch. #6 ET West'g. Combined Auto. and Straight Air
Parts: Eng. Tr'k, sch. ——
Foundation / Parts: Drivers, sch. WN-2 American O. S. Equalized.
Parts: Eng. Tr'k, sch. ——
Air pump Two 9½" Pos. Right and Left.
Train connections Front and Back.
Train signal, sch. ——
Air reservoir to be West'g. Enamelled.

11 **Tender** Eight Wheeled, Drawing No. 918
Weight, with fuel and water, about 80,000 lbs.

11 **Tank** {Oil 1400 Gallons, Bill 4268 / Water 3500 4266
Tank "U" shape, straight top.

Tool Boxes of hard wood, top.

Frame Steel 8" and 10" channels.

16 Front Drawbar height 31⅜"
Pilot of wood at rear. Pushing shoes None.
Back drawhead, center above rail 33½"
Coupler M. C. B. Automatic.

Steps, hand holds, etc. to conform to I.C.C. requirements.

Trucks Square bror Iron, equalized frames.

Springs Half-Elliptic. Standard Steel Works.
Journals, Diam. 4½" Length 8"
Wheels, Diam. 30" Tread —— Kind Cast Iron Plate centre.
24 Tires Steel Cen. diam. 25" Size 2½" x 5½"
Tires held by Bolted type fastening.
Safety chains Single.

46 **Brake** Position On all wheels.
Brake sch. #6 ET West'g. Auto. and Straight Air with 10" x 12" tender cylinder.

List of tools, sch. 31 One pair of wrecking frogs (See sup. 33)
Photo sch. #2 Inspection B. L. W. (See sup. 1)
To be weighed Yes. Material specs B. L. W.
Certificate of boiler test Three copies of B.L.W. form 1036.
Junior laws to 7-29-16. Shipment On own wheels. (See sup. 30)

Brass shop finish, No. 1
Machine shop finish D-165.

Patents B. L. W.: Throttle, Patented Jan. 23, 1900 (Cast On); Feed Pipe Strainer, Patented Sept. 1, 1903 (Cast On); Back Engine Truck, 645834 Mar. 30, 1900 (Brass Plat

Property plates None.

Painting: Engine, style 291 Olive Green and Aluminum.
Painting: Tender, style 291 Olive Green and Aluminum.

Lettering to be same as for 12 32½ E 14.
Mark on tank sides, Peninsular Railway Company

Road Nos. Pos.	Road Nos.	Name None.
F. No Plate	11	
Front Sand Box		
Cab sides		
Back of tank.		

SPECIFICATION FOR LOCOMOTIVES 12 34½ E 44

FOR PENINSULAR RAILWAY COMPANY.

1 THE BOILER MUST BE GIVEN SPECIAL INSPECTION BY MR. DIEHL AND MR. BURNS.

2 DOME OF THE ONE PIECE TYPE.

3 AUXILIARY DOME FOR SAFETY VALVES AND WHISTLE

4 BACK TUBE SHEET TO BE STRAIGHT.
BACK FLUE SHEET TO HAVE SUFFICIENT ROOM BETWEEN TOP ROW OF FLUES AND RIVET HEADS TO ALLOW USE OF FLUE ROLLER. THIS WAS NOT DONE ON 12 34½ E 12.

5 CROWN AND SIDES OF FIRE BOX IN ONE PIECE.

5½ FIRE DOOR TO HAVE HOOD.

6 FLEXIBLE STAYS TO BE TATE APPLIED IN SAME MANNER AS FOR 12 32½ E 14.

7 TUBES TO BE SET WITH PROSSER EXPANDER.
TUBES TO BE WELDED IN BACK TUBE SHEET.

8 OIL BURNING ARRANGEMENT SOUTHERN PACIFIC STYLE, WITH VON BODEN INGLES BURNER.
ROYALTY PAYABLE BY THE B. L. W.
MCLAUGHLIN FLEXIBLE CONDUITS FOR ALL OIL AND STEAM CONNECTIONS BETWEEN ENGINE AND TENDER.

9 FIRE BRICK ARRANGEMENT TO BE SAME AS FOR 12 32½ E 14, INCLUDING ONE ADDITIONAL ROW OF BRICK IN THE BACK WALL, LAID LENGTHWISE OF FIREBOX, MAKING THE BACK WALL APPROXIMATELY 14" THICK
FIRE BRICK IS TO BE SAME AS USED ON 12 32½ E 14.

10 FIRE PAN TO BE PLACED LOWER THAN ON 12 32½ E 14.

11 OMIT KLINGER WATER GLASS, AND ~~APPLY THE OLD STYLE WITH SLOTTED TUBE PROTECTOR AND~~ COPPER PIPE FITTING TO BOILER HEAD. *Water gauge guard to be B.L.W. Iron clad* 9/30/16

BOTTOM OF WATER GAUGE TO BE 6" ABOVE HIGHEST PART OF CROWN

12 WATER DEFLECTOR, C. B. & Q. STYLE, INSIDE OF BOILER AT INJECTOR CHECKS.

13 ONE FIRE EXTINGUISHER "Y" WITH STOP VALVES TO BE PROVIDED IN INJECTOR CHECK PIPES.

14 CAB SEATS TO BE B.L.W. REGULAR.

15 DRAWBAR BETWEEN ENGINE AND TENDER TO HAVE LARGE PIN; BAR OF PROPORTIONATE STRENGTH.

16 SIGHT FEED LUBRICATOR TO BE LOCATED SO THAT IT CAN BE SEEN BY BOTH ENGINEER AND FIREMEN.

17 PISTON HEADS OF CAST IRON WITH FOLLOWER AND T RING.

18 MAIN ROD STRAP WITH KEY PUT IN FROM TOP.
PARALLEL RODS WITH STRAPS, KEYS AND BRASSES ON MAIN CONNECTIONS, AND WITH SOLID ENDS ON ALL OTHER CONNECTIONS.
COMPRESSION GREASE CUPS FORGED ON ALL RODS.

19 ADDITIONAL CLEARANCE TO BE PROVIDED BETWEEN THE OUTSIDE ROCKER ARM AND SIDE ROD.

25 ALL OF THE VALVE MOTION TO BE BUSHED.
ECCENTRICS IN HALVES, TO BE PLACED ON MAIN PAIR OF DRIVERS WITH HOOKED ECCENTRIC OVER SECOND PAIR DRIVERS, WITH TRANSMISSION BAR TO BE OMITTED.
ECCENTRIC STRAPS TO BE BABBITTED ALL THE WAY AROUND INSTEAD OF WITH THE BABBITT INSERTS AS ON 12 32½ E 14.

26 ALL TIRES AND AXLES FROM STANDARD STEEL WORKS.

27 COLLINS FLANGE LUBRICATOR FOR FRONT AND BACK DRIVING WHEELS.

28 ALL DRIVING WHEEL CENTRES TO HAVE CAST IRON OR CAST STEEL H LINERS.

29 ALL DRIVING BOXES TO HAVE FACES BABBITTED.

30 AMPLE CLEARANCE TO BE GIVEN BETWEEN SPRING LINKS AND ENGINE FRAME.
ALL SPRING RIGGING TO BE BUSHED.

31 AIR PUMP EXHAUST TO BE PIPED INTO THE EXHAUST CAVITY OF THE CYLINDERS.

32 AIR LINE FITTINGS TO BE EXTRA HEAVY.

33 SHIP TWO OUTSIDE WRECKING FROGS AS THERE WERE TWO INSIDE SHIPPED ON 12 32½ E 14. THE MAKE OF THESE FROGS WAS B. NEWTON.

34 LETTERING, NUMBERING AND PAINTING SAME AS 12 32½ E 14.

35 EXTRAS ORDERED THROUGH EXTRA WORK DEPARTMENT ORDER NO. 6018 DATED 8-3-16 TO BE SHIPPED WITH LOCO.

Certificate dated 9-23-16 covering test of reservoirs No. 4003 furnished by the W.A.B.Co. is filed in Main Office file 1022 for 1916. J.C.W.

Certificate dated 10-10-16 covering test of reservoirs No. 4058 furnished by W.A.B.Co. is filed in Main Office File 1022 for 1916. J.C.W.

TENDER.

41 DRAIN PIPE IN TANK SAME AS FOR 12 34½ E 12, I.E. DRAIN PIPE 2" DIAM. ON EACH SIDE OF TANK FUNNEL TO CARRY WATER TO TRACK.

42 OIL TANK TO BE RECTANGULAR AND PLACED IN COAL SPACE, 12" ABOVE TENDER FLOOR INSTEAD OF FLAT TANK AS ON 12 32½ E 14
BOTTOM OF OIL TANK TO BE AT LEAST 20" ABOVE OIL BURNER.

OIL TANK HEATER ON TOP OF TANK.

43 OIL BURNING ARRANGEMENT SOUTHERN PACIFIC STYLE, WITH VON BODEN INGLES BURNER.
ROYALTY PAYABLE BY THE B. L. W.
MCLAUGHLIN FLEXIBLE CONDUITS FOR ALL OIL AND STEAM CONNECTIONS BETWEEN ENGINE AND TENDER.

44 FEED WATER HOSE TO BE ANACONDA.

45 DRAWBAR BETWEEN ENGINE AND TENDER TO HAVE LARGE PIN; BAR OF PROPORTIONATE STRENGTH.

46 AIR LINE FITTINGS TO BE EXTRA HEAVY.

THE BALDWIN LOCOMOTIVE WORKS Dup. 6 30 D 455, with same Extras except as otherwise specified.

Memorandum Spec'n 10656

SPECIFICATION FOR LOCOMOTIVES 6 30 D 459 Gen. as Neg. 3048

For Port Huron Southern Railroad Co. **Engine Drawing No.** 49

10-19-15

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 9' 6" Driving 9' 6" Total 9' 6"
Total wheelbase, eng. and tend { Actual 38' 1" / Limited to -----

Track in rough condition
Curves 35 degrees

Limits, Height ----- Width ----
Weight approximate in working order, Total 100,000 lbs.
On F. tr'k ----- lbs., Drivers 100,000 lbs., B. tr'k ---- lbs.

Tractive power 24,780 lbs., Ratio of adhesion 4.0
Work'g St'm Pres. 180 lbs., Service Switching
Fuel Soft Coal
Locomotive to work around industrial plant.
Locomotive to comply with the I.C. C. requirements.

Boiler Steel Thick ⅝" Bill 6908
Boiler, Diam. 56" Plan Straight Top
Boiler st'm pres. 200 lbs., Tested to { 220 lbs. steam pres. / 267 lbs. water pres.
Longitud. seams Butt jointed, with double covering stripe.

Dome, diam. 27½" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 66-11/16" Width 34⅜" Depth F. 66" B. 64⅛"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diam.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Single Riveted
Water space stays 1" diam. with 7/16" hole 1½" deep from O. S.

Radial stays 1⅛" diam. Sling stays front One 1 Bar
Button heads below crown on Eight central rows
Crown bars None Placed ---- above crown
Crown bolts -----

Tubes #12 W. G. Iron
Tube ends Swaged for copper rings fire box ends.
Tubes, No. 202 Diam. 2" Length 12' 5"

Heating Surface, Tubes 1305 sq. Firebox 105 sq. Total 1410 sq.
Grate area 15.9 sq. Ratio to heat'g surface, 1 : 88
Superheater ----- Feed-water heater -----
Reheater----- Fire brick tubes-----

Fire Brick arch None

Grates Rocking bars and drop plate
Ash Pan, Depth 15" Dampers Front and Back
Ash Pan of the dump type

Throttle Balance Pos. Dome
Dry pipe ~~Cast Iron or~~ Steel

Superheater None

~~Smokebox extension~~ With Cleaning hole and cap L.S. only
~~Diaphragm or hopper~~ With
~~Netting and deflect. plates~~ With

~~Exhaust nozzles~~ Double Nick
~~Diam. 14"~~ ~~Hole in S.B. 20"~~

(Not Spare)
Safety Valves Two Consolidated 2½"
Safety valves None with relief lever, Set to 180 lbs.
Whistle B. L. W. plain

Steam Gauge One Iron 7" MAKER:- Ashcroft (Not Spare)
Steam gauge stand Iron **Clock** None

Water Gauge One B.L.W.(Ironclad) **Cab lamps** to burn kerosene
Gauge Cocks Three Back Surface valve None
Lowest gauge cock 3½" above highest part of crown
Lubricator steam valve to have separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One B. L. W. POS:- Right Side
Cleaning Plugs
Firebox Corners, back ones diagonal, left side and back
Crown. Two each side and three back
Waist, One under front
Front tube sheet, Two FUSIBLE PLUG:- One

Pump None Pos. -----
Top chamb. ---- Bottom chamb. ----
Feed cock ---- Feed pipes-----
Checks ---- Check pipes-----

Injector on right side to be outside of cab.
(Not Spare)
Injectors Two Monitor No. 8
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. Right and Left

Steam Heat None

Cab Wood

Cab boards Wood Nosing None
Running boards Wood Nosing None
Hand rail Iron Located on Boiler

Back Bumper Bar Steel Back drawbar height 34"
Chafing plates between engine and tender to be amply long and deep to prevent lapping on curves of 35 degrees.
Pilot None Pushing shoes Front
Front Bumper Cast Iron Bumper plate None
Steps, across front with hand rail
Steps, hand holds, etc., to conform to I. C. C. requirements
Front Drawhead, Center above rail 33½"
Coupler M. C. B. Automatic

Flag fixtures None

Headlight Two Round Case 16" Reflector, To burn Kerosene
Headlight, Nos. on sides With H'd'l't step With
Lamp shelf None Nosing -----

Bell 92 pounds Gollmar Air Bell Ringer.
Sand Box Two Diam. 28" Body Iron Ftd. Pipes Iron
(Not Spare)
Sander, Leach Air, Type A-1

Dome casing Iron Painted
Boiler Jacket { #22 Soft / Steel Ftd. Bands Iron Style 6
Boiler Lagging Magnesia Sectional

Tender Eight Wheeled Drawing No. 258
Weight, with fuel and water, about 79,000

Tank 2800 Gallons, Bill 3027
Tank ¼" Sloped, sloping back. Fuel Capacity 6 tons.

Tool Boxes Hard Wood, Top

Frames Oak and Yellow Pine

Front drawbar height 30½"
Chafing plate between engine and tender to be amply long and deep to prevent lapping on curves of 35 degrees.
Back drawbar, center above rail 30½"
Coupler M. C. B. Automatic
Pushing Shoes at rear
Steps, hand holds, etc. to conform to I. C. C. Requirements
Steps across back with hand rail.

Trucks Arch Bar type, with cast steel bolsters.

Springs Elliptic. B. L. W. Make
Journals, Diam. 3½" Length 7"
Wheels, Diam. 30" Tread 4½" Kind Chilled Cast Iron Plate
Tires None Cen. diam. ---- Size -----
Tires held by -----
Safety chains Single

Brake Position On all wheels.
Brake sch. 8-ET West'g Auto. and Straight Air with 10" x 12" tender brake cylinder.

List of tools, sch. 29 Bolts, nuts and threads B. L. W.
Photo sch. None Inspection B. L. W.
To be weighed No Material spec'ns B. L. W.
Certificate of boiler test Three copies of B. L. W. form 611
Junior laws to 11.8.12 Shipment On own wheels.

Brass shop finish, No. 1
Machine shop finish D-165

Patent } Throttle, 642,007, Jan. 23, 1900 (Cast on)
Plates } Feed Pipe Strainer, 738,088, Sept. 1, 1903 (Cast on)

Property Plates None

Painting:--Engine, style 29I, Olive Green and Aluminum
Painting:--Tender, style 29I, Olive Green and Aluminum

Mark on cab sides, P. H. S. R. R.
Mark on tank sides, PORT HURON SOUTHERN

No. Pas. Road No. Name None
F. Sp. Plate 8
Bumper
Back of Tank