REEL 20 VOL 62

ENGINE Class	ENGINE Number	PURCHASER	Page
6-38 D	107	Allen Wood Iron & Steel Co.	122
4-11 C	1120	" " " "	274
4-18 C	118	" " " "	276
4-22 C	269	" " " "	278
10-30 D	672	Alger-Sullivan Lumber Co.	282
6-30 D	1168	American Bridge Co.	116
4-16 C	181	" " "	113
6-26 D	1605	Anderson-Tweobaker Co.	118
12-31½ E	119	Apache Railway Co.	2
10-36½ D	169	Arkansas Land & Lumber Co.	285

ENGINE Class	ENGINE Number	PURCHASER	Page
6-38 D	81 to 86	Baldwin Locomotive Works	120
6-38 D	100 to 102	" " "	122
6-38 D	109	Baltimore Car and Ferry Co.	125
10-20½ D	30	Barfield Lumber Co.	288
4-16 C	150	Beech Bottom Power Co.	128
6-28 D	331	" " " "	130
16-28½-26½ DD	10	Booth-Kelly Lumber Co.	291
6-38 D	87 to 90	Brier Hill Steel Co.	132
12-30½ E	48	Brooks-Scanlon Lumber Co.	294
8-22 D	356	Brown & Sons Lumber Co. W.P.	298
10-36½ D	173	Buckwalter Lumber Co. J.R.	302
10-36½ D	149	Burton-Swartz Cypress Co.	304
4-32 C	5	Birmingham Rail & Locomotive Co.	252

ENGINE Class	ENGINE Number	PURCHASER	Page
10-28½ D	137	Caddo River Lumber Co.	306
"	139	" " " "	309
6-30 D	1169	Canton Railroad Co.	6
6-36 D	308	" "	8
4-22 C	271	Carey Mfg. Co. Philip	135
4-14 C	300 & 301	Casey Co. John F.	138
6-34 D	968	Chattahoochee Valley Railroad	11
10-36 E	2279	Cherry River Boom & Lumber Co.	314
12-30½ E	46	Cherry Valley Timber Co.	314
6-38 D	115	Chicago Heights Terminal Transfer R.R.Co.	13
6-36 D	314	Chicago Short Line Railway Co.	16
6-40 D	1	Chicago West Pullman & Southern R.R.Co.	20
10-34 E	2099	Cisco and North Eastern Ry. Co.	24
12-34½ E	46	Colorado, Wyoming & Eastern Railway Co.	26
10-28½ D	136	Columbia and Nehalem River R.R.	30
10-30½ D	43	" " " "	33
6-32 D	1134	Corn Products Refining Co.	141
4-14 C	299	Crescent Refractories Co.	143
10-24½ D	134	Crowell and Spencer Lumber Co.	317
10-32 D	1167	" " "	320
"	1298	" " "	324
4-10½ C	137	Crucible Steel Co. of America	145

ENGINE Class	ENGINE Number	PURCHASER	Page
10-30 D	669	Darby Lumber Co. J.F.	328
8-32 D	799	Dayton-Goose Creek Railroad Co.	36
10-18½ D	36	Deep River Lumber Corp.	330
6-36 D	317 to 319	Des Moines Union Railway Co.	39
6-36 D	311-312	Detroit Edison Co.	147

ENGINE		PURCHASER	Page
Class	Number		
12-34½ E	47	East Broad Top Railroad & Coal Co.	47
6-38 D	108	Fairport, Painesville & Eastern R.R. Co.	47
6-38 D	121	" " "	51
10-34½ D	124	Florida Sawmill Co.	332
"	125	" " "	334
6-38 D	105	Forged Steel Works Co.	122
12-30½ E	45	Frost Johnson Lumber Co.	336
8-14¾ C	35	Gale Lumber Co.	338
10-30 D	667	Giles Bay Lumber Co.	340
8-22 D	355	Goldsboro Lumber Co.	342
6-38 D	113	Goodyear Tire and Rubber Co.	150
6-30 D	470	Gulf Refining Co.	154
6-34 D	969 to 973	Guthrie & Co. Inc. A	157
10-24½ D	128-129	Harbeson Lumber Co. W.B.	344
"	131	" "	344
"	132	" "	346
10-28½ D	144	" "	348
"	148	" "	354
"	146-147	Henderson-Waits Lumber Co.	356
4-16 C	119	Humble Oil and Refining Co.	166
4-28 C	70 to 74	Hydro Electric Power Commission	168

A B E F G H C I J K L D M N O P D Q R S T E U V W Y F

ENGINE Class	ENGINE Number	PURCHASER	Page
8-34 D	5149	Illinois Terminal Railroad Co.	55
8-38 D	20-21	" " "	57
4-10½ C	136	Indiana Portland Cement Co.	174
10-28½ D	155-156	Industrial Lumber Co.	359
4-28 C	66	Inland Steel Co.	174
6-38 D	106	Interstate Railroad Co.	122
8-36 E	59	Ironton Railroad Co.	60

ENGINE Class	ENGINE Number	PURCHASER	Page
12-38½ E	129	Kanawha Glen Jean & Eastern R.R.Co.	62
4-22 C	273	Kansas City Power & Light Co.	249
10-24½ D	123	King-Ryder Lumber Co.	361

ENGINE Class	ENGINE Number	PURCHASER	Page
4-28 C	69	La Belle Iron Works	176
10-28½ D	1441	Leesville, Slagle & Eastern Ry Co.	68
10-38 E	3701-3702	Litchfield & Madison Ry Co.	64
10-20½ D	27	Lodwick Lumber Co.	363
8-30 D	711	Long Bell Company	365
10-24½ D	130	Lufkin Land & Lumber Co.	367

ENGINE Class	ENGINE Number	PURCHASER	Page
6-38 D	114	Manufacturer's Junction Ry. Co.	70
10-24½ D	133	Mardez Lumber Co.	369
8-22½ C	43	Mengel Box Co.	178
"	50	" "	178
10-24½ D	135	Meredith Lumber Co.	370
8-28 D	313	Meridan Lumber Co.	374
10-26 D	334 to 336	Midland Railway	73
4-32 C	5	Midvale Steel and Ordnance Co.	252
6-38 D	119	Minnesota Steel Co.	180
6-28 D	332	Mississippi State Insane Hospital	184
10-38 D	3700	Morgantown & Kingwood Ry Co.	75
6-38 D	117	Muskegon Railway & Navigation Co.	81

A B C I J K L D M N O P D Q R S T E U V W Y F

ENGINE Class	ENGINE Number	PURCHASER	Page
6-38 D	1141	Manufacturers Junction Ry. Co.	70
10-24½ D	133	Mardez Lumber Co.	369
8-22½ C	113	Mengel Box Co.	178
"	50	" "	178
10-24½ D	135	Meredith Lumber Co.	372
8-28 D	313	Meridian Lumber Co.	371
10-26 D	331 to 336	Midland Railway	73
4-32 C	5	~~Midvale Steel and Ordnance Co.~~	252
6-38 D	119	Minnesota Steel Co.	180
6-28 D	332	Mississippi State Insane Hospital	181
10-38 D	3700	Morgantown & Kingwood Ry. Co.	75
6-38 D	112	Muskegon Railway & Navigation Co.	81

ENGINE Class	ENGINE Number	PURCHASER	Page
4-14 C	302	Nawn Contracting Co. Hugh	138
"	303	" " "	138
"	304	" " "	138
6-32 D	1131	New York Shipbuilding Corporation	186

ENGINE Class	ENGINE Number	PURCHASER	Page
10-28½ D	138	Ozan-Graysonia Lumber Co.	376

ENGINE Class	ENGINE Number	PURCHASER	Page
4-22 C	276	Parklap Construction Corp.	249
"	277	" " "	249
"	272	Petroskey Portland Cement Co.	188
4-20 C	55	Philadelphia Suburban Gas & Electric Co.	190
8-26 D	213	Pickens Railroad Co.	83
6-30 D	473	Pittsburgh Plate Glass Co.	197
"	474	" " "	195
4-22 C	275	Powers-Weighlman Rosengarten Co.	249
10-22½ D	53	Prettyman & Sons J.F.	379
6-32 D	1135	Proctor and Gamble Co.	198
4-22 C	278	Pure Oil Co.	249

A B C D M N O P D Q R S T E U V W Y F

ENGINE Class	ENGINE Number	PURCHASER	Page
6-38 D	110	Rainey-Wood Coke Co.	202
8-24 C	321	Red River & Gulf R.R.	85
10-30 D	662	" " "	89
8-38 D	19	Republic Iron & Steel Co.	205
4-28 C	68	Riter-Conley Mfg. Co.	207
10-26 E	411	Ryan Lumber Co. Philip J.	382

ENGINE Class	ENGINE Number	PURCHASER	Page
10-30¼ D	44	San Augustine County Lumber Co.	384
10-18¼ D	35	Sandy River & Rangeley Lakes R.R.	93
8-28 D	314	San Louis Southern Ry. Co.	96
10-20¼ D	32	Santee Timber Co.	388
10-18¼ D	40	Sartin Lumber Co.	391
10-22 D	91	Savanah & Southern Railway	98
12-30¼ E	47	Sewell Valley Railroad Co.	100
12-34½ E	55	" " "	102
6-38 D	111	Shenango Furnace Co.	209
12-34½ E	48	Shevlin-Hixon Co.	393
4-30 C	60	Simmons Company	212
12-26½ E	22	Simpson Logging Co.	396
4-11 C	31	Smith-McCue Coal Co.	215
12-32½ E	16	Snoqualmie Falls Lumber Co.	399
10-26½ D	157	Southern Pine Lumber Co.	402
4-6 C	19	Standard Oil Company	231
6-28 D	320	Standard Oil Co. of Louisana	217
6-32 D	1147	" " "	219
"	1133	" " of New Jersey	221
"	1145	" " " "	224
6-36 D	313	" " of Ohio	228
6-30 D	471	Steel and Tube Co. of America	233
"	472	" " "	237
6-32 D	1137	" " "	240
"	1140	" " "	244
6-38 D	104	Struthers Furnace Co.	122
6-32 D	1141	Sun Company	254
10-18¼ D	37-38	Surry Lumber Co.	406
"	42-43	" "	409
4 14 C	305	STASO MILLING CO.	138

ENGINE Class	ENGINE Number	PURCHASER	Page
10-26½ D	147	Texas Oklahoma & Eastern R.R.	105
6-38 D	99	Trumbull Steel Co.	359

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ENGINE		PURCHASER	Page
Class	Number		
10-28¼ D	142	Uniadilla Valley Ry. Co.	108
"	143	" "	108
6-38 D	103	United States Govt. Navy Dept.	122
4-10 C	39	United States Metals Refining Co.	260
"	40	" " "	260
4-32 C	5	United States Midvale Gun Plant	252
8-28 C	938	Union Transportation Co.	110
6-20 D	41	Virginia Anthracite Coal Corp.	262
"	42	" " "	262
4-14 C	298	Virginia Shipbuilding Corp.	265

ENGINE		PURCHASER	Page
Class	Number		
10-28¼ D	145	Weed Lumber Company	417
6-38 D	102	Weirton Steel Company	122
4-32 C	274	Westmoreland Coal Co.	249
10-28¼ D	140	White-Grandin Lumber Co.	420
10-36 E	3558	Whitney Company	416
6-36 D	309	Winston-Dear Company	267
"	310	" " "	267
"	315	" " "	270
"	316	" " "	270
8-28 D	320	Wisconsin & Arkansas Lumber Co.	424
12-32¼ E	17	Wisconsin Logging & Timber Co.	422
4-28 C	67	Wood and Company R.D.	280
ENGINE		PURCHASER	Page
Class	Number		

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ENGINE Class	ENGINE Number	Page	ENGINE Class	ENGINE Number	Page	ENGINE Class	ENGINE Number	Page	ENGINE Class	ENGINE Number	Page
			4-4	31	215	8-11½	35	338			
			4-6	19	231	8-22½	49-50	178			
			4-10	39-40	260						
			4-10½	136	174	8-24	221	85			
			"	137	145						
			4-11	120	274	8-28	938	110			
			4-14	298	265						
			"	299	143						
			"	300 to 305	138						
			4-16	149	166						
			"	150	128						
			"	151	113						
			4-18	115	276						
			4-20	55	190						
			4-22	269	278						
			"	271	135						
			"	274	188						
			"	273 to 278	249						
			4-28	66	174						
			"	67	280						
			"	68	207						
			"	69	176						
			"	70 to 74	168						
			4-30	60	212						
			4-32	5	252						

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ENGINE Class	ENGINE Number	Page	ENGINE Class	ENGINE Number	Page	ENGINE Class	ENGINE Number	Page	ENGINE Class	ENGINE Number	Page

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ENGINE Class	ENGINE Number	Page	ENGINE Class	ENGINE Number	Page	ENGINE Class	ENGINE Number	Page	ENGINE Class	ENGINE Number	Page
			6-20	41-42	262	8-24	355	342			
						"	356	298 ✓			
			6-26	165	118						
						8-26	213	83 VR			
			6-28	330	217						
			"	331	130	8-28	313	374			
			"	332	184	"	314	96			
						"	320	424			
			6-30	468	116						
			"	469	6	8-30	311	365			
			"	470	154						
			"	471	233 R ✓	8-32	799	36			
			"	472	237 ✓						
			"	473	192	8-34	519	55			
			"	474	195						
			6-32	1131	186	8-38	19	205			
			"	1132	240	"	20-21	54			
			"	1133	221						
			"	1134	141						
			"	1135	198 ✓						
			"	1140	244						
			"	1141	254						
			"	1142	219						
			"	1145	224						
			6-34	968	11 ✓						
			"	969 to 973	157						
			6-36	308	8 ✓						
			"	309-310	267						
			"	311-312	149						
			"	313	228						
			"	314	16						
			"	315-316	270						
			"	317 to 319	39						
			6-38	81 to 86	120						
			"	87 to 90	132						
			"	99	257						
			"	100 to 107	132						
			"	108	47						
			"	109	125						
			"	110	202						
			"	111	209						
			"	112	81						
			"	113	150						
			"	114	70						
			"	115	13						
			"	119	180						
			"	121	51						
			6-40	1	20						

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ENGINE Class	ENGINE Number	Page

ENGINE Class	ENGINE Number	Page

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ENGINE Class	ENGINE Number	Page
10-18¼	35	93
"	36	330
"	37-38	406
"	40	391
"	42-43	409
10-20¼	29	363
"	30	288
"	37	388
10-22	91	98
10-22¼	53	379
10-24¼	123	361
"	124	337
"	125	334
"	128	344
"	129	342
"	130	367
"	131	344
"	132	346 ✓
"	133	369
"	134	317
"	135	372
10-26	334 to 336	73
10-26½	147	105
"	149	304
"	157	407
"	169	285
"	173	307
"	155-156	359
10-28½	136	30
"	137	306
"	138	376
"	139	309
"	140	420
"	141	68
"	142-143	108
"	144	348
"	145	417
"	146-147	356
"	148	352
~~"~~	~~155-156~~	~~359~~
10-30	662	89
"	667	340
"	669	328
"	677	287

10-D

ENGINE Class	ENGINE Number	Page
10-30¼	43	33
"	44	384
10-32	1167	320
"	1298	324

16 DD

ENGINE Class	ENGINE Number	Page
16 28/46 ½	10	291

ENGINE Class	ENGINE Number	Page

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ENGINE Class	ENGINE Number	Page	ENGINE Class	ENGINE Number	Page	ENGINE Class	ENGINE Number	Page	ENGINE Class	ENGINE Number	Page

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12 - E

ENGINE Class	ENGINE Number	Page	ENGINE Class	ENGINE Number	Page	ENGINE Class	ENGINE Number	Page	ENGINE Class	ENGINE Number	Page
			8-36	59	60	12-26¼	22	396			
						12-30½	45	336			
						"	46	314			
						"	47	100			
						"	48	394			
						12-32½	16	399 ✓			
						"	17	427			
						12-34½	46	26 ✓			
						"	47	427			
						"	48	393			
						"	49	2 ✓			
						"	55	107			
						12-38½	129	62			

10 E

10-26	411	384
10-34	2099	24
10-36	2279	314 ✓
"	3558	416
10-38	3700	75
"	3701-3707	64

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-5830

Memorandum Spec'n 19040

SPECIFICATION FOR LOCOMOTIVES 12 3½ E 49

FOR APACHE RAILWAY Co.

RTL

Gen. as 5371

Engine Drawing No. 16

6-16-19

Gauge of Road 4' 8½" Play ¾"

Wheelbase, Rigid 13' 1" Driving 13' 1" Total 27' 1"

Total wheelbase, eng. and tend. {Actual 57' 11½" / Limited to ——

Curves 16 DEGREES Grades 1.6%

RAILS 60 POUNDS

Limits, Height —— Width ——

Weight (approximate) in working order, Total 179,000 POUNDS

On F. tr'k 15,500 lbs., Drivers 141,500 lbs., B. tr'k 22,000 lbs.

WEIGHT ON DRIVERS MUST NOT EXCEED 141,500 POUNDS.

Tractive power 36,500 lbs., Ratio of adhesion 3.9

Work'g St'm Pres. 175 lbs., Service FREIGHT

Fuel SOFT COAL (Sup. 10)

FRONT TUBE SHEET ½" THICK

Boiler STEEL Thick ¾" Bill 8597

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 4.56

Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS.

Dome, diam. 33" Pos. CENTRAL

AUXILIARY DOME — NONE.

Firebox STEEL Combustion chamb. NONE

Firebox, length 90 3/16" Width 66" Depth F. 68½" B. 64"

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

Firedoor opening 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 {THREE ROWS B.L.W. EXPANSION STAYS

Button heads below crown on EIGHT central rows

Crown bars NONE Placed —— above crown

Crown bolts ——

Tubes Flues #9 W. G. STEEL

Tubes #5½ W. G. CHARCOAL IRON OR STEEL (B.L.W. OPTION)

Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.

Number 28 / 199 Diam. 5½" / 2" Length 16' 3"

Heating Surface				
Flues	637	Combus. Chamb. ——	Total	2500.2
Tubes	1685	Fire Box 154	Fire Brick Tubes	24.2

Grate area 41.3 Ratio to Heating Surface 1 : 60.5

Superheater 553

Fire Brick ARCH AMERICAN ARCH Co.'s SECURITY ARCH ON FOUR TUBES 3" O. S. DIAM.

Grates ROCKING BARS AND DROP PLATE

Ash Pan, Dampers FRONT

Throttle BALANCE Pos. DOME

Dry pipe STEEL

Superheater SCHMIDT TYPE (See Sup. 1)

2 Smokebox extension WITH 3 Cleaning hole and cap L. S. ONLY

Spark ejector hopper WITH

Netting and deflect. plates WITH

Exhaust nozzles SINGLE HIGH

Franklin RUSHTON IMPROVED Dia. 18"

Safety Valves TWO COALE 3" OPEN (Not Spec.)

Safety valves NONE with relief lever, Set to 175 POUNDS

Whistle ONE B. L. W. PLAIN

Steam Gauge ONE IRON 7" MAKER: ASHCROFT (Not Spec.)

Steam gauge stand IRON **Clock** NONE

5 **Water Gauge** ONE B.L.W. (IRONCLAD) 6 **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 ——

Injectors TWO NATHAN SIMPLEX (Spec.) No. 10

Injectors, Pos. R. AND L. Steam pipes COPPER

Pipes, Check STEEL Feed STEEL Overflow - STEEL.

Check B. L. W. Pos. R. AND L.

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 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 M. C. B. AUTO.

Signal fixtures IRON ON BUMPER

1 **Headlight** TWO 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. 31" Body IRON PAINTED Pipes IRON

(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 ptd Bands IRON Style 9

Boiler Lagging MAGNESIA SECTIONAL

THE BALDWIN LOCOMOTIVE WORKS

C. WAGNER Aug. 1919.

SPECIFICATION FOR LOCOMOTIVES 12 3½ E 49

2

FOR APACHE RAILWAY Co.

RTL

Frames CAST STEEL

Cylinders, Diam. 20½" Stroke 28" FOR 12 3½ E 49 ONLY

St'm ports, Length 28" Width 1⅞" Bridges ——

Exh. ports, Length —— Width —— Valve lead 1/4"

Valve travel 5" Forward Motion 5¼" Steam lap 1" Exhaust clearance 1/8"

Eccentric crank throw 14½" By-pass valve NONE

S. F. Lubr. MICHIGAN FIVE-FEED 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 —— Covers ——

St'm chest valves 12" DIAM. PISTON TYPE

Met. pkg {PISTON ROD / VALVE STEMS} U. S. KING TYPE (Not Spec.)

1 **Pistons** CAST IRON RINGS SPRUNG INTO SOLID HEAD.

Guides STEEL Oil cups NEEDLE

Crossheads CAST STEEL, WITH BEARINGS OF CAST IRON, TINNED.

4 **Wrist Pins** STEEL 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.

DRIVING WHEEL HUB LINERS OF BRONZE.

Drivers, O.S. Diam. 48" Cen. diam. 42" CENTERS CAST STEEL

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

Journals, Diam. {MAIN 9" Length 10" / OTHERS 8½"

Springs. Make B. L. W.

Front Engine Truck TWO Wheeled SWING BOLSTER, CENTER BEARING

To swing 3⅜" each side of cen., Cen. pin liners NONE

Journals, Diam. 6" 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

WHEEL HUB LINERS — NONE

Back Engine Truck TWO Wheeled RUSHTON INSIDE BEARING TYPE

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

Journals, Diam. 6" Length 10" 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

WHEEL HUB LINERS — BRASS

Brake, position ON ALL DRIVING AND TENDER WHEELS

Operating Parts: Engine, Sch. No. 6-ET WESTG. COMBINED AUTO. AND STRAIGHT AIR

Operating Parts: Eng. Tr'k, sch. ——

Foundation Parts: Drivers, sch. UNI-2 AMERICAN O. S. EQUALIZED

Foundation Parts: Eng. Tr'k, sch. ——

Air pump TWO 9½" Pos. BOTH L. S.

Train connections FRONT AND BACK

Train signal, sch. NONE

AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

Tender EIGHT Wheeled, Drawing No. 1408

Weight, with fuel and water, about 153,000 POUNDS

Tank 7,000 Gallons. Bill 4871

TANK "U" SHAPE, STRAIGHT TOP. FUEL CAPACITY 10 TONS

Tool Boxes HARD WOOD, TOP

Frame STEEL, 12" CHANNELS, WITH BUMPERS OF WOOD AND CHANNEL IRON.

Front Drawbar height 28¼"

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.

Trucks ARCH BAR TYPE WITH CAST STEEL BOLSTERS.

Springs ELLIPTIC - B. L. W.

Journals, Diam. 5½" Length 10"

Wheels, Diam. 30" Tread —— Kind CAST IRON PLATE CENTERS

Tires STEEL Cen. diam. 25" Size 2½" x 5½"

Tires held by SHRINKAGE AND SHOULDER

Safety chains SINGLE

Brake Position ON ALL WHEELS

Brake sch. No. 6-ET WESTG. AUTO. AND STRAIGHT AIR WITH 12" x 12" TENDER CYLINDER.

List of tools, sch. 29 ONE PAIR BRECKING FROGS.

Photo sch. No. 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 7-1-19 Shipment ON OWN WHEELS (Sup. 9)

Brass shop finish, No. 1

Machine shop finish D-165

Patents: B. L. W. FEED WATER STRAINER — PAT'D 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, ~~APACHE RAILWAY COMPANY~~ APACHE RAILWAY (TRADE MARK)

Mark on TANK SIDES, Co.'s TRADE MARK AS SHOWN ON CUT HEREWITH, TO BE PAINTED IN COLORS.

	Road Nos. Pos.	Road Nos.	Name
F. No. Plate		300	
F. Sand Box			
Cab Sides			
Back of Tank			

Actual Dimensions of Loco.— Extreme height over all 16' 6½"

Extreme Width:—Cab boards 10' 1" Cylinders at valve motion 9' 11½"

Length outside face front bumper of engine to face of tender wedge 38' 4"

Length face of tender wedge to outside face back bumper of tender 21' 5½"

Total length outside face front bumper of engine to outside face back bumper of tender 59' 9½"

SPECIFICATION FOR LOCOMOTIVES 12 34 ½ E 48

APACHE RAILWAY COMPANY.

Specification for Type A Double Loop Superheater SPECN. A40-282-A JULY 11TH, 1919

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. Tubes to be in accordance with the American Society for Testing Materials Specification A-28-18.
BOILER FLUES	28 in number 5-5/8 o. d 49 of cold drawn seamless steel. Flues to be in accordance with the American Society for Testing Materials Specification A-28-18 ..... Card 1908-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. Prosser to have at least 12 sections ..... Card 1138
TUBE SHEET LAYOUT	Card 5224
UNITS	28 units H o. d 49 Pipes to be in accordance with the American Society for Testing Materials Specification A-28-18. Pipes united by return bends. Each unit to be tested, before being placed in boiler, with water under pressure of 500 lb. per sq. in.
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-A ..... 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 pipe or cylinder. Pipe to be well protected against freezing. Card 1149-H
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-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 at least 30% more than the working pressure of the boiler.

DAMPER	Card 1965-P	S. H. UNIT BOLT WASHER	Card 1071
DAMPER CYL. ARM.	Card 1074	S. H. UNIT CLAMP	Card 1073
DAMPER CYL. PIPE FITTING	Card 11115	S. H. UNIT CLAMP WASHER	Card 10305
DAMPER CYL. PIPE UNION	Card 11114	S. H. PIPE END	Card 524
DAMPER CYL. PIPING DIAGRAM	Card 3208	S. H. PIPE BAND	Card 1988
DAMPER CYL. SUPPORT	Card	SPACING OF BANDS & SUPPORTS	Card 10759
DAMPER SHAFT	Card 1086	TYPE OF RETURN BENDS	FORGED
DAMPER SHAFT ARM	Card 1085	RETURN BENDS	Card 11022
DAMPER SHAFT BEARING (O.S.)	Card 1148	LUBRICATOR CONNECTION	Card 3025
DAMPER SHAFT BEARING (I.S.)	Card 1275-G	DEFLECTING PLATE HANDLE	Card 1087
DAMPER SHAFT LINK	Card 1070	DEFLECTING PLATE STUDS	Card 10809
PATENT PLATE	Card 3212	DEFLECTING PLATE CLAMP	Card 10809-A
PYROMETER	None		

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SPECIFICATION FOR LOCOMOTIVES 12 34 ½ E 49

FOR APACHE RAILWAY CO.
RTL

1 SUPERHEATER AS LOCO. SUPERHEATER CO.'S SPEC'N A-40-282-A, DATED JULY 11, 1919 (COPY ATTACHED).
SUPERHEATER TO CONNECT WITH TOP HEADER IN SMOKE BOX AND WITH OUTSIDE STEAM PIPE CONNECTIONS TO VALVE CHAMBERS.
ROYALTY PAYABLE BY THE B. L. W.

2 SMOKE BOX TO BE ARRANGED FOR BURNING COAL.

3 ADDITIONAL CLEANING HOLE AND CAP IN EACH SIDE OF SMOKE BOX FOR INSPECTION OF SUPERHEATER.

4 SMOKE STACK TO BE RUSHTON IMPROVED TYPE HAVING CLEANING HOLE IN EACH SIDE OF STACK WITH A PIPE APPROXIMATELY 5" DIAM. AND NO. 19 OR NO. 20 GAUGE MATERIAL ATTACHED TO EACH OF THESE OPENINGS. THESE PIPES TO EXTEND STRAIGHT DOWN ACROSS SIDES OF CYLINDER.
SLIDE TO BE INSERTED IN THESE PIPES AT THE POINT OF CONNECTION TO THE STACK. THIS ARRANGEMENT TO PERMIT EMPTYING SPARKS DIRECTLY ON THE GROUND AT ANY POINT ALONG THE LINE.

5 WATER GAUGE TO BE B. L. W. STANDARD TYPE, INCLUDING THE REGULATION TUBE SURROUNDED BY A CAGE HAVING THREE GLASS SECTIONS.

6 HEADLIGHT EQUIPMENT TO BE PYLE NATIONAL ELECTRIC, TYPE "K" WITH INCANDESCENT HEADLIGHTS.

7 PISTON RODS TO BE KEYED TO CROSSHEAD.

8 PARALLEL RODS TO HAVE SOLID ENDS.

9 EXTRAS ORDERED ON EXTRA ORDER NO. 5219, DATED 7-7-19, TO BE SHIPPED WITH LOCO.

10 This Loco. has now been changed by Customer to burn oil fuel - Note 5/11/27 from S.S. Nickles to Owner -

For Heusaftr. Valve lead 1/8, Valve travel 5½"
Steam ldg 7/8" Exhaust clearance 0" OK WRS

Gauge of Road 4' 8½" Play ⅞"
Wheelbase, Rigid 9' 6" Driving 9' 6" Total 9' 6"
Total wheelbase, eng. and tend. { Actual 37' 8½" / Limited to ----

Curves 573 FEET RADIUS, OR 10 DEGREES
RAILS 75 POUNDS PER YARD GRADE 1%
Limits, Height ---- Width 10'0" ACTUAL
Weight (approximate) In working order, Total 105,000 POUNDS
On F. tr'k ---- lbs., Drivers 105000 lbs., B. tr'k ---- lbs.

Tractive power 24,400 lbs., Ratio of adhesion 4.3
Work'g St'm Pres. 185 lbs., Service SWITCHING
Fuel SOFT COAL

FRONT TUBE SHEET TO BE ½" THICK
Boiler STEEL Thick ⅝" Bill 8430
Boiler, Diam. 56" Plan STRAIGHT TOP
Boiler st'm pres. 200 lbs., Tested to { 220 lbs. steam pres. / 267 lbs. water pres.
WITH FACTOR OF SAFETY OF 4.95
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS

Dome, diam. 29" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE
Firebox, length 66 3/16" Width 41¼" Depth F. 57½" B. 55½"
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" DIAM. Sling stays front { TWO ROWS OF B.L.W. EXPANSION STAYS
Button heads below crown on EIGHT control rows
Crown bars NONE Placed ---- above crown
Crown bolts ----

Flues ----
Tubes 212 W. G. CHARCOAL IRON OR STEEL (B.L.W. OPTION)
Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS
Number 200 Diam. 2" Length 12' 6"

Heating Surface	Flues	----	Combus. Chamb.	---- Total 1395
	Tubes	1300	Fire Box	95 Fire Brick Tubes --
Grate area	18.9	Ratio to Heating Surface 1 :		73.8

Superheater ----

Fire Brick ARCH ON STUDS

Grates, Rocking BARS AND DROP PLATE
Ash Pan, Clearance FRONT AND BACK

Throttle, Balance Pos. DOME

Engine Number 2000
Engine Building No. 61.
7-17-18.

(not specd.)
Safety Valves TWO CONSOLIDATED 2"
Safety valves NONE with relief lever, Set to 185 POUNDS
Whistle ONE B. L. W. PLAIN

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

Water Gauge ONE B.L.W. IRONCLAD **Cab Lamps** TO BURN OIL
Gauge Cocks THREE RACK 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, BACK ONES DIAGONAL, RIGHT SIDE, FRONT 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 TWO MONITOR (not specd.) 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 STEEL

Cab boards STEEL Nosing T-IRON
Running boards STEEL Nosing T-IRON
Hand rail IRON Located on BOILER

Back Bumper BAR STEEL Back draw bar height 33"

Pilot NONE Pilot beam, CAST IN PIECES Pilot knee, Pilot brace,
Pilot pedestal, Pilot truck wheels, Pilot axle, Pilot boxes, Pilot springs, Pilot equalizers, Pilot pin, Pilot hangers, Pilot frame, Pilot frame braces, Pilot frame keys, Pilot frame bolts, Pilot frame pedestals, Pilot frame pedestal binders, Pilot frame pedestal braces, Pilot frame pedestal tie bolts, Pilot frame pedestal tie bolt nuts, Pilot frame pedestal tie bolt cotters, Pilot frame pedestal tie bolt cotter keys, Pilot frame pedestal tie bolt cotter key washers, Pilot frame pedestal tie bolt cotter key washer nuts, Pilot frame pedestal tie bolt cotter key washer nut cotters, Pilot frame pedestal tie bolt cotter key washer nut cotter keys, Pilot frame pedestal tie bolt cotter key washer nut cotter key washers, Pilot frame pedestal tie bolt cotter key washer nut cotter key washer nuts, Pilot frame pedestal tie bolt cotter key washer nut cotter key washer nut cotters, Pilot frame pedestal tie bolt cotter key washer nut cotter key washer nut cotter keys, Pilot frame pedestal tie bolt 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Pilot frame pedestal tie bolt cotter key washer nut

SPECIFICATION FOR LOCOMOTIVES 6 36 D Jan 1918 308

FOR CANTON RAILROAD COMPANY

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Frames CAST STEEL Braces SOLID

Cylinders, Diam. 21" Stroke 28"
St'm ports, Length 19" Width 1⅝" Bridges 1⅝"
Exh. ports, Length 19" Width 3" Valve lead 3/16"
Valve travel 5½" Steam lap 1" Exhaust clearance ——
Eccentric crank throw 21" By-pass valve NONE
S. F. Lubr. DETROIT TRIPLE No. 22, BULLS EYE (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 (SUP. 13) WITH VACUUM VALVES
Met. pkg {PISTON RODS / VALVE STEMS} TROJAN (Spec)

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD
Guides STEEL Oil cups NEEDLE
Crossheads CAST STEEL. BEARINGS OF GUN IRON BABBITTED
Wrist Pins STEEL Rod cups {COMPRESSION GREASE CUPS FORMED ON RODS}
PARALLEL RODS TO HAVE SOLID ENDS.

Valve Motion SOUTHERN: ROYALTY PAYBLE 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.

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 9/64" TOTAL (TEM. 4.13.??)

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. No. 6-ET WEST'G. COMBINED AUTO. AND STRAIGHT AIR
Eng. Tr'k, sch. ——
Foundation Parts { Drivers, sch. W-3 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 110,000 POUNDS

Tank 5500 Gallons, Bill 4041
TANK "U" SHAPE, SLOPING BACK; FUEL CAPACITY:- 8 TONS.

Tool Boxes HARD WOOD, TOP

Frame STEEL 10" CHANNELS WITH BUMPERS OF WOOD (SUP. 52)

Front Drawbar height 30⅝"
Pilot NONE Pushing shoes AT REAR
Back drawhead, center above rail 33½"
Coupler TOWER M.C.B. AUTO. WITH FARLOW DRAFT GEAR.

Steps, HAND HOLDS, ETC., TO CONFORM TO I.C.C. REQUIREMENTS.
STEPS ACROSS REAR WITH HANDRAIL. 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 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 WEST'G. AUTO. AND STRAIGHT AIR WITH 12" x 12" TENDER CYLINDER.

List of tools, sch. No. 29; ONE PAIR TILDEN RE-RAILING FROGS.
Photo sch. NONE Inspection B. L. W.
To be weighed Yes No Material spec'ns B. L. W.
Certificate of boiler test THREE COPIES OF B.L.W. FORM 1036
Junior laws to 11-1-18 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 291. OLIVE GREEN AND ALUMINUM
Painting:—Tender, style 291. OLIVE GREEN AND ALUMINUM

LETTERING, ETC., TO BE SIMILAR TO 6 36 D 235
Mark on TANK SIDES:- CANTON RAILROAD

Road Nos. Pos. Road Nos. Name NONE
F. No. PLATE 5
BOTH SAND BOXES
BACK OF TANK

Actual Dimensions of Loco. Extreme height over all 14'8½"
Extreme Width:—Cab boards 10'3" Cylinders or valve motion 12'5"
Length outside face front bumper of engine to face of tender wedge 32'7½"
Length face of tender wedge to outside face back bumper of tender 24'10½"
Total length outside face front bumper of engine to outside face back bumper of tender } 57'6"

SPECIFICATION FOR LOCOMOTIVE 0 36" D 200
FOR CANTON RAILROAD COMPANY

1 FIRE DOOR TO BE FRANKLIN, BUTTERFLY TYPE.

2 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 NUMBER IN BREAKING ZONE.

3 GRATES TO BE HINGED TO BACK SHEET SO THAT PLATE WILL DROP INTO BACK OF ASH PAN.

4 ASH PAN TO HAVE SAME SLOPE IN BACK AS IN FRONT.

5 INJECTOR CHECK TO BE SELLERS DOUBLE BACKHEAD TYPE WITH STOP VALVE.

6 FEED WATER STRAINER TO BE SELLERS No. 3, AS SHOWN ON THEIR PRINT No. 32198.

7 INJECTOR OVERFLOW TO BE PIPED INTO AS PAN.

8 SELLERS WETTING DOWN HOSE, COLD WATER ATTACHMENT.

9 CAB SIDE WINDOWS TO BE LARGE TO PROVIDE TWO-THIRDS OPEN SPACE.

10 ENGINE AND TENDER FLOOR TO BE ON SAME LEVEL.

11 CONNECTION BETWEEN ENGINE AND TENDER DESIGNED FOR 35 DEGREE CURVE.
RADIAL BUFFER BETWEEN ENGINE AND TENDER (ECONOMY DEVICES CORPORATION).

12 CYLINDERS TO BE BORED AND BUSHED.

13 STEAM CHEST VALVES TO BE JACK WILSON DOUBLE-PORTED SLIDE VALVES.

14 BABBITT TO BE DOVETAILED IN CROSSHEAD BEARINGS.

15 CROSSHEAD PINS AND ALL KNUCKLE PINS TO HAVE CASTELLATED NUTS.

16 FLANGE OILERS:- DETROIT FLANGE LUBRICATOR, PENDULUM TYPE, FOR FRONT OF FRONT DRIVERS AND BACK OF REAR DRIVERS ~~XXX~~ SAME FURNISHED AND APPLIED BY THE B. L. W.

17 DRIVING WHEELS TO HAVE HUB LINERS OF BRASS.

18 DRIVING BOX OIL CELLARS TO BE CUT DOWN ABOUT 1/2" ON INSIDE AND TO HAVE SMALL PLATES BOLTED OVER OPENING TO FACILITATE RESPONGING THE BOXES.

19 DRIVING BOX BRASSES TO BE TURNED WITH A SHOULDER OF NOT LESS THAN 1/2", AND TO BE PRESSED INTO BOXES FROM FACE SIDE. DRIVING BOX PLUGS TO BE DRIVEN FROM INSIDE OF BRASSES THROUGH THE BOXES.

20 AIR PUMP EXHAUST RUNNING INTO CYLINDER SADDLE SO AS TO PREVENT EXCESS USE OF FUEL WHEN ENGINE IS STANDING.

21 BRAKE WORK TO BE KEPT HIGH ABOVE RAIL.
BRAKE SHOES RIGGED TO BRAKE ON BACK OF WHEELS.

22 AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

TENDER

51 MANHOLE TO BE APPLIED BACK OF COAL SPACE.

52 STEEL PLATE TO BE APPLIED IN FRONT AND BACK OF BUMPERS.

53 ENGINE AND TENDER FLOOR TO BE ON SAME LEVEL.

54 CONNECTION BETWEEN ENGINE AND TENDER DESIGNED FOR 35-DEGREE CURVE.
RADIAL BUFFER BETWEEN ENGINE AND TENDER (ECONOMY DEVICES CORPORATION).

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-5712

Memorandum Spec'n 19024

SPECIFICATION FOR LOCOMOTIVES 6 34 D 968

FOR CHATTANOOCHEE VALLEY RAILROAD

RTL

Gen. as PHOTO 4767 (EXCEPT WITH STEEL CAB AND STRAIGHT TOP TENDER.

Engine Drawing No. 72

5-3-19.

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 10' 10" Driving 10' 10" Total 10' 10"
Total wheelbase, eng. and tend. { Actual 42' 2" / Limited to ---

Curves ---
RAILS 60 AND 70 POUNDS PER YARD.
Limits, Height --- Width ---
Weight (approximate) in working order, Total 133,000 POUNDS
On F. tr'k --- lbs., Drivers 133,000 lbs., B. tr'k --- lbs.

Tractive power 31,810 lbs., Ratio of adhesion 4.18
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 8533
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 5.4
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS.

Dome, diam. 29" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE
Firebox, length 108 9/16" Width 41⅜" Depth F 62½" B. 59⅜"
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 DOUBLE Riveted
Water space stays ⅞" DIAM. WITH 3/16" HOLES 1½" DEEP FROM O.S.
FLEXIBLE STAYBOLTS, TATE, ABOUT 400, IN BREAKING ZONE.
Radial stays 1" DIAM. Sling stays front { TWO ROWS 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 (B. L. W. OPTION)
Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.
Number 280 Diam. 2" Length 10' 6"

Heating	Flues ---	Combus. Chamb. ---	Total	1685
Surface	Tubes 1527	Fire Box 144	Fire Brick Tubes 14	
Grate area 31.3	Ratio to Heating Surface 1 : 53.8			
Superheater ---				

Fire Brick ARCH, AMERICAN ARCH CO.'S "SECURITY" ARCH ON TWO 3" TUBES 3/16" THICK.

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"

Safety Valves TWO CROSBY 3" ONE MUFFLED (Spec)
Safety valves NONE with relief lever, Set to 180 LBS. MUFFLED / 183 LBS. OPEN
Whistle FREIGHT TYPE

Steam Gauge ONE IRON 7" MAKER: STAR (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 TWO EVERLASTING Pos.: R. AND L.
Cleaning Plugs
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 TWO SELLERS CLASS "N" (Spec) No. 10
Injectors, Pos. R. AND L. Steam pipes COPPER
Pipes, Check STEEL Feed STEEL Overflow STEEL
Check SELLERS Pos. R. AND L.

Steam Heat NONE

Cab STEEL VENTILATOR IN CAB ROOF.

Cab boards STEEL Nosing T-IRON
Running boards STEEL Nosing T-IRON
Hand rail IRON Located on BOILER

Jack Bumper BAR STEEL Back drawbar height 34½"
SPRING BUFFER BETWEEN ENGINE AND TENDER.

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.
LOCO. TO MEET REQUIREMENTS AND REGULATIONS OF THE I.C.C.

Signal fixtures IRON ON BUMPER
☆ COMBINATION FLAG AND LAMP BRACKETS ON FRONT OF ENGINE.

Headlight TWO ROUND CASE 16" Reflector, To burn KEROSENE
Headlight, Nos. on sides WITH Hd'lt stop WITH
Lamp shell NONE Nosing ---

Bell 52 POUNDS
Sand Box TWO Diam. 28" Body IRON PAINTED Pipes IRON
Sander (Spec) LEACH #18 TRAP 8-1 IN EACH BOX. TO SAND FRONT AND BACK.
Dome casing IRON PAINTED

Boiler Jacket #18 PLAIN STEEL Bands IRON Style S
Boiler Lagging MAGNESIA SECTIONAL

THE BALDWIN LOCOMOTIVE WORKS

J. A. Pfeifer JULY-1919.

SPECIFICATION FOR LOCOMOTIVES 6 34 D 968

FOR CHATTANOOCHEE VALLEY RAILROAD.

RTL

11

Frames CAST STEEL Braces SOLID

Cylinders, Diam. 20" Stroke 26"
St'm ports, Length 16" Width 1⅝" Bridges 1⅜"
Exh. ports, Length 16" Width 3" Valve lead ¼"
Valve travel 5½" Steam lap ⅞" Exhaust clearance ---
Eccentric crank throw 11-19/32" By-pass valve NONE
S. F. Lubr. DETROIT TRIPLE No. 22 BULL'S EYE (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. KING TYPE, (Spec)

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD.
Guides ALLIGATOR TYPE, STEEL Oil cups NEEDLE
Crossheads CAST STEEL WITH BEARINGS OF CAST IRON, TINNED.
Wrist Pins STEEL Rod cups GREASE CUPS ON RODS
CONNECTING RODS "I" SECTION.
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 ⅜" THICK.
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 x 10163-25 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 ---

Brakes, position ON ALL DRIVING AND TENDER WHEELS.
Operating Parts: Engine, Sch. NO. 6-ET WESTG. COMBINED AUTO. AND STRAIGHT AIR; Eng. Tr'k, sch. ---
Foundation Parts: Drivers, sch. NO-2 AMERICAN O.S. EQUALIZED; Eng. Tr'k, sch. ---
Air pump Two 9½" Pos. BOTH L. S.
Train connections FRONT AND BACK
Train signal, sch. NONE
AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS.
☆ EXTRAS ORDERED ON EXTRA ORDER 4480 DATED 6-5-19 TO BE SHIPPED WITH LOCO.

Tender EIGHT Wheeled, Drawing No. 1393
Weight, with fuel and water, about 100,000 POUNDS

Tank 5,000 Gallons, Bill 4834
TANK "U" SHAPE, STRAIGHT TOP. FUEL CAPACITY 10½ TONS
DRAIN PIPE IN REAR CORNER OF TANK.
Tool Boxes HARD WOOD, TOP.
TANK MAN HOLE TO BE 15" x 30" WITH HINGED COVER.
Frame STEEL 8" AND 10" CHANNELS, WITH BUMPERS OF WOOD.
SPRING BUFFER BETWEEN ENGINE AND TENDER.
Front Drawbar height 33½"
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 AND GRAB IRONS AT EACH CORNER.
STEPS ACROSS REAR WITH HAND RAIL.
Trucks ARCH BAR TYPE WITH TOP AND BOTTOM BOLSTERS OF CAST STEEL.

Springs ELLIPTIC - B. L. W.
Journals, Diam. 4½" 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. NO. 6-ET WESTG. AUTO. AND STRAIGHT AIR WITH 12" x 12" TENDER CYLINDER.

☆ COMBINATION FLAG AND LAMP BRACKETS ON REAR OF TANK

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 7-1-19 Shipment ON OWN WHEELS (SEE * BELOW)

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

S. L. W. Patents { FEED WATER STRAINER, PAT'D. 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., IN GOLD LEAF.
Mark on CAB SIDES, C. V. RY.
MARK ON TANK SIDES, C. V. RY.
ROAD NUMBER IN SMALL FIGURES UNDER MARK ON CAB.

Road Nos. Pos.	Road Nos.	Name NONE
F. No. PLATE	11	
CAB SIDES		
BACK OF TANK		

Actual Dimensions of Loco. Extreme height over all 13' 11⅞"
Extreme Width:—Cab boards 10' 0" Cylinders or valve motion 10' 0"
Length outside face front bumper of engine to face of tender wedge 29' 1¾"
Length face of tender wedge to outside face back bumper of tender 24' 5"
Total length outside face front bumper of engine to outside face back bumper of tender 53' 6¾"

THE BALDWIN LOCOMOTIVE WORKS As Specn. 0-6386
Memorandum Sheet 20054
SPECIFICATION FOR LOCOMOTIVES 6 38 D 115
EE
FOR Chicago Heights Terminal Transfer Railroad Co.
HW

Gen. as Photo. 5863 {Except to have straight top tender tank (Shp. 14c)
Engine Drawing No. 21

2.27.20

Gauge of Road 4'8½" Play ¾"
Wheelbase, Rigid 11'0" Driving 11'0" Total 11'0"
Total wheelbase, eng. and tend., {Actual 42' 7"
{Limited to ---

Curves Not over 28 degrees

Limits, Height 14'2" (Sup.3) Width 10'10"
Weight {Total engine and weight on drivers, Total 160,000 pounds
{On F. tr'k --- lbs., Drivers 160,000 lbs. B. tr'k --- lbs.
{Weight not to exceed 81 tons.
Tractive power 39,100 lbs. Ratio of adhesion 4.1
Work'g St'm Pres. 190 lbs. Service Switching (See Sup.2)
Fuel Soft Coal

Boiler Steel Thick ¾" Bill 8969
Front Tube Sheet ½" Thick
Boiler, Diam. 78" Plan Straight Top
{Allowable st'm pres. 200 lbs **Tested to** 220 lbs. steam pres.
{With Factor of Safety of 4.7 267 lbs. water pres.
Longitud. seams (See Sup. 4)

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

Firebox Steel Combustion chamb. None
Firebox, length 120-3/16" Width 42½" Depth F. 73⅛" B. 69⅜"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diam.
Water space, Front 4" Sides 3" Back 4"
6 Water space frame Double Riveted
Water space stays ⅜" diam. with 3/16" holes 1¼" deep from O.S.

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

Flues None
Tubes #11 W.G. Steel
Tube ends Swaged for copper ferrules, fire box ends.
Number 374 Diam. 2" Length 10'6"

Heating Surface {Flues --- Combus. Chamb --- Total 2245⁰
{Tubes 2040⁰ Fire Box 205⁰ Fire Brick Tubes ---
Grate area 35.1 Ratio to Heating Surface 1: 64
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 arrester hopper With
Netting and deflector plates With

Exhaust nozzles Double High

Stack Straight Dia. 19"

Safety Valves Two Crosby 3" Open
Safety valves None with relief lever. Set to 190 pounds
Whistle One B.L.W. Chime, low tone

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

Water Gauge One (See sup. 7) **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.

8 **Blow off Cock** Two Scully Everlasting 2" Pos. R. and L.
9 **Cleaning Plugs** One plug above fire door
Firebox, Corners diagonal, sides and back
Crown, Three each side and three back
Waist, One under front
Front tube sheet, One Fusible plug None

Pump None

14 **Injectors** (Spec.) Two Monitor (Sup. 10) No. 10
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Steel Feed Steel Overflow Iron
Check B. L. W. (See Sup. 11) Pos. Right and Left

Steam Heat None (See Sup. 12 and 14)

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 31"

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 Sharon M. C. B. Automatic

Signal fixtures None

15 **Headlight** Two Round case 18" Reflector,
Headlight, Nos. on sides With Hd'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 air trap A-1 in each box to sand front and rear.

Dome casing Iron Painted

14 **Boiler Jacket** #18 Soft Steel Pto. Bands Iron Style 9 and 14
Boiler Lagging Magnesia Sectional
Back head of boiler to be lagged and jacketed.

THE BALDWIN LOCOMOTIVE WORKS
Jas Brecknock May 1920.
SPECIFICATION FOR LOCOMOTIVES 6 38 D 115
FOR Chicago Heights Terminal Transfer Railroad Co.
HW

Frames Cast Steel

Cylinders, Diam. 22" Stroke 26"
St'm ports, Length 19" Width 1⅞" Bridges 1⅜"
Exh. ports, Length 19" Width 3" Valve head 3½"
Valve travel 5½" Steam lap ¾" Exhaust clearance ---
Eccentric crank throw 10-5/16" By-pass valve None
S. F. Lubr. Detroit Triple No. 22 Bull's Eye (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 Locke Metal U.S. King Type (Spec.)
Piston rods to be keyed to crossheads
Pistons Heads of cast iron with rings of cast iron sprung in
Guides Steel Oil cups Needle
Crossheads Cast Steel with bearings of cast iron tinned
Wrist Pins Steel Rod cups Grease Cups
Parallel rods to have solid ends.

15 **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 wheel hub liners Bronze
Drivers, O. S. Diam. 52" Cen. diam. 9½" Centres Cast Steel

Tires Steel (Sup. 16) 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 = 3/16" total
Driving Boxes Cast Steel (See Sup. 17)
Journals, Diam. 9" Length 12"

18 **Springs.** Make Standard Steel Works

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

19 **Brakes,** position On all driving and tender wheels
Operating Parts { Engine, sch. No. 6 ET Westg. combined auto. and straight air.
{ Eng. Tr'k, sch. ---
Foundation Parts { Drivers, sch. 188-3 BC American O. S. equalized
{ Eng. Tr'k, sch. ---
14c Air pump One 11" Pos. Left Side
Train connections Front and Back
Train signal, sch. None

Tender Eight Wheeled, Drawing No. 1530
Weight, with fuel and water, about 113,500 pounds
Tender to be weighed:- Yes
Tank 5,500 Gallons, Bill 5869
Tank "U" shape, straight top. Fuel capacity 8 tons.

Tool Boxes of hard wood, top.

Frame Steel, 10" channels, with bumpers of wood and steel plate.
Front Drawbar height 30⅜"
Pilot None Pushing shoes at rear
Back drawhead, center above rail 33½"
Coupler Sharon M. C. B. automatic, with Westinghouse friction draft gear.

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, Standard Steel Works
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 Westinghouse combined automatic and straight air with 12"x12" tender cylinder.

List of tools, sch. 29
Photo sch. None Inspection B. L. W.
To be weighed Yes Material specifns B. L. W.
Certificate of boiler test Three copies of B.L.W. form 1036
Junior laws to 5-30-20 Shipment On own wheels

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

B. L. W.,
Patents { Feed water strainer, Pat'd Sept. 1, 1903 (Cast on)

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

Painting, style 291, Olive Green and Aluminum
Painting and Marking to be same as for 6 36 D 215
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 9
Back of tank

Actual Dimensions of Loco. Extreme height over all 14'2 10½"
Extreme Width: Cab boards 10' 3" Cylinders or valve motion 10' 4⅛"
Length outside face front bumper of engine to face of tender wedge = 31' 1"
Length face of tender wedge to outside face back bumper of tender = 21' 3"
Total length outside face front bumper of engine to outside face back bumper of tender 53' 1"

SPECIFICATION FOR LOCOMOTIVES 6 38 D 115

FOR CHICAGO HEIGHTS TERMINAL TRANSFER RAILROAD COMPANY

NW

1 DETAILS, AS FAR AS PRACTICABLE, TO BE INTERCHANGEABLE WITH Co's LOCO. No. 8, B.L.W. CLASS 6 36 D 215.

2 LOCOMOTIVE FOR USE IN I. C. C. SERVICE.

3 LIMIT HEIGHT IS 14' 2", EXCEPT SAFETY VALVES MAY BE 15'0" ABOVE RAIL.

4 LONGITUDINAL SEAMS, BUTT JOINTED DOUBLE COVERING STRIPS, 90% SEAMS.

5 MAIN DOME ONE PIECE TYPE.
AUXILIARY DOME, NONE.

6 MUD RING OF CAST STEEL, IN ONE PIECE, NOT WELDED.

7 WATER GAUGE TO HAVE THREE FACE SARGENT GLASS, SAME AS FOR RAILROAD ADMINISTRATION LOCOMOTIVES.

8 BLOW OFF COCKS TO BE ARRANGED TO OPERATE FROM CAB AND LOCATED THE SAME AS FOR Co's LOCO. No. 8, B.L.W. CLASS 6 36 D 215.

9 CLEANING HOLES TO BE LOCATED SAME AS FOR Co's ROAD No. 8, B. L. W. CLASS 6 36 D 215, ONE PLUG IN EACH SIDE OF WAIST SHEET 18" ABOVE CENTRE OF BOILER AND 18" FROM FRONT TUBE SHEET.

10 INJECTORS TO BE MONITOR SCREW BACK TYPE, AND TO BE EQUIVALENT TO HANCOCK No. 9½.

11 BOILER CHECKS TO BE SECURELY FASTENED WITH FOUR STUDS AND BALL JOINT AND NUTS AND SCREWED INTO SHELL.

12 ~~CAB HEATER TO BE SAME AS FOR R. R. ADMINISTRATION LOCOS.~~
CAB STEAM HEAT STYLE AS UNION PACIFIC RY.Co's. DWG.CA-21036.

13 HEADLIGHT EQUIPMENT TO BE PYLE NATIONAL ELECTRIC TYPE K-2 WITH INCANDESCENT HEADLIGHT AND WITH CAB LIGHTS, FOR SWITCHING SERVICE.

14 PIPES TO BE WRAPPED IN ACCORDANCE WITH U.S.R.A. REQUIREMENTS.

15 MAGONNET POWER REVERSE GEAR, TYPE "B" AS COVERED ON EXTRA ORDER No. 19740, DATED 6-2-20.

16 DRIVING TIRES TO BE EXTRA HARD FOR SWITCHING SERVICE.

17 DRIVING BOXES TO BE EQUIPPED WITH ELVIN GREASE CELLERS.

18 ENGINE SPRINGS TO HAVE EXTRA STRONG HANGERS.
SPRINGS TO BE EXTRA STRONG.

19 AIR RESERVOIR TO BE ENAMELLED AND TO HAVE HUDROSTATIC TEST OF 210 POUNDS.

THE BALDWIN LOCOMOTIVE WORKS — As Spec'n. C-5129, Dup. 6 36 D 228 — Except where otherwise specified.

Memorandum Spec'n 19088

SPECIFICATION FOR LOCOMOTIVES 6 36 D 314

FOR Chicago Short Line Railway Company — Except to have Piston Valves and Baker Valve Gear

P — Gen. as Photo. 5761 — Engine Drawing No. 39

12-12-19

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"
Total wheelbase, eng. and tend. (Actual 41' 10" / Limited to ----

Curves ---

Limits, Height --- Width ---
Weight (approximate) in working order, Total 144,000 pounds
On F. tr'k --- lbs., Drivers 144,000 lbs., B. tr'k --- lbs.

Tractive power 34,400 lbs., Ratio of adhesion 4.2
Work'g St'm Pres. 180 lbs., Service Switching
Fuel Soft Coal

1-3 **Boiler** Steel Thick 11/16" Bill 8819
16 Front Tube Sheet ½" Thick
Boiler, Diam. 68" Plan Straight Top
(Allowable st'm pres. 180 lbs. **Tested to** 200 lbs. steam pres.
(With Factor of Safety of 5.25 2/0 lbs. water pres.
Longitud. seams Butt jointed, double covering strips

5 **Dome,** diam. 29" Pos. Forward of fire box
Dome - One piece type
6-8 **Firebox** Steel Combustion chamb. None
3 Firebox, length 102-3/16" Width 42½" Depth F. 65½" B. 62½"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
4 Firedoor opening 16" diam.
Water space, Front 4" Sides 3" Back 3"
Water space frame Single Riveted
7 Water space stays 1" diam. with 3/16" holes 1¼" deep from O. S.
6 Radial stays 1⅛" diam. Sling stays front (Two Rows B. L. W. / Expansion Stays
Button heads below crown on Eight central rows
Crown bars None Placed --- above crown
Crown bolts ---

6 Flues ---
Tubes #12 W. G. Seamless Steel
Tube ends Swaged for copper ferrules, firebox ends
Number 318 Diam. 2" Length 10' 5"

3 **Heating Surface** Flues --- Combus. Chamb. --- Total 1899.5
Tubes 1721.5 Fire Box 163.5 Fire Brick Tubes 15.0
Grate area 30.0 Ratio to Heating Surface 1: 63.1
Superheater ---

Fire Brick Arch - American Arch Co's. Security Arch on three tubes, 3" O. D. 3/16" thick.

Grates Rocking bars and drop plate (See Sup. 9)
10 **Ash Pan,** Dampers Front and back

5 **Throttle** Balance Pos. Dome
11 Dry pipe Steel

11 **Superheater** None

12 **Smokebox** extension With (13 Cleaning hole and cap) L. S. only
Spark ejector-hopper With (See Sup. 14)
Netting and deflect. plates With

Exhaust nozzles Double, High

15 Stack Straight Dia. 18"

Safety Valves Two Crosby 3" Open (Spec)
Safety valves None with relief lever, Set to 180 pounds
Whistle One 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** (23) 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 Everlasting 1½" Pos: L. S.
17 **Cleaning Plugs**
Firebox, Corners, back ones diagonal, sides and back
Crown, Three each side and four back
Waist, Two under (See Sup. 17)
Front tube sheet, One Fusible plug None

Pump None

Injectors Two Sellers, Class "N" (Spec) No. 10½
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
18 Check Sellers Duplex, with Stop Valve Pos. Top of boiler

Steam Heat - None

19 **Cab** Steel Ventilator in cab roof
Cab side windows to provide two-thirds opening.

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

22 **Back Bumper** Bar Steel Back drawbar height 31½"

Pilot None Pushing shoes at front
24 **Front Bumper** Cast Steel Bumper plate None
Steps Across front, with handrails
Steps, hand holds etc. to conform to I. C. C. requirements
Front Drawhead, Center above rail 33½"
Coupler Sharon M. C. B. Automatic.

Signal fixtures Iron on bumper

28 **Headlight** Two Round Case 14" Reflector, To burn
Headlight, Nos. on sides With H'dl't step With
Lamp shelf None Nosing ---

Bell 92 pounds Trojan Air Bell Ringer (Spec)
Sand Box Two Diam. 28" Body Iron painted Plate Iron
Sanders (Nathan) Vesh 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
30 **Boiler Lagging** Magnesia Sectional
Back head of boiler to be lagged and jacketed.

THE BALDWIN LOCOMOTIVE WORKS

H. K. Hartwick — Jan. 1920. — 16

SPECIFICATION FOR LOCOMOTIVES 6 36 D 314

FOR Chicago Short Line Railway Company — Furnish to Railway Company One complete set of Vandyke Prints. 16

P

31 41 **Frames** Cast Steel

Cylinders, Diam. 21" Stroke 26"
St'm ports, Length 26.16" 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. Nathan Triple Bull's Eye (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 --- Covers ---
St'm chest valves 10" diam. Piston type, inside admission
Met. pkg. (Piston rods / Valve stems) United States, King type (Spec)
Piston rods to be keyed to crossheads
Pistons Heads of Cast Iron, with rings of cast iron, sprung in.
32 **Guides** Laird Type, Steel Oil cups Needle (Sup. 33)
34 **Crossheads** Cast Steel: Bearings of Hunt-Spiller Gun Iron
Wrist Pins Steel Rod cups (See Sup. 37)
Rods: (See Sup. 35 - 36)

38 **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.
Ragonnet Power Reverse Gear (See Sup. 39)

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 wheel hub liners Bronze (See Sup. 40)
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 - 3/16" total
41 **Driving Boxes** Cast Steel, with oil cellars
Journals, Diam. 9" Length 12"

51 **Springs.** Make B. L. W.

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

42 **Brake,** position On all driving and tender wheels
Operating Parts: Engine, sch. No. 6-ET Westinghouse Combined Auto. and Straight Air; Eng. Tr'l. sch. ---
Foundation Parts: Drivers, sch. M-2 American O. S. Equalized; Eng. Tr'l. sch. ---
42 Air pump One 8½" Cross Compound Pos: L. S.
Train connections Front and back
Train signal, sch. None
Air reservoirs to have hydrostatic test of 210 pounds

943
52

76 **Tender** Eight Wheeled. Drawing No. 1482
Weight, with fuel and water, about 121,000 pounds
Tender to be weighed: Yes
76 **Tank** 6,000 Gallons, Bill 5152
Tank "U" shape, straight top. Fuel capacity 7 tons.
Manhole in tank to be 1' 0" across tank and 2' 0" in length.
Tool Boxes Hard Wood, Top. Chain coal gates to be applied.

Frame Steel 12" channels, with front and back bumpers of wood

Front Drawbar height 32½"
Pilot None Pushing shoes At rear
Back drawhead, center above rail 33½"
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 hand rail.

Trucks Arch Bar Type with Cast Steel Bolsters.

Springs Elliptic, B. L. W.
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 Westg. Auto. and Straight Air with 12" x 12" tender cylinder

List of tools, sch. 29
Photo sch. No. 2 Inspection B. L. W. (See Sup. 47)
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 12-31-19 Shipment On Own Wheels (See Sup. 2)

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

B. L. W. Patents: Feed Water Strainer, Patented September 1, 1903 (cast on)

Property plates B. L. W. for Engine and Tender.

Painting, style 291, Olive Green and Aluminum

Lettering etc. to be same as for 6 36 D 228
Mark on On sides of cab and tank collars C. S. L. Ry. Co.

	Road Nos. Pos.	Road Nos.	Name None
F. No. Plate		10	
Dome			
Sides of Tank			
Back of Tank			

Actual Dimensions of Loco. Extreme height over all 14' 6" Extreme Width: Cab boards 10' 6" Cylinders or valve motion 9' 11½"
Length outside face front bumper of engine to face of tender wedge 29' 3½"
Length face of tender wedge to outside face back bumper of tender 23' 3½"
Total length outside face front bumper of engine to outside face back bumper of tender 53' 7"

SPECIFICATION FOR LOCOMOTIVES 6 36 D 314

FOR CHICAGO SHORT LINE RAILWAY COMPANY

P

1 LOCOMOTIVE FOR OPERATION IN ILLINOIS, I. E., BOILER TO CONFORM TO THE I. C. C. REQUIREMENTS.

2 GALENA OIL TO BE USED FOR INITIAL LUBRICATION.

3 BOILER TO HAVE BROKEN THROAT OFF-SET 6" BACK, REDUCING LENGTH OF FURNACE AND GRATE AREA ACCORDINGLY.

4 FIRE DOOR TO HAVE FRANKLIN OPENER, BUTTERFLY TYPE.

5 DOME AND THROTTLE PARTS TO BE ARRANGED SO AS TO PERMIT MAN TO ENTER FOR INSPECTION.

6 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.

7 (Not Space) TATE STAYS, ABOUT 350, IN BREAKING ZONE, 34 IN THROAT, 118 IN EACH SIDE, AND 80 IN BACK HEAD.

8 SMOKE CONSUMER, CONSISTING OF THREE HOLES THROUGH EACH SIDE WATER SPACE OF FIRE BOX, AND PROVIDED WITH THREE STEAM JETS.

9 GRATES TO HAVE ROCKING BARS DOUBLE CONNECTED, WITH SMALL FINGERS AND WITH DROP PLATE AT REAR OF FIREBOX.

10 ASH PAN AS B. L. W. PRINT 25734, ARRANGED SO THAT IT CAN BE READILY REMOVED WITHOUT MAVING TO JACK UP THE BOILER.

11 STEAM PIPES TO HAVE OUTSIDE CONNECTIONS TO VALVE CHAMBERS: NO PROVISION TO BE MADE FOR APPLICATION OF SUPERHEATER.

12 DO NOT APPLY HOLES IN SMOKE BOX FRONT OPPOSITE TO TUBE SHEET PLUGS.

13 CLEANING HOLE AND CAP TO HAVE SLIDING COVER TO BE TAPERED AND WORKED DOWN.

14 SPARK HOPPER TO HAVE SLIDE INSTEAD OF COVER.

15 STACK TO BE SECURED TO BOILER BY SIX BOLTS.
SMOKE STACK BOLTS APPLIED ON CROSS CENTER.

16 ALL HOLES TAPPED INTO BOILER TO HAVE TWELVE THREADS PER INCH.

17 ~~ONE PLUG ABOVE FIRE DOOR FOR CLEANING ALL POINTS AROUND TOP OF FIRE DOOR.~~ (Omit 1926) 3.14.25
ONE PLUG EACH SIDE IN FIRST COURSE ABOVE CENTER LINE OF BOILER
ONE PLUG EACH SIDE IN BARREL OF BOILER JUST ABOVE AND IN FRONT OF CROWN SHEET.
ONE PLUG EACH SIDE OF BOTTOM CENTER IN FIRST COURSE, AND ONE PLUG IN EACH SIDE OF BOTTOM CENTER IN SECOND COURSE, SO LOCATED THAT THE DRIVING WHEELS WILL NOT INTERFERE WITH GETTING AT THE PLUGS WITH A TOOL.
TWO WASHOUT PLUGS UNDER SAISE, ONE FRONT AND ONE BACK.

18 INJECTOR CHECK TO BE SAME AS FOR 6 36 D 228, EXCEPT TO HAVE BALL JOINT AT TOP AND BOTTOM.
INJECTOR CHECK STUDS TO BE OFF-CENTER ON INJECTOR CHECK, SAME AS FOR 6 36 D 228.

19 CAB CORNERS TO BE ROUNDED TO 3" RADIUS.

20 CAB ARRANGEMENT TO BE IDENTICAL WITH 6 36 D 228.

21 FRONT PORTION OF RUNNING BOARD TO BE A GRATING.

22 FRANKLIN RADIAL BUFFER BETWEEN ENGINE AND TENDER.

23 LIGHT FOOT PLATE OF STEEL TO BE APPLIED AT FRONT.

27 FRONT BUMPER TO BE CAST SEPARATE FROM THE FRONT FOOT PLATE, AND TO BE SECURELY BRACED.

28 HEADLIGHT EQUIPMENT TO BE PYLE NATIONAL ELECTRIC, DOUBLE END TYPE, "K-2" LATEST IMPROVED, WITH INCANDESCENT HEADLIGHTS. HEADLIGHT EQUIPMENT TO INCLUDE FULL INSTALLATION OF CAB LIGHTS AND ONE LAMP EACH SIDE OF ENGINE UNDER RUNNING BOARD AND OVER VALVE GEAR.

29 HEADLIGHT GENERATOR TO BE SET IMMEDIATELY AHEAD OF CAB.

30 REMOVABLE LAGGING FOR STAYBOLT INSPECTION AS B. L. W. PRINT 5195.

31 ALL CASTINGS ON FRAME TO BE OF STEEL, INCLUDING FOOT PLATE. FRAME FILLING TO BE CAST STEEL AND TO HAVE STIRRUPS, SPRING TO BE 4" WIDE.

32 GUIDES TO BE B. L. W. REGULAR MATERIAL FITTED WITH COVERS. GUIDES TO HAVE STRAIGHT BOLTS IN GUIDE BARS.

33 ONE OIL CUP TO BE PLACED ON GUIDES, LOCATED CENTRALLY.

34 CROSSHEAD TO HAVE DIAGONAL 3/8" OIL HOLE IN SIDE OF CROSSHEAD SHOE, DRILLED TO RUN INTO THE VERTICAL OIL HOLE.

35 CONNECTING RODS FORGED SOLID, AND FURNISHED WITH ALL NECESSARY BOLTS, WEDGES AND BRASSES.
MAIN ROD TO BE 120" LONG TO FACILITATE REMOVAL OF PISTON RINGS.
BACK END OF MAIN ROD TO HAVE STRAP STUB.
~~BACK ENDS OF MAIN RODS TO BE FORGED WITH OPEN JAW (FORKED TYPE) TO RECEIVE STRAP AND WEDGE BLOCK, AND HELD BY OUTSIDE BOLTS. WEDGE BOLTS AT BACK END OF MAIN ROD TO BE ARRANGED SO AS NOT TO PROTRUDE BEYOND THE BOTTOM OF STRAP MORE THAN 1" TO PREVENT BOLTS FROM BEING KNOCKED OFF.~~ 2/27/25.

36 PARALLEL RODS TO HAVE SOLID ENDS.

37 GREASE CUPS TO BE FORGED SOLID ON RODS ADAPTED FOR 2" PIPE BUSHINGS.
GREASE PLUG TO HAVE 1½" PIPE THREAD STRAIGHT 2" LONG UNDER HEAD
HEAD TO BE 1" HIGH AND 1½" SQUARE, SIMILAR TO B.L.W. CARD 3083.

38 BAKER VALVE GEAR TO BE PURCHASED FROM THE PILLIOD CO.

39 POWER REVERSE GEAR COVERED BY EXTRA ORDER NO. 14283, DATED 1-16-20.
REVERSE GEAR PACKING TO BE FRANKLIN RY. SUPPLY CO'S. STANDARD STYLE.
REVERSE GEAR TO BE PLACED AHEAD OF VALVE MOTION.

40 DRIVING WHEELS TO HAVE HUB LINERS OF BRONZE 7/8" THICK AND SET IN WHEEL 3/8. HUB LINERS TO BE SOLID, (NOT IN HALVES) AND TO BE SECURED BY PLUGS DRIVEN IN.

41 PEDESTAL WEDGE BOLTS TO HAVE ROUND HEADS, BOLTS TO BE SECURED BY STIRRUP, WITH NUT ABOVE AND BELOW.

42 AIR PUMP TO HAVE U. S. KING TYPE METALLIC PACKING.
AIR STRAINER TO BE APPLIED TO AIR PUMP.
DRIP PAN TO BE APPLIED UNDER PUMP TO CATCH ALL DRIPPINGS FROM PUMP.

43 AIR BRAKE DISTRIBUTING VALVE TO BE LOCATED IN SUCH A POSITION AS TO AVOID CHANCE OF FREEZING.

SPECIFICATION FOR LOCOMOTIVES 6 36 D 314

FOR CHICAGO SHORT LINE RAILWAY COMPANY

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18 18

46 BRAKE HANGER PINS TO BE STRENGTHENED, AND STIRRUP FROM HEAD OF PIN TO TOP BAR OF HANGER TO BE APPLIED.
FRONT BRAKE HANGER TO HAVE 2½" PIN.

47 MR. SHEEHY, VICE-PRESIDENT OF CHICAGO SHORT LINE, DESIRES TO SEE LOCO. IN ERECTING SHOP. THE SALES DEPARTMENT IS TO BE ADVISED IN AMPLE TIME FOR HIM TO GET HERE.

For Hereafter: Valve Gear to be changed to remove excessive side play from reach rod. (See report dated 3.18.20 from Mr. Sinkler.) (C.R. 4.1.21.)

Hereafter. Seams on roof, back and sides of Cab to be butt seams instead of lap. - Letter Chicago Office. Oct. 7-1926 RUHE. 10/7/26

TENDER

76 TANK IS TO BE SAME LENGTH AND WIDTH AS FOR 6 36 D 228, WITH ABOUT THE SAME COAL CAPACITY, BUT IS TO HAVE A STRAIGHT BACK WITH SUCH INCREASE IN WATER CAPACITY AS THIS PERMITS.

77 LENGTH AND WIDTH OF TANK AND FLARE AROUND COAL SPACE TO BE SAME AS FOR 6 36 D 228.
THE FLARE AROUND COAL SPACE TO BE ARRANGED SO AS NOT TO INTERFERE WITH ENGINEMAN'S VISION TO THE REAR.

THE BALDWIN LOCOMOTIVE WORKS As Specn. C-8427

Memorandum Spec'n 20051

SPECIFICATION FOR LOCOMOTIVES 6 40 D 1

FOR Chicago, West Pullman & Southern R. R. Co.

Gen'l Arr. Photo. 5300 (Except to have straight top tender.)

Engine Drawing No.

2.26.20

Gauge of Road 4'8½" Play 3"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"
Total wheelbase, eng. and tend. (Actual 46'11½" / Limited to ---

Curves 38 degrees

Limits, Height 14' 7" Width ---
Weight (approximate) in working order, Total 180,000 pounds
On F. tr'k --- lbs., Drivers 180,000 lbs., B. tr'k --- lbs.

Tractive power 44,400 lbs., Ratio of adhesion 4.06
Work'g St'm Pres. 180 lbs., Service Switching
Fuel Soft Coal

1 **Boiler** Steel Thick 13/16" Bill 8993
Front Tube Sheet ½" Thick
Boiler, Diam. 76" Plan Straight Top
(Allowable st'm pres. 200 lbs. **Tested to** 220 lbs. steam pres.
(With Factor of Safety of 4.8 **Tested to** 267 lbs. water pres.
Longitud. seams Butt jointed, double covering strips

3 **Dome,** diam. 33" Pos. Forward of Firebox

Firebox Steel Combustion chamb. None
Firebox, length 90" Width 66" Depth F. 74½" B. 65½"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back 5/16"
4 Firedoor opening Oval 13" x 18"
Water space, Front 5" Sides 4½" Back 4½"
Water space frame Double Riveted
5 Water space stays ⅞" diam. with 3/16" holes 1½" deep from O. S.

Radial stays 1" diam. Sling stays front (See sup. 6)
Button heads below crown on Ten central rows
Crown bars None Placed --- above crown
Crown bolts ---

Flues #9 W. G. Seamless Steel
Tubes #12 W. G. Charcoal Iron
Tube ends Swaged for copper ferrules, firebox ends.
Number 36 / 228 Diam. 5½" / 2" Length 12'6"

Heating (Flues 644.0 Combus. Chamb. --- Total 2284.0
Surface (Tubes 1482.0 Fire Box 159.0 Fire Brick Tubes ---
Grate area 41.2 Ratio to Heating Surface 1: 55.6
Superheater 552.0

Fire Brick Arch None

7 **Grates** Rocking bars and drop plate
Ash Pan, Dampers None

Throttle valve to have auxiliary drifting valve.
Throttle Chambers balanced Pos. Dome
Dry pipe Steel

Superheater Schmidt type (See sup. 8)

Smokebox extension With 9 Cleaning hole and cap L. S. Only
Stack spacer or hopper With
Netting and deflect plates With
Exhaust nozzles Single Fixed
Blower Diameter 10"

Safety Valves Two Consolidated 3" Open (Spec.)
Safety valves None with relief lever, Set to 180 pounds
Whistle One B. L. W. Plain

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

Water Gauge One Nathan Reflex **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
10 **Cleaning Plugs** One plug above fire door.
Firebox, Corners diagonal
Crown, Two each side and three back
Waist, One under front
Front tube sheet One Fusible plug None

Pump None

Injectors Two Nathan Simplex (Spec.) No. 9
Injectors, Pos. Right and left Steam pipes Copper
Pipes, Check Steel Feed Steel Overflow Iron
11 Check Nathan Reversible Stop Pos. R. and L.

Steam Heat None

Cab Wood Three windows each side of cab.

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

Back Bumper Bar Steel Back drawbar height 26½"

Pilot None Pushing shoes Cast in bumper
Front Bumper Cast Steel Bumper plate
Steps Continuous, across front with hand rails.

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

Signal fixtures Iron on bumper

12 **Headlight** Two round case 16" Reflector, To burn
Headlight, Nos. on sides With H'dl't stop With
Lamp shell None Nosing ---

Bell 92 pounds Gollmar Air Bell Ringer
Sand Box Two Diam. 36" Body Iron Painted Plugs Iron
Sander Leach Air Trap-A-1, in each box, to sand front and back

Dome casing Iron Painted

Boiler Jacket #18 Soft Steel Ptd. Bands Iron Mym 9 and 24
Boiler Lagging Magnesia Sectional
Back head of boiler to be lagged and jacketed.

May 1920.

20

20

SPECIFICATION FOR LOCOMOTIVES 6 40 D 1

FOR Chicago, West Pullman & Southern R. R. Co.

15 **Frames** Cast Steel

Cylinders, Diam. 23" Stroke 28"
St'm ports, Length 32½" Width 1 11/16" Bridges ---
Exh. ports, Length --- Width --- Valve lead 3/16"
Valve travel 6½" Steam lap 1 5/16" Exhaust clearance ---
Eccentric crank throw --- By-pass valve None
14 S. F. Lubr. Nathan Fish-Feed Bull's Eye (Spec.)
Cyl'r heads Cast steel at front and back
Cyl'r casings Iron Pte. Head covers Steel Painted
St'm chest castings --- Covers ---
St'm chest valves 9" diam. Piston type, Inside admission
Met. pkg. United States, King Type (Spec.)
Piston rods to be keyed to crossheads

Pistons Heads of steel with rings of cast iron sprung in
Guides Alligator type, Steel Oil cups Needle
Crossheads Cast steel with bearings of steel, tinned
15 **Wrist Pins** Steel Rod cups Grease cups forged solid.
Parallel rods to have solid ends.

16 **Valve Motion** Young, Royalty, if any, 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 wheel hub liners Bronze
17 **Drivers,** O. S. Diam. 51" Cen. diam. 44" Centers Cast Steel

Tires Steel Held by Shrinkage and shoulder
Tires, Flanged, Pos. All Size 36" x 5"
Tires, Plain, Pos. None Size ---
Lateral play between driving boxes and wheel hubs 3/16" total
Driving Boxes Cast Steel
Journals, Diam. 10" 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 ---
Wheel hub liners ---
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 ---
Wheel hub liners ---
Wheels, Diam. --- Tread --- Kind ---
Tires --- Cen. diam. --- Size ---
Tires held by ---

Brakes, position On all drivers and tender wheels
Cylinders 1 Brake cyl. No. 6 ET Westg. combined auto. and straight air
Foundation Brake Gear Diam. 10" Brake Shaft Diam. 5½" Journals 5" x 9"

Tender Eight Wheeled, Drawing No. 1537
Weight, with fuel and water, about 160,500 pounds.
Tender to be weighed: Yes
Tank B,000 Gallons, Bill 5308
Tank "U" shape, water bottom type. Fuel capacity 14 tons.

Tool Boxes of steel, top.

Frame Steel, 12" channels, with bumper of wood reinforced with 12" channels. Tender back bumper of Cast Steel.
Front Drawbar height 30½"
Pilot None Pushing shoes Cast in rear bumper
Back drawhead, center above rail 33½"
Coupler M. C. B. automatic

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

Trucks Arch bar type with cast steel bolsters.

Springs Elliptic, B. L. W.
Journals, Diam. 5½" Length 10"
Wheels, Diam. 33" Tread 4½" Kind Rolled Steel
Tires None Cen. diam. --- Size ---
Tires held by --- Wheel rims 2" thick
Safety chains Single

Brake Position On all wheels
Brake sch. No. 6 ET Westg. combined auto. and straight air, with 12" x 12" tender cylinder.
Brake beams to be Hercules.

List of tools, sch. 29
Photo sch. No. 2 Inspection (See sup. 19)
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 5.1.20 Shipment On own wheels

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

B. L. W. Patents: Feed Water Strainer Pat'd Sept. 1, 1903 (cast on)

Property plates None

Painting, style 291, Olive Green and Aluminum

20 Mark on tank sides: Chicago, West Pullman & Southern Railroad

20 Road Nos. Pos. F. No. plate / Sand Box / Cab Steps / Steps on Tank / **Actual Dimensions of Loco** Road Nos. 23 Name None
Extreme height over all 14'7⅛"
Cylinders

SPECIFICATION FOR LOCOMOTIVE 6 40 D 1

CHICAGO, WEST PULLMAN & SOUTHERN R. R. CO.

Specification for Type A Double Loop Superheater. SPEC'N. O-13556 MAY 7, 1920.

BOILER TUBES	228 in number 2 o. d. 12 ft. 6 in. over tube sheets. Tubes located between and adjacent to boiler flues are to be headed over at front end. Tubes to be in accordance with the American Society for Testing Materials Specification A-28-18.
BOILER FLUES	36 in number 5½ o. No. 9 BWG of cold drawn seamless steel. Flues to be in accordance with the American Society for Testing Materials Specification A-28-18. Card 1524-N
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 50592
UNITS	36 units 12 o. d. NO. 9 BWG Pipes to be in accordance with the American Society for Testing Materials Specification A-28-18. Pipes united by return bends. Each unit to be tested, before being placed in boiler, with water under pressure of 500 lb. per sq. in.
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-A Card 1004-N
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 11120
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 pipe or cylinder. Pipe to be well protected against freezing. Card 11314
DAMPER SHAFT COUNTERWEIGHT	To be painted a light color to render it easily visible by the engineer Card 1057-A 11.8.21.
S. H. ARRANGEMENT	To be in accordance with Card 10621-A 11.8.21.
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		S. H. UNIT BOLT WASHER	Card 1021
DAMPER CYL. ARM	Card 11406-E	S. H. UNIT CLAMP	Card 1023
DAMPER CYL. PIPE FITTING	Card 1065-A	S. H. UNIT CLAMP WASHER	Card 10305
DAMPER CYL. PIPE UNION	Card 11115	S. H. PIPE END	Card 1344
DAMPER CYL. PIPING DIAGRAM	Card 11114	S. H. PIPE BAND	Card 1388
DAMPER CYL. SUPPORT	Card 11274	SPACING OF BANDS & SUPPORTS	Card 10759
DAMPER SHAFT	Card 1068	TYPE OF RETURN BENDS	FORGED
DAMPER SHAFT ARM	Card 1074-C	RETURN BENDS	Card 11022
DAMPER SHAFT BEARING (O.S.)	Card 1148	LUBRICATOR CONNECTION	Card 3023
DAMPER SHAFT BEARING (I.S.)	Card 10386-E	DEFLECTING PLATE HANDLE	Card 1187
DAMPER SHAFT RING	Card 1070	DEFLECTING PLATE STUDS	Card 10309
PISTON PLATE	Card 3278	DEFLECTING PLATE CLAMP	Card 10309-A
DAMPER REGULATOR	CARD 11308-AG	PYROMETER	NONE

SPECIFICATION FOR LOCOMOTIVES 6 40 D 1

FOR CHICAGO, WEST PULLMAN & SOUTHERN R. R.

NO

1 LOCOMOTIVE FOR 1. C. C. SERVICE.

2 BOILER TEST TO BE MADE UNDER STEAM WITHOUT LAGGING OR JACKET.

3 MAIN DOME TO BE ONE PIECE TYPE.
AUXILIARY DOME - NONE

4 FIRE DOOR TO BE FRANKLIN AUTOMATIC.

5 STAYBOLTS OF ENARO IRON OR EQUIVALENT.
TATE (Not Jose) FLEXIBLE STAYS ABOUT 350 IN BREAKING ZONE, SIDES, BACK AND THROAT.

6 THREE ROWS AT FRONT OF CROWN TO BE TATE EXPANSION STAYS.

7 GRATE DROP PLATE TO BE OPERATED FROM OUTSIDE.

8 SUPERHEATER AS LOCO. SUPERHEATER CO'S SPECN. NO. O-13556 DATED MAY 7TH, 1920 (COPY ATTACHED)
SUPERHEATER TO CONNECT WITH TOP HEADER IN SMOKEBOX, AND TO HAVE OUTSIDE STEAM PIPE CONNECTIONS TO VALVE CHAMBERS.
ROYALTY PAYABLE BY THE B. L. W.

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

10 WASHOUT PLUGS TO BE PLACED 8" ABOVE BOILER CHECK ON EITHER SIDE.

11 COAL SPRINKLER B. L. W.

12 HEADLIGHT EQUIPMENT TO BE PYLE-NATIONAL ELECTRIC TYPE K-2 WITH INCANDESCENT HEADLIGHTS, AND WITH THREE-WAY WIRING FOR HIGH AND LOW LIGHTS.

13 PEDESTAL WEDGES AND GIBS OF BRONZE.

14 LUBRICATOR PIPES OF IRON, UNDER JACKET.

15 BACK END OF MAIN ROD TO BE ARRANGED SO THAT BRASSES CAN BE REMOVED WITHOUT TAKING OFF STRAP AS B. L. W. CARD 5910.
BACK END OF MAIN ROD AS B. L. W. CARD 5910 APPROVED.

16 INCORRECT POWER REVERSE GEAR WITH CONNECTIONS FOR OPERATION BY AIR AND BY STEAM. REVERSE GEAR IS COVERED ON EXTRA ORDER No. 2008 DATED 1920.

17 DETROIT FLANGE LUBRICATOR TO BE APPLIED TO FRONT AND BACK DRIVERS.

18 AIR RESERVOIR TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

19 INSPECTION BY ALFRED LOVELL. ARRANGE TO FURNISH TO HIM COPIES IN DUPLICATE OF ORDERS FOR MATERIALS, COVERING PRINCIPAL ITEMS OF MATERIAL USUALLY TESTED AND INSPECTED, ALSO ARRANGE TO GIVE HIM THE USUAL FACILITIES TO LOOK AFTER INSPECTION OF DIFFERENT MATERIALS AND OF WORKMANSHIP.

20 LETTERING ETC. TO BE APPLIED IN SILVERED COLORED PAINT SAME AS FOR 6 38 D 40.
FIGURES TO BE 10" HIGH, ON FRONT NUMBER PLATE, FRONT SAND BOX AND SIDES OF CAB AND TANK. THE NUMBER ON SIDES OF TANK TO BE 10" ABOVE THE LETTERING.
NAME ON SIDES OF TANK TO BE IN LETTERS 12" HIGH, 4" SPACE.

For Hereafter: Ash pan to be designed with air space between top flanges of pan and bottom of mud ring.
J.S.KEEN - K.R. 11.28.21.

For Hereafter: Smoke stack to extend into smoke box 10" and cleaning pipe shortened same amount. P.S.McC. 11.28.21.

THE BALDWIN LOCOMOTIVE WORKS — Dup. of 10 3+ E 2057 WITH SAME EXTRAS EXCEPT WHERE OTHERWISE SPECIFIED. As Specification F-1956

* Memorandum Spec'n ~~F 20178~~ 20186

SPECIFICATION FOR LOCOMOTIVES 10 3+ E 2099

FOR ~~Stock~~ Cisco & Northeastern Ry. Co.

Gen. as Photo. 7203

Engine Drawing No. 177

~~7-28-20~~ 12-14-20

Gauge of Road 4'8½" Play ¾"

Wheelbase, Rigid 14'6" Driving 14'6" Total 22'0"

Total wheelbase, eng. and tend. {Actual 51'9" / Limited to ——

* THIS LOCO. WAS ORIGINALLY ORDERED FOR STOCK ON FOREIGN SALES DEPARTMENT MEMO. SPECN. F-20178.

Curves 8 DEGREES GRADES 2% FOR LENGTH OF 300 METERS.

Limits, Height —— Width ——

Weight (approximate) in working order, Total 132,000 POUNDS.

On F. tr'k ~~41,000~~ 43600 lbs., Drivers ~~110,000~~ 118,800 lbs., B. tr'k —— lbs.

WEIGHT OF ENGINE EMPTY, ABOUT ~~117,500~~ 118200 POUNDS.

Tractive power ~~27,000~~ 27720 lbs., Ratio of adhesion ~~4.25~~ 4.29

Work'g St'm Pres. 170 lbs., Service ~~PLANTATION~~ FREIGHT

Fuel OIL

Boiler STEEL Thick 9/16 & ⅝" Bill ~~8831~~ 8807

Front Tube Sheet ½" Thick ~~BOILER FOR EXPORT~~

Boiler, Diam. 56" Plan EXTENDED WAGON TOP.

Allowable st'm pres. 200 lbs. **Tested to** 220 lbs. steam pres.

With Factor of Safety of 4.55 267 lbs. water pres.

Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS.

AUXILIARY DOME — NONE

Dome, diam. 29" Pos. FORWARD OF FIRE BOX.

Firebox STEEL Combustion chamb. NONE

Firebox, length 102 11/16" Width 42½" Depth F. 63¼" B. 60⅞"

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

Firedoor opening 16" DIAM. CROWN AND SIDES IN ONE SHEET.

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.

WATER SPACE STAYS TO PROJECT THROUGH SHEET 5/16" FOR RIVETING.

Radial stays 1" DIAM. Sling stays from THREE ROWS 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 (B.L.W. OPTION)

Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.

Number 241 Diam. 2" Length 13'0"

TUBES TO BE ELECTRICALLY WELDED IN FIRE BOX TUBE SHEET, AND TO PROJECT THROUGH SMOKE BOX TUBE SHEET A UNIFORM DISTANCE 2".

Heating Surface Flues —— Combus. Chamb. —— Total 1774 sq. ft.

Tubes 1630 sq. ft. Fire Box 144 sq. ft. Fire Brick Tubes ——

Grate area 30.3 sq. ft. Ratio to Heating Surface 1: 58.5

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 ONLY.

OIL BURNING ARRANGEMENT B.L.W. STANDARD, WITH BURNER IN FRONT END OF FIRE BOX. ROYALTY, IF ANY, PAYABLE BY THE B. L. W.

Throttle BALANCE Pos. DOME

Dry pipe STEEL

Superheater NONE — FOR NEGRETTE: PROVIDE A CAST STEEL CROSSTIE FOR GUIDE YOKE AND BRAKE CYLINDER SUPPORT, INSTEAD OF SEPARATE BRAKE CYLINDER ON A SEPARATE PLATE. BRAKE CYLINDERS TO BE RAISED 1¾".

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

Spark ~~arrester~~ hopper WITH

Netting and deflect. plates NONE

Exhaust nozzles DOUBLE LOW

CLEARING PIPE — WITH.

Stack STRAIGHT Dia. 16"

Safety Valves TWO ASHTON 2½" OPEN

Safety valves NONE with relief lever, Set to 170 POUNDS

Whistle ONE B. L. W. PLAIN

Steam Gauge ONE BRASS 7" MAKER: ASHCROFT (Not specd.)

Steam gauge stand BRASS **Clock** NONE

Water Gauge ONE B.L.W. IRONCLAD **Cab Lamps** ELECTRIC

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 EVERLASTING Pos: R.S.

Cleaning Plugs ONE FILLING PLUG IN TOP OF BOILER.

Firebox, CORNERS, BACK ONES DIAGONAL, SIDES, FRONT AND BACK.

Crown, TWO EACH SIDE AND TWO BACK.

Waist, ONE UNDER FRONT

Front tube sheet, TWO Fusible plug ONE

~~PRESSED~~ STEEL COLLARS RIVETED TO JACKET AROUND CLEANING HOLES.

Pump NONE

DETAILS TO BE ARRANGED SO THAT LOCOMOTIVE CAN BE READILY CHANGED TO BURN COAL FUEL. LOCO. TO OPERATE IN STATE OF TEXAS, IN I.C.C. SERVICE AND TO MEET ALL REQUIREMENTS OF THE I.C.C. RULES AND THE U. S. SAFETY APPLIANCE LAWS.

Injectors (Not specd.) TWO NATHAN SIMPLEX, TYPE "R" No. 8

Injectors, Pos. R. AND L. Steam pipes COPPER

Pipes, Check COPPER Feed COPPER Overflow IRON

Check B. L. W. Pos. R. AND L.

THIS LOCO WAS ORIGINALLY ORDERED FOR STOCK ON FOREIGN SALES MEMO. SPECN. F-20178.

Steam Heat NONE

Cab STEEL CRYSTAL PLATE GLASS CAB WINDOWS.

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 33¾"

Pilot WOOD Pushing shoes NONE

Front Bumper YELLOW PINE Bumper plate WITH

Steps AND HAND HOLDS TO CONFORM TO I.C.C. REQUIREMENTS.

Front Drawhead, Center above rail 33½"

Coupler (Not Spec.) SHARON M.C.B. AUTO. WITH ~~SCOTTED~~ SOLID KNUCKLE.

Signal fixtures IRON ON BUMPER

HEADLIGHT EQUIPMENT TO BE SCHROEDER ELECTRIC WITH INCANDESCENT HEADLIGHTS.

Headlight TWO ROUND BASE 18" Reflector,

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

Lamp shelf NONE Nosing ——

Bell 92 POUNDS

Sand Box (Not specd.) ONE Diam. 31" Body HIGH, IRON PTD. Pipes IRON

Sanding LEAKY AIR TRAP A-10 DOUBLE, TO SAND FRONT AND BACK.

Dome casing IRON PAINTED: PRESSED STEEL TOP AND BOTTOM RINGS.

Boiler Jacket #18 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

E. M. Bell Dec 1920.

SPECIFICATION FOR LOCOMOTIVES 10 3+ E 2099

FOR ~~Stock~~ Cisco & North Eastern Ry. Co.

24

Frames CAST STEEL

Cylinders, Diam. 20" Stroke 24"

St'm ports, Length 16" Width 1½" Bridges 1"

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

Valve travel 5¼" Steam lap 15/16" Exhaust clearance ——

Eccentric crank throw 12¾" By-pass valve NONE

S. F. Lubr. (Not specd.) NATHAN TRIPLE BULLS EYE.

Cyl'r heads CAST IRON LUBR. PIPES OF COPPER O.S. OF 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 (Not specd.) UNITED STATES, KING TYPE.

PISTON RODS TO BE KEYED, TO CROSSHEADS.

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD.

Guides ALLIGATOR, TYPE, STEEL Oil cups NEEDLE

Crossheads CAST STEEL WITH BEARINGS OF CAST IRON, TINNED.

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 wheel hub liners ~~BRONZE~~ FOR MAIN WHEELS ONLY.

Drivers, O. S. Diam. 50" Cen. diam. 44"

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. "INTERMEDIATE Size 3" x 6"

Lateral play between driving boxes and wheel hubs — 3/16" TOTAL

Driving Boxes STEELED CAST IRON.

Journals, Diam. MAIN 8" Length 8½"

OTHERS 7½"

Springs. Make B.L.W.

Front Engine Truck TWO Wheeled SWINGBOLSTER, CENTRE BEARING.

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

Journals, Diam. 5" Length 10" Boxes CAST IRON

Wheel hub liners NONE

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

~~HEAT, HYDLEY, OIL BOX, TOOLS, GAS LAMPS AND ELECTRIC LIGHT BULBS TO BE PACKED IN A BOX AND PLACED IN SMOKE BOX FOR SAFE KEEPING DURING TRANSIT.~~

~~ENGINE COVERED ON EXTRA ORDER No. 1116 DATED 9-22-20 TO BE SHIPPED WITH LOCO.~~ (OMIT)

Brake, position ON ALL DRIVING AND TENDER WHEELS.

Operating Engine, sch. No. 6 ET WESTG. COMBINED AUTO. AND STRAIGHT AIR.

Parts Eng. T'r, sch. ——

Foundation Drivers, sch. W-1 AMERICAN O.S. EQUALIZED

Parts Eng. T'r, sch. ——

Air pump ONE 11" Pos. L.S.

Train connections FRONT AND BACK

Train signal, sch. NONE

AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

Tender EIGHT Wheeled, Drawing No. 1589 **Weight,** with fuel and water, about ~~130,000~~ POUNDS. WEIGHT EMPTY 112500 62000 ABOUT 34,000 LBS.

TENDER TO BE WEIGHED:- YES

Tank OIL 2500 WATER 5000 Gallons, Bill 5154 5289

TANK "U" SHAPE, STRAIGHT TOP. TANK COCK AND HOSE - WITH.

TWO SIDE TANK FUNNELS.

Tool Boxes OF STEEL, TOP.

TENDER FLOOR OF STEEL.

Frame STEEL, 10" CHANNELS, WITH BUMPERS OF WOOD.

Front Drawbar height 30⅞"

Pilot NONE Pushing shoes NONE

Back drawhead, center above rail 33½"

Coupler (Not Spec) SHARON M. C. B. AUTO. WITH SOLID KNUCKLE.

Steps AND HAND HOLDS TO CONFORM TO I.C.C. REQUIREMENTS.

Trucks ARCH BAR TYPE WITH CAST STEEL BOLSTERS.

JOURNAL BRASSES TO BE M. C. B. STANDARD, LEAD LINED.

Springs ELLIPTIC, B.L.W. JOURNAL BOX WEDGES, M.C.B. TYPE.

Journals, Diam. 5" Length 9" AXLES M.C.B. STANDARD

Wheels, Diam. 33" Tread 1⅝" Kind CAST IRON SPOKE 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. No. 6 ET WESTINGHOUSE AUTOMATIC AND STRAIGHT AIR WITH 12" x 12" TENDER CYLINDERS.

List of tools, sch. 37 TWO TRAVERSING JACKS

Photo sch. NONE Inspection B.L.W.

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

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

Junior laws to 7-28-20 Shipment ~~ERECTED~~ ON OWN WHEELS (SEE A)

Brass shop finish, No. 3, EXCEPT INJECTOR CHECKS TO BE PAINTED.

Machine shop finish D-158, EXCEPT CYLINDER HEAD COVERS AND STEAM CHEST COVERS TO BE PAINTED.

Patents B. L. W. NONE

Property plates ~~NONE~~, B. L. W. FOR ENGINE AND TENDER.

Painting, style 291, OLIVE GREEN AND ALUMINUM

LETTERING ETC. TO BE SAME AS FOR 10 30 D 682

Mark on TANK SIDES:- CISCO & NORTHEASTERN RY. CO.

Road Nos. Pos. Road Nos. Name NONE

F. No. PLATE 61

~~DOME~~ SAND BOX

BACK OF TANK

CAB SIDES

Actual Dimensions of Loco. Extreme height over all 13'11½"

Extreme Width, Cab boards 9'9" Cylinders or valve motion 9'11"

Length outside face front bumper of engine to face of tender wedge 32'11½"

Length face of tender wedge to outside face back bumper of tender 21'6"

Total length outside face front bumper of engine to outside face back bumper of tender 57'6"

SPECIFICATION FOR LOCOMOTIVES 12 - 24 D E 90

FOR The Colorado, Boulder & Eastern Railway Company

Engine Drawing No. 20

Gauge of Road 4' 8½" Play 2" except 1½" for F.& B. drivers

Wheelbase, Rigid 13' 1" Driving 13' 1" Total 28' 2"

Total wheelbase, eng. and tend. { Actual 59' 1½" / Limited to ——

Curves ——

Limits, Height —— Width ——

Weight (approximate) in working order, Total 185,000 pounds

On F. tr'k. 13,500 lbs. Drivers 144,000 lbs., B. tr'k. 27,500 lbs.

Tractive power 33,720 lbs., Ratio of adhesion 4.28

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

Fuel Lignite Coal

Front tube sheet to be ½" thick

Boiler Steel Thick ⅜" Rivet 8183

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 5.0)

Longitud. seams Butt jointed, double covering strips

Dome, diam. 33" Pos. Central

Firebox Steel Combustion chamb. None

Firebox, length 108" Width 72" Depth F. 70⅝" B. 61½"

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 Single Riveted

Water space stays ⅜" diam. with 3/16" holes 1½" deep from O.S.

Radial stays 1" diam. Sling stays front { Three rows of S. L. W. / Expansion stays

Rivets heads below crown on Eight central rows

Crown bars None Placed —— above crown

Crown bolts ——

Tubes { Flues #9 W. G. Seamless Steel / Tubes #12 W. G. Charcoal Iron

Tube ends Swaged for copper ferrules, fire box ends

Number { 28 / 199 } Diam. { 5½" / 2" } Length 16' 3"

Heating Surface { Flues 637⁰⁰ Combus. Chamb. —— Total 2500⁰⁰ / Tubes 1685⁰⁰ Fire Box 178⁰⁰ Fire Brick Tubes —— / Grate area 54⁰⁰ Ratio to Heating Surface 1 : 46.3 / Superheater 530⁰⁰

Fire Brick Arch American on angle iron (see sup. 8-24)

Grate Rocking table grates, with drop plate

Ash Pan Dumping None

Exhaust Nozzle Balanced Pos. Dome

Steel.

Stack Taper (See sup. 5-34)

Safety Valves Two Consolidated 3"

Safety valves None with relief lever, Set to 170 pounds

Whistle B. L. W. operated by a lever instead of rope

Steam Gauge One Iron 7" Manets-Ashcroft (Special)

Steam gauge stand Iron Clock None

Water Gauge One Klinger 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 Everlasting Pos:-Front

Cleaning Plugs

Firebox Corners diagonal, sides and back

Crown, Two each side and four back

Waist, Two unders-one in each course

Front tube sheet, Two Fusible plug One

Pump None Pos. ——

Top chamb. —— Bottom chamb. ——

Feed Cock —— Feed pipes ——

Checks —— Check pipes ——

Injectors Two Monitor (Special) No. 9

Injectors, Pos. Right and Left Steam pipes Copper

Pipes, Check Iron Feed Iron Overflow Iron

Check B. L. W. (see sup. 9) Pos. Right and Left

Steam Heat None

Cab Steel, lined with wood

Cab boards Wood Nosing None

Running boards Wood Noseing None

Hand rail Iron Located on Boiler

Back Bumper Bar Steel Back drawbar height 31"

Pilot Iron 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 M. C. B. Automatic

Signal fixtures Iron on bumper

Headlight One Round Class 10 Pattern

Headlight, Pos. on boiler With Electric Wiring

Lamp shell None Mounting ——

Bell 50 pounds

Signal Bell Tap Drawn 31" Body Iron Painted Stem Iron

Bell Yoke Cast Iron Painted

Boiler Jacketed Black Russia Iron Lagging Steel

Frames Cast Steel Braces Solid

Cylinders, Diam. 20" Stroke 28"

St'm ports, Length 23½" Width 1⅞" Bridges ——

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

Valve travel 5½" Steam lap ⅞" Exhaust clearance ——

Eccentric crank throw 18" 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

Mot. pkg { Piston Rods / Valve Stems } U. S. King type (special)

Pistons Cast Iron rings sprung into solid head

Guides Steel Oil cups Needle

Crossheads Cast Steel with bearings of bronze

Wrist Pins Steel Rod cups Grease cups, 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 laws to be well case hardened or to have hardened bushings.

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.

Main Driving Wheels only to have hub liners of Brass

Drivers, O. S. Diam. 48" Cen. diam. 42"

Wheel centers:- Main cast steel, others 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 Main, cast steel; others steel cast iron

Journals, Diam. 8½" Length 10"

Springs. Make Railway Steel Spring Co.

Front Engine Truck Two Wheels Swing bolster, center bearing

To swing 25° 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

Tires Steel Cen. diam. 33" Size 2½" x 5½"

Tires held by Bolted type fastening

Front and back driving truck wheels without hub liners

Back Engine Truck Two Wheels Hyatton, Inside Bearing Type

Trailing 25° each side Steel, Cen. pin liners None

Journals, Diam. 6" Length 10" Boxes Cast Iron

Wheels, Diam. 30" Tread ——Kind Cast Iron Spoke Centre

Tires Steel Cen. diam. 31" Size 2½" x 5½"

Tires held by Bolted type fastening

Tender Eight Wheeler, Drawing No. 610

Weight, with fuel and water, about 130,000 pounds

Tank 7000 Gallons, Bill 457a

Tank Water Bottom type Fuel capacity 12 tons

Tool Boxes Built into tank

Frame Steel 12" channels

Front Drawbar height 27½"

Pilot None Pushing shoes None

Back drawhead, center above rail 33½"

Coupler M. C. B. Auto., with Miner Friction draft gear

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. 5½" Length 10"

Wheels, Diam. 33" Tread ——Kind Cast Iron Plate Centers

Tires Steel Cen. diam. 28" Size 2½" x 5½"

Tires held by Bolted type fastening

Safety chains Single

Brake Position On all wheels

Brake sch. No. 6 - ET Westg's. Auto. and Straight air with 12" x 12" cylinder

List of tools, sch. 29

Photo sch. #2 Inspection ~~B. L. W.~~ (see sup. 28)

To be weighed Yes Material specifns B. L. W.

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

Junior laws to 6-1-17 Shipment On own wheels

Brass shop finish, No. 1

Machine shop finish D-165

B. L. W. Feed Water Strainer, Patented Sept. 1, 1903 (Cast On)

Patents Steam Pipe Cover, Patented July 18, 1911 (Cast On)

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

Classification Mark on cab sides to be in whole figures

Painting Engine, style 294 Olive Green and Aluminum

Painting Tender, style 291 Olive Green and Aluminum

Mark on cab panels, --- C. W. & E. Ry.

Classification mark on cab under panels: 12-24 E

Mark on tank steps, Colorado, Boulder & Eastern Ry.

Weight of tender ~~(2)~~ lbs.

Water 7000 gallons

Coal 12 tons

Marks on back of tank { Road Nos. Pos. / Class Pos. / Engine Nos. Pos. / F. No. Plate 21 / T. Class Pos. }

SPECIFICATION FOR LOCOMOTIVES 12 - 34½ E 46

FOR THE COLORADO, WYOMING & EASTERN RY. CO.

Specification for Type A Double Loop Superheater SPECIFICATION O-7821 DATED JUNE 26TH 1917

BOILER TUBES	199 in number 2 in o.d. 16 ft. 3 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 5" in 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 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, headed and prosetted except for copper sheets. Front end to be rolled and headed. Rollers to have at least 8 rolls. Prosser to have at least 12 sections. Card 1136
TUBE SHEET LAYOUT	Card 5224
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 special number cast on in such a location as not to be removed in finishing. No patch pings 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 through 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 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 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-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 1982-P	DAMPER SHAFT BRG.	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 3246	S. H. UNIT CLAMP WASHER	Card 10305
DAMPER CYL. SUPPORT	Card	S. H. PIPE END	Card 1344
DAMPER SHAFT	Card 1068	V. H. PIPE END	Card 1988
DAMPER SHAFT ARM	Card 1065	RETURN BEND	Card 10300
DAMPER SHAFT BEARING (B.E.)	Card 1148	DEFLECTING PLATE SUPPORT	Card 1487
DAMPER SHAFT BEARING (E.E.)	Card 1275-G	CORRUGATION CONNECTION	Card 3023
SPACING OF HANGER & SUPPORTS	Card 10792	DEFLECTING PLATE STUD	Card 10809
TYPE OF HEADER BENDS	CAST STEEL	DEFLECTING PLATE CLAMP	Card 10804-A

SPECIFICATION FOR LOCOMOTIVES 12 - 34½ E 46

FOR THE COLORADO, WYOMING & EASTERN RAILWAY COMPANY

28

1 AUXILIARY DOME FOR SAFETY VALVES AND WHISTLE.

2 STAYBOLTS TO BE DRILLED IN ACCORDANCE WITH FEDERAL REQUIREMENTS

3 ~~FIRE BRICK ARCH TO BE APPLIED AFTER DELIVERY OF LOCOMOTIVE.~~ (SEE SUP. 26)

4 ASH PAN TO BE HOPPER TYPE WITH NETTING ALONG SIDES, AT MUD RING.

5 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 B. L. E.

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

7 GAUGE COCKS TO BE "NEVER-LEAK"

8 EVERLASTING BLOW-OFF VALVE IS MADE BY PATTERSON-ALLEN VALVE CO.

9 INJECTORS TO BE APPLIED OUTSIDE AND JUST IN FRONT OF CAB. INJECTOR CHECK CAGES TO BE FLANGED TYPE SECURED TO BOILER BY BOLTS.

10 SPRING AND POCKET TO BE APPLIED BETWEEN ENGINE AND TENDER, I.E., SPRING BUFFER BETWEEN ENGINE AND TENDER

11 PILOT TO HAVE SPACES BETWEEN SPOKES OR SLATS NOT EXCEEDING 2" AND TO BE WELL BRACED TO STAND STRAIN OF BUCKING SNOW

12 RAY SNOW FLANGER, MANUFACTURED BY THE G. & C. CO., NO. 90 WEST STREET, NEW YORK CITY, N. Y.

13 HEADLIGHT EQUIPMENT TO BE PYLE NATIONAL, TYPE "K" WITH INCANDESCENT ~~ELECTRIC~~ HEADLIGHT

14 FRONT AND BACK DRIVING TIRES TO BE SET IN 3/16" ON EACH SIDE.

15 TIRES AND AXLES FROM STANDARD STEEL WORKS (SEE SUP. 27)

16 PARTICULAR CARE TO BE TAKEN WITH DRIVING SPRINGS. DRIVING SPRINGS TO BE OF SUFFICIENT STRENGTH TO CARRY 17,500 POUNDS OVER EACH DRIVING BOX.

17 AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS

18 AIR PUMP TO HAVE U. S. RING TYPE METALLIC PACKING.

19 DETROIT LUBRICATOR FOR AIR PUMP AIR CYLINDER.

20 DETROIT PNEUMATIC LUBRICATOR FOR AIR BRAKE.

26 ANGLE IRON SUPPORT FOR FIRE BRICK ARCH TO BE FURNISHED AND APPLIED BY THE B. L. E.
FIRE BRICK ARCH TO BE FURNISHED AND APPLIED BY THE RY. CO. AFTER DELIVERY OF LOCO.

27 FRONT AND BACK ENGINE TRUCK AXLES ORDERED BY MISTAKE FROM CAMDEN FORGE CO.- FOR 12 34½ E 46.
FOR HEREAFTER SHOULD BE ORDERED FROM STANDARD STEEL WORKS

28 MATERIAL AND WORKMANSHIP TO BE INSPECTED BY ALFRED LOVELL

29 SUPERHEATER, AS LOCOMOTIVE SUPERHEATER CO'S SPECIFICATION NO. O-7821, DATED JUNE 26TH, 1917, COPY ATTACHED.

For Hereafter- Brake lever fulcrum pins to be raised or lowered, to clear cab front. REMOVE N. 15 B.

THE BALDWIN LOCOMOTIVE WORKS Dup. of 10 28 ½ D 57 WITH SOME EXTRAS EXCEPT WHERE OTHERWISE SPECIFIED.

Memorandum Spec'n 18028.

SPECIFICATION FOR LOCOMOTIVES 10 28 ½ D 136

FOR COLUMBIA & NEHALEM RIVER R. R.

J.

Gen. as PHOTO. 5835.

Engine Drawing No. 27.

3.8.18.

Gauge of Road 4' 8½" Play ¾"

Wheelbase, Rigid 10' 0" Driving 10' 0" Total 25' 9"

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

Curves 35 DEGREES GRADES 7%

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

Weight (approximate) in working order, Total 120,650 POUNDS

On F. tr'k 12,300 lbs., Drivers 90,000 lbs., B. tr'k 18,350 lbs.

Tractive power 22,100 lbs., Ratio of adhesion 4.

Work'g St'm Pres. 165 lbs., Service LOGGING

Fuel OIL

FRONT TUBE SHEET TO BE ½" THICK

Boiler STEEL Thick ⅝" Bill 6810

Boiler, Diam. 50" Plan STRAIGHT TOP

Boiler st'm pres. 180 lbs., Tested to { 200 lbs. steam pres. / 240 lbs. water pres. WITH FACTOR OF SAFETY OF 6.

Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS

Dome, diam. 25" Pos. CENTRAL

CROWN AND SIDES OF FIRE BOX TO BE IN ONE SHEET

Firebox STEEL Combustion chamb. NONE

Firebox, length 60-7/16" Width 34 1/2" Depth F. 57 1/8" B. 53"

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 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 ----

Tubes #12 W.G. CHARCOAL IRON OR STEEL

Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS

Number 152 Diam. 2" Length 13' 6½"

Heating Surface				
Flues ---- Combus. Chamb. ---- Total 1151 sq. ft.				
Tubes 1071 sq. ft.	Fire Box 80 sq. ft.	Fire Brick Tubes ----		
Grate area 14.4 sq. ft.	Ratio to Heating Surface 1 : 80.			
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

SMOKE BOX TO HAVE LONG EXTENSION, SAME AS 10 28 ½ D 43 & 57.

Smokestack extension WITH Cleaning hole and cap NONE

Spark arrester or liner NONE

Netting and cutter plates NONE

Diamond stack DIRECT LOW

Exhaust Pipes, With

Steam Pipes, With Dia. 12" Inside B. dia. 21"

Safety Valves (As Specid) TWO COALE 2½"

Safety valves NONE with relief lever, Set to 165 POUNDS

Whistle B.L.W. PLAIN

Steam Gauge ONE IRON 7" MAKER:- ASHCROFT (As Specid)

Steam gauge stand IRON **Clock** NONE

WATER GAUGE TO BE MADE LONG ENOUGH FOR GRADES

Water Gauge ONE REFLEX **Cab Lamps** ELECTRIC

Gauge Cocks THREE BACK Surface valve NONE

Lowest gauge cock 4½" above highest part of crown

Lubricator steam valve TO HAVE separate dry pipe to dome

Blower Valve B.L.W. ON RIGHT SIDE WITHIN REACH OF ENGINEER

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

Cleaning Plugs ONE FILLING PLUG ON TOP OF BOILER

Firebox CORNERS, RIGHT SIDE, FRONT 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 MONITOR (As Specid) 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 OAK

Pilot NONE Pushing shoes FRONT AND BACK

Front Bumper OAK Bumper plate WITH, SAME AS FOR 10 28 ½ D 43 & 57.

Steps ACROSS FRONT AND BACK

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

F. & B. Drawhead, Center above rail 33½"

Coupler M.C.B. AUTO WITH SLOTTED KNUCKLE, SAME AS FOR 12 30 ½ E 40 AND 10 28 ½ D 57.

Signal fixtures IRON ON BUMPER

Headlight TWO ROUND CASE 18" Reflector,

Headlight, Mtgs. on sides WITH H'dl't stop NONE

Lamp shell NONE Nosing NONE

Bell 85 POUNDS

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

Sander (EACH AIR, TRAP A-1, IN EACH SAND BOX.

Dome casing IRON PAINTED

Boiler Jacket #22 SOFT STEEL PLATE Bands IRON Style 9

Boiler Lagging MAGNESIA SECTIONAL.

THE BALDWIN LOCOMOTIVE WORKS

E Powell Aug 1918.

SPECIFICATION FOR LOCOMOTIVES 10 28 ½ D 136 30

FOR COLUMBIA & NEHALEM RIVER R.R. 30

J.

Frames CAST STEEL Braces SOLID

Cylinders, Diam. 17" 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 5/8" Exhaust LAP 1/16"

Eccentric crank throw 4½" By-pass valve NONE

S. P. Lubr. (As Specid) 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 (As Specid)

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD

Guides STEEL Oil cups NEEDLE

Crossheads CAST STEEL

Wrist Pins STEEL Rod cups FOR GREASE

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 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 -- 1/16" TOTAL

Driving Boxes CAST IRON

Journals, Diam. 7" Length 8"

DRIVING AXLES FROM STANDARD STEEL WORKS

Springs. Make STANDARD STEEL WORKS

Front Engine Truck TWO Wheeled SWING BOLSTER, CENTER BEARING

To swing 4⅜" each side of cen., Cen. pin liners NONE

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

* Wheels, Diam. 28" Tread -- Kind CAST IRON SPOKE CENTER

Tires STEEL Cen. diam. 23" Size 2½" x 5½"

Tires held by BOLTED TYPE FASTENING

ENGINE TRUCK WHEEL AND AXLE FROM STANDARD STEEL WORKS

Back Engine Truck TWO Wheeled SWING BOLSTER, SIDE BEARING

To swing 5⅜" each side of cen., Cen. pin liners NONE

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

* Wheels, Diam. 28" Tread --- Kind CAST IRON SPOKE CENTRE

Tires STEEL Cen. diam. 23" Size 2½" x 5½"

Tires held by BOLTED TYPE FASTENING

* FRONT AND BACK TRUCK WHEELS WITHOUT HUB LINERS

Tender NONE

Tank { OIL 750 GALLONS BILL 4682 / WATER 1600 GALLONS BILL 4185

WATER TANK SADDLE OVER TOP OF BOILER

List of tools, sch. 28 ONE PAIR OF WRECKING FROGS

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 3.14.18 Shipment ON OWN WHEELS

Brass shop finish, No. No. 1

Machine shop finish D-165

B. L. W. Patents { REAR END SUSPENSION, 1095929 MAY 5, 1914 (BRASS PLATE)

Property plates B.L.W. for Engine

Painting: Engine, style 223 OLIVE GREEN AND ALUMINUM

Painting:—Tender, style ———

LETTERING, ETC. TO BE SAME AS FOR 10 28 ½ D 57.

Mark on TANK SIDES COLUMBIA & NEHALEM RIVER RAILROAD

Brakes, position ON ALL DRIVING AND BACK TRUCK WHEELS (NO TENDER)

Operating { Engine, Sch. No. 6-ET Best's Combined Auto. and

Parts { B. Eng. Tr'k, sch. --- STRAIGHT AIR

Foundation { Drivers, sch. 886-1 American Outside Equalized

Parts { B. Eng. Tr'k, sch. 886 American

Air pump, Cust 9½" Pos. LEFT SIDE

Train connections FRONT AND BACK

Train signal, sch. None

PAINT BY HEAVY REVISION

AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

Road Nos. Pos.	Road Nos.	Name NONE
F. NO. PLATE	124	
F. SAND BOX		
CAB SIDES		
BACK OF OIL TANK		

SPECIFICATION FOR LOCOMOTIVES 10 28 ½ D 135

FOR COLUMBIA & NEHALEM RIVER R. R.

J.

31 31

1 FIRE DOOR OPENING TO BE LOCATED AS HIGH AS POSSIBLE
FIRE DOOR TO BE SOLID WITH HOLE IN CENTER FOR SANDING.
(BAFFLE FIRE DOOR NOT TO BE USED).

2 OIL BURNING ARRANGEMENT, B.L.W. STANDARD WITH VON BODEN-INGLES BURNER PLACED IN FRONT OF FIRE PAN, SAME AS FOR 12 30 ½ E 40 AND 10 28 ½ D 57 TO STANDARDIZE THE OIL BURNING EQUIPMENT ON ALL OF THIS CO'S LOCOMOTIVES.
ROYALTY, IF ANY, ON OIL BURNING ARRANGEMENT PAYABLE BY B.L.W.
FIRING VALVES TO BE PROVIDED ON BOTH SIDES OF CAB.
OIL INJECTOR TO BE LOCATED IN A STEEL TUBE 3½" DIAMETER THROUGH FRONT WATER LEG.

3 PARTICULAR ATTENTION TO BE PAID TO LOCATING THE OIL CONTROLLER AND BLOWER ON THE ENGINEER'S SIDE OF THE CAB WITHIN EASY REACH OF THE ENGINEER IN ORDER THAT NO DIFFICULTY MAY ARISE IN OPERATION AS THIS LOCOMOTIVE IS TO BE OPERATED BY ONE MAN.

4 TWO BOILER TUBES 2" DIAMETER TO BE APPLIED THROUGH WATER LEG BELOW THE LARGER TUBE FOR SUPPLYING AIR.

5 FIRE BRICK WALL AT BACK TO BE MADE DOUBLE THICKNESS
THE HIGHEST POINT OF FIRE BRICK ARCH TO BE LOCATED BELOW THE LOWEST TUBE.

6 FIRE PAN TO BE BOLTED TIGHT TO THE MUD RING, USING SHEET ASBESTOS TO MAKE THE JOINT.
OPENING 17" SQUARE TO BE LOCATED CENTRALLY IN BOTTOM OF FIRE PAN.
SUB-PAN TO HAVE DAMPER AT FRONT END.

7 EXHAUST NOZZLE TO HAVE THIMBLES 3¾", 4" AND 4¼" DIAMETER.

8 OIL TANK LOCATED IN REAR OF CAB ON REAR EXTENSION OF ENGINE FRAME.
A SMALL RACK, SAY 6" HIGH TO BE PLACED AROUND TOP OF OIL TANK TO CARRY MATERIAL AND PREVENT FIREMAN'S FOOT SLIPPING WHEN FILLING TANK.

9 OIL TANK VALVE AT LEAST 6" OR 8" HIGH WITH COVER HELD BY THREE OR FOUR BOLTS.

10 RUNNING BOARD TO BE PROVIDED EACH SIDE OF CAB.
RUNNING BOARD ON RIGHT AND LEFT SIDE OF WATER TANK TO BE 10" WIDE.

11 WHISTLE TO HAVE A DIFFERENT TONE FROM THOSE ON 12 30 ½ E 37 AND 40 AND 10 28 ½ D 57 SO THAT CO. CAN DISTINGUISH LOCOS. FROM EACH OTHER BY THE SOUND OF THE WHISTLES. WHISTLE TO HAVE A SOUND FULLY AS LOUD AS THAT FOR 12 30 ½ E 37.

12 HEADLIGHT EQUIPMENT PYLE NATIONAL ELECTRIC, TYPE E WITH ARC HEADLIGHTS.
PARTICULAR ATTENTION TO BE GIVEN TO THE HEADLIGHTS AND GENERATOR WHICH SHOULD BE TRIED OUT BEFORE THE LOCOMOTIVE LEAVES THE B.L.W.
RY. CO. CLAIMS TO HAVE HAD TROUBLE WITH HEADLIGHTS ON THEIR ENGINE 117, 12 30 ½ E 37, AND ARE OF THE OPINION THAT THE WIRING HAS NOT BEEN CORRECTLY DONE. HEADLIGHT TO HAVE LONG EXTENSION.

13 COLLINS FLANGE LUBRICATORS TO BE APPLIED TO FRONT AND BACK PAIRS OF DRIVING WHEELS.

16 ACTUAL DIMENSIONS OF LOCO.—

EXTREME HEIGHT OVER ALL (WHISTLE)		13' 4"
EXTREME WIDTH	CAB BOARDS	9' 10"
	CYLINDERS	9' 9"
LENGTH OUTSIDE FACE FRONT BUMPER TO OUTSIDE FACE OF BACK BUMPER		32' 6¾"

THE BALDWIN LOCOMOTIVE WORKS As Spec'n D 4 5998 Dup. of 10 30½ D 43 EXCEPT WHERE OTHERWISE SPECIFIED.

Memorandum Spec'n 19067

SPECIFICATION FOR LOCOMOTIVES 10 30½ D 43

FOR COLUMBIA & NEHALEM RIVER RAILROAD

Gen. as PHOTO. 3494

Engine Drawing No. 14.

10 - 14 - 19

Gauge of Road 4' 8½" Play 2"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 26' 7"
Total wheelbase, eng. and tend. {Actual 48' 3" / Limited to ——

Curves ——

Limits, Height —— Width ——
Weight (approximate) in working order, Total 133,000 POUNDS.
On F. tr'k 17,000 lbs., Drivers 103,000 lbs., B. tr'k 13,000 lbs.

Tractive power 24,000 lbs., Ratio of adhesion 4.3
Work'g St'm Pres. 160 lbs., Service LOGGING
Fuel OIL

Boiler STEEL Thick 1 1/16" Bill 8748
Front Tube Sheet ½" Thick
Boiler, Diam. 72" Plan STRAIGHT TOP
{Allowable st'm pres. 180 lbs. / With Factor of Safety of 4.9} **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 89-1 1/16" Width 41⅜" Depth F. 66⅛" B. 62½"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back 5/16"
Firedoor opening 16" DIA. CROWN AND SIDES IN ONE SHEET.
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 18" DIAM. Sling stays front {THREE ROWS B.L.W. EXPANSION STAYS}
Button heads below crown on EIGHT central rows
Crown bars NONE Placed —— above crown
Crown bolts ——

Flues M——
Tubes #12 W.G. CHARCOAL IRON OR STEEL (B.L.W. OPTION)
Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.
Number 255 Diam. 2" Length 12' 6"

Heating Surface {Flues —— Combus. Chamb. —— Total 1821 sq. ft.
Tubes 1658 sq. ft. Fire Box 145 sq. ft. Fire Brick Tubes 18 sq. ft.}
Grate area 26.1 sq. ft. Ratio to Heating Surface 1: 69.8
Superheater ——

Fire Brick ARCH NONE- (SEE SUP. 4)
FIRE BOX LINED WITH FIRE BRICK FOR OIL BURNING
FIRE BRICK PAVEMENT IN PAN.
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 arrester hopper NONE
Netting and deflector plates WITH

Exhaust nozzles DOUBLE LOW
Cleaning Pipe - WITH
Stack STRAIGHT Dia. 18"

Safety Valves TWO COALE 3"
Safety valves NONE with relief lever, Set to 160 POUNDS
Whistle ONE CHIME

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 ½" 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: R AND L
Cleaning Plugs ONE FILLING PLUG IN TOP OF BOILER.
Firebox, CORNERS DIAGONAL,
Crown, THREE EACH SIDE AND THREE BACK
Waist, ONE UNDER FRONT ONE ABOVE FIRE DOOR.
Front tube sheet, ONE Fusible plug ONE

Pump NONE

Injectors (Not Spec) TWO SELLERS, CLASS "N" 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.
INTERMEDIATE CHECK VALVE TO BE APPLIED R. AND L.

Steam Heat NONE

Cab STEEL. 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 33½"

LONG WOODEN STEPS 5" WIDE ON SIDES OF PILOT.
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. WITH SLOTTED KNUCKLE.

Signal fixtures IRON ON BUMPER.

Headlight TWO ROUND BASE 16" Reflector,
Headlight, Nos. on sides WITH H'd'l't step WITH
Lamp shelf NONE Nosing ——

Bell 92 POUNDS
Sand Box TWO Diam. 28" (Not Spec) 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 PTD Bands IRON Style 9
Boiler Lagging MAGNESIA SECTIONAL

THE BALDWIN LOCOMOTIVE WORKS

E. A. Steele

SPECIFICATION FOR LOCOMOTIVES 10 30½ D 43 Jan. 1920.

FOR COLUMBIA & NEHALEM RIVER RAILROAD

33 33

Frames CAST STEEL

Cylinders, Diam. 18" Stroke 24"
St'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 11 5/16" By-pass valve - NONE
S. P. Lubr. (Not Spec) DETROIT TRIPLE No. 22 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. {(Not Spec) PISTON RODS / VALVE STEMS} UNITED STATES, KING TYPE.
PISTON RODS TO BE KEYED TO CROSSHEADS.
Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD
Guides STEEL Oil cups NEEDLE
Crossheads CAST STEEL WITH BEARINGS OF CAST IRON, TINNED.
Wrist Pins STEEL Rod cups FOR GREASE, FORGED ON RODS
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.
Driving wheel hub liners NONE
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 - 3/16" 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 5" each side of cen., Cen. pin liners NONE
Journals, Diam. 5" Length 8" Boxes CAST IRON
Wheel hub liners NONE
Wheels, Diam. 28" Tread 1¼" Kind ROLLED STEEL
Tires NONE Cen. diam. —— Size ——
Tires held by —— WHEEL RIMS 2½" THICK.

Back Engine Truck TWO Wheeled SWING BOLSTER, SIDE BEARING.
To swing 5" each side of cen., Cen. pin liners NONE
Journals, Diam. 9" Length 8" Boxes CAST IRON
Wheel hub liners NONE
Wheels, Diam. 28" Tread 1¼" Kind ROLLED STEEL
Tires NONE Cen. diam. —— Size ——
Tires held by —— WHEEL RIMS 2½" THICK.

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. WH-2 AMERICAN O.S. EQUALIZED / Eng. Tr'k, sch. ——}
Air pump TWO 9½" Pos. BOTH L.S.
Train connections FRONT AND BACK
Train signal, sch. NONE
11 AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

Tender EIGHT Wheeled, Drawing No. 1140
Weight, with fuel and water, about 70,000 POUNDS.
Tank {OIL 1200 2032 / WATER 3000 Gallons, Bill 5054}
TANK "U" SHAPE, STRAIGHT TOP.

Tool Boxes OF HARD WOOD, TOP.

Frame OAK AND YELLOW PINE, WITH BUMPERS OF WOOD.

Front Drawbar height 30½"
Pilot NONE Pushing shoes NONE
Back drawhead, center above rail 33½"
Coupler M.C.B. AUTO. WITH SLOTTED KNUCKLE.

STEPS, HAND HOLDS, ETC., TO CONFORM TO THE 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 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 WESTINGHOUSE AUTOMATIC AND STRAIGHT AIR BRAKE WITH 10" x 12" TENDER CYLINDER.

TWO JACK SCREWS, ORDINARY TYPE.
List of tools, sch. 31. TWO PRESSED STEEL WRECKING FROGS.
Photo sch. NONE Inspection - B.L.W.
To be weighed YES Material spec'ns - B.L.W.
Certificate of boiler test THREE COPIES B.L.W. FORM 1036
Junior laws to 12-6-19 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 B.L.W., FOR ENGINE AND TENDER

Painting, style 291 OLIVE GREEN AND ALUMINUM

MARKING TO BE SAME STYLE AS FOR 12 30½ E 40
Mark on TANK SIDES: COLUMBIA AND NEHALEM RIVER R.R.

Road Nos. Pos. Road Nos. Name None
F. No. Plate 125
F. Sand Box
Cab Sides
Back of Tank

Actual Dimensions of Loco. Extreme height over all 13' 5"
Extreme Width: Cab boards 10' 0" ; Cylinders as valve motion 9' 10½"
Length outside face front bumper of engine to face of tender wedge = 31' 2"
Length face of tender wedge to outside face back bumper of tender = 22' 9"
Total length outside face front bumper of engine to outside face back bumper of tender = 53' 11"

SPECIFICATION FOR LOCOMOTIVES 10 30½ D NO. 49

FOR COLUMBIA & NEHALEM RIVER RAILROAD

34

1 FUEL OIL: GRAVITY 14 TO 17, FLASH, 125 TO 150, FIRE 150 TO 185, ACCORDING TO GRAVITY, COLD TEST NEVER MADE.

2 OIL BURNING ARRANGEMENT TO HAVE VON BODEN BURNER IN FRONT OF FIRE BOX, WITH CAST IRON HOOD FOR AIR INTAKE. ROYALTY ON SAME PAYABLE BY THE B.L.W.

3 OIL MECHANISM OPERATING VALVES TO BE LOCATED HIGH ENOUGH TO BE CONVENIENT TO FIREMAN WHILE IN HIS SEAT.

4 FIRE BRICK ARCH TUBES TO BE PROVIDED, I.E., THREE TUBES 3" O.S. DIAM. #7 W.G.
FIRE BRICK ARCH NOT TO BE FURNISHED.

5 SMOKE BOX TO BE PROVIDED WITH NETTING TO PREVENT OIL WHICH SOMETIMES PASSES THROUGH IN FLAKES, FROM THROWING OUT A SHEET OF FLAME.

6 BLOW OFF COCK TO BE THREADED FOR IRON PIPE CONNECTION.

7 FIRE EXTINGUISHER AND "Y" TO BE PLACED ON FRONT END OF INJECTOR PIPE, RIGHT AND LEFT.

8 PIPES FROM BREAM TURRET TO INJECTOR TO BE OF COPPER.

9 FRONT BUMPER PLATE TO EXTEND BACK TO STEAM CHESTS AND TO BE SUPPORTED BY KNEES.

10 HEADLIGHT EQUIPMENT TO BE SCHROEDER ELECTRIC WITH INCANDESCENT HEADLIGHTS.

11 AIR RESERVOIRS TO BE EXTRA LARGE CAPACITY, PLACED UNDER FRONT END OF RUNNING BOARDS.

TENDER

36 WATER TANK, TOP AND BOTTOM PLATES ½", INSIDE PLATES ½", OUTSIDE PLATES 3/16" RIVETS ⅞", PITCH 1½".

TENDER

27 TOP OF TANK FUNNEL TO BE SAME HEIGHT ABOVE TOP OF RAIL AS BOTTOM OF CAB WINDOWS.

28 DRAIN PIPES ON SIDE OF TANK FUNNEL LEADING TO TRACK.

29 2" IRON PIPE TO BE PROVIDED TO FEED FROM BOTTOM OF TANK AND TO LEAD TO RIGHT AND LEFT SIDES, WITH VALVES ON ENDS.

30 OIL TANK IN FUEL SPACE, AND ARRANGED SO THAT IT CAN READILY BE REMOVED IN CASE IT IS DESIRED TO BURN COAL.

31 LADDER ON REAR OF TANK.

32 STEEL SAND BOX TO BE PLACED IN FRONT OF OIL TANK.

For Hereafter: Back engine truck bolster to be made of cast steel. (RSMC 4.8.21)

THE BALDWIN LOCOMOTIVE WORKS
Memorandum Sheet 19020

SPECIFICATION FOR LOCOMOTIVES 8-32-D-729

FOR DAYTON-GOOSE CREEK RAILROAD COMPANY

Gen. as PHOTO. 5526

Engine Drawing No. 73

5-22-19

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 12' 0" Driving 12' 0" Total 20' 3"
Total wheelbase, eng. and tend. { Actual 48' 1⅝" / Limited to ——

Curves 12 DEGREES 30 MINUTES Grades not to exceed 7/10 of 1%
TRACKS 13' 0" CENTER TO CENTER RAILS 80 POUNDS PER YARD
Limits, Height —— Width ——
Weight (approximate) in working order, Total 122,800
On F. tr'k 17,800 lbs., Drivers 105,000 lbs., B. tr'k —— lbs.

Tractive power 24,500 lbs.. Ratio of adhesion 4.3
Work'g St'm Pres. 180 lbs., Service FREIGHT
Fuel OIL SPECIFIC GRAVITY OF OIL IS 22 TO 24.

FRONT TUBE SHEET TO BE ½" THICK
Boiler STEEL Thick 9/16" & ⅝" Bill 8565
Boiler, Diam. 58" Plan EXTENDED WAGON 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, SEXTUPLE RIVETED

Dome, diam. 29" Pos. FORWARD OF FIRE BOX
AUXILIARY DOME, NONE
Firebox STEEL Combustion chamb. NONE
Firebox, length 89-15/16" Width 41⅜" Depth F. 63½" B. 61"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back 5/16"
Firedoor opening 18" DIAM. CROWN AND SIDES IN ONE SHEET.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame SINGLE Riveted
Water space stays ⅞" DIAM. WITH 5/16" HOLES 1½" DEEP FROM O.S. {TWO ROWS B. L. W.
Radial stays 1" DIAM. Sling stays front {EXPANSION STAYS
Button heads below crown on FOUR central rows

OIL BURNING WORK B. L. W. STANDARD, WITH BURNER IN FRONT OF FIRE BOX. ROYALTY PAYABLE BY THE B. L. W.

Flues #9 W. G. STEEL
Tubes #12 W. G. CHARCOAL IRON OR STEEL (B. L. W. OPTION)
Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.
Number 19 / 135 Diam 5⅜" / 2" Length 11' 3"

Heating Surface	Flues	2990	Combus. Chamb. ——	Total	1219
	Tubes	789	Fire Box 131	Fire Brick Tubes ——	
Grate area	26		Ratio to Heating Surface 1 :		46.8
Superheater	233				

Fire Brick ARCH, NONE
FIRE BOX LINED WITH FIRE BRICK FOR OIL BURNING
FIRE BRICK PAVEMENT IN PAN
Grates NONE
Ash Pan, Dampers BACK

THROTTLE TO BE PROVIDED WITH AUXILIARY DRIFTING VALVE
Throttle BALANCE Pos. DOME
Dry pipe STEEL
SUPERHEATER AS LOCO. SUPERHEATER CO'S SPECN. D-20-230-A
SUPERHEATER SCHMIDT TYPE, CONNECTED WITH TOP HEADER IN SMOKE BOX AND WITH OUTSIDE STEAM PIPE CONNECTIONS TO VALVE CHAMBERS. ROYALTY PAYABLE BY THE B. L. W.
Smokebox extension NONE Cleaning hole and cap NONE
Spark ejector or hopper NONE HAND HOLE AND CAP IN EACH SIDE OF SMOKEBOX FOR INSPECTION OF SUPERHEATER
Netting and deflect. plates NONE

Exhaust nozzles SINGLE LOW
Exhaust pipe WITH
Stack STRAIGHT Dia. 18"

Safety Valves TWO COALE 2½" (Not Spec)
Safety valves NONE with relief lever, Set to 180 POUNDS
Whistle ONE B. L. W. PLAIN OF BRASS

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: FRONT
Cleaning Plugs
Firebox CORNERS, DIAGONAL
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 MONITOR (Not Spec) No. 7
Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER
Pipes, Check STEEL Feed STEEL Overflow STEEL
Check B. L. W. Pos. R. AND L.

Steam Heat NONE

Cab STEEL

Cab boards #10 STEEL Nosing NONE Talon
Running boards STEEL Nosing T-IRON (4-5-K)
Hand rail IRON Located on BOILER

Back Bumper BAR STEEL Back drawbar height 33"
TENDER WEDGE TO HAVE FACE 10" DEEP.

Pilot WOOD Pushing shoes NONE
Front Bumper OAK Bumper plate NONE
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 EQUIPMENT TO BE PYLE NATIONAL ELECTRIC, TYPE "K" WITH INCANDESCENT HEADLIGHTS
Headlight TWO ROUND CASE 16" Reflector,
Headlight, Nos. on sides WITH H'd'r't step WITH
Lamp shelf NONE Nosing ——

Bell 92 POUNDS
Sand Box ONE Diam. 28" Body IRON PAINTED Pipes IRON
Sanding (Not Spec) LEACH AIR, DOUBLE THAP 4-10, TO SAND FRONT OF FRONT AND BACK OF MIDDLE PAIR OF DRIVERS. (Not Spec)
Dome casing IRON PAINTED

Boiler Jacket #23 SOFT STEEL PLATES IRON Style D
Boiler Lagging MAGNESIA SECTIONAL

Frames, Main Spec.

Cylinders, Diam. 19" Stroke 24"
Cylinders, Length 27" Width 12" Bridges ——
Exh. joint, Length —— Width —— Valve head 5/16"
Valve travel 5½" Steam lap 1" Exhaust clearance ——
Eccentric crank throw 10" By-pass valve NONE
B. P. Valve RICHARDSON FIVE FEED BULL'S EYE (Not Spec)
Cyl. heads CAST IRON LUGS, PIPED OF IRON UNDER JACKET
Cyl. casings IRON PAINTED Head covers STEEL PAINTED
Steam chest linings —— Covers ——
Steam chest valves 9½" DIAM., PISTON TYPE, INSIDE ADMISSION
Mot. leg Valve gear UNITED STATES, KING TYPE. (Not Spec)

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD
Guides ALLIGATOR TYPE, STEEL Oil cups NEEDLE
Crossheads CAST STEEL, WITH BEARINGS OF CAST IRON, TINNED
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 ——— case hardened or to have hardened bushings.

All bearings on parts subject to wear to be United States Standard.
All bearings moveable made of steel or of iron case hardened.

Wearing Bearings B. L. W.
SIDES, CENTERS WITHOUT HUB LINERS
Drivers, O. S. Diam. 64" Cen. diam. 45" 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 Two Wheels 36" SWING BOLSTER, CENTER BEARING
To swing 6" each side of cen. Cen. pin liners NONE
Journals, Diam. 5" Length 8½" Boxes CAST IRON
Wheels, Diam. 30" Tread —— Kind CAST IRON SPOKE CENTER
Tires STEEL Cen. diam. 28" Size 2½" x 5½"
Tires held by SHRINKAGE AND SHOULDER
ENGINE TRUCK WHEELS WITHOUT HUB LINERS
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 { Engine: Sch. No. 6-ET WESTG. COMBINED AUTO. AND STRAIGHT AIR / Parts Eng. Trk. sch. ——
Foundation { Drivers, sch. 24½" AMERICAN O.S. EQUALIZED. / Parts Eng. Trk. sch. ——
Air pump One 9½" Pos. LEFT SIDE
Train connections FRONT AND BACK
Train signal, sch. NONE
AIR EQUIPMENTS TO HAVE HYDROSTATIC TEST OF 210 POUNDS

Tender EIGHT Wheeled, Drawing No. 1405
Weight, with fuel and water, about 100,000 POUNDS
TENDER TO BE VANDERBILT TYPE, PATENT PLATE No. 2807
Tank { OIL 2,000 Gallons, Bill 4808 / WATER 5,000 4809
TANK "U" SHAPE, CYLINDRICAL
Tool Boxes OF WOOD, TOP

Frame STEEL ANGLES, WITH BUMPERS OF WOOD.
TENDER WEDGE BLOCK TO HAVE FACE 10" DEEP
Front Drawbar height 31½"
Pilot WOOD Pushing shoes NONE
Back drawhead, center above rail 33½"
Coupler M. C. B. AUTOMATIC

Steps HAND HOLDS ETC. TO CONFORM TO I.C.C. REQUIREMENT 6

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 WESTINGHOUSE AUTO. AN 8 STRAIGHT AIR, WITH 12" x 12" TENDER CYLINDER

List of tools, sch. 31
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 1038
Junior laws to 7-1-19 Shipment ON OWN WHEELS

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

B. L. W. FEED WATER STRAINER, PAT'D SEPT. 1, 1903 (CAST ON)
Patents

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

Painting: Engine, style 23 OLIVE GREEN AND ALUMINUM
Painting: Tender, style 29 OLIVE GREEN AND ALUMINUM

LETTERING ETC. TO BE SAME STYLE AS PHOTO 5546 CO.
Mark on TANK SIDES, DAYTON-GOOSE CREEK RAILWAY CO.

Road Nos. Pos. —— Road Nos. —— Name NONE
F. No. PLATE 103
SAND BOX
CAB SIDES
BACK OF TANK

Actual Dimensions of Loco. Extreme height over all 14' 2½"
Extreme Width: Cab boards 9' 11" Cylinders or valve motion 9' 7½"
Length outside face front bumper of engine to face of tender at top 70' 1"
Length face of smoke arch/box to outside face back bumper of tender 22' 5"
Total length outside face front bumper of ——

3737

SPECIFICATION FOR LOCOMOTIVE 8 32 0 799

DAYTON-GOOSE CREEK RAILROAD COMPANY.

Specification for Type A Double Loop Superheater. SPECN. No. D-20-200-A, JUNE 27, 1919.

BOILER TUBES	135 ...in number... 2 ...o. d... 11 ...ft... 3 ...in. over tube sheets. Tubes located between and adjacent to boiler flues are to be headed over at front end. Tubes to be in accordance with the American Society for Testing Materials Specification A-28-18.	
BOILER FLUES	19 ...in number... 5-3/8 ...o. d... #9 B.W.G. ...of cold drawn seamless steel. Flues to be in accordance with the American Society for Testing Materials Specification A-28-18. Card	10360-K
BOILER FLUE SETTING	..., 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 prosered 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	50447
UNITS	19 units. 1½ ...o. d... #9 B.W.G. ...Pipes to be in accordance with the American Society for Testing Materials Specification A-28-18. Pipes united by return bends. Each unit to be tested, before being placed in boiler, with water under pressure of 500 lb. per sq. in.	
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-A. 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	10258-J
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 ARRG'T
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 pipe or cylinder. Pipe to be well protected against freezing. Card	1149-H
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	40444
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	11242-M	S. H. UNIT BOLT WASHER	Card	1071
DAMPER CYL. ARM	Card	1074	S. H. UNIT CLAMP	Card	1075
DAMPER CYL. PIPE FITTING	Card	11115	S. H. UNIT CLAMP WASHER	Card	10305
DAMPER CYL. PIPE UNION	Card	11114	S. H. PIPE END	Card	1344
DAMPER CYL. PIPING DIAGRAM	Card	2258	S. H. PIPE BAND	Card	1983
DAMPER CYL. SUPPORT	Card		SPACING OF BANDS & SUPPORTS	Card	10759
DAMPER SHAFT	Card	1088	TYPE OF RETURN BENDS		FORGED
DAMPER SHAFT ARM	Card	1085	RETURN BENDS	Card	11022
DAMPER SHAFT BEARING (O.S.)	Card	1148	LUBRICATOR CONNECTION	Card	3023
DAMPER SHAFT BEARING (I.S.)	Card	10386-P	DEFLECTING PLATE HANDLE	Card	1297
DAMPER SHAFT LINK	Card	1070	DEFLECTING PLATE STUDS	Card	10309
PATCH PLATE	Card	5372	DEFLECTING PLATE CLAMP	Card	10309-A
PYROMETER		[illegible]			

THE BALDWIN LOCOMOTIVE WORKS — Specn. 0-6331

Memorandum Sheet 3003

SPECIFICATION FOR LOCOMOTIVES 6 36 D 317 TO 319

FOR Des Moines Union Railway Company

HP

Gen'l Dr. Photo. 6542

Engine Drawing No. 140

3-27-20

Gauge of Road 4'8½" Play 3/8"

Wheelbase, Rigid 11'0" Driving 11'0" Total 11'0"

Total wheelbase, eng. and tend. {Actual 42'2" / Limited to ---

Curves 40 DEGREES TRACK VERY ROUGH

Limits, Height --- Width ---

Weight (approximate) on working order, Total 138,000 POUNDS

On F. tr'k --- lbs., Drivers 138,000 lbs., B. tr'k --- lbs.

WEIGHT AS SPECIFIED MUST NOT BE EXCEEDED.

Tractive power 34,400 lbs., Ratio of adhesion 4.07

Work'g St'm Pres. 180 lbs., Service SWITCHING

Fuel SOFT COAL

1 Boiler STEEL Thick 5/8" Bill 9031

Front Tube Sheet 1/2" Thick

Boiler, Diam. 68" Plan STRAIGHT TOP

{Allowable st'm pres. 180 lbs. **Tested to** 200 lbs. steam pres.

{With Factor of Safety of 5.08 240 lbs. water pres.

Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS, SEXTUPLE RIVETED, 90% SEAMS.

Dome, diam. 29" Pos CENTRAL

Firebox STEEL Combustion chamb. NONE

Firebox, length 108-3/16" Width 42⅜" Depth F 65½" B 62½"

Firebox, Tube 1/2" Crown 3/8" Sides 5/16" Back 5/16"

2 Firedoor opening 15" DIAM.

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

Water space frame DOUBLE Riveted

Water space stays 5/8" DIAM. WITH 3/16" HOLES 1½" DEEP FROM O.S.

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

Button heads below crown sh. TEN central rows

Crown bars NONE Plates --- above crown

Crown bolts ---

Flues ---

Tubes 411 2" O.D. CHARCOAL IRON

Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.

Number 322 Diam. 2" Length 10'3"

Heating {Flues --- Combus. Chamb. --- Total 1904.6

Surface {Tubes 1742.6 Fire Box 162 Fire Brick Tubes ---

Grate area 31.7 Ratio to Heating Surface 1: 60

Superheater ---

Fire Brick ARCH, ON STUDS.

Grates ROCKING FINGER BARS WITH DROP PLATES

Ash Pan, Dampers FRONT AND BACK

ASH PAN TO BE DELT CLEANING TYPE.

Throttle BALANCE Pos. DOME

Dry pipe STEEL

Superheater NONE

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

Spark {arrester} {(SEE SUP. 4)}

Netting and deflector plates WITH

Exhaust nozzles DOUBLE, FISH

Stack Straight Dia. 15"

Stack casting TO BE SIMILAR TO 6 32 D 1071.

Safety Valves TWO CROSBY 3" CLASS "F" MUFFLED (Spec)

Safety valves NONE additional lever Safe 180 POUNDS

Whistle ONE B.L.W. PLAIN

Steam Gauge ONE IRON 7" MAKER: ASHCROFT (Spec)

Steam gauge stem IRON **Clock** NONE

Water Gauge ONE (SEE SUP. 5) **Cab Lamps** ELECTRIC

Gauge Cocks THREE BACK Surface valve NONE

Lowest gauge cock 3" above highest part of crown

Lubricator steam valve WITHOUT equalizing pipe to dome

Blower Valve B. L. W.

Blow off Cock ONE JOHNSTONE Pos. FRONT

Cleaning Plugs ONE PLUG ABOVE FIREDOOR.

Firebox, CORNERS DIAGONAL, SIDES AND BACK.

Crown, THREE EACH SIDE AND TWO BACK.

Waist, ONE UNDER FRONT

Front tube sheet ONE Flexible plug ONE

Pump NONE

Injectors (Spec) TWO OHIO (SUP. 6)

Injectors, Pos. R. & L. (SEE SUP. 6) Steam pipes COPPER

Pipes, Check STEEL From STEEL Overflow STEEL

Check (SUP. 7) Pos. RIGHT AND LEFT

Steam Heat NONE

8 Cab STEEL

Cab boards STEEL Nosing T-IRON

Running boards STEEL Nosing T-IRON

Hand rail IRON Located on BOILER

9 Back Bumper BAR STEEL. Back drawbar height 31½"

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 SIMPLEX, M.C.B. AUTO. WITH ADJUSTABLE COUPLER POCKET.

Signal fixtures IRON ON BUMPER

HEADLIGHT EQUIPMENT TO BE PYLE-NATIONAL ELECTRIC, TYPE "K-2" WITH INCANDESCENT HEADLIGHTS.

Headlight TWO ROUND CASE 14" Reflector

Headlight, Nos. generator WITH Hdlt. step WITH

Lamp shelf NONE Nosing ---

Bell 92 POUNDS GOLLMAR AIR BELL RINGER

Sand Box TWO (Spec) Diam. 28" Body IRON PAINTED Pipes IRON

Sand LEACH AIR TRAP 4-1 IN EACH BOX, TO SAND FRONT AND BACK.

Dome casing IRON PAINTED

Boiler Jacket 18 SOFT STEEL PTS Bands IRON Style 9

Boiler Lagging MAGNESIA SECTIONAL

THE BALDWIN LOCOMOTIVE WORKS

Jas. Brenerick

SPECIFICATION FOR LOCOMOTIVES 6 36 D 317 TO 319 July-1920.

FOR Des Moines Union Railway Company

HP.

39 39

Frames CAST STEEL

Cylinders, Diam. 21" Stroke 26" 1/8" for 6-36 D 319 only

St'm ports, Length 19" Width 1⅞" Bridges 1⅛" 1/8" B.S. only for 6-36 D 319 only

Exh. ports, Length 19" Width 3¼" Valve lead 1/8"

Valve travel 5½" Steam lap 1" Exhaust clearance 1/8" for 6-36 D 319 only

Eccentric crank throw 13-13/16" By-pass valve NONE L.S. only for 6-36 D 319 only.

S. F. Lubr NATHAN TRIPLE BULL'S EYE (Spec)

Cyl'r heads CAST STEEL Lubr. PIPES OF IRON UNDER JACKET.

Cyl'r casings IRON PTD. Head covers STEEL PTD.

St'm chest castings IRON PTD. Covers STEEL PTD.

St'm chest valves RICHARDSON BALANCED, WITH VACUUM VALVES

Met. pkg. ~~CROCODILE~~ U.S. KING TYPE (Spec)

Pistons (SEE SUP. 10)

Guides LAIRD TYPE, STEEL Oil cups NEEDLE

Crossheads CAST STEEL WITH BEARINGS OF CAST IRON, TINNED.

11 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.

Driving wheel hub liners BRONZE

Drivers, O. S. Diam. 51" 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 3½" x 5½"

Tires, Plain, Pos. MIDDLE Size 3½" x 6½"

Lateral play between driving boxes and wheel hubs - 3/16" 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 ---

Wheel hub liners ---

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 ---

Wheel hub liners ---

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

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

Tires held by ---

12 Brake, position ON ALL DRIVING AND TENDER WHEELS.

Operating {Engine, sch. A-1 & SNB WESTG. AUTOMATIC AND

Parts {Eng. Tr'k, sch. --- STRAIGHT AIR

Foundation {Drivers, sch. WM-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. None

AIR RESERVOIR TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

2½ Tender EIGHT Wheeled, Drawing No. 1556

Weight, with fuel and water, about 120,000 POUNDS

TENDER TO BE WEIGHED: YES

2½ Tank 6,000 Gallons, Bill 5348

TANK "U" SHAPE, SLOPING BACK. FUEL CAPACITY 9 TONS.

TANK TO HAVE SLOPING BACK PLATE IN COAL SPACE (I.E., SLOPING BOSOM)

Tool Boxes OF HARD WOOD, TOP.

Frame STEEL, 8" AND 10" CHANNELS, WITH CAST STEEL END SILLS.

21 Front Drawbar height 31½"

Pilot NONE Pushing shoes AT REAR

Back drawhead, center above rail 33½"

Coupler SIMPLEX, M.C.B. AUTO. WITH ADJUSTABLE COUPLER POCKET.

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, B. L. W.

23 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

12 Brake sch. FL-212, AND SNB WESTG. AUTOMATIC AND STRAIGHT AIR.

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 fawns to 6.2.20 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, style 291, OLIVE GREEN AND ALUMINUM

Mark NONE

Road Nos. Pos. Road Nos. Name NONE

F.No. PLATE ONLY 10 TO 12

Actual Dimensions of Loco. Extreme height over all 14'11"

Extreme Width: Cab boards 10'1" Cylinders or valve motion 10'2½"

Length outside face front bumper of engine to face of tender wedge 29'3"

Length face of tender wedge to outside face back bumper of tender 27'6½"

Total length outside face front bumper of engine to outside face back bumper of tender 57'9½"

SPECIFICATION FOR LOCOMOTIVES 6 30 / 317 to 319

FOR DES MOINES UNION RAILWAY COMPANY

HW

40 40

1 BOILER TO MEET I. C. C. REQUIREMENTS.

2 FIRE DOOR TO BE FRANKLIN AUTOMATIC, PENDULUM TYPE.

3 SMOKE BOX FRONT AND DOOR OF PRESSED STEEL.

4 CINDER HOPPER TO BE FURNISHED AND APPLIED BY R. R. CO. AFTER DELIVERY OF LOCOMOTIVES. B. L. W. IS NOT TO CUT THE HOLE NOR MAKE ANY PROVISION FOR APPLICATION OF CINDER HOPPER.

5 WATER GAUGE TO BE TUBULAR OGADEE TYPE 14 G. #12 PROTECTOR.

6 INJECTORS: ONE STANDARD "A" LIFTING No. 9 ON R. S. AND ONE STANDARD "B" NON-LIFTING No. 8 ON L. S.

7 INJECTOR CHECK TO BE NATHAN MFG. CO'S REVERSIBLE CHECK WITH STOP VALVE.

8 CAB DECK CASTING OF STEEL.

9 CHAFING ARRANGEMENT BETWEEN ENGINE AND TENDER TO BE PROVIDED WITH LARGE RADIUS AND DEEP FACE SUITABLE FOR SHARP CURVES.

10 PISTONS TO BE BUILT UP TYPE WITH REMOVABLE FOLLOWER PLATE, BULL RINGS AND VALVE PACKING RINGS. PISTON RODS TO BE KEYED TO CROSSHEADS.

11 MAIN ROD TO HAVE SOLID STUB AT CROSSHEAD END. PARALLEL RODS TO HAVE SOLID ENDS.

12 BRAKE CYLINDERS TO BE PLACED BACK OF CYLINDER SADDLE. AIR BRAKE CYLINDER TO HAVE JOHNS-MANVILLE EXPANDER RINGS AND PACKING CUPS.

TENDER

26 TANK TO HAVE SQUARE ENDS.

27 CHAFING ARRANGEMENT BETWEEN ENGINE AND TENDER TO HAVE LARGE RADIUS AND DEEP FACE SUITABLE FOR SHARP CURVES.

28 TENDER AXLE BOX BEARINGS OF M. C. B. TYPE.

Engine Drawing No. 17.

Diameter of Stack 17" 0" Plan 8"
Smokebox, Wrot 13' 6" Girders 13' 6" Tubes 12' 8"
Front tubeplate, wrot. and cast. {Actual 54" 8½"
Limited to ———

Stays:- ⅝" Rivets:- 60 LBS. PER KEG.
Carried {17 SCREWED, (238 FT.) on Main Line.
{21 SCREWED, (250 FT.) on Trk.

Limits, Height 12' 10" Width 9' 0"
Weight (approximate in working order, Total 161,000 POUNDS.
On F. Trk 11,000 lbs. Drivers 131,000 lbs. B. Trk 19,000 lbs.

Tractive power 30,600 lbs. Ratio of adhesion 4.28
Work'g Steam Pres. 180 lbs. Service FREIGHT
Fuel SOFT COAL.

FRONT TUBE SHEET TO BE ½" THICK.
Boiler STEEL. Thick ⅞" Butt D272
Boiler, Diam. 66" Plan STRAIGHT TOP
Boiler shell plates. 220 lbs. Tested to {220 lbs. above pres.
WITH FACTOR OF SAFETY OF 5.7 {267 lbs. water-pres.
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS.

Dome, diam. 29" Plan CENTRAL

Firebox STEEL Combustion chamb. Brick
Firebox, length 101-1 1/16" Width 60" Depth F. 62½" B. 51½"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firebox opening 16" DIAMETER.
Water space, Front 3½" Sides 3" Back 3"
Water space, Frame DOUBLE Riveted
Water space stays ⅞" diam. (SEE SUP. 11a).

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

Plates #9 U.S. STEEL.
Tubes #11 U.S. HOT ROLLED SEAMLESS STEEL.
Tube ends SWAGED FOR COPPER FERRULES, FIREBOX ENDS.
Number {22 {147 Diam. {5⅜" {2" Length 17' 6"

Heating Surface: Firebox 539⁰ Combust. Chamb. —— Total 2822⁰
Tubes 1340⁰ Fire Box 141⁰ Fire Brick Tubes ——
Grate area 42.5⁰ Ratio to Heating Surface 1 : 47.6
Superheater 169⁰

Fire Brick Arch, NONE.

Rocking bars with drop plate. (SEE SUP. 11a).
Ash Pan, Dampers NONE.

Throttle to be provided with auxiliary shifting valve.
Throttle Balance Pos. Dome.
Valve gear STEEL

Superheater SCHMIDT TYPE. (SEE SUP. 6a)

Superheater removable with flue ends and cap L.S. only.
Flue sheet reinforced. (SEE SUP. 2a)
Smokebox and tubeplate joints STEAM

Safety Valves Two CROSBY-ACME 3"
Safety valves alone with relief valve, Set to 180 pounds.
Whistle (SEE SUP. 25)

Steam Gauge One INCH 7". MAKER:- AMERICAN ST. (Special)
Steam gauge stand IRON Clock NONE

Water Gauge ONE, (SEE SUP. 3?) Lamps ELECTRIC
Gauge Cocks THREE BACK Sectain 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 (SEE SUP. 3a)
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

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

(Special)
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. R. Side L.

Steam Heat CONSOLIDATED CAR HEATING CO'S SYSTEM
WITH TRAIN CONNECTIONS ON RIGHT SIDE OF TENDER.

Steel.

Cab boards WOOD Running Handle Iron.
Running boards WOOD Reverse Handle Iron
Hand rail IRON. Located on BOILER

Back Bumper BAR STEEL. Back drawbar height 24"

Seat WOOD, SHORT PATTERN Pushing shoes NONE
Front Bumper OAK (SEE SUP. 3a) Bumper plate WITH
Steps (SEE SUP. L 38)

Front Deadwood, Center above rail 25"
Coupler CLIMAX AUTO. THREE-QUARTER SIZE, OF CAST STEEL

Signal fixtures IRON OR BRONZE.

Headlight ONE ADAMS GANZ 18" Reflector.
Headlight, Elec. or Acetylene WITH WAIT'S cap WITH
Lens shield NONE Mounting ———

Bell 92 POUNDS. BELL METAL. (SEE SUP. 10b)
Tender Size TWO-Diam. 31" Body IRON PAINTED. Pipe IRON
Tender TANDEM AXIS, TYPE A-1. IN EVERY WAY TO CONFORM
OF FURNISHING SAME WORK AND SAME OF REAR DRIVERS.
Deadwood IRON PAINTED.

Tender Journal #13 PLAIN. STEEL. Brass IRON Pads ?
Journal Bearing BOXED IN SECTIONS.
Lubrication ROOT'S SYSTEM TO BE ARRANGED.

Engine Drawing No. 17.

Cylinders, Diam. 20" Stroke 24"
Main ports, Length 20.25" Width 14" Bridges ——
Exh. ports, Length —— Width —— Valve lead ¼"
Valve travel 5¾" Steam lap 1" Exhaust clearance ——
Cylinders, cast Iron 20" Bypass valve NONE
Cyl'r bushing DETROIT Bushing Bolts ETC. (SEE SUP. 11?)
Cyl'r heads CAST IRON.
Cyl'r castings Iron Pte. Head covers STEEL PLATED.
Steam chest castings —— Covers ——
Steam valves 8" Slide, PISTON TYPE.
Valve pkg {Piston rings} UNITED STATES, KING TYPE. (Special)

Pistons CAST IRON RINGS SPRING INTO SOLID HEAD.
Cylinder O. H. STEEL. Oil cups (SEE SUP. 5a)
Crossheads CAST STEEL
Wrist Pins STEEL. Rods Bc. (SEE SUP. 5a-c)

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. 48" Cen. diam. 42" CENTERS CAST IRON.

Tires HARD STEEL. Held by SHRINKAGE AND SHOULDER.
Tires, Flanged, Pos. FRONT AND BACK Size 3" x 5½"
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. 11a, 2a)
Journals, Diam. 8½" Length 8"

Engine Make B. L. W.

Front Engine Truck TWO Wheels Swing Bolster {CENTER BEARING.
To swing 4" each side of cen., Cen. pin loose NONE
Journals, Diam. 5" Length 7" Boxes CAST IRON.
Wheels, Diam. 24" Tread —— Kind CAST IRON SPOKE CENTRES.
Tires STEEL Cen. diam. 19" Size 2½" x 5½"
Tires held by SHRINKAGE AND SHOULDER.
FRONT ENGINE TRUCK WHEELS WITHOUT HUB LINERS.

Back Engine Truck TWO Wheels Between RADIAL O.S. BEARING.
To swing ——— each side of cen., Cen. pin loose NONE
Journals, Diam. 5" Length 9" Boxes CAST STEEL
Wheels, Diam. 33" Tread —— Kind CAST IRON SPOKE CENTRES.
Tires STEEL Cen. diam. 29" Size 2½" x 5½"
Tires held by SHRINKAGE AND SHOULDER.

Driving Wheel Centers, Drawing No. 405.
Weights, with tires and water, about 90,000 POUNDS.

Tank WOOD Gallons, 800 IMP.
TANK 7/8" SHAPE, STRAIGHT TOP. FUEL CAPACITY 8½ TONS.

Tool Boxes OF HARD WOOD, TOP.
TENDER FLOOR BOARDS TO BE SPACED ABOUT 1" APART.
Frames STEEL, 15" CHANNELS, WITH BUMPERS OF WOOD.
FRAME, TO BE SIMILAR TO 12 3½ & 41, WITH WOOD FLOOR.
Front Drawbar height 28½"
Pilot NONE Pushing shoes NONE
Back drawhead, center above rail 26"
Coupler CLIMAX AUTO. THREE-QUARTER SIZE, OF CAST STEEL.

Steps (SEE SUP. 1.76)
SIDE BEARINGS ON BOTH FRONT AND BACK TENDER TRUCKS.
Trucks VULCAN TYPE, WITH CAST STEEL BOLSTERS.

Springs ELLIPTIC. B.L.W. MAKE.
Journals, Diam. 4½" Length 8"
Wheels, Diam. 26" Tread —— Kind CAST IRON SPOKE CENTRES.
Tires STEEL Cen. diam. 21" Size 2½" x 5½"
Tires held by SHRINKAGE AND SHOULDER.
Safety chains SINGLE.

Brake Position ON ALL WHEELS.
Brake sch. NO. 6-ET WEST'G. AUTO. AND STRAIGHT AIR WITH 10"x12"
TENDER CYLINDER.
BRAKE SHAFT TO PASS THRU END OF TANK, TO BE OUT OF WAY OF FIREMAN.

List of tools, sch. #29. TWO JOHNSON REPLACERS FOR 60 POUND RAILS.
Photo sch. NONE Inspection B.L.W. EXCEPT AS SUP. 5-A5)
To be weighed NO Material specs B.L.W.
Certificate of boiler test (SEE SUP. 4)
Junior laws to 12-3-17. Shipment ON CAR. (SEE SUP. 14)

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

B.L.W. Patents {FEED PIPE STRAINER PAT. SEPT. 1ST, 1903, (CAST ON)
{STEAM PIPE COVER, PAT. JULY 18TH, 1911, (CAST ON)
{BACK ENGINE TRUCK 645,834, MAR. 20, 1900. (BRASS PLATE)

Property plates NONE.

Painting Engine, style ——— OLIVE GREEN, NO STRIPING.
Painting Tender, style ——— OLIVE GREEN, NO STRIPING.
LETTERING, STEEL WITH LIGHT CHROME YELLOW (ORANGE) SAME AS FOR
12 3½ C & E. FIGURES TO BE AS ON DOME AND 10" ON CAB SIDES,
AND 18" x 12" ON SIDES OF TANK. LETTERS ON TANK SIDES TO BE 12"
ADAMS, TANK BRIDGE, L. S. & I.

SPECIFICATION FOR LOCOMOTIVES 12 3½ E 47

FOR THE EAST BROAD TOP RAILROAD AND COAL COMPANY.

1 SHOPS AND TENDER TO BE BUILT TO LATEST REQUIREMENTS OF THE INTERSTATE COMMERCE COMMISSION.

2 THE ROLLER, CRIST PINS, PISTON RODS TO HAVE THE DATE OF APPLICATION, ORIGINAL DIAMETER, AND KIND OF MATERIAL STAMPED ON END.

3 ALL PIPING SUBJECT TO BOILER STEAM PRESSURE TO BE DOUBLE STRENGTH AND TO HAVE EXTRA HEAVY FITTINGS.

4 ENGINE AND TENDER TO BE LOADED ON CAR ON THEIR OWN WHEELS.

5 BOILER TO BE INSPECTED DURING PROCESS OF BUILDING.
E.C.HALL, GEN'L. MGR. IS TO BE ADVISED WHEN WE ARE READY FOR AN INSPECTOR.

6 BOILER AND MACHINERY TO BE BUILT TO STAND 200 LBS. PRESSURE.
PROVIDE BOILER INSPECTION CERTIFICATE TO PENNSYLVANIA STATE RAILROAD REQUIREMENTS, IN ADDITION TO REQUIREMENTS OF THE INTERSTATE COMMERCE COMMISSION, I.E., FURNISH THREE COPIES OF B.L.W. FORM 1036.

7 DOME TO BE ONE PIECE TYPE.
DOME CONSTRUCTION, TO BE B.L.W. WITH THROTTLE VALVE SIMILAR TO 12 3½ E 41.

8 MANHOLE AND COVER TO BE APPLIED IN TOP OF BOILER FOR INSPECTION.

9 FIREBOX TO BE MADE AS DEEP AS PRACTICABLE.
CROWN AND SIDE SHEETS TO BE IN THREE PIECES.

10 FIRE DOOR OPENING TO BE FORMED BY FLANGING OUTWARD AND RIVETING TOGETHER THE INNER AND OUTER SHEETS.
DISTANCE BETWEEN TOP OF FIRE DOOR AND CROWN SHEET TO BE ABOUT 6".
FIRE DOOR TO BE FRANKLIN, BUTTERFLY TYPE, OPERATED BY AIR.
DOOR TO BE HUNG PARALLEL WITH SLOPE OF BACK HEAD.

11 STAYBOLTS (EXCEPT TATE) TO BE FALLS HOLLOW HOLLOW STAYBOLT IRON.
FLEXIBLE STAYBOLTS, TATE, ABOUT 401, IN NUMBER AT SIDES OF FIREBOX AND AT THROAT SAME AS FOR 12 3½ E 41.

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 6", LIGHT FERRULES TO BE USED.
TUBES (2" AND 5½") TO BE ELECTRICALLY WELDED IN FIREBOX TUBE SHEET.

14 GRATE BARS TO ROCK IN FOUR SECTIONS AND TO HAVE DROP PLATE AT FRONT AND BACK.
GRATES TO HAVE CENTER FRAME OF CAST STEEL.

15 ASH PAN TO BE SAME AS FOR 12 3½ E 41.
ASH PAN OF THE SELF DUMPING HOPPER TYPE, WITH BOTTOM AS NEAR AND FLAT AS POSSIBLE. AIR SPACE BETWEEN ASH PAN AND MUD RING LARGE ENOUGH TO PROVIDE ALL AIR NECESSARY FOR COMBUSTION.
ASH PAN COMING TO BE 2" LOWER THAN FOR 12 3½ E 41.
SPECIAL ATTENTION TO BE PAID TO DESIGNING OF ASH-PAN.
ASH PAN TO BE SO CONSTRUCTED AS TO CLEAR THE RAIL NOT LESS THAN 2½" WHEN TIRES ARE DOWN TO SCRAP LIMIT.

16 SMOKE BOX FRONT OF FLANGED STEEL, 1" THICK, WITH DOOR SIMILAR TO 12 3½ E 41. DOOR TO BE HELD BY CLAMPS.
SPARK EJECTOR OPERATED BY STEAM TO DELIVER TO RIGHT SIDE OF ENGINE, SAME STYLE AS FOR 12 3½ E 41.

17 HAND HOLE AND CAP IN EACH SIDE OF SMOKEBOX FOR INSPECTION OF SUPERHEATER.

18 SMOKE BOX ARRANGEMENT TO BE SIMILAR TO 12 3½ E 41.

19 SAFETY VALVES TO BE APPLIED IN SIDE OF DOME.

20 ONE HANCOCK 6½" INSHME WHISTLE, TO BE CONNECTED TO RIGHT SIDE OF DOME, WITH SUITABLE ANGLE VALVE.

21 STEAM GAUGE TO HAVE DOUBLE SPRING CRANK MOVEMENT.

22 WATER GAUGE TO BE ASHCROFT PRISMATIC, LOCATED ON RIGHT SIDE, IN FRONT OF ENGINEER, SAME AS FOR 12 3½ E 41.
WATER GAUGE NOT TO OBSTRUCT THE PASSAGE TO THE FRONT OF THE CAB, IT SHOULD BE LOCATED CLOSE TO THE BOILER, SAME AS FOR 12 3½ E 41.

23 ADDITIONAL CAB LAMP FOR USE OF ENGINEER IN READING ORDERS.
THIS LAMP TO BE SO CONSTRUCTED THAT IT CAN BE DARKENED WHEN NOT IN USE.

24 BLOWER VALVE FITTING TO BE PLACED NEAR CENTER OF BOILER.

25 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.

26 INJECTORS TO BE PLACED IN FRONT AND OUTSIDE OF CAB.
CHECKS WITH FROST COCKS, B.L.W. STYLE. OPERATED FROM CAB.

27 STEAM HEAT HOSE TO BE CHICAGO STEAM HEATING CO'S PATTERN NO. 302, WITH HOSE COUPLINGS COMPLETE WITH HOSE.

28 BRIDGE PIPE THRU WHICH THE THROTTLE STEM PASSES TO BE MADE LARGE ENOUGH TO TAKE INJECTOR THROTTLE, BLOWER VALVES AND AIR PUMP THROTTLE. ALL STEAM VALVES AND PIPE WORK TO BE PLACED AHEAD AND OUTSIDE OF CAB. (SEE SUP. 3)
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.

29 CAB TO BE MADE AS ROOMY AS POSSIBLE.
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 SASH BEING MADE IN HALVES, ARRANGED TO SLIDE EACH SIDE OF CENTER.
CAB ROOF TO HAVE WELL ROUNDED CORNERS WITH VENTILATOR IN ROOF.
CAB TO BE PROVIDED WITH STORM WINDOW CONSTRUCTED SO AS TO BE CONVENIENT FOR ENGINEER WHEN SEATED.
DOOR OPENING IN REAR OF CAB TO BE ABOUT 6' 3" HIGH.

30 PILOT MUST CLEAR THE RAIL 6" WHEN THE SPRINGS ARE DOWN.

31 SPRING BUFFER BETWEEN ENGINE AND TENDER, LOCATED ON TENDER.

32 CAB APRON BETWEEN ENGINE AND TENDER TO BE ROUGHENED IN ORDER TO SECURE FOOTING.

33 ALL STEPS, GRAB IRONS, UNCOUPLING LEVERS AND ASH PANS TO CONFORM TO THE REQUIREMENTS OF BOTH THE PENNSYLVANIA STATE RAILROAD AND THE INTERSTATE COMMERCE COMMISSION.

34 CROSS HEADING TO BE OF OPEN GAGE TO BE TAKEN IN THE ARRANGEMENT OF THAT CLEARED AS THE ENGINES CONSTRUCTED FOR 12 3½ E, WILL BE ALREADY PAINTED AND DRIED.

SPECIFICATION FOR LOCOMOTIVES 12 3½ E 47

FOR THE EAST BROAD TOP RAILROAD AND COAL COMPANY.

Specification for Type A Double Loop Superheater, Spec'n. No. 0-86½, dated December 6th, 1917.

BOILER TUBES	147 in number 2 in. o.d. 17 ft. 6 in. over tube sheets. Tubes located between and adjacent to boiler flues are to be headed west 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 1909-A
BOILER FLUE SETTING	To be, ends on back 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 pressured except for copper sheets. Front end to be rolled and beaded. Rollers to have at least 8 rolls. Plugger to have at least 12 sections.	Card 1136
TUBE SHEET LAYOUT		Card 5691
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 of dry pipe to have flat side against header flange. Casting should be machined with cast 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 shoulder allowed in ball joint seats. Headers must not be treated with nat ammonia. 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 1942-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 Annot.
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 so 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 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 10754-K	DAMPER SHAFT LINE	Card 1070
DAMPER CYL. ASS.	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 3258	S. H. UNIT CLAMP WASHER	Card 10305
DAMPER CYL. SUPPORT	Card	S. H. PIPE END	Card 1344
DAMPER SHAFT	Card 1068	S. H. PIPE HAND	Card 1965
DAMPER SHAFT ARM	Card 1065	RETURN BEND	Card 11022
DAMPER SHAFT BEARING (L.E.)	Card 1077	DEFLECTING PLATE HANDLE	Card 1487
DAMPER SHAFT BEARING (T.E.)	Card 1275-D	DEFLECTING SHINGLING	Card 3023
SPACING OF RADIUS BAR CENTERS	Card 10759	DEFLECTING PLATE STUDS	Card 10809
TYPE OF HEADER ENDS	FORGED	DEFLECTING PLATE CLAMP	Card 10809-A

SPECIFICATION FOR LOCOMOTIVES 12 3½ E 47.

FOR THE EAST BROAD TOP RAILROAD AND COAL COMPANY.

HL

45 46

41 HEADLIGHT EQUIPMENT TO BE PYLE NATIONAL ELECTRIC TYPE "E" WITH INCANDESCENT HEADLIGHT.
ELECTRIC EQUIPMENT FOR LIGHTING COACHES TO BE LOCATED ON LEFT SIDE OF TENDER.
DYNAMO BRACKET OF WROT IRON, LOCATED ON SUPPORT OVER MANHOLE BACK OF DOME.
Front end to be wired for future application of Marklers 3/14/18.

42 BELL RINGER TO BE GOLLMAR, IMPROVED AUTO. TYPE.

43 SAND BOXES TO HAVE EXTRA LARGE CAPACITY.
FRONT SAND BOX AND BELL PLACED AHEAD OF DOME, WITH BELL AHEAD OF SAND BOX, WITH EQUAL SPACES BETWEEN STACK, BELL SAND BOXES, DOME AND CAB, USING LARGEST OUTSIDE DIAMETER FOR SPACING.

44 BOILER JACKET TO BE APPLIED OVER STAYBOLTS SO THAT IT CAN BE REMOVED IN SECTIONS WITHOUT DAMAGE TO JACKET OR REMOVAL OF ANY OF THE INJECTOR PIPES OR OTHER PIPING.

45 ENGINE FRAMES OF HEAVY DESIGN, 4" WIDE, WELL BRACED.
FRAMES TO HAVE SINGLE FRONT RAILS.
FRAMES TO BE INSPECTED AFTER MACHINING.

46 PEDESTAL WEDGES AND GIBS OF CAST IRON.
PEDESTAL WEDGE BOLTS TO BE 1½" DIAMETER. (INSTEAD OF 1¼").

47 CYLINDERS TO BE SECURELY BOLTED TOGETHER AND TO SMOKEBOX.
CYLINDERS TO BE PROVIDED WITH A DOUBLE ROW OF BOLTS AROUND THE SMOKEBOX SADDLE AND ALSO FOR THE VERTICAL ROW CONNECTING THE SADDLES TOGETHER.

48 CYLINDER COCKS TO BE NATHAN TYPE L.S. 1334, THREE CYLINDER COCKS ON EACH CYLINDER, CENTRAL COCK TO BE CONNECTED WITH EXHAUST CAVITY BY WROT IRON PIPE, PLACED UNDER CYLINDER JACKET.

49 CYLINDER LUBRICATOR TO HAVE ATTACHMENT TO LUBRICATE AIR END OF AIR PUMP.
CYLINDER LUBRICATOR PIPES OF COPPER UNDER JACKET.

50 PISTON RODS TO BE KEYED TO CROSSHEADS.

51 GUIDES TO BE LAIRD TYPE, SAME STYLE AS FOR 12 3½ E 41.
OIL CUPS ON GUIDES TO BE HANCOCK NEEDLE.

52 GUIDES YOKE BRACES, CROSSTIES, AND WAIST SHEETS TO BE OF AMPLE STRENGTH.

53 CROSSHEADS TO BE SAME STYLE AS FOR 12 3½ E 41, WITH BEARINGS OF WHITE METAL.
CROSSHEAD PIN THREADED END TO BE 2½" DIAMETER WITH 10 THREADS PER INCH, AND WITH DOUBLE NUTS 1" THICK.

54 MAIN RODS, I-SECTION, OTHERS RECTANGULAR SECTION.
KEY ON MAIN RODS OF WEDGE TYPE, OPERATED BY THREADED BOLT RUNNING THRU THE WEDGE WITH LOCK NUT UNDERNEATH, SIMILR TO B.L.W. CARD 4723.
THE BOLT ON THE BACK END OF THE MAIN RODS TO BE PLACED SO THAT NUTS SHALL BE ON THE TOP SIDE INSTEAD OF ON THE BOTTOM. PARALLEL RODS TO HAVE SOLID ENDS.
CARE TO BE TAKEN IN FITTING OF SIDE ROD KNUCKLE PINS AS THOSE ON RY. CO'S LOCOMOTIVE NO. 16 CLASS 12 3½ E 41, WERE NOT FITTED IN TAPER PROPERLY AND WORKED LOOSE WHEN LOCOMOTIVE WAS RECEIVED.
OIL CUPS FORGED ON RODS.
SIDE ROD BUSHINGS TO HAVE ¼" COLLARS ON THE INSIDE.

55 WRIST PIN COLLAR ON NO. 3 FRONT AND NO. 6 BACK PINS TO BE HELD BY THRU BOLT INSERTED FROM INSIDE, WITH TWO NUTS ⅜" THICK ON THE OUTSIDE AND WITH ¼" DOWEL PIN TO PREVENT TURNING.

56 ROYALTY ON VALVE MOTION PAYABLE BY THE B.L.W.
OIL CUPS TO BE FORGED SOLID ON MOTION WORK.

57 RAGONNET POWER REVERSE GEAR, TO BE TYPE "A" COVERED ON EXTRA ORDER NO. 12098, DATED DECEMBER 20TH, 1917.

58 FLANGE OILERS OF APPROVED TYPE TO BE APPLIED TO FRONT AND BACK FACES OF DRIVING WHEELS.

59 DRIVING WHEEL CENTERS TO HAVE LARGE HUB BEARING SURFACE INSIDE. ALL DRIVING BOXES TO HAVE HUB LINERS OF BRASS ATTACHED TO THE BOXES AND NOT TO THE WHEEL CENTRES.

60 SLOTS IN DRIVING SPRINGS TO BE MADE 1 11/16" x 1⅛" TO PROVIDE FOR A SPRING LINK SECTION OF 3½" x 1". A CIRCULAR PIN IS TP BE PROVIDED, TURNED TO 1 11/16" DIAMETER AT CENTER, 1½" DIAMETER AT ENDS, INSTEAD OF KEY.
OMIT STRAP LINKS.

61 DRIVING SPRINGS TO BE STRONG AND TO BE SAME AS FOR 12 3½ E 41.
(INSERT SUP. NO)

62 BACK ENGINE TRUCK TO HAVE LOOSE COLLAR OF CAST IRON BETWEEN THE BOX AND THE WHEEL SAME AS FOR 12 3½ E 41.

63 TRAIN SIGNAL TO HAVE TRAIN CONNECTIONS ON RIGHT SIDE OF TENDER.

64 MAIN AIR RESERVOIRS TO BE WESTINGHOUSE ENAMELLED, AND TO HAVE EXTRA LARGE CAPACITY.
FURNISH WESTINGHOUSE AIR DRUM COCKS. (INSTEAD OF B.L.W.)
AIR RESERVOIRS TO BE LOCATED FORWARD UNDERNEATH THE RUNNING BOARDS.

65 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.

71 TANK WATER SPACE TO BE 6" HIGHER THAN FOR 12 3½ E 41. (Loco #16).

72 TANK COLLAR TO BE 12" HIGH AT SIDES.

73 TANK FUNNEL TO BE OVAL, ABOUT 14" x 30"
TWO DRAIN PIPES IN REAR OF TANK, NEAR FUNNEL.

74 SPRING BUFFER BETWEEN ENGINE AND TENDER, LOCATED ON TENDER.

75 TENDER COUPLER TO BE APPLIED WITH SIX 1¼" BOLTS.

76 STEP AND HAND RAIL 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 COMMISSIONS.

77 CLEARANCE OF 3½" BETWEEN BOTTOM OF TENDER TRUCK SIDE FRAME AND THE TOP OF RAIL.

78 JOURNALS M.C.B. STANDARD, WITH McCORD CAST STEEL JOURNAL BOXES.

79 TENDER WHEELS TO HAVE TREAD 4" WIDE AND FLANGES 1½" WIDE AS PER RY. CO'S SKETCH, FORM 208-B.

80 FOUNDATION BRAKE GEAR SHALL BE SO CONSTRUCTED AS TO CLEAR THE RAIL NOT LESS THAN 2½" WHEN TIRES ARE WORN TO SCRAP LIMIT.

THE BALDWIN LOCOMOTIVE WORKS

SPECIFICATION FOR LOCOMOTIVES 6 38 D 108

FOR THE FAIRMONT, PARKERSBURG & EASTERN R. R. CO.

Gen. ex Photo. 5000

Engine Drawing No. 13

3-19-18

Gauge of Road 4' 8½" Play ⅜"

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 pounds

Curves 16 degrees, Grades 2½%

Limits, Height ——— Width ———

Weight (approximate) in working order, Total 156,000 pounds

On F. tr'k ——— lbs., Drivers 156,000 lbs., B. tr'k ——— lbs.

Tractive power 38,500 lbs., Ratio of adhesion 4.05

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 8346

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 5.4

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. 66⅝"

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

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. Seamless Steel

Tubes #11 W. G. Seamless Steel

Tube ends Shaded for copper ferrules, fire box ends.

Number 26 / 179 Diam. 2" Length 10' 5"

Heating Surface: Flues 387 sq. ft. Combus. Chamb. None Total 1546.1 sq. ft.

Tubes 969 sq. ft. Fire Box 175 sq. ft. Fire Brick Tubes 15.1 sq. ft.

Grate area 32.2 sq. ft. Ratio to Heating Surface 1 : 48

Superheater 324 sq. ft.

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

Cylinder Steel

Superheater Schmidt Type (See Sup. 14)

Grosshead Alemite: With 2 lubricating hole and cup L.S. only

Guide Alemite: With

Valve and Valve Stem Alemite: With

Eccentric Alemite: With

Safety Valves (not opened) 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 opened)

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 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 ———

Injectors Two Simplex, Non-Lifting No. 8 (not opened)

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 33½"

Pilot None Pushing shoes at front

Front Bumper Oak 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 M. C. B. Automatic

Signal fixtures Iron on bumper.

Headlight Two Round Cast 23" Reflector, To burn Kerosene

Headlight, Nos. on sides With Without With

Lamp shelf None Nosing ———

Bell 92 pounds

Sand Box Two Diam. 31" Body Iron Painted Plate Iron

Sander Nelson Air, Type A-1, in each box toward front and rear.

Dome casing Iron painted

Roller Bearings (See Sup. 15) Style 9 and 14

Roller Lubricator Nathusia Sight feed.

Brackets of boiler to be lugged and jacketed.

THE BALDWIN LOCOMOTIVE WORKS

SPECIFICATION FOR LOCOMOTIVES 6 38 D 108 July 1918

FOR THE FAIRMONT, PARKERSBURG & EASTERN R. R. CO.

47

Frames Cast Steel Braces Solid

Cylinders, Diam. 22" Stroke 26"

St'm ports, Length 24.55" Width 1⅞" 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. Michigan Five Feed Bulls Eye (2nd Batch)

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 opened)

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.

Driving wheels to have hub liners of Bronze.

Drivers, O. S. Diam. 50" Cen. diam. 44" centers 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 – 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 ———

Brakes, position On all driving and tender wheels.

Operating Parts: Engine, Sch. A-1 and SMA, 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

Air reservoir to have hydrostatic test of 210 pounds.

Tender Eight Wheeled, Drawing No. 918

Weight, with fuel and water, about 100,000 pounds

Tank 5,000 Gallons, Bill 3887

Tank "U" shape sloping top. Fuel Capacity 8 tons.

Tank manhole to be made larger.

Tool Boxes Hard wood, top.

Frame Steel, 8" and 10" channels with bumpers of wood.

Front Drawbar height 33⅜"

Pilot None Pushing shoes at rear

Back drawhead, center above rail 33½"

Coupler M. C. B. Automatic.

Step across rear with hand rail

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

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 1¼" 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 SMB Westinghouse Auto and Straight Air.

List of tools, sch. 29

Photo sch. None Inspection B. L. W. (See Sup. 1 & 2.)

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 4.1.18 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 38 D 47

Mark on Cab Sides, F. P. & E. R. R. Co.

Road Nos. Pos. Road Nos. Name None

F. No. Plate 4

F. Sand Box

Sides of Tank

Back of Tank.

SPECIFICATION FOR LOCOMOTIVES 6 38 D 108

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 INSPECTION AND 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 350 BALDWIN FLEXIBLE STAYBOLTS.

4 SUPERHEATER AS LOCOMOTIVE SUPERHEATER CO'S. SPEC'N. NO. F-12-060-B, DATED MARCH 22ND, 1918. (COPY ATTACHED) SUPERHEATER TO CONNECT WITH TOP HEADER IN SMOKE BOX AND HAVING OUTSIDE STEAM PIPE CONNECTIONS TO VALVE CHAMBER.
ROYALTY ON SUPERHEATER PAYABLE BY B.L.W.

5 ADDITIONAL HAND HOLE AND CAP TO BE APPLIED IN EACH SIDE OF SMOKE BOX FOR INSPECTION OF SUPERHEATER.

6 CAB ARRANGEMENT AS B. L. W. TRACING 36696.

7 BUFFER WITH A LARGE RADIUS AND DEEP FACE, TO BE APPLIED BETWEEN ENGINE AND TENDER.

8 STEEL PLATE $\frac{3}{8}$" THICK TO BE APPLIED IN FRONT OF FRONT BUMPER.

9 ENGINE FRAMES TO HAVE SINGLE FRONT RAILS.

10 DISTANCE FROM CENTER OF CYLINDERS TO FRONT TUBE SHEET TO BE 32".

11 MAIN ROD BRASSES TO BE ADJUSTED BY MEANS OF A KEY. THIS KEY TO BE MADE ADJUSTABLE BY MEANS OF A BOLT AND NUTS, WHICH WILL PREVENT IT FROM COMING LOOSE.

12 DRIVING WHEELS TO BE SPACED EVENLY, THAT IS 5' 6" CENTER TO CENTER.
DRIVING WHEEL CENTERS TO BE MADE FROM THE SAME PATTERN AS THOSE ON 6 36 D 99.

13 ACTUAL DIMENSIONS OF LOCO.-

EXTREME HEIGHT OVER ALL: (WHISTLE)		15' 2"
EXTREME WIDTH:	CAB HANDLE	11' 5"
	CYLINDERS	10' 2"
LENGTH OUTSIDE FACE FRONT BUMPER OF ENGINE TO FACE OF TENDER WEDGE		30' 3¼"
LENGTH FACE OF TENDER WEDGE TO OUTSIDE FACE BACK BUMPER OF TENDER		24' ½"
TOTAL LENGTH OUTSIDE FACE FRONT BUMPER OF ENGINE TO OUTSIDE FACE BACK BUMPER OF TENDER		54' 3¾"

49

SPECIFICATION FOR LOCOMOTIVES 6 38 D 108

FOR THE FAIRPORT, PAINESVILLE & EASTERN R. R. CO.

Specification for Type A Double Loop Superheater. F12-060-B, DATED NEW YORK, MARCH 22, 1918

BOILER TUBES	179 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	26 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 10731
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. Frontend 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 5635
UNITS	26 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 1015¼-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 10721
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 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 at least 30% more than the working pressure of the boiler.	

DAMPER	Card 10651-K	DAMPER SHAFT LINK	Card 1070
DAMPER CYL. ARM	Card 1074	PATENT PLATE	Card 3274
DAMPER CYL. PIPE FITTING	Card 1069-A	S. H. UNIT BOLT WASHER	Card 1071
DAMPER CYL. PIPE UNION	Card 1207	S. H. UNIT CLAMP	Card 1073
DAMPER CYL. PIPING DIAGRAM	Card 3251	S. H. UNIT CLAMP WASHER	Card 10305
DAMPER CYL. SUPPORT	Card	S. H. PIPE END	Card 1344
DAMPER SHAFT	Card 1235-M	S. H. PIPE BAND	Card 1988
DAMPER SHAFT ARM	Card 1226 & 1231-C	RETURN BENDS	Card 11022
DAMPER SHAFT BEARING (O.S.)	Card 1223 & 1144-B	DEFLECTING PLATE HANDLE	Card 1487
DAMPER SHAFT BEARING (I.S.)	Card 10396-D	LUBRICATOR CONNECTION	Card 3023
SPACING OF BANDS & SUPPORTS	Card 10759	DEFLECTING PLATE STUDS	Card 10809
TYPE OF RETURN BENDS	FORGED	DEFLECTING PLATE CLAMP	Card 10809-A

THE BALDWIN LOCOMOTIVE WORKS As Specn. C-6433 Sup. 6 38 D 108 WITH SAME EXTRAS EXCEPT WHERE OTHE-WISE SPECIFIED.

Modernization Spec'n 20083

SPECIFICATION FOR LOCOMOTIVES 6 38 D 121

FOR THE FAIRPORT, PAINESVILLE & EASTERN R. R. Co.

H.W.

Gen. as PHOTO. 5800

Engine Drawing No. 13

3-31-20

Gauge of Road 4' 8½" Play 2" **Wheelbase,** Rigid 11'0" Driving 11'0" Total 11'0"
Total wheelbase, eng. and tend. {Actual 42'7" / Limited to ——
RAILS 80 AND 90 POUNDS.
Curves 16 DEGREES. GRADES 2½

Limits, Height —— Width ——
Weight (approximate) in working order, Total 150,000 POUNDS
On F. tr'k —— lbs., Drivers 156,000 lbs., B. tr'k —— lbs.

Tractive power 38,500 lbs. Ratio of adhesion 4.05
Work'g St'm Pres. 180 lbs., Service SWITCHING
Fuel SOFT COAL

12 **Boiler** STEEL Thick 13/16" Bit 83/40
Front Tube Sheet ½" Thick
Boiler, Diam. 74" Plan STRAIGHT TOP
{Allowable st'm pres. 200 lbs. **Tested to** 220 lbs. steam pres.
{With Factor of Safety of 5.4 267 ~~285~~ lbs. water pres.
Longitud. seams BUTT JOINTED, WITH DOUBLE COVERING STRIPS.
DOME ONE PIECE TYPE. AUXILIARY DOME – NONE
Dome, diam. 33" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE
Firebox, length 112-3/16" Width 41½" Depth F. 69⅝" B. 66⅜"
Firebox, Tube 2" Crown ⅜" Sides 5/16" Back 5/16"
3 Firedoor opening 16" DIAM.
Water space, Front 4" Sides 3½" Back 3½"
Water space frame SINGLE Riveted
4 Water space stays ⅝" DIAM. WITH 3/16" HOLES 12" DEEP FROM OUTSIDE.

Radial stays 1" DIAM. Sling stays front {THREE ROWS 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 #11 W.G. SEAMLESS STEEL
Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.
Number {26 / 179 Diam. {5½" / 2" Length 10'5"

Heating {Flues 387 Combus. Chamb. —— Total 1546.4
Surface {Tubes 969 Fire Box 175 Fire Brick Tubes 15.4
Grate area 32.2 Ratio to Heating Surface 1 to 48
Superheater 334

Fire Brick ARCH, AMERICAN ARCH CO'S SECURITY ARCH ON TWO TUBES 3" O.D. DIAMETER

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

5 **Throttle** BALANCE Pos. DOME
Dry pipe STEEL

Superheater SCHMIDT TYPE (SEE SUP. 6)

Smokebox extension WITH 7 cleaning hole and cap L. S. ONLY
Spark ~~arrester~~ hopper WITH
Netting and deflector plates WITH

Exhaust nozzle SINGLE, HIGH

Stack CAST IRON, STRAIGHT Dia. 18"

Safety Valves TWO COALE 3" OPEN (Not Spec)
Safety valves NONE with relief lever, Set to 180 POUNDS
Whistle ONE B.L.W. PLAIN

Steam Gauge ONE IRON 7" 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 TO HAVE separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock ONE CRANE 2" 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

Injectors (Not Spec) 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

8 **Cab** WOOD

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

9 **Back Bumper** BAR STEEL Back drawbar height 33½"

Pilot NONE Pushing shoes AT FRONT
10 **Front Bumper** OAK 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. AUTOMATIC

Signal fixtures IRON ON BUMPER

HEADLIGHT EQUIPMENT TO BE SCHROEDER WITH INCANDESCENT HEADLIGHTS.
Headlight IRON ROUND CASE 18" Reflector
Headlight, Nos. on sides WITH H'dl't step WITH
Lamp shelf NONE Nosing ---

Bell 32 POUNDS
Sand Box (Not Spec) TWO Diam. 31" Body IRON PAINTED Pipes IRON
Sander LEACH AIR, TRAP A-1 IN EACH BOX, TO SAND FRONT AND REAR

11 Dome casing IRON PAINTED

Boiler Jacket #22 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

H. Seneib JUNE-1920

SPECIFICATION FOR LOCOMOTIVES 6 38 D 121

FOR THE FAIRPORT, PAINESVILLE & EASTERN RAILROAD COMPANY.

H.W.

51

51

13 **Frames** CAST STEEL

Cylinders, Diam. 22" Stroke 26"
St'm ports, Length 24.55" Width 18" Bridges ---
Exh. ports, Length —— Width --- Valve lead ¼"
Valve travel 6" Steam lap ⅞" Exhaust clearance ---
Eccentric crank throw 13⅜" By-pass valve NONE
13 F. Lubr. MICHIGAN FIVE FEED BULL'S EYE (Not Spec)
Cyl'r heads CAST IRON LUBR. PIPES OF IRON UNDER JACKET
Cyl'r castings IRON PTD. Head covers STEEL PAINTED
St'm chest castings --- Covers ---
St'm chest valves 11" DIAM. PISTON TYPE
Met. pkg. UNITED STATES (Not Spec)
PISTON RODS TO BE KEYED TO CROSSHEADS
Pistons HEADS OF CAST IRON WITH RINGS OF CAST IRON SPRUNG IN.
Guides LAIRD TYPE, STEEL Oil cups NEEDLE
Crossheads CAST STEEL WITH BEARINGS OF CAST IRON, TINNED.
14 **Wrist Pins** STEEL Rod cups PLUNGER
PARALLEL RODS TO HAVE SOLID ENDS.

15 **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.
Driving wheel hub liners OF BRONZE
Drivers, O. S. Diam. 50" Cen. diam. 44" CENTERS 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 3/16" 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 ---
Wheel hub liners ---
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 ---
Wheel hub liners ---
Wheels, Diam. --- Tread --- Kind ---
Tires --- Cen. diam. --- Size ---
Tires held by ---

16 **Brake,** position ON ALL DRIVING AND TENDER WHEELS.
Operating { Engine, sch. A-1 AND SWA, WESTG. AUTOMATIC AND STRAIGHT AIR.
Parts { Eng. Tr'k, sch. ---
Foundation { Drivers, sch. B. L. ¾
Parts { Eng. Tr'k, sch. ---
Air pump ONE 11" Pos. LEFT SIDE
Train connections FRONT AND BACK
Train signal, sch NONE
AIR RESERVOIR TO HAVE AMPLE CAPACITY AND TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

Tender EIGHT Wheeled, Drawing No. 963X
Weight, with fuel and water, about 100,000 POUNDS.
TENDER TO BE WEIGHED: YES
Tank, 5,000 Gallons, Bill 3087
TANK "U" SHAPE, SLOPING BACK. FUEL CAPACITY, 8 TONS.

Tool Boxes HARD WOOD, TOP.

Frame STEEL, 8" AND 10" CHANNELS, WITH BUMPERS OF WOOD.

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

STEPS ACROSS REAR WITH HAND RAILS.
STEPS HAND HOLDS, ETC. TO CONFORM TO I.C.C. REQUIREMENTS.
STEPS AND HAND RAIL OF SLOPING BACK OF TANK.
Trucks ARCH BAR TYPE WITH CAST STEEL BOLSTERS.

Springs ELLIPTIC, B. L. W. MAKE
Journals, Diam. 5" Length 9"
Wheels, Diam. 33" Tread 1½" Kind CHILLED CAST IRON PLATE
Tires NONE Cen. diam. --- Size ---
Tires held by NONE
Safety chains SINGLE

Brake Position ON ALL WHEELS
Brake sch. FL-1212 AND SWB WESTG. AUTO. AND STRAIGHT AIR.

List of tools, sch. 29
Photo sch. NONE Inspection B.L.W. (SUP. 2)
To be weighed No. Material specns B.L.W.
Certificate of boiler test THREE COPIES OF B.L.W. FORM 1036
Junior laws to 4-1-18 Shipment ON OWN WHEELS.

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

B. L. W.
Patents { NONE

Property plates NONE

Painting, style 291, OLIVE GREEN AND ALUMINUM

LETTERING ETC. TO BE SAME AS FOR 6 38 D 108
Mark on CAB SIDES: F. P. & E. R. R. Co.

Road Nos. Pos 5 Road Nos. —— Name NONE
F. No. PLATE
F. SAND BOX
SIDES OF TANK
BACK OF TANK

Actual Dimensions of Loco. Extreme height over all 15' 2" (W/ HANDLES)
Extreme Width, Cab 11' 5" Cylinders or valve motion 10' 2"
Length outside face front bumper of engine to face of tender wedge 30' 3½"
Length face of tender wedge to outside face back bumper of tender 24' 0½"
Total length outside face front bumper of engine to outside face back bumper of tender 54' 3½"

SPECIFICATION FOR LOCOMOTIVES 6 38 D 121

FOR THE FAIRPORT, PAINESVILLE & EASTERN R. R. Co.

1 BOILER TO CONFORM TO THE REQUIREMENTS OF THE OHIO STATE RAILROAD COMMISSION, I.E. TO INCLUDE I.C.C. REQUIREMENTS.

2 BOILER TO BE INSPECTED BY THE HARTFORD STEAM BOILER INSPECTION AND INSURANCE COMPANY. BE SURE TO ADVISE THEM IN TIME FOR THEM TO SEE THE INTERIOR OF THE BOILER.

3 FIRE DOOR TO BE FRANKLIN, BUTTERFLY TYPE.

4 FIRE BOX TO HAVE AN INSTALLATION OF 350 BALDWIN FLEXIBLE STAY-BOLTS.

5 THROTTLE STUFFING BOX TO BE APPLIED IN DOME.
THROTTLE TO HAVE LEVER ON TOP OF BOILER.

6 SUPERHEATER AS LOCOMOTIVE SUPERHEATER COMPANY'S SPECIFICATION No. O-14024 DATED 6-2-20.
SUPERHEATER TO BE PLACED IN 5½" TUBES TO CONNECT WITH TOP HEADER IN SMOKE BOX AND HAVING OUTSIDE STEAM PIPE CONNECTIONS TO VALVE CHAMBERS.
ROYALTY ON SUPERHEATER PAYABLE BY THE B. L. W.

7 ADDITIONAL HAND HOLE AND CAP TO BE APPLIED IN EACH SIDE OF SMOKEBOX FOR INSPECTION OF SUPERHEATER.

8 CAB ARRANGEMENT AS B. L. W. TRACING No. 36695.
CAB VENTILATOR TO BE LARGER THAN FOR 6 38 D 108.

9 BUFFER WITH A LARGE RADIUS AND DEEP FACE, TO BE APPLIED BETWEEN ENGINE AND TENDER.

10 STEEL PLATE ¾" THICK TO BE APPLIED IN FRONT OF FRONT BUMPER.

11 DOME CASING TO HAVE PRESSED STEEL TOP RING.

12 ENGINE FRAMES TO HAVE SINGLE FRONT RAILS.

13 LUBRICATOR TO BE LOCATED SAME AS Co's LOCO. No. 2, B. L. W. CLASS 6 38 D 47.

14 MAIN ROD BRASSES TO BE ADJUSTED BY MEANS OF A KEY.
THIS KEY TO BE MADE ADJUSTABLE BY MEANS OF A BOLT AND NUTS, WHICH WILL PREVENT IT FROM COMING LOOSE.
MAIN ROD BRASSES AND WEDGES TO BE SAME AS FOR 6 38 D 108.

15 REVERSE LEVER TO BE MOVED FORWARD 6".

16 STRAIGHT AIR BRAKE VALVE TO BE PLACED BESIDE AUTOMATIC BRAKE VALVE INSTEAD OF ON RIGHT HAND SIDE OF CAB, AS ON 6 38 D 108.

TENDER

24 TENDER FRAME CHANNELS TO BE SAME WEIGHT AS FOR Co's LOCOMOTIVE No. 2, B. L. W. CLASS 6 38 D 47.

25 BUFFER WITH LARGE RADIUS AND DEEP FACE, TO BE APPLIED BETWEEN ENGINE AND TENDER.
LENGTH FACE OF TENDER WEDGE TO OUTSIDE FACE BACK BUMPER OF TENDER 2'4 10".
TOTAL LENGTH OUTSIDE FACE FRONT BUMPER OF ENGINE TO OUTSIDE FACE BACK BUMPER OF TENDER 54'3⅜"

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SPECIFICATION FOR LOCOMOTIVES 6 38 D 121

FOR: THE FAIRPORT, PAINESVILLE & EASTERN R.R. Co.

Specification for Type A Double Loop Superheater. AS SPEC. # O-14024, DATED JUNE 2ND, 1920

BOILER TUBES	179 in number 2 o.d. 10 ft. 5 in. over tube sheets. Tubes located between and adjacent to boiler flues are to be headed over at front end. Tubes to be in accordance with the American Society for Testing Materials Specification A-25-18.
BOILER FLUES	26 in number 5½ o.d. #9 BWG of cold drawn seamless steel. Flues to be in accordance with the American Society for Testing Materials Specification A-28-18 ..... Card 10731
FOILER 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, headed and prosetted except for copper sheets. Front end to be rolled and headed. Rollers to have at least 3 rolls. Prosser to have at least 12 sections ..... Card 1137
TUBE SHEET LAYOUT	Card 7635
UNITS	26 units 13 o.d. #9 BWG Pipes to be in accordance with the American Society for Testing Materials Specification A-28-18. Pipes united by return bends. Each unit to be tested, before being placed in boiler, with water under pressure of 500 lb. per sq. in.
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-A ..... 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 10154-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 10721
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 pipe or cylinder. Pipe to be well protected against freezing. Card 11314
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-A-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 at least 30% more than the working pressure of the boiler.

DAMPER	Card 11406-P	S. H. UNIT BOLT WASHER	Card 1021
DAMPER CYL. ARM	Card ~~1074~~ 1065-A	S. H. UNIT CLAMP	Card 1073
DAMPER CYL. PIPE FITTING	Card 11115	S. H. UNIT CLAMP WASHER	Card 10305
DAMPER CYL. PIPE UNION	Card 11114	S. H. PIPE END	Card 1344
DAMPER CYL. PIPING DIAGRAM	Card 11274	S. H. PIPE BAND	Card 1988
DAMPER CYL. SUPPORT	Card	SPACING OF BANDS & SUPPORTS	Card 10759
DAMPER SHAFT	Card 1068-H	TYPE OF RETURN BENDS	FORGED
DAMPER SHAFT ARM	Card ~~1065~~ 1074-C	RETURN BENDS	Card 11022
DAMPER SHAFT BEARING (R.S.)	Card 1148	LUBRICATOR CONNECTION	Card 3023
DAMPER SHAFT BEARING (L.S.)	(RS) Card 10386-D	DEFLECTING PLATE HANDLE	Card 1447
DAMPER SHAFT LINK	Card 1070	DEFLECTING PLATE STUDS	Card 10809
PATENT PLATE	Card 3272	DEFLECTING PLATE CLAMP	Card 10809-A
DAMPER RIGGING	CARD ~~11393~~ 11388-D	PYROMETER	NONE

THE BALDWIN LOCOMOTIVE WORKS As Spec'n. C-24660
Memorandum Spec'n 17047 Dup. 8-34 D 547 EXCEPT WHERE OTHERWISE SPEC'D.
SPECIFICATION FOR LOCOMOTIVES 8 - 34 D 549
MD. FOR ILLINOIS TERMINAL RAILROAD COMPANY
R.

Gen. as PHOTO. 4797 {EXCEPT WITH FIREBOX ON TOP OF FRAMES AND WITH SOUTHERN VALVE GEAR
Engine Drawing No. 46

3-6-17

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 19' 0"
Total wheelbase, eng. and tend. {Actual 50' 2" {Limited to -----

Curves -----

Limits, Height ----- Width -----
Weight (approximate) in working order. Total 126,000 POUNDS
On F. tr'k 12,500 lbs., Drivers 113,500 lbs., B. tr'k ----- lbs.

Tractive power 26,600 lbs., Ratio of adhesion 4.26
Work'g St'm Pres. 170 lbs., Service SWITCHING
Fuel SOFT COAL

FRONT TUBE SHEET TO BE ½" THICK
Boiler STEEL Thick ⅝" Bill 8108
Boiler, Diam. 64" Plan STRAIGHT TOP
{Boiler st'm pres. 170 lbs., Tested to {190 lbs. steam pres.
{WITH FACTOR OF SAFETY OF 5.2 {227 lbs. water pres.
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS

Dome, diam. 29" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE
Firebox, length 96-7/16" Width 40⅛" Depth F. 62⅝" B. 60"
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 (Co. PREFERS STEEL)
Tube ends SWAGED FOR COPPER FERRULES 3/32" X 1" FIRE BOX ENDS
Number 268 Diam. 2" Length 10' 11¾"

Heating Surface	Flues -----	Combus. Chamb. -----	Total 1669⁰	
	Tubes 1529⁰	Fire Box 140⁰	Fire Brick Tubes -----	
Grate area 27.4	Ratio to Heating Surface 1 : 61			
Superheater -----				

Fire Brick ARCH NONE

Grates ROCKING FINGER BARS WITH 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~~ hopper WITH
Netting and deflect. plates WITH
SMOKE BOX NETTING TO BE 2½ X 2½ MESH, No. 8 B.W.G.
Exhaust nozzles SINGLE, HIGH

Stack STRAIGHT Dia. 18" Hole for S. B., dia. 18⅜"
STACK TO HAVE STEEL BASE

(not spec.)
Safety Valves 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 (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 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, ONE EACH SIDE AND ONE 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 -----

(spec'd)
Injectors TWO SELLERS, CLASS N IMPROVED, No. 9½
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 TO HAVE CURTAIN AT REAR
Cab STEEL, CAB TO HAVE LARGE SIDE WINDOWS
CAB HANDLE TO HAVE AMPLE CLEARANCE TO PREVENT IT FROM STRIKING TENDER FRAME ON SHARP CURVES
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 IRON 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 JANNEY M.C.B. AUTO. AS McC & T PRINT C-12937, WITH BASE CASTINGS AS McC. & T. PTS. C-12588

Signal fixtures IRON ON BUMPER
HEADLIGHT EQUIPMENT TO BE PYLE NATIONAL, TYPE K, WITH INCANDESCENT NITROGEN LAMPS
Headlight TWO ROUND CASE 18" Reflector,
Headlight, Nos. on sides WITH H'd'l't step WITH
Lamp shelf NONE Nosing -----

Bell 92 POUNDS
Sand Box (improved) TWO Diam. 28" Body IRON PAINTED Pipes IRON
Sander LEACH AIR TRAP "A-1" IN EACH BOX TO SAND FRONT AND BACK. SANDER AIR PIPES OF COPPER, LOCATED UNDER JACKET
Dome casing IRON PAINTED

Boiler Jacket #22 Soft Steel Pt'd Bands IRON Style 9
Boiler Lagging MAGNESIA SECTIONAL
LAGGING ON SIDES OF FIRE BOX TO BE REMOVABLE

THE BALDWIN LOCOMOTIVE WORKS
L. L. Keebe Nov 1917
SPECIFICATION FOR LOCOMOTIVES 8 - 34 D 549
FOR ILLINOIS TERMINAL RAILROAD COMPANY
R.

55
53

Frames CAST STEEL Braces SOLID

Cylinders, Diam. 20" Stroke 24"
St'm ports, Length 16" Width 1¼" 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 NONE
(spec'd)
S-P. Lubr. 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 UNITED STATES (not spec'd)
{PISTON RODS TO BE KEYED TO CROSSHEADS
Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD
Guides LAIRD TYPE STEEL Oil cups NEEDLE
Crossheads CAST STEEL, WITH PIN AS RY.CO'S PRINT 828
Wrist Pins STEEL Rod cups {GREASE CUPS FORGED ON WITH 1¾" PLUGS 10 THREADS PER INCH
PARALLEL RODS TO HAVE SOLID ENDS
MAIN ROD TO CONNECT TO MIDDLE PAIR OF DRIVERS
★ **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.
AMPLE CLEARANCE TO BE PROVIDED BETWEEN REVERSE LEVER AND RIGHT SIDE OF CAB FOR GREATER CONVENIENCE IN HANDLING
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. 52" Cen. diam. 44"
WHEEL CENTERS:--MAIN CAST STEEL, OTHERS CAST IRON
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
Driving Boxes CAST STEEL
Journals, Diam. 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. 5" Length 10" Boxes CAST IRON
Wheels, Diam. 28" Tread 4¼" 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 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 TWO 11" Pos. BOTH LEFT SIDE
Train connections FRONT AND BACK
Train signal, sch. NONE
AIR PUMP THROTTLE TO BE ONE 1½" ANGLE VALVE WITH ONE 1¼" GLOBE INTERMEDIATE VALVE FOR EACH AIR PUMP.
AIR RESERVOIR TO HAVE HYDROSTATIC TEST OF 210 POUNDS

Tender EIGHT Wheeled, Drawing No. 435
Weight, with fuel and water, about 115,000 POUNDS
TANK "U" SHAPE, STRAIGHT TOP. FUEL CAPACITY 10 TONS
⊛ **Tank** 6,000 Gallons, Bill 4600
DRAIN PIPE, 4" DIAM. TO BE PROVIDED THROUGH BACK OF TANK.
COAL BOARD OF STEEL SET 5'0" FROM BACK OF TANK
Tool Boxes OF HARD WOOD, TOP.
HEADLIGHT TO BE LOCATED IN CENTRE OF TENDER
Frame STEEL 10" CHANNELS, WITH STEEL BUMPERS FRONT AND BACK

Front Drawbar height 30⅛"
Pilot NONE Pushing shoes CAST IN BUMPER
Back drawhead, center above rail 33½"
Coupler JANNEY M.C.B. AUTO. AS McC & T PT. C-12937, WITH BASE CASTING AS McC & T. PRINT C-12588 (JANNEY COUPLER FOR THIS TENDER WAS REQUISITIONED FOR U.S. CONT. LOCO. NO. 346 -- AND A SHARON COUPLER APPLIED TO THIS TEND. 12-14-17.)
STEPS, HAND HOLDS, ETC. TO CONFORM TO I.C.C. REQUIREMENTS
Steps ACROSS REAR, WITH HAND RAILS

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. #6 ET WEST'G. AUTO. AND STRAIGHT AIR WITH 12" X 12" CYLINDER.
⊛ TANK FUNNEL TO BE OBLONG, 17" X 30", AND TO BE LOCATED 3'0" FROM CENTRE OF FUNNEL TO BACK OF TANK.

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 8-20-17 Shipment ON OWN WHEELS (SEE * BELOW)

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 ----- BLACK, NO STRIPING
Painting:--Tender, style ----- BLACK, NO STRIPING

LETTERING, ETC. TO BE SAME AS FOR 8 - 34 D 547
Mark on TANK SIDES, ILLINOIS TERMINAL

Road Nos. Pos. Road Nos. Name NONE
F. No. PLATE 15
F. SAND BOX
CAB PANEL

* EXTRAS ORDERED THROUGH EXTRA WORK DEPT., ORDER No. 2626 DATED 1917 TO BE SHIPPED WITH LOCOMOTIVE. (CHARGE)
★ SOUTHERN LOCOMOTIVE VALVE GEAR PATENT PLATES (HEREWITH) GOVERNING VALVE GEAR TO BE APPLIED TO THE REAR END OF THE LINK SUPPORT ON EACH SIDE OF LOCOMOTIVE.

THE BALDWIN LOCOMOTIVE WORKS As Sect'n G-1.1.20
Memorandum Specn 2001

SPECIFICATION FOR LOCOMOTIVES 8 38 0 20 AND 21

FOR ILLINOIS TERMINAL RAILROAD COMPANY.

Gen. as PHOTO. 6746

Engine Drawing No. 4

1.23.20

Gauge of Road 4' 8½" Play 3"
Wheelbase, Rigid 13' 6" Driving 13' 6" Total 22' 0"
Total wheelbase, eng. and tend. (Actual 53' 3"
(Limited to ——

Curves ——

Limits, Height —— Width ——
Weight (approximate) in working order, Total 173,500 POUNDS.
On F. tr'k 21,000 lbs., Drivers 152,500 lbs., B. tr'k —— lbs.

Tractive power 36,700 lbs., Ratio of adhesion 4.1
Work'g St'm Pres. 180 lbs., Service SWITCHING
Fuel SOFT COAL

Boiler STEEL Thick ⅞ Bill 8882
Front Tube Sheet ½" Thick
Boiler, Diam. 76" Plan STRAIGHT TOP.
Allowable st'm pres. 180 lbs. **Tested to** 200 lbs. steam pres.
With Factor of Safety of 5.6 240 lbs. water pres.
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS.
DOME ONE PIECE TYPE. AUXILIARY DOME — NONE
Dome, diam. 38" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE
Firebox, length 120-3/16" Width 42" Depth F. 72" B. 71⅝"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back ⅝"
Firedoor opening 16" DIAM. Crown AND SIDES IN ONE SHEET.
Water space, Front 4" Sides 3" Back 3"
Water space frame DOUBLE Riveted
Water space stays ⅝" DIAM. WITH 3" HOLES 12" DEEP FROM O.S.
Radial stays 1" diam. Stay stays front EXPANSION STAYS.
Button heads below crown on 12" central rows
Crown bars NONE Placed —— above crown
Crown bolts ——

Flues ——
Tubes #11 W.G. GOLD DRAWN SEAMLESS STEEL.
Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.
Number 346 Diam. 2" Length 12' 6"

Heating Flues —— Circulat. Chamb. —— Total 2450 sq. ft.
Surface Tubes 2350 sq. ft. Fire Box 201 sq. ft. Fire Brick Tubes ——
Grate area 35.4 sq. ft. Ratio to Heating Surface 1: 69.8
Superheater ——

Fire Brick, Arch NONE

Ash pan, Hopper PITTED BARS WITH DROP PLATE.
Ash pan, Bottom FRONT AND BACK.
Ash pan, Damper DOUBLE TYPE.

Safety Valves TWO CONSOLIDATED 2½" OPEN (Spec.)
Safety valves NONE with relief lever, Set to 180 POUNDS.
Whistle ONE 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" 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, THREE EACH SIDE AND TWO BACK.
Waist, ONE UNDER FRONT.
Front tube sheet, ONE Fusible plug ONE

Pump NONE

Injectors (Spec.) TWO SELLERS IMPROVED, CLASS "N" No. 10½
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

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 31½"

Pilot NONE Pushing shoes CAST IN BUMPER
Front Bumper CAST IRON Bumper plate BOTH
BRACED ACROSS FRONT WITH HAND RAILS.
STEPS, HAND HOLDS, ETC., TO CONFORM TO I.C.C. REQUIREMENTS.
Front Drawhead, Coupler shown on
Cross Compound Simple
Wheels, Driving, CHILLED CAST IRON, SPOKE, M.C.B., AUTO. OR BROOKWAY & TOWLER'S PRINT No.
Engine Truck, WITH BASE CASTING OR BROOKWAY & TOWLER'S PRINT No.
Trailing Truck, IRON CENTER
Tender Frame, STEEL PLATE
Tender Wheels, CHILLED CAST IRON, SPOKE

THE BALDWIN LOCOMOTIVE WORKS

M. Garner

SPECIFICATION FOR LOCOMOTIVES 8 38 0 20 AND 21 April 1920.

FOR ILLINOIS TERMINAL RAILROAD COMPANY

57

57

Frames CAST STEEL

Cylinders, Diam. 22" Stroke 26"
St'm ports, Length 19" Width 1⅜" Bridges 1⅜"
Exh. ports, Length 19" Width 3" Valve lead ⅛"
Valve travel 5½" Steam lap ⅞" Exhaust clearance ——
Eccentric crank throw 22" By-pass valve NONE
S. F. Lubr. (Spec.) DETROIT TRIPLE No. 22 BULL'S 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
St'm chest valves RICHARDSON BALANCED, WITH VACUUM VALVES.
Met. pkg. (Spec.) VALVE STEMS UNITED STATES, KING TYPE.

Pistons HEADS OF CAST IRON WITH CAST IRON RINGS SPRUNG IN.
Guides LAIRD TYPE STEEL Oil cups NEEDLE
Crossheads CAST STEEL WITH BEARINGS OF CAST IRON, TINNED.
Wrist Pins STEEL Rods etc. (SEE SUP. 10 sc.)
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.
Driving wheel hub liners BRONZE, FOR MAIN WHEELS ONLY.
Drivers, O. S. Diam. 52" Cen. diam. 44"
CENTERS, MAIN CAST STEEL, OTHERS, CAST IRON.
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 = 3/16" TOTAL
Driving Boxes STEELED CAST IRON.
Journals, Diam. 9" Length 12"

Springs. Make B. L. W.

Front Engine Truck TWO Wheeled SWING BOLSTER, CENTER BEARING
To swing 32" each side of cen., Cen. pin liners NONE
Journals, Diam. 5½" Length 10" Boxes CAST IRON
Wheel hub liners NONE
Wheels, Diam. 28" Tread 4½" 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 ——
Wheel hub liners ——
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 WESTG. COMBINED AUTO AND STRAIGHT AIR.
Eng. Tr'k, sch. ——
Foundation Parts — Drivers, sch. WM-3 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

Tender EIGHT Wheels, Drawing No. 1500.
Weight, with fuel and water, about 115,000 POUNDS.
TENDER TO BE WEIGHED: YES
Tank 6,000 Gallons, Bill 5203
TANK "U" SHAPE STRAIGHT TOP. FUEL CAPACITY 10 TONS.

Tool Boxes HARD WOOD, TOP.

Frame STEEL 12" CHANNELS.
BUMPERS OF STEEL, AT FRONT AND BACK.
Front Drawbar height 27½"
Pilot NONE Pushing shoes CAST IN BUMPER
Back drawhead, center above rail 33"
Coupler SHARON M.C.B. AUTOMATIC

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.
TRUCK SIDE BARS TO BE MADE OF STEEL.
Springs ELLIPTIC, B. L. W.
Journals, Diam. 5" Length 9"
Wheels, Diam. 33" Tread 1½" Kind CHILLED CAST IRON PLATE.
Tires NONE Cen. diam. —— Size ——
Tires held by ——
Safety chains SINGLE

Brake Position ON OWN WHEELS
Brake sch. No. 6 ET WESTG. AUTO. AND STRAIGHT AIR WITH 12"x12" TENDER CYLINDER.

List of tools, sch. 29
Photo sch. No. 2 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 3.1.20 Shipment ON OWN WHEELS.

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

Patents NONE

Property plates NONE

Painting, style —BLACK, NO STRIPING

LETTERING ETC. TO BE SAME AS FOR 8 34 D 549
Mark on TANK SIDES: ILLINOIS TERMINAL

	Road Nos.	Name
Pos.		NONE
F. No. PLATE	16	
F. SAND BOX	17	
CAB PANEL		

Actual Dimensions of Loco. Extreme height over all 14'8½"
Extreme Width: Cab boards 10'3" Cylinders or valve motion 10'6½"
Length outside face front bumper of engine to face of tender wedge = 33'2½"
Length face of tender wedge to outside face back bumper of tender = 25'0½"
Total length outside face front bumper of engine to outside face back bumper of tender = 58' 9½"

SPECIFICATION FOR LOCOMOTIVES 8 38 0 20 AND 21
FOR ILLINOIS TERMINAL RAILROAD COMPANY.
HW

58 58

1 LOCOMOTIVE TO CONFORM TO ALL I. C. C. REQUIREMENTS.

2 SMOKE BOX NETTING TO HAVE 2½ x 2½ MESH OF No. 8 B. W. G.

3 CAB TO HAVE LARGE SIDE WINDOWS.
CAB TO HAVE CURTAIN AT REAR.
CAB HANDLES TO HAVE AMPLE CLEARANCE.

4 HEADLIGHT EQUIPMENT TO BE PYLE-NATIONAL ELECTRIC, TYPE K-2, WITH INCANDESCENT HEADLIGHTS.
HEADLIGHTS TO HAVE NITROGEN LAMPS.

5 SANDER AIR PIPES OF COPPER PLACED UNDER JACKET.

6 DOME CASING TO HAVE PRESSED STEEL TOP RING AND PRESSED STEEL BOTTOM RING.

7 LAGGING ON SIDES OF FIRE BOX SO ARRANGED AS TO BE EASILY REMOVED.

8 PISTON RODS TO BE KEYED TO CROSSHEADS.

9 CROSSHEADS PIN AS RY. CO'S PT. 828.

10 MAIN ROD TO BE CONNECTED TO MIDDLE PAIR OF DRIVING WHEELS.

11 GREASE CUPS FORGED ON RODS WITH ½" PLUGS, 10 THREADS PER INCH.

12 ROYALTY ON VALVE MOTION, IF ANY, PAYABLE BY THE B. L. E.

13 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 LOCOMOTIVE.

14 EQUALIZING BEAMS OF WROUGHT STEEL AND CAST STEEL.

15 FRONT ENGINE TRUCK FRAME OF WROUGHT STEEL.

16 AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

17 RODS FURNISHED BY STANDARD STEEL WORKS WITH KNUCKLE JOINTS SMALLER THAN CARD SIZE MAY BE USED FOR 8 38 D 20 AND 21 ONLY.

- TENDER -

26 COAL BOARD OF STEEL LOCATED 5' 0" FROM BACK OF TANK.

27 TANK FUNNEL TO BE OBLONG 17"x30", WITH CENTER OF FUNNEL LOCATED 3'0" FROM BACK OF TANK.

28 DRAIN PIPE 4" DIAMETER, THROUGH BACK OF TANK.

29 BEARINGS AT SIDES OF BOTH TRUCKS.
LOCOMOTIVE TO CONFORM TO ALL I. C. C. REQUIREMENTS.

For Hereafter: Increase air opening in ash pan. Railway Co. complain that air opening in ash pans is insufficient for 8 38 D 20 & 21.
K. Ruckstuhl 7-28-20.

For Hereafter and Extras: Ash pan to be provided with larger dampers front and back. Openings to be placed in sides of pans. B.L.E. Engineer reported after assembling engines 8 38 D 20 & 21, it was necessary to drill a number of holes in sides of pans in order to enable engines to steam.
K. Ruckstuhl 4.8.21.

For Hereafter: Clean note following. Smoke box arrangement changed to eliminate throwing sparks as follows: Petticoat pipe in steam, 6" from top of smoke box and 7" from tube plate with deflector plate 17" from bottom of smoke box. Netting 3" x ⅝" was used but netting 2½ x 2½ is recommended.
Letter 7-18-25 from B.L.E. Engineer, O.O. Alexander, app. A.S.M.E. 7.30.25.

THE BALDWIN LOCOMOTIVE WORKS, Dec. 8 35 E 43 [illegible]

Memorandum Specn 4908 [illegible]

SPECIFICATION FOR LOCOMOTIVES 8 36 E 59

FOR THE IROQUOIS RAILROAD COMPANY

P

Gen. ar. Photo. 234, with exception [illegible]

Engine Drawing No. 11

7-30-19

Gauge of Road 4' 8½" Play 3/8"
Wheelbase, Rigid 15' 0" Driving 15' 0" Total 15' 0"
Total wheelbase, eng. and tend. { Actual 49' 1½" / Limited to ---

Curves ---

Limits, Height --- Width ---
Weight (approximate) in working order, Total 163,000 POUNDS
On F. tr'k --- lbs., Drivers 163,000 lbs., B. tr'k --- lbs.

Tractive power 37,040 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 11/16" Bill 869#
Boiler, Diam. 68" Plan STRAIGHT TOP
Boiler st'm pres. 180 lbs., Tested to { 200 / 240 } lbs. steam / water pres.
WITH FACTOR OF SAFETY OF 5.12
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS

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 42⅛" Depth F. 70⅛" B. 68⅛"
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 3/16" HOLES 1¼" DEEP FROM O.S. (Spec)
FLEXIBLE STAY BOLTS, TATE, 350 LOCATED IN BREAKING ZONE
Radial stays 1⅛" DIAM Sling stays front THREE ROWS 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
Tube ends SUNKEN FOR COPPER FERRULES, FIRE BOX ENDS.
Number 274 Diam. 2" Length 11' 2"
TUBES TO HAVE 3" SPACES
Tubes to be electrically welded to back tube sheet. (Spec)

Heating Surface				
	Flues ---	Combus. Chamb. ---	Total 2183
	Tubes 2020	Fire Box 163	Fire Brick Tubes ---
Grate area 33.6	Ratio to Heating Surface 1 : 64		
Superheater ---			

Fire Brick NONE

GRATES: ROCKING BARS AND DROP PLATE.
Grates DROP GRATE ARRANGEMENT AS RAILWAY CO'S. DIAGRAM
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 [illegible] hopper WITH
Netting and deflect. plates WITH, NETTING TO BE 2½ MESH.

Exhaust nozzle DOUBLE, HIGH

Blast Exhaust Dia. 18"

Safety Valves TWO CONSOLIDATED 3" DUE NOZZLES
Safety valves, None with relief lever, Set to [illegible] POUNDS STEAM PRESS.
Whistle ONE S. L. W. PLAIN [illegible] POUNDS, PLAIN

Steam Gauge ONE Ingn. 7" Manufr. ASHCROFT
Steam gauge stand IRON Clock NONE
GLASS WATER GAUGE TO BE ASHCROFT PATTERN NO. 5
Water Gauge ONE Cock Lengths CLOSE
Gauge Cocks THREE - RIGHT SIDE Surface valve NONE
Lowest gauge cock 4" above highest part of crown
Lubricator steam valve TO HAVE separate dry pipe to dome
Blower Valve S. L. W.
GAUGE COCKS TO BE EXTENSION.
Blow off Cock ONE S. L. W. Post FRONT
Cleaning Plugs ONE PLUG ABOVE FIRE DOOR
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 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. Post BOTH R. S.
INJECTOR CHECK TO BE SELLERS, FLANGE TYPE, BOLTED TO BOILER
Steam Heat NONE

Sheet
Cab WOOD
SHEET IRON FROM BACK OF BAR 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 Overhang Ingn. 35¾"

Pilot NONE Pushing Shoes AT REAR
Front Bumper OAK Bumper Steps STEEL
Steps ACROSS, FRONT WITH HAND RAIL

Front Drawhead, Center above rail 33"
Coupler TOWER M. C. B. AUTO.

Signal features [illegible]
PIPING, FRONT AND EQUIPMENT TO BE [illegible]
[illegible] WITH IMPROVEMENT BRASS [illegible]
Headlight THE ADAMS CASE 16" Reflector
Headlight, Pilot or sides WITH Front and Side Wires
Lamps and Brackets

Bell 32 POUNDS
Bell Stand YOKE Diam. 3½" Duty [illegible] PATTERN Post [illegible]
Safety Valve ASH, Type A-1, IN CAB END, TO SAND [illegible]

Dome casing IRON PAINTED

Boiler Jacketing SOFT STEEL Protected [illegible]
Boiler Lagging MAGNESIA SECTIONAL
Bare spots on [illegible] TO BE LAGGED AND [illegible]

SPECIFICATION FOR LOCOMOTIVES 8 36 E 59 October 1919

FOR The Iroquois Railroad Co.

P

60

Frames CAST STEEL
CYLINDER COCKS TO BE FURNISHED BY Railway Co.
Cylinders, Diam. 21" Stroke 28"
St'm ports, Length 18" Width 1⅜" Bridges 1⅜"
Exh. ports, Length 18" Width 3" Valve lead 3/16"
Valve travel 5½" Steam lap 15/16" Exhaust clearance ---
Eccentric crank throw 10-2/16" By-pass valve NONE
S. F. Lubr. DETROIT TRIPLE No. 22 BULLS EYE (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 [illegible] 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 PLUNGER
CROSSHEAD GIBS TO BE CAST STEEL, DOVE-TAILED ON FACE AND SIDES FOR BABBITT. DOVE-TAILS TO BE ABOUT 2½" APART.
Valve Motion WALSCHAERTS
(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.

Wearing Bearings B. L. W.
Driving wheel hub liners (SEE ✱ BELOW)
Drivers, O. S. Diam. 51" Cen. diam. 44" CENTERS CAST STEEL
FRONT AND BACK DRIVING WHEEL TIRES OF VANADIUM 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 1/16" TOTAL
Driving Boxes CAST STEEL
Journals, Diam. 9½" Length 12"

EQUALIZING BEAM FULCRUM REINFORCED FOR PIN BEARING.
Springs. Make B. L. W.

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

Back Engine Truck NONE

✱ BRASS HUB LINER 3" THICK IN HALVES, EXTENDING FROM ARM 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 13" TO 14" DIAMETER.

Brake, position ON ALL DRIVING AND TENDER WHEELS
Operating { Engine, sch. A-1 AND SMA WESTG. AUTO. AND STRAIGHT AIR
Parts { Eng. Tr'k, sch. ---
Foundation { Drivers, sch. WI-2 AMERICAN O. S. EQUALIZED
Parts { Eng. Tr'k, sch. ---
Air ..... Two - 9½" Pos. BOTH LEFT SIDE
Train connections FRONT AND BACK
Train signal, sch. NONE
STRAIGHT AIR BRAKE VALVE, 8-3-A, WITH DRIVER BRAKE RELEASE ATTACHMENT.
AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS.
AIR PUMP EXHAUST TO BE PIPED INTO EXHAUST PORT OF CYLINDER SADDLE.

Tender Every Wheeled, Drawing No. 935
Weight, with fuel and water, about 100,000 POUNDS
TRUCKS TO BE OF LONG, LOW DESIGN
Tank 5,000 Gallons, Bill 3903
TANK "U" SHAPE, STRAIGHT TOP. FUEL CAPACITY 12 TONS
TANK FUNNEL TO BE ON LOG ABOUT 18" X 30".
Tool Boxes, OF HARD WOOD, TOP

Frame STEEL, 10" CHANNELS WITH BUMPERS OF WOOD

Front Drawbar height 28"
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.
Journals, Diam. 5" Length 9"
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. FL-1212 AND SMB WESTINGHOUSE AUTO. AND STRAIGHT AIR.

✱ MATERIALS AND CONSTRUCTION OF LOCO. TO BE INSPECTED BY ALFRED LOVELL. FURNISH TO HIM COPIES IN DUPLICATE OF ORDERS FOR PRINCIPAL MATERIALS USUALLY TESTED AND INSPECTED.
List of tools, scn. 29
Photo sch. NONE ✱ Inspection BY ALFRED LOVELL
To be weighed YES Material specns B. L. W.
Certificate of boiler test THREE COPIES OF B. L. W. FORM 1036
Junior laws to 8-29-19 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, style 29½, OLIVE GREEN AND YELLOW
LETTERING ETC. TO BE IN CHROME YELLOW.

Mark on TANK SIDES: IROQUOIS RAILROAD (18" 7" LETTERS)
ROAD NUMBER TO BE APPLIED IN 6" FIGURES ON SAND BOX, IN 7" FIGURES ON CAB AND IN 12" FIGURES ON BACK OF TANK.
Road Nos. Pos. Road Nos. Name NONE
F. No. PLATE 27
F. SAND BOX
CAB SIDES
BACK OF TANK.

Actual Dimensions of Loco. Extreme height over all 14' 9"
Extreme Width: Cab boards 9' 3" Cylinders [illegible] 9' 6"
Length outside face front bumper of engine to face of tender wedge 33' 6½"
Length face of tender wedge to outside face back bumper of tender 25' 5½"
Total length outside face front bumper of engine to outside face back bumper of tender 60' 1½"

Gauge of Rails 4' 8½" Ftgs 2

Wheelbase, Right 14' 0" Driving 14' 0" Total 31' 1"

Rigid wheelbase, eng. and tend. { Actual 58' 6" / Limited to (MAY BE 58' 6") }

Curves ——

Limits, Height 16' 0" Width 10' 6"

Weight (approximate as working order. Total 218,500 POUNDS

On F. truck 19,000 lbs. Drivers 175,000 lbs. B. truck 24,500 lbs.

Tractive power 46,100 lbs. Ratio of adhesion 3.8

Work'g St'm Pres. 200 lbs. Service FREIGHT

Fuel SOFT COAL

FRONT TUBE SHEET TO BE ½" THICK

Boiler STEEL Thick 13/16" Bilt BIBS

Boiler, Diam. 78" Plan STRAIGHT TOP

Grade of Stock 200 lbs. Tested to 220 lbs. steam pres.
WITH FACTOR OF SAFETY OF 4.5 267 lbs. water pres.

Longitud. seams DOUBLE BUTT JOINTED, DOUBLE COVERING STRIPS, SEXTUPLE RIVETED

Dome, diam. 33" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE

Firebox, length 102" Width 72" Depth F. 72" B. 62"

Firebox, Tubs ½" Crown ⅜" Sides ⅜" Back ⅜"

Fireplug opening OVAL 16" X 20"; CROWN AND SIDES IN ONE PIECE

Water space, Front 5" Sides 4" Back 4"

Water space, Frame DOUBLE Riveted

Water spade stays 2" DIAM. WITH 3/16" HOLES 4½" DEEP FROM O.S.

FLEXIBLE STAYS.—350 AMERICAN, 15/16" DIAM.; 19 BREAKING ZONE.

Radial stays 1" DIAM. Stay stays front { THREE ROWS OF B. L. W. EXPANSION STAYS

Button heads, below crown on TEN central rows

Crown bars NONE Placed —— above crown

Holes ——

Flues ——

Tubes #12 B. G. CHARCOAL IRON

Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS

Number 300 Diam. 2¼" Length 18' 5"

TUBES TO BE BEADED OVER AND WELDED AT FIRE BOX ENDS

Heating Surface Flues —— Combus. Chamb. —— Total 3604
Tubes 3254 Fire Box 170 Fire Brick Tubes ——
Grate area 51 Ratio H. Surface to G. 67
Superheater ——

Fire Brick Arch NONE

Tender Frame Steel Channels

Tender Trucks Arch bar type with steel bolsters

Springs Elliptic. 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 12" x 12" cylinder.

Combination brake heads available for Christie or American type shoes. Brake rigging to be set higher than for 12-ET. E. Pl.

List of tools, sch. 29

Photo sch. 42 Impressions BY ALFRED LOWELL

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 B-165

Painting: Engine style 291 OLIVE GREEN AND ALUMINUM

Painting — Tender style 291 OLIVE GREEN AND ALUMINUM

PAINTING AND LETTERING TO BE SAME AS FOR 12-38½ E Pl. EXCEPT NUMBER ON SIDES OF CAB TO BE IN FIGURES 10" HIGH

Property plates NONE

Steam Gauge ONE INCH 7" BAKER-ASHCROFT (Special)

Steam gauge stand INCH Check NOSE

Water Gauge ONE KLINGER **Cab Lamps** ELECTRIC

Gauge Cocks THREE — BACK Surface valve NONE

Lowest gauge cock 3½" above highest part of crown

Lubricator steam valve TO HAVE 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 R. S., THREE L. S. AND FOUR BACK

Water, ONE UNDER FRONT AND ONE UNDER BACK

Front tube sheet, TWO Fusible plug ONE

CLEANING HOLES TO BE EASILY ACCESSIBLE

Pumps NONE Pos. ——

Top chamb. —— Bottom chamb. ——

Front Cock —— Feed pipes ——

Checks —— Check pipes ——

Injectors TWO MONITOR (Special) No. 10

Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER

Pipes, Check INCH Feed INCH Overflow INCH

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

Steam Heat NONE

Cab STEEL

HOLES TO BE CUT IN SIDE SHEETS TO GIVE ACCESS TO GRATE RODDING FIRE WITHOUT UNCOUPLING TENDER.

Cab boards WOOD Nosing NONE

Flooring boards WOOD Nosing NONE

Hand rail IRON Located on BOILER

Back Bumper BAR STEEL Back drawbar height 31½"

TAPE CHAFING CASTING TO BE APPLIED BETWEEN ENGINE AND TENDER TO PREVENT LOCKING ON CURVES

Pilot NONE Pushing shoe CAST IN BUMPER

Front Bumper CAST STEEL Bumper plate 9/16

STEPS ACROSS FRONT WITH HAND RAILS.

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

Front Drawbar, Center above rail 33½"

Coupler TOWER M. C. B. AUTO.

SPECIFICATION FOR LOCOMOTIVES 12-38½ E 1st

FOR KANAWHA GULF NEW & EASTERN RAILROAD CO.

Frames CAST STEEL Bilsby SOLID

Cylinders, Diam. 22" Stroke 28"

S'dle ports, Length 19" Width 1⅞" Bridges 1⅞"

Exh. ports, Length 19" Width 3" Valve lead 3/16"

Valve travel 5½" Steam lap 1" Exhaust clearance ——

Eccentric crank throw 21" By-pass valve NONE

S. P. Lube (Special) 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 (Special)

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD

Guides STEEL Oil cups NEEDLE

* **Crossheads** CAST STEEL, WITH BRONZE BEARINGS.

Wrist Pins STEEL Rod cups PLUNGER, FORGED ON.

PARALLEL ROD TO HAVE STRAPS, KEYS AND BRASSES

* CROSSHEAD BEARING LUGS AS SHOWN ON B.L.W. CARD 3156

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.

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.

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. 141" CENTERS CAST STEEL

Tires STEEL Held by SHRINKAGE AND SHOULDER

Tires, Flanged Pos. FRONT AND BACK Size 3" X 6½"

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

Lateral play between driving boxes and wheel hubs 1/16" TOTAL

Driving Boxes CAST STEEL

Journals, Diam. MAIN 9" Length 12"
OTHERS 9"

Springs, Make B. L. W.

Front Engine Truck TWO Wheeled SWING BOLSTER CENTER BEARING

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

Journals, Diam. 5½" Length 10" Boxes CAST IRON

Wheels, Diam. 33" Tread —— Kind CAST IRON SPOKE CENTRE

Tires STEEL Cen. diam. 33" Size 2½" X 5½"

Tires held by SHRINKAGE AND SHOULDER

ENGINE TRUCK WHEELS WITHOUT HUB LINERS

Back Engine Truck TWO Wheeled RIGHTON RADIAL TYPE

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

Journals, Diam. 5" Length 10" Boxes CAST IRON

Wheels, Diam. 36" Tread —— Kind CAST IRON SPOKE CENTRE

Tires STEEL Cen. diam. 31" Size 2½" X 5½"

Tires held by SHRINKAGE AND SHOULDER

RADIUS PLATE SHOWING AS SHOWN ON B.L.W. TRACK TO BE FURNISHED

Tender LIGHT Wheels, Drawing No. 435

Weight, with fuel and water, about 100,000 POUNDS

Tank 5000 Gallons, Bill 4586

TANK "U" SHAPE, SLOPING BACK. FUEL CAPACITY 8 TONS

MAN HOLE TO BE PLACED OUTSIDE OF COAL HOPPER

Tool Boxes OF HARD WOOD, TOP

Frame STEEL 10" CHANNELS

FRONT AND BACK BUMPERS OF CAST STEEL

Front Drawbar height 29" Spacing casting between engine and tender to be made to prevent toe jams on curves

Pilot NONE Pushing shoe CAST IN REAR BUMPER

Back drawhead, center above rail 33½"

Coupler TOWER M. C. B. AUTOMATIC

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

STEPS ACROSS BACK WITH HANDRAILS

Steps AND HAND RAILS ON BOTH SIDES OF SLOPING BACK OF TANK

Rear of tender to be in accordance with I.C.C requirements for switching service

Trucks ARCH BAR TYPE WITH 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 12" X 12" CYLINDER.

Combination brake heads available for Christie or American type shoes. Brake rigging to be set higher than for 12-38½ E Pl.

List of tools, sch. 29

Photo sch. 42 Impressions BY ALFRED LOWELL

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 B-165

B. L. W. Patents FEED WATER 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

PAINTING AND LETTERING TO BE SAME AS FOR 12-38½ E Pl. EXCEPT NUMBER ON SIDES OF CAB TO BE IN FIGURES 10" HIGH

Number on TANK SIDES. No. 61 in 4 E.

Cylinders ——

Limits, Height —— Width ——
Weight (approximate) of working parts, Total 190000 POUNDS
On F. B's 24000 lbs. On Drvrs. 191000 On T. B's —— lbs.

Tractive power 43000 lbs. Ratio of adhesion 3.95
Work'g St'm Pres. 190 lbs. per Sq. inch. Thickness
Fuel SOFT COAL

FRONT TUBE SHEET TO BE 5/8" THICK
Boiler STEEL Thick 7/8" Dia. 83 3/8"
Radial Diam. 76" Plan STRAIGHT TOP

Number of tubes 280 Ins. Tapering 280 Ins. Diam. of tubes
WITH RATIO OF HEATED SURFACE TO GRATE AREA OF 71.65 : 1 207 Ins. Diam. of
Longitud. seams (SEE SHT. 1)

F. Diam. Diam. 33" Plan CENTRAL

Firebox STEEL Combustion chamber Length
Crown, length 108 1/8" Width 39 1/2" Depth F. 70 1/8" B. 69 1/8"
Crown, Thick 1/2" Sides 1/2" Back 1/2"
Crown stays OVAL 1 1/8" x 1 3/4"
Water space Front 4" Back 4"
Water space Sides DOUBLE Bottom
Roof supported by 3/4" RADIAL WITH 240 HOLES 1 1/8" HOLES FROM C.S.
Tubes, Thick 1/2" Diam. 2" Material (SEE SHT. 1) Ins. Diam. Ins.
Smoke box Diam. 70" Plan CYLINDRICAL Extension plate
Netting —— Spark arrester ——

Safety Valves TWO (SEE SHT. 2)"
Valve stems Bored with relief holes, Set to 190 POUNDS
Whistle ONE B. L. W. PLAIN

Steam Gauge ONE INCH 7" MAKER:- ASHCROFT (SEE SHT.)
Steam gauge stand IRON Check NONE

Water Gauge ONE B.L.W., IRONCLAD Cab Lamps ELECTRIC
Gauge Cocks THREE BACK Surface valve NONE
Lowest gauge cock 3/4" above highest part of steam
Lubricator steam valve TO HAVE separate dry pipe to dome
Blower Valve (WITH) B. L. W.

Blow off Cock ON B. L. W. POS.:- FRONT
Cleaning Plugs ONE PLUG ABOVE FIRE DOOR
Firebox CORNERS DIAGONAL, SIDES AND BACK
Crown, THREE EACH SIDE AND THREE BACK
Waist, ONE UNDER FRONT
Front tube sheet, ONE Foreign plug ONE

Pump NONE Pin ——
Top chamb. —— Bottom chamb. ——
Feed Cock —— Feed pipes ——
Checks —— Check pipes ——

Injectors (SEE SHT.) TWO SELLERS, CLASS "N" No. 10 1/2
Injectors, Pos. RIGHT AND LEFT Steam Pipes COPPER
Pipes, Class IRON Feed IRON Overflow IRON
Check B. L. W. Pin B. AND L.

Steam Heat NONE

Cab STEEL

Cab handle STEEL Floors Tongued
Flooring boards STEEL Ceiling Tongued
Hand rail IRON Lockers on Bottom

Back Number SAN STEEL Cab Heating Stove ——

Pilot BOSS
Front Bumper CAST STEEL Bumper posts BOSS
Steps, hand holds, etc., to conform to I.C.C. requirements

Front Drawhead, Centre above rail 34"
Coupler M. C. B. AUTO.

Signal Devices (SEE SHT. 2)

Headlight TWO PYRAMID PANS (SEE SHT. 2)
Lens and Case BOSS Reflector BOSS

Bell Ringer ——
Bell Hanger ——

Tender Frame Drawing No. 610
Weight on drivers, Loaded 130000 POUNDS

Tires 7000 Flanges, Std. M676
Tank BUTLER BOTTOM TYPE Fuel Capacity - 12 TONS

Tool Boxes HARD WOOD - TOP

Frame STEEL, 12" CHANNELS, WITH BUMPERS OF WOOD.

Front Drawbar height 32 1/2"
Pins NONE Pushing shoes NONE
Back drawbar top, under above rail 33 1/2"
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 1/2" Length 10"
Wheels, Diam. 33" Tread 4 1/2" 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 with NONE Inspection B. L. W.
Tires weighed YES Material specs B. L. W.
Certificate of boiler test THREE COPIES OF B.L.W. FORM 1036
Driver tires to 3-1-18 Lettering ON IRON WHEELS

Cab and shop finish, No. 1
Machine shop finish B-159

Name FEED WATER HEATER, PATENTED, SEPT. 1, 1903 (CAST ON)
Material

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

Painting:- Engine, style —— BLACK, NO STRIPING
Painting Tender, style —— BLACK, NO STRIPING

LETTERING, GILT IN ALUMINUM, SAME AS FOR 10-32-0-89, &c.
NUMBER TANK SIDES:- L. & M. IN LETTERS 24" HIGH.
FIGURES ON BACK OF TANK TO BE 21" HIGH; FIGURES IN OTHER
LOCATIONS TO BE QUITE SMALL SAME AS FOR 10-32-0-89, &c.

Road Nos. Nos. Roads Name ROAD
F. No. PLATE 157
Name Bar 192
Cab Nos.
Class or Name

SPECIFICATION FOR LOCOMOTIVES 10-38-E-3701-3702

FOR LITCHFIELD & MADISON RAILWAY COMPANY.

1 BOILER LONGITUDINAL SEAMS TO HAVE BUTT JOINTS, WITH DOUBLE WELDING STRIPS, BOTH WELDED RIVETED, 90% SEAMS.

2 DOME ONE PIECE TYPE.
AUXILIARY DOME FOR SAFETY VALVES AND WHISTLE.

3 AMERICAN ARCH CO.'S SECURITY FIRE BRICK ARCH SUPPORTED ON FOUR TUBES 3" O. S. DIAMETER. $\frac{1}{4}$" THICK.

4 SUPERHEATER AS LOCOMOTIVE SUPERHEATER CO.'S SPEC'N. NO. 0.9168 DATED MARCH 8, 1918 (COPY ATTACHED)
SUPERHEATER TO CONNECT WITH TOP HEADER IN SMOKE BOX AND HAVING OUTSIDE STEAM PIPE CONNECTIONS TO VALVE CHAMBERS.
ROYALTY PAYABLE BY THE B. L. W.

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

6 LINER $\frac{3}{8}$" THICK TO BE APPLIED IN BOTTOM OF SMOKE BOX AHEAD OF CYLINDER.

7 HEADLIGHT EQUIPMENT TO BE SCHROEDER - ELECTRIC - WITH INCANDESCENT HEADLIGHT.

8 CYLINDERS TO BE BUSHED.

9 PISTON RODS TO BE KEYED TO CROSSHEAD.

10 CROSSHEAD GIBS OF CAST IRON FINISHED.

11 COTTER PINS TO BE APPLIED TO ALL BRIGHT PINS.

12 VALVE MOTION TO BE BUSHED.

13 PARALLEL RODS TO HAVE SOLID ENDS.

14 FRONT ENGINE TRUCK WHEELS WITHOUT HUB LINERS.

15 ALL BUSHED EXHAUST PIPES INTO CYLINDER SADDLE.

SPECIFICATION FOR LOCOMOTIVES 10-38-E-3701-3702

FOR LITCHFIELD & MADISON RAILWAY COMPANY

Specification for Type A Double Loop Superheater O-9168 DATED MARCH 8, 1918.

	225 elements 2" 13 x 10	
	32 5/8 #9 BWG	1197-3
		1136
TUBE SHEET LAYOUT UNITS	32 tubes 1½" x #9 BWG of seamless steel. Pneumatic	5214
UNIT FLUE SUPPORTS		10773
UNIT FLUE JOINT		1043
UNIT FLUE JOINT		10695
HEADER		10981-A
		1323
		1998
		1149
		1067
		4192

	1168-E			1070
	107A			3272
	1029-A			1073
	1227			1073
	1230			10305
				1344
	1068			1983
	1065			11022
	1148			1427
	1270-D			3021
	10759			10809
FORGED				10809-A

THE BALDWIN LOCOMOTIVE WORKS As Specn C-3803

Memorandum Spec'n 19044

SPECIFICATION FOR LOCOMOTIVES 10 28 ± D 141

FOR Leesville, Slagle and Eastern Ry. Co.

P

6-27-19

Except apply headlight on back of tender instead of on cab.

Gen. as Photo. 3555

Engine Drawing No. 26

Gauge of Road 4' 8½" Play ⅜"

Wheelbase, Rigid 10' 3" Driving 10' 3" Total 28' 10"

Total wheelbase, eng. and tend. {Actual 46' 10" / Limited to ---

Curves ---

Limits, Height --- Width ---

Weight (approximate) in working order, Total 128,000 pounds

On F. tr'k 12,500 lbs., Drivers 94,000 lbs., B. tr'k 15,500 lbs.

Tractive power 22,100 lbs., Ratio of adhesion 4.25

Work'g St'm Pres. 185 lbs., Service Freight

*** Fuel** Oil

Front Tube Sheet ½" Thick

Boiler Steel Thick ⅜" & 1 1/16" Bill 8619

Boiler, Diam. 56" Plan Extended Wagon Top

Boiler st'm pres. 200 lbs., Tested to {220 lbs. steam pres. / 287 lbs. water pres.

With factor of safety of 5.14

Longitud. seams Butt jointed, double covering strips.

Dome, diam. 28" Pos. Forward of Firebox

Auxiliary Dome - None

Firebox Steel Combustion chamb. None

Firebox, length 64-3/16" Width 42" Depth F. 63½" B. 60½"

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

Firedoor opening 16" diam. Crown and sides in one sheet

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

Water space, Frame Single Riveted

Water space stays ⅜" diam. with 3/16" holes 1½" deep from O.S.

Radial stays 1" diam. Sling stays front {Two rows 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 (B.L.W. Option)

Tube ends Swaged for copper ferrules, fire box ends

Number 200 Diam. 2" Length 14' 9"

Heating Surface	Flues ---	Combus. Chamb. ---	Total 1637
	Tubes 1536	Fire Box 101	Fire Brick Tubes -
Grate area 18.7	Ratio to Heating Surface 1 : 88		
Superheater ---			

Fire Brick Arch, None

Fire box to be lined with fire brick for oil burning

Fire brick pavement in pan.

Grates None

Ash Pan, Dampers Front

Throttle Balance Pos. Dome

Dry pipe Steel

Superheater None

Smoke box to have short extension

Smokebox extension Short Cleaning hole and cap None

Spark ejector or hopper None

Netting and deflect. plates None

Exhaust nozzles Double, Low

Cleaning Pipe - With

Stack Straight Dia. 16"

* Fuel Oil - Specific Gravity .903 with flashing point around 250° Fire 310°, depending of course, upon whose oil is used.

Safety Valves Two Coale 2½" Open (Not Spec)

Safety valves None with relief lever, Set to 185 pounds

Whistle One 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: R. S.

Cleaning Plugs One filling plug in top of boiler

Firebox Corners, 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 Two Monitor (Not Spec) No. 8

Injectors, Pos. Right and left Steam pipes Copper

Pipes, Check Steel Feed Steel Overflow Steel

Check B. L. W. Pos. R. and L.

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 35½"

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.

Signal fixtures Iron on bumper

Headlight equipment to be Pyle National Electric Type "K-3" 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

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 #23 Soft Steel Bands: Iron Style 9

Boiler Lagging Magnesia Sectional

THE BALDWIN LOCOMOTIVE WORKS

J. F. Woessner Aug. 1919.

SPECIFICATION FOR LOCOMOTIVES 10 28½ D 141

FOR Leesville, Slagle and Eastern Ry. Co.

P

68 68

Frames Cast Steel

Cylinders, Diam. 17" Stroke 24"

St'm ports, Length 16" Width 1½" Bridges 1"

Exh. ports, Length 16" Width 2½" Valve lead 5/16"

Valve travel 5" Steam lap ⅞" Exhaust clearance ---

Eccentric crank throw 10¾" By-pass valve None

S. F. Lubr. Detroit No. 22 Michigan Triple, Bull's Eye. (Gravity) (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 Balanced, with vacuum valves

Met. pkg {Piston rods / Valve stems United States, King Type (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, with bearings of cast iron, tinned

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 Wheel Hub Liners - Brass

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 Steel

Journals, Diam. 8" Length 9"

Springs. Make B. L. W.

Front Engine Truck Two Wheeled Swing Bolster, Center bearing

To swing 4" 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 plate

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

Tires held by ---

Wheel hub liners: None

Back Engine Truck Two Wheeled Swing bolster, side bearing

To swing 4" 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 plate

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

Tires held by ---

Wheel hub liners: None

Brake, position On all driving and tender wheels

Operating Parts — Engine, Sch. No. 6-ET Westg. Combined Auto. and Straight Air

Eng. Tr'k, sch. ---

Foundation Parts — Drivers, sch. WS-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 pounds.

Tender Eight Wheeled, Drawing No. 1413

Weight, with fuel and water, about 74,000 pounds

Tank {Oil 1,500 4906 / Water 3,500 Gallons, Bill 4885

Tank "U" shape, straight top.

Tool Boxes Hard Wood, Top

Frame Steel, 6" and 8" channels, with bumpers of wood.

Front Drawbar height 31⅞"

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 bolsters

Springs Elliptic - B. L. W.

Journals, Diam. 4½" Length 8"

Wheels, Diam. 28" 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 Westg. Auto. and Straight Air with 10" x 12" tender cylinder.

Hereafter: Apply hollow stay bolts in area covered by fire brick. R.S.M.C. Taylor

List of tools, sch. 31

Photo sch. No. 2 Inspection B. L. W.

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

Certificate of boiler test Three copies of B. L. W. form 1038

Junior laws to 7-30-19 Shipment On own wheels

Brass shop finish, No. 1

Machine shop finish D-185

B. L. W. Patents: Feed Water Strainer, Patd. 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, Leesville, Slagle & Eastern Ry. Co.

Road Nos. Pos.	Road Nos.	Name
F. No. Plate	1	
F. Sand Box		
Cab Sides		
Back of Tank		

Actual Dimensions of Loco. Extreme height over all 14' 4"

Extreme Width:—Cab boards 9' 11" Cylinders or valve motion 9' 10"

Length outside face front bumper of engine to face of tender wedge 32' 0½"

Length face of tender wedge to outside face back bumper of tender 20' 2"

Total length outside face front bumper of engine to outside face back bumper of tender 52' 2½"

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-6375
Memorandum Spec'n 20050
SPECIFICATION FOR LOCOMOTIVES 6 38 D 114
CP/
FOR MANUFACTURERS' JUNCTION RAILWAY COMPANY
No.

Gen. as PHOTO. 6352
Engine Drawing No. 19
2.26.20

Gauge of Road 4'8½" Play ¾"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"
Total wheelbase, eng. and tend. {Actual 43' 4½" / Limited to ---

Curves ---

Limits, Height --- 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 SOFT COAL

1st **Boiler** STEEL Thick 13/16" Rivet 8929
Front Tube Sheet ½" Thick
Boiler, Diam. 74" Plan STRAIGHT TOP.
{Allowable st'm pres. 180 lbs. / With Factor of Safety of 5.46} **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 96⅛" Width 39" Depth F. 71⅞" B. 69½"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back ⅜"
Firedoor opening 16" DIAM. (SEE SUP. 2)
Water space, Front 4" Sides 4" Back 4"
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 {THREE ROWS 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 (B. L. W. OPTION)
Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.
Number 330 Diam. 2" Length 11' 0"

Heating Surface Flues --- Combus. Chamb. --- 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 ROCKING BARS WITH DROP PLATE
Ash Pan, Dampers NONE

Throttle BADANCE Pos. DOME
Dry pipe STEEL

Superheater NONE

Smokebox extension WITH Cleaning hole and cap L. S. ONLY
Spark [illegible] hopper WITH
Netting and deflect. plates WITH

Exhaust nozzles DOUBLE-HIGH.
Stack STRAIGHT Dia. 16"

Safety Valves TWO COALE 3" OPEN (Not Spec.)
Safety valves NONE with relief lever, Set to 180 POUNDS.
Whistle ONE 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** 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 THREE B. L. W. POS: (SEE SUP. 5)
Cleaning Plugs ONE PLUG ABOVE FIRE DOOR.
Firebox, CORNERS, DIAGONAL
Crown, TWO EACH SIDE AND THREE BACK
Waist, ONE UNDER FRONT
Front tube sheet, ONE Fusible plug ONE

Pump NONE

Injectors TWO MONITOR (Spec.) No. 8
Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER
6 Pipes, Check IRON Feed IRON Overflow IRON
Check NATHAN MFG. CO'S TYPE 280-A Pos. RIGHT AND LEFT.

Steam Heat NONE

Cab STEEL

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 35½"
1st

Pilot NONE Pushing shoes AT FRONT
Front Bumper OAK Bumper plate NONE
10 **Steps,** HAND HOLDS, ETC. TO CONFORM TO I. C. C. REQUIREMENTS.

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

Signal fixtures MALLEABLE IRON ON SMOKE BOX.

11/16 **Headlight** TWO ROUND CASE --- Reflector
Headlight, Nos. of sides WITH Hdlt'r step WITH
Lamp shelf NONE Nosing ---

Bell 92 POUNDS VELOCO 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 PTD. Bands IRON Style 9
Boiler Lagging MAGNESIA SECTIONAL

THE BALDWIN LOCOMOTIVE WORKS
E. C. Roberts April 1920.
SPECIFICATION FOR LOCOMOTIVES 6 38 D 114
70 70
FOR MANUFACTURERS' JUNCTION RAILWAY COMPANY
No.

1st **Frames** CAST STEEL

Cylinders, Diam. 22" Stroke 26"
St'm ports, Length 19" Width 1⅜" Bridges 1⅛"
Exh. ports, Length 19" Width 2¾" Valve lead ¼"
Valve travel 5¼" Steam lap ¾" Exhaust clearance ---
Eccentric crank throw 12-7/32" By-pass valve NONE
S. F. Lubr. NATHAN TRIPLE BULL'S EYE. (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 ROD / VALVE STEM} UNITED STATES, KING TYPE. (Spec.)
PISTON RODS TO BE KEYED TO CROSSHEADS.
Pistons HEADS OF CAST IRON WITH RINGS OF CAST IRON SPRUNG IN.
Guides ALLIGATOR TYPE, STEEL Oil cups NEEDLE
Crossheads CAST STEEL WITH BEARINGS OF CAST IRON, TINNED.
Wrist Pins STEEL Rod cups FOR GREASE, FORGED SOLID.
PARALLEL RODS TO HAVE SOLID ENDS.

1st **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 wheel hub liners BRASS
Drivers, O. S. Diam. 51" Cen. diam. 44½" CENTRES, CAST STEEL.

Tires STEEL Held by SHRINKAGE ONLY
Tires, Flanged, Pos. ALL Size 3½" x 5½"
Tires, Plain, Pos. NONE Size ---
Lateral play between driving boxes and wheel hubs = 3/16" TOTAL.
1st **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 ---
Wheel hub liners ---
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 ---
Wheel hub liners ---
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
Parts { Eng. Tr'k, sch. --- STRAIGHT AIR
Foundation { Drivers, sch. 188-3 AND BC, AMERICAN G. S. EQUALIZED.
Parts { 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 POUNDS.

Tender EIGHT Wheeled, Drawing No. 1515
Weight, with fuel and water, about 91,500 LBS.
TENDER TO BE WEIGHED: YES
Tank 4,500 Gallons, Bill 5200
TANK "U" SHAPE, SLOPING BACK. FUEL CAPACITY 6 TONS.

Tool Boxes OF WOOD TOP.

Frame STEEL, 8" AND 10" CHANNELS, WITH BUMPERS OF WOOD AND STEEL PLATE.
Front Drawbar height 34½"
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 BACK WITH HAND RAILS.
STEPS AND HAND HOLDS 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" 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. No. 6 ET WESTG. AUTO AND STRAIGHT AIR, WITH 10"x12" TENDER CYLINDER

List of tools, sch. 29
Photo sch. NONE Inspection B. L. W.
To be weighed NO YES Material specns B. L. W.
Certificate of boiler test THREE COPIES OF B. L. W. FORM 1036
Junior jaws to 4-21-20 Shipment ON OWN WHEELS.

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

B. L. W. Patents: FEED WATER STRAINER, PATD. SEPT. 1, 1903 (CAST ON)

Property plates NONE

Painting, style 291, OLIVE GREEN AND ALUMINUM.

Mark on TANK SIDES, M. J. RY. CO.

Road Nos. Pos. Road Nos. Name NONE
F. No. PLATE 4
F. SAND BOX
CAB SIDES
BACK OF TANK

Actual Dimensions of Loco. Extreme height over all 14' 0"
Extreme Width: Cab boards 10' 3⅛" Cylinders or valve motion 10' 5⅛"
Length outside face front bumper of engine to face of tender wedge = 29' 8⅛"
Length face of tender wedge to outside face back bumper of tender = 29' 7"
Total length outside face front bumper of [illegible] 59' 3⅛"
engine to outside face back bumper of tender

SPECIFICATION FOR LOCOMOTIVES 6 38 0 1Ph

FOR MANUFACTURERS' JUNCTION RAILWAY COMPANY.

1 LOCOMOTIVE FOR OPERATION IN CHICAGO, ILLINOIS.
BOILER DETAILS TO CONFORM TO I. C. C. REQUIREMENTS.

2 FIRE DOOR TO BE FRANKLIN AUTOMATIC.

3 GRATE SHAKER TO BE FRANKLIN AUTOMATIC.

4 WATER GAUGE TO BE DELCO THREE-SIDE SAFETY.

5 BLOW OFF COCKS LOCATED ONE FRONT OF THROAT, AND ONE IN EACH SIDE OF FIRE BOX.

6 COAL SPRINKLER TO BE NATHAN MFG. COMPANY'S.

7 FRANKLIN ECONOMY RADIAL BUFFER BETWEEN ENGINE AND TENDER.

8 FRANKLIN UNIT DRAW BAR BETWEEN ENGINE AND TENDER.

9 PATENT PLATE NO. 2298-20 (HEREWITH) COVERING UNIT SAFETY DRAWBAR, TO BE APPLIED TO LOCOMOTIVE.

10 STEPS ACROSS FRONT OF ENGINE WITH HAND RAILS.

11 HEADLIGHT EQUIPMENT TO BE PYLE-NATIONAL ELECTRIC TYPE "K-2" WITH INCANDESCENT HEADLIGHTS FOR SWITCHING SERVICE. HEADLIGHTS TO HAVE GLASS REFLECTORS. (SEE SUP. 15)

12 PEDESTAL WEDGES TO BE FRANKLIN AUTOMATIC.

13 RAGONNET POWER REVERSE GEAR AS COVERED BY EXTRA ORDER NUMBER 17566, DATED 4-8-20.

14 BACK FOOT PLATE TO BE MADE OF CAST IRON.

15 HEADLIGHT TO HAVE 14" CASE AND 12" GLASS REFLECTOR. HEADLIGHT CASE AND REFLECTOR, INCLUDING LAMP STAND TO BE SHIPPED DIRECT TO RY. CO. FOR APPLICATION AFTER DELIVERY OF LOCOMOTIVE.

THE BALDWIN LOCOMOTIVE WORKS DUP. OF 10 26 D 334, EXCEPT WHERE OTHERWISE SPECIFIED.

Memorandum Spec'n 19070

SPECIFICATION FOR LOCOMOTIVES 10 26 D 334 TO 336

FOR MIDLAND RAILWAY

P

10-28-19

Gen. as PHOTO ——

Engine Drawing No. 36

Gauge of Road 4' 8½" Play ¾" EXCEPT 1" FOR BACK DRIVERS

Wheelbase, Rigid 12' 10" Driving 12' 10" Total 22' 11¾"

Total wheelbase, eng. and tend. {Actual 48' 6¼" / Limited to ——

RAILS – 40 POUNDS

Curves ——

Limits, Height —— Width ——

Weight (approximate) in working order, Total 98,000 POUNDS

On F. tr'k 25,000 lbs., Drivers 73,000 lbs., B. tr'k —— lbs.

Tractive power 16,800 lbs., Ratio of adhesion 4.3

Work'g St'm Pres. 180 lbs., Service FREIGHT

Fuel OIL, OF SAME QUALITY AS FOR 12 38¼ E 146 TO 148

FRONT TUBE SHEET ½" THICK

Boiler STEEL Thick ½" & ⅝" Bill 8755

Boiler, Diam. 50" Plan WAGON 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 WITH DOUBLE COVERING STRIPS

Dome, diam. 29" Pos. FORWARD OF FIRE BOX

Firebox STEEL Combustion chamb. NONE

Firebox, length 64-15/16" Width 39¼" Depth F. 71⅞" B. 68⅞"

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

Firedoor opening 16" DIAM. CROWN AND SIDES IN ONE SHEET.

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" DIAM. Sling stays front {TWO ROWS 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 178 Diam. 2" Length 12' 2¾"

Heating Surface	Flues ——	Combus. Chamb. ——	Total	1222 sq. ft.
	Tubes 1132 sq. ft.	Fire Box 90 sq. ft.	Fire Brick Tubes ——	
Grate area 15.5 sq. ft.	Ratio to Heating Surface 1 : 78			
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 ONLY

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 NONE

Exhaust nozzles DOUBLE – LOW

CLEANING PIPE – WITH

Stack STRAIGHT Dia. 16"

Safety Valves TWO CONSOLIDATED 2½" PLAIN (Not Spec)

Safety valves NONE with relief lever, Set to 180 POUNDS

Whistle ONE, 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** 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

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 TWO HANCOCK, TYPE "A" (Spec) No. 7

Injectors, Pos. R. & L. O. S. OF CAB Steam pipes COPPER

Pipes, Check IRON Feed IRON Overflow IRON

Check B. L. W. Pos. R. AND L.

Steam Heat CONSOLIDATED 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 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 M. C. B. AUTO. RIGID TO BUMPER

Signal fixtures IRON ON BUMPER

Headlight ONE – SEE * BELOW Reflector, To burn ——

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

Lamp shelf NONE Nosing NONE

Bell 85 POUNDS

Sand Box ONE Diam. 28" Body IRON PAINTED Pipes IRON

Sander WATTERS AIR No. 8 DOUBLE (Spec)

Dome casing IRON PAINTED

Boiler Jacket #22 SOFT STEEL PTD. BANDS: IRON Style 9

Boiler Lagging MAGNESIA SECTIONAL

* LOCOMOTIVE TO BE WIRED AND EQUIPPED FOR ELECTRIC HEADLIGHT AND CAB LIGHTS. HEADLIGHT CASE AND GENERATOR TO BE FURNISHED FREE AND APPLIED BY R. R. CO. AFTER DELIVERY OF LOCOMOTIVE. B. L. W., HOWEVER, TO PROVIDE ALL NECESSARY WIRING AND CONNECTIONS.

THE BALDWIN LOCOMOTIVE WORKS

C. WAGNER

SPECIFICATION FOR LOCOMOTIVES 10 26 D 334 TO 336 JAN. 1920

FOR MIDLAND RAILWAY

P

73 73

Frames CAST STEEL

Cylinders, Diam. 16" Stroke 24"

St'm ports, Length 16" Width 1¼" Bridges 1"

Exh. ports Length 16" Width 2½" Valve lead ⅛"

Valve travel 5" Steam lap ¾" Exhaust clearance ——

Eccentric (Spec) throw 5" By-pass valve NONE

S. F. Lub. NATHAN TRIPLE No. 9 BULL'S EYE, TYPE 166 F 3

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 ROD / VALVE STEM UNITED STATES (Not Spec)

Pistons CAST IRON RINGS SPRUNG INTO SOLID CAST IRON HEAD.

Guides "ALLIGATOR" TYPE, STEEL Oil cups NEEDLE

Crossheads CAST STEEL, WITH BEARINGS OF CAST STEEL, TINNED.

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 wheel hub liners NONE

Drivers, O. S. Diam. 56" Cen. diam. 50" 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 – ⅛" TOTAL

Driving Boxes STEELED CAST IRON

Journals, Diam. 7" Length 8"

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

Wheel hub liners NONE

Wheels, Diam. 28" Tread 1⅛" Kind CHILLED CAST IRON PLATE

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 ——

Wheel hub liners ——

Wheels, Diam. —— Tread —— Kind ——

Tires —— Cen. diam. —— Size ——

Tires held by ——

Brake, position ON ALL DRIVING AND TENDER WHEELS

Operating / Engine, sch. A-1, WESTINGHOUSE AUTO. AIR

Parts / Eng. Tr'k, sch. ——

Foundation / Drivers, sch. W-1, AMERICAN O. S. EQUALIZED

Parts / Eng. Tr'k, sch. ——

Air pump ONE 9½" Pos. L. S.

Train connections FRONT AND BACK

Train signal, sch. NONE

AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

Tender EIGHT Wheeled, Drawing No. 1465

Weight, with fuel and water, about 80,000 POUNDS

Tank {OIL 1,700 5059 / {WATER 4,000 Gallons, Bill 5057

TANK "U" SHAPE, STRAIGHT TOP, OF THE LONG LOW TYPE

Tool Boxes OF HARD WOOD, TOP

Frame OAK AND YELLOW PINE, WITH BUMPERS OF WOOD

Front Drawbar height 31"

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 BOLSTERS

Springs ELLIPTIC, B. L. W.

Journals, Diam. 5" Length 9" SYMINGTON BOXES

Wheels, Diam. 33" Tread 1⅛" 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 WESTINGHOUSE AUTO. AIR

List of tools, sch. 28

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 9-5-19 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 B. L. W. FOR ENGINE AND TENDER

Painting, style 291, OLIVE GREEN AND GOLD

Mark on TANK SIDES: MIDLAND

	Road Nos. Pos.	Road Nos.	Name
F. No. Plate	CAB SIDES / BACK OF TANK	101 TO 103	NONE

Actual Dimensions of Loco.

Extreme height over all 13' 3½"

Extreme Width: Cab boards 9' 7" ; Cylinders or valve motion 8' 8"

Length outside face front bumper of engine to face of tender wedge 28' 5¼"

Length face of tender wedge to outside face back bumper of tender 24' 5½"

Total length outside face front bumper of engine to outside face back bumper of tender 52' 10¾"

SPECIFICATION FOR LOCOMOTIVES 10 38 E 3700

FOR MONTAYNON & KINGSDON RAILWAY CO.

Engine Drawing No. 110

Gauge of Road 4' 8½" Play ⅜" Driving 14' 3" Total 22' 10"
Wheelbase, Rigid 14' 3" Total engine and tender { Actual 53' 8½" / Limited to ——
TURNTABLE 70 FT. LONG, ROUND HOUSE 75' 0" LONG.
Curves 18 DEGREES ON MAIN LINE, 21 DEGREES ON "Y"
Grades 2½%
Limits, Height 15' 1½" Width ——
Weight (approximate) in working order, Total 181,000 POUNDS
On F. tr'k 17,000 lbs., Drivers 164,000 lbs., B. tr'k —— lbs.

Tractive power 45,170 lbs., Ratio of adhesion 3.63
Work'g St'm Pres. 200 lbs., Service FREIGHT
Fuel SOFT COAL

FRONT TUBE SHEET TO BE ½" THICK
Boiler STEEL Thick ⅝" Bill 8269
Boiler, Diam. 76" Plan STRAIGHT TOP
Boiler st'm pres. 200 lbs., Tested to 220 lbs. steam pres. / WITH FACTOR OF SAFETY OF 4.42 — 267 lbs. water pres.
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS.

Dome, diam. 33" Pos. CENTRAL

Firebox STEEL
Combustion chamb. NONE
Firebox, length 125⅝" Width 40⅜" Depth F. 71½" B. 67½"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back ⅜"
Firedoor opening OVAL 16" x 20" (SEE SUP. 5)
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 { 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 Flues #9 W.G. SEAMLESS STEEL / #11 W.G. IRON
Tube ends SWAGED FOR COPPER FERRULES, FIREBOX ENDS
Number 32 / 161 Diam. 5½" / 2⅛" Length 12' 10"

Heating Surface Flues 587.0 Combus. Chamb. —— Total 2004.0
Tubes 1209.0 Fire Box 208.0 Fire Brick Tubes ——
Grate area 35.1 Ratio to Heating Surface 1 : 56.6
Superheater 503.0

Fire Brick ARCH, ON STUDS

Grates ROCKING BARS WITH DROP PLATES, FRONT AND BACK
Ash Pan, Dampers FRONT AND BACK
ASH PAN SLIDES TO WORK LENGTHWISE WITH LEVER CONNECTION

Throttle BALANCE Pos. DOME
Dry pipe BROUGHT IRON OR STEEL

Superheater SCHMIDT TYPE (SEE SUP. 1, 9, 10)

Smokebox extension WITH Cleaning hole and cap L.B. BUILT.
Front connection HUNG WITH
Netting and netting plates WITH, NETTING 24 MESH

Stack SINGLE HIGH
Dia. 18" Inside at S. H. dia. 15½"
Nozzle WITH PLAIN TOP.

Safety Valves (Special) THREE ASHTON 3", TWO MUFFLED ONE OPEN
Safety valves NONE with relief lever, Set to { 200 LBS. MUFFLED / 202 LBS. OPEN
Whistle P. R. R. STANDARD PASSENGER

Steam Gauge ONE IRON 7" MAKER:- ASHCROFT (No Special)
Steam gauge stand IRON **Clock** NONE

Water Gauge ONE (SEE SUP. 13) **Cab Lamps** SEE SUP. 15)
Gauge Cocks THREE (SUP. 14) Surface valve NONE
Lowest gauge cock 5½" above highest part of crown
Lubricator steam valve WITHOUT separate dry pipe to dome
Blower Valve (SEE SUP. 16)

Blow off Cock ONE JOHNSTONE 2". POS:- FRONT
Cleaning Plugs ONE PLUG ABOVE FIRE DOOR
Firebox CORNERS, BACK ONES DIAGONAL, SIDES AND BACK
Crown, FOUR 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 MONITOR (Special) No. 10
Injectors, Pos. BOTH ON R. S. (SUP. 21) Steam pipes COPPER
Pipes, Check IRON Feed IRON Overflow IRON
Check (SEE SUP. 23) Pos. R.S.

Steam Heat SAFETY CAR HEATING & LIGHTING CO'S SYSTEM
STEAM TURRET IN CAB.

Cab WOOD, P. R. R. STYLE, VENTILATOR IN CAB ROOF
DROP SLIDE SEATS ON EACH SIDE OF CAB.

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 30"

Pilot WOOD, RY. CO'S STYLE Pushing shoes CAST IN BUMPER
Front Bumper CAST STEEL Bumper plate WITH (SUP. 31)
Steps ABOUT 3 FT. LONG ON PILOT, WITH HANDRAIL ON BUMPER
STEPS, HAND HOLDS ETC. TO CONFORM TO I. C. C. REQUIREMENTS.
Front Drawhead, Center above rail 34½"
Coupler SHARON PIVOTED M. C. B. AUTO. (SEE SUP. 32)

Signal fixtures IRON ON BUMPER

Headlight ONE ROUND CASE 18" Reflector,
Headlight, Nos. on sides WITH H'd'l't step (SEE SUP. 37)
Lamp shelf NONE Nosing ——

Bell 92 POUNDS
Sand Box ONE Diam. 31" Body IRON PAINTED. Pipes IRON
Sander LEACH AIR TRAP "C", DOUBLE. RODS ⅞" DIAMETER
Dome casing IRON PAINTED

Boiler Jacket #18 PLAN. STEEL Bands IRON Style 9
Boiler Lagging K. & M. 85% MAGNESIA SECTIONAL.

SPECIFICATION FOR LOCOMOTIVES 10 38 E 3700

FOR MONTAYNON & KINGSDON RAILWAY COMPANY

Frames CAST STEEL Bracs SOLID

Cylinders, Diam. 22" Stroke 28"
St'm ports, Length 26.69" Width 1⅝" Bridges ——
Exh. ports, Length —— Width —— Valve lead 1/4"
Valve travel 6" Steam lap 1" Exhaust clearance ——
Eccentric crank throw 14-9/16" By-pass valve NONE
S. P. Lubr. NATHAN FIVE FEED 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 —— Covers ——
St'm chest valves 12" DIAM. PISTON TYPE, INSIDE ADMISSION
Met. pkg { PISTON RODS / VALVE STEMS UNITED STATES (Special)

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD
Guides HARD STEEL Oil cups NEEDLE
Crossheads "ALLIGATOR" CAST STEEL, WITH BABBITTED BEARINGS
Wrist Pins STEEL Oil cups PLUNGER, FORGED ON SIDE RODS

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 stayholts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings DAMASCUS BRONZE

Drivers, O. S. Diam. 51" Cen. diam. 44" CENTRES CAST STEEL

Tires LATROBE STEEL Held by SHRINKAGE AND SHOULDER
Tires, Flanged, Pos. ALL EXCEPT MAIN Size 3½" x 5½"
Tires, Plain, Pos. MAIN (THIRD PAIR) Size 3½" x 6½"
Lateral play between driving boxes and wheel hubs = ½" TOTAL
Driving Boxes CAST STEEL (SEE SUP. 49 A&C)
Journals, Diam. { MAIN 10" Length 12" / OTHERS 9"

Springs. Make PITTSBURG SPRING & STEEL CO'S THROUGHOUT

Front Engine Truck TWO Wheeled SWING BOLSTER
To swing 4½" each side of cen., Cen. pin liners NONE
Journals, Diam. 5" Length 10" Boxes CAST IRON
Wheels, Diam. 30" Tread —— Kind CAST STEEL SPOKE CENTRES
Tires STEEL Cen. diam. 24¼" Size 28" x 5½"
Tires held by SHRINKAGE AND DOUBLE LIP RETAINING RINGS.

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. 9N2, AMERICAN O.S. EQUALIZED / Eng. Tr'k, sch. ——
Air pump TWO 11" Pos. LEFT SIDE (SEE SUP. 43, 44)
Train connections FRONT AND BACK
Train signal, sch. L.

ACTUAL DIMENSIONS OF LOCO. EXTREME HEIGHT OVER ALL 15' 0"
EXTREME WIDTH: CAB DECKING 10' 3", CYLINDERS 10' 0"
LENGTH OUTSIDE FACE FRONT OF BUMPER OF ENGINE TO FACE OF TENDER BUMPER 31' 3½"
LENGTH FACE OF TENDER BUMPER TO OUTSIDE FACE BACK BUMPER OF TENDER 23' 10"
TOTAL LENGTH OUTSIDE FACE FRONT BUMPER OF ENGINE TO OUTSIDE FACE BACK BUMPER OF TENDER 55' 1½"

Tender EIGHT Wheeled, Drawing No. 610
Weight, with fuel and water, about 120,000 POUNDS

Tank 6300 Gallons. Bill 4637
TANK "U" SHAPE, SQUARE TOP. FUEL CAPACITY 12 TONS.

Tool Boxes OF STEEL TOP
SIGNAL HOLDERS, P.R.R. STANDARD FOR BACK OF TENDER.
Frame STEEL 12" CHANNELS, WITH FRONT AND BACK BUMPERS OF CAST STEEL.
Front Drawbar height 28⅜"
Pilot NONE Pushing shoes CAST IN REAR BUMPER
Back drawhead, center above rail 33½"
Coupler SHARON, M. C. B. AUTO. WITH 5" x 7" SHANK 21¼" LONG, 9⅛" END, WITH MINER DRAFT RIGGING.

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

Trucks ARCH BAR TYPE WITH STEEL BOLSTER.

Springs ELLIPTIC. PITTSBURG SPRING & STEEL CO'S MAKE.
Journals, Diam. 5" Length 9"
Wheels, Diam. 33" Tread —— Kind CAST STEEL SPOKE CENTRES
Tires STEEL Cen. diam. 27¼" Size 28" x 5½"
Tires held by SHRINKAGE AND DOUBLE LIP RETAINING RINGS
Safety chains SINGLE

Brake Position ON ALL WHEELS. HAND BRAKE ON R. S.
Brake sch. No. 6-ET, WEST'G. AUTO. AND STRAIGHT AIR WITH 12" x 12" CYLINDER. FULL BRAKE HOSE EQUIPMENT TO BE PROVIDED.
CRECO BRAKE BEAMS WITH CHRISTIE HEADS.

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 2.1.18 Shipment ON OWN WHEELS

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

B. L. W. Patents { FEED PIPE STRAINER, PATENTED SEPTEMBER 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 —— OLIVER GREEN, NO STRIPING
Painting:—Tender, style —— OLIVE GREEN, NO STRIPING
LETTERING IN ALUMINUM LEAF AS RY. CO'S PENCIL SKETCHES (HEREWITH) EXCEPT THAT SIZES MAY BE CHANGED SLIGHTLY IF NECESSARY
Mark on SIDES AND BACK OF TANK, M & K (OMIT PERIODS)

Road Nos. Pos. Road Nos. Name NONE
F. No. PLATE 4
SAND BOX
CAB SIDES

SPECIFICATION FOR LOCOMOTIVE 10 38 E 3700

FOR MORGANTOWN & KINGWOOD RAILWAY COMPANY

1 ALL PARTS POSSIBLE TO BE MADE INTERCHANGEABLE WITH 10-38 E 3385 AND 3386.

WHILE SUPERHEATER AND PISTON VALVES ARE NOW TO BE USED THE RAILWAY CO. WISH THE NEW LOCOMOTIVE AS NEARLY UNIFORM AS POSSIBLE WITH 10 38 E 3385-3386

THE CO. ARE AGREEABLE TO ANY ADDITIONAL WEIGHT BROUGHT ABOUT BY ADDITION OF SUPERHEATER AND PISTON VALVES.

2. LOCO. TO CONFORM TO THE U. S. SAFETY APPLIANCE ACT.

3 INSPECTION DOME ON BOILER FOR INTERNAL INSPECTION AND TO AVOID REMOVAL OF THE THROTTLE BOX FOR INSPECTION.

4 FIRE BOX OUTSIDE WIDTH TO BE SAME AS FOR 10 38 E 3049 TO ALLOW FOR CLEARANCE OF BACK DRIVING WHEELS.
SIDES AND CROWN OF FIRE BOX TO BE IN ONE PIECE.

5 FIRE DOOR TO BE SLIDING TYPE AS B.L.W. CARD 227.

6 FURNACE BEARER PADS TO HAVE HOLES DRILLED OPPOSITE EACH STAYBOLT, LARGE ENOUGH TO PERMIT OF RENEWAL OF BOLTS.

7 WATER SPACE STAYBOLTS TO BE MADE OF ULSTER SPECIAL IRON.

8 ASH PAN TO HAVE A TOP SECTION OF ABOUT 10" TO CONNECT WITH ANGLE IRON AND KEY BOLTS TO LOWER SECTION, SO IT CAN BE REMOVED TO GET AT MUD RING WITHOUT TAKING DOWN THE ENTIRE ASH PAN.
PANS TO BE SUPPORTED ON FRAMES SAME AS FOR 10-38 E 3385 ETC.
ASH PAN WITH WROUGHT IRON BOTTOM AND ANGLE IRONS (INSTEAD OF CAST IRON BOTTOM.)

9 TO PROVIDE FOR A MODIFIED THROUGH BOLT HEADER, PROVIDE 8" MORE ROOM BETWEEN THE FRONT TUBE SHEET AND THE CENTER OF LINE OF STACK OR 36" (INSTEAD OF 28") I.E., MAKE TUBES 8" SHORTER.

10 SUPERHEATER AS LOCOMOTIVE SUPERHEATER CO'S SPEC'N. NO. M22 - 280 -A DATED AUG. 24, 1917 (COPY ATTACHED)
ROYALTY, IF ANY ON SUPERHEATER, PAYABLE BY THE B.L.W.

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

12 SAFETY VALVES AND WHISTLE TO BE APPLIED IN INSPECTION DOME COVER.

13 WATER GAUGE TO BE MCNAIRNHALL NO. 4, BULLS EYE TYPE.

WATER GAUGE TO BE PLACED AS FAR ON RIGHT SIDE OF BOILER HEAD AS POSSIBLE (INSTEAD OF ON LEFT SIDE).

14 GAUGE COCKS IN BACK HEAD CORNER OF BOILER ON RIGHT SIDE CONVENIENT FOR ENGINEER.
GAUGE COCKS SHOULD NOT, HOWEVER, INTERFERE WITH INJECTOR.

15 CAB LAMP BRACKET TO BE 14" LONG AS LAMP WILL LIGHT ALL GAUGES.
CAB LIGHTS TO BE PROVIDED WITH 7 VOLT, 10 WATT, S-14 BULB EDISON BASE LAMPS.

16 BLOWER IN SMOKE BOX WITH TEE CONN. INSTEAD OF ELL WITH PLUG IN BRANCH OF TEE, SO OUTSIDE END STEAM CONN. CAN BE MADE. BLOWER CONN. TO BE 1".

17 BLOWOUT PLUGS TO HAVE 1¼" SQUARE SHANK.
BLOWOUT PLUGS ON EACH SIDE OF LEG OF FIRE BOX AS LOW AND AS CLOSE AS CAN WITH SAFE SPACE SO HOE CAN BE HANDLED IN CLEANING OPERATIONS, CLEANING OUT MUD, ETC.

21 ONE INJECTOR TO BE PLACED OUTSIDE OF THE CAB.

22 INJECTOR FEED AND CHECK PIPES TO BE LAP WELDED WROT IRON PIPE. STRAINERS IN FEED PIPES TO BE MADE OF CAST BRASS INSTEAD OF MALLEABLE IRON.

23 INJECTOR CHECK TO BE SELLERS DUPLEX, BOTTOM OPENING TYPE.

24 SPRINKLER HOSE FROM INJECTOR CHECK PIPE, FOR WETTING COAL. SQUIRT HOSE PIPE TO BE PLACED UNDER CAB FLOOR INSTEAD OF ON THE FLOOR.

25 STEAM HEAT HOSE FOR REAR OF TENDER TO BE No. 720-8S 5
STEAM HEAT HOSE BETWEEN ENGINE AND TENDER TO BE INTERCHANGEABLE WITH HOSE BETWEEN TENDER AND TRAIN. (Sup. 40)

26 HOLES TO BE CUT THROUGH SHIELD ABOVE FIRE DOOR TO PERMIT REMOVAL OF WASHOUT PLUGS ABOVE CROWN SHEET,

27 THROTTLE LEVER SUPPORT TO BE ½" x 1½" OR 2", ABOUT 10" FROM THROTTLE STEM.
AMPLE CLEARANCE BETWEEN THROTTLE LEVER AND GAUGE COCKS.

28 GANGWAY, 36" WIDE, BETWEEN BACK OF CAB AND FRONT OF TANK LEG.

29 CHAFING CASTING OF CAST STEEL BETWEEN ENGINE AND TENDER.
SPRING CHAFING CASTING TO BE SIMILAR TO 10 38 E 3049-3050.
TENDER WEDGE TO BE SIMILAR TO B.L.W. CARD 182. (Sup. 80)
SPRING BUFFER BETWEEN ENGINE AND TENDER TO BE SIMILAR TO B. L. W. CARD 3135.

30 PILOT ON ENGINE TO BE SHORT AND TO BE BOLTED TO UNDER SIDE OF BUMPER BEAM, ~~WITH WITH 2" PIECE OF OAK FULL LENGTH OF BEAM TO PERMIT ADJUSTMENT WHEN TIRES ARE TURNED.~~ F.R.F. 6-18
PILOT TO BE 6" ABOVE RAIL AT HEEL AND 7" AT POINT, AND TO HAVE A 2" PIECE OF OAK THE FULL WIDTH OF THE BOTTOM FRAME OF PILOT, BOLTED TO THE SAME WITH 3" x 2" BAND ON IT. THE DISTANCE ABOVE RAIL REFERS, OF COURSE, TO THE UNDER PART OF THIS STRIP WHICH WILL BE REMOVED AS ENGINE IS LOWERED BY TURNING OF TIRES, ETC.
A HEAVY BAR OF IRON EACH SIDE OF PILOT TO PROTECT CYLR. COCKS SIMILAR TO B.L.W. PILOT CARD 1881.

31 ENGINE FRONT DECK OF CAST STEEL.
HOLE TO BE PROVIDED THROUGH FRONT BUMPER PLATE CONNECTING FRAMES OF ENGINE, UNDER SPARK HOPPER.

32 PILOT COUPLER CASTING TO BE BOLTED TO PILOT BUMPER AND FRONT END FRAMING ARRANGED SO THAT THE THRUST OF THE COUPLER IS DIRECTLY AGAINST THE FRAME, MAKING AN OFFSET IN FRAME IF NECESSARY.
IF COUPLER IS LOCATED BELOW THE FRAME IT IS PUSHED DOWNWARD AND TAKES THE FRAME WITH IT.
FRONT DRAW CASTING FOR AUTO. COUPLERS TO BE HEAVY AND OF STEEL. COUPLER AND POCKET CASTING OF STEEL.
COUPLER TO HAVE 2½" PIVOT PIN. THIS CAN BE DONE BY HAVING HOLE IN POCKET MADE 2½" FULL, AND OMIT BUSHING.
COUPLER KNUCKLE TO HAVE 11" FACE.

33 CLASSIFICATION LAMPS TO BE PROVIDED WITH 7 VOLT, 10 WATT, S-14 BULB, EDISON BASE LAMPS, AT FRONT OF ENGINE.
SIGNAL HOLDERS P. R. R. STD. FOR FRONT OF LOCOMOTIVE.

Specification for Type A Double Loop Superheater M-22-280-A, DATED AUG. 24, 1917.

BOILER TUBES	161 in number 2-1/4 o. d. 12 ft. 10 in. over tube sheets. Tubes located between and adjacent to boiler flues are to be beaded over at front end.
BOILER FLUES	32 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 1912-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, beaded and prosected 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 50083
UNITS	32 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 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 10678-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 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 40097
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 11013-M	DAMPER SHAFT LINK	Card 1070
DAMPER CYL. ARM	Card 1074	PATENT PLATE	Card 3152
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 3246	S. H. UNIT CLAMP WASHER	Card 10305
DAMPER CYL. SUPPORT	Card	S. H. PIPE BEND	Card 1314
DAMPER SHAFT	Card 1068	S. H. PIPE BAND	Card 1988
DAMPER SHAFT ARM	Card 1065	RETURN BENDS	Card
DAMPER SHAFT BEARING (O.S.)	Card 1148	DEFLECTING PLATE HANDLE	Card 1487
DAMPER SHAFT BEARING (L.S.)	Card 1275-J	LUBRICATOR CONNECTION	Card 3023
SPACING OF BANDS & SUPPORTS	Card 10759	DEFLECTING PLATE STUDS	Card 10809
TYPE OF RETURN BENDS	FORGED	DEFLECTING PLATE CLAMP	Card 10809-A

36 HEADLIGHT EQUIPMENT TO INCLUDE GENERAL ELECTRIC CO'S HEADLIGHT WITH 6.5 VOLT, 175 WATT, 3600 R.P.M. TURBO GENERATOR, SET WITH ELECTRIC CLASSIFICATION, CAB AND INSPECTION LAMPS.
HEADLIGHTS TO BE PROVIDED WITH ONE G-30 BULB, 6 VOLT, 180 WATT TYPE "C" MOGUL LAMP.
HEADLIGHT TO BE PLACED IN THE SAME LOCATION AS THE OIL HEADLIGHTS ON PREVIOUS LOCOMOTIVES, I.E., 10 38 E 3385.
TURBO GENERATOR TO BE SET ON TOP OF BOILER, JUST AHEAD OF CAB.
EXHAUST TO BE RUN INTO THE PIPE WHICH CARRIES AWAY EXHAUST FROM AIR PUMPS.

37 TWO HEADLIGHT STEPS ON SIDE OF SMOKE BOX, WITH A SHORT HAND RAIL NEAR HEADLIGHT.

38 SANDBOX TO BE 5" HIGHER THAN FOR PREVIOUS LOCOS., I.E., SAND BOX TO BE 20" HIGH.

39 JACKET COVERING UPPER PART OF BOILER FROM HEAD TO END OF FIRE BOX, MADE IN THREE SECTIONS INSIDE OF CAB, AND IN TWO SECTIONS IN FRONT OF CAB, COVERING BOILER UP AS HIGH AS STAYBOLTS GO. JACKET IN CAB TO BE FITTED AROUND GAUGE COCKS AND VALVES, ETC., SO IT CAN BE REMOVED WITHOUT DAMAGE. SECTIONS TO BE FITTED TOGETHER BY RIVETING ONE EDGE AT EACH SECTION OF JACKET TO AN UNDERLYING STRIP AND ATTACH THE ADJOINING SECTION OF JACKET TO STRIP BY BRASS SCREWS.

40 ENGINE FRAMES TO BE 4½" WIDE (INSTEAD OF 4") AND TO HAVE SINGLE FRONT RAIL.

41 DRAIN COCKS IN EXHAUST PASSAGES TO BE OPERATED FROM CAB. CYLINDER COCKS M. & K. STANDARD IN BOTTOM OF CYLINDERS.

42 PISTON RODS TO BE CHROME VANADIUM STEEL.

43 CROSSHEAD GIB SIDE LIPS TO HAVE AT LEAST 1½" BEARING ON SIDE OF GUIDES.

44 WRIST PINS ON BACK DRIVERS, WITH THREADED SHANKS SO COLLAR PLATES CAN BE HELD ON WITH NUTS INSTEAD OF BY BOLTS SCREWED ONTO PINS. WHERE NECESSARY ON ACCOUNT OF CLEARANCE TO HOLD ON COLLAR PLATES WITH COUNTERSUNK BOLTS SCREWED INTO WRIST PINS, HAVE THE PROJECTION ON COLLAR PLATE FITTING INTO WRIST PIN, FIT NEATLY TO AVOID BREAKING DOWELL PINS WHICH PREVENT PLATES FROM TURNING.

45 MAIN ROD BACK END STRAPS TO HAVE ⅛" OFFSET TO ALLOW FOR WEARING SO THAT BRASSES CAN BE REFITTED WITHOUT CLOSING STRAPS AS RY. CO'S PENCIL SKETCH. THE FACES OF BRASSES FOR MAIN ROD BACK END ARE TO SAME AS FOR 10 38 E 2847, 3128, 3049, 3050.

46 PARALLEL RODS TO HAVE SOLID ENDS.

47 DETROIT PENDULUM TYPE FLANGE OILER TO BE APPLIED TO FRONT PAIR OF DRIVERS.

48 HUB LINERS OF DAMASCUS NICKEL BRONZE ½" THICK FOR ALL DRIVING WHEELS. HUB PLATES OF WHEELS TO EXTEND DOWN TO JOURNALS.

49 DRIVING BOXES TO BE SAME AS FOR 10 38 E 3385, ETC., EXCEPT PEDESTAL FITS TO BE WIDENED TO SUIT FRAMES 4½" WIDE. DRIVING BOXES TO HAVE FRANKLIN GREASE CELLARS.

50 DRIVING BOX SHOES AND WEDGES TO BE DAMASCUS NICKEL BRONZE.

51 JOURNALS OF DRIVING AXLES TO BE TURNED ¼" LONGER THAN WIDTH OF DRIVING BOXES.

52 SPRING ARRANGEMENT AS B.L.W. PENCIL TRACING SPRING EQUALIZERS TO BE FORGED STEEL.

53 ENGINE TRUCK FRAMES TO BE FORGED STEEL.

54 ENGINE TRUCK LINK SWING TO BE SAME AS RY. CO'S LOCOS., CLASS 10 38 E 2847, 3128, 3049, 3050 RESPECTIVELY.

55 SUSPENSION SCREWS THROUGH CENTRE OF ENGINE TRUCK TO BE 32" FROM CENTRE OF HOLE TO END OF SCREW TO PERMIT USE OF NUT 2¼" THICK.

60 ENGINE TRUCK WHEELS AS STANDARD STEEL WORKS' PRINT A-1146. ENGINE TRUCK AND TENDER WHEELS TO BE INTERCHANGEABLE WITH THE ENGINE TRUCK AND TENDER WHEELS HERETOFORE FURNISHED.

61 THE WESTINGHOUSE AMERICAN OPERATING AND FOUNDATION BRAKE FIXTURES TO BE FURNISHED FREE THESE WORKS BY RY. CO. EXCEPT AIR RESERVOIRS TO BE FURNISHED BY THE B.L.W. (SUP. 89)

62 AIR PUMPS TO BE PLACED FAR ENOUGH FORWARD TO CLEAR STAY BOLTS.

63 AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS DRAIN COCKS IN MAIN AND AUXILIARY RESERVOIRS.

64 ENGINEER'S BRAKE VALVE TO BE 14" IN FRONT OF BOILER HEAD AND STRAIGHT AIR VALVE IN FRONT OF AUTO. VALVE SO THAT CAB DOOR WILL NOT STRIKE VALVE HANDLE.

65 FULL BRAKE HOSE EQUIPMENT TO BE PROVIDED.

66 AIR PUMP EXHAUST TO BE PIPED AS FOLLOWS:- APPLY 2" PIPE FROM AIR PUMP ALONG SIDE OF BOILER TO A POINT IN SECTION OF BOILER JUST BACK OF STACK, THEN AN ELL, 5" NIPPLE, BALL JOINT UNION, PIPE CURVED AROUND FRONT OF BOILER OR SMOKEBOX TO CENTER OF BASE OF STACK; ELL, VERTICAL PIPE 1½" FROM BACK OF STACK AND PARALLEL WITH IT TO WITHIN 10" OF THE TOP OF STACK, AND OF VERTICAL SECTION OF PIPE THREADED SO THAT MUFFLER CAN BE SCREWED ON BY R. R. CO. DRAIN COCK TO BE APPLIED IN THE HORIZONTAL PIPE NEAR THE END OF THE RUNNING BOARD, JUST BACK OF THE FIRST ELL.

For Hereafter. Raise question about providing a thin brake shoe with a separate head for the second pair of driving wheels. See note dated 9.19.18 from E. B. Peirce to R. S. McConnell File No. 2209.
R.S.McC. 9.19.18.

SPECIFICATION FOR LOCOMOTIVE 10 38 E 3700
FOR MORGANTOWN & KINGWOOD RAILWAY COMPANY
F

79 79

76 TANK TO BE 120" WIDE WITH LEGS SAME AS FOR TENDERS OF PREVIOUS LOCOMOTIVES. (SEE SUP. 1)

77 GANGWAY 36" WIDE BETWEEN BACK OF CAB AND FRONT OF TANK LEG.

78 PROVIDE 2" PIPE IN BOTH BACK CORNERS OF TENDERS, RUNNING CLEAR THROUGH TANK TO DRAIN TOP WHEN IT OVERFLOWS. THESE PIPES TO BE LOCATED SO AS TO CLEAR BOTH TRUCK AND RAILS WHEN FLOWING.

79 TENDER FRAMES SIMILAR TO 10 38 E 2847, 3128, 3049, 3050. REAR TENDER BUMPERS TO HAVE SQUARE ENDS WITH HEAVY PUSH POCKETS ON EACH CORNER.

80 CHAFING CASTING OF CAST STEEL BETWEEN ENGINE AND TENDER. SPRING CHAFING CASTING TO BE SIMILAR TO 10 38 E 3049-3050. TENDER WEDGES TO BE SIMILAR TO B.L.W. CARD 482. (SUP. 29) SPRING BUFFER BETWEEN ENGINE AND TENDER TO BE SIMILAR TO B.L.W. CARD 3135.

81 TENDER TO HAVE CONTINUOUS DRAFT RODS 1¾" DIAM.

82 DRAFT GEAR TO BE MINER CLASS A-18, AS MINER PRINT 4032-D EXCEPT TO SUIT UNDER FRAME.

83 LADDER ON REAR OF TANK AND STEPS AND HAND HOLDS AT EACH CORNER OF TENDER.

84 STEPS ON TENDER TO HAVE WROT IRON BRACKET WITH WOOD TREAD.

85 LOCOMOTIVE TO CONFORM TO U. S. SAFETY APPLIANCE ACT.

86 TENDER TRUCKS TO BE DUP. OF 10 38 E 3049, 3050 WITH PITTSBURGH CAST STEEL TENDER TRUCK BOLSTERS.
SIDE BEARINGS ON BOTH FRONT AND BACK TRUCKS.
TRUCK CROSS BEAMS OF CHANNEL IRON.

87 TENDER AXLE BOX, ETC. TO BE M. C. B. STANDARD.
JOURNAL BOXES TO BE SYMINGTON.

88 TENDER WHEELS AS STANDARD STEEL WORKS' PRINT C-2256.
ENGINE TRUCK AND TENDER WHEELS TO BE INTERCHANGEABLE WITH THE ENGINE TRUCK AND TENDER WHEELS HERETOFORE FURNISHED.

89 THE WESTINGHOUSE OPERATING BRAKE FIXTURES TO BE FURNISHED FREE THESE WORKS BY RY. CO. (SEE SUP. 61)

90 STEAM HEAT HOSE FOR REAR OF TENDER TO BE NO. 720-BS 5
STEAM HEAT HOSE BETWEEN ENGINE AND TENDER TO BE INTERCHANGEABLE WITH HOSE BETWEEN TENDER AND TRAIN. (SUP. 25)

Changes ---

Limits, Height 14' 7" Width ---

Weight (approximate) in working order, Total 154,000 POUNDS
On F. t'k --- lbs. Drivers 154,000 lbs. B. t'k --- lbs.

Tractive power 38,500 lbs., Ratio of adhesion 4.

Work'g St'm Pres. 180 lbs., Service. SUBTONTING.

Fuel SOFT COAL.

LOCO. MUST CONFORM TO ALL I.C.C. REQUIREMENTS.

LIGHT ZERO SHEET 1/4" UNDERFRAME.

Boiler STEEL Thick 13/16" Rivets ---
Boiler, Diam. 76" Plan STRAIGHT TOP Bill 8588

Boiler st'm tests 180 lbs., Tested to 200 lbs. steam pres.
WITH FACTOR OF SAFETY OF 4.83 240 lbs. water pres.
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS.
DOME - ONE PIECE TYPE
Dome, diam. 33" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE
Firebox, length 120 3/16" Width 42 1/8" Depth F 73 7/8" B. 71 3/8"
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 DOUBLE Riveted
Water space stays 7/8" DIAM. WITH 3/16" HOLES 1/2" DEEP FROM O.S.
MUD RING TO HAVE ALL FOUR CORNERS REINFORCED.
Radial stays 1" DIAM. Sling stays front THREE ROWS B.L.W. EXPANSION STAYS
Button heads below crown sht. Eight central rows
Crown bars NONE Placed --- above crown
Crown bolts ---

Flues ---

Tubes #12 W. G. SPELLERIZED STEEL
Tube ends SERRED FOR COPPER FERRULES, FIRE BOX ENDS.
Number 374 Diam. 2" Length 10' 5"

Heating Surfaces Flues --- Combus. Chamb. --- Total 2216 sq. ft.
Tubes 2023 sq. ft. Fire Box 192 sq. ft. Fire Brick Tubes ---
Grate area 35.1 sq. ft. Ratio to Heating Surface 1 : 63
Superheater ---

Fire Brick ARCH ON STUDS

GRATES TO BE ARRANGED FOR DUMPING ON CURSIDES
Grates, Rocking BARS AND DROP PLATE.
Ash. Pan, Dampers FRONT AND BACK

Safety Valves TWO CROSBY 3" (Not Spec)
Safety valves, Right with relief lever, Set to 180 POUNDS
Whistle B. L. W. PLAIN

Steam Gauge ONE 1 MOW 7" MAKERS' AMERICAN (Spec)
Steam gauge stands IRON BASE Check NONE

Water Gauges ONE NATHAN KEYLESS Cock Lavoye ELECTRIC
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. WITH 1" GLOBE LINE

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 TWO MONITOR (Not Spec) 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.
NATHAN FUEL SPRINKLER

Steam Heat NONE

Cab WOOD

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

Back Bumper BAR STEEL Back drawbar height 30 1/2"

Pilot NONE Pushing shoes AT FRONT
Front Bumper (OAK) Bumper plate NONE
Steps ACROSS FRONT WITH HAND RAIL.
COUPLERS, HAND HOLDS, ETC., TO CONFORM TO I.C.C. REQUIREMENTS.
Front Drawhead, Center above rail 33 1/2"
Coupler M. C. B. AUTO.

Signal fixtures IRON ON BUMPER
HEADLIGHT EQUIPMENT TO BE PYLE NATIONAL ELECTRIC, TYPE "K" WITH INCANDESCENT HEADLIGHT OUTFIT.
Headlight TWO YOUNG CAST 17" Reflector. ---
Headlight, Pos. on cab or BOILER Mounted WITH
Lamp shell NONE Nosing ---

Bell 92 POUNDS GOLLMAR AIR BELL RINGER.
Sand Box TWO Locat. OVER BODY IRON PAINTED Pipes IRON
SAND BOX TO HAVE 4-1" AIR BOX TO SAND FRONT AND BACK.

Deck casting IRON PAINTED

Boiler Jacket #22 SOFT STEEL Planish IRON Style 9
Boiler Lagging MAGNESIA SECTIONAL

SPECIFICATION FOR LOCOMOTIVES 6 38 0 1/2 Jan. 1919

FOR BANGOR RAILWAY AND NAVIGATION COMPANY.

Type 4-6-2 CAST STEEL

Cylinders, Diam. 22" Stroke 26"
St'm ports, Length 19" Width 1 3/8" Bridges 1 3/8"
Exh. ports, Length 19" Width 3" Valve lead 1/16"
Valve travel 5 1/2" Steam lap 1" Exhaust clearance ---
Eccentric crank throw 5" By-pass valve NONE
S. F. Lubr. NATHAN TRIPLE BULL'S EYE (Spec)
Cyl'r heads CAST STEEL Lubr. PIPED 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. KING TYPE (Spec)
PISTON RODS TO BE KEYED TO CROSSHEADS.
Pistons CAST IRON RINGS SPRUNG INTO SOLID HEADS
Guides STEEL Oil cups NEEDLE
Crossheads CAST STEEL, WITH BEARINGS OF CAST IRON, TINNED.
Wrist Pins STEEL Rod cups PLUNGER, FORGED ON
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.
PUSHER REVERSE GEAR TO BE RAGONNET COVERED BY EXTRA ORDER 1972, DATED 6-25-19.
All threads on bolts (except stayboits) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.
GUIDES TO HAVE "T" SHAPED STANDARDS APPLIED ON THE BACK END OF GUIDES.
Wearing Bearings B. L. W.
DRIVING WHEEL HUB LINERS OF BRONZE.
Drivers, O. S. Diam. 82" Con. diam. 74" CENTERS CAST STEEL
DETROIT FLANGE LUBRICATOR APPLIED TO FRONT AND BACK DRIVERS.
Tires STEEL Held by SHRINKAGE AND SHOULDER
Tires, Flanged, Pos. FRONT AND BACK Size 3" x 5 1/2"
Tires, Plain, Pos. MIDDLE Size 3" x 6 1/2"
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. NO. 6-ET WESTG. AUTO. AND STRAIGHT AIR
Eng. Tr'k, sch. ---
Foundation Parts: Drivers, sch. 84-3 AMERICAN O. S. EQUALIZED
Eng. Tr'k, sch. ---
Air pump One 11" Pos. LEFT SIDE
Train connections FRONT AND BACK
Train signal, sch. NONE
AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

Tender EIGHT Wheeled, Drawing No. 1401
Weight, with fuel and water, about 100,000 POUNDS
LOCOMOTIVE MUST CONFORM TO ALL I.C.C. REQUIREMENTS.
Tank 5,000 Gallons, Bill 3887
TANK "U" SHAPE, SLOPING BACK. FUEL CAPACITY 7 TONS

Tool Boxes HARD WOOD, TOP

Frame STEEL, 10" CHANNELS, WITH BUMPERS OF WOOD.

Front Drawbar height 30"
Pilot NONE Pushing shoes AT REAR.
Back drawhead, center above rail 33 1/2"
Coupler M.C.B. AUTO., WITH CARDWELL DRAFT GEAR.

STEPS ACROSS REAR WITH HAND RAIL.
Steps, HAND HOLDS, ETC., TO CONFORM TO I.C.C. REQUIREMENTS.
STEPS AND HAND RAILS ON SLOPING BACK OF TANK.
Trucks ARCH BAR TYPE WITH STEEL BOLSTERS.

Springs ELLIPTIC, B. L. W.
Journals, Diam. 5" Length 9"
Wheels, Diam. 33" Tread 1 1/4" Kind CHILLED CAST IRON PLATE
Tires --- Cen. diam. --- Size ---
Tires held by ---
Safety chains SINGLE

Brake Position ON ALL WHEELS
Brake sch. No. 6-ET WESTG. AUTO. AND STRAIGHT AIR, WITH 12" x 12" TENDER CYLINDER. BRAKE BEAMS TO BE HERCULES.

ALL CASTINGS SUCH AS TRUCK CENTRE CASTINGS, TOP AND BOTTOM, TO BE OF CAST STEEL.

List of tools, sch. 29
Photo sch. No. 2 Inspection B. L. W.
To be weighed NO Material specins B. L. W.
Certificate of boiler test THREE COPIES OF B. L. W. FORM 1036
Junior laws to 6-24-19 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 B. L. W. FOR ENGINE AND TENDER.

Painting:—Engine, style 291 BLACK WITH STRIPING IN YELLOW.
Painting:—Tender, style 291 BLACK WITH STRIPING IN YELLOW.
LETTERING SIMILAR TO PHOTO 6496 EXCEPT ROAD NO. TO BE PAINTED ON TANK COLLAR ABOVE MONOGRAM, AS ON PHOTO. 2078, THUS: No. 1
Mark on CAB SIDES, M. R. & N. Co.
MARK ON TANK SIDES, RY. CO.'S MONOGRAM AS PRINT (HEREWITH).

Road Nos. Pos.	Road Nos.	Name NONE
F. No. PLATE	1	
F. SAND BOX		
SIDE COLLAR OF TANK		
BACK OF TANK		

Actual Dimensions of Loco.—Extreme height over all 15' 5"
Extreme Width:—Cab boards 10' 2" Cylinders or valve motion 9' 8"
Length outside face front bumper of engine to face of tender wedge 39' 7"
Length face of tender wedge to outside face back bumper of tender 24' 6"
Total length outside face front bumper of engine to outside face back bumper of tender 64' 1"

THE BALDWIN LOCOMOTIVE WORKS

Philadelphia, Pa., U.S.A. 1918

SPECIFICATION FOR LOCOMOTIVES B - 25 D 213

FOR PICKENS RAILROAD CO.

R.

4-17-19. Engine Drawing No. 45

Same as PHOTO. 3772 {EXCEPT TO HAVE SOUTHERN VALVE MOTION

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 10' 6" Driving 10' 6" Total 17' 8"
Total wheelbase, eng. and tend. {Actual 43' 9" / Limited to ——

Curves 16 DEGREES **Grades,** 3%
Rails, 50 POUNDS
Limits, Height —— Width ——
Weight (approximate) in working order. Total 99,000 POUNDS
On F. tr'k 16,000 lbs., Drivers 83,000 lbs., B. tr'k —— lbs.

Tractive power 19,500 lbs., Ratio of adhesion 4.25
Work'g St'm Pres. 180 lbs., Service PASSENGER AND FREIGHT
Fuel SOFT COAL

FRONT TUBE SHEET TO BE ½" THICK
Boiler STEEL Thick ⅝" Bill 8559
Boiler, Diam. 54" Plan EXTENDED WAGON TOP
{Boiler st'm pres. 200 lbs., Tested to {220 lbs. steam pres. / WITH FACTOR OF SAFETY OF 4.7 {267 lbs. water pres.
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS

Dome, diam 29" Pos. FORWARD OF FIREBOX

Firebox STEEL Combustion chamb. NONE
Firebox, length 70-3/16" Width 42⅜" Depth F. 57½" B. 57½"
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.

Radial stays 1" DIAM. Sling stays front {TWO ROWS 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 (B.L.W. OPTION)
Tube ends SWAGED FOR COPPER FERRULES, FIREBOX ENDS.
Number 212 Diam. 2" Length 10' 2"

Heating Surface	Flues ——	Combus. Chamb. ——	Total	1221⁰
	Tubes 1119⁰	Fire Box 102⁰	Fire Brick Tubes ——	
Grate area 20.6⁰	Ratio to Heating Surface 1 : 59.2			
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"

Safety Valves TWO STEM 2½" ONE MUFFLED (Spec)
Safety valves NONE with relief lever, Set to {180 LBS. MUFFLED / 183 LBS. OPEN
Whistle ONE B. L. W. PLAIN

Steam Gauge ONE IRON 7" MAKER:—STAR (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 EVERLASTING 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 TWO SELLERS, CLASS "N" (Spec) No. 8½
Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER
Pipes, Check STEEL Feed STEEL Overflow STEEL
Check SELLERS COMBINED CHECK AND STOP VALVE POS.—R. AND L.

Steam Heat NONE

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 30¾"

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. WITH SLOTTED KNUCKLE

Signal fixtures IRON ON BUMPER
HEADLIGHT EQUIPMENT TO BE PYLE NATIONAL ELECTRIC TYPE "K" WITH INCANDESCENT HEADLIGHT. HEADLIGHT CASE TO BE DRESSEL.
Headlight ONE ROUND CASE 18" Reflector {SMALL RED LIGHT ON REAR OF TENDER
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 (Spec) WATTERS AIR DOUBLE. TO SAND FRONT OF FRONT AND BACK OF MAIN DRIVERS.
Dome casing IRON PAINTED

Boiler Jacket #22 SOFT STEEL PtdBands IRON Style 9
Boiler Lagging MAGNESIA SECTIONAL ON FIRE BOX, AND LAGGING B.L.W. PLASTIC MAGNESIA FROM STOCK ON BARREL

THE BALDWIN LOCOMOTIVE WORKS

W. CONKLIN

SPECIFICATION FOR LOCOMOTIVES B - 26 D 213 July-1919.

FOR PICKENS RAILROAD CO.

RD.

83 83

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 head 3/16"
Valve travel 5" Steam lap ¾" Exhaust clearance ——
Eccentric crank throw 20" By-pass valve NONE
(Spec) 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 U.S. KING TYPE (Not Spec)

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

Valve Motion SOUTHERN, ROYALTY IF ANY, 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.
PATENT PLATES (HEREWITH) COVERING SOUTHERN VALVE GEAR TO BE APPLIED TO THE REAR END OF THE LINK SUPPORT ON EACH SIDE OF LOCO.
All threads on bolts (except stayboltts) 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. 48" Cen. diam. 42" 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 IRON
Journals, Diam. 7" Length 8"
FOR HEREAFTER - MAIN DRIVING BOXES OF CAST STEEL (HVW-9PR KR-7/6/20)
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. 4½" Length 7½" Boxes CAST IRON
Wheels, Diam. 28" Tread 1¼" Kind CHILLED CAST IRON PLATE
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 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. MV-1 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 RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

* ONE SET PISTON ROD AND VALVE STEM PACKING ORDERED THROUGH EXTRA WORK DEPT., ORDER NO. 3226, DATED 5-28-19 TO BE SHIPPED WITH LOCOMOTIVE - NO CHARGE.

Tender EIGHT Wheeled, Drawing No. 1387
Weight, with fuel and water, about 60,000 POUNDS
TENDER TO BE OF THE LONG, LOW DESIGN.
Tank 3000 Gallons, Bill 4818
TANK "U" SHAPE, STRAIGHT TOP. FUEL CAP. 6 TONS.

Tool Boxes HARD WOOD, TOP.

Frame STEEL 6" AND 8" CHANNELS WITH BUMPERS OF WOOD.

Front Drawbar height 30½"
Pilot NONE Pushing shoes NONE
Back drawhead, center above rail 33½"
Coupler M.C.B. AUTO. WITH SLOTTED KNUCKLE

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. 30" Tread 1¼" Kind CHILLED CAST IRON PLATE
Tires NONE Cen. diam. —— Size ——
Tires held by ——
Safety chains SINGLE

Brake Position ON ALL WHEELS CYLINDER
Brake sch. NO.6 ET WEST'G. AUTO. AND STRAIGHT AIR WITH 10" X 12"
ONE SMALL RED LIGHT ON BACK OF TENDER, TO BE CONNECTED WITH HEADLIGHT GENERATOR, SOUTHERN RY. STANDARD.

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 6-14-19 Shipment ON OWN WHEELS (SEE * BELOW)

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 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, THE PICKENS RAILROAD CO.

Road Nos. Pos. —— Road Nos. —— Name NONE
F. No. Plate
Sand Box
Cab Sides
Back of Tank

Actual Dimensions of Loco. Extreme height over all 13' 5½"
Extreme Width:—Cab boards 9' 0" Cylinders or valve motion 10' 2½"
Length outside face front bumper of engine to face of tender wedge 26' 7"
Length face of tender wedge to outside face back bumper of tender 22' 8"
Total length outside face front bumper of engine to outside face back bumper of tender 49' 3"

THE BALDWIN LOCOMOTIVE WORKS

Memorandum Sheet 19037

SPECIFICATION FOR LOCOMOTIVES 8-24-C 221

FOR Red River & Gulf R. R

P

6-17-19

Except to have two bind brs., Piston Valves and outside steam pipes

Gen. as Photo. 4865

Engine Drawing No. 28

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 8' 0" Driving 8' 0" Total 21' 9"
Total wheelbase, eng. and tend. { Actual 47' 6⅜" / Limited to ----

Curves ----

Limits, Height ---- Width ----
Weight (approximate) in working order, Total 80,500 pounds
On F. tr'k 29,500 lbs., Drivers 51,000 lbs., B. tr'k ---- lbs.
Tractive power ~~13,400~~ 19700 lbs., Ratio of adhesion 3.81
Work'g St'm Pres. 180 lbs., Service Pass. and Freight
Fuel Soft Coal

Front Tube Sheet ½" thick
Boiler Steel Thick ½" & 9/16" Bill 8606
Boiler, Diam. 48" Plan Extended Wagon Top
Boiler st'm pres. 200 lbs., Tested to 220 lbs. steam pres.
With factor of safety of 4.7 267 lbs. water pres.
Longitud. seams Butt jointed, double covering strips

Dome, diam. 25" Pos. Forward of Fire Box
Auxiliary Dome None
Firebox Steel Combustion chamb. None
Firebox, length 64-15/16" Width 39/64" Depth F. 55½" B. 54½"
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 1½" deep from O. S.
Hollow Stays, 150 in number located in inaccessible places.
Radial stays 1" diam. Sling stays front Two Rows 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 (B.L.W. Option)
Tube ends Swaged for copper ferrules, firebox ends.
Number 13 / 77 Diam. 5⅜" / 2" Length 10' 6"

Heating Surface	Flues 1917	Combus. Chamb. ----	Total 2098
	Tubes 2020	Fire Box 87	Fire Brick Tubes ---
Grate area 15.5		Ratio to Heating Surface 1 : 66	
Superheater 157			

Fire Brick Arch, None

Grates Rocking bars and drop plate.
Ash Pan, Dampers Front and Back

Throttle valve to have auxiliary drifting valve
Throttle Balance Pos. Dome
Dry pipe Steel

Superheater Schmidt Type (See Sup. 2 etc.)

Smokebox extension With Cleaning hole and cap L. S. Only
Spark arrester hopper With
Netting and deflect. plates With

Exhaust nozzles Single, High

Stack Cast Iron, Straight Dia. 14"

Safety Valves Two Coale 2" Open (Not Spec)
Safety valves None with relief lever, Set to 180 pounds
Whistle One B. L. W. with loud fine tone

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 3⅛" 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 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 Two Monitor (Not Spec) No. 6
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Copper Feed Copper Overflow Steel
Check B. L. W. Pos. R. and L.

Steam Heat Gold System

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 35¼"

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. with slotted knuckle as deep as possible, i.e. 15" deep.

Signal fixtures Iron on bumper

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 Two Diam. 28" Body Iron Painted Pipes Iron
Sander Leach Air, Trap A-1 to sand front and back.

Dome casing Iron painted

Boiler Jacket #22 Plain. Steel Bands Iron Style 9
Boiler Lagging Magnesia Sectional

THE BALDWIN LOCOMOTIVE WORKS

H.R. Greene

SPECIFICATION FOR LOCOMOTIVES 8-24-C 221 July 1919.

FOR Red River & Gulf R. R.

P

85-185

Frames Cast Steel

Cylinders, Diam. 15" Stroke 24"
St'm ports, Length 25⅛" Width 1⅞" Bridges ---
Exh. ports, Length --- Width --- Valve lead 3/16"
Valve travel 5" Steam lap ⅞" Exhaust clearance ---
Eccentric crank throw 11-9/16" By-pass valve None
S. F. Lubr. Michigan Five Feed Bulls 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 --- Covers ---
St'm chest valves 8" diam. Piston Type
Met. pkg (Piston rods / Valve stems) United States. King Type (Not Spec)
Piston rods to be keyed to crossheads
Pistons Cast iron rings sprung into solid head
Guides Alligator type, Steel Oil cups Needle
Crossheads Cast Steel, with bearings of cast iron, tinned.
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 stayboltz) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.
Driving wheel hub liners Brass
Drivers, O. S. Diam. 60" Cen. diam. 54" 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 Cast Steel
Journals, Diam. 7" Length 8"

Springs. Make B. L. W.

Front Engine Truck Four Wheeled Swing bolster
To swing 3" each side of cen., Cen. pin liners ----
Journals, Diam. 4½" Length 7½" Boxes Cast Iron
Wheels, Diam. 28" Tread 1½" Kind Rolled Steel
Tires None Cen. diam. --- Size ---
Tires held by ---- Wheel rims 2½" thick
Wheel hub liners Brass
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
Foundation Parts: Drivers, sch. WY-1, American O. 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. 1407
Weight, with fuel and water, about 79,000 pounds
Tank plates to be two gauges heavier than usual
Tank 4,000 Gallons, Bill 4866
Tank "U" shape, straight top. Fuel capacity 4 tons

Tool Boxes Hard Wood, Top

Frame Steel, 8" and 10" channels, with bumpers of wood and steel plate.
Front Drawbar height 33½"
Pilot None Pushing shoes None
Back drawhead, center above rail 33½"
Coupler M. C. B. Auto. with slotted knuckle as deep as possible i.e., 15" deep. (See Sup. 41)

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. 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. No. 6-ET Westinghouse Automatic and Straight Air, with 10" x 12" tender cylinder.

List of tools, sch. 26
Photo sch. No. 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 7-7-19 Shipment On own wheels (See Sup. 12)

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 Aluminum

Lettering, etc., to be same as for 10 30 D 662
Mark on Tank sides, Red River and Gulf R.R.Co.

Road Nos. Pos.	Road Nos.	Name None
F. No. Plate	104	
F. Sand Box		
Cab Sides		
Back of Tank		

Actual Dimensions of Loco. Extreme height over all 12'1½" Before 11/9
Extreme Width: Cab boards 8'3" (Before) Cylinders or valve motion 8' 5½"
Length outside face front bumper of engine to face of tender wedge 28' 4⅝"
Length face of tender wedge to outside face back bumper of tender 24' 5½"
Total length outside face front bumper of engine to outside face back bumper of tender 52' 9⅞"

SPECIFICATION LOCOMOTIVE 8 24 C 221

RED RIVER & GULF R. R.

Specification for Type A Double Loop Superheater. Spec'n No. R15-WO-B June 28, 1919

BOILER TUBES	77 ..... 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. Tubes to be in accordance with the American Society for Testing Materials Specification A-28-18.	
BOILER FLUES	13 ..... in number ..... 5-3/8" ..... o. d #9 BWG ..... of cold drawn seamless steel. Flues to be in accordance with the American Society for Testing Materials Specification A-28-18.	
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 1523-R
TUBE SHEET LAYOUT		Card 1136
UNITS	13 ..... units ..... 13 ..... o. d ..... #9 BWG ..... Pipes to be in accordance with the American Society for Testing Materials Specification A-28-18. Pipes united by return bends. Each unit to be tested, before being placed in boiler, with water under pressure of 500 lb. per sq. in.	Card 50439
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-A.	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 surfaces 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 11112-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 Appr'd
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 pipe or cylinder. Pipe to be well protected against freezing.	Card 1149-J
DAMPER SHAFT COUNTERWEIGHT	To be painted a light color to render it easily visible by the engineer	Card 1057-B
S. H. ARRANGEMENT	To be in accordance with	Card NO441-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 11242-V	S. H. UNIT BOLT WASHER	Card 1071
DAMPER CYL. ARM	Card 1074	S. H. UNIT CLAMP	Card 1073
DAMPER CYL. PIPE FITTING	Card 11115	S. H. UNIT CLAMP WASHER	Card 10305
DAMPER CYL. PIPE UNION	Card 11114	S. H. PIPE END	Card 1344
DAMPER CYL. PIPING DIAGRAM	Card 3258	S. H. PIPE BAND	Card 1988
DAMPER CYL. SUPPORT	Card	SPACING OF BANDS & SUPPORTS	Card 10759
DAMPER SHAFT	Card 1068-V	TYPE OF RETURN BENDS	Forged
DAMPER SHAFT ARM	Card 1065	RETURN BENDS	Card 11022
DAMPER SHAFT BEARING (O.S.)	Card 11277	LUBRICATOR CONNECTION	Card 3023
DAMPER SHAFT BEARING (I.S.)	Card 11107-L.S.	DEFLECTING PLATE HANDLE	Card 1489
DAMPER SHAFT LINK	Card 1070-K	DEFLECTING PLATE STUDS	Card 10800
PATENT PLATE	Card 3272	DEFLECTING PLATE CLAMP	Card 10809-A

PYROMETER None

SPECIFICATION FOR LOCOMOTIVES 8 24 C 221
FOR RED RIVER & GULF R. R.
P

87 87

1 DETAILS TO BE ARRANGED SO LOCO. CAN BE READILY CHANGED TO BURN WOOD.

2 SUPERHEATER AS LOCOMOTIVE SUPERHEATER CO'S SPECIFICATION No. R-15-WO-B DATED JUNE 28TH, 1919. (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.

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

4 BACK BUMPER TO BE HEAVY TO PERMIT JACKING UP ENGINE

5 HEADLIGHT EQUIPMENT TO BE PYLE NATIONAL ELECTRIC WITH TYPE "E" TURBO GENERATOR, HAVING SPECIAL NOZZLE TO DEVELOP 1800 WATTS. HEADLIGHT TO HAVE INCANDESCENT LAMP. WIRING TO BE PROVIDED TO REAR OF TENDER FOR USE IN LIGHTING TRAIN.

6 ENGINE FRAMES TO BE MADE EXTRA HEAVY FOR HARD SERVICE.

7 DRIVING WHEEL CLEARANCE TO BE AMPLE TO PREVENT RUBBING OUTSIDE OF FIREBOX AND FRAMES WHEN ENGINE HAS WORN TO LIMIT OF LATERAL MOTION.

8 DETROIT FLANGE OILER, TWO FEED, PENDULUM TYPE, TO BE APPLIED TO FRONT DRIVERS.

9 EQUALIZING BEAMS AND ENGINE SPRINGS TO BE MADE EXTRA HEAVY FOR HARD SERVICE.

10 DRIVING SPRINGS TO BE EXTRA STRONG FOR ROUGH SERVICE, I. E., TO HAVE TWO PLATES MORE THAN REQUIRED.

11 ONE PAIR JOHNSON WRECKING FROGS, TYPE Z, FOR 60 POUND RAILS. BOTH WRECKING FROGS TO BE RIGHT HAND FROGS TO CORRECT ERROR OF FURNISHING TWO LEFT HAND FROGS FOR 10 32 D 1167.

12 ONE EXTRA CROSSHEAD GIB TO BE ORDERED ON EXTRA ORDER No. 5112 DATED JULY 7TH, 1919, AND TO BE SHIPPED WITH LOCO.

TENDER.

A1 COUPLER TO HAVE EXTRA HEAVY DRAFT RIGGING WITH STANDARD DRAWHEAD SPRINGS ETC. TO ABSORB SHOCK AND TO WITHSTAND HARD SERVICE.

THE BALDWIN LOCOMOTIVE WORKS

SPECIFICATION FOR LOCOMOTIVES 10 30 D 662

FOR RED RIVER AND GULF RAILROAD COMPANY

Gen. Ar Photo. 981 (Except to have piston valve and outside steam pipes)

Engine Drawing No. 94.

10-24-17.

Gauge of Road 4' 8½" Play ¾"

Wheelbase, Rigid 11' 4" Driving 11' 4" Total 22' 2"

Total wheelbase, eng. and tend. {Actual 51' 0¾" / Limited to ----

Rails 56 and 60 pounds

Curves ----

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

Weight (approximate) in working order, Total 129,000 pounds

On F. tr'k 30,000 lbs., Drivers 99,000 lbs., B. tr'k ---- lbs.

Tractive power 21,750 lbs., Ratio of adhesion 4.

Work'g St'm Pres. 180 lbs., Service Freight

Fuel Wood

Front tube sheet to be ½" thick

Boiler Steel Thick 21/32" & 11/16" Ins. 8268

Boiler, Diam. 58" 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 4.7

Longitud. seams Butt jointed, double covering strips

Circ. one piece type

Dome, diam. 29" Pos. Forward of firebox

Firebox Steel Combustion chamb. None

Firebox, length 95-15/16" Width 38¾" Depth F. 67⅞" B. 54½"

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 1½"

Water space stays 1" diam. with 3/16" hole deep from O. S.

Radial stays 1" diam. Sling stays front {Two rows of B.L.W. Expansions 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. Charcoal Iron or Steel (B.L.W. Option)

Tube ends Seared for copper ferrules firebox ends

Number {21 / 130} Diam. 5½" 2" Length 13' 1"

Heating Surface	Flues	384.6	Combus. Chamb. ----	Total	1406.6
	Tubes	885.0	Fire Box 137.0	Fire Brick Tubes ----	
Grate area	21.5	Ratio Heating Surface ÷ : 65.4			
Superheater	320.0				

Fire Brick Arch, None

Grates Plain bars and dead plates

Ash Pans, Dampers Front and back

Throttle to have auxiliary safety valve

Throttle Balanced Pos. Dome

Valves Steel

Superheater Schmidt type (See sup. 4)

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

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 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 Two Monitor (not spec'd) 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 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"

Pilot Wood Pushing shoes None

Front Bumper Oak Bumper plate With

8 **Steps,** Hand holds, etc. to conform to I. C. C. requirements

Front Drawhead, Center above rail 33½"

Coupler M.C.B. Auto. with open knuckle having wide slot for use with link and pin. Knuckle to have face 15" deep.

Signal fixtures Iron on bumper.

4 **Headlight** Ted Round Case 18" Reflector, To burn ----

Headlight, Nos. on sides With Number plate With

Lens shell None Nosing ----

Bell 92 pounds

Sand Box Two Diam. 22" Body Iron Painted Pipes Iron

Sanders Leach Air Trap A-1, in each set, to sand front and back

Cylinders Cast Iron with Saddle

Valves Slide

Valve Gear Walschaerts

Valve Packing Ramsbottom Cast Iron

Pistons Cast Iron

Piston Rods Steel

Crossheads Alligator type, Cast Steel (See sup. 10)

Main Rods Steel

Side Rods Steel

Wrist Pins Steel

Bushings Manganese Bronze

Boiler Lagging Asbestos Sectional

Cylinder Lagging Asbestos Sectional

Cylinder saddle supports to be horizontal

THE BALDWIN LOCOMOTIVE WORKS

R. J. Smith. Mch 1918

SPECIFICATION FOR LOCOMOTIVES 10 30 D 662

FOR RED RIVER & GULF RAILROAD COMPANY

89 89

Frames Cast Steel Braces Solid

Frames to be extra heavy for hard service

Cylinders, Diam. 18" Stroke 26"

St'm ports, Length 20.84" Width 1⅜" Bridges ----

Exh. ports, Length ---- Width ---- Valve lead ¼"

Valve travel 5½" Steam lap ⅞" Exhaust clearance ----

Eccentric crank throw 1¼" By-pass valve None

S. F. Lubr. (not spec'd) Michigan 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 9½" diam. Piston type

Met. pkg {Piston rods / Valve stems} U. S. King type (not spec'd)

Piston rods to be keyed to crossheads

Pistons Cast Iron rings sprung into solid head

Guides Steel Oil cups Needle

Crossheads Alligator type, Cast Steel (See sup. 10)

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. 52" Cen. diam. 44" Centres 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 Cast Steel

Journals, Diam. 8½" Length 8½"

Spring and Equal Beams to be extra heavy for hard service

Springs. Make B. L. W.

Front Engine Truck Four 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 1 11/16" Kind Rolled Steel

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

Tires held by ---- Wheel Rims 2½" thick

Engine truck wheels to have hub liners of brass

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. 166-1 American O. S. Equalized; Eng. Tr'k, sch. ----

Air pump Size 9½" Pos. 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. 918

Weight, with fuel and water, about 90,000 pounds

Tank 4500 Gallons, Bill 4182.

Tank "U" shape, straight top, Fuel capacity 3½ cords

Wood rack around top of tank

Tool Boxes Hard Wood, Top

Frame Steel 8" and 10" channels, with bumpers of wood.

Front Drawbar height 32½"

Pilot None Pushing shoes None

Back drawhead, center above rail 33½"

Coupler M.C.B. Auto. with open knuckle having wide slot for use with link and pin. Knuckle to have face 15" deep.

8 Steps, hand holds, etc. to conform to the I.C.C. requirements. Step 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 Westg. Auto. and Straight Air with 10" x 12" tender cylinder.

13 * The type Z car replacers to be shipped direct to R.R. Co. at Long Leaf, La. One pair Johnson Wrecking Frogs, suitable for 60 pound rails.

List of tools, sch. 30 * One pair Johnson Car Replacers, Type W Z"

Photo sch. #2 Inspection B. L. W. (Except see sup. 1)

To be weighed Yes Material specifications B. L. W.

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

Junior laws to 1-1-18. 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 10 30 D 655

Mark on Tank Sides, RED RIVER AND GULF R. R. CO.

Road Nos. Pos.	Road Nos.	Name None
F. No. Plate	103	
F. Sand Box		
Cab Sides		
Back of Tank		

Actual Dimensions of Loco. Extreme height over all 15' 5¾"

Extreme Width:—Cab boards 9' 11" Cylinders or valve motion 10' 6"

Length outside face front bumper of engine to face of tender wedge 51' 6"

Length face of tender wedge to outside face back bumper of tender 37' 6"

Total length outside to outside face front bumper of tender 96' 3"

SPECIFICATION FOR LOCOMOTIVES 10 30 D 662

FOR RED RIVER AND GULF RAILROAD COMPANY

BOILER TO BE INSPECTED BY THE HARTFORD STEAM BOILER INSPECTION AND INSURANCE COMPANY.

3 HOLLOW STAY BOLTS TO BE APPLIED WHERE THE ENGINE FRAMES INTERFERE WITH INSPECTION OF SAME.

2 ALL JACKET AND BEARER PADS, ETC. TO BE APPLIED SO THAT STAY BOLTS CAN BE INSPECTED WITHOUT REMOVING.

14 SUPERHEATER AS LOCOMOTIVE SUPERHEATER COMPANY'S SPECIFICATION NO. O-8512 DATED 11-12-17. (COPY ATTACHED). 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.

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

4 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.
SMOKE BOX TO BE EXTENDED SO LOCO. CAN BE CHANGED TO BURN COAL BUT DO NOT FURNISH HIGH EXHAUST NOR NETTING, ETC., FOR COAL.

7 CHAFING PLATES BETWEEN ENGINE AND TENDER TO BE GIVEN SPECIAL ATTENTION FOR OPERATING ON ROUGH TRACK.

3 LOCO. TO BE BUILT TO CONFORM TO THE NECESSARY REQUIREMENTS OF THE INTERSTATE COMMERCE COMMISSION FOR MAIN LINE SERVICE.

9 HEADLIGHT EQUIPMENT TO BE PYLE NATIONAL ELECTRIC, TYPE "E" WITH ARC HEADLIGHTS, WITH SWITCHES CONVENIENTLY LOCATED IN CAB TO CONTROL SAME.

10 CROSSHEADS TO HAVE BEARINGS OF CAST STEEL, TINNED.

11 NICKEL CLEARANCE TO BE AMPLE TO PREVENT RUBBING OUTSIDE OF FIRE BOX AND FRAMES WHEN ENGINE HAS WORN TO LIMIT OF LATERAL MOTION.

TENDER

21 TENDER TO BE OF LONG LOW TYPE.

22 DRAFT RIGGING TO BE MADE EXTRA HEAVY WITH STANDARD DRAWHEAD SPRINGS, ETC. TO ABSORB SHOCK AND TO WITHSTAND HARD SERVICE.

SPECIFICATION FOR LOCOMOTIVES 10 30 D 662

FOR RED RIVER AND GULF RAILROAD COMPANY

Specification for Type A Double Loop Superheater No. O-8512, DATED NOVEMBER 12TH, 1917.

BOILER TUBES	130 in number 2 o. d. 13 ft. 1 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 10115-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, headed and prosected 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 50115
UNITS	21 units 12" 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 to 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 10893-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 ARR'T.
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 40130
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 11037-L	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 1282	S. H. UNIT CLAMP	Card 1073
DAMPER CYL. PIPING DIAGRAM	Card 3258	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	SMOKE BOX	Card
DAMPER SHAFT BEARING (O.R.)	Card 1148	DEFLECTING PLATE HANDLE	Card 1487
DAMPER SHAFT BEARING (I.S.)	Card 1275-B	SUPERHEATER CONNECTION	Card 3023
SPACING OF BANDS & SUPPORTS	Card 10759	DEFLECTING PLATE RIVET	Card 10809
TYPE OF SMOKE BOX	Forney	DEFLECTING PLATE CLAMP	Card 10809-A

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THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-3602

Memorandum Spec'n 19012

SPECIFICATION FOR LOCOMOTIVES 10 18½ D 35

FOR RTL Sandy River and Rangeley Lakes R. R.

Gen. as B. L. W. Trading 38202

Engine Drawing No. 15

3.28.19.

Gauge of Road 2' 0" Play ½"
Wheelbase, Rigid 7' 0" Driving 7' 0" Total 20' 0"
Total wheelbase, eng. and tend. { Actual 47' 2" / Limited to —

Curves 20 degrees Grades 4%

Limits, Height — Width (See Sup. 1)
Weight (approximate) in working order. Total 54,000 pounds
On F. tr'k 6,000 lbs., Drivers 42,000 lbs., B. tr'k 6,000 lbs.

Tractive power 10,100 lbs., Ratio of adhesion 4.15
Work'g St'm Pres. 170 lbs., Service Passenger and Freight
Fuel Soft Coal

Front tube sheet to be ½" thick.
Boiler Steel Thick 7/16" Bill 8486
Boiler, Diam. 42" 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
Auxiliary Dome, None
Dome, diam. 22" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 42-3/16" Width 31 7/16" Depth F. 40½" B. 40½"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 14" 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" diam. Sling stays front (See Sup. 5)
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 (B.L.W. Option)
Tube ends Swaged for copper ferrules, fire box ends
Number 100 Diam. 2" Length 10' 9⅛"

Heating Surface	Flues —	Combus. Chamb. —	Total 608⁰	
	Tubes 559⁰	Fire Box 50⁰	Fire Brick Tubes —	
Grate area 9.3⁰	*Ratio to Heating Surface 1 : 65.3			
Superheater —				

Fire Brick Arch, on lugs in side sheets

Grates of cast iron.
Grates Rocking finger type, without dump
Ash Pan, Dampers Back only
Ash pan of sheet iron, arranged to dump without the necessity of anyone going under the engine.
Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Smoke box extension in one piece.
Smokebox extension With Cleaning hole and cap L. S. only
Spark ejector ~~or hooks~~ With
Netting and deflect. plates With
Smoke box netting to be 3 x 3 mesh No. 12 gauge.
Exhaust nozzles Single High

Stack Cast iron, tapered Dia. 11"

Safety Valves (Spec) Two Consolidated 2" one muffled
Safety valves None with relief lever, Set to { 170 pounds muffled / 173 pounds open
Whistle One Iron, Chime as B.L.W. Cat. 415

Steam Gauge One Iron, 6½" dial Maker: Star (Spec)
Steam gauge stand Iron **Clock** None

Water Gauge (See Sup. 13) **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 (Sup. 16)
Blower Valve Hancock

Blow off Cock One Gordo 1½" Pos. Front
Cleaning Plugs 2" ~~and 2½"~~ 5-1-19 diam. tapered, 12 threads per inch
Firebox Corners diagonal
Crown, Two each side and two 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 Two Hancock, type "A" (Spec) No. 5
Injectors, Pos. R. and L. Steam pipes Copper
Pipes, Check Copper Feed Copper Overflow Iron
Check Hancock double, with stop valve Pos. (See Sup. 18)

Steam Heat None

Cab Wood, with ventilator in roof

Cab floor to be covered with wood.
Cab boards Sheet Steel Nosing T-Iron
Running boards Sheet Steel Nosing T-Iron
Hand rail Iron Located on Boiler

Back Bumper Bar Steel Back drawbar height 23¾"

Pilot Hard Wood, short type Pilot 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 17"
Coupler Climax M.C.B. Auto. three-quarter size from National Malleable Castings Co.

Signal fixtures Iron on bumper

Headlight One Round Cast 18" Reflector, To burn —
Headlight, Nos. on sides With H'dl't step None
Lamp shelf None Nosing —

Bell 85 pounds
Sand Box One Diam. 23" Body Iron painted Pipes Iron
Sander Hanlon Air Double to sand front of front drivers and back of main drivers. (Spec)
Dome casing Iron painted

Boiler Jacket #22 Sheet Steel Bands Iron Style 9
Boiler Lagging Magnesia Sectional

THE BALDWIN LOCOMOTIVE WORKS

W. O. Webster

SPECIFICATION FOR LOCOMOTIVES 10 18½ D 35 April - 1919.

FOR RTL Sandy River and Rangeley Lakes R. R.

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Frames Outside of wheels, cast steel. Braces Solid
Cylinder balls to be heavy enough to stand bushing.
Cylinders, Diam. 12" Stroke 16"
St'm ports, Length 10" Width 1" Bridges ⅞"
Exh. ports, Length 10" Width 2" Valve lead ⅛"
Valve travel 4½" Steam lap 1 1/16" Exhaust clearance —
Eccentric crank throw 7-5/32" By-pass valve None
S. F. Lubr. Detroit three feed #22 Bull's Eye (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 Richardson Balanced (See Sup. 28)
Met. pkg' { Piston rod / Valve stems } Trojan (Spec)
Piston rods to be keyed to crossheads.
Pistons Cast iron rings sprung into solid head
Guides Laird type, steel Oil cups (Sup. 30)
Crossheads Cast steel with bearings of cast iron tinned
Wrist Pins Steel Rods etc. (See Sup. 31)

Valve Motion Walschaerts
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings. (See Sup. 33)

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. 33" Cen. diam. 28" Centers cast iron

Tires Steel Held by Shrinkage and shoulder
Tires, Flanged, Pos. Front and back Size 2½" x 5"
Tires, Plain Pos. Middle Size 2½" x 6"
Lateral play between driving boxes and wheel hubs — 1/32" total
Driving Boxes cast iron
Journals, Diam. 5½" Length 6"

Springs. Make. B. L. W.

Front Engine Truck Two Wheeled Radial type
To swing 1⅜" each side of cen. Cen. pin liners None
Journals, Diam. 3½" Length 6" Boxes Cast Iron
Wheels, Diam. 22" Tread 3⅜" Kind Chilled cast iron plate
Tires None Cen. diam. — Size —
Tires held by —
Front engine truck wheels without hub liners.
Back Engine Truck Two Wheeled (See Sup. 34)
To swing 1⅜" each side of cen. Cen. pin liners None
Journals, Diam. 4" Length 6" 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.

Brakes, position On all driving and tender wheels
Operating { Engine, Sch. No. 6-ET Westg. Cons. Auto. and / Eng. Trk. sch. — Straight Air
Foundation { Drivers sch. No. 1 American O.S. Equalized / Eng. Trk. sch. —
Air pump One 8" Pos. L. S.
Train connections Front and Back
Train signal, sch. None
Air necessary to have hydrostatic test of 210 pounds.

Tender Eight Wheeled, Drawing No. 1374
Weight, with fuel and water, about 141,000 pounds

Tank 2000 Gallons. Bill 3701
Tank "U" shape, straight top. Fuel capacity 3 tons

Tool Boxes Hard Wood, Top
One small tool box on each leg of tank.
Frame Steel 6" channels, with bumpers corbed steel pipe channels turned in towards center.
Front Drawbar height 21"
Pilot None Pushing shoes None
Back drawhead, center above rail 17"
Coupler Climax M.C.B. Auto. three-quarter size face platt type from National Malleable Castings Co.
Steps, hand holds, etc., to conform to I.C.C. requirements.

Trucks (See Sup. 107)

Springs Semi-elliptic, B. L. W.
Journals, Diam. 3½" Length 6"
Wheels, Diam. 20" Tread 3¾" 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 Westg. Auto. and Straight Air with 8" x 12" brake cylinder.

List of tools, sch. 26
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 1036
Junior laws to 4-1-19 Shipment On cars

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

B. L. W. Patents { Feed Water Strainer, Pat'd Sept. 1, 1903 (Cast On)

Property plates None

Painting: Engine, style — Black, No Striping
Painting:—Tender, style — Black, No Striping
Lettering, etc., to be Roman type in gold leaf, same style as for 10 18½ D 18.
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 24
Sand Box
Cab Sides
Back of Tank

Actual Dimensions of Loco. Extreme height over all 10' 5"
Extreme Width Cab boards 9' 5" Cylinders or valve motion 9' 5"
Length outside face front bumper of engine to face of tender bumper
Length face of tender wedge to outside face back bumper
Total length outside face front bumper of

SPECIFICATION FOR LOCOMOTIVES 10 18 & 0 35

FOR SANDY RIVER AND RANGELY LAKES R. R.

RTL

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1 WIDTH OVER CAB MAY BE 7' 6".
WIDTH OVER CYLINDERS MAY BE 7' 8".

2 MR. P. M. HASSET, SUPT. MOTIVE POWER, MAINE CENTRAL R. R., PORTLAND, MAINE, IS TO BE NOTIFIED A FEW DAYS IN ADVANCE OF TIME OF SHIPMENT OF LOCO. SO THAT HE OR HIS REPRESENTATIVE, CAN COME HERE TO INSPECT LOCOMOTIVE WHEN IT IS SUBSTANTIALLY COMPLETE. MR. F. WOOLLYEN IS TO BE NOTIFIED FOUR DAYS IN ADVANCE OF COMPLETION OF LOCO SO HE CAN TELEGRAPH FOR MR. HASSET TO COME HERE. Stalg

3 FURNISH SET O. PERING. TOOLS. (SEE ALSO SUP. 103)

4 FACES OF TIRES, EDGES OF RUNNING BOARDS, AND PARTS OF MACHINERY OUTSIDE OF FRAMES, WHICH ARE USUALLY POLISHED, TO BE PAINTED LEAD COLOR.

5 STAYBOLTS TO BE SPACED NOT OVER 4" CENTER TO CENTER.
WATER SPACE AND RADIAL STAYS TO HAVE WHITWORTH THREADS.
THREE FRONT ROWS OF CROWN STAYS TO BE TATE FLEXIBLE BOLTS.

6 THROTTLE STAND PIPE TO BE SO CONNECTED TO DRY PIPE THAT IT CAN BE READILY REMOVED TO PERMIT INTERNAL INSPECTION OF BOILER.

7 SMOKE BOX FRONT AND DOOR OF CAST IRON.

8 SPARK HOPPER TO BE APPLIED ON BOTTOM OF EXTENSION WITH ARRANGEMENT FOR BLOWING OUT CYLINDERS WITH WATER TAKEN FROM BARREL OF BOILER.

9 ADJUSTABLE DEFLECTING PLATES TO BE PLACED BACK OF STEAM PIPE.

10 SAFETY VALVES TO HAVE 2" PIPE TAP AND TO BE APPLIED IN DOME CAP.

11 STEAM GAUGE TO BE GRADUATED TO 350 POUNDS.
STEAM GAUGE VALVE TO BE HANCOCK.

12 HANCOCK VALVE TO BE APPLIED IN TOP OF BOILER, BACK OF DOME, FOR ATTACHMENT OF TEST GAUGE.

13 WATER GAUGE TO BE HANLON BULL'S EYE TYPE, MADE BY F. J. HANLON CO., FLITCHBURG, MASS.

14 GAUGE COCKS AS M. C. TRACING 920.

15 STEAM GAUGE AND WATER GAUGE LAMPS TO BE B.L.W. PATTERN. 4-1-19.

16 LUBR. STEAM VALVE TO BE HANCOCK.

17 INJECTOR STARTING VALVE TO BE HANCOCK.

18 INJECTOR CHECK TO BE LOCATED IN TOP OF BOILER NEAR FRONT TUBE SHEET.

19 STEAM TURRET OF BRASS, IN CAB.

20 CAB SEATS TO HAVE CANVASS COVERED CUSHIONS.
ARM RESTS FOR ENGINEER AND FIREMAN.

21 COUPLER POCKET OF MALLEABLE IRON BOLTED TO BUMPER.

22 SIGNAL LAMP BRACKET ON SMOKE BOX AS M. C. TRACING 2324, AND ON BUMPER AS M. C. TRACING 3032.

23 HEADLIGHT EQUIPMENT TO BE PYLE NATIONAL ELECTRIC, TYPE "K-2" WITH INCANDESCENT HEADLIGHT.

26 PEDESTAL BINDERS TO BE ADJUSTABLE TYPE.

27 CYLINDER COCKS OF MALLEABLE IRON WITH FORGED STEEL DROPS AS RY. CO.'S TRACING 2363. CYLINDER COCKS TO BE OPERATED FROM CAB.

28 ONE VACUUM VALVE ON EACH STEAM CHEST.

29 GUIDES TO BE BOLTED TO GUIDE YOKE.

30 GUIDE OIL CUPS AS RY. CO.'S TRACING 2752.

31 MAIN AND SIDE RODS OF HAMMERED OPEN HEARTH STEEL, RECTANGULAR SECTION.
FRONT END OF MAIN RODS TO BE SOLID WITH ADJUSTABLE BRASSES.
BACK END OF MAIN RODS TO HAVE STRAP, WITH WEDGE ADJUSTABLE FOR BRASSES.
PARALLEL RODS TO HAVE SOLID ENDS.
SIDE RODS TO BE FITTED WITH BRONZE BUSHINGS.

32 RODS TO BE FITTED WITH GREASE CUPS FORGED ON AS RY. CO.'S TRACING 2424.

33 LINKS, SLIDING BLOCKS, LIFTING LINKS, PIN, AND ROD JAW OF BEST STEEL OR HAMMERED IRON CASE HARDENED.

34 BACK ENGINE TRUCK TO BE RADIAL TYPE, EQUALIZED WITH DRIVERS.

35 AIR PUMP THROTTLE TO BE HANCOCK.

101 TANK TO BE WATER LEG TYPE, WELL STAYED AND EQUIPED WITH SPLASH PLATES. OMIT COLLAR BACK OF COAL BOARD.

102 TANK VALVES TO BE AS M. C. TRACING 3087.

103 TOOL BOX ON TENDER BACK OF COAL SPACE TO CONTAIN:-

TWO BLOCKS FOR MAIN PIN	ONE SLEDGE
TWO CROSSHEAD BLOCKS	20 FEET OF BELL CORD
TWO OAK WEDGES	ONE FRONT ENGINE TRUCK BRASS
ONE PINCH BAR	ONE BACK ENGINE TRUCK BRASS
TWO ENGINE CHAINS	ONE TENDER TRUCK BRASS

104 SIGNAL LAMP BRACKETS ON REAR OF TENDER AS PER M. C. TRACING 3032.

105 COUPLER POCKET OF MALLEABLE IRON BOLTED ON BUMPER.

106 HANDRAIL TO BE APPLIED BACK OF COAL BOARD.

107 TENDER TRUCKS TO BE CONTINUOUS IRON FRAME PEDESTAL TYPE, WITH EQUALIZERS AS B. L. W. CARD 1885.

108 BRAKE BEAMS OF OAK WITH CAST IRON HEADS AS RY. CO.'S TRACING 20095.

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-5398

Memorandum Spec'n 19033

SPECIFICATION FOR LOCOMOTIVES 8 28 D 314

FOR San Luis Southern Ry. Co.

RTL

Gen. as Photo 6208 { Except to have Walschaerts Valve Gear, straight top tank, and to omit rear headlights.

Engine Drawing No. 58

5-28-19

Gauge of Road 4' 8½" Play 3"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 19' 0"
Total wheelbase, eng. and tend. { Actual 1~~81-0~~" (See * next page) / Limited to —

Curves —

Limits, Height — Width —
Weight (approximate) in working order, Total 100,000 pounds
On F. tr'k 15,000 lbs., Drivers 85,000 lbs., B. tr'k — lbs.

Tractive power 19,650 lbs., Ratio of adhesion 4.32
Work'g St'm Pres. 180 lbs., Service Freight
Fuel Soft Coal

Front tube sheet ½" thick.
Boiler Steel Thick 9/16" Bill 8610
Boiler, Diam. 50" 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 5.09
Longitud. seams Butt jointed, double covering strips.
Auxiliary Dome – None
Dome, diam. 29" Pos. Forward of fire box

Firebox Steel Combustion chamb. None
Firebox, length 71 11/16" 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" diam. Sling stays front { Two rows B.L.W. Expansion Stays
Button heads below crown on Right central rows
Crown bars None Placed — above crown
Crown bolts —

Flues —
Tubes #12 W. G. Charcoal Iron or Steel (B.L.W. Option)
Tube ends Swaged for copper ferrules, fire box ends.
Number 180 Diam. 2" Length 10' 2"

Heating Surface	Flues —	Combus. Chamb. —	Total 1093
	Tubes 950	Fire Box 93	Fire Brick Tubes —
Grate area 16.6	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

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

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

Exhaust nozzles Double high

Stack Straight Dia. 15"

Injector equipment to be Pyle National Electric, type "K" with incandescent headlight furnished and applied by Ry. Co. after delivery of Loco. The headlight stand and steam connection for turbine to be provided by The B. L. W.

Safety Valves Two Coale 2½" Open (Not Spec)
Safety valves None with relief lever, Set to 180 pounds
Whistle One 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 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 Monitor (No. Spec) No. 7
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Steel Feed Steel Overflow Steel
Check B. L. W. Pos. R. and L.

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"

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 r. 33½"
Coupler M. C. B. Auto.

Signal fixtures Iron on bumper

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 Two Diam. 28" Body Iron painted Pipes Iron
(No. Spec) Each air. Trap A-1 in each box, to sand front and back

Dome casing Iron painted

Boiler Jacket #22 Soft Steel, Bands Iron Style 4
Boiler Lagging Magnesia Sectional

THE BALDWIN LOCOMOTIVE WORKS

W. Conklin August-1919.

SPECIFICATION FOR LOCOMOTIVES 8 28 D 314

FOR San Luis Southern Ry. Co.

RTL

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Frames Cast steel

Cylinders, Diam. 17" Stroke 24"
St'm ports, Length 18" Width 1½" Bridges 1"
Exh. ports, Length 18" Width 2½" Valve lead ⅛"
Valve travel 5" Steam lap ¾" Exhaust clearance —
Eccentric crank throw 3-5/16" By-pass valve None
S. F. 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. King type (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, with bearings of cast iron, tinned
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.
For Horsfield Bushes to be Laird Type so side rods can be removed easily. (Chms. App. R.S.M.E. 9.9.19)
All threads on bolts (except stay bolts) to be United States Standard.
All finished movable nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.
Driving wheel hub liners None
Drivers, O. S. Diam. 54" Cen. diam. 48" 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 2½" each side of cen., Cen. pin liners None
Journals, Diam. 6½" 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
Engine Truck Wheel Hub Liners – None

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 Westg. 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 9½" Pos. Left side
Train connections Front and back
Train signal, sch. None
Air reservoirs to have hydrostatic test of 210 pounds.
Do not ship Loco. until financial arrangements are completed; give F. Woollven notice one week in advance of date of shipment, so financial arrangements may be completed.

Tender { See * below Wheeled, Drawing No. —
Weight, with fuel and water, about —

Tank — Gallons. Bill —

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 — *Tender to be omitted as Ry. Co. will provide a tender which is standard in every respect. Tender drawbar 37" above rail, tank platform 48" above rail.
Safety chains —
Brake Position —
Brake sch. — Suitable back bumper and rear drawhead to be ordered on Extra Order No. 6209, dated 7-30-19, for use in shipping engine to destination, no charge.

List of tools, sch. 26
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 7-14-19 Shipment On own wheels (See * above)

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

Patents { B. L. W. Feed Water Strainer – Pat'd Sept. 1, 1903 (Cast on)

Property plates B. L. W. for engine

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

Mark on cab panels, S. L. S. Ry.

Road Nos. Pos. Road Nos. Name None
F. No. Plate 102
F. Sand Box

Actual Dimensions of Loco. Extreme height over all 13' 3⅞"
Extreme Width: Cab boards 9' 3" Cylinders or valve motion 9' 9⅜"
Length outside face front bumper of engine to face of tender wedge 27' 3"
Length face of tender wedge to outside face back bumper of tender (See * above)
Total length outside face front bumper of engine to outside face back bumper of tender (See * above)

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-5718

Memorandum Spec'n 19022

SPECIFICATION FOR LOCOMOTIVES 10 22 0 91

FOR SAVANNAH AND SOUTHERN RAILWAY.

RTL

4-26-19.

Gen. as PHOTO 14973, EXCEPT LAIRD GUIDES.

Engine Drawing No. 17

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 9' 2" Driving 9' 2" Total 18' 6"
Total wheelbase, eng. and tend. { Actual 42' 8" / Limited to ---

Curves ---
RAILS 30 POUNDS
Limits, Height --- Width ---
Weight (approximate) in working order, Total 82,000 POUNDS
On F. tr'k 23,000 lbs., Drivers 59,000 lbs., B. tr'k --- lbs.
IMPORTANT TO KEEP WEIGHT DOWN TO SPECIFICATION.
Tractive power 13200 lbs. Ratio of adhesion 4.47
Work'g St'm Pres. 180 lbs., Service PASSENGER AND FREIGHT
Fuel COAL

FRONT TUBE SHEET TO BE ½" THICK.
Boiler STEEL Thick ½" Bill 8535
Boiler, Diam. 46" 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 4.5
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS.
DOME PRESSED OUT IN ONE PIECE.
Dome, diam. 25" Pos. FORWARD OF FIRE BOX.

Firebox STEEL Combustion chamb. NONE
Firebox, length 52 3/16" Width 42⅜" Depth F. 49" B. 48"
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" DIAM. Sling stays front { TWO ROWS B.L.W. EXPANSION STAYS
Button heads below crown on SIX central rows
Crown bars NONE Placed --- above crown
Crown bolts ---

Flues ---
Tubes 112 W. G. CHARCOAL IRON OR STEEL (B. L. W. OPTION)
Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.
Number 132 Diam. 2" Length 11' 6"

Heating Surface	Flues ---	Combus. Chamb. ---	Total	856⁰
	Tubes 789⁰	Fire Box 67⁰	Fire Brick Tubes ---	
Grate area 15.3⁰	Ratio to Heating Surface 1 : 56			
Superheater ---				

Fire Brick ARCH NONE

Grates ROCKING BARS AND DROP PLATE
Ash Pan, Dampers FRONT

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 nozzle DOUBLE HIGH

Stack STRAIGHT Dia. 14"

Safety Valves TWO STAR 2" (Spec)
Safety valves NONE with relief lever, Set to 180 POUNDS
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
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 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 "M" (Spec) No. 6½
Injectors, Pos. R. AND L. Steam pipes COPPER
Pipes, Check STEEL Feed STEEL Overflow STEEL
Check SELLERS COMBINED MAIN CHECK AND STOP VALVE. POS. R. AND L.

Steam Heat ~~CONSOLIDATED~~ GOLD 4-26-19 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 27½"

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.

Signal fixtures IRON ON BUMPER
HEADLIGHT EQUIPMENT TO BE PYLE NATIONAL ELECTRIC, TYPE "K-2" WITH INCANDESCENT HEADLIGHT. HEADLIGHT CASE TO BE DRESSEL.
Headlight ONE ROUND CASE 18" Reflector,
Headlight, Nos. on sides WITH H'dl't step WITH
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 18 SOFT STEEL PTD Bands IRON Style 9
Boiler Lagging MAGNESIA SECTIONAL

THE BALDWIN LOCOMOTIVE WORKS

C. WAGNER July 1919.

SPECIFICATION FOR LOCOMOTIVES 10 22 0 91

FOR SAVANNAH AND SOUTHERN RAILWAY.

RTL

98

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 ⅛"
Valve travel 4½" Steam lap ¾" Exhaust clearance ---
Eccentric crank throw 9" By-pass valve NONE
S. F. Lubr. DETROIT TRIPLE No. 22 BULL'S EYE (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 ROD / VALVE STEMS } U. S. KING TYPE (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, WITH BEARINGS OF CAST IRON, TINNED.
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 WITHOUT HUB LINERS.
Drivers, O. S. Diam. 50" Cen. diam. 44" CENTERS CAST IRON

Tires STEEL Held by SHRINK 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. 6" Length 8"

Springs. Make B. L. W.

Front Engine Truck FOUR Wheeled SWING BOLSTER, CENTER 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 PLATE
Tires NONE Cen. diam. --- Size ---
Tires held by ---
ENGINE TRUCK WHEEL HUB LINERS – NONE.
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 WESTG. COMBINED AUTO. AND / Eng. Tr'k, sch. - - STRAIGHT AIR
Foundation Parts { Drivers, sch. AM-1 AMERICAN O.S. EQUALIZED / Eng. Tr'k, sch. ---
Air pump ONE 9½" Pos. L. S.
Train connections FRONT AND BACK
Train signal, sch. L
AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

Tender EIGHT Wheeled, Drawing No. 1392
Weight, with fuel and water, about 50,000 POUNDS

Tank 2500 Gallons, Bill 4833
TANK "U" SHAPE, STRAIGHT TOP. FUEL CAPACITY 5 TONS

Tool Boxes STEEL, TOP

Frame STEEL 6" & 8" CHANNELS, WITH BUMPERS OF WOOD.

Front Drawbar height 29½"
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 BOLSTERS.

Springs ELLIPTIC – B. L. W.
Journals, Diam. 3½" Length 7"
Wheels, Diam. 28" 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 WESTG. AUTO. AND STRAIGHT AIR, WITH 8" x 12" TENDER CYLINDERS.

List of tools, sch. 26
Photo sch. ~~2~~ 3 7-24-19 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 6-1-19 Shipment ON OWN WHEELS

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

B. L. W. Patents { FEED WATER STRAINER, PAT'D SEPTEMBER 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, SA. & SD. RY.
Mark on TANK SIDES, SAVANNAH & SOUTHERN RY.

Road Nos. Pos. Road Nos. Name NONE
F. No. PLATE 105
F. SAND BOX
BACK OF TANK

Actual Dimensions of Loco. Extreme height over all 12' 8"
Extreme Width: Cab boards 8' 7" Cylinders ~~exhaust motion~~ 9' 4"
Length outside face front bumper of engine to face of tender wedge 25' 0⅛"
Length face of tender wedge to outside face back bumper of tender 21' 3⅞"
Total length outside face front bumper of engine to outside face back bumper of tender 47' 3⅝"

THE BALDWIN LOCOMOTIVE WORKS As Specn. 0-5631

Memorandum Spec'n 19045

SPECIFICATION FOR LOCOMOTIVES 12 30 ½ E 47

FOR Sewell Valley Railroad Co.

P

Gen as Photo. 5511

Engine Drawing No. 8

8-27-19

Gauge of Road 4' 8½" Play ½"

Wheelbase, Rigid 12' 1" Driving 12' 1" Total 27' 3"

Total wheelbase, eng. and tend. { Actual 47' 4½" / Limited to ---

Rails - 70 pounds

Curves 30 degrees

Grades - 3% - 4% - 5.3%

Limits, Height --- Width ---

Weight (approximate) in working order. Total 144,000 pounds

On F. tr'k 16,000 lbs., Drivers 113,000 lbs., B. tr'k 15,000 lbs.

Tractive power 27,000 lbs., Ratio of adhesion 4.2

Work'g St'm Pres. 180 lbs., Service Passenger

Fuel Soft Coal

Front Tube Sheet ½" thick

Boiler Steel Thick 1 1/16" Bill 8815

Boiler, Diam. 70" Plan Straight Top

Boiler st'm pres. 200 lbs., Tested to 220 lbs. steam pres.
With Factor of Safety of 4.87 287 lbs. water pres.

Longitud. seams Butt jointed, double covering strips, 90% seams.

Dome, diam. 33" Pos. Central

Auxiliary Dome - None

Firebox Steel Combustion chamb. None

Firebox, length 89-1 1/16" Width 41" Depth F. 68" B. 59½"

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 5"

Water space, Frame Double Riveted

Water space stays ⅝" diam. with 3/16" holes 1½" deep from O.S. { Three rows B. L. W. / Expansion Stays

Radial stays 1" diam. Sling stays front

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 (B.L.W. Option)

Tube ends Swaged for copper ferrules, fire box ends.

Number 291 Diam. 2" Length 13' 0"

Heating Surface | Flues --- Combus. Chamb. --- Total 2110⁰

Tubes 1968⁰ Fire Box 142⁰ Fire Brick Tubes ---

Grate area 25.5⁰ Ratio to Heating Surface 1 : 82.8

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 arrester hopper With

Netting and deflect. plates With

Exhaust nozzles Double, High

Stack Straight Dia. 18"

Safety Valves Two Coale 3" open (No. Spec)

Safety valves None with relief lever, Set to 180 pounds

Whistle One B. L. W. Plain

Steam Gauge One Iron 7" Maker: Ashcroft (No. 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: Front

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

Pump None Pos. ---

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

Feed Cock --- Feed pipes ---

Checks --- Check pipes ---

Injectors Two Sellers, Non-Lifting (Spec) 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 With (Make Insp'n)

Cab 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 35½"

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.

Signal fixtures Iron on Bumper

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 32 pounds

Sand Box Two Diam. 31" 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 Soft Steel Pld. Iron Style 9

Boiler Lagging Magnesia Sectional

THE BALDWIN LOCOMOTIVE WORKS

M. Garner Aug. 1919.

SPECIFICATION FOR LOCOMOTIVES 12 30 ½ E 47

FOR Sewell Valley Railroad Co.

100

100

Frames Cast Steel

Cylinders, Diam. 18" Stroke 24"

St'm ports, Length 16" Width 1½" Bridges 1"

Exh. ports, Length 16" Width 2½" Valve lead ⅛"

Valve travel 5" Steam lap 13/16" Exhaust clearance ---

Eccentric crank throw 9-15/16" By-pass valve None

S. F. Lubr. Michigan Triple Bull's Eye (No. 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 Balanced, with Vacuum Valves

Met. pkg (Piston rods / Valve stems) United States. King Type (No. Spec)

Pistons Cast Iron. Rings sprung into solid head

Guides Steel Oil cups Needle

Crossheads Cast Steel, with bearings of cast iron, tinned

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.

Two sets of Collin's Flange Lubricators to be applied, one set for front drivers, and one set for back drivers

Wearing Bearings B. L. W.

Driving Wheel hub liners - None

Drivers, O. S. Diam. 44" Cen. diam. 38" Centers cast iron

Tires Steel Held by Shrinkage and shoulder

Tires, Flanged, Pos. Front and Main back Size 3" x 5½"

Tires, Plain, Pos. Intermediate (Second) Size 3" x 6½"

Lateral play between driving boxes and wheel hubs - 1/16" total

Driving Boxes Steeled cast iron

Journals, Diam. 7½" Length 8"

Springs. Make B. L. W.

Front Engine Truck Two Wheeled Swing Bolster, Center Bearing

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

Journals, Diam. 4½" Length 7½" 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

Wheel hub liners - None

Back Engine Truck Two Wheeled Swing bolster, side bearing

To swing 5" each side of cen., Cen. pin liners None

Journals, Diam. 4½" Length 7½" 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

Wheel hub liners - None

Brake, position On all driving and tender wheels

Operating Parts: Engine, Sch. No. 8-ET Westg. Combined Auto. and Straight Air

Eng. Tr'k. sch. ---

Foundation Parts: Drivers, sch. 28-I American O.S. Equalized

Eng. Tr'k. sch. ---

Air pump One 11" Pos. Left Side

Train connections Front and Back

Train signal, sch. L

Air reservoirs to have extra large capacity.

Air reservoir to have hydrostatic test of 210 pounds.

Tender Eight Wheeled, Drawing No. 1413.

Weight, with fuel and water, about 70,000 pounds

Tank 3,500 Gallons. Bill 4885

Tank "U" shape, Straight top. Fuel capacity 6 tons.

Tool Boxes Hard Wood, Top

Frame Steel, 6" and 8" channels, with bumpers of wood and steel plate.

Front Drawbar height 31½"

Pilot None See to 1000 or 1020 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 bolsters.

Springs Elliptic, B. L. W.

Journals, Diam. 4½" Length 8"

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. No. 8-ET Westinghouse Auto. and straight air, with 10" x 12" tender cylinder.

~~F. Woollven to be advised when engine is in Erecting Shop, and practically completed, so H. Raine, President of the Railroad, may come here to inspect engine.~~

List of tools, sch. 29 One pair of wrecking frogs

Photo sch. No. 2 Inspection B. L. W. (See ☆ above)

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

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

Junior laws to 8-1-19 Shipment On own wheels

★ Do not fail to get photo of this loco.

Brass shop finish, No. 1

Machine shop finish D-165

B. L. W. Feed Water Strainer, Patented Sept. 1, 1903 (Cast on)

Patents Rear End Susp. Truck, 1035029, Patd. 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 tank sides, Sewell Valley Railroad

	Road Nos. Pos.	Road Nos.	Name
F. No. Plate		6	
F. Sand Box			
Cab Panel			
Back of Tank			

Actual Dimensions of Loco. Extreme height over all 13' 8½"

Extreme Width: Cab boards 10' 0" Cylinders --- 9' 9½"

Length outside face front bumper of engine to face of tender wedge 32' 8½"

Length face of tender wedge to outside face back bumper of tender 20' 2"

Total length outside face front bumper

THE BALDWIN LOCOMOTIVE WORKS 0-5832

Memorandum Spec'n 19066

SPECIFICATION FOR LOCOMOTIVES 12 34 ½ E 55

FOR SEWELL VALLEY RAILROAD CO.

RTL

Gen. as PHOTO 5371

Engine Drawing No. 15

10-13-19.

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 13' 1" Driving 13' 1" Total 27' 0"
Total wheelbase, eng. and tend. {Actual 52' 0" {Limited to ---

Curves 30 DEGREES
GRADES 3%, 4%, 5.3%. RAILS 70 POUNDS.
Limits, Height --- Width ---
Weight (approximate) in working order, Total 179,000 POUNDS
On F. tr'k 15,500 lbs., Drivers 141,500 lbs., B. tr'k 22,000 lbs.

Tractive power 33,300 lbs., Ratio of adhesion 4.2
Work'g St'm Pres. 160 lbs., Service FREIGHT
Fuel SOFT COAL

Boiler STEEL Thick ¾" Bill 8741
Front Tube Sheet ½" Thick
Boiler, Diam. 74" Plan STRAIGHT TOP
{Allowable st'm pres. 200 lbs. **Tested to** {220 lbs. steam pres.
{With Factor of Safety of 4.6 {267 lbs. water pres.
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS.
AUXILIARY DOME - NONE
Dome, diam. 33" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE
Firebox, length 90 3/16" Width 66⅜ Depth F. 68¼" B. 62½"
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
Water space stays ⅞" DIAM. WITH 3/16" HOLES 1½" DEEP FROM O.S.
Radial stays 1" DIAM. Sling stays front {THREE ROWS 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 (B. L. W. OPTION) (To use stock)
Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.
Number 350 Diam. 2" Length 16' 6"

Heating Surface {Flues --- Combus. Chamb. --- Total 3191.0
{Tubes 3009.0 Fire Box 158.0 Fire Brick Tubes 24.0
Grate area 41.3 Ratio to Heating Surface 1: 77.4
Superheater ---

Fire Brick ARCH - AMERICAN ARCH CO.'S SECURITY ARCH ON FOUR TUBES, 3" DIAM. #7 W. G.

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 SINGLE HIGH

Stack STRAIGHT Dia. 18"

Safety Valves TWO COALE 3½" OPEN (Not Spec)
Safety valves NONE with relief lever, Set to 160 POUNDS
Whistle ONE (SEE SUP. 2)

Steam Gauge ONE IRON 7" MAKER: ASHCROFT (Not Spec)
Steam gauge stand IRON **Clock** NONE

Water Gauge ONE (SEE SUP. 3) **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, SIDES AND BACK
Crown, TWO EACH SIDE AND FOUR BACK
Waist, ONE UNDER FRONT
Front tube sheet. TWO Fusible plug ONE

Pump NONE

Injectors TWO SELLERS NON-LIFTING (Spec) 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 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"

4 **Pilot** WOOD Pushing shoes CAST IN BUMPER
Front Bumper CAST STEEL Bumper plate WITH
5 **Steps,** HAND HOLDS, ETC., TO CONFORM TO I.C.C. REQUIREMENTS.

Front Drawhead, Center above rail 33½"
Coupler M. C. B. AUTO. WITH SPRING DRAFT RIGGING.

Signal fixtures IRON ON BUMPER
HEADLIGHT EQUIPMENT TO BE PYLE NATIONAL ELECTRIC, TYPE "K-2" WITH INCANDESCENT HEADLIGHTS.
Headlight TWO ROUND CASE 18" Reflector,
Headlight, Nos. on sides WITH H'dl't step WITH
Lamp shelf NONE Nosing ---

Bell 92 POUNDS
1 **Sand Box** TWO Diam. 31" Body IRON PAINTED Pipes IRON
(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 PTD. Bands IRON Style 9 AND 14
Boiler Lagging MAGNESIA SECTIONAL
9 BACK HEAD OF BOILER TO BE LAGGED AND JACKETED.

THE BALDWIN LOCOMOTIVE WORKS

C. WAGNER Nov. 1919.
SPECIFICATION FOR LOCOMOTIVES 12 34 ½ E 55 102 102

FOR SEWELL VALLEY RAILROAD CO.
RTL

Frames CAST STEEL

Cylinders, Diam. 20½" Stroke 28"
St'm ports, Length 18" W. 1⅞" Bridges 1⅜"
Exh. ports, Length 18" W. 3" Valve lead ⅛"
Valve travel 5¼" Steam lap 1" Exhaust clearance ---
Eccentric crank throw 11-7/16" By-pass valve NONE
S. F. Lubr. MICHIGAN THREE FEED 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. UNITED STATES, KING TYPE (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, WITH BEARINGS OF CAST IRON, TINNED.
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 wheel hub liners NONE
Drivers, O. S. Diam. 48" Cen. diam. 42" CENTERS CAST IRON

9 **Tires** STEEL Held by SHRINKAGE AND SHOULDER
10 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 = ⅛" TOTAL
Driving Boxes STEEL & CAST IRON
Journals, Diam {MAIN 9" Length 10"
{OTHERS 8½"

Springs. Make B. L. W.

Front Engine Truck TWO Wheeled SWING BOLSTER, CENTER BEARING
To swing 4⅝" each side of cen. Cen. pin liners NONE
Journals, Diam. 6" Length 10" Boxes CAST IRON
Wheel hub liners NONE
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 RUSHTON, INSIDE BEARING
To swing 4" each side of cen., Cen. pin liners NONE
Journals, Diam. 6" Length 10" Boxes CAST IRON
Wheel hub liners NONE
Wheels, Diam. 36" Tread --- Kind CAST IRON SPOKE CENTERS
Tires STEEL Cen. diam. 31" 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 WESTG. COMBINED AUTO. AND STRAIGHT AIR
{Eng. Trk., sch. ---
Foundation Parts {Drivers, sch. WH-2 AMERICAN O.S. EQUALIZED
{Eng. Trk., sch. ---
Air pump ONE 11" Pos. L. S.
Train connections FRONT AND BACK
Train signal, sch. L
AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

Tender EIGHT Wheeled, Drawing No. 1459
Weight, with fuel and water, about 80,000 POUNDS

Tank 4,000 Gallons Slit 5040
TANK "U" SHAPE, STRAIGHT TOP. FUEL CAPACITY 6½ TONS

Tool Boxes HARD WOOD, TOP

Frame STEEL 8" AND 10" CHANNELS, WITH BUMPERS OF WOOD RE-INFORCED WITH STEEL PLATE.
Front Drawbar height 30½" EEN-10/25/20
Pilot OF WOOD AT REAR Pushing shoes NONE
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.

Trucks ARCH BAR TYPE WITH CAST STEEL BOLSTERS

Springs ELLIPTIC - B. L. W.
Journals, Diam. 4¼" Length 8"
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 WESTG. AUTO. AND STRAIGHT AIR WITH 10" x 12" TENDER CYLINDER.

List of tools, sch. 29 ONE PAIR WRECKING FROGS.
Photo sch. No. 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 taws to 10-18-19 Shipment ON OWN WHEELS (SEE SUP. 11)

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

1 **Patents** FEED WATER STRAINER, PATENTED SEPTEMBER 1, 1903 (CAST ON)

Property plates NONE

Painting, style 291 OLIVE GREEN AND ALUMINUM

LETTERING, ETC., TO BE SAME AS FOR 12 30 ½ E 47.
Mark on TANK SIDES, SEWELL VALLEY RAILROAD

Road Nos. Pos. Road Nos. Name NONE
F. No. PLATE 7
F. SAND BOX
CAB PANEL
BACK OF TANK

1 **Actual Dimensions of Loco.** Extreme height over all 15' 9"
Extreme Width: Cab boards 10' 3" Cylinders or valve motion 10' 0"
Length outside face front bumper of engine to face of tender wedge 36' 10⅛"
Length face of tender wedge to outside face back bumper of tender 20' 7⅞"
Total length outside face front bumper of engine to outside face back bumper of tender 57' 6"

SPECIFICATION FOR LOCOMOTIVES 12 3¼ ½ E 55

FOR SEWELL VALLEY RAILROAD COMPANY.

RTL

103

1 TOTAL DISTANCE FROM FRONT BUMPER ON ENGINE TO BACK BUMPER ON TENDER - 57' 6".

2 WHISTLE MUST HAVE LOUD COARSE TONE, PREFERABLY CHIME.

3 WATER GAUGE TO BE NATHAN, KLINGER TYPE.

4 PILOT TO BE SIMILAR TO 12 30 ½ E 47.

~~5 STEPS TO BE PROVIDED ALONG THE BOTTOM EDGE OF THE PILOT ON BOTH SIDES.~~ N.S. 11-25-20.

6 STEPS AT FRONT END TO BE AT LEAST 4" LOWER THAN FOR 12 30 ½ E 47, I. E., NOT MORE THAN 10" ABOVE TOP OF RAIL (INSTEAD OF 14").

7 SAND PIPES TO BE LOCATED TO CLEAR BRAKE RIGGING WHEN THE BRAKES ARE APPLIED.

8 BACK HEAD JACKET PREFERABLY OF POLISHED STEEL.

9 TWO SETS OF COLLIN'S FLANGE LUBRICATORS TO BE APPLIED, ONE SET FOR FRONT DRIVERS AND ONE SET FOR BACK DRIVERS. GRAPHITE STICKS TO BE FURNISHED WITH THE LUBRICATORS.

10 TWO MIDDLE PAIRS OF DRIVERS MUST HAVE PLAIN TIRES.

11 EXTRAS FURNISHED ON EXTRA ORDER 9713 DATED 10-31-19 TO BE SHIPPED WITH LOCOS.

THE BALDWIN LOCOMOTIVE WORKS Dup. 10-26½ D 146, with same extras except as otherwise specified.

Memorandum Spec'n 11241

SPECIFICATION FOR LOCOMOTIVES 10 26½ D 147.

FOR Texas, Oklahoma & Eastern Railroad Company.

L.

Gen. as Photo. 6455.

Engine Drawing No. 38.

2-3-17.

Gauge of Road 4' 8½" Play ¾"
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 pounds.
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.
Fuel Coal. (Omit all oil burning parts.)

Front tube sheet to be ½" thick.

6 **Boiler** Steel. Thick ½" & 9/16" Bill 8089.
Boiler, Diam. 52" Plan Extended Wagon Top.
Boiler st'm pres. 180 lbs., Tested to 200 lbs. steam pres.
with factor of safety of 4.92 240 lbs. water pres.
Longitud. seams Butt jointed, double covering strips.

Dome, diam. 29" Pos. Forward of fire box.

1 **Firebox** Steel. Combustion chamb. None
Firebox, length 54 3/4" Width 54 1/4" Depth F. 59" B. 53½"
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 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.
2 Tube ends Swaged for copper ferrules, fire box ends.
Number 178 Diam. 2" Length 14' 9"

Heating Surface	Flues ----	Combus. Chamb. ----	Total 1466[sq]		
	Tubes 1367[sq]	Fire Box 88[sq]	Fire Brick Tubes 11[sq]		
Grate area 20.6[sq]	Ratio to Heating Surface 1 : 71.2				
Superheater --------					

Fire Brick Arch, to be Security on three tubes of seamless steel, 3" O.S. diameter, 3/16" thick.

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
Blast Straight Dia. 16" Hole in S. B. dia. 18"

Safety Valves Two Crosby 2½" (spec)
Safety valves None with relief lever, Set to 180 pounds.
Whistle B. L. W. Plain.

6 **Steam Gauge** One Iron 7" MAKER:- Ashcroft. (spec)
Steam gauge stand Iron. **Clock** None

Water Gauge One B.L.W. (Ironclad) **Cab Lamps** Electric (sup.s)
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 Bridle, POS:- Front.
Cleaning Plugs
Firebox Corners 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 self action type suitable for hot water.
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., with stop valve. Pos. Right and Left.

Steam Heat None

14 **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.

5 **Back Bumper** Bar Steel. Back drawbar height 34"

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

6 **Front Drawhead,** Center above rail 33½"
Coupler Sharon M. C. B. Auto. with 13" face.

Signal fixtures Iron on bumper.

7 **Headlight** Two Round Case 18" Reflector,
Headlight, Nos. on sides With H'dl't step None
Lamp shelf None Nosing ----

Bell 85 pounds.
Sand Box Two Diam. 28" Body Iron Painted Pipes Iron
9 (Spec) Sanders Leach Air Trap A-1, to sand front and back.

Dome casing Iron Painted.

4 **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

W. E. Moore Dec Aug 1917.

SPECIFICATION FOR LOCOMOTIVES 10 26¼ D 147.

FOR Texas, Oklahoma & Eastern Railroad Company.

L.

105

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 Pto. Head covers Steel Painted.
St'm chest casings Iron Pto. 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.

10 **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 stayboltsi 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. None 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"

12 **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
11 Journals, Diam. 4½" Length 7½" Boxes Cast Iron.
Wheels, Diam. 28" Tread 4½" Kind Chilled cast iron plate.
Tires None Cen. diam. ---- Size ------
Tires held by ------
Front Engine Truck Wheels without hub liners
Back Engine Truck Two Wheeled Swing bolster, side bearing.
13 To swing 5½" each side of cen., Cen. pin liners None
11 Journals, Diam. 4½" Length 7½" Boxes Cast Iron.
Wheels, Diam. 28" Tread 4½" Kind Chilled cast iron plate.
Tires None Cen. diam. --- Size ----
Tires held by ------
Back Engine Truck Wheels without hub liners.

Brake, position On all driving and tender wheels.
Operating Engine, Sch. No. 6-ET, West'g. Combined Auto. and
Parts Eng. Tr'k, sch. ---- Straight Air.
Foundation Drivers, sch. WM-1 American Outside Equalized.
Parts 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.

26 **Tender** Eight Wheeled, Drawing No. 724
Weight, with fuel and water, about 60,000 pounds.

27 **Tank** 3000 Gallons, Bill 4427
Tank "U" shape, straight top, Fuel Capacity 6 Tons.

Tool Boxes Hard wood, Top and back.

Frame Steel 8" channels.

29 Front Drawbar height 31"
30 Pilot None Pushing shoes None
Back drawhead, center above rail 33½"
6 **Coupler** Sharon M. C. B. Auto. with 13" face.

6 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. 3½" Length 7"
Wheels, Diam. 33" Tread 4¼" Kind Chilled cast iron plate
Tires None Cen. diam. --- Size ---
Tires held by -----
Safety chains Double.

32 **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. 26. 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 8-1-17 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.

Mark on tank sides, D. Q. & E.

Road Nos. Pos. Road Nos. Name None
F. No. Plate 208
Dome
Cab Sides.
Back of tank.

SPECIFICATION FOR LOCOMOTIVES 10 26 ½ D 147.

FOR TEXAS, OKLAHOMA & EASTERN RAILROAD COMPANY.

L.

106

1. FIRE BOX TO BE PLACED ON TOP OF FRAMES.

2. TUBES TO BE LENGTHENED SO THAT THROAT SHEET WILL CLEAR THE SPRINGS OVER THE BACK PAIR OF DRIVING WHEELS.

3. INCANDESCENT LIGHTS TO BE PROVIDED IN CAB FOR GAUGES AND FIREDECK.

4. 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)

5. 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)

6. LOCOMOTIVE TO CONFORM TO ALL I. C. C. REQUIREMENTS FOR BOTH SWITCHING AND ROAD SERVICE.

7. HEADLIGHT EQUIPMENT TO BE AMERICAN (SAME AS REMY) ELECTRIC WITH INCANDESCENT HEADLIGHTS.

8. SAND PIPES TO BE LARGE, SAME AS FOR 10-26 ½ D 107 AND 111.

9. 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 TO BE READILY REMOVABLE FOR INSPECTION OF STAY BOLTS.

10. VALVE GEAR TO BE DESIGNED TO GIVE MAXIMUM CLEARANCE ABOVE RAIL AND TO BE COMPACT AS POSSIBLE.

11. FRONT AND BACK TRUCK JOURNALS TO BE EQUIPPED FOR OIL INSTEAD OF FOR GREASE LUBRICATORS.

12. 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.

T E N D E R.

26. TENDER TO BE SAME SHAPE AS FOR 10 26 ½ D 107, 110 AND 111, AND TO BE DUPLICATE OF 10 26 ½ D 111, EXCEPT AS OTHERWISE SPECIFIED.

27. SYPHON TO BE MADE BY LIMA LOCOMOTIVE & MACHINERY CO., HAVING 4" SECTION (MY. 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 (SUP. 4)

28. McLAUGHLIN FLEXIBLE METALLIC CONNECTION BETWEEN ENGINE AND STEAM SYPHON LOCATED ON TENDER. (SEE SUP. 4)

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. 5)

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.

THE BALDWIN LOCOMOTIVE WORKS Air Specn. C-527

Memorandum Spec'n 19060

SPECIFICATION FOR LOCOMOTIVES 10 28 & D 142, 143

FOR UNADILLA VALLEY RAILWAY COMPANY

P

Gen. as PHOTO. 5829

Engine Drawing No. 26

8-20-19

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 10' 3" Driving 10' 3" Total 26' 10"
Total wheelbase, eng. and tend. { Actual 46' 10" / Limited to ---

TRACK OF LIGHT CONSTRUCTION RUNNING THROUGH BOGGY GROUND.
Curves SLIGHT GRADES A LITTLE LESS THAN 2%
RAILS 56 AND 70 POUNDS PER YARD, LAID ON ROAD BED OF GRAVEL
Limits, Height --- Width ---
Weight (approximate) in working order, Total 122,000 POUNDS
On F. tr'k 12,500 lbs., Drivers 94,000 lbs., B. tr'k 15,500 lbs.

Tractive power 22,100 lbs., Ratio of adhesion 4.25
Work'g St'm Pres. 165 lbs., Service FREIGHT
Fuel SOFT COAL

FRONT TUBE SHEET ½" THICK
Boiler STEEL Thick 13/16" & 11/16" Bill 8697
Boiler, Diam. 56" Plan EXTENDED WAGON TOP
{ Boiler st'm pres. 180 lbs., Tested to { 200 lbs. steam pres. / WITH FACTOR OF SAFETY OF 5.5 { 240 lbs. water pres.
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS

Dome, diam. 29" Pos. FORWARD OF FIRE BOX
AUXILIARY DOME - NONE
Firebox STEEL Combustion chamb. NONE
Firebox, length 94-3/16" Width 42 1/8" Depth F. 63½" B. 60½"
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. { TWO ROWS B.L.W. / EXPANSION STAYS
Radial stays 1" DIAM. Sling stays front
Button heads below crown on EIGHT 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 200 Diam. 2" Length 14' 9"

Heating Flues --- Combus. Chamb. --- Total 1637
Surface Tubes 1536 Fire Box 101 Fire Brick Tubes ---
Grate area 18.9 Ratio to Heating Surface 1 : 87
Superheater ---

Fire Brick ARCH, ON STUDS.

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 ~~ejector~~ or hopper WITH
Netting and deflect. plates WITH

Exhaust nozzles DOUBLE, HIGH
Stack STRAIGHT Dia. 16"

Safety Valves TWO COALE 2½" (Not Spec)
Safety valves NONE with relief lever, Set to 165 POUNDS
Whistle ONE 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: R. S.
Cleaning Plugs ONE FILLING PLUG IN TOP OF BOILER
Firebox CORNERS, 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 TWO MONITOR (Not Spec) No. 8
Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER
Pipes, Check STEEL Feed STEEL Overflow STEEL
Check B. L. W. Pos R. AND L.

Steam Heat NONE

Cab WOOD. CAB TO HAVE CLEAR VISION WINDOWS.

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 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 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 PTD Bands: BANDS: IRON Style 9
Boiler Lagging PLASTIC MAGNESIA FROM B. L. W. STOCK

THE BALDWIN LOCOMOTIVE WORKS

MRS. BRETNERICK Oct. 1919.

SPECIFICATION FOR LOCOMOTIVES 10 28 & D 142, 143 108

FOR UNADILLA VALLEY RAILWAY COMPANY

P

Frames CAST STEEL

Cylinders, Diam. 17" Stroke 24"
St'm ports, Length 16" Width 1¼" Bridges 1"
Exh. ports, Length 16" Width 2½" Valve lead 3/16"
Valve travel 5" Steam lap ¾" Exhaust clearance ---
Eccentric crank throw 10¾" 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 BALANCED, WITH VACUUM VALVES
Met. pkg. PISTON RODS TWELVE BYLIN UNITED STATES, KING TYPE. (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 WITH BEARINGS OF CAST IRON, TINNED
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 wheel hub liners NONE
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 9"

Springs. Make B. L. W.

Front Engine Truck TWO Wheeled SWING BOLSTER, CENTER BEARING
To swing 4" each side of cen., Cen. pin liners NONE
Journals, Diam. 5" Length 10" Boxes CAST IRON
Wheel hub liners NONE
Wheels, Diam. 26" Tread --- Kind CAST IRON SPOKE CENTERS
Tires STEEL Cen. diam. 21" Size 2½" X 5½"
Tires held by SHRINKAGE AND SHOULDER

Back Engine Truck TWO Wheeled SWING BOLSTER, SIDE BEARING
To swing 4" each side of cen., Cen. pin liners NONE
Journals, Diam. 5" Length 10" Boxes CAST IRON
Wheel hub liners NONE
Wheels, Diam. 26" Tread --- Kind CAST IRON SPOKE CENTERS
Tires STEEL Cen. diam. 21" 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 WESTG. COMBINED AUTO. AND STRAIGHT AIR / Eng. Tr'k, sch. ---
Foundation Parts { Drivers, sch. WA-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 POUNDS

Tender EIGHT Wheeled, Drawing No. 1413
Weight, with fuel and water, about 74,000 POUNDS

Tank 3500 Gallons, Bill 4885
TANK "U" SHAPE. STRAIGHT TOP. FUEL CAPACITY 6 TONS.

Tool Boxes HARD WOOD, TOP

Frame STEEL, 6" AND 8" CHANNELS, WITH BUMPERS OF WOOD, REINFORCED WITH STEEL PLATE.
Front Drawbar height 31 13/16"
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 BOLSTERS

Springs ELLIPTIC B. L. W.
Journals, Diam. 4½" Length 8"
Wheels Diam. 28" 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 Westg. Auto. AND STRAIGHT AIR WITH 10" X 12" TENDER CYLINDER.

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 9-28-19 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 B. L. W., FOR ENGINE AND TENDER

Painting, style 291 OLIVE GREEN AND ALUMINUM
LOCO. TO BE PAINTED A GOOD DURABLE COAT WITH A GOOD WEARING FINISH OF B. L. W. DESIGN AND SELECTION.
Mark on TANK SIDES: UNADILLA VALLEY
MARK ON BACK OF TANK: 3500 GALLONS

	Road Nos.	Name
F. No. PLATE	4	
F. SAND BOX	5	
CAB SIDES		
BACK OF TANK		

Actual Dimensions of Loco. Extreme height over all 14' 2½"
Extreme Width: Cab boards 9' 11"; Cylinders ~~or valve motion~~ = 8' 10"
Length outside face front bumper of engine to face of tender wedge = 32' 0½"
Length face of tender wedge to outside face back bumper of tender = 20' 2½"
Total length outside face front bumper of engine to outside face back bumper of tender = 52' 3"

THE BALDWIN LOCOMOTIVE WORKS DUP. OF S 28 C 919, EXCEPT WHERE OTHERWISE SPECIFIED.

Memorandum Spec'n 19048

SPECIFICATION FOR LOCOMOTIVES S 28 C 958

FOR UNION TRANSPORTATION CO.

Engine Drawing No. 59

7-30-19

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 7' 6" Driving 7' 6" Total 21' 5"
Total wheelbase, eng. and tend. { Actual 45' 10½" / Limited to ---

Curves ---

Limits, Height --- Width ---
Weight (approximate) in working order, Total 96,700 POUNDS
On F. tr'k 31,000 lbs., Drivers 65,000 lbs., B. tr'k --- lbs.

Tractive power 15,200 lbs., Ratio of adhesion 4.27
Work'g St'm Pres. 160 lbs., Service PASSENGER AND FREIGHT
Fuel SOFT COAL

FRONT TUBE SHEET ½" THICK
Boiler STEEL Thick ½" & 9/16" Bill 8625
Boiler, Diam. 52" Plan WAGON TOP
{ Boiler st'm pres. 180 lbs., Tested to { 200 lbs. steam pres. / 240 lbs. water pres. } WITH FACTOR OF SAFETY OF 5.4
Longitud. seams SEXTUPLE RIVETED, BUTT JOINT 90%

Dome, diam. 29" Pos. FORWARD OF FIRE BOX

Firebox STEEL Combustion chamb. NONE
Firebox, length 107-11/16" Width 33⅜" Depth F. 68½" B. 52½"
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 5/16" HOLES 1½" DEEP FROM Ø.S.
TWO TOP ROWS OF SIDE STAYBOLTS TO BE DRILLED
Radial stays 1" DIAM. Sling stays front { TWO ROWS 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. IRON
Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS
Number 186 Diam. 2" Length 11' 8"

Heating Surface Flues --- sq. ft. Combus. Chamb. --- Total 1250
Tubes 1112 Fire Box 138 Fire Brick Tubes ---
Grate area 24.75 Ratio to Heating Surface 1 : 50
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

1 **Smokebox** extension WITH Cleaning hole and cap RIGHT AND LEFT
2 Spark arrester as hopper P.R.R. SLIDING GATE TYPE
Netting and deflect plates WITH
Exhaust nozzles DOUBLE, HIGH
3 Stack CAST IRON, STRAIGHT Dia. 17"

Safety Valves (Spec) TWO COALE 3" ONE OPEN, ONE MUFFLED
Safety valves NONE with relief lever, Set to { 160 POUNDS MUFFLED / 165 POUNDS OPEN
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
4 **Gauge Cocks** THREE BACK Surface valves 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: FRONT
Cleaning Plugs (SEE SUP. 5)
Firebox CORNERS, 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 TWO SELLERS, 1887 (Spec) No. 8½
Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER FINISHED
Pipes, Check COPPER FINISHED Feed COPPER w Overflow: IRON
Check B. L. W. FINISHED Pos. RIGHT AND LEFT

Steam Heat CONSOLIDATED SYSTEM

6 **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 34½"

Pilot WOOD Pushing shoes AT FRONT
Front Bumper OAK Bumper plate WITH
7 **Steps** HAND HOLDS, ETC. TO CONFORM TO I.C.C. REQUIREMENTS.

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

8 Signal fixtures IRON ON BUMPER

Headlight ONE 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
Sand Box ONE Diam. 28" Body IRON PAINTED Pipes IRON
Sander HAND
SAND BOX AND DOME CASINGS TO HAVE PLAIN FINISH.
Dome casing IRON PAINTED

Boiler Jacket #22 SOFT STEEL PTD. BANDS: IRON Style 9
Boiler Lagging MAGNESIA SECTIONAL

THE BALDWIN LOCOMOTIVE WORKS

Jas. Brotherick Aug. 1919.

SPECIFICATION FOR LOCOMOTIVES S 28 C 958 12 110

FOR UNION TRANSPORTATION CO.

9 **Frames** CAST STEEL

Cylinders, Diam. 17" Stroke 24"
10 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. F. Lubr. DETROIT TRIPLE No. 22 BULL'S EYE. (Spec)
Cyl'r heads CAST IRON Lubr. PIPES OF COPPER UNDER JACKET.
Cyl'r casings IRON PAINTED Head covers STEEL FINISHED
St'm chest casings IRON PAINTED Covers STEEL FINISHED
St'm chest valves BALANCED, WITH VACUUM VALVES
11 Met. pkg { PISTON RODS / VALVE STEMS } U. S. (Spec)

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD
Guides STEEL Oil cups NEEDLE
Crossheads CAST STEEL WITH BEARINGS OF BRASS
12 **Wrist Pins** STEEL Rod cups NEEDLE

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 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 WHEEL HUB LINERS BRONZE
Drivers, O. S. Diam. 62" Cen. diam. 56" CENTERS 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 1/16" TOTAL
9 **Driving Boxes** CAST STEEL
Journals, Diam. 7½" Length 8½"

Springs. Make B. L. W.

Front Engine Truck FOUR Wheeled RIGID CENTER
To swing --- each side of cen., Cen. pin liners NONE
Journals, Diam. 4½" Length 8" Boxes CAST IRON
Wheels, Diam. 28" Tread 4½" Kind CHILLED CAST IRON SPOKE
Tires NONE Cen. dian. --- Size ---
Tires held by ---
TRUCK WHEEL HUB LINERS - NONE

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 **Brake,** position ON ALL DRIVING AND TENDER WHEELS
15 Operating Parts { Engine, Sch. A-1 WESTG. AUTO. AIR / Eng. Tr'k, sch. ---
Foundation Parts { Drivers, sch. --- B. L. W. (SEE SUP. 17) / 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. 1415
Weight, with fuel and water, about 70,000 POUNDS
DECK OF TENDER TO BE FLUSH WITH BOTTOM OF TANK ON THE SIDES.
Tank 3500 ✓ Gallons, Bill 4932
TANK "U" SHAPE, STRAIGHT TOP. OMIT SLUSH PLATE FROM TANK
PIPES AT REAR OF TENDER TO DRAIN OVERFLOW
Tool Boxes OF HARD WOOD, TOP

Frame STEEL, 6" & 8" CHANNELS, WITH BUMPERS OF WOOD AND STEEL PLATES.
Front Drawbar height 32½"
Pilot NONE Pushing shoes AT REAR
Back drawhead, center above rail 33½"
Coupler JANNEY M. C. B. AUTO.

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

Trucks ARCH BAR TYPE WITH BOLSTER OF CAST STEEL
TRUCK CHANNEL BARS TO BE LAID FLAT.
Springs ELLIPTIC, B. L. W.
Journals, Diam. 4½" Length 8" JOURNAL BOX ETC. M.C.B. STANDARD
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 WESTINGHOUSE AUTOMATIC AIR.

18 List of tools, sch. 78
Photo sch. NONE Inspection B. L. W.
To be weighed YES Material spec'ns B. L. W.
Certificate of boiler test THREE COPIES B. L. W. FORM 1036.
Junior laws to 8-12-19 Shipment ON OWN WHEELS

Brass shop finish, No. 1.
Machine shop finish D-180, EXCEPT SIDE RODS PAINTED IN CHANNEL AND FINISHED ON EDGE.

B. L. W.
Patents FEED WATER STRAINER, PATENTED SEPT. 1, 1903 (CAST ON)

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

Painting: Engine, style 151 DARK GREEN AND GOLD
Painting Tender, style 151 DARK GREEN AND GOLD
PAINTING TO BE SAME AS FOR P. R. R.

Mark on TANK SIDES, UNION TRANSPORTATION CO.

Road Nos. Pos. F. No. PLATE CAB PANEL BACK OF TANK Road Nos. 7 Name NONE

Actual Dimensions of Loco. Extreme height over all 14' 8"
Extreme Width: Cab boards 9' 5" Cylinders or valve motion 8' 4"
Length outside face front bumper of engine to face of tender wedge 23' 5"
Length face of tender wedge to outside face back bumper of tender 22' 5½"
Total length outside face front bumper of engine to outside face back bumper of tender 50' 10½"

1 SMOKEBOX EXTENSION OF $\frac{3}{8}$" STEEL, REINFORCED AT BOTTOM ONE-THIRD WAY AROUND.

2 SPARK HOPPER PIPE TO BE STRAIGHT.

3 STACK TO HAVE P. R. R. STANDARD TOP.
STACK TO EXTEND DOWN INTO SMOKE BOX TO PREVENT WATER DRIPPING BETWEEN SMOKEBOX AND STACK BASE.

4 GAUGE COCKS TO BE P. R. R. STANDARD, ON BACK HEAD.

5 ONE PLUG IN EACH SIDE OF FIRST RING OF BOILER ABOVE TUBES.

6 TOOL BOX TO BE PROVIDED IN CAB; LOCKS TO BE FURNISHED BY R. R. CO.

7 STEPS ON BOTTOM OF PILOT AND ONE SMALL STEP ON EACH SIDE HALF WAY UP.

8 SIGNAL LAMP BRACKETS AT FRONT OF ENGINE.

9 DRIVING BOX WEDGES AND GIBS TO BE CAST IRON AND TO BE SCRAPED.

10 CYLINDER COCKS TO BE P. R. R. STANDARD.

11 STEAM CHEST PACKING JOINTS TO BE ROUND IN GROOVE, NO SQUARE CORNERS.

12 MAIN RODS RECTANGULAR SECTION.
SIDE RODS I SECTION, WITH SOLID ENDS.

13 ECCENTRICS IN HALVES.
ECCENTRIC STRAPS TO HAVE BRASS LINERS.

14 ENGINE BRAKE VALVE TO BE PLACED ABOUT 12" AHEAD OF BACK OF BOILER.

15 AIR DRUM TO BE PLACED UNDER WAIST AND TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

16 DRIVING BRAKE CYLINDER TO BE 10".

17 DRIVING BRAKE SHOES TO BE "PERFECTO" APPLIED ON FRONT OF DRIVERS.

18 JACK SCREWS, PINCH BAR, WRENCHES, TOOLS, OIL CANS, AND FIRE TOOLS ARE NOT TO BE FURNISHED.

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-6191

Memorandum Spec'n 20033

SPECIFICATION FOR LOCOMOTIVES 4 16 C 151

FOR AMERICAN BRIDGE COMPANY, PENCOYD PLANT.

Engine Drawing No. 22

Same as PHOTO 6532 {EXCEPT TO HAVE CAB WITH TWO SIDE WINDOWS.

2.13.20

Gauge of Road 3' 0" Play 3/8"
Wheelbase, Rigid 5' 0" Driving 5' 0" Total 5' 0"
Total wheelbase, eng. and tend, {Actual —— {Limited to ——

Curves 30 FEET RADIUS RAILS 40 POUNDS.

Limits, Height 8' 9" Width 6' 4"
Weight (approximate) in working order, Total 44,600 POUNDS.
On F. tr'k —— lbs., Drivers 44,600 lbs., B. tr'k —— lbs.

Tractive power 9,320 lbs., Ratio of adhesion 4.8 TANK EMPTY 4.1
Work'g St'm Pres. 170 lbs., Service SWITCHING
Fuel SOFT COAL.

Boiler O. H. STEEL Thick 7/16" Bill 8916
Front Tube Sheet 7/16" Thick
Boiler, Diam. 40" Plan STRAIGHT TOP.
Allowable st'm pres. 170 lbs. {Tested to 190 lbs. steam pres.
With Factor of Safety of 5.9 {Tested to 255 lbs. water pres.
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS.

Dome, diam. 22" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE
Firebox, length 36 1/2" Width 32 1/4" Depth F. 39 3/8" B. 39 3/8"
Firebox, Tube 7/16" Crown 3/8" Sides 3/8" Back 5/16"
Firedoor opening 16" DIAM. CROWN AND SIDES IN ONE SHEET.
Water space, Front 2" AND 2 1/2" Sides 2" Back 2"
Water space frame SINGLE Riveted
Water space stays 3/8" DIAM. WITH 3/16" HOLES 1 1/2" DEEP FROM O. S.

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

Flues ——
Tubes #12 W.G. SEAMLESS STEEL
Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.
Number 106 Diam. 2 1/4" Length 8' 1 1/2"

Heating Surface {Flues —— Combus. Chamb. —— Total 428.0
{Tubes 390.0 Fire Box 38.0 Fire Brick Tubes ——
Grate area 8.2 Ratio to Heating Surface 1: 52.2
Superheater ——

Fire Brick ARCH NONE

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

Throttle BALANCE Pos. DOME
Double STEEL

Blower NONE

Washout connection WITH Cleaning hole and cap NONE
Mud rings WITH
Foundation rings WITH

Safety Valves TWO CONSOLIDATED 1 1/2" OPEN. (Spec)
Safety valves BOTH with relief lever, Set to 170 POUNDS.
Whistle ONE B. L. W. PLAIN

Steam Gauge ONE IRON 6" MAKER: ASHCROFT (Not 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 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, R.S. AND L. S.
Crown, ONE EACH SIDE AND TWO BACK.
Waist, ONE UNDER FRONT.
Front tube sheet. ONE Fusible plug ONE

BOILER TO CONFORM TO A.S.M.E. STANDARD AND TO PASS INSPECTION OF HARTFORD STEAM BOILER INSPECTION AND INSURANCE COMPANY AND THE BUREAU OF BOILER INSPECTION DEPARTMENT, CITY OF PHILADELPHIA.

INJECTORS TO BE REGULATED FROM CAB
Injectors TWO SELLERS, CLASS "N" (Spec) No. 5 1/2/10
Injectors, Pos. R. AND L. Steam pipes COPPER
Pipes, Check IRON Feed IRON Overflow IRON
Check B.L.W. WITH STOP VALVE Pos. R. AND L.

Steam Heat NONE

Cab STEEL. CAB TO HAVE DROP WINDOWS, AT SIDES.
CAB DOORS TO SLIDE INSIDE AND TO BE ARRANGED FOR SAFETY.

Cab boards STEEL Nosing T-IRON
Running boards NONE Nosing ——
Hand rail NONE Located on ——

Back Bumper CORED CAST STEEL

Pilot NONE Pushing shoes CAST IN BUMPERS
Front Bumper CORED CAST STEEL Bumper plate NONE
Steps ACROSS FRONT AND BACK, WITH HAND RAILS.

E & B Drawhead, Center above rail 18"
Coupler CAST STEEL DRAWHEAD, FRONT AND BACK.

Signal fixtures IRON

Headlight TWO ROUND CASE 10" 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. 23" Body IRON PAINTED Pipes IRON
Sander HAND, IN EACH BOX, TO SAND FRONT AND BACK.

Dome casing IRON PAINTED.

Main reservoir 22" Diam. STEEL Bands IRON Style 9
Number furnished MACHESNEY SECTIONAL

THE BALDWIN LOCOMOTIVE WORKS

Dr. P. Hutton May-1920.

SPECIFICATION FOR LOCOMOTIVES 4 16 C 151

FOR AMERICAN BRIDGE COMPANY, PENCOYD PLANT.

Frames CAST STEEL, ANNEALED

Cylinders, Diam. 11" Stroke 16"
St'm ports, Length 9" Width 1" Bridges 7/8"
Exh. ports, Length 9" Width 1 3/4" Valve lead 1/16"
Valve travel 3 5/8" Steam lap 7/8" Exhaust clearance ——
Eccentric ~~crank~~ throw 3 1/4" By-pass valve NONE
S. F. Lubr. DETROIT TRIPLE No. 22 BULL'S EYE. (Spec)
Cyl'r heads CAST IRON. LUBR. PIPES OF IRON, UNDER JACKET
Cyl'r casings PLAN. STEEL Head covers FORGED STEEL PAINTED.
St'm chest casings PLAN. STEEL Covers STEEL PAINTED.
St'm chest valves RICHARDSON BALANCED, WITH VACUUM VALVES.
Met. pkg. PISTON RODS VALVE STEMS UNITED STATES, KING TYPE (Spec)
PISTON RODS TO BE KEYED TO CROSSHEADS.
Pistons HEADS OF CAST IRON, WITH RINGS OF CAST IRON SPRUNG IN
Guides STEEL HARDENED Oil cups NEEDLE
Crossheads CAST STEEL WITH BEARINGS OF BRONZE
Wrist Pins (Sup. 6) Rod cups PLUNGER
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 wheel hub liners BRONZE
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. NONE Size ——
Lateral play between driving boxes and wheel hubs — 1/32" TOTAL
Driving Boxes CAST STEEL
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 ——
Wheel hub liners ——
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 ——
Wheel hub liners ——
Wheels, Diam. —— Tread —— Kind ——
Tires —— Cen. diam. —— Size ——
Tires held by ——

Brake, position ON ALL DRIVING WHEELS (NO TENDER)
Operating {Engine, sch. U-O B.L.W. STEAM
Parts {Eng. Trk. sch. ——
Foundation {Drivers, sch. U-O B.L.W.
Parts {Eng. Trk. sch. ——
Air pump —— Pos. ——
Train connections ——
Train signal, sch. ——
SEPARATE LUBRICATOR FOR STEAM BRAKE VALVE.
STEAM BRAKE EXHAUST TO BE PIPED TO SMOKE BOX.

Tender NONE

Tank 750 Gallons, Bill 5231
SADDLE TANK OVER TOP OF BOILER AND EXTENDING TO FRONT END OF SMOKE BOX.

FUEL BOX IN LEFT SIDE OF CAB. FUEL CAPACITY 800 POUNDS.

BUMPERS TO BE ARRANGED SO THAT AUTOMATIC COUPLERS CAN BE USED, IF DESIRED.

BOILER TO BE JACKETED WITH POLISHED STEEL.
CYLINDERS LAGGED AND JACKETED WITH SAME MATERIAL AS BOILER.

CYLINDER LUBRICATOR IN CAB TO BE CONNECTED TO STEAM CHESTS AND TO STEAM BRAKE CYLINDER.

WRIST PINS OF OPEN HEARTH STEEL, FORGED, WITH AMPLE BEARING SURFACE.

PURCHASER'S INSPECTOR TO MAKE INSPECTION OF LOCOMOTIVE DURING CONSTRUCTION. MR. F. WOOLLVEN IS TO BE ADVISED TWO DAYS IN ADVANCE OF THE TIME INSPECTOR SHOULD BE HERE TO MAKE THIS INSPECTION.
INSPECTION - THE ACCEPTANCE OF LOCOMOTIVE SUBJECT TO THE INSPESTION AND APPROVAL OF THE MECHANICAL ENGINEER OF THE AMERICAN BRIDGE COMPANY, OR HIS AUTHORIZED REPRESENTATIVE.

List of tools, sch. 26
Photo sch. NONE Inspection B.L.W. EXCEPT SEE ABOVE - (Sup. 7-11)
To be weighed No Material spec'ns B.L.W. Except See Sup. 14.
Certificate of boiler test THREE COPIES OF B.L.W. FORM 1036
Junior laws to 2.19.20 Shipment ON CAR

Brass shop finish, No. 1
Machine shop finish D-165, EXCEPT CYLINDER CASINGS AND STEAM CHEST CASINGS TO BE ~~PLAINISHED~~ POLISHED STEEL.

B. L. W. {NONE
Patents {

Property plates NONE

STRIPING TO BE APPLIED TO CAB AND TANK ONLY.
DRIVING WHEELS TO BE BANDED STEEL COLOR.
Painting, style 223, OLIVE GREEN AND ALUMINUM.

LETTERING TO BE IN BLOCK LETTERS 4" HIGH X 3" WIDE
Mark on TANK SIDES: AMERICAN BRIDGE COMPANY

Road Nos. Pos.	Road Nos.	Name
F. No. PLATE	17	NONE
F. SAND BOX		
CAB SIDES		

Actual Dimensions of Loco. Extreme height over all — 8' 8" {TO TOP OF FLUE SHT.
Extreme Width {Over cab boards — 6' 4"
{Over ~~cylinders or valve motion~~ — F. BUMPER 6' 4"
Length outside face of front bumper to outside face of back bumper of engine — 18' 8"

SPECIFICATION FOR LOCOMOTIVES 4 16 C 151

FOR AMERICAN BRIDGE COMPANY, PENGOYD PLANT

P

11 BOILER TO BE OPERATED IN THE STATE OF PENN'A. BOILER TO BE BUILT TO CONFORM TO THE BOILER CODE OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS (1918), AND MUST BE INSPECTED DURING CONSTRUCTION AND UPON COMPLETION BY AN AUTHORIZED INSPECTOR WHO SHALL NOT BE INTERESTED EITHER DIRECTLY OR INDIRECTLY WITH THE MANUFACTURERS.

12 A DATA REPORT, ON FORMS FURNISHED BY THE ABOVE MENTIONED STATE SHALL BE FORWARDED TO THE PROPER OFFICIAL BEFORE THE BOILER LEAVES THE BUILDER'S WORKS.

13 A HYDROSTATIC TEST SHALL BE APPLIED EQUAL TO ONE-AND -ONE-HALF (1½) TIMES THE WORKING PRESSURE.

14 THE MATERIALS ENTERING INTO THE CONSTRUCTION SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS:-

BOILER AND FIRE BOX STEEL MATERIAL FOR ONE-PIECE DOME	A.S.M.E. SPEC. PAGE 11
BOILER RIVET STEEL	A.S.M.E. SPEC. PAGE 15
BOILER RIVET IRON	A.S.M.E. SPEC. PAGE 31
BOILER BRACE IRON	A.S.M.E. SPEC. PAGE 32
BOILER STAYBOLT IRON	A.S.M.E. SPEC. PAGE 34
BOILER TUBES	A.S.M.E. SPEC. PAGE 40

15 FRONT TUBE SHEET SHALL BE OF FIRE BOX STEEL. ALL BOILER AND FIRE BOX STEEL AND MATERIAL FOR ONE PIECE DOME SHALL BE MARKED BY THE MANUFACTURER WITH THE HEAT NUMBER, NAME OF MANUFACTURER, GRADE AND LOWEST TENSILE STRENGTH IN THE MANNER AND LOCATION DESCRIBED ON B.L.W. MARKING CARD 6859. SMOKE BOX STEEL MAY CONFORM TO B.L.W. SPECIFICATION.

16 THE MINIMUM FACTOR OF SAFETY SHALL BE FIVE. (1918) LONGITUDINAL SEAMS SHALL BE OF BUTT AND DOUBLE STRAP CONSTRUCTION.

17 THE OUTSIDE ENDS OF SOLID STAYBOLTS, 8 IN. AND LESS IN LENGTH, SHALL BE DRILLED WITH A HOLE AT LEAST 3/16" DIA., TO A DEPTH EXTENDING AT LEAST ½" BEYOND THE INSIDE OF THE PLATES

18 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 TABLES:

SIZE OF PIPE CONNECTION OR CORRESPONDING TAPER TAP.	1" & 1¼"	1½" & 2"	2½" TO 4"
NO. OF THREADS PER INCH.	11½	11½	8
MINIMUM NO. OF THREADS REQUIRED IN OPENING.	4	5	7
MINIMUM THICKNESS OF MATERIAL REQUIRED TO GIVE ABOVE NO. OF THREADS.	7/16"	7/16"	7/8"

IF THICKNESS OF BOILER MATERIAL IS NOT SUFFICIENT TO GIVE THE ABOVE NUMBER OF THREADS, A LINER OR FLANGE MUST BE APPLIED.

19 EACH BOILER MUST BE PROVIDED WITH A CONNECTION ¼ PIPE SIZE FOR ATTACHING INSPECTOR'S TEST GAUGE.

20 A FUSIBLE PLUG MUST BE APPLIED. THE PLUG MUST BE FILLED WITH PURE TIN AND THE LEAST DIAMETER OF THE FUSIBLE METAL MUST BE NOT LESS THAN ½" EXCEPT FOR WORKING PRESSURE ABOVE 175 LBS., IN WHICH CASE THE LEAST DIAMETER SHALL NOT BE LESS THAN ⅝", (I. E., USE FUSIBLE PLUG CARD 4144 FOR PRESSURE ABOVE 175 LBS. AND FUSIBLE PLUG CARD 4219 FOR 175 LBS. AND LESS).

25 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~~

26 SAFETY VALVES MUST MEET THE REQUIREMENTS OF THE A. S. M. E. BOILER CODE AND MUST BE PLAINLY STAMPED BY THE MANUFACTURER AS PER B. L. W. MARKING CARD 6858.
SAFETY VALVES OVER 3" IN DIAMETER SHALL HAVE FLANGED INLETS. THESE FLANGES SHALL CONFORM TO THE AMERICAN STANDARD.
ALL SAFETY VALVES MUST BE PROVIDED WITH RELIEF LEVERS.

27 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: ALSO WHERE POSSIBLE ONE NEAR THE THROAT SHEET.

28 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.

29 UPON COMPLETION, EACH BOILER SHALL BE STAMPED IN THE PRESENCE OF THE AUTHORIZED INSPECTOR, WITH THE WORDS AS ARRANGED BELOW. THE HEIGHT OF THE LETTERS AND FIGURES SHALL NOT BE LESS THAN ¼" THE LOCATION OF THE STAMP SHALL BE ON THE BACK HEAD ABOVE A PLUG HOLE.

(MANUFACTURER'S SERIAL NUMBER)	PENNSYLVANIA (STATE IN WHICH BOILER IS TO BE USED)
	NO. 8 (MANUFACTURER'S STATE STANDARD NUMBER)
	THE BALDWIN LOCOMOTIVE WORKS (NAME OF MANUFACTURER)
	(LEAVE BLANK) (STATE'S NUMBER) (LEAVE BLANK) (YEAR PUT IN SERVICE)
	170 LBS. (MAXIMUM WORKING PRESSURE WHEN BUILT)

SPECIFICATION FOR LOCOMOTIVES 6 30 0 468

FOR AMERICAN BRIDGE COMPANY

Gen. & Photo. 5290.
Engine Drawing No. 60.
2-8-18.

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 9' 6" Driving 9' 6" Total 9' 6"
Total wheelbase, eng. and tend. { Actual 37' 8½" / Limited to ——

Curves ——

Limits, Height —— 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. 200 lbs., Tested to { 220 lbs. steam pres. / 267 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 66-1 1/16" Width 39⅜" Depth F. 66" B. 63½"
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" 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 (B.L.W. OPTION)
Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS
Number 262 Diam. 2" Length 12' 5"

Heating Surface	Flues ——	Combus. Chamb. ——	Total 1410⁰	
	Tubes 1305⁰	Fire Box 105⁰	Fire Brick Tubes ——	
Grate area 15.9⁰	Ratio to Heating Surface 1 : 88.			
Superheater ——				

Fire Brick ARCH, ON STUDS

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

Throttle BALANCE Pos. DOME
STEEL

Superheater NONE

Blower BLV Cleaning holes and cap L.S. ONLY
Blower pipe WITH
Blower nozzles WITH

Exhaust nozzle, Diam. 16" Hole in S. Pipe 7½"

Safety Valves TWO CONSOLIDATED 2½" (Hotspecial)
Safety valves NONE with relief lever, Set to 180 POUNDS
Whistle ONE B. L. W. PLAIN

Steam Gauge ONE IRON 7" MAKER:- ASHCROFT (Hotspecial)
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 (TO USE STOCK) POS:- R.S.
Cleaning Plugs
Firebox CORNERS, BACK ONES DIAGONAL, L.S. 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 TWO MONITOR (Hotspecial) 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 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 33½"

Pilot NONE Pushing shoes FRONT
Front Bumper (Hood) 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. AUTO.

Signal fixtures NONE

Headlight TWO ROUND CASE 16" Reflector, To burn KEROSENE
Headlight, Nos. on sides WITH Mast step WITH
Lamp shelf NONE Nosing ——

Bell 90 pounds
Bell Yoke, Top Diam. 28" Body IRON PAINTED Pipes IRON
Bell Ringer AIR, TRAP A-1, IN EACH BOX TO HAND FRONT AND BACK

Bell casing IRON PTD.

Number Jacket 202 Body STEEL Hollands IRON Style 9
Boiler Lagging, MANUFACTURERS STANDARD

SPECIFICATION FOR LOCOMOTIVES 6 30 0 468

FOR AMERICAN BRIDGE COMPANY

116 116

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" Steam lap ¾" Exhaust clearance ——
Eccentric (Steel) throw 5" By-pass valve NONE
S. F. Lubr. MICHIGAN THIPLE 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 (Special)

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. 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 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. No.1 AMERICAN O. S. EQUALIZED / Eng. Tr'k, sch. ——
Air pump One 9½" Pos. L. S.
Train connections FRONT AND BACK
Train signal, sch. NONE
AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

Tender EIGHT Wheeled, Drawing No. 921
Weight, with fuel and water, about 60,000 POUNDS

Tank 3000 Gallons, Bill 4166
TANK "U" SHAPE, SLOPING BACK FUEL CAPACITY 5 TONS

Tool Boxes HARDWOOD, TOP

Frame STEEL 6" AND 8" CHANNELS, WITH WOOD BUMPERS

Front Drawbar height 31"
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
STEP AND HAND RAILS ON SLOPING BACK OF TANK
Trucks ARCH BAR TYPE WITH CAST STEEL BOLSTERS

Springs ELLIPTIC, B.L.W.
Journals, Diam. 3¾" Length 7"
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. No.6-ET. West'g. AUTO. AND STRAIGHT AIR WITH 8" x 12" TENDER CYLINDER.

List of tools, sch. 29
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 4.17.16. Shipment ON OWN WHEELS

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

* BOILER TO BE INSPECTED BY THE HARTFORD STEAM BOILER INSPECTION AND INSURANCE CO.

B. L. W. Patents { FEED WATER STRAINER, PATENTED, SEPT. 1, 1903 (CAST ON)

Property plates NONE

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

MARKING TO BE IN BLOCK LETTERS OF SUITABLE SIZE
Mark on CAB SIDES, AMERICAN BRIDGE CO.
MARK ON TANK SIDES, AMERICAN BRIDGE CO.

Road Nos. Pos.	Road Nos.	Name NONE
F. No. PLATE	12	
CAB SIDES		
BACK OF TANK		

Actual Dimensions of Loco.—Extreme height over all 13' 4"
Extreme Width—Cab boards 9' 7" Cylinders or valve motion
Length outside face front bumper of engine to face of tender
Length face of tender wedge to outside face back bumper of
Total length outside face front bumper of engine to outside face back bumper of tender 71' 7½".

THE BALDWIN LOCOMOTIVE WORKS Ass Spec. 0-535
Memorandum Spec'n 2000B

SPECIFICATION FOR LOCOMOTIVES 6 26 D 165

FOR ANDERSON-THEOBALD COMPANY

P

1-21-20

Gen. as PHOTO. 6288

Engine Drawing No. 30

Gauge of Road 4ft 8½in Play ⅜in

Wheelbase, Rigid 9ft 9in Driving 9ft 9in Total 9ft 9in

Total wheelbase, eng. and tend. {Actual 39ft 1¼in / Limited to ——

RAILS ABOUT 70 POUNDS

Curves 50 FEET RADIUS **Grades** 3%

Limits, Height —— Width ——

Weight (approximate) in working order, Total 85,000 POUNDS

On F. tr'k —— lbs., Drivers 85,000 lbs., B. tr'k —— lbs.

Tractive power 18,800 lbs., Ratio of adhesion 4.5

Work'g St'm Pres. 180 lbs., Service SWITCHING

Fuel SOFT COAL

Boiler STEEL Thick 1in Bill 8877

Front Tube Sheet ½in Thick

Boiler, Diam. 48in Plan STRAIGHT TOP

{Allowable st'm pres. 200 lbs. / With Factor of Safety of 4.80} **Tested to** {220 lbs. steam pres. / 267 lbs. water pres.}

Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS

DOME - ONE PIECE TYPE

Dome, diam. 25in Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE

Firebox, length 53-1 1/16in Width 41⅜in Depth F. 51⅝in B. 50⅜in

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

Firedoor opening 16in DIAM.

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

Water space frame SINGLE Riveted

Water space stays ⅝in DIAM. WITH 3/16in HOLES 1¼in DEEP FROM O. S. {TWO ROWS B. L. W. EXPANSION STAYS}

Radial stays 1in DIAM. Sling stays front

Button heads below crown on SIX central rows

Crown bars NONE Placed —— above crown

Crown bolts ——

Flues ——

Tubes #12 W. G. STEEL

Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS

Number 135 Diam. 2in Length 13ft 0in

Heating Surface {Flues —— Combus. Chamb. —— Total 983sq.ft. / Tubes 913sq.ft. Fire Box 70sq.ft. Fire Brick Tubes ——}

Grate area 15.8sq.ft. Ratio to Heating Surface 1: 62.2

Superheater ——

Fire Brick ARCH - NONE

Grates ROCKING BARS WITH DROP PLATES

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. 15in

Safety Valves TWO CONSOLIDATED 2in OPEN

Safety valves NONE with relief lever, Set to 180 POUNDS

Whistle ONE B. L. W. PLAIN

Steam Gauge ONE IRON 7in MAKERS: 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 3in 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, TWO EACH SIDE AND TWO BACK

Waist, ONE UNDER FRONT

Front tube sheet, ONE Fusible plug ONE

LOCOMOTIVE TO BE OPERATED IN ILLINOIS.

BOILER TO BE INSPECTED BY THE HARTFORD STEAM BOILER INSPECTION AND INSURANCE COMPANY.

MR. F. WOOLVEN IS TO BE ADVISED 48 HOURS PRIOR TO COMPLETION OF LOCO. SO HE CAN ARRANGE FOR MR. ANDERSON THE PURCHASER TO COME HERE AND MAKE INSPECTION BEFORE SHIPMENT.

Injectors TWO "SELLERS" CLASS "N" 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

Cab boards WOOD Nosing NONE

Running boards WOOD Nosing NONE

Hand rail IRON Located on BOILER

Back Bumper BAR STEEL Back drawbar height 29½in

Pilot NONE Pushing shoes FRONT

Front Bumper OAK 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 33½in

Coupler M. C. B. AUTO.

Signal fixtures NONE

Headlight TWO ROUND CASE 14in 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. 23in Body IRON PAINTED Pipes IRON

Sander 1 EACH 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 MAGNESIA SECTIONAL

THE BALDWIN LOCOMOTIVE WORKS

SPECIFICATION FOR LOCOMOTIVES 6 26 D 165

FOR ANDERSON-THEOBALD COMPANY

P

Frames CAST STEEL

Cylinders, Diam. 16in Stroke 24in

St'm ports, Length 15in Width 1½in Bridges 1in

Exh. ports, Length 15in Width 2½in Valve lead 1/16in

Valve travel 5½in Steam lap ¾in Exhaust clearance ——

Eccentric ~~crank~~ throw 1⅝in By-pass valve NONE

S. F. Lubr. NATHAN THREE-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 castings IRON PAINTED Covers STEEL PAINTED

St'm chest valves RICHARDSON BALANCED, WITH VACUUM VALVES

Met. pkg. {PISTON ROD / VALVE STEM} UNITED STATES, KING TYPE

PISTON RODS TO BE KEYED TO CROSSHEADS

Pistons HEADS OF CAST IRON WITH RINGS OF CAST IRON SPRUNG IN.

Guides LAIRD TYPE, STEEL Oil cups NEEDLE

Crossheads CAST STEEL, WITH BEARINGS OF CAST IRON, TINNED

Wrist Pins STEEL Rod cups GREASE CUPS FOR ALL RODS

PARALLAL 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 wheel hub liners NONE

Drivers, O. S. Diam. 50in Cen. diam. 44in CENTERS CAST IRON

Tires STEEL Held by SHRINKAGE AND SHOULDER

Tires, Flanged, Pos. FRONT AND BACK Size 3in x 5½in

Tires, Plain, Pos. MIDDLE Size 3in x 6½in

Lateral play between driving boxes and wheel hubs = 3/16in TOTAL

Driving Boxes CAST IRON

Journals, Diam. 7in Length 9in

Springs. Make B. L. W.

Front Engine Truck NONE Wheels ——

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

Journals, Diam. —— Length —— Boxes ——

Wheel hub liners ——

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 ——

Wheel hub liners ——

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 WESTG. COMBINED AUTO. AND STRAIGHT AIR / Parts Eng. Tr'k, sch. ——}

Foundation {Drivers, sch. WA-1 AMERICAN O. S. EQUALIZED / Parts Eng. Tr'k, sch. ——}

Air pump ONE 9½in Pos. L. S.

Train connections FRONT AND BACK

Train signal, sch. NONE

AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

Tender EIGHT Wheeled, Drawing No. 1496

Weight, with fuel and water, about 60,000 POUNDS

TENDER TO BE WEIGHED: YES

Tank 2800 Gallons, Bilt 5188

TANK "U" SHAPE STRAIGHT TOP. FUEL CAPACITY 4 TONS.

Tool Boxes OF HARD WOOD, TOP

Frame STEEL, 6in AND 8in CHANNELS, WITH END SILLS OF OAK.

Front Drawbar height 27¾in

Pilot NONE Pushing shoes AT REAR

Back drawhead, center above rail 33½in

Coupler M. C. B. AUTO.

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

Steps ACROSS REAR WITH HAND HOLDS.

Trucks ARCH BAR TYPE WITH CAST STEEL BOLSTERS.

Springs ELLIPTIC, B. L. W.

Journals, Diam. 3¾in Length 7in

Wheels, Diam. 30in Tread 1¼in 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 WESTG. AUTO. AND STRAIGHT AIR WITH 10in x 12in TENDER CYLINDER.

List of tools, sch. 26

Photo sch. No. 2 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 1-24-20 Shipment ON OWN WHEELS

Brass shop finish, No. 1

Machine shop finish D-165

B. L. W. Patents FEED WATER STRAINER PAT'D SEPT. 1, 1903 (CAST ON)

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

Painting, style 291 OLIVE GREEN AND ALUMINUM

Mark on SIDES OF CAB AND TANK: A. T. CO.

Road Nos. Pos. Road Nos. Name NONE

F. No. PLATE 2

F. SAND BOX

BACK OF TANK

Actual Dimensions of Loco. Extreme height over all 12ft 9½in

Extreme Width: Cab boards 8ft 7in Cylinders or valve motion 8ft 8in

Length outside face front bumper of engine to face of tender wedge 27ft 8⅝in

Length face of tender wedge to outside face back bumper of tender 22ft 2⅝in

Total length outside face front bumper of engine to outside face back bumper of tender 49ft 11in

THE BALDWIN LOCOMOTIVE WORKS Sup. 6 38 D 77 & 78, with same sketch except where otherwise specified. (See sup. 26)
Memorandum Smg'n 17132.

SPECIFICATION FOR LOCOMOTIVES 6 38 D 81 to 86.

FOR The Baldwin Locomotive Works. (Eddystone Plant). 2 to Gen. as Photo. 6352
L. See sup. 28 ✓ **Engine Drawing No. 19.**

11-1-17.

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11'0"
Total wheelbase, eng. and tend. { Actual 43' 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 8255
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 96½" Width 39" Depth F. 71⅜" B. 69½"
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
1 Water space stays ⅜" diam. with 3/16" holes 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 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, firebox ends.
Number 330 Diam. 2" Length 11' 0"
Tubes to have ⅜" spaces.

Heating Surface	Flues None	Combus. Chamb. None	Total 2046⁰
	Tubes 1886⁰	Fire Box 160⁰	Fire Brick Tubes ----
Grate area 26⁰	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
Steel

Superheater None

Cleaning hole and cap None

Safety Valves Three Consolidated 3" One muffled. (not spec'd)
Safety valves None with relief lever, Set to { 180 lbs. muffled. / 183 lbs. open.
Whistle B. L. W. Chime.

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** 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
4 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 --------

(not spec'd)
5 **Injectors** Two Sellers, Class "N" No. 9½
5 Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Copper Feed Iron Overflow Iron.
Check Sellers (not spec'd) Pos. Right and Left.

Steam Heat None

6 **Cab** Steel (see sup. 6) Ventilator in cab roof.
12/19/17 Cab curtain to be provided.

7 Cab boards Steel plate Nosing T-iron
7 Running boards Steel Plate Nosing T-iron
Hand rail Iron Located on Boiler

10 **Back Bumper** Bar Steel Back drawbar height 32"

Pilot None Pushing shoes Cast in bumper.
Front Bumper Cast steel Bumper plate None
8 **Steps** Hand holds, etc. to conform to I.C.C. requirements.

Front Drawhead, Center above rail 34½"
Coupler Sharon M.C.B. Automatic, with slotted knuckle

Signal fixtures ~~None~~ Malleable iron on Smoke Box 4-lts.

Headlight Two Round case 16" Reflector, To burn Kerosene.
Headlight, Nos. on sides With H'd'l step With
Lamp shell 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.

11 **Boiler Jacket** #18 Steel ptd. Bands Iron Style 9 and 14
11 **Boiler Lagging** Magnesia sectional
Each end of boiler to be lagged and jacketed.

THE BALDWIN LOCOMOTIVE WORKS
H. F. Branin Jan. 1918
SPECIFICATION FOR LOCOMOTIVES 6 38 D 81 to 86.
FOR The Baldwin Locomotive Works (Eddystone Plant). 120
L. 120

12 **Frames** Cast Steel. Braces Solid

14 **Cylinders,** Diam. 22" Stroke 26"
St'm ports, Length 19" Width 1⅜" Bridges 1⅛"
Exh. ports, Length 19" Width 2½" Valve lead ¼"
Valve travel 5¼" Steam lap ⅞" Exhaust clearance ----
Eccentric crank throw 12 7/32" By-pass valve None
(not spec'd)
S. F. Lubr. 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 rod, valve stem) U. S. King type. (not spec'd)

Pistons Cast iron rings sprung into solid head
Guides Two bar type, Steel Oil cups Needle.
15 **Crossheads** Alligator Type, Cast Steel.
16 **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 B. L. W. (see sups. 18-19)

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"
4 Tires, Plain, Pos. Middle Size 3½" x 6½"
Lateral play between driving boxes and wheel hubs = 1/16" total.
13 **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.
20 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. ---------
21 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 pounds.

Tank 4500 Gallons, Bill 4551
Tank "U" shape, Sloping back. Fuel Capacity, 6 tons.
Coal gates of steel.
Tool Boxes of steel built into legs of tank.

Frame Steel, 10" channels
Front and back bumpers to have ⅞" plate in back of same
10 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 West'g. Friction Draft Gear. Coupler to have slotted knuckle.

5 Steps Hand holds, etc. to conform to the I.C.C. requirements.

Trucks Arch Bar type with 6st steel bolster.
Truck spring blanks to be of Channel Iron.
Springs Elliptic. B.L.W. make
Journals, Diam. 5" Length 9"
Wheels, Diam. 33" Tread 4¼" 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 & 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. form 1036.
Junior laws to 11-2-17 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 38 D 77 etc.,
Mark on Tank Sides, THE BALDWIN LOCOMOTIVE WORKS

Road Nos. Pos. Road Nos. Name None
F. No. Plate 14 to 19
Cab Sides
Back of Tank.

SPECIFICATION FOR LOCOMOTIVES 6 38 D 81 TO 86.

FOR THE BALDWIN LOCOMOTIVE WORKS (EDDYSTONE PLANT).

L.

1214 1214

1 FLEXIBLE STAYBOLTS TO BE TATE, OF EWALD IRON, 1" DIAM. ABOUT ~~400~~ 390 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.~~ R.F.G. 9/8/13

5 INJECTOR TO BE SELF ACTING TYPE ~~FOR HOT WATER~~ AND TO BE LOCATED AS LOW AS POSSIBLE. R.S.McC. 9/8/13.

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. (SEE SUP. 27)
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 WRIST PINS TO BE RIVETED OVER.

17 THE BLIND TIRES ON MIDDLE WHEELS TO BE AS WIDE AS PRACTICABLE.

18 DRIVING WHEELS TO HAVE HUB LINERS OF BRONZE.

19 DRIVING BOXES TO HAVE HEAVY BRONZE BEARINGS WITH SUITABLE OIL GROOVES.

20 MAIN RESERVOIRS TO HAVE DRAIN COCKS.

21 AIR PUMP EXHAUST TO BE PIPED INTO CYLINDER SADDLE.

22 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.

27 STEPS FRONT OF ENGINE AND BACK OF TENDER, TO BE MADE IN SHORT SECTIONS WITH SPACE BETWEEN TO CLEAR PILOT OF ANOTHER LOCOMOTIVE TO WHICH THIS LOCOMOTIVE MAY BE COUPLED.

28 6 38 D 81, SOLD TO UNITED STATES GOVERNMENT NAVAL ORDNANCE PLANT, CHARLESTON, WEST VIRGINIA. 12/4/19.
OMIT LETTERING AND NUMBERS. SEE EX. ORD. 11090 - 1919.

T E N D E R.

51 STEPS TO BE PROVIDED AT REAR OF TENDER WITH BRACKETS OF STEEL, SUPPORTING A STEEL PLATE ON WHICH IS BOLTED AN OAK PLANK. (SEE SUP. 27)
SIDE STEPS TO BE PROVIDED AT REAR OF TENDER.
HAND RAIL ON TANK, ONLY 26" HIGH.

Wheelbase, Rigid 11'0" Driving 11'0" Total 11'0"

Total wheelbase, eng. and tend. {Actual 34'1" / Limited to ——

Curves 100 FT. RADIUS

Limits, Height 14'2" Width ——

Weight (approximate) in working order, Total 160,000 POUNDS *(Actual 158,560 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 TO BE ½" THICK

Boiler STEEL Thick 13/16" Bill 8326

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 5.17

Longitud. seams BUTT JOINTED, DOUBLE COVERED STRIPS.

Dome, diam. 33" Pos. CENTRAL

DOME TO BE LARGE FOR INSPECTION PURPOSES

Firebox STEEL Combustion chamb. NONE

Firebox, length 96⅛" Width 30" Depth F. 71½" B. 60¼"

Firebox, Tube 2" Crown ⅜" Sides ⅜" Back ⅜"

Firedoor opening 16" DIAMETER.

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

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 from {THREE ROWS OF B.L.W. EXPANSION STAYS.

Button heads below crown sh. SIX central rows

Crown bars NONE Placed —— above crown

Crown bolts ——

Flues ——

Tubes #12 W.G. CHARCOAL IRON OR STEEL. (B.L.W. OPTION)

Tube ends SHAPED FOR COPPER FERRULES, FIREBOX ENDS.

Number 350 Diam. 2" Length 11'0"

TUBES TO HAVE ⅝" SPACES.

Heating Flues —— Combust. Chamb. —— Total 2040

Surface Tubes 1890 Fire Box 150 Fire Brick Tubes ——

Grate Area 29 Ratio of Heating Surface 70.3

Superheater ——

Fire Brick ARCH, NONE

Grates ROCKING BARS WITH DUMP PLATE

Ash Pan, Dampers NONE

Safety Valves THREE COALE 3" ONE MUFFLED (or Approved)

Safety valves with relief valve, Set to {180 LBS. MUFFLED / 183 LBS. OPEN

Whistle B.L.W. CHIME

Steam Gauge ONE IRON 7" MAKERS:- ASHCROFT (or Approved)

Steam gauge stand IRON Clock NONE

Water Gauge ONE B.L.W. [illegible] Cab Lamps TO BURN OIL.

Gauge Cocks THREE EACH 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 B.L.W. POS:- FRONT

Cleaning Plugs

Firebox CORNERS DIAGONAL AND SIDES

Crown, TWO EACH SIDE AND ONE BACK

Waist, TWO UNDER, AND 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 TWO SELLERS, CLASS "N" No. 9½ (or Approved)

Injectors Pos. RIGHT AND LEFT Steam valve [illegible]

Pipes, Check COPPER, Feed IRON Overflow IRON

Check SELLERS Pos. RIGHT AND LEFT

Steam Heat NONE

Cab STEEL (SEE SUP. 7) VENTILATOR IN CAB ROOF

Cab boards STEEL PLATE

Running boards STEEL PLATE

Hand rail IRON Located on [illegible]

Back Bumper BAR STEEL

Pilot NONE

Front Bumper CAST STEEL

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

Front Drawhead, Center above rail 33"

Coupler SHARON M.C.B. AUTOMATIC

Frames CAST STEEL Braces SOLID

Cylinders, Diam. 22" Stroke 26"

Stm. ports, Length 19" Width 1⅝" Bridges 1¼"

Exh. ports, Length 19" Width 2¾" Valve lead ¼"

Valve travel 5½" Steam lap ⅞" Exhaust clearance ——

Exhaust nozzle, three 4-3/4" By-pass valve NONE

S.C. Lubr. DETROIT TRIPLE #22 BULLS EYE.

Cyl'r heads CAST IRON, LONG. 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. UNITED STATES, KING TYPE (or Approved)

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD.

Guides TWO BAR TYPE, STEEL Oil cups NEEDLE

Crossheads ALLIGATOR TYPE, CAST STEEL.

Wrist Pins STEEL Oil 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 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 Dim. 3½" x 5½" / 3½" x 6½"

Tires, Plain, Pos. MIDDLE

Lateral play between driving boxes and wheel hubs - ⅛" TOTAL

Driving Boxes CAST STEEL

Journals, Diam. 9" Length 12"

Springs B.L.W.

Front Engine Truck NONE

Back Engine Truck NONE

Tender EIGHT WHEELED

Weight, with fuel and water, about 90,000 POUNDS

Tank 4500 Gallons, Bill 4551

TANK "U" SHAPE, SLOPING BACK. FUEL CAPACITY 6 TONS.

COAL GATES OF STEEL

Tool Boxes OF STEEL, BUILT INTO LEGS OF TANK

Frame STEEL, 10" CHANNELS, WITH WOOD BUMPERS

FRONT AND BACK BUMPERS TO HAVE ⅝" 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 WEST'G FRICTION DRAFT GEAR, COUPLER TO HAVE SLOTTED KNUCKLE

Coupler to be fitted to radial draw bar (to our stock) for [illegible] 4-7-18

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

Trucks ARCH BAR TYPE, WITH CAST STEEL BOLSTER.

TRUCK SPRING PLANKS TO BE OF CHANNEL IRON

Springs ELLIPTIC, B.L.W. MAKE

Journals, Diam. 5" Length 9"

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 SWB WEST'G AUTO. AND STRAIGHT AIR

List of tools, sch. 29 — BY A. LOVELL FOR [illegible] 6-28-18

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 11.2.17 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 sch. 291 OLIVE GREEN AND ALUMINUM

Painting: Tender sch. 291 OLIVE GREEN AND ALUMINUM

1 FLEXIBLE STAYBOLTS TO BE TATE 1" DIAM. ABOUT 400 IN BREAKING TYPE
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. DOOR TO BE OPERATED FROM THE SIDE OF LOCOMOTIVE

3 FRONT END ARRANGEMENT TO BE M.U. STANDARD SELF CLEANING TYPE.

5 ONE PLUG EACH SIDE IN WAIST, BACK OF SAND BOX AND JUST ABOVE THE LONGITUDINAL BEAMS.

6 INJECTOR TO BE SELF ACTING TYPE AND TO BE LOCATED AS LOW AS POSSIBLE.

7 CAB TOOL BOXES AND CAB SEAT BOXES TO BE MADE OF STEEL. CAB CURTAIN TO BE PROVIDED.

8 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.

9 STEP TO BE PROVIDED IN FRONT OF ENGINE WITH BRACKETS OF STEEL, SUPPORTING A STEEL PLATE ON WHICH IS BOLTED AN OAK PLANK. THIS STEP TO BE MADE IN SHORT SECTIONS, WITH SPACE BETWEEN TO CLEAR PILOT OF ANOTHER LOCOMOTIVE TO WHICH THIS LOCOMOTIVE MAY BE COUPLED.
ADDITIONAL STEPS ON BACK OF FRONT BUMPER BEAM.

10 ONE STEP ON RIGHT AND TWO STEPS ON LEFT SIDE OF SMOKE BOX

11 CONNECTIONS BETWEEN ENGINE AND TENDER TO BE CHANGED, SAME AS FURNISHED EXTRA FOR 6 38 D 81 AND 82, TO MAKE PROVISION FOR LOCOMOTIVE TO PASS DROPPER CURVES.

12 ROSMOUT DEVICES CORPORATION CAST STEEL (DOUBLE SPRING) RADIAL BUFFER TO BE APPLIED BETWEEN ENGINE AND TENDER.

13 TOP AND SIDES OF FIREBOX ENDS OF CAB TO BE LAGGED AND JACKETED.

14 FRAMES TO BE THOROUGHLY ANNEALED AND TO HAVE DOUBLE FORWARD SECTION. FRAMES TO HAVE GOOD CROSS BRACES.

15 BEARING BRASSES AND SHOES OF CAST IRON.

16 CYLINDERS TO BE BORED

17 CROSSHEADS TO HAVE SIDE PLATES.
CROSSHEAD GIBS OF CAST IRON, BABBITTED.

18 SMOKE PINS TO BE RIVETTED OVER.

19 TIRE FLANGES ON DRIVING WHEELS TO BE AS WIDE AS PRACTICABLE

20 DRIVING WHEELS TO HAVE BOX LININGS OF BRONZE.

21 DRIVING WHEELS TO HAVE SPLASH BRONZE BEARINGS WITH SUITABLE OIL GROOVES.

22 MAIN CONNECTING ROD AND CRANK BOXES.

23 ALL MAIN BEARINGS TO BE PIPED INTO CYLINDER SADDLE.

24 DRIVING BOXES SECURED TO BE 10"x 12"

26 USE ON THESE LOCOS THE OIL CELLARS AND THE OIL CUPS MADE FOR 6 38 D 93 TO 98.

27 LETTERING, ETC., IN ALUMINUM LEAF, SAME AS FOR 10 34 ½ C 114
LETTERS AND FIGURES TO BE 8" HIGH X 12" WIDE
MARK ON CAB SIDES, I. R. R.
MARK ON TANK SIDES, INTERSTATE
MARK ON BACK OF TANK, 4500 GALLONS
ROAD NUMBER ON CAB TO BE PLACED BELOW MARK
ROAD NUMBER TO BE 11 ON F. NO. PLATE, AND
F. SAND BOX, CAB SIDES AND BACK OF TANK.
} For 6 38 D 106. 6.28.18

28 FOR 6 38 D 107 ALAN WOOD IRON & STEEL COMPANY
MARK ON TANK SIDES, UPPER MERION & PLYMOUTH R. R.
THE LETTERS U M P R R TO BE 8½" HIGH AND 6" WIDE, AND INCLUDING THE CHARACTERS & THE OTHER LETTERS TO BE 7" HIGH AND 4" WIDE.
ROAD NUMBER ON F.NO.PLATE AND ON SIDES OF CAB.
FIGURES ON CAB TO BE 16½" HIGH AND 15½" WIDE.

29 FOR 6 38 D 105 FORMED STEEL WHEEL COMPANY
MARK ON TANK SIDES, F. S. W. CO.
ROAD NO. 7 ON F.NO.PLATE, SIDES OF CAB AND BACK OF TANK.

30 FOR 6 38 D 103 SOLD TO UNITED STATES GOV'T. NAVY DEPT.
MARKING ORD. THRU EX.WK. DEP'T. ORDER #6509.- 7.3.1918
MARK ON TANK SIDES, NAVAL PROVING GROUND
ROAD NO. 9 ON F.NO.PLATE, SIDES OF CAB AND BACK OF TANK.

31 FOR 6 38 D 102 SOLD TO WEMTON STEEL CO., WITH CHANGES COVERED ON EXTRA ORDER NO. 3053 DATED 4.18.19.
LOCO. PLACED IN FIRST CLASS CONDITION.
NEW TUBES AND NEW TIRES THROUGHOUT.
MARK ON TANK SIDES: WEMTON STEEL COMPANY
ROAD NO. 101 ON F.NO.PLATE, HEADLIGHTS AND ON SIDES OF CAB.

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. THIS STEP TO BE MADE IN SHORT SECTIONS WITH SPACE BETWEEN TO CLEAR PILOT OF ANOTHER LOCO. TO WHICH THIS LOCO. MAY BE COUPLED.

52 SIDE STEPS TO BE PROVIDED AT REAR OF TENDER.

53 HANDRAIL ON TANK ONLY 26" HIGH.

For Hereafter: Lateral play between driving boxes and wheel hubs to be 3/16" instead of 1/8" and crank pins to be 1" instead of 7/8". See W.J. McConnell, Atlas Ang. 22, 1919.

Nov 1918

SPECIFICATION FOR LOCOMOTIVES 6 38 D 109

FOR Baldwin Locomotive Works and Canadian Locomotive Company, Ltd. Engine Drawing No. 19.

10-2418

Curves 100 FT. 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 TO BE ½" THICK

Boiler STEEL Thick 13/16" Bill 8826

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 5.47

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 96 1/16" Width 39" Depth F. 71 3/8" B. 69 1/4"

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

Firedoor opening 16" DIAMETER

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" 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 ---

Tubes #12 W. G. CHARCOAL IRON OR STEEL (B.L.W. OPTION)

Tube ends SPACED FOR COPPER FERRULES, FIREBOX ENDS

Number 330 Diam. 2" Length 11' 0"

TUBES TO HAVE ⅜" SPACES

Heating Surface	Flues ---	Combus. Chamb. ---	Total 2046 sq ft
	Tubes 1886 sq ft	Fire Box 160 sq ft	Fire Brick Tubes ---
Grate area 26 sq ft	Ratio to Heating Surface 1 : 78.7		
Superheater ---			

Fire Brick ARCH, NONE

Grate ROCKING BARS WITH DROP PLATE

Ash Pan, Dampers NONE

Throttle, BALANCE Pos. DOME

Dry pipe STEEL

Superheater NONE

Safety Valves THREE COALE 3" ONE MUFFLED (cont'd space)

Safety valves NONE with relief lever, Set to { 180 LBS. MUFFLED / 183 LBS. OPEN

Whistle B. L. W. CHIME

Steam Gauge ONE IRON 7" MAKER:- ASHCROFT (cont'd space)

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 B.L.W. POS:- FRONT

Cleaning Plugs

Firebox CORNERS DIAGONAL AND SIDES

Crown, TWO EACH SIDE AND ONE BACK

Waist, TWO UNDER, AND 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 (cont'd space) 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. 4) 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 32"

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, WITH SLOTTED KNUCKLE

Signal fixtures MALLEABLE IRON ON SMOKE BOX

Headlight TWO ROUND CASE 16" Reflector To burn KEROSENE

Headlight, Nos. on sides WITH Shroud step WITH

Lamp shelf NONE Nosing ---

Bell 92 POUNDS; GOLDMAR 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 STEEL PAINTED Bands IRON Style 9 and 14

Boiler Lagging DIAMOND SECTIONAL

BACK HEADED BOILER TO BE LAGGED AND JACKETED

Nov 1918

SPECIFICATION FOR LOCOMOTIVES 6 38 D 109

FOR Baldwin Locomotive Company, Ltd. 2 125

Frames CAST STEEL Braces SOLID

Cylinders, Diam. 22" Stroke 26"

St'm ports, Length 19" Width 1⅜" Bridges 1⅛"

Exh. ports, Length 19" Width 2¾" Valve lead ¼"

Valve travel 5½" Steam lap ¾" Exhaust clearance ---

Eccentric crank throw 12-7/32" By-pass valve NONE

S. P. Lubr. DETROIT TRIPLE #22 BULLS EYE (cont'd space)

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 RICHARDSON BALANCED, WITH VACUUM VALVES (cont'd space)

Met. pkg SPECIAL RODS VALVE STEMS UNITED STATES, KING TYPE

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD

Guides TWO BAR TYPE, STEEL Oil cups NEEDLE

Crossheads ALLIGATOR TYPE, CAST STEEL

Wrist Pins STEEL Pad 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 B. L. W.

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"

Tires, Plain, Pos. MIDDLE Size 3½ x 6½"

Lateral play between driving boxes and wheel hubs — 3/16" 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. AI-SVA WEST'G. AUTO. AND STRAIGHT AIR / Eng. Tr'k, sch. ---

Foundation Parts { Drivers, sch. BM-3 AND 8C, 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 HYDROSTATIC TEST OF 210 POUNDS

Tender EIGHT Wheeled, Drawing No. 485

Weight, with fuel and water, about 90,000 POUNDS

Tank 4500 Gallons, Bill 4551

TANK "U" SHAPE, SLOPING BACK, FUEL CAPCITY 6 TONS

COAL GATES OF STEEL

Tool Boxes OF STEEL, BUILT INTO LEGS OF TANK

Frame STEEL, 10" CHANNELS, WITH WOOD BUMPERS

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 12½" HEAD AND WITH WEST'G. FRICTION DRAFT GEAR. COUPLER TO HAVE SLOTTED KNUCKLE

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

Trucks ARCH BAR TYPE, WITH CAST STEEL BOLSTER.

TRUCK SPRING PLANKS TO BE OF CHANNEL IRON

Springs ELLIPTIC, B.L.W. MAKE

Journals, Diam. 5" Length 9"

Wheels, Diam. 33" Tread 1¼" 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 SVB WEST'G. AUTO. 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 10.19.18. 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 TANK SIDES B.C.&F.Co.

Road Nos. Pos. Road Nos. Name

F. No. Plate 2

Back of Tank Cab Sides

Actual Dimensions of Loco. Extreme height over all 14' 0"

Extreme Width: Cab boards 10' 3½" Cylinders or valve motion

Length outside face front bumper of engine to face of tender wedge

Length face of tender wedge to outside face back bumper of tender

Total length outside face front bumper of engine to face back bumper of tender

1 FLEXIBLE STAYBOLTS IN WL TAPE 1" DIAM. ABOUT 900 IN WORKING 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. DOOR TO BE OPERATED FROM THE SIDE OF LOCOMOTIVE

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 BEAMS.

5 INJECTORS TO BE SELF ACTING TYPE AND TO BE LOCATED AS LOW AS POSSIBLE.

6 CAB TOOL BOXES AND CAB SEAT BOXES TO BE MADE OF STEEL
CAB CURTAIN TO BE PROVIDED.

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. THIS STEP TO BE MADE IN SHORT SECTIONS, WITH SPACE BETWEEN TO CLEAR PILOT OF ANOTHER LOCOMOTIVE TO WHICH THIS LOCOMOTIVE MAY BE COUPLED.
ADDITIONAL STEPS ON BACK OF FRONT BUMPER BEAM.

9 ONE STEP ON RIGHT AND TWO STEPS ON LEFT SIDE OF SMOKE BOX

10 CONNECTIONS BETWEEN ENGINE AND TENDER TO BE SAME AS FOR 6 38 D 105, TO MAKE PROVISION FOR LOCOMOTIVE TO PASS SHARP CURVES.

11 ECONOMY DEVICES CORPORATION CAST STEEL (DOUBLE SPRING) RADIAL BUFFER TO BE APPLIED BETWEEN ENGINE AND TENDER

12 TOP AND SIDES OF FIRE BOX INSIDE OF CAB TO BE LAGGED AND JACKETED.

13 FRAMES TO BE THOROUGHLY ANNEALED AND TO HAVE DOUBLE FORWARD SECTION. FRAMES TO HAVE GOOD CROSS BRACES.

14 PEDESTAL BRACES AND GIBS OF CAST IRON.

15 CYLINDERS TO BE BUSHED.

16 CROSSHEADS TO HAVE SIDE PLATES.
CROSSHEAD GIBS OF WROT IRON, BABBITTED.

17 RADIUS PINS TO BE RIVETED OVER.

18 THE DRIVER TIRES ON MIDDLE WHEELS TO BE AS THIN AS PRACTICABLE

19 DRIVING WHEELS TO HAVE HUB LINERS OF BRONZE.

20 DRIVING BOXES TO HAVE HEAVY BRONZE BEARINGS WITH SUITABLE OIL GROOVES.

21 MAIN BEARINGS TO HAVE DRAIN CUPS

22 AIR PUMP CONNECT TO BE WIRED INTO CYLINDER SADDLE.

23 DRIVING BRAKE CYLINDERS TO BE 14" x 10".

TENDER

50 STEPS TO BE PROVIDED AT REAR OF TENDER WITH BRACKETS OF STEEL, SUPPORTING A STEEL PLATE ON WHICH IS BOLTED AN OAK PLANK. THIS STEP TO BE MADE IN SHORT SECTIONS WITH SPACE BETWEEN TO CLEAR PILOT OF ANOTHER LOCO. TO WHICH THIS LOCO. MAY BE COUPLED.

51 SIDE STEPS TO BE PROVIDED AT REAR OF TENDER.

52 HANDRAIL ON TANK, ONLY 26" HIGH.

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-6434
Memorandum Spec'n 20031
SPECIFICATION FOR LOCOMOTIVES 4 16 C 150
FOR BEECH BOTTOM POWER COMPANY.
HW

Gen. as PHOTO 4698
Engine Drawing No. 4/14 C DWG. 41
2.12.20

Gauge of Road 4'8½" Play 3/8"
Wheelbase, Rigid 6' 0" Driving 6' 0" Total 6' 0"
Total wheelbase, eng. and tend. {Actual ---, Limited to ---}

Curves ---

Limits, Height 9' 0" Width ---
Weight (approximate) in working order, Total 46,000 POUNDS.
On F. tr'k --- lbs., Drivers 46,000 lbs., B. tr'k --- lbs.

Tractive power 9325 lbs., Ratio of adhesion 4.93
Work'g St'm Pres. 170 lbs., Service SWITCHING.
2 **Fuel** SOFT COAL.

3 **Boiler** STEEL Thick 3/8" Bill 8914 (8935 FOR HEREAFTER)
Front Tube Sheet 7/16" Thick
Boiler, Diam. 32" Plan STRAIGHT TOP.
{Allowable st'm pres. 170 lbs. / With Factor of Safety of 6.12} **Tested to** {190 lbs. steam pres. / 227 lbs. water pres.}
Longitud. seams BUTT JOINTED DOUBLE COVERING STRIPS.

Dome, diam. 19" Pos. FORWARD OF FIRE BOX.

Firebox STEEL Combustion chamb. NONE
Firebox, length 32 3/16" Width 31½" Depth F. 42½" B 42½"
Firebox, Tube 7/16" Crown 3/8" Sides 3/8" Back 3/8"
Firedoor opening 14" DIAM.
Water space, Front 32½" Sides 2½" Back 2½"
Water space frame SINGLE Riveted
Water space stays 3/8" DIAM. WITH 3/16" HOLES 1½" DEEP FROM O.S.

Radial stays 3/8" 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 (B.L.W. OPTION)
Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.
Number 73 Diam. 1¾" Length 9' 2½"

Heating {Flues --- Combus. Chamb. --- Total 343.0 sq. ft.
Surface {Tubes 304.4 sq. ft. Fire Box 38.6 sq. ft. Fire Brick Tubes ---
Grate area 7.6 sq. ft. Ratio to Heating Surface 1: 45
Superheater ---

Fire Brick ARCH - NONE

Grates PLAIN BARS AND DROP PLATE.
Ash Pan, Dampers RIGHT AND LEFT.

Throttle BALANCE Pos. DOME
Dry pipe STEEL

Superheater NONE

SMOKE BOX TO HAVE SHORT EXTENSION.
Smokebox extension SHORT Cleaning hole and cap L.S. ONLY
Netting and deflect. plates WITH

Exhaust nozzles SINGLE - HIGH
Stack STRAIGHT Dia. 9"

Safety Valves TWO COALE 1½" OPEN (Mer Spec)
Safety valves NONE with relief lever, Set to 170 POUNDS.
Whistle ONE B. L. W. PLAIN

Steam Gauge ONE IRON 7" MAKER: ASHCROFT (Mer 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: RIGHT SIDE
Cleaning Plugs
Firebox, CORNERS, L.S. FRONT AND BACK
Crown, ONE EACH SIDE AND ONE BACK
Waist, ONE UNDER FRONT
Front tube sheet, ONE Fusible plug ONE

Pump NONE

FOR HEREAFTER: Firebox back sheet to be 5/16" thick (Boiler Card) 8/8/21

Injectors TWO MONITOR (Mer Spec) 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

3 **Cab** STEEL

Cab boards WOOD Nosing NONE
Running boards WOOD Nosing NONE
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 HAND RAILS.
STEPS, HAND HOLDS ETC., TO CONFORM TO I.C.C. REQUIREMENTS.
E & B. Drawhead, Center above rail 33½"
Coupler M. C. B. AUTO. AT FRONT AND BACK.

Signal 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.
Sand Box TWO Diam. 15" 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

Frames CAST STEEL

Cylinders, Diam. 11" Stroke 16"
St'm ports, Length 9" Width 1" Bridges 7/8"
Exh. ports, Length 9" Width 1¾" Valve lead 1/16"
Valve travel 4½" Steam lap 1" Exhaust clearance ---
Eccentric ~~crank~~ throw 3" By-pass valve NONE
S. F. Lubr. NATHAN TRIPLE BULL'S EYE. (Mer 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 PLAIN "D"
~~Met~~ pkg. PISTON ROD / VALVE STEMS BRAIDED PACKING.
PISTON RODS TO BE KEYED TO CROSSHEAD.
Pistons HEADS OF CAST IRON WITH RINGS OF CAST IRON SPRUNG IN.
Guides SINGLE BAR STEEL Oil cups NEEDLE
Crossheads CAST STEEL WITH BEARINGS OF CAST IRON, TINNED.
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.
SIDE APRON OVER MACHINERY.

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 wheel hub liners NONE
Drivers, O. S. Diam. 30" Cen. diam. 26" CENTRES CAST IRON.

Tires STEEL Held by SHRINKAGE AND SHOULDER.
Tires, Flanged, Pos. ALL Size 2" x 5½"
Tires, Plain, Pos. NONE Size ---
Lateral play between driving boxes and wheel hubs = 3/16" TOTAL
Driving Boxes CAST IRON
Journals, Diam. 5" 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 ---
Wheel hub liners ---
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 ---
Wheel hub liners ---
Wheels, Diam. --- Tread --- Kind ---
Tires --- Cen. diam. --- Size ---
Tires held by ---

SEPARATE LUBRICATOR FOR STEAM BRAKE VALVE.
Brakes, position BOTH PAIR OF WHEELS (NO TENDER)
Operating {Engine, sch. UO-B.L.W. STEAM. / Parts {Eng. Tr'k, sch. ---
Retardation {Drivers, sch. UO-B. L. W. / Parts {Eng. Tr'k, sch. ---
Air pump ONE 9½" Pos. L.S. } FOR AIR DUMP CARS.
Train connections FRONT AND BACK }
Train signal, sch. NONE
AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

Tender NONE

Tank 600 Gallons, Bill 5240
SADDLE TANK OVER TOP OF BOILER, AND EXTENDING TO FRONT OVER TOP OF SMOKE BOX. CLEANING HOLE IN FRONT END OF TANK.

3 FUEL SPACE IN LEFT SIDE OF CAB, CAPACITY 900 POUNDS.

3 LOCO. TO BE OPERATED IN WEST VIRGINIA.

4 WESTERN WHEELED SCRAPER COMPANY'S AIR VALVE TO BE PROVIDED TO OPERATE KILBOURNE & JACOBS DUMP CARS.

List of tools, sch. 26
Photo sch. ~~No. 2~~ 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 2.23.20 Shipment ON CAR

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

B. L. W. 1 NONE
Patents

Property plates NONE

Painting, style 222, OLIVE GREEN AND ALUMINUM.

Mark on TANK SIDES: BEECH BOTTOM POWER COMPANY

Road Nos. Pos. Road Nos. Name NONE
F. No. PLATE 4
CAB SIDES

Actual Dimensions of Loco. Extreme height over all = 9'0"
Extreme Width { Over cab boards = 7' 8½" / Over cylinders or valve motion = 7' 3"
Length outside face of front bumper to { = 18' 5" / outside face of back bumper of engine }

THE BALDWIN LOCOMOTIVE WORKS As Specn. C-4286
Memorandum Spec'n 20034
SPECIFICATION FOR LOCOMOTIVES 6 28 D 331
FOR Beech Bottom Power Company
P

Gen. as Photo. 2932
2-6-20 Engine Drawing No. 47

Gauge of Road 4ft 8½in Play ¾in
Wheelbase, Rigid 10ft 0in Driving 10ft 0in Total 10ft 0in
Total wheelbase, eng. and tend. {Actual 39ft 0½in / Limited to ——

Curves 12 degrees or 478 ft. radius

Limits, Height —— Width ——
Weight (approximate) in working order, Total 88,000 pounds
On F. tr'k —— lbs., Drivers 88,000 lbs., B. tr'k —— lbs.

Tractive power 21,438 lbs., Ratio of adhesion 4.1
Work'g St'm Pres. 160 lbs., Service Switching
Fuel Soft Coal

✱ **Boiler** Steel Thick ⅜in, 7/16in, ½in Bill 6973
Front Tube Sheet ½in Thick
Boiler, Diam. 46in Plan Extended Wagon Top
{Allowable st'm pres. 160 lbs. / With Factor of Safety of 5.72 — **Tested to** {180 lbs. steam pres. / 214 lbs. water pres.
Longitud. seams Butt jointed, double covering strips, sextuple riveted, 90% seams.
Dome, diam. 25in Pos. Forward of Fire-Box
Dome - One piece type
Firebox Steel Combustion chamb. None
Firebox, length 72-5/16in Width 34⅜in Depth F. 58½in B. 49in
Firebox, Tube ½in Crown ⅜in Sides ⅜in Back 5/16in
Firedoor opening 16in diam. Crown and sides in one sheet
Water space, Front 4in Sides 2½in Back 3in
Water space frame Single Riveted
Water space stays 1in diam. with 3/16in holes 1¼in deep from O.S.

Radial stays 1⅛in diam. Sling stays front One ⊥ bar
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 178 Diam. 2in Length 12ft 0in

Heating Surface Flues —— Combus. Chamb. —— Total 1203sq
Tubes 1111sq Fire Box 92sq Fire Brick Tubes ——
Grate area 17.3sq Ratio to Heating Surface 1: 69.4
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 L.S. only
Spark ~~arrester~~ hopper With
Netting and deflect. plates With

Exhaust nozzles Double - High

Stack Straight Dia. 14in

Safety Valves Two Consolidated 2½in Open (Not Spec.)
Safety valves None with relief lever. Set to 160 pounds
Whistle One B. L. W. Chime

Steam Gauge One Iron 7in 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 3in 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
Crown, Two each side and two back
Waist, One under front
Front tube sheet, Two Fusible plug One

Pump None
Locomotive to be operated in West Virginia.
✱ Boiler originally built for 12 24 GT 1 is to be put in good condition on Extra Order No. 15466, dated 2-21-20, and is to be used for this loco. (Boiler not built to A.S.M.E. Code - Suitable for I.C.C. Memo. 10-6-20)
Injectors Two "Monitor" (Not Spec.) 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 27in

Pilot None Pushing shoes Cast in Bumper
Front Bumper Cast Steel Bumper plate None
Steps Across front with handrails
Steps, hand holds to conform to I. C. C. requirements
Front Drawhead, Center above rail 33½in
Coupler M. C. B. Auto.

Signal fixtures None

Headlight Two Round Case 14in Reflector, To burn Kerosene
Headlight, Nos. on sides With H'dl't stop With
Lamp shelf None Nosing ——

Bell 85 pounds.
Sand Box Two Diam. 23in Body Iron painted Pipes Iron
Sanding Leach air trap A-1 in each box, to sand front and back

Dome casing Iron painted

Boiler Jacket #18 Soft Steel Ptd. Bands Iron Str. 9
Boiler Lagging Magnesia Sectional

THE BALDWIN LOCOMOTIVE WORKS
J. V. Applin May 1920.
SPECIFICATION FOR LOCOMOTIVES 6 28 D 331 130
FOR Beech Bottom Power Company
P

Frames Cast Steel

Cylinders, Diam. 17in Stroke 24in
St'm ports, Length 16in Width 1½in Bridges 1in
Exh. ports, Length 16in Width 2½in Valve lead 1/10in
Valve travel 5in Steam lap ⅞in Exhaust clearance ——
Eccentric ~~sheave~~ throw 4½in Bypass valve None
S. F. Lubr. Nathan 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 Balanced, with vacuum valves.
Met. pkg. ~~piston rod valve stem~~ United States. King Type (Not Spec.)
Piston rods to be keyed to crossheads.
Pistons Heads of cast iron, with rings of cast iron, sprung in
Guides Steel Oil cups Needle
Crossheads Cast Steel, with bearings of cast iron, tinned
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 wheel hub liners None
Drivers, O. S. Diam. 44in Cen. diam. 38in Centers Cast Iron

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

Springs, Make B. L. W.

Front Engine Truck None Wheels ——
To swing —— each side of cen. Cen. pin liners ——
Journals, Diam. —— Length —— Boxes ——
Wheel hub liners ——
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 ——
Wheel hub liners ——
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 Westg. Combined Auto. and Straight Air
Parts { Eng. Tr'k, sch. ——
Foundation { Drivers, sch. 88-1 American O. S. Equalized
Parts { Eng. Tr'k, sch. ——
Air pump One 9½in Pos. L. S.
Train connections Front and Back
Train signal, sch. None
Air reservoirs to have hydrostatic test of 210 pounds.

Tender Eight Wheeled. Drawing No. 1503
Weight, with fuel and water, about 65,000 pounds
Tender to be weighed: Yes
Tank 3,000 Gallons, Bill 5209
Tank "U" shape, straight top. Fuel capacity 4½ tons.

Tool Boxes of hard wood, Top

Frame Steel, 6in and 8in channels, with bumpers of wood and steel plate.
Front Drawbar height 28½in
Pilot None Pushing shoes At rear
Back drawhead, center above rail 33½in
Coupler M. C. B. Auto.

Steps, hand holds etc. to conform to I. C. C. requirements
Steps Across back with handrails

Trucks Arch bar type with cast steel bolsters

Springs Elliptic, B. L. W.
Journals, Diam. 3½in Length 7in
Wheels, Diam. 30in Tread 1¼in 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 Westinghouse Auto. and Straight Air, with 10in x 12in tender cylinders.

List of tools, sch. 26
Photo sch. No. 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 2/24/20 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, style 291, Olive Green, and Lettering

Mark on Tank Sides: Beech Bottom Power Company

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

Actual Dimensions of Loco. Extreme height over all 13ft 2in
Extreme Width: Cab boards 8ft 11in; Cylinders or valve motion
Length outside face front bumper of engine to face of tender wedge
Length face of tender wedge to outside face back bumper of tender
Total length outside face front bumper of engine to outside face back bumper of tender 49ft 11in

Gauge of Road 4' 8½" Play 2"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"
Total wheelbase, eng. and tend. Actual ---- Limited to ----

Curves ----

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 TO BE ½" THICK.
Boiler STEEL Thick 13/16" Bill 8305
Boiler, Diam. 74" Plan STRAIGHT TOP.
Boiler st'm pres. 180 lbs., Tested to 200 lbs. steam pres.
WITH FACTOR OF SAFETY OF 4.7 270 lbs. water pres.
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. 71.2" B. 69⅛"
Firebox, Tube ½" Crown ½" Sides ⅜" Back ⅜"
Firedoor opening 16" DIAMETER.
Water space, Front 4" Sides 4" Back 4"
Water space, Frame DOUBLE Riveted
Water space stays ⅜" DIAM. WITH 3/16" HOLES, 1¼" DEEP EACH 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 ----
Tubes #12 W.G. CHARCOAL IRON OR STEEL. (B.L.W. OPTION)
Tube ends SHAGED 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 2040⁰
Tubes 1889⁰ Fire Box 160⁰ Fire Brick Tubes ----
Grate area 26⁰ Ratio to Heating Surface 1 : 78.7
Superheater ----

Fire Brick ARCH, NONE.

Safety Valves THREE CONSOLIDATED 3", One MUFFLED
Spring valves NONE with relief valve, Set to 180 POUNDS MUFFLED
185 POUNDS OPEN.
Whistle B.L.W. ORIDE.

Steam Gauge ONE (NOS 7". MAKER:- ASHCROFT. (cost space)
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
6 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 ----

(cost space)
6 Injectors TWO SELLERS, CLASS "N" No. 9½
6 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. 7) VENTILATOR IN CAB ROOF.

Cab boards STEEL PLATE Nosing T-IRON
8 Running boards STEEL PLATE Nosing T-IRON
Hand rail IRON Located on BOILER.

Buck Bumper BAR STEEL Bank drawbar height 32"

Pilot NONE Pushing shoes CAST IN BUMPER
Front Bumper CAST STEEL (cost space) Bumper plate NONE
Steps, HAND HOLDS, ETC., TO CONFORM TO THE I.C.C. REQUIREMENTS.

Front Drawhead, Center above rail 34½"
Coupler SHARON M.C.B. AUTOMATIC, WITH SLOTTED KNUCKLE.

Signal fixtures MALLEABLE IRON OR SWING GOOSE.

Headlight TWO ROCHE CADET 16" Reflector, TYDOL KEROSENE
Headlight, Pos. on stack BACK WITH SHIELD BACK
Generator NONE Wiring ----

Bell 52 POUNDS. COMPOSITION BELL METAL.
Bell Stand TWO Diam. 20" Body IRON PAINTED Pipes IRON.
Sander LEACH AIR TYPE 4-T, 18 BOX SIZE TO SAND FRONT AND BACK.

Name plate IRON PAINTED.

Driver Axles #18 STEEL KING Journals LARGE Diam. 9" and 10"
Driver Coupling FLEXIBLE CONSTRUCTION.
Driver Boxes TO BE CAST STEEL AND CASTELLATED.

Driving Boxes CAST STEEL. Brass Solid
Cylinders, Diam. 20" Stroke 26"
Steam ports, Length 19" Width 1½" Bridges 1½"
Exhaust ports, Length 32" Width 3½" Valve seat 1½"
Valve travel 6" Steam lap 1" Exhaust clearance ----
Eccentric cranks Inside 12-2/32" Outside valve NONE
S. T. Lubr. Nathan TRIPLE FEED BULLS EYE.
Cyl'r heads CAST IRON, LIGHT. PIPES OF COPPER UNDER JACKET.
Cyl'r casings IRON PTD. Head covers STEEL PAINTED.
St'm sheet casings IRON PTD. Covers STEEL PAINTED.
St'm sheet valves RICHARDSON BALANCED, WITH RELIEF VALVES.
Mot. pkg (cost space) UNITED STATES, KING TYPE. (cost space)

Pistons CAST IRON HEADS SPRUNG INTO SOLID HEAD.
Guides TWO BAR TYPE, STEEL Offside NEEDLE
Crossheads ALLIGATOR TYPE, CAST STEEL.
Wrist Pins STEEL Rod ends 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.

Driving Bearings B.L.W.
Drivers, O. S. Diam. 51" Con. diam. 44" CENTERS, CAST STEEL.

Tires STEEL Fitted by SHRINKAGE AND SHOULDER.
Tires, Flanged, Pos. FRONT AND BACK Size 3½" x 5½"
Tires, Plain, Pos. MIDDLE Size 3½" x 6"
Lateral play between driving boxes and wheel hubs ½" 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 from ----
Journals, Diam. ---- Length ---- Boxes ----
Wheels, Diam. ---- Tread ---- Kind ----
Tires ---- Con. diam. ---- Size ----
Tires held by ----

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

Tender (Left) Standard, Drawing No. 435.
Weight, with fuel and water, about 90,000 pounds.

Tank 9500 Gallons. Bill 1601
Tank "U" SHAPE, SLOPING BACK. Fuel capacity 5 TONS.
COAL GATES OF STEEL.
Tool Boxes OF STEEL, BUILT INTO LEGS OF TANK.

Frame STEEL, 10" CHANNELS.
FRONT AND BACK BUMPERS TO HAVE ⅜" PLATE IN BACK OF SAME
Front Drawbar height 34"
Pins NONE Pushing shoes AT HEAD.
Back drawhead, center above rail 34"
Coupler SHARON M.C.B. AUTO. WITH 12" HEAD AND WITH WEST'S FRICTION DRAFT GEAR, COUPLER TO HAVE SLOTTED KNUCKLE.

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

Trucks ARCH BAR TYPE, WITH CAST STEEL BOLSTER.
TRUCK SPRING PLANKS TO BE OF CHANNEL IRON.
Springs ELLIPTIC, B.L.W. MAKE.
Journals, Diam. 5" Length 9"
Wheels, Diam. 33" Tread 4½" Kind ROLLED STEEL
Tires NONE Con. diam. ---- Size ----
Tires held by ---- RUSSELL RING, 2½" THICK.
Safety chains SINGLE.

Brake Position ON ALL WHEELS.
Brake sch. FL-1212 & 985 WEST'S, AUTO. AND STRAIGHT AIR.

List of tools, sch. 29
Photo sch. NONE Inspection B.L.W. (EXCEPT SEE SUP. 1)
To be weighed No. Material oper'ns B.L.W.
Certificate of boiler test THREE COPIES OF B.L.W. FORM 1036.
Junior laws to 11-2-17. Shipment ON OWN WHEELS.

Brass shop finish, No. 1.
Machine shop finish D-185.

B. L. W. Patents } FEED PIPE STRAINER, PATENTED SEPT. 1ST, 1903. (CAST ON)

Property plates NONE.

Painting:—Engine, style ---- BLACK, NO STRIPING.
Painting—Tender, style ---- BLACK, NO STRIPING.
LETTERING, ETC., AS ALUMINUM LIST.

Mark on Tank Sides, B. L. W. Co.

(cost space) FRONT BUMPER PLATE, (ACCOUNT OF LOCATION OF END SECTIONS)
Front Nos. Pos. Head Nos.
F. Baby Pos. (29 to 131.
Cen. Stud:
Back of Tank

SPECIFICATION FOR LOCOMOTIVES A 32 0-8-0 TO BE.

FOR THE BALDWIN HEAVY STEEL COMPANY.

N.

1 Boiler to be inspected by The Hartford Steam Boiler Inspection and Insurance Co., - Notify this Company when to send Inspector. (See also 24)

2 Flexible staybolts to be Tate or Rowe Iron, 1" 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.

3 Ash Pan to be dumping type with cleaning doors in bottom of pan. Doors to be operated from the side of locomotive.

4 Front end arrangement to be M.M. Standard self cleaning type

5 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.~~ R.F.D. 3.6.18

6 Injector to be self acting type ~~for hot water~~ and to be located as low as possible. R.F.D. 3.6.18.

7 Cab tool boxes and cab seat boxes to be made of steel.
Cab curtain to be provided.

8 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.

9 Step to be provided in front of engine with brackets of steel, supporting a steel plate on which is bolted an oak plank. This step to be made in short sections, with space between to clear pilot of another locomotive to which this locomotive may be coupled.
Additional steps on back of front bumper beam.

10 One step on right and two steps on left side of smoke box.

11 ~~Connections between engine and tender to be changed, same as furnished extra for 6 30 n 01 and 02, to make provision for locomotive to pass sharper curves.~~ R.F.D. 3/10/18.

12 Economy Devices Corporation cast steel (double spring).
Radial buffer to be applied between engine and tender.

13 Headlight to be placed in centre of the smoke box door.

14 Top and sides of firebox inside of cab to be lagged and jacketed.

15 Frames to be thoroughly annealed and to have double forward section. Frames to have wood cross braced.

16 Pedestal wedges and gibs of cast iron.

17 Cylinders to be bushed.

18 Crossheads to have side plates.
Crosshead gibs of cast iron, babbitted.

19 Valve pins to be riveted over.

20 Tire blind fixed on middle wheels to be as side as practicable.

21 Driving wheels to have non leaded of bronze.

22 Driving boxes to have brass bronze bearings with suitable oil grooves.

23 Main reservoirs to have brass studs.

24 Air pump couplings to be pipe size with pipe screw ends.

25 Boiler must be stamped on the back head, in the presence of the Authorized Inspector, thus ~~CHIO STD 20 to 23~~ BALDWIN 3/20/18

26 Air Reservoirs to be furnished by The B. L. W. because Westg. Air Brake Co. cannot furnish in time. 4/19/18

27 Boiler:- Factor of Safety, First Course 5.5
Factor of Safety, second course, 4.7 neglecting value of welded seam.. Factor of Safety, second course 5.7, assuming strength of welded seam to be 50% of that of the original plate. 3/20/18.

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. This step to be made in short sections with space between to clear pilot of another loco. to which this loco. may be coupled.

52 Side steps to be provided at rear of tender.

53 Hand rail on tank only 26" high.

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-565½ (HEREWITH)
Memorandum Spec'n 19013 Dup. 4 22 C 271 WITH SAME EXTRAS
SPECIFICATION FOR LOCOMOTIVES 4 22 C 271 EXCEPT WHERE OTHERWISE SPECIFIED.
FOR THE PHILIP CAREY MFG. CO.
RTL

Gen. as Photo 6894
Engine Drawing No. 40

3-3-19

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 7' 0" Driving 7' 0" Total 7' 0"
Total wheelba eng. and tend. {Actual ---, Limited to ---}
GRADES 6%
★ **Curves** 12 DEGREES

Limits, Height --- Width ---
Weight (approximate) in working order, Total 79,000 POUNDS
On F. tr'k --- lbs., Drivers 79,000 lbs., B. tr'k --- lbs.

Tractive power 17,300 lbs., Ratio of adhesion 4.56
Work'g St'm Pres. 180 lbs., Service SWITCHING
Fuel BITUMINOUS COAL

FRONT TUBE SHEET TO BE ½" THICK.
Boiler STEEL Thick 7/16" Bill 8481
Boiler, Diam. 42" Plan STRAIGHT TOP
Boiler st'm pres. 180 lbs., Tested to 200 lbs. steam pres. / 240 lbs. water pres.
WITH FACTOR OF SAFETY OF 5.4
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS.
AUXILIARY DOME, NONE
Dome, diam. 22" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE
Firebox, length 46-3/16" Width 42¼" Depth F. 44" B. 41½"
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 15/16" 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. CHARCOAL IRON OR STEEL (B.L.W. OPTION)
Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.
Number 100 Diam 2" Length 10' 9"
FRONT AND BACK TUBE SHEETS TO HAVE ¾" BRIDGES BETWEEN TUBES.

Heating Surface	Flues ---	Combus. Chamb. ---	Total 611⁰	
	Tubes 559⁰	Fire Box 52⁰	Fire Brick Tubes ---	
Grate area 13.5⁰	Ratio to Heating Surface 1	45.3		
Superheater ---				

Fire Brick ARCH, NONE

Grates ROCKING BARS WITH 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. S. ONLY
Spark-arrester hopper WITH
Netting and deflect. plates WITH

Exhaust nozzles DOUBLE HIGH

Stack STRAIGHT Dia. 12" Hole in S. B., dia. 14"

Safety Valves TWO COALE 1½" (Not Spec)
Safety valves EACH with relief lever, Set to 180 POUNDS
Whistle ONE B. L. W. PLAIN
FOR HEREAFTER: SAFETY VALVE RELIEF LEVERS TO BE OMITTED.
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 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, 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 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. R. AND L.

Steam Heat NONE

Cab STEEL
COAL BOX IN LEFT SIDE OF CAB, CAPACITY 1600 POUNDS.

Cab boards STEEL Nosing T-IRON
Running boards STEEL Nosing T-IRON
Hand rail IRON Located on TANK

Back Bumper OAK

Pilot NONE Pushing shoes ~~FRONT AND BACK~~ NONE
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. 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 85 POUNDS
Sand Box (Not Spec Sander) TWO Diam. 22½" Body IRON PAINTED Pipes IRON
LEACH AIR TRAP A-1 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

T. E. HERRICK APRIL-1919.
SPECIFICATION FOR LOCOMOTIVES 4 22 C 271 135
FOR THE PHILIP CAREY MFG. CO.
RTL

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 1 3/16" Exhaust clearance ---
Eccentric throw 4" By-pass valve NONE
S. F. Lubr. (Not Spec) DETROIT MICHIGAN No. 22 TRIPLE, BULL'S 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
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 NEEDLE
Crossheads CAST STEEL WITH BEARINGS OF CAST IRON TINNED.
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. NONE 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 ---

Brake, position ON BOTH PAIR OF WHEELS (NO TENDER)
Operating Parts: Engine, Sch. NO. 6-ET "REGTG. COMBINED AUTO. AND STRAIGHT AIR
Eng. Trk. sch. ---
Foundation Parts: Drivers, sch. W-2 AMERICAN O.S. EQUALIZED
Eng. Trk. sch. ---
Air pump ONE 9½" Pos. L. S. ON SMOKE BOX
Train connections FRONT AND BACK
Train signal, sch. NONE

Tender NONE

Tank 1300 Gallons, Bill 4787
SADDLE LOCATED OVER TOP OF BOILER, AND EXTENDING OVER SMOKE BOX.

★ LOCO. TO BE BUILT FOR SERVICE IN OHIO, AND BOILER IS TO CONFORM TO THE OHIO LAWS AND BE STAMPED WITH SERIAL NUMBER 25.
BOILER TO BE INSPECTED BY HARTFORD STEAM BOILER INSURANCE AND INSPECTION CO., OF PHILADELPHIA.

★ LOCO. TO HAUL ONE LOADED COAL CAR OR A TOTAL WEIGHT OF 75 TONS, UP A GRADE OF 6%, IN COMBINATION WITH CURVES OF 12 DEGREES.

ACTUAL DIMENSIONS OF LOCO.:- EXTREME HEIGHT OVER ALL 11' 10⅜"
EXTREME WIDTH OVER FRONT BUMPER 8' 9"
LENGTH O.S. FACE FRONT BUMPER TO O.S. FACE OF BACK BUMPER OF ENGINE 23' 7½"

List of tools, sch. 26
Photo sch. NONE Inspection B.L.W. EXCEPT SEE ★ FOR BOILER.
To be weighed NO Material spec'ns B.L.W.
Certificate of boiler test ~~DUPLICATE~~ THREE Copies B.L.W. FORM 1086 5-16-19
Junior laws to 3-12-19 Shipment ON OWN WHEELS.
~~(EXCEPT DISREGARD LAW PAGE 34 JR. LAW SH. 13)~~ TER. 5-16-19
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 PHILIP CAREY MFG. CO.

Road Nos. Pos. Road Nos. Name NONE
F. NO. PLATE 3
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.

2 A 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
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" & 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"	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.

5 A 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.

6 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 A 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.

8 Upon completion each boiler shall be stamped with the words

OHIO STANDARD
~~(serial no. as specified)~~ 25
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."

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.

THE BALDWIN LOCOMOTIVE WORKS As Specn. 0-6934

Memorandum Spec'n 20067

SPECIFICATION FOR LOCOMOTIVES 4-14-C 300 to 305

FOR (Stock) John F. Casey Co., Pittsburg, Pa. for 300 & 301
The Hugh Nawn Contracting Co. for 302, 303 & 304.
Straso Milling Co., Whitefield, Hartford Co., Mo. for 305.

Gen. as Photo. 3546

Engine Drawing No. 49

3-16-20

Gauge of Road 3'0" Play 5/8"
Wheelbase, Rigid 5'0" Driving 5'10" Total 5'10"
Total wheelbase, eng. and tend. Actual —— Limited to ——

Curves ——

Limits, Height —— Width ——
Weight (approximate) in working order, Total 37,000 pounds
On F. tr'k —— lbs., Drivers 37,000 lbs., B. tr'k —— lbs.

Tractive power 7,738 lbs., Ratio of adhesion 4.78
Work'g St'm Pres. 165 lbs., Service Switching
Fuel Soft Coal

Boiler Steel (See Sup. 5) Thick 3/8" Bill 9085
Front Tube Sheet 1/2" Thick
Boiler, Diam. 36" Plan Straight Top
Allowable st'm pres. 165 lbs. **Tested to** 185 lbs. steam pres.
With Factor of Safety of 5.83 248 lbs. water pres.
Longitud. seams Butt jointed double covering strips.
Dome - one piece type
Dome, diam. 19" Pos. Forward of fire box.

Firebox Steel (See Sup. 5) Combustion chamb. None
Firebox, length 42-1/16" Width 29 7/8" Depth F. 38 1/2" B. 36 1/2"
Firebox, Tube 1/2" Crown 3/8" Sides 3/8" 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 1" diam. Sling stays front None
Button heads below crown on Two central rows
Crown bars None Placed —— above crown
Crown bolts ——

Flues ——
Tubes #12 W.G. Charcoal iron or steel (B.L.W. Option)
Tube ends Swaged for copper ferrules, fire box ends.
Number 74 Diam. 2" Length 8'6 1/2"

Heating Surface Flues —— Combus. Chamb. —— Total 368 sq.ft.
Tubes 328 sq.ft. Fire Box 40 sq.ft. Fire Brick Tubes ——
Grate area 8.7 sq.ft. Ratio to Heating Surface 1: 42.3
Superheater ——

Fire Brick Arch None

Grates Rocking bars and drop plate
Ash Pan, Dampers Right and Left

Throttle Balance Pos. Dome
Dry pipe Cast Iron

Superheater None

Dome box to have short extension.
Smokebox extension Short Cleaning hole and cap None
Back shoot or hopper None
Netting and deflect. plates With

Exhaust nozzle Single - High

Safety Valves Two Coale 1 1/2" Plain (Not Spec.)
Safety valves Both with relief lever, Set to 165 pounds
Whistle One 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: R. S.
Cleaning Plugs
Firebox, Corners diagonal, front and back
Crown, One each side and two back
Waist, One under front
Front tube sheet. One Fusible plug One

Pump None

Injectors (Not Spec.) Two Metropolitan, Model "H" No. 3
Injectors, Pos. R. and L. Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B.L.W. with stop valve Pos. R. and L.

Steam Heat None

Cab Wood
Fuel box in left side of cab. capacity 1000 pounds

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 handrails.
E. & B. Drawhead, Center above rail 18" and 24" for 300 and 301 / 16" and 20" for 302 to 305
Coupler Two pocket draw casting for link and pin coupling (THIRD PAGE)

Signal fixtures None

Headlight Two round case 10" Reflector, To burn Kerosene
Headlight, Nos. on sides None H'd'l step None
Lamp shelf None Nosing ——

Bell 28 pounds
Sand Box Top Diam. 15" Body Iron Painted Pipes Iron
Sander Hand, 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

H. B. Lichetti Oct. 1920

SPECIFICATION FOR LOCOMOTIVES 4-14-C 300 to 305

FOR Stock (See preceeding page)

138 138

Frames Cast Steel

Cylinders, Diam. 10" Stroke 16"
St'm ports, Length 2 1/2" Width 3" Bridges 3"
Exh. ports, Length 2 1/2" Width 1 1/2" Valve lead 1/8"
Valve travel 3" Steam lap 9/16" Exhaust clearance ——
Eccentric crank throw 2 1/2" By-pass valve None
S. F. Lubr. (Not Spec.) Nathan double bull's eye, 1 3/8 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 Plain "D"
Pkg. (Not Spec.) Braided Packing
Piston rods to be keyed to crossheads.

Pistons heads of cast iron with rings of cast iron sprung in.
Guides Steel Oil cups Needle
Crossheads Cast Steel, with bearings of cast iron, tinned.
Wrist Pins Steel Rod cups Plunger.
Parallel rods to have solid ends.

Valve Motion Stephenson.
Links, sliding blocks, pins, bushings and eccentric rod jaws to be liquid case hardened so 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 wheel hub liners None
Drivers, O.S. Diam. 29" Cen. diam. 25" 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 = 1/16" total
Driving Boxes Cast Iron
Journals, Diam. 5" 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 ——
Wheel hub liners ——
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 ——
Wheel hub liners ——
Wheels, Diam. —— Tread —— Kind ——
Tires —— Cen. diam. —— Size ——
Tires held by ——

Brake, position On all driving 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

Tank 700 Gallons. Bill 5389
Saddle tank over top of boiler, extending over smoke box.

Boiler to be built to conform to the A.S.M.E. Code, and to be stamped for use in Pennsylvania. (See * next page)

Boiler to be inspected by the Hartford Steam Boiler Inspection and Insurance Co.

Boilers to be suitable for operation in Ohio, Indiana and Michigan.
4-14-C 300 and 301 sold to John F. Casey Co. Pittsburg, Pa. Union Arcade Bldg. for operation in Detroit, Michigan.

List of tools, sch. 26
Photo sch. None No. 2 Inspection B.L.W. (except for boiler (Sup. 18 & 19)
To be weighed No Material specns B.L.W. (except for boiler (Sup. 4 & 5)
Certificate of boiler test Three copies of B.L.W. form 1-36
Junior fawns to 6-3-20 Shipment On car

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

B. L. W. Patents None

* Next page
Property plates None

Painting, style 223, Olive Green and Aluminum (Not Page)
* Mark on tank sides for 4-14-C 300 & 301 — John F. Casey Co. / Engineering - Contracting / Pittsburg, Pa. — (Omit letter "H" from word Pittsburg.)

* (Next Page) Road Nos. Pos. F. No. Plate Cab Sides — Road Nos. 11 and 12 for 300 & 301; B-1 for 302; B-2 for 303; B-3 for 304 — Name None

Actual Dimensions of Loco. Extreme height over all = 10'2 3/8"
Extreme Width Over cab boards = 7'8" Over cylinders 5'11"
Length outside face of front bumper to outside face of back bumper of engine 19'5"

SPECIFICATION FOR LOCOMOTIVES 4 14 C 300 TO 305

FOR STOCK (SEE SHEET 1)

P

139 139

1 BOILER TO BE OPERATED IN THE STATE OF

BOILER TO BE BUILT TO CONFORM TO THE BOILER CODE OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS (1918), AND MUST BE INSPECTED DURING CONSTRUCTION AND UPON COMPLETION BY AN AUTHORIZED INSPECTOR WHO SHALL NOT BE INTERESTED EITHER DIRECTLY OR INDIRECTLY WITH THE MANUFACTURERS.

2 A DATA REPORT, ON FORMS FURNISHED BY THE ABOVE MENTIONED STATE SHALL BE FORWARDED TO THE PROPER OFFICIAL BEFORE THE BOILER LEAVES THE BUILDER'S WORKS.

3 A HYDROSTATIC TEST SHALL BE APPLIED EQUAL TO ONE-AND -ONE-HALF (1½) TIMES THE WORKING PRESSURE.

4 THE MATERIALS ENTERING INTO THE CONSTRUCTION SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS:-

BOILER AND FIRE BOX STEEL / MATERIAL FOR ONE-PIECE DOME	A.S.M.E. SPEC. PAGE 11
BOILER RIVET STEEL	A.S.M.E. SPEC. PAGE 15
BOILER RIVET IRON	A.S.M.E. SPEC. PAGE 31
BOILER BRACE IRON	A.S.M.E. SPEC. PAGE 32
BOILER STAYBOLT IRON	A.S.M.E. SPEC. PAGE 34
BOILER TUBES	A.S.M.E. SPEC. PAGE 40

5 FRONT TUBE SHEET SHALL BE OF FIRE BOX STEEL.

ALL BOILER AND FIRE BOX STEEL AND MATERIAL FOR ONE PIECE DOME SHALL BE MARKED BY THE MANUFACTURER WITH THE HEAT NUMBER, NAME OF MANUFACTURER, GRADE AND LOWEST TENSILE STRENGTH IN THE MANNER AND LOCATION DESCRIBED ON B.L.W. MARKING CARD 6859. SMOKE BOX STEEL MAY CONFORM TO B.L.W. SPECIFICATION.

6 THE MINIMUM FACTOR OF SAFETY SHALL BE FIVE. (1918)

LONGITUDINAL SEAMS SHALL BE OF BUTT AND DOUBLE STRAP CONSTRUCTION.

7 THE OUTSIDE ENDS OF SOLID STAYBOLTS, 8 IN. AND LESS IN LENGTH, SHALL BE DRILLED WITH A HOLE AT LEAST 3/16" DIA., TO A DEPTH EXTENDING AT LEAST ½" BEYOND THE INSIDE OF THE PLATES

8 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 TABLES:

SIZE OF PIPE CONNECTION OR CORRESPONDING TAPER TAP.	1" & 1¼"	1½" & 2"	2½" TO 4"
NO. OF THREADS PER INCH.	11½	11½	8
MINIMUM NO. OF THREADS REQUIRED IN OPENING.	4	5	7
MINIMUM THICKNESS OF MATERIAL REQUIRED TO GIVE ABOVE NO. OF THREADS.	⅜"	7/16"	⅞"

IF THICKNESS OF BOILER MATERIAL IS NOT SUFFICIENT TO GIVE THE ABOVE NUMBER OF THREADS, A LINER OR FLANGE MUST BE APPLIED.

9 EACH BOILER MUST BE PROVIDED WITH A CONNECTION ¼ PIPE SIZE FOR ATTACHING INSPECTOR'S TEST GAUGE.

10 A FUSIBLE PLUG MUST BE APPLIED. THE PLUG MUST BE FILLED WITH PURE TIN AND THE LEAST DIAMETER OF THE FUSIBLE METAL MUST BE NOT LESS THAN ½" EXCEPT FOR WORKING PRESSURE ABOVE 175 LBS., IN WHICH CASE THE LEAST DIAMETER SHALL NOT BE LESS THAN ⅜", (I. E., USE FUSIBLE PLUG CARD 4114 FOR PRESSURE ABOVE 175 LBS. AND FUSIBLE PLUG CARD 4219 FOR 175 LBS. AND LESS).

4-14 C 305 - SOLD TO STRAUB MILLING CO., WHITEFORD, HARFORD CO., MD.
WITH NECESSARY CHANGES COVERED ON EXTRA ORDER NO. 6647, 1922.
LOCO. TO OPERATE IN STATE OF MARYLAND.
LOCO. TO BE BLOWN OUT BEFORE SHIPMENT.
PAINTING STYLE NO. 223, OLIVE GREEN AND ALUMINUM.
MARK ON TANK SIDES, STRAUB MILLING CO.
ROAD NO. NONE, F. NO. PLATE A STAR

15 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.

16 SAFETY VALVES MUST MEET THE REQUIREMENTS OF THE A. S. M. E. BOILER CODE AND MUST BE PLAINLY STAMPED BY THE MANUFACTURER AS PER B. L. W. MARKING CARD 6858.
SAFETY VALVES OVER 3" IN DIAMETER SHALL HAVE FLANGED INLETS. THESE FLANGES SHALL CONFORM TO THE AMERICAN STANDARD.
ALL SAFETY VALVES MUST BE PROVIDED WITH RELIEF LEVERS.

17 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: ALSO WHERE POSSIBLE ONE NEAR THE THROAT SHEET.

18 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.

19 UPON COMPLETION, EACH BOILER SHALL BE STAMPED IN THE PRESENCE OF THE AUTHORIZED INSPECTOR, WITH THE WORDS AS ARRANGED BELOW. THE HEIGHT OF THE LETTERS AND FIGURES SHALL NOT BE LESS THAN ¼" THE LOCATION OF THE STAMP SHALL BE ON THE BACK HEAD ABOVE A PLUG HOLE.

S

PENNSYLVANIA
(State in which boiler is to be used)
Nos. 15 TO 20
(Manufacturer's State Standard number)
THE BALDWIN LOCOMOTIVE WORKS
(Name of manufacturer)
(LEAVE BLANK) (State's number) (LEAVE BLANK) (Year put in service)
(Manufacturer's Serial Number)
165 LBS.
(Maximum working pressure when built)

*4 14 C 302 AND 303 SOLD TO THE HUGH NAWN CONTRACTING CO. WITH NECESSARY CHANGES COVERED ON EXTRA ORDER NO. 4350 DATED 2-24-22.
LOCOS. TO OPERATE IN THE STATES OF PENNSYLVANIA, NEW YORK AND NEW JERSEY.
COUPLINGS LINK AND PIN TYPE 2½" CENTER ABOVE RAIL.
LOCOMOTIVES TO BE BLOWN OUT BEFORE SHIPMENT.
PROPERTY PLATES B. L. W.
MARK ON TANK SIDES { HUGH NAWN CONTRACTING COMPANY / BOSTON, MASS.
ROAD NOS. "B-1" AND "B-2" ON FRONT NO. PLATE AND CAB SIDES.

*4 14 C 304 SOLD TO THE HUGH NAWN CONTRACTING CO., WITH NECESSARY CHANGES COVERED ON EXTRA ORDER NO. 7887 - 6-22-22.
LOCOMOTIVE TO OPERATE IN STATES OF PENNSYLVANIA, NEW YORK AND NEW JERSEY.
COUPLINGS LINK AND PIN TYPE 2½" CENTER ABOVE RAIL.
LOCOMOTIVE TO BE BLOWN OUT BEFORE SHIPMENT.
PROPERTY PLATES B. L. W. FOR ENGINE.
MARK ON TANK SIDES { THE / HUGH NAWN CONTRACTING COMPANY / BOSTON, MASS.
ROAD NOS. "B-3" ON F. NO. PLATE AND CAB SIDES.

THE BALDWIN LOCOMOTIVE WORKS As Specn. D-5387

Memorandum Spec'n 19068

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1134

FOR Corn Products Refining Company

P

Gen. as Photo. 6408

Engine Drawing No. 52

10-15-19

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"
Total wheelbass, eng. and tend. { Actual ---- / Limited to ----

Curves 195' 6" radius
Grades, 3% **Rails,** 70 pounds
Limits, Height ---- Width ----
Weight (approximate) in working order, Total 132,000 pounds
On F. tr'k ---- lbs.. Drivers 132,000 lbs.. B. tr'k ---- lbs.

Tractive power 30,100 lbs., Ratio of adhesion 4.38
Work'g St'm Pres. 180 lbs., Service Switching
Fuel Coal

Boiler Front Tube Sheet ½" Thick
Steel Thick 9/16" Bill 8746
Boiler, Diam. 56" Plan Straight Top
Boiler st'm pres. 180 lbs., Tested to { 200 lbs. steam pres. / 270 lbs. water pres.
With factor of Safety of 5.05
Longitud. seams Butt jointed, double covering strips

Dome, diam. 29" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 69⅜" Width 42" Depth F. 55⅞" B. 51⅛"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back ⅜"
Firedoor opening 16" diam. Crown and sides in one sheet
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Single Riveted
Water space stays ⅝" diam. (See Sup. 4)
Radial stays 1" Dia". Sling stays front { Two rows 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 (B.L.W. Option)
Tube ends Swaged for copper ferrules, fire box ends.
Number 198 Diam. 2" Length 12' 4"

Heating Surface	Flues ----	Combus. Chamb. ----	Total	1362⁰
	Tubes 1270⁰	Fire Box 92⁰	Fire Brick Tubes	----
Grate area 20.3⁰	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"

Safety Valves Two Coale 2½" Plain (Not Spec.)
Safety valves Both with relief lever, Set to 180 pounds
Whistle One B. L. W. Plain

Additional steam gauge on outside of back of cab for fireman.
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: L. S.
Cleaning Plugs
Firebox Corners diagonal, R. S., 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 Two "Monitor" (Not Spec.) No. 8
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. R. and L.

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 rear, with hand rails.
Steps, hand holds, etc. to conform to I. C. C. requirements
E & B Drawhead, Center above rail 33½"
Coupler M. C. B. Auto.

Signal fixtures None

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
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 ptd. Bands: Iron Style 9
Boiler Lagging Magnesia Sectional

THE BALDWIN LOCOMOTIVE WORKS

Geo. P. Trick Dec. 1919.

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1134 1141

FOR Corn Products Refining Company

P

Frames Cast Steel

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. Detroit Triple No. 22 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 Balanced, with Vacuum Valves
Met. pkg. (Piston rods / Valve stems) United States, King Type (Not Spec.)
Piston rods of steel, keyed to crossheads
Pistons Cast Iron rings sprung into solid heads
Guides Steel Oil cups Needle
Crossheads Cast Steel, with bearings of cast iron, tinned
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 wheel hub liners None
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 = 3/16" 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 ----
Wheel hub liners ----
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 ----
Wheel hub liners ----
Wheels, Diam. ---- Tread ---- Kind ----
Tires ---- Cen. diam. ---- Size ----
Tires held by ----

Brake, position On all driving wheels (No tender)
Operating { Engine, sch. No. 6-ET Weste. Combined Auto. and Straight Air
Parts { Eng. Trk. sch. ----
Foundation { Drivers, sch. WM-2 American O. S. Equalized
Parts { Eng. Trk. sch. ----
Air pump One 9½" Pos. L. S.
Train connections Front and Back
Train signal, sch. None
Air reservoir to have hydrostatic test of 210 pounds.

Tender None

Tank 2250 Gallons. Bill 1471
Saddle tank located over top of boiler.

1 Boiler to conform to the 1918 A. S. M. E. Code.
Boiler to be inspected by the Hartford Steam Boiler Inspection and Insurance Company.

2 Boiler must have factor of safety of at least 5.

3 Boiler to be tested with hot water to one and one half times the boiler pressure.

4 All stay bolts 8" or less in length to have 3/16" holes drilled to a depth extending at least ½" beyond the inside of plate.

For hereafter: Provide only one steam gauge located so as to be easily seen by Engineer and Fireman. (Verbal KR. 12.30.19)

List of tools, sch. 29
Photo sch. ~~No. 8~~ Non Inspection B. L. W. (See Sup. 1)
To be weighed No Material specns B. L. W.
Certificate of boiler test Three copies of B. L. W. form 1036
Junior laws to 10-14-19 Shipment On own wheels

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

B. L. W. { None
Patents

Property plates None

Painting, style 220, Olive Green and Aluminum

Mark on Tank Sides: CORN PRODUCTS REFINING COMPANY

Road Nos. Pos	Road Nos.	Name None
F. No. Plate	2	
Cab Sides		
Back of fuel box		

Actual Dimensions of Loco. Extreme height over all = 14' 8"
Extreme Width { Over cab boards = 10' 3" / Over cylinders or valve motion = 9' 1"
Length outside face of front bumper to outside face of back bumper of engine = 29' 0⅞"

THE BALDWIN LOCOMOTIVE WORKS As Spec'n. 6-3296

Memorandum Spec'n 19087

SPECIFICATION FOR LOCOMOTIVES 4 14 C 299

FOR CRESCENT REFRACTORIES COMPANY

7-29-19

Gen. as PHOTO. 3546 {EXCEPT HEADLIGHT AT FRONT ONLY.

Engine Drawing No. 49

Gauge of Road 3' 0" Play 3/8"
Wheelbase, Rigid 5' 0" Driving 5' 0" Total 5' 0"
Total wheelbase, eng. and tend. {Actual ---- / Limited to ----

Curves 50 FEET RADIUS **GRADES** 2% & 5%
RAILS 30 POUNDS
Limits, Height --- Width ---
Weight (approximate) in working order, Total 36,000 POUNDS
On F. tr'k --- lbs., Drivers 36,000 lbs., B. tr'k --- lbs.

1-3 Tractive power 7725 lbs., Ratio of adhesion 4.6
Work'g St'm Pres. 165 lbs., Service SWITCHING
Fuel SOFT COAL

FRONT TUBE SHEET 1/2" THICK
Boiler STEEL Thick 3/8" Bill 8663
Boiler, Diam. 36" Plan STRAIGHT TOP
Boiler st'm pres. 165 lbs., Tested to 185 lbs. steam pres. / WITH FACTOR OF SAFETY OF 5.1 220 lbs. water pres.
Longitud. seams DOUBLE RIVETED, LAP JOINTS

Dome, diam. 19" Pos. FORWARD OF FIREBOX

Firebox STEEL Combustion chamb. NONE
Firebox, length 42-1/16" Width 30" Depth F. 39 1/2" B. 36 1/2"
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 1/2" 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 ---

Flues ---
Tubes #12 W. G. CHARCOAL IRON
Tube ends SWAGED FOR COPPER FERRULES, FIREBOX ENDS
Number 74 Diam. 2" Length 8' 6 1/2"

Heating Surface Flues --- Combus. Chamb. --- Total 368 sq. ft.
Tubes 328 sq. ft. Fire Box 40 sq. ft. Fire Brick Tubes ---
Grate area 8.7 sq. ft. Ratio to Heating Surface 1 : 42.3
Superheater ---

Fire Brick ARCH, NONE

Grates ROCKING BARS
Ash Pans, Dampers RIGHT AND LEFT

Throttle BALANCE Pos. DOME
Dry pipe STEEL

Superheater NONE

Smokebox extension NONE Cleaning hole and cap NONE
Spark arrester or stopper NONE
Netting and deflect. plates NONE

Exhaust nozzle tips, Lee
Cleaning Pipe - Style
Stack Diameter Dia. 10"

Safety Valves TWO COALE 1 1/2" PLAIN (Not Spec.)
Safety valves NONE with relief lever, Set to 165 POUNDS
Whistle ONE 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: R. S.
Cleaning Plugs
Firebox CORNERS DIAGONAL, FRONT 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 SELLERS, CLASS "N" (Spec) No. 4-3/10
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 TO BE OPEN BACK WITH SLIDING DOORS. SEATS ON BOTH SIDES.
FUEL BOX ON LEFT SIDE OF CAB.- CAPACITY 1000 POUNDS.
Cab boards WOOD Nosing NONE
Running boards WOOD Nosing NONE
4 Hand rail IRON Located on (SEE SUP. 4)

5 **Back Bumper** OAK

Pilot NONE Pushing shoes NONE (Not Spec.)
5 **Front Bumper** OAK Bumper plate NONE
5 **Steps** (SEE SUP. 5)

Drawhead, Center above rail 11" 13" AND 15"
Coupler THREE POCKET GRAB CASTING FOR L.INK AND PIN COUPLING.
MINE CAR TO BE HANDLED AS SHOWN ON PRINT No. 10474.

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 28 POUNDS
Sand Box TWO Diam. 15" Body IRON PAINTED Pipes IRON
Sander HAND, TO SAND FRONT AND BACK.
SAND BOXES MUST BE WATER-PROOF.
Dome casing IRON PAINTED

Boiler Jacket #22 Sop. STEEL PTD. Sands BANDS, IRON Style
Boiler Lagging PLASTIC MAGNESIA FROM B. L. W. STOCK

THE BALDWIN LOCOMOTIVE WORKS

F. I. BIRD SEPT. 1919.

SPECIFICATION FOR LOCOMOTIVES 4 14 C 299

FOR CRESCENT REFRACTORIES COMPANY

143

143

Frames CAST STEEL

Cylinders, Diam. 10" Stroke 16"
St'm ports, Length 7 1/2" Width 2" Bridge 3/4"
Exh. ports, Length 7 1/2" Width 1 1/2" Valve lead 1/16"
Valve travel 3" Steam lap 9/16" Exhaust clearance ---
Eccentric crank throw 2 1/2" By-pass valve NONE
S. F. Lubr. MICHIGAN DOUBLE BULL'S EYE, 1 1/8 PINTS CAPACITY (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 PLAIN "D"
Met. pkg. (PISTON RODS / VALVE STEMS) BRAIDED PACKING
PISTON RODS TO BE KEYED TO CROSSHEADS
Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD
Guides STEEL Oil cups NEEDLE
Crossheads CAST STEEL, WITH BEARINGS OF CAST IRON, TINNED
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.
REVERSE LEVER TO HAVE GOOD LEVERAGE

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 wheel hub liners NONE
Drivers, O. S. Diam. 29" Cen. diam. 25" 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. 5" 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 ---
Wheel hub liners ---
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 ---
Wheel hub liners ---
Wheels, Diam. --- Tread --- Kind ---
Tires --- Cen. diam. --- Size ---
Tires held by ---

Brake, position ON ALL DRIVING WHEELS (NO TENDER)
2 Operating / Engine, sch. U-O B.L.W. STEAM, PUSH TYPE
Parts / Eng. Tr'k, sch. ---
Foundation / Drivers, sch. U-O B.L.W.
Parts / Eng. Tr'k, sch. ---
Air pump --- , Pos. ---
Train connections --- {SEPARATE LUBRICATOR FOR
Train signal, sch. --- {STEAM BRAKE VALVE.
STEAM BRAKE TO HAVE ONE PUSH TYPE CYLINDER PLACED BETWEEN FRAMES JUST AHEAD OF FIREBOX, WITH THE BRAKE SHOES ON FRONT SIDE OF DRIVING WHEELS. BRAKE AS B.L.W. CARD 7654 IS APPROVED.

Tender NONE

Tank 700 Gallons. Bill 4949
SADDLE TANK OVER TOP OF BOILER, EXTENDING OVER SMOKE BOX.

1 LOCOMOTIVE TO BE CAPABLE OF HAULING A MAXIMUM LOAD OF 46 TONS UP A 5% GRADE, ALLOWING A CAR FRICTION OF 20 POUNDS PER TON.

2 LOCOMOTIVE TO BACK DOWN A 5% GRADE WITH 24 CARS, EACH CAR WEIGHING 5400 POUNDS GROSS, AND TO HOLD THE LOAD ON THIS GRADE PROVIDED THE BRAKES ON THE CARS ARE SET BEFORE DESCENDING.

3 FRONT DOOR OF SMOKE BOX TO BE KEPT AS CLOSE TO SMOKE STACK AS POSSIBLE. SMOKE DOOR TO BE OPEN WITH A LATCH (NO BOLTS) AS SMOKE BOX MUST BE CLEANED EACH TRIP.

4 HAND RAIL ON FRONT OF TANK, SIDES OF TANK AND ON REAR CORNERS OF CAB.

5 TOP OF BACK BUMPER TO BE FLUSH WITH FLOOR OF CAB. BUMPERS TO BE 5" ABOVE RAIL AND 21" TO TOP OF BUMPER. BUMPERS ON EXTREME ENDS TO BE AT LEAST 6" WIDE TO ACCOMMODATE A STAPLE TO CARRY A SNOW PLOW. OMIT BUMPER END STEPS. BUMPERS AS B. L. W. TRACING 39484, APPROVED. BUMPING BLOCKS, FRONT AND BACK, OF WOOD AMPLY WIDE TO ACT AS STEP FOR FIREMAN AND SWITCHMAN. BLOCKS TO BE COVERED AT FRONT WITH A PLATE 1/2" THICK EXTENDING ACROSS BOTH BLOCKS, WITH A HOLE FOR THE COUPLING.

List of tools, sch. 26 ONE PAIR WRECKING FROGS.
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 9-1-19 Shipment ON CAR

Brass shop finish, No. 1
Machine shop finish D-165
* BOILER TO BE INSPECTED BY THE HARTFORD STEAM BOILER INSPECTION AND INSURANCE CO.

B. L. W. Patents NONE

Property plates B. L. W. FOR ENGINE

Painting, style 223 BLACK AND ALUMINUM

Mark on TANK SIDES, CRESCENT REFRACTORIES COMPANY

Road Nos. Pos. F. No. PLATE CAB SIDES — Road Nos. 5 — Name NONE

LOCOMOTIVE TO COMPLY WITH ALL PENNA. STATE REQUIREMENTS, AND TO BE STAMPED ON THE BACK HEAD IN THE PRESENCE OF THE AUTHORIZED INSPECTOR, THUS: {PENNA STD 5 H.S.B. BALDWIN 10897

Actual Dimensions of Loco. Extreme height over all = 10' 2 1/4"
Extreme Width / Over cab boards = 7' 2" / Over cylinders or valve motion = 5' 11 1/2"
Length outside face of front bumper to outside face of back bumper of engine = 19' 5"

THE BALDWIN LOCOMOTIVE WORKS As Shown C-5817

Memorandum Spec'n 19053

SPECIFICATION FOR LOCOMOTIVES 4-10-½-C-137

FOR Crucible Steel Co. of America

RTL

Gen. as Photo 5533 {Except to have steel plate bumpers and steps.

Engine Drawing No. 41,

7-21-19.

Gauge of Road 3' 0" Play 5/8"
Wheelbase, Rigid 4' 0" Driving 4' 0" Total 4' 0"
Total wheelbase, eng. and tend. {Actual —— {Limited to ——

Curves 25° 0" RADIUS GRADES 1 TO 2%

Limits, Height 7' 0" Width 5' 6"
Weight (approximate) in working order, Total 22,000 POUNDS
On F. tr'k —— lbs., Drivers 22,000 lbs., B. tr'k —— lbs.

* Tractive power 4,680 lbs., Ratio of adhesion 4.48
Work'g St'm Pres. 160 lbs., Service SWITCHING
Fuel SOFT COAL
* TRACTIVE POWER CALCULATED AT 85% OF WORKING STEAM PRESSURE.

Boiler STEEL FRONT TUBE SHEET 7/16" THICK. Thick 5/16" Bu 8677
Boiler, Diam. 28" Plan STRAIGHT TOP

{Boiler st'm pres. 160 lbs. Tested to {180 lbs. steam pres.
WITH FACTOR OF SAFETY OF 5.3 {214 lbs. water pres.
Longitud. seams DOUBLE RIVETED, LAP JOINTS.

Dome, diam. 19" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE
Firebox, length 26-11/16" Width 24-3/8" Depth F. 33-1/4" B. 33-1/2"
Firebox, Tube 5/16" Crown 5/16" Sides 5/16" Back 5/16"
Firedoor opening 12" DIAM. CROWN AND SIDES IN ONE SHEET.
Water space, Front 2" AND 2½" Sides 2" Back 2"
Water space, Frame SINGLE. Rivets ——
Water space stays 7/8" DIAM. WITH 3/16" HOLES 1½" 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 #12 W. G. CHARCOAL IRON OR STEEL (B.L.W. OPTION)
Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.
Number 46 Diam. 2" Length 7' 0"

Heating Surface	Flues ——	Combus. Chamb. ——	Total 170
	Tubes 1145	Fire Box 24	Fire Brick Tubes ——
Grate area 44.5	Ratio to Heating Surface 1 : 37.8		
Superheater ——			

Fire Brick ARCH, NONE

Grates PLAIN BARS
Ash Pan, Dampers RIGHT AND LEFT

Throttle BALANCE Pos. DOME
Dry pipe STEEL

Superheater NONE

SAND BOX TO HAVE SHORT EXTENSION
Sandbox extension SHORT Cleaning hole and cap UNDERNEATH
Sand ejector or hopper NONE
Nozzles and deflect. plates WITH
Exhaust nozzle SINGLE, NON
Stack DIAMOND Dia. 8"

Safety Valves (Not Spec) TWO COALE 1½" OPEN
Safety valves NONE with relief lever, Set to 160 POUNDS
Whistle B. L. W. PLAIN

Steam Gauge ONE IRON 6" 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 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, 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 ——

Injectors (Not Spec) TWO METROPOLITAN CLASS "H" No. 3
Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER
Pipes, Check STEEL Feed STEEL Overflow STEEL
Check B. L. W. Pos. RIGHT AND LEFT

Steam Heat NONE

Cab STEEL
FUEL BOX IN LEFT SIDE OF CAB, CAPACITY 500 POUNDS.
Cab boards STEEL Nosing IRON
Running boards NONE Nosing ——
Hand rail - IRON Located on CAB

Back Bumper STEEL PLATE

Pilot NONE Pushing shoes FRONT AND BACK
Front Bumper STEEL PLATE Bumper plate NONE
Steps OF SHEET STEEL, ACROSS FRONT AND REAR, WITH HAND HOLDS.

E & B Drawhead, Center above rail 25"
Coupler DRAWHEAD FOR LINK AND PIN COUPLING

Signal fixtures NONE

Headlight TWO ROUND CASE 8" Reflector, To burn KEROSENE
Headlight, Nos. on sides NONE H'd'l't step NONE
Lamp shelf NONE Nosing NONE

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 PTD **Boiler Lagging** PLASTER MATERIALS FROM B. L. W. STOCK.

THE BALDWIN LOCOMOTIVE WORKS

W. O. Webster Sept. 1919.

SPECIFICATION FOR LOCOMOTIVES 4-10½-[illegible]-137

FOR Crucible Steel Company of America

P

145

Frames CAST STEEL

Cylinders, Diam. 8" Stroke 14"
St'm ports, Length 7½" Width 2" Bridges 2"
Exh. ports, Length 7½" Width 1¼" Valve lead 1/16"
Valve travel 2-9/16" Steam lap ½" Exhaust clearance ——
Eccentric sheave throw 2" By-pass valve NONE
(Not Spec) S. F. Lubr. MICHIGAN DOUBLE BULLS EYE 1½ 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 PLAIN "D"
Met. pkg. {PISTON RODS VALVE STEMS BRAIDED PACKING
PISTON RODS TO BE KEYED TO CROSSHEADS
Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD.
Guides STEEL Oil cups NEEDLE
Crossheads CAST STEEL, WITH BEARINGS OF CAST IRON, FITTED
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 wheel hub liners NONE
Drivers, O. S. Diam. 26" Cen. diam. 22" 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 ——
Wheel hub liners ——
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 ——
Wheel hub liners ——
Wheels, Diam. —— Tread —— Kind ——
Tires —— Cen. diam. —— Size ——
Tires held by ——

Brake, position ON ALL DRIVING WHEELS (No TENDER)
Operating { Engine, sch. U-O B. L. W. STEAM
Parts { Eng. Tr'k, sch. ——
Foundation { Driver, sch. U-O B. L. W.
Parts { Eng. Trk. sch. ——
Air pump —— Pos. ——
Train connections ——
Train signal, sch. ——
SEPARATE LUBRICATOR FOR STEAM BRAKE VALVE.

Tender NONE

Tank 350 Gallons, Bill 4933
SADDLE TANK OVER TOP OF BOILER.

LOCOMOTIVE TO BE OF STEEL CONSTRUCTION THROUGHOUT.

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 9-1-19 Shipment ON CAB

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

B. L. W.
Patents NONE

Property plates NONE

Painting, style 223 OLIVE GREEN AND ALUMINUM

Mark on TANK sides, CRUCIBLE STEEL COMPANY OF AMERICA

Road Nos. Pos.	Road Nos.	Name NONE
F. No. PLATE	5	
SAND BOX		
CAB SIDES		

Actual Dimensions of Loco. Extreme height over all = 7' 0"
Extreme Width { Over cab boards = 5' 9"
{ Over cylinders or valve motion = 5' 5½"
Length outside face of front bumper to outside face of back bumper of engine = 15' 3½"

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-6087

Memorandum Spec'n 19071

SPECIFICATION FOR LOCOMOTIVES 6 36 D 311-312

FOR The Detroit Edison Company

RTL (See opposite page - bottom of 2nd column)

Gen. as Photo 5761 {Except to have Electric Headlight

10-30-19 **Engine Drawing No.** 1

Gauge of Road 4' 8½" Play ¾"

Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"

Total wheelbase, eng. and tend. {Actual 44' 9½" 44' 10½" {Limited to —

Curves —

Rails - 60 pounds and 70 pounds per yard

Limits, Height 14' 0" Width —

Weight (approximate) in working order, Total 139,000 pounds

On F. tr'k — lbs., Drivers 139,000 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 or Coke

Boiler to conform to Michigan State Boiler Requirements, U.S. A.S.M.E. code. (Superheater)

Boiler Steel Thick 11/16" Bill 8761

Front Tube Sheet ½" Thick

Boiler, Diam. 68" Plan Straight Top

Allowable st'm pres. 180 lbs. **Tested to** 200 lbs. steam pres.

With Factor of Safety of 5.13 240 279 lbs. water pres.

Longitud. seams Butt jointed, double covering strips

Dome - One-piece type

Dome, diam. 29" Pos. Forward of fire box

Firebox Steel Combustion chamb. None

Firebox, length 108⅛" Width 42" Depth F. 65¼" B. 62¾"

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 3/16" holes 1¼" deep from O.S.

Flexible staybolts, Tate, of Ewald Iron about 300 in breaking zone.

Radial stays 1" diam. Sling stays front {Two rows 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 (B.L.W. Option)

Tube ends Swaged for copper ferrules, fire box ends

Number 317 Diam. 2" Length 10' 5"

Heating	Flues —	Combus. Chamb. —	Total	1912
Surface	Tubes 1715	Fire Box 181	Fire Brick Tubes	16
Grate area	31.5	Ratio to Heating Surface 1:		61
Superheater	—			

Fire Brick Arch - American Arch Co.'s Security Arch on two tubes 3" O.D. No. 7 W. G.

Grates Rocking bars and drop plates

Ash Pan, Dampers Front and back

Ash pan dumping apparatus 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 Arrester-as hopper With

Netting and deflect. plates With

Exhaust nozzle Double high

Blast Cylinder Dia. 18"

Headlight equipment to be Pyle National Electric, type "K" with incandescent headlights and to include cab lamps and headlight and wiring to be so arranged as not to interfere with opening smoke box door.

Safety Valves Two Consolidated 3" Plain (Spec.)

Safety valves Both with relief lever, Set to 180 pounds

Whistle One B. L. W. Plain

Steam Gauge One Iron 7" 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 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 above fire door

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

Injectors Two Sellers, Class "N" (Spec.) No. 9½

Injectors, Pos. Right and Left 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 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 M.C.B. Auto., swing head type.

Signal fixtures None

Headlight Two 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 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 Pro. Bands Iron Style 9

Boiler Lagging Magnesia Sectional

THE BALDWIN LOCOMOTIVE WORKS

H. J. McNeal Jan 1920

SPECIFICATION FOR LOCOMOTIVES 6 36 D 311-312

FOR The Detroit Edison Company

RTL

147

Frames Cast Steel

Cylinders, Diam. 21" Stroke 26"

St'm ports, Length 19" Width 12" Bridges 1⅜"

Exh. ports, Length 19" Width 3" Valve bead 1⅜"

Valve travel 5" Steam lap ¾" Exhaust clearance —

Eccentric sheave throw 5" By-pass valve None

S. F. Lubr. Michigan Triple Bull's Eye (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 valve

Met. pkg. (piston rods) (valve rods) United States, Ring type (Not Spec.)

Piston rods to be keyed to crossheads.

Pistons Heads cast iron with cast iron rings sprung in.

Guides Steel Oil cups Needle

Crossheads Cast steel with bearings 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. 10364, dated 11-17-19

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 wheel hub liners Bronze for main wheels only

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 - 3/16" 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 —

Wheel hub liners —

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 —

Wheel hub liners —

Wheels, Diam. — Tread — Kind —

Tires — Cen. diam. — Size —

Tires held by —

Brakes, position On all driving and tender wheels

Operating Engine, sch. Nos. 6-ET Westg. Combined Auto. and

Parts Eng. Tr'k, sch. — Straight Air

Foundation Drivers, sch. No. 2 Ajax-Brown C.S. Cyl. 1200

Parts 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 in bottom of exhaust passage in cylinder.

Air reservoir to have hydrostatic test of 210 pounds.

Tender Eight Wheeled, Drawing No. 1466

Weight, with fuel and water, about 99,000 pounds

Tank 5,000 Gallons, Bill 4834

Tank "U" shape, straight top. Fuel Capacity 5 tons.

Tool Boxes Hard wood, top

Frame Steel 8" and 10" channels with end sills of cast steel.

Spring buffer between engine and tender.

Front Drawbar height 29¾"

Pilot None Pushing shoes at rear

Back drawhead, center above rail 33½"

Coupler Sharon M.C.B. Auto., swing head type.

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. 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 Westg. Auto. and Straight Air with 10" x 12" cylinder.

★Boiler to be inspected by Hartford Steam Boiler Inspection and Insurance Company.

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. (Except See Sht'l etc.)

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

Junior laws to 11-18-19 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, style 291 Olive Green and Gold

Mark . None

Front number plate & blank.

Road Nos. Pos. Road Nos. Name None

6 36 D 311 for Delray Plant.

6 36 D 312 for Connors Creek Plant.

Actual Dimensions of Loco. Extreme height over all 13' 10⅝"

Extreme Width: Cab boards 10' 1" Cylinders or valve motion - 9' 6½"

Length outside face front bumper of engine to face of tender wedge - 29' 5⅝"

Length face of tender wedge to outside face back bumper of tender - 24' 7½"

Total length outside face front bumper of engine to outside face back bumper of tender - 54' 0"

SPECIFICATION FOR LOCOMOTIVES 6 36 D 311 AND 312

FOR THE DETROIT EDISON COMPANY

148 148

P

1 BOILER TO BE OPERATED IN THE STATE OF MICHIGAN
BOILER TO BE BUILT TO CONFORM TO THE BOILER CODE OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS (1918), AND MUST BE INSPECTED DURING CONSTRUCTION AND UPON COMPLETION BY AN AUTHORIZED INSPECTOR WHO SHALL NOT BE INTERESTED EITHER DIRECTLY OR INDIRECTLY WITH THE MANUFACTURERS.

2 A DATA REPORT, ON FORMS FURNISHED BY THE ABOVE MENTIONED STATE SHALL BE FORWARDED TO THE PROPER OFFICIAL BEFORE THE BOILER LEAVES THE BUILDER'S WORKS.

3 A HYDROSTATIC TEST SHALL BE APPLIED EQUAL TO ONE-AND -ONE-HALF (1½) TIMES THE WORKING PRESSURE.

4 THE MATERIALS ENTERING INTO THE CONSTRUCTION SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS:-

BOILER AND FIRE BOX STEEL MATERIAL FOR ONE-PIECE DOME	A.S.M.E. SPEC. PAGE 11
BOILER RIVET STEEL	A.S.M.E. SPEC. PAGE 15
BOILER RIVET IRON	A.S.M.E. SPEC. PAGE 31
BOILER BRACE IRON	A.S.M.E. SPEC. PAGE 37
BOILER STAYBOLT IRON	A.S.M.E. SPEC. PAGE 34
BOILER TUBES	A.S.M.E. SPEC. PAGE 40

5 FRONT TUBE SHEET SHALL BE OF FIRE BOX STEEL.
ALL BOILER AND FIRE BOX STEEL AND MATERIAL FOR ONE PIECE DOME SHALL BE MARKED BY THE MANUFACTURER WITH THE HEAT NUMBER, NAME OF MANUFACTURER, GRADE AND LOWEST TENSILE STRENGTH IN THE MANNER AND LOCATION DESCRIBED ON B.L.W. MARKING CARD 6859. SMOKE BOX STEEL MAY CONFORM TO B.L.W. SPECIFICATION.

6 THE MINIMUM FACTOR OF SAFETY SHALL BE FIVE. (1918)
LONGITUDINAL SEAMS SHALL BE OF BUTT AND DOUBLE STRAP CONSTRUCTION.

7 THE OUTSIDE ENDS OF SOLID STAYBOLTS, 8 IN. AND LESS IN LENGTH, SHALL BE DRILLED WITH A HOLE AT LEAST 3/16" DIA., TO A DEPTH EXTENDING AT LEAST ½" BEYOND THE INSIDE OF THE PLATES

8 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 TABLES:

SIZE OF PIPE CONNECTION OR CORRESPONDING TAPER TAP.	1" & 1¼"	1½" & 2"	2½" TO 4"
NO. OF THREADS PER INCH.	11½	11½	8
MINIMUM NO. OF THREADS REQUIRED IN OPENING.	4	5	7
MINIMUM THICKNESS OF MATERIAL REQUIRED TO GIVE ABOVE NO. OF THREADS.	⅜"	7/16"	½"

IF THICKNESS OF BOILER MATERIAL IS NOT SUFFICIENT TO GIVE THE ABOVE NUMBER OF THREADS, A LINER OR FLANGE MUST BE APPLIED.

9 EACH BOILER MUST BE PROVIDED WITH A CONNECTION ¼ PIPE SIZE FOR ATTACHING INSPECTOR'S TEST GAUGE.

10 A FUSIBLE PLUG MUST BE APPLIED. THE PLUG MUST BE FILLED WITH PURE TIN AND THE LEAST DIAMETER OF THE FUSIBLE METAL MUST BE NOT LESS THAN ½" EXCEPT FOR WORKING PRESSURE ABOVE 175 LBS., IN WHICH CASE THE LEAST DIAMETER SHALL NOT BE LESS THAN ⅝". (I. E., USE FUSIBLE PLUG CARD 4114 FOR PRESSURE ABOVE 175 LBS. AND FUSIBLE PLUG CARD 1219 FOR 175 LBS. AND LESS).

15 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,

16 SAFETY VALVES MUST MEET THE REQUIREMENTS OF THE A. S. M. E. BOILER CODE AND MUST BE PLAINLY STAMPED BY THE MANUFACTURER AS PER B. L. W. MARKING CARD 6858.
SAFETY VALVES OVER 3" IN DIAMETER SHALL HAVE FLANGED INLETS. THESE FLANGES SHALL CONFORM TO THE AMERICAN STANDARD.
ALL SAFETY VALVES MUST BE PROVIDED WITH RELIEF LEVERS.

17 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: ALSO WHERE POSSIBLE ONE NEAR THE THROAT SHEET.

18 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.

19 UPON COMPLETION, EACH BOILER SHALL BE STAMPED IN THE PRESENCE OF THE AUTHORIZED INSPECTOR, WITH THE WORDS AS ARRANGED BELOW. THE HEIGHT OF THE LETTERS AND FIGURES SHALL NOT BE LESS THAN ¼". THE LOCATION OF THE STAMP SHALL BE ON THE BACK HEAD ABOVE A PLUG HOLE.

S

MICHIGAN
(State in which boiler is to be used)
No. 1 AND 2
(Manufacturer's State Standard Number)
THE BALDWIN LOCOMOTIVE WORKS
(Name of Manufacturer)
(LEAVE BLANK) (State Number) (LEAVE BLANK) (Year put in service)
180 LBS.
(Maximum working pressure when built)
(Manufacturer's Serial Number)

THE BALDWIN LOCOMOTIVE WORKS As Speak. 0-5998

Memorandum Spec'n 20010

SPECIFICATION FOR LOCOMOTIVES 6 38 D 113

FOR THE GOODYEAR TIRE AND RUBBER COMPANY

P

Gen. as PHOTO. 6352

Engine Drawing No. 19

1-22-20

Gauge of Road 4' 8½" Play 2"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"
Total wheelbase, eng. and tend. {Actual 43' 7" / Limited to ——

GRADES, SLIGHT
Curves ——

Frogs, No. 7, ONE OR TWO No. 6.
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 4.24
Work'g St'm Pres. 180 lbs., Service SWITCHING
Fuel SOFT COAL

Boiler STEEL Thick 13/16" Bill 8876
Front Tube Sheet 9/16" Thick
Boiler, Diam. 74" Plan STRAIGHT TOP
Allowable st'm pres. 180 lbs. **Tested to** {200 lbs. steam pres. / 270 lbs. water pres.
With Factor of Safety of 5.42
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS.

Dome, diam. 33" Pos. FORWARD OF FIRE BOX

Firebox STEEL Combustion chamb. NONE
Firebox, length 96-1/16" Width 39" Depth F. 71½" B. 69½"
Firebox, Tube 9/16" Crown ½" Sides ⅜" Back ⅜"
Firedoor opening 16" DIAMETER.
Water space, Front 4" Sides 4" Back 4"
Water space frame DOUBLE Riveted
Water space stays ⅞" HOLES, WITH 3/16" HOLES 1½" DEEP FROM O. S.
Radial stays 1" DIAM. Sling stays front {THREE ROWS 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. STEEL
Tube ends SHAVED FOR COPPER FERRULES, FIRE BOX ENDS
Number 330 Diam. 2" Length 11' 0"

Heating Surface {Flues —— Combus. Chamb. —— Total 2016 sq. ft.
{Tubes 1886 sq. ft. Fire Box 130 sq. ft. Fire Brick Tubes ——
Grate area 26 sq. ft. Ratio to Heating Surface 1: 78.7
Superheater ——

Fire Brick Arch NONE

Grates ROCKING BARS WITH 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
Front end arrangement WITH
Netting and deflect. plate WITH

Exhaust nozzles DOUBLE, HIGH
Nozzle tips STRAIGHT Dia. 16"

Safety Valves (Spring) TWO COALE 3" OPEN
Safety valves BOTH with relief lever. Set to 180 AND 183 POUNDS
Whistle ONE B. L. W. 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 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: FRONT
Cleaning Plugs ONE PLUG ABOVE FIRE DOOR
Firebox, CORNERS DIAGONAL AND SIDES
Crown, TWO EACH SIDE AND ONE BACK
Waist, ONE UNDER FRONT
Front tube sheet ONE ½ fusible plug ONE

Pump NONE

Injectors TWO SELLERS, CLASS "N" (Spec) No. 9½
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

Cab STEEL
CAB TO HAVE SIDE CURTAINS

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 ACROSS FRONT WITH HAND RAIL
STEPS, HAND HOLDS ETC., TO CONFORM TO I.C.C. REQUIREMENTS
Front Drawhead, Center above rail 34½"
Coupler SHARON M. C. B. AUTOMATIC WITH SLOTTED KNUCKLE.

Signal fixtures MALLEABLE IRON ON SMOKE BOX

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 GOLDMAN 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 #18 SOFT STEEL PTD. Bands IRON Style 9 AND 11
Boiler Lagging MAGNESIA SECTIONAL
BACK HEAD OF BOILER TO BE LAGGED AND JACKETED.

THE BALDWIN LOCOMOTIVE WORKS

G. C. ADSIT MARCH - 1920.

SPECIFICATION FOR LOCOMOTIVES 6 38 D 113

FOR THE GOODYEAR TIRE AND RUBBER COMPANY

P

150

Frames CAST STEEL

Cylinders, Diam. 22" Stroke 26"
St'm ports, Length 19" Width 1⅞" Bridges 1⅛"
Exh. ports, Length 19" Width 2¾" Valve lead ¼"
Valve travel 5¼" Steam lap ¾" Exhaust clearance ——
Eccentric crank throw 12-7/32" By-pass valve NONE
S. F. Lubr. DETROIT TRIPLE No. 22 BULL'S EYE (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 RICHARDSON BALANCED, WITH VACUUM VALVES
Met. pkg. {PISTON ROD / VALVE STEMS} UNITED STATES, KING TYPE (Not Spec)

Pistons HEADS OF CAST IRON WITH RINGS OF CAST IRON SPRUNG IN.
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 laws 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 wheel hub liners BRASS
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 = 3/16" TOTAL
Driving Boxes CAST STEEL
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 ——
Wheel hub liners ——
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 ——
Wheel hub liners ——
Wheels, Diam. —— Tread —— Kind ——
Tires —— Cen. diam. —— Size ——
Tires held by ——

Brake, position ON ALL DRIVING AND TENDER WHEELS
Operating {Engine, sch. A-1-SUA WESTG. AUTO. AND STRAIGHT AIR
Parts {Eng. Trk. sch. ——
Foundation {Drivers, sch. W-3 AND BC, AMERICAN O. S. EQUALIZED
Parts {Eng. Trk. sch. ——
Air pump ONE 9½" Pos. LEFT SIDE (See Ex Order #9745-2d)
Train connections FRONT AND BACK
Train signal, sch. NONE
AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

Tender EIGHT Wheeled, Drawing No. 1497
Weight, with fuel and water, about 90,000 POUNDS
TENDER TO BE WEIGHED: YES
Tank 4500 Gallons, Bill 5200
TANK "U" SHAPE, SLOPING BACK. FUEL CAPACITY, 5 TONS.

Tool Boxes OF HARD WOOD, TOP.

Frame STEEL, 8" AND 10" CHANNELS, WITH BUMPERS OF WOOD AND STEEL PLATE.
Front Drawbar height 33½"
Pilot NONE Pushing shoes AT REAR
Back drawhead, center above rail 34½"
Coupler SHARON M. C. B. AUTO. WITH 12½" HEAD, AND WESTINGHOUSE FRICTION DRAFT GEAR. COUPLER TO HAVE SLOTTED KNUCKLES.
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, 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. FL-1012 AND SWB WESTG. AUTOMATIC AND STRAIGHT AIR.

List of tools, sch. 29
Photo sch. NONE Inspection B. L. W. (EXCEPT SEE SUP. 33822)
To be weighed NO Material spec'ns B. L. W. (SEE SUP. 33819)
Certificate of boiler test THREE COPIES OF B. L. W. FORM 1036
Junior laws to 2-20-20 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, style 291, OLIVE, GREEN AND GOLD

Mark on TANK SIDES: {GOOD / AKRON / YEAR} WITH A WINGED FOOT BETWEEN THE WORDS "GOOD" AND "YEAR", ALL AS SHOWN ON Co's. BLUE PRINT.

Road No. Pos. Road No. Name NONE
F. NO. PLATE 1
F. SAND BOX
CAB SIDES
BACK OF TANK

Actual Dimensions of Loco. Extreme height over all 14' 0"
Extreme Width, Cab boards 10' 3½" Cylinders or valve motion 10' 5½"
Length outside face front bumper of engine to face of tender wedge = 29' 9½"
Length face of tender wedge to outside face back bumper of tender = 24' 9½"
Total length outside face front bumper of engine to outside face back bumper of tender 54' 6½"

SPECIFICATION FOR LOCOMOTIVES 6 38 D 113

FOR THE GOODYEAR TIRE AND RUBBER COMPANY

P

1 BOILER TO BE OPERATED IN THE STATE OF OHIO
BOILER TO BE BUILT TO CONFORM TO THE BOILER CODE OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS (1918), AND MUST BE INSPECTED DURING CONSTRUCTION AND UPON COMPLETION BY AN AUTHORIZED INSPECTOR WHO SHALL NOT BE INTERESTED EITHER DIRECTLY OR INDIRECTLY WITH THE MANUFACTURERS.

2 A DATA REPORT, ON FORMS FURNISHED BY THE ABOVE MENTIONED STATE SHALL BE FORWARDED TO THE PROPER OFFICIAL BEFORE THE BOILER LEAVES THE BUILDER'S WORKS.

3 A HYDROSTATIC TEST SHALL BE APPLIED EQUAL TO ONE-AND ONE-HALF (1½) TIMES THE WORKING PRESSURE.

4 THE MATERIALS ENTERING INTO THE CONSTRUCTION SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS:-

BOILER AND FIRE BOX STEEL MATERIAL FOR ONE-PIECE DOME	A.S.M.E. SPEC. PAGE 11
BOILER RIVET STEEL	A.S.M.E. SPEC. PAGE 15
BOILER RIVET IRON	A.S.M.E. SPEC. PAGE 31
BOILER BRACE IRON	A.S.M.E. SPEC. PAGE 32
BOILER STAYBOLT IRON	A.S.M.E. SPEC. PAGE 34
BOILER TUBES	A.S.M.E. SPEC. PAGE 40

TUBES MAY HAVE VARIATION IN GAUGE OF 10% EITHER WAY.

5 FRONT TUBE SHEET SHALL BE OF FIRE BOX STEEL.
ALL BOILER AND FIRE BOX STEEL AND MATERIAL FOR ONE PIECE DOME SHALL BE MARKED BY THE MANUFACTURER WITH THE HEAT NUMBER, NAME OF MANUFACTURER, GRADE AND LOWEST TENSILE STRENGTH IN THE MANNER AND LOCATION DESCRIBED ON B.L.W. MARKING CARD 6859. SMOKE BOX STEEL MAY CONFORM TO B.L.W. SPECIFICATION.

6 THE MINIMUM FACTOR OF SAFETY SHALL BE FIVE. (1918)
LONGITUDINAL SEAMS SHALL BE OF BUTT AND DOUBLE STRAP CONSTRUCTION.

7 THE OUTSIDE ENDS OF SOLID STAYBOLTS, 8 IN. AND LESS IN LENGTH, SHALL BE DRILLED WITH A HOLE AT LEAST 3/16" DIA., TO A DEPTH EXTENDING AT LEAST ½" BEYOND THE INSIDE OF THE PLATES

8 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 OR CORRESPONDING TAPER TAP.	1" & 1½"	1¾" & 2"	2½" TO 3"
NO. OF THREADS PER INCH.	11½	11½	8
MINIMUM NO. OF THREADS REQUIRED IN OPENING.	4	5	7
MINIMUM THICKNESS OF MATERIAL REQUIRED TO GIVE ABOVE NO. OF THREADS.	⅜"	7/16"	½"

IF THICKNESS OF BOILER MATERIAL IS NOT SUFFICIENT TO GIVE ABOVE NUMBER OF THREADS, A LINER OR FLANGE MUST BE APPLIED.

9 EACH BOILER MUST BE PROVIDED WITH A CONNECTION ½ PIPE SIZE FOR ATTACHING INSPECTOR'S TEST GAUGE.

10 A FUSIBLE PLUG MUST BE APPLIED. THE PLUG SHALL BE FILLED WITH ... AND THE LEAST DIAMETER OF THE FUSIBLE METAL MUST BE ... AND LESS THAN ½" EXCEPT FOR BOILERS OPERATING ABOVE 175 LBS. ... AND THE LEAST DIAMETER SHALL NOT BE LESS THAN ... FUSIBLE PLUG DATA SHEET FOR BOILERS ABOVE 175 LBS. ... PLUG DATA SHEET FOR 175 LBS. AND BELOW).

15 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.

16 SAFETY VALVES MUST MEET THE REQUIREMENTS OF THE A. S. M. E. BOILER CODE AND MUST BE PLAINLY STAMPED BY THE MANUFACTURER AS PER B. L. W. MARKING CARD 6859.
SAFETY VALVES OVER 3" IN DIAMETER SHALL HAVE FLANGED INLETS. THESE FLANGES SHALL CONFORM TO THE AMERICAN STANDARD.
ALL SAFETY VALVES MUST BE PROVIDED WITH RELIEF LEVERS.

17 THERE SHALL BE NOT LESS THAN SIX CRANK WASH-OUT PLUGS NOT SMALLER THAN 1½" PIPE SIZE 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 LEGS ALSO WHERE POSSIBLE ONE NEAR THE THROAT SHEET.

18 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 SMALLER 1/8" LESS THAN FULL SIZE FOR PLATES OVER 5/16" IN THICKNESS, AND ¼" 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 ¼" LESS THAN FULL SIZE AND THEN DRILLED, REAMED OR FINISHED FULL SIZE WITH ROTATING CUTTER.

19 UPON COMPLETION, EACH BOILER SHALL BE STAMPED IN THE PRESENCE OF THE AUTHORIZED INSPECTOR, WITH THE WORDS AS ARRANGED BELOW. THE HEIGHT OF THE LETTERS AND FIGURES SHALL NOT BE LESS THAN ¼". THE LOCATION OF THE STAMP SHALL BE ON THE BACK HEAD ABOVE A PLUG HOLE.

(NAME OF BUILDER)	OHIO (STATE IN WHICH BOILER IS TO BE USED) No. 28 (MANUFACTURER'S SHOP NUMBER) THE BALDWIN LOCOMOTIVE WORKS (NAME OF MANUFACTURER) (LEAVE BLANK) (CHARGE NUMBER) (LEAVE BLANK) (TIME PUT IN SERVICE) 180 LBS. (MAXIMUM WORKING PRESSURE WHEN BUILT)

SPECIFICATION FOR LOCOMOTIVES 6 38 D 113

FOR THE GOODYEAR TIRE AND RUBBER COMPANY

P

151 152

21 LOCOMOTIVE TO BE OPERATED IN OHIO.

22 BOILER TO CONFORM TO THE STATE LAWS OF OHIO, AND TO BE INSPECTED BY THE HARTFORD STEAM BOILER INSPECTION AND INSURANCE COMPANY.

23 FLEXIBLE (Sprague) STAYBOLTS TO BE "TATE", 1" DIAM. ABOUT 400 IN NUMBER, IN BREAKING ZONE.

24 ASHPAN TO BE DUMPING TYPE, WITH CLEANING HOLE IN BOTTOM.

25 FRANKLIN RAILWAY SUPPLY COMPANY'S CAST STEEL (DOUBLE SPRING) RADIAL BUFFER TO BE APPLIED BETWEEN ENGINE AND TENDER.

26 CYLINDERS TO BE BUSHED.

27 CROSSHEADS TO HAVE SIDE PLATES.
CROSSHEAD BEARINGS OF WROT IRON, BABBITTED.

THE BALDWIN LOCOMOTIVE WORKS As Sent'd 6-9233
Philadelphia, Penna. 1920

SPECIFICATION FOR LOCOMOTIVES 6 30 D 470

FOR Gulf Refining Company
RTL

Same as Photo. 5230.
Engine Drawing No. 61
1-24-19.

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 9' 6" Driving 9' 6" Total 9' 6"
Total wheelbase, eng. and tend. {Actual 38' 1¼" / Limited to —

Curves —

Limits, Height 13' 10½" — Width over Cab Boards 9' 7"
Weight (approximate) in working order, Total 105,000 pounds
On F. tr'k — lbs., Drivers 105,000 lbs., B. tr'k — lbs.

Tractive power 24,400 lbs., Ratio of adhesion 4.3
Work'g St'm Pres. 185 lbs., Service Switching
Fuel Oil

Front tube sheet to be ½" thick.
Boiler Steel Thick ⅝" Bill 8470
Boiler, Diam. 56" Plan Straight Top
Boiler st'm pres. 200 lbs., Tested to {220 lbs. steam pres. / 267 lbs. water pres.
With factor of safety of 4.95
Longitud. seams Butt jointed, double covering strips

Dome, diam. 29" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 66 3/16" Width 41½" Depth F. 57½" B. 55½"
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 1½" dup. from O.S. Tate Flexible Stay Bolts 1" diam. in breaking zone.
Radial stays 1" diam. Sling stays front {Two rows 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 (B.L.W. Option)
Tube ends Swaged for copper ferrules, fine box ends.
Number 200 Diam. 2" Length 12' 6"

Heating Surface	Flues —	Combus. Chamb. —	Total 1395⁰ᵍ
	Tubes 1300⁰ᵍ	Fire Box 95⁰ᵍ	Fire Brick Tubes —
Grate area 18.9⁰ᵍ	Ratio to Heating Surface 1 : 73.8		
Superheater —			

Fire Brick Arch, None
To be lined with fire brick for oil burning.
Arch upon pavement in man.
Grates None
Ash Pan, Dampers Front only

Safety Valves Two Consolidated 2" Muffled (Spec)
Safety valves None with relief lever, Set to 185 pounds
Whistle One B.L.W. Plain - Whistle to be muffled.

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

Water Gauge One Reflex **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. Position L. S.
Cleaning Plugs
Firebox Corners back ones diagonal, R. S. and front
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 (Spec) Two Ohio No. 9
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 33"
Spring buffer between engine and tender, same as 10 36 E 1295.

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 Tower M.C.B. Auto. from National Malleable Castings Co.

Signal fixtures None
Headlight equipment to be Pyle Electric, type "S" with Incandescent headlights.
Headlight Two Round Cast 14" Reflector,
Headlight Nos. on sides With Hoops and With
Cane shelf None Nosing —

Bell 90 pounds
Sand Box Two Diam. 28" Body Iron Rtd. Pipes Iron
Sander Leach Air Trap Co. in each box, to sand front and back.

Dome casing Iron Rtd.

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 4" Steam lap ¾" Exhaust clearance —
Eccentric crank throw 5" By-pass valve None
L. S. F. Lubr. Detroit Triple No. 22 Bull's Eye (Spec)
Cyl'r heads Cast Iron
Cyl'r casings Iron Rtd. Head covers Steel Painted
St'm chest casings Iron Rtd. Covers Steel Painted
St'm chest valves Richardson Balanced, with Vacuum Valves
Met. pkg {Piston rods / Valve stems} U. S. King Type (not spec)
Piston rods keyed to crosshead
Pistons Cast Iron rings sprung into solid head.
Guides Alligator type, steel Oil cups Needee
Crossheads Cast Steel with Bearings of cast iron, tinned.
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.
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 = 1/10" 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 —

Brakes, position On all driving and tender wheels.
Operating { Engine, sch. Christensen Auto. and Straight Air
Parts { Eng. trk. sch. U.S. Equalized.
Foundation { Drivers, sch. Tender, sch. —
Parts { Eng. trk. sch. —
Air pump One Size Pos. L. S.
Train connections Front and Back
Train signal, sch. None
Air hose to have hydrostatic test of 250 pounds.

Tender Eight Wheeled. Drawing No. 921
Weight, with fuel and water, about 60000 pounds

Tank {Oil 1000 Gallons, Bill 4762 / Water 3000 Gallons, Bill 4166
Tank "U" shape, sloping back.

Tool Boxes None
Spring buffer bet. engine and tender, same as 10 36 E 1295.
Frame Steel 6" & 8" Channels, with cast steel bumpers front and back.

Front Drawbar height 32"
Pilot None Pushing shoes Cast in Bumper
Back drawhead, center above rail 33½"
Coupler Tower M.C.B. " to. from Nat'l Malleable Castings Co.

Steps, hand holds, etc., to conform to I.C.C. Requirements.
Steps across back with hand rails {Step across rear to be of Diamond or knobbled plate
Steps and hand rails on sloping back of tank.
Trucks Arch bar type with Steel Bolsters

Springs Elliptic, B. L. W. Make
Journals, Diam. 3¾" Length 7"
Wheels, Diam. 30" Tread — Kind Cast Iron Plate Centers
Tires Steel Cen. diam. 25" Size 2½" x 5½"
Tires held by Shrinkage and Shoulder
Safety chains Single

Brake Position On all wheels
Brake sch. No 6 St. Louis Auto. and Straight Air with 8" x 12" tender cylinder.

List of tools, sch. 31
Photo sch. None Inspection B.L.W. (See Sup. 10)
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 2-10-19 Shipment On own wheels

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

B. L. W. Patents | Feed Water 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

Mark on Sides of tank G. R. Co.

Road Nos. Pos. Road Nos. Name None
Front No. Plate 1
Cab Sides
Back of Tank

Actual Dimensions of Loco.—Extreme height over all 13' 10½"
Engine weight—Cab boards 9' 7"—Cylinders of same diameter
Tender bumping face from bumper of engine to be 47' 6"
Tender wheels to be in line with engine wheels
Total weight outside fire box sheets 105,000 lbs.
Engine to be outside fire box sheets 105,000 lbs.

SPECIFICATION FOR LOCOMOTIVES - 0-10-0 TYPE

FOR GULF REFINING COMPANY.

1 OIL BURNING ARRANGEMENT - BALDWIN STANDARD WITH BURNER PLACED AT FRONT END OF FIRE BOX.
ROYALTY, IF ANY, ON OIL BURNING ARRANGEMENT PAYABLE BY B.L.W.

2 CAB TO HAVE DROP SEAT FOR ENGINEER, AND BOX SEAT FOR FIREMAN.

3 RUNNING BOARDS TO BE STRAIGHT WITH CONTINUOUS HAND RAIL EXTENDING TO THE FRONT OF THE SMOKE BOX.

4 STEP ARMOR FRONT TO BE OF DIAMOND OR KNURLED PLATE.

5 HEADLIGHT GENERATOR TO BE PLACED BACK OF THE FIRST SAND BOX, WITH THE EXHAUST PIPE RUNNING ABOVE THE CAB. HEADLIGHTS TO BE SMALL SIZE, AND TO BE WIRED FOR SIDEWIRE.
TWO-WAY SWITCH TO BE APPLIED, ONE WAY TO LIGHT THE FRONT HEADLIGHT AND THE OTHER WAY TO LIGHT THE BACK HEADLIGHT.

6 PIPES RUNNING FROM LUBRICATOR TO STEAM CHESTS TO BE OF ~~BRASS AND COPPER~~, ~~ALLOWANCE B.L.W. STANDARD TO CLOSE THE BEST GRADE OF PIPE.~~

7 REVERSE LEVER TO BE PLACED ON SIDE OF BOILER, SO THAT ENGINEER NEED NOT HAVE TO TURN AROUND TO REVERSE THE ENGINE.

8 ~~CROSSHEAD PUMP DRIVE PLATE TO BE PLACED ON THE RIGHT HAND SIDE AS ENGINEER STANDS SIDE OF CAB AND LOOK FROM THE BOILER.~~ (RIGHT HAND SIDE)

9 AIR PUMP TO BE SO LOCATED THAT THE JACKET COVERING THE FIRE BOX MAY BE REMOVED WITHOUT MOVING THE PUMP.

10 ~~SAID~~ ENGINE IS TO BE ~~SATISFIED~~ WHEN ERECTING IS IN ERECTING SHOP AS ARRANGEMENTS CAN BE MADE FOR GEORGE H. TABER, VICE PRESIDENT, GULF REFINING CO. TO MAKE INSPECTION.

SPECIFICATION FOR LOCOMOTIVES - B.30.D.420

[illegible] Coal Burning Company.

[illegible]

1 Oil burning arrangement, Baldwin Standard with burner placed on front end of fire box.
Royalty, if any, on oil burning arrangement payable by B.L.W.

2 Cab to have drop seat for engineer, and box seat for fireman.

3 Running boards to be straight with continuous hand rail extending to the front of the smoke box.

4 Step across front to be of diamond or knurled plate.

5 Headlight generator to be placed back of the first sand box, with the exhaust pipe running above the cab. Headlights to be small size, and to be wired for dinners.
Two-way switch to be applied, one way to light the front headlight and the other way to light the back headlight.

6 Piping running from lubricator to steam chests to be of steel and copper. Allowance by B. L. W. [illegible] B.L.W. spec. 4000.

7 Reverse lever to be placed on side of boiler, so that engineer does not have to turn around to reverse the engine.

8 Straight air brake valve to be placed on the right hand side of engineer, [illegible] of cab and away from the boiler. [illegible]

9 Air pump to be so located that the jacket covering the fire box can be removed without moving the pump.

10 Sales Dept. is to be notified when engine is in Erecting Shop so arrangements can be made for George H. Taber, Vice President, Jule Refining Co. to make inspection.

THE BALDWIN LOCOMOTIVE WORKS Dup. 6-34 D 946 with same extras except as otherwise specified.
Renumbered Specn 1906

SPECIFICATION FOR LOCOMOTIVES 6 34 D 969 to 973 (See also Ry.Co's Erecting Card 9664 (See sup. 132)

FOR A. Guthrie & Co. Incorporated. Engine Drawing No. 76

No. 12-6-14.

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 10' 9" Driving 10' 9" Total 10' 9"
Total wheelbase, eng. and tend. { Actual 38' 10¾" / Limited to -----
Length of engine and tender over-all 52' 4½"
Curves 30 Degrees. Grades, 3%.

Limits, Height { 14' 4½" to top of stack. Width (See sup. 69)
Weight (approximate) in working order, Total 135,000 lbs.
On F. Tr'k ----- lbs., Drivers 135,000 lbs., B. Tr'k ----- lbs.

Tractive power 31,900 lbs., Ratio of adhesion 4.23
Work'g St'm Pres. 180 lbs., Service Switching (See sup. 33)
Fuel Bituminous Coal.
Loco. TO OPERATE AT CALUMET, MINNESOTA.
FRONT TUBE SHEET 9/16" THICK.

Boiler Steel Thick ¾" Bill 8803
Boiler, Diam. 67½" Plan Straight Top.
Boiler st'm pres. 200 lbs., Tested to { 240 lbs. steam pres. / 300 lbs. water pres.
WITH FACTOR OF SAFETY OF 5.21
Longitud. seams Butt jointed, sextuple riveted with welt strips, inside and outside. (See sup. A 42)
Dome, diam. 29" Pos. Central.
Firebox to be Belpaire type.
Firebox Steel Combustion chamb. None.
Firebox, length 96" Width 40" Depth F. 70⅞" B. 67⅞"
Firebox, Tube ⅝" Crown 7/16" Sides ⅜" Back ⅜"
Firedoor opening One, oval 15" x 18"
Water space, Front 4" Sides 3½" Back 3½"
Water space, Frame Double Riveted
Water space stays 1" diam. with 3/16" hole 1½" deep from O. S.
Vertical stays (See sup. 46) Sling stays front (See sup. 46)
Button heads below crown on Ten central rows
Crown bars None. Placed ----- above crown
Crown bolts -----

Flues None.
Tubes 311 B. W. G. Charcoal Iron.
Tube ends Swaged for copper ferrules firebox ends.
Number 291 Diam. 2" Length 11' 3"
Give particular attention to flue setting.

Heating Surface: Flues None. Combus. Chamb. None. Total 1861.4
Tubes 1701.4 Fire Box 160 Fire Brick Tubes -----
Grate area 27.2 Ratio to Heating Surface 1 : 68.4
Superheater -----

Fire Brick Arch None.

Grates Rocking bars of cast iron.
Ash Pan, Dampers Front only.

Throttle Balance Pos. Dome.
Dry pipe Wrot Iron or Steel.

Superheater None.

Smokebox extension Short Cleaning hole and cap { R. S. only. Diameter for Diagram Stripper
Spark arrester or stopper None.
Netting and deflect. plates With (See sup. 53)

Exhaust nozzles Single (See sup. 54)
Blowing Pipe, None.
Blower Cock Iron, Taper. Dia. 12"

Safety Valves (Spec) Two Ashton 3", One Open, One Muffled.
Safety valves Both with relief lever, Set to 180 lbs. Muffled. 183 lbs. Open.
Whistle O. B. L. W. Plain (See sup. 56)

Steam Gauge One Iron 6½" (Spec) Baker:-Ashton, Improved
Steam gauge stand Iron Clock None.

Water Gauge (See sup. 58) Cab Lamps Electric (Sup. 77)
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 (Tropenas Mold Co's pt. 9208. POS:-Front.
Cleaning Plugs (See sup. 62-63)
Firebox Corners diagonal, sides and back.
Crown, Four back.
Waist, Six under.
Front tube sheet, One Fusible plug One

Pump None.

Injectors Two Nathan Non-lifting (Spec) No. 9
Injectors, Pos. Right and Left. Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check Hancock, flange type. Pos. Right and Left.

Steam Heat None.

Cab Steel Plate.

Cab boards 3/16" steel plate. Nosing T-Iron
Running boards 3/16" steel plate Nosing T-Iron
Hand rail Iron 1" pipe Located on (See sup. 74)

Back Bumper Bar Iron Back drawbar height 33½"

Pilot None Pushing shoes At front.
Front Bumper Oak Bumper plate (See sup. 72)
Steps, hand holds, etc. to conform to I.C.C. requirements.

Front Drawhead, Center above rail 34"
Coupler Major solid shank, swing head, M. C. B. Auto. (Sup. 75)
WITH KNUCKLE 13" DEEP (SEE SUP.

Signal fixtures Iron on bumper, B. L. W. design.

Headlight Two Round Case 18" Reflector,
Headlight, Nos. on sides With H'd'l'g step With
Lamp shelf Iron Nosing None.

Bell as Co's print. Bell Ringer, Gollmar Air.
Sand Box Two Diam. 28" Body Iron Painted. Pipes Iron
Sander Leach Air Improved Trap A-1 (Spec)
Sand Box and dome casing to be helmet shaped.
Dome casing Iron Painted, B. L. W. design.

Boiler Jacket #23 Plain. Steel Bands Iron Style 9 and 31
Boiler Lagging Sectional 85% magnesia.

THE BALDWIN LOCOMOTIVE WORKS

N. O. Webster February. 1920. 187

SPECIFICATION FOR LOCOMOTIVES 6 34 D 969 to 973

FOR A. Guthrie & Co. Incorporated

Frames Cast Steel (See sup. 83 a)

Cylinders, Diam. 20" Stroke 26"
St'm ports, Length 19" Width 1¾" Bridges 1⅜"
Exh. ports, Length 19" Width 3" Valve lead 1/16"
Valve travel 5½" Steam lap ⅞" Exhaust clearance -----
Eccentric crank throw 5½"
S. F. Lubr. DETROIT Four Feed (See sup. 86)
Cyl'r heads Cast Steel
Cyl'r casings Sheet Steel Painted Head covers Pressed Steel Painted.
St'm chest casings Sheet Steel Painted Covers Pressed Steel Painted.
St'm chest valves Richardson balanced "D" type, (See sup. 89)
Met. pkg (PISTON RODS / VALVE STEMS) (See sup. 90-91)

Pistons (See sup. 95)
Guides (See sup. 96) Oil cups Needle.
Crossheads Laird type, cast steel (See sup. 97)
Wrist Pins O.H. Steel Rod cups (See sup. 99 100)

Valve Motion Stephenson (See sup. 101 a)

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

Wearing Bearings (See sup. 107-141)

Drivers, O. S. Diam. 49" Con. diam. 42" Centres Cast Steel.

Tires Steel (Sup. 105) Held by Shrinkage.
Tires, Flanged, Pos. All Size 3½" x 5½"
Tires, Plain, Pos. ----- Size -----
Lateral play between driving boxes and wheel hubs = 1/32" 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 { Engine, Sch. #6 ET West'g. combined Auto. and Straight Air / Eng. Tr'k, sch. -----
Foundation { Drivers, sch. WB-2 American C. S. Equalized. / Parts Eng. Tr'k, sch. -----
Air pump Two (Sup. 119) Pos. (See sup. 116 129-1)
Train connections Front and back.
Train signal, sch. None.

Tender Eight Wheeled, Drawing No. 701
Weight, with fuel and water, about 90,000 lbs.

Tank 4500 Gallons. Bill 5119
Tank sloping back. Fuel capacity 6 tons.

Tool Boxes (See sup. 132-133)

Frame Steel 10" Channels., WITH BUMPERS OF WOOD AND STEEL PLATE.

Front Drawbar height 34½"
Pilot None. Pushing shoes at rear.
Back drawhead, center above rail 33½"
Coupler Major Solid Shank, swing head, M.C.B.Auto. (See sup. 138)
WITH KNUCKLE 13" DEEP.

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

Trucks Arch Bar Type (See sup. 139)

Springs Elliptic. B.L.W. make.
Journals, Diam. 4½" Length 8"
Wheels, Diam. 33" Tread 4½" Kind Chilled Cast Iron Double Plate.
Tires None. Cen. diam. ----- Size -----
Tires held by -----
Safety chains Double, of 1" standard pro'f.

Brake Position On all wheels.
Brake sch. #6 ET West'g Auto. and Straight Airsmith 10" x 12" cylinder (See sup. 110-117 129-133 136 138)

List of tools, sch. (See sup. 35)
Photo sch. None. Inspection B. L. W. (EXCEPT SEE Sup. 59)
To be weighed No. Material spec'ns B. L. W. Except See Sup. 4)
Certificate of boiler test Three copies of B. L. W. form 1C36.
Junior laws to None. Shipment On own wheels (See sup. 34)

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 -----Blank, No Striping.
Painting: Tender, style -----Black, No Striping.
Marking to be in white paint, using block letters.
Lettering, etc. to be same as 6-34 D 946.
Mark on tank sides, A. GUTHRIE & CO., INC. In 8" BLOCK LETTERS.
Engine front bumper and tender side sills to be marked to indicate the application of U.S. Standard Safety Appliances, as C.N.Ry.Co's pt. 182c.

	Road Nos. Pos.	Road Nos.	Name None.
F. No Plate		214 to 218	
F. Sand Box		"	
Cab Sides			
Back of tank.			

SPECIFICATION FOR LOCOMOTIVES, 6 34 D 969 to 973

FOR, A. Guthrie & Co., INC.

1 BOILER TO BE OPERATED IN THE STATE OF MINNESOTA
BOILER TO BE BUILT TO CONFORM TO THE BOILER CODE OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS (1918), AND MUST BE INSPECTED DURING CONSTRUCTION AND UPON COMPLETION BY AN AUTHORIZED INSPECTOR WHO SHALL NOT BE INTERESTED EITHER DIRECTLY OR INDIRECTLY WITH THE MANUFACTURERS.

2 A DATA REPORT, ON FORMS FURNISHED BY THE ABOVE MENTIONED STATE SHALL BE FORWARDED TO THE PROPER OFFICIAL BEFORE THE BOILER LEAVES THE BUILDER'S WORKS.

3 A HYDROSTATIC TEST SHALL BE APPLIED EQUAL TO ONE-AND-ONE-HALF (1½) TIMES THE WORKING PRESSURE.

4 THE MATERIALS ENTERING INTO THE CONSTRUCTION SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS:-

BOILER AND FIRE BOX STEEL MATERIAL FOR ONE-PIECE DOME	A.S.M.E. SPEC. PAGE 11
BOILER RIVET STEEL	A.S.M.E. SPEC. PAGE 15
BOILER RIVET IRON	A.S.M.E. SPEC. PAGE 31
BOILER BRACE IRON	A.S.M.E. SPEC. PAGE 32
BOILER STAYBOLT IRON	A.S.M.E. SPEC. PAGE 34
BOILER TUBES	A.S.M.E. SPEC. PAGE 40

TUBES MAY HAVE VARIATION IN GAUGE OF 10% EITHER WAY.

5 FRONT TUBE SHEET SHALL BE OF FIRE BOX STEEL.
ALL BOILER AND FIRE BOX STEEL AND MATERIAL FOR ONE PIECE DOME SHALL BE MARKED BY THE MANUFACTURER WITH THE HEAT NUMBER, NAME OF MANUFACTURER, GRADE AND MINIMUM TENSILE STRENGTH IN THE MANNER AND LOCATION DESCRIBED ON B.L.W. MARKING CARD 6859. SMOKE BOX STEEL MAY CONFORM TO B.L.W. SPECIFICATION.

6 THE MINIMUM FACTOR OF SAFETY SHALL BE FIVE. (1918)
LONGITUDINAL SEAMS SHALL BE OF BUTT AND DOUBLE STRAP CONSTRUCTION.

7 THE OUTSIDE ENDS OF SOLID STAYBOLTS, 8 IN. AND LESS IN LENGTH, SHALL BE DRILLED WITH A HOLE AT LEAST 1/16" DIA., TO A DEPTH EXTENDING AT LEAST ½" BEYOND THE INSIDE OF THE PLATES

8 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 OR CORRESPONDING TAPER TAP.	1" & 1¼"	1½" & 2"	2½" TO 4"
NO. OF THREADS PER INCH.	11½	11½	8
MINIMUM NO. OF THREADS REQUIRED IN OPENING.	6	5	7
MINIMUM THICKNESS OF MATERIAL REQUIRED TO GIVE ABOVE NO. OF THREADS.	½"	7/16"	¾"

IF THICKNESS OF BOILER MATERIAL IS NOT SUFFICIENT TO GIVE THE ABOVE NUMBER OF THREADS, A LINER OR FLANGE MUST BE APPLIED.

9 EACH BOILER MUST BE PROVIDED WITH A CONNECTION ¼ PIPE SIZE FOR ATTACHING INSPECTOR'S TEST GAUGE.

10 A FUSIBLE PLUG MUST BE APPLIED. THE PLUG MUST BE FILLED WITH PURE TIN AND THE LEAST DIAMETER OF THE FUSIBLE METAL MUST BE NOT LESS THAN ½" EXCEPT FOR WORKING PRESSURE ABOVE 175 LBS., IN WHICH CASE THE LEAST DIAMETER SHALL NOT BE LESS THAN ⅝". (I.C. 891 ONE FUSIBLE PLUG SAME SIZE FOR ONE BOILER ABOVE 175 LBS. AND FUSIBLE PLUG SAME SIZE FOR 175 LBS. AND LESS).

15 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.

16 SAFETY VALVES MUST MEET THE REQUIREMENTS OF THE A. S. M. E. BOILER CODE AND MUST BE PLAINLY STAMPED BY THE MANUFACTURER AS PER B. L. W. MARKING CARD 5053.
SAFETY VALVES OVER 3" IN DIAMETER SHALL HAVE FLANGED INLETS.
THESE FLANGES SHALL CONFORM TO THE AMERICAN STANDARD.
ALL SAFETY VALVES MUST BE PROVIDED WITH RELIEF LEVERS.

17 THERE SHALL BE NOT LESS THAN SIX GRASS 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; ALSO WHERE POSSIBLE ONE NEAR THE THROAT SHEET.

18 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 EXCEEDING ¼" LESS THAN FULL SIZE FOR PLATES OVER ⅝" IN THICKNESS, AND ⅛" LESS THAN FULL SIZE FOR PLATES ⅝" 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.

19 UPON COMPLETION, EACH BOILER SHALL BE STAMPED IN THE PRESENCE OF THE AUTHORIZED INSPECTOR, WITH THE WORDS AS ARRANGED BELOW. THE HEIGHT OF THE LETTERS AND FIGURES SHALL NOT BE LESS THAN ⅜". THE LOCATION OF THE STAMP SHALL BE ON THE BACK HEAD ABOVE A PLUG HOLE.

(Manufacturer's Serial Number)	MINNESOTA (State in which boiler is to be used) No. 1 TO 5 (Manufacturer's State Numbers) THE BALDWIN LOCOMOTIVE WORKS (Name of manufacturer) (LEAVE BLANK) (Shows number) (LEAVE BLANK) (Year put in service) 200 LBS. (Maximum working pressure when built)

31 Details of Locos. to conform to R. R. Co's prints as per following list:- The B. L. W. must check these prints and will be responsible for parts going together as intended.

9895	Air Pump Bracket
11688	Ash Pan Hopper and Bottom
10324	Ash Pan Work
11668	Bumper Beam Plate
11383	Balance plate for main valve
9573	Boiler
11482	Blower elbow
11702	Bumper beam bracket
10151	Bell and stand
11788	Bolster end plate Tender truck
11624	Bumper Beam
11400	Brake head and shoe
11786	Bumper Scroll
	Boiler diagram for lagging
11668	Bumper Plate
11781	Back tender draft sill bracket
9675	Cylinder
10830	Cylinder Heads
11762	Cylinder Cocks Work
11520	Cab Ventilator Works
10322	Cab
11744	Cab Door Fastening
11491	Cylinder Cock Lever
11443	Crosshead
10826	Cab Bracket
20301	Crank Pins
11519	Cab Apron
11758	Cylinder head casing
20587	Counterbalance Spring
11756	Cab step in cab
11652	Cab Handle
11765	Center on tender truck bolsters
20555	Driver Springs, coil
10891	Driver Brake Details
20509	Driver Springs. 20512 Driver Springs.
12035	Driver Box
10133	Dome Cap and Ring
11730	Driving Wheel hub liner.
20805	Driving Axle
10833	Driving Wheel
11739	Drawhead front of tender.
11769	Dome Casing
10968	Driver Brake (General Arrangement)
11636	Drawhead for switch engines tenders.
11287	Driving Spring Saddle
11626	Eccentric Strap (steel)
11754	Eccentric Rods
11297	Expansion Staybolt
10835	Exhaust Pipe
10999	Engine Frame
11627	Engine Chafing Plate
11927	Eccentric
11779	Front and main rod
11679	Furnace Crossties
11687	Frame brace front of firebox
10150	Foot Plate
10813	Furnace Bearer
11671	Frame Column
11789	Flue Sheet Ring
11394	Firebox Door
11751	Frame brace on lower rail.
9936	Fire-door frame.
11682	Frame Crossties
11712	Flange for Boiler Check
9514	Flanged Sheets
12221	Front Flue Sheet

(List continued at top of next column)

10148	Gauge
9809	Gauge Cock
10326	Grate
11770	Guides
11755	Guide Yoke
11748	Guide Bearer Knee
~~9435~~	~~Gauge Water Glass~~
~~11549~~	~~Hose connection~~
9901	Headlight Step
11774	Headlight board on tender
11747	Headlight board on engine
11831	Handrail for front of engine and back of tender.
11670	Gauge cock socket
11676	Guide bearer knee
11722	Handrail on boiler
11706	Handrail on tender
9684	General Elevations
11518	Link Hanger
11280	Link
11753	Oil pipe connection
11795	Pipes and bushings motion work
11678	Push Pole Pocket
11851	Piston 19"
9860	Piston Rod
11641	Piston Packing
11784	Plate for steam chest casing top.
	Pedestal shoes and wedges.
11517	Reach Rod
10816	Reverse Lever
11763	Reverse Lever Fulcrum
11674	Reverse Lever Foot Rest
11522	Reverse Lever spring coupling rod.
11778	Reverse lever spring pocket
11485	Running Board
11787	Rocket Box
11673	Rocker Arm
11696	Rods, main and side forgings
10811	Rods, intermediate stub.
11651	Rods, side stub
11718	Rods main stub, back end.
11649	Rods, knuckle stub.
9265	Steam pipes and nigger head.
11716	Steam Gauge Stand
11512	Sleeve for Injector Valve
11393	Step on front of engine.
11355	Step on sand box.
10030	Smokebox Front
11513	Sand Pipe Connections
10829	Sand Box
10323	Sander G. N.
12720	Oil cup and bracket for valve stem packing.
10005	Side rod, solid ends.
11270	Steam Chest
11353	Slide Valve, Richardson D
11349	Steam chest casing top.
11693	Steam chest casing
12137	Support for end sill
11685	Steam Chest Cap
10812	Spring Gear Details
11764	Side bearing for tender truck
20902	Tender truck axle
11418	Truss rod plated tender truck
11642	Tumbling Shaft
11690	Tender truck columns
11781	Tender draft sill bracket (back)
9854	Throttle lever
11516	Turret dry pipe
10814	Turret
11647	Tail Plate

(Continued on next page)

Sup.31 (Continued):
11709 Tumbling Shaft Bearing
10838 Tank 4000 gallons
11669 Tank Valve
10137 Throttle valve pipe and stand pipe
11783 Tank valve gen.
9674 Tender frame
9370 Tender Truck
11623 Tender chafe plate
10824 Tender brake
11750 Tender spring seat and shoe
11773 Tender journal brass 4½" x 8"
11766 Tender step rear
11760 Top center for tender truck
11757 Tender side bearing
11989 Tender Sills
11339 Valve Rod
11348 Valve Yoke
10815 Valve stem packing, G. N.
11650 Washout Plug
11669 Wedge Bolt
9920 Whistle Extension
11734 Whistle Rigging
11735 Whistle Lever
9897 Whistle Rod Jaw
11496 Whistle Elbow

32 Locs. to be built as Co's specification and prints, except as altered for previous locos. built for Great Northern Ry. and as otherwise specified.

33 Locs. to be used in stripping work on Iron Range.

34 Galena Signal Oil Co's Oil and grease to be used for lubrication.

35 Tools, etc. as per list, as follows:-

Large Tool Box.
1 Side and Main Rod Pin and nut Wrench
1 Knuckle Pin Wrench
1 Pedestal Nut Wrench
1 Large Spanner Wrench
1 Crosshead Pin Wrench

1 Pinch Bar
1 Switch Chain
1 Steam Chest Cover Lifter
2 Iron faced wedges for running drivers onto rail.
2 Guide Blocks
2 Tank Truck Brasses
1 Pair Buda No. 3 Car and Engine Replacers.

Steel open end wrenches necessary according to requirements where monkey wrenche cannot be used.
8 Flue Plugs
1 Air Hose
Oilers in cab
2 Engine Oilers
1 Tallow Can
Extras
4 Red Flags
1 Broom
1 Water pail
1 PushPole (For Switch Locos.)
1 Plugging Bar

B. L. W. Sch.No. 185
Small Tool Box.
1 16" Monkey Wrench
1 12" Combination Wrench
1 Flat Chisel
1 Cape Chisel
1 Hard Hammer
1 Soft Hammer
2 Set Screw wrenches
1 Spanner Air Pump Wrench
1 Small Screw Driver
1 Packing Spoon and Hook
1 Rod Cup Wrench
Oil and Lantern Box.
1 White Lantern
2 Red Lanterns
2 Two Gallon Oil Cans
2 Dope pail for cut grease
1 Dope pail for hot box dope
8 Torpedos and Box

Fire Tools.
1 Coal Pick
1 Coal Scoop.
1 Fire Rake.
1 Front End Poker
1 Ash Hoe
1 Clinker Bar (for engines with dump grates)

36 Ship direct to Calumet, Minnesota, to be applied to locomotive after delivery, the following:
Oil Cups as B. L. W. tracings 12307 and 12315.
Oilers as B. L. W. tracing 12316 → Dope Pails as B.L.W. tracing 12317

40 Cylinder cocks, brakes and front and back steps to be at least 6" above rail.

41 Boiler largest course 67½" diameter inside.
Boiler shell thoroughly reinforced at openings. Plates planed at edges. Rivet holes to be reamed after plates are assembled and slightly counterbored under heads of rivets. Rivets to be driven by hydraulic or pneumatic pressure wherever possible. All plates to be carefully flanged and all flanged plates to be annealed after flanging.
Boiler must conform to U. S. Federal Boiler laws.

42 Boiler, Longitudinal seams welded, B. L. W. seams, staying, dome flange and ring.
Throat sheet to be in two pieces.

43 Dome to be B. L. W. pressed steel. "One piece type.
Auxiliary dome, None. (see sup. 65)

44 Mud ring machined at corners and welds, outside corners to be plugged and riveted over to draw sheet closely up to mud ring.

45 Flexible staybolts (Not Spec) - Tate - 403 in breaking zone.
Staybolts to be spaced not over 4" center to center.

46 Vertical stays 1" diameter in roof sheet and 1⅛" diam. in crown sheet with button heads, screwed through crown sheet and shell and riveted over.
Two front transverse rows of crown stays to be Tate pattern expansion stays.

47 The flat sides above crown braced by two rows of crose stays 1½" diameter in body, screwed through sheets and riveted over on outside. Backhead and front flue sheet to be braced by heavy tee iron and by longitudinal braces to shell of boiler. Firebox flue sheet braced to barrel below flues.
All holes in boiler braces to be drilled and brace pins to be turned.

48 Grates to be as shown on Co's print 10328.

49 Ash pan hopper bottom type as shown on Co's print 11683 with swing doors and perforated plate. Omit turn-buckles in ash pan slide rods.

50 Throttle valve to be as Co's print 10137.
Give particular attention to throttle work.

51 Front end doors of cast iron, with machined joints.

52 Front end self cleaning type as Co's print 9421.

53 Deflecting plates applied in two removable sections as large as practicable using Hendrick Mfg. Co's perforated plate 5/16" by 1½" mesh. Holes in plate to be staggered. Stubbs gauge #14, instead of wire netting.
Omit doors in deflecting plate front of flues.

54 Exhaust nozzles to be as Co's print 10835 bored to 4½" diam.

55 Stack to be made in one piece.

56 Whistle elbow of Tropenas metal.

57 Steam gauge location to be arranged so that gauge can be more easily read by Engineer and Fireman.

58 Water gauge to be Reflex.

59 Boiler to conform to the A. S. M. E. Code.
Boiler to be inspected by the Hartford Steam Boiler Inspection and Insurance Company (See Sup.1)

60 Gauge cocks, B. L. W. standard design.

62 Cleaning plugs 2½" diameter tap 12 threads.
Cleaning plugs to be located similar to Co's pt. 9673.
One plug above fire-door.
Two in backhead at sides below crown.

63 Three handholes to be applied in each side on Belpaire Corners, Penna. R. R. Style (See sup.80)

64 Apply Hancock filling valve on boiler 4½ above top gauge water line.

65 Extra heavy 1½" Syphon cock to be applied in dome.

66 Apply a turret for supplying steam to injectors, air pump and blower. Turret to be made of Tropenas Metal.
Turret supplied with steam by a dry pipe running inside of boiler to dome. Turret to have shut off valve with the handle extending through the roof of cab.

67 Cab valves to be fitted with ~~Zero~~ Baldwin handles, with extended stem and nut.

68 Injector check to have a cut out valve.

69 Cab as Co's print 10322, except to be ⅜" thick.
Cab eaves to be rounded; width over eaves to be 10' 4"
Back end of cab of the half open type.
Apply sliding windows in cab.
Cab doors and sashes to have fastenings.
Apply a trap ventilator in roof.
Cab to be well secured to boiler and to running board.
Cab to be fastened to a cast iron arch piece, attached to top of boiler, all securely bolted together.
Apply not less than three wrot iron braces supporting cab from bottom and fastened to boiler with not less than three stud bolts of suitable size.

70 Provide sliding drop seat on rod on engr's side of cab.
Provide Engineer's Tool Box, in rear of cab on left side.
Provide Tool Box in left side of cab for fireman.

71 Apply a 1¼" standard proof safety chain between engine and tender, Genns. between Engine and Tender to be arranged for 30 degree curves.

72 Bumper to extend to outside of each cylinder and be fastened to engine frame, covered with iron, and backed and faced with steel plates ⅜" thick same width as bumpers.

73 Step front of engine, supported from bumper with wrot iron braces and grab irons (as Co's print 11393, except steps and grab irons to conform to the United States Safety Appliance Standards. (see sup.80)

74 Iron Hand Rail to be provided along side of engine above running board similar to Ry.Co's Sketch and to conform to the requirements of the Minnesota State Laws.

75 Pilot coupler to have uncoupling rod operating from each side of locomotive.

76 Blizzard lamps and brackets to be omitted.

77 ~~Headlight to be Pyle National Electric latest type equipped with incandescent lamps instead of arc lamps.~~ (Sup. 80) 82
Headlight generator to be placed on top of boiler just in front of the cab.
B. L. W. to provide the usual complement of incandescent lamps for lighting the cab and under the running board for lighting the running gear when oiling and making repairs.
Wiring to be applied underneath running boards and around tender, and mica water-proof sockets attached at intervals for lamps.
Provision to be made for an extension lamp which can be used as far back as the rear of the tender.

78 Bell to be placed on smoke box between the stack and the headlight, lowering the headlight if necessary to provide proper clearance.

79 Sand Box, B. L. W. design.
Sand box steps on left side only.

80 Corners of Belpaire boiler covered with cast iron pieces to fit jacket.

81 Backhead and sides of firebox to be lagged and jacketed.
Jacket band in cab B. L. W. design.

82 Headlight Equipment to be Pyle-National Electric with special incandescent cases having Pyle-National No. 1450 lamp stand. (See sup. 77-130)

For hereafter: Joint between steam chest and cap, steam chest and cylinder to be made B.L.W. regular practice. (J.S.Keen 2.24.20)

83 Frame as Co's print 10828 with forward section bolted and keyed to main frame.
Pedestals fastened together at bottom by binders lugged and bolted to bottom of pedestals.
All frame bolts to be turned and to have taper of 1/16" in 12" and fitted to reamed holes in frames.

84 Frame braced together and to boiler by suitable castings, braces, expansion plates and pads.

85 Cylinders to be as Co's print 9675-modified.
Cylinder, bushings of close grained cast iron as hard as can be worked.
Cut out rib on cylinder sufficiently to drive top frame key.

86 Lubricator to have independent steam connections as per manufacturers requirements.
Lubricator pipes to be copper under jacket.
The fourth feed of the lubricator to be piped to the steam end of the second air pump.

87 Cylinders to have sectional lagging.

88 Cylinder cocks, B. L. W. design.
Cylinder cock work to be modified to suit B. L. W. design
Cylinder cocks to be set inside of center to prevent knocking off. (see sup.80)

89 Steam chest valves to be as Co's print 11273
Steam chest relief valves B. L. W. design.

90 (Spec.) Metallic packing to be Great Northern single ring as Co's prints modified. Alloy of copper 10, antimony 10, tin 80
Swab cups to be of pressed steel.

91 Piston rod and valve stem packing oil cups to be indestructible similar to B. L. W. cards 2617

95 Pistons heads solid cast iron with cast iron packing ring as per Co's print 11851 modified.
Pistons rods of steel 3⅞" diam. secured to crossheads and pistons as per Co's print 11443.

96 Guides, Two bar type of steel.
Guides to be bolted to cylinders heads and to guide yokes extending across frames.
Guide oil cups to be indestructible type.

97 Crossheads bearings of cast iron with babbitt strips in gibs

98 Wrist pins as per Co's print 2C3C1, except main pins to have loose collar.

99 Connecting and parallel rods of hammered O.H. Steel.
Rods rectangular shape as per Co's print 11696.
Parallel rods to have solid ends.
All rod bolts tapered 1/11" in 12" turned and fitted to reamed holes in rods and straps.
Connecting rod bearings of phosphor bronze.

100 Rod cups to be hard grease compression cups forged on rods.
Cups to be made as sketch
Cmit bushing.
Plugs to be made of cast iron.

101 Reverse lever handle and bushings to be omitted.
Reverse lever rod jaws to be B. L. W. standard.

102 Links as Co's print 11280.
Links, sliding blocks, plates, lifting links, pins and eccentric rod jaws to be of best hammered iron or steel thoroughly case hardened.
Eccentrics, cast iron as Co's print 11927.
Eccentric straps, cast steel, lined with cast iron as Co's print 9C30.

103 Rocker shaft cast steel.
Rocker boxes cast steel with phosphor bronze bushings.
Lifting shaft wrot iron with solid arms forged on. (B.L.W. design with coil counterbalance spring.)
Expansion plates of steel well secured by studs, and bolts.

104 All bolts to be threaded United States standard except where finer threads are necessary, (blue prints to govern.)
All finished removable nuts to be case hardened.

105 Driving wheel centers as Co's print 1C633.
Driving tires from Standard Steel Works.

106 Driving axles of Hammered O.H. Steel as per Co's pt.20805.

107 Driving boxes to have deep flanges and large oil cellars, with heavy bronze bearings arranged with suitable oil grooves Box hub faces babbitted, B. L. W. metal bearings.

108 Driving springs cast steel tempered in oil.
Driving spring hangers refined iron, fitted with steel gibs.

109 Equalizers of hammered iron or steel.
Omit square holes in equal beams.

110 Main reservoirs piped as shown on Co's print 9212.
Train line pipe 1½" diameter.
Dart unions to be used on all brake pipe connections.
Brakes:- Nore Meehan steel brake shoes on drivers. Shoes and heads as Co's print 11400.

111 Apply air coupling cock combination as supplied by the K.& J. Company (See sup. 129)

116 Apply 8½" gross compound pump on the left side and the 9½" pump on the right side. (See sup. 129-A-119)

117 Exhaust from air pumps to be piped into the front end.
The exhaust pipes from the two compressors may be joined by a "Y" fitting at any convenient point, but beyond this connection the pipe, if so connected, is to be 2".

118 Brake rigging and brake shoes to be raised to as near 6" above the rail as practicable.

119 Westinghouse-American No. 6-ET air brake equipment, also K. & J. apparatus for operating dump cars, as Co's specification dated July 25, 1914 (herewith) as follows:-

		PC.NO.
1	Set Westinghouse No. 6-ET with:	
1	8½" C. C. Compressor, (See sup. 116129-A)	
1	9½" R. H. Compressor (See sup. 116129-A)	1957
1	1½" Steam Valve	17402
1	1" steam valve	17941
1	SF-4 Governor Complete (Tapped for connection to other S V portion)	21735
1	1½" Governor Steam Portion	17897
2	Gage pipe ells complete with unions nuts and union swivels (Pos.2011, 2001 and 16286) for connection between SF-4 governor Siamese fittings and governor steam valve portion, latter to be bushed to suit gage pipe ell.	
1	Detroit, Triple Feed, Self Closing Type Compressor Air Cylinder Lubricator.	47782
1	Special Tender cylinder Hose connection (instead of standard)	3C626
1	Tender Drain Cup with ½" cock (side outlet closed)	31576
1	10" tender brake cylinder (Unless light weight of tender is under 32,000 lbs.)	7776

1 Drain cock for each main reservoir
Two or more Westinghouse enumeled main reservoirs total capacity 60,000 cu. in., of dimensions specified by locomotive builders and suitable for locating one under each running board, forward of firebox. Standard tapping.
1 Reservoir to be used in connection with air dump for dump cars.
1 Set American Brake Co's WN-2 Driver Brakes (conditional on weight on drivers being between 101,000 and 150,000 lbs.) and Schedule BC.
Brake 50% on 90 lbs. Cylinder Pressure.
All fittings for main brake pipe to suit 1½" size.

FOR K. & J. DUMPING SYSTEM:-(See sup 129)

		PC.NO.
8	(4 pairs) 1½" x 22" hose with H. P. 4 couplings and ¾" nipples.	46252
12	¾" x ¾" Angle Fittings	2237
7	¾" cut out cocks	2238
1	C-6 feed valve with F pipe bracket and gasket	18481

Air brake and dumping system here to be M. C. B. 1905 specifications.

ACTUAL DIMENSIONS OF LOCO - EXTREME HEIGHT OVER ALL 14'4"
EXTREME WIDTH : CAB BOARDS 10'6"-CYLRS. OR VALVE MOTION 9'6"

LENGTH OUTSIDE FACE OF FRONT BUMPER OF ENGINE TO FACE OF TENDER WEDGE	27' 6⅝"
LENGTH FACE OF TENDER WEDGE TO OUTSIDE FACE BACK BUMPER OF TENDER	21' 5½"
TOTAL LENGTH OUTSIDE FACE FRONT BUMPER OF ENGINE TO OUTSIDE FACE BACK BUMPER OF TENDER	49' 0⅛"

Air brake equipment and K. & J. apparatus for operating dump cars to be installed as per letter of instructions from the W. A. B. Co'mdated St. Paul, Minn., July 27, 1914, (herewith) as follows:- (See sub notes A to J)

A. COMPRESSORS AND BRACKET:- Locate 8½" C. C. Compressor on (see sup 117) left side and 9½" on right side. Each to be forward of stay bolts, low enough not obstruct view ahead, so they 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 brackets, fitted to boiler and with true bearing for compressor lugs. Bracket for 8½" C. C. Compressor to have accurately finished lugs to engage lower lugs of compressor, to relieve bolts of compressor weight.

B. STEAM VALVES:- Locate horizontal in steam turret convenient for manipulation, extending stems, if necessary, so that handles can be reached easily, bracing stems substantially close to handles.

C. GOVERNORS:- Connect SF-4 governor to 9½" compressor in usual position, and governor steam valve portion for 8½" C. C. compressor in similar position. Connect latter and Siamese fitting of former by ¾" O. D. Copper pipe, as directed under "Piping", using the two gage pipe ells with union nuts and swivels, as furnished with brake equipment.

D. 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.

E. DISTRIBUTING VALVE:- Locate 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 and to have 12" wrench clearance for each of the four nuts attaching valve to reservoir.

F. BRAKE VALVES:- ~~Locate in convenient position for use from usual position of engineer when braking. If cab arrangement favors, locate independent brake valve against side of cab, on same side whence that opens, and automatic brake valve on opposite side of boiler head. The essential is convenience for use.~~ BRAKE VALVES TO BE LOCATED SO THAT HANDLE WILL BE WITHIN CONVENIENT REACH OF ENGR.

G. AIR GAGES:- Locate a short distance forward of the brake valves, near right side of boiler and low enough to enable 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 gauges and so the lamps rays will not be reflected in the engineer's eyes.

H. FEED AND REDUCING VALVES:- Be located in the cab as to avoid extremes of temperature and to be accessible for adjustment, cleaning and replacement. If right hand pipe bracket wanted for either to facilitate piping Locomotive Builders to advise W. A. B. Co. before material is shipped.

I. 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 stoker and pump governor so that they will be well away from contact with boiler.
Two connections from main lubricator to be tapped into main steam pipes between main steam valves 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 compressors center piece. (Continued in next column)

I. Piping (Continued):
Steam pipe to 8½" C. C. Compressor to be 1½" and to 9½" compressor 1". These pipes outside of cab to be covered with good ½" sectional lagging enclosed by ~~sheet iron~~ and substantially secured ~~by metal bands~~. 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 8½" C. C. Compressor discharge pipe 1½" size and 9½" Compressor discharge pipe 1½" size. These pipes to be between 25 and 35 feet long, and connect to rear end of left main reservoir, with 2" Y fitting. The 9½" Compressor discharge pipe to immediately cross underneath boiler, then rise to sufficient height to there after slope gradually so as to drain with the flow of air to reservoir, within about 10 feet of the 8½" C. C. Compressor being its discharge pipe to a sufficient height to thereafter drain as directed for the 9½" compressor.
Connect forward ends of two main reservoirs by between 40 to 50 feet of 1" pipe. From left reservoir run 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 (not between reservoir and boiler) and above horizontal center lines of their reservoirs.
Use copper tubing for air connections to compressor governor between Siamese fitting of SF-4 governor and governor steam portion, to air gages 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.
Locate brake pipe cut out cock at pilot so that it can be reached easily when coupling hose.
Brake pipe terminals to be M. C. B. standard.

J. TENDER:- Braking power to be 60% on light weight, based on 50 lbs. brake cylinder pressure.
Brake beam heads solid type, of design to suit height of beams and spaced 60" centers.
Strength of Foundation Brake Rigging, including height of beams, to conform to M. C. B. Standards and recommended practice for High Speed Brake.
Brake Beam levers not over 4 to 1 proportion.
Cylinder levers 32" ~~c.m. to cen. of end holes~~.
Tender cylinder push rod 26" 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 slack adjuster to fully compensate 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.

K. FOR K AND J DUMPING SYSTEM:- Install the K and J operating valves, if practicable without interferring with other operating devices, forward of the engineers seat so they can be reached conveniently.
From the main reservoir pipe to automatic brake valve extend a 1" pipe into a 1"x¾"x1" tee. From one end of this tee extend a ¾" pipe, having a ¾" cut-out cock, to the K and J operating valves. From the other end of the tee extend a ¾" pipe to the C-6 reducing valve with F bracket. The latter to be located near boiler head (not adjacent to feed and reducing valves for brake system)
From the reducing valve just mentioned extend a ¾" pipe to each end of engine having a plugged ¾" angle fitting at rear of engine and a ¾" cut-out cock and ¾" plugged angle fitting on front end of engine. On the tender install a ¾" pipe with angle fittings on either end and a ¾" cut-out cock just forward of rear angle fitting. These pipes are not to

(Continued on next page)

For K. & J. Dumping System (Continued):
K have been and are installed for an auxiliary dumping system supply pipe when cars have been so equipped. Therefore, their terminals must be so located that with standard length hose they can be coupled to dumping reservoir supply line on cars and between engine and tender.
From the K and J operating valves on engine extend two dumping lines of 1¼" pipe to forward end of engine and rear of tender having a 1¼" cut out cock on each end. The 1¼"x 22" hose will be used on these pipes.
The pipe terminals of the dumping lines must be located in accordance with K and J specifications so that standard length hose will couple to corresponding line on cars.
All westinghouse equipment subject to W. A. B. Co's inspection.

130 Headlight and wiring to be applied in accordance with Great Northern Ry. Co's specification ME-76-A dated 4-6-14, ie., as follows:- (see notes A to C.) (see sup. 77)

A TURBINE & GENERATOR:- To be located on top of boiler, ~~in front of cab with turbine on fireman's side, except where construction of boiler makes this location impossible, when it may be located~~ in front of stack, on two wrot iron brackets fastened to boiler shell suitable for base board of equipment. Base board to be of steel plate and equipment bolted in place. Make steam connection to turbine with ¾" pipe running from fountain to ¾" valve in convenient location on engineer's side of cab, thence to turbine. Use 1½" pipe for exhaust.

B WIRING:- (a) Wiring diagram shown on drawing 34622.
(b) Insulation for all wires to be "Kerite". The wires from generator to clamp and from clamp to headlight shall be continuous conductors, using #8 solid copper conductor for arc lamps feeders and #14 solid copper conductor for marker and pilot light feeders; the wires used for cab lights shall be #14 solid copper conductor. (HEADLIGHTS TO BE WIRED SO THAT FRONT AND BACK LIGHTS MAY BE BURNING AT SAME TIME.)

C METHOD OF INSTALLING CONDUIT & WIRING:- Install 1" Electre galvanized conduit from the generator to inside cab, engineer's side, using lock nuts and bushings where entering into cab as per drawing 34622. Conduit shall be secured by clamps at proper intervals and in no case more than six feet intervals. Conduit to be laid on outside planished steel lagging cover. Use ¾" conduit from generator to headlight;

Install switches, fuses, clamps, etc., as per detail drawing #34622.
A 60 ampere S. P. main line cut out Trumbull #25696 and a 60 ampere S. P. D. T. Trumbull slate base, front connected knife switch shall be installed in cab, controlling headlight and cab lights. See drawing 34622 for connection. Cab light wiring to be in ½" galvanized conduit and condulets, using Edison main line cut out Paiste #62965 with 6 ampere H & L refillable fuse plugs, connected in circuit as shown on drawing 34622.
The run-way for wires must be continuous and water tight from generator to inside of cab and from the inside of cab to headlight and marker lights.
All ends of conduit to be thoroughly reamed out. All wires must be without splices in conduit. Wires must pull easily. No other lubricant than powdered soapstone will be permitted. Use of block and tackle pulling in wires absolutely prohibited.
All joints or splices made in wiring shall be carefully soldered, using a non-corrosive soldering paste for a flux, then taped with "Kerite" or "Okonite" splicing compound and "Mennon" tape and painted with insulating paint.
All work to be done in a neat and workmanlike manner.
Material list drawing #34299, detail drawings 34622, 34336 and 34297 are parts of this specification.

TENDER

131 Tank as per Co's pt. 10636, made of ¼" steel plates.
Tank water hole oval with hinged cover, 9' 8" above top of rail.

132 Apply one tool box on frame at rear the full width across and one on each water leg in front.

133 Provide water cooler and box on tender.

134 Omit MARKERS AND BRACKETS.

135 Tender frame to be as Co's print 9674.

136 Apply a cast steel drawbar pocket at front of tender.

137 Apply a 1¼" standard proof safety chain between engine and tender. Chains between Eng. & Tend. To be arranged for to cross chains.

138 Tender uncoupling rod operating from either side.
Apply a cast steel drawbar pocket casting on rear of tender.

139 Tender truck B. L. S. regular with cast steel bolster.
Arch bars of wrot iron.
Center plates to be ball faced as shown on Co's prints 11760 and 11765.
Side bearings on rear truck only.
Tender axles of hammered steel to M. C. B. specifications.

140 Journal boxes of malleable iron with Harrison inside dust guards.
Tender journal boxes to have Harrison inside dust guards.
Malleable iron wedges of the M. C. B. type.

141 Journal brasses to be M. C. B. type of the following composition:- Copper 80%, Tin 10%, Lead 10%; with lining of the following composition, Lead 88%, Tin 6%, Antimony 6%

142 Tender wheels to weigh 650 lbs. each.

143 Braking power of tender ~~100% of the light weight~~ (see sup. 79)

144 Brake beams solid type.
Brake beam heads to be spaced 60" center to center.
Tender brake shoes plain cast iron with Christie heads.

145 Train line pipe to be 1½" diameter.

146 Apply Dart unions on all brake pipe connections.

148 Brake rigging and brake shoes to be at least 6" above rail

THE BALDWIN LOCOMOTIVE WORKS 4-6 Simple C-Sprd

Memorandum Spec. 1662

SPECIFICATION FOR LOCOMOTIVES 4-16-0 (19)

FOR HUMBLE OIL AND REFINING CO.
BTL

Orig. or Proto 868
Engine Drawing No. 3/16 C Dwg. 41
5-8-19

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

Curves ——
RAILS 70 POUNDS PER YARD
Limits, Height —— Width ——
Weight (approximate) in working order, Total 43,000 POUNDS
On F. tr'k —— lbs. Drivers 43,000 lbs., B. tr'k —— lbs.

Tractive power 9050 lbs., Ratio of adhesion 4.75
Work'g St'm Pres. 165 lbs., Service SWITCHING
Fuel OIL

FRONT TUBE SHEET TO BE 7/16" THICK
Boiler STEEL Thick 3/8" Bill 8530
Boiler, Diam. 32" Plan STRAIGHT TOP
Boiler st'm pres. 165 lbs., Tested to {185 / 220} lbs. steam pres. / lbs. water pres.
WITH FACTOR OF SAFETY OF 5.69
Longitud. seams DOUBLE RIVETED, LAP JOINTS

Dome, diam. 19" Pos. FORWARD OF FIRE BOX
DOME SECURED TO BOILER BY FLANGED STEEL COLLAR.
Firebox STEEL Combustion chamb. NONE
Firebox, length 32-3 1/16" Width 3 1/8" Depth F. 42 1/2" B. 42 1/2"
Firebox, Tube 7/16" Crown 3/8" Sides 3/8" Back 3/8"
Firedoor opening 14" DIAM. CROWN AND SIDES IN ONE PIECE.
Water space, Front 3½" Sides 2½" Back 2½"
Water space, Frame SINGLE Riveted
Water space stays 7/8" DIAM. WITH 3 1/16" HOLE 1½" DEEP FROM O.S.

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 #12 W. G. CHARCOAL IRON OR STEEL (B. L. W. OPTION)
Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.
Number 73 Diam. 1¾" Length 9' 2½"

Heating Surface	Flues ——	Comb. Chamb. ——	Total 343.6		
	Tubes 304.4	Fire Box 38.6	Fire Brick Tubes ——		
Grate area 7.6	Ratio to Heating Surface 1 : 45				
Superheater ——					

Fire Brick ARCH, NONE
FIRE BOX LINED WITH FIRE BRICK FOR OIL BURNING.
FIRE BRICK PAVEMENT IN PAN.
Grates NONE
Ash Pan, Dampers BACK OF

Trouble BALANCE Pos. DOME
Dia. conn. STEEL

Superheater NONE

Safety Valves TWO COSELE 1½" (Not Spec)
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. RIGHT SIDE
Cleaning Plugs PLUGS 1½" PIPE TAP
Firebox CORNERS, L. S., FRONT AND BACK
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 ——

(Not Spec)
Injectors 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. 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 RAILS

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

Signal fixtures NONE

Headlight TWO PYLE CASE 10" Reflector, To burn KEROSENE
Headlight, Nos. on sides NONE Hdlt shop NONE
Lamp shell NONE Nosing ——

Bell 35 POUNDS
Sand Box TWO Diam. 15" Size IRON PAINTED Plate IRON
Sanders Hand, IN CAB BOX TO BAND FRONT AND BACK.

Dome casing IRON PAINTED

Boiler Jacket #22 SOFT STEEL PLANISH IRON Style B
Boiler Lagging WOOD'S & SHEATHING.

Frames CAST STEEL Braces SOLID

Cylinders, Diam. 11" Stroke 15"
St'm ports, Length 9" Width 1" Bridges ⅞"
Exh. ports, Length 9" Width 1¾" Valve lead 1/16"
Valve travel 4½" O. S. lap ⅞" Ins. lap ——
Eccentric throw 3" (Not Spec) (Konel) 1⅜
S. F. Lubr. MICHIGAN DOUBLE BULL'S EYE, 4 QUART 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 PLAIN "D"
Main pkg PISTON RODS, VALVE STEMS. BRAIDED PACKING.
PISTON RODS TO BE KEYED TO CROSSHEAD.
Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD.
Guides SINGLE BAR, STEEL Oil cups NEEDLE
Crossheads CAST STEEL WITH BEARINGS OF CAST IRON, TINNED
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 moveable 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. 26" CENTERS CAST IRON

Tires STEEL Held by SHRINKAGE AND SHOULDER
Tires, Flanged, Pos. ALL Size 2" x 5½"
Tires, Plain, Pos. NONE Size ——
Lateral play between driving boxes and wheel hubs — 1/32" total
Driving Boxes CAST IRON
Journals, Diam. 5" Length 6"

Springs Make B. L. W.

Front Engine Truck Nest 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 ——

Tender NONE

Tank {OIL 120 / WATER 700} Gallons, Bill {4917 / 4710}
SADDLE TANK LOCATED OVER TOP OF BOILER, AND EXTENDING TO FRONT OF SMOKE BOX. CLEANING HOLE IN FRONT END OF TANK.
OIL TANK IN LEFT SIDE OF CAB.

OIL BURNING ARRANGEMENT B. L. W. STANDARD WITH BURNER IN FRONT END OF FIRE BOX.
GRAVITY OF OIL .25 WITH HIGH FLASH OF 150.
ROYALTY, IF ANY, PAYABLE BY B. L. W.

ENGINE TO BE BLOWN OUT BEFORE SHIPMENT.

HEREAFTER:- PUT A BRACE BETWEEN FRONT BUMPER AND CYLINDER. 5/20/19 (Verbal Not. Cor.)

ACTUAL DIMENSIONS OF LOCO.—EXTREME HEIGHT OVER ALL 9' 8½"
EXTREME WIDTHS: {OVER CAB BOARDS 7' 9" / OVER CYLINDERS 7' 10"}
LENGTH OUTSIDE FACE OF FRONT BUMPER TO OUTSIDE FACE OF BACK BUMPER OF ENGINE: 18' 11"

List of tools, sch. 28
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 5-8-19 Shipment On own

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

Patent Plates NONE

Property plates NONE

Painting:—Engine, style —— BLACK, NO STRIPING
LOCOMOTIVE TO HAVE AT LEAST TWO COATS OF STANDARD LOCOMOTIVE PAINT AND TO BE SURFACED.

Mark on TANK SIDES, BAYTOWN REFINERY NO. 1

No. Pos. Proto No. Name Work
P. No. Plate — 1

FROM COLLECTION OF C. W. KNIGHT P. O. HARMONY, PENNSYLVANIA

THE BALDWIN LOCOMOTIVE WORKS

H. B. Lichtetter — Oct. 1920.

SPECIFICATION FOR LOCOMOTIVES 4-28-C-70 TO 74

FOR HYDRO ELECTRIC POWER COMMISSION

HW

168

Frames CAST STEEL

Cylinders, Diam. 17" Stroke 24"
St'm ports, Length 16" Width 1½" Bridges 1"
Exh. ports, Length 16" Width 2½" Valve lead 3/32"
Valve travel 4½" Steam lap ⅞" Exhaust clearance —
Eccentric crank throw 4½" By-pass valve NONE
S. F. Lubr. NATHAN TRIPLE #9 BULL'S EYE (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 RICHARDSON BALANCED, WITH VACUUM VALVES.
Met. pkg. (Piston rods, Valve stems) U. S. KING TYPE (Not Spec.)
PISTON RODS TO BE KEYED TO CROSSHEADS.

Pistons HEADS OF CAST IRON WITH RINGS OF CAST IRON SPRUNG IN.
Guides LAIRD TYPE, STEEL. Oil cups NEEDLE
Crossheads CAST STEEL WITH BEARINGS OF CAST IRON TINNED.
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 wheel hub liners NONE
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 = 3/16" 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 —
Wheel hub liners —
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 —
Wheel hub liners —
Wheels, Diam. — Tread — Kind —
Tires — Cen. diam. — Size —
Tires held by —

Brake, position ON ALL WHEELS (NO TENDER)
Operating Engine, sch. No. 5 ET "ESTO, COMBINED AUTO. AND STRAIGHT AIR.
Parts Eng. Tr'k, sch. —
Foundation Drivers, sch. MV-2 AMERICAN O. S. EQUALIZED
Parts Eng. Tr'k, sch. —
Air pump ONE 8½" CD Pos. L. S. OF SMOKE BOX.
Train connections FRONT AND BACK
Train signal, sch. NONE
AIR RESERVOIR TO HAVE HYDROSTATIC TEST OF 210 POUNDS.
WESTERN WHEELED SCRAPER CO'S AIR DUMP RIGGING WITH CONNECTIONS FRONT AND BACK, FOR OPERATING AIR DUMP CARS.

Tender NONE

(A) **Tank** 1500 Gallons. Bill 5521
SADDLE TANK OVER TOP OF BOILER, BUT NOT TO EXTEND OVER SMOKE BOX.

(B) FUEL BOX ON REAR EXTENSION OF ENGINE FRAME BACK OF CAB.
FUEL CAPACITY 2200 POUNDS.

(C) LOCOMOTIVE FOR OPERATION IN PROVINCE OF ONTARIO, CANADA, AND INCLUDING BOILER, TO MEET ALL LAWS OF THE PROVINCE OF ONTARIO. ONTARIO REQUIREMENTS:- BOILER FITTINGS, VIZ: GAUGE COCKS, WATER GAUGE GLASS, STOP COCK AND BLOW-OFF COCK SHALL BE APPROVED BY THE RESPECTIVE DEPARTMENTS OF THE PROVINCE.

(D) SAFETY VALVES, INJECTORS, LUBRICATORS, METALLIC PACKING AND WATER GAUGE MAY BE OF ANY MAKE SUITABLE, WHICH MAY QUICKLY BE OBTAINED.

(E) BOILER TO BE INSPECTED BY THE HARTFORD STEAM BOILER INSPECTION AND INSURANCE COMPANY.

(F) MR. F. WOOLLVEN TO BE ADVISED ONE WEEK IN ADVANCE OF THE ASSEMBLING OF THE FIRST BOILER, SO THAT HE MAY ARRANGE TO HAVE O. M. METCALF, CHIEF INSPECTOR OF STEAM BOILERS FOR THE PROVINCE OF ONTARIO, TO COME HERE TO INSPECT SAME. THIS WILL BE IN ADDITION TO THE HARTFORD INSPECTION. (SEE SUP.

List of tools, sch. 29
Photo sch. No. 2 Inspection B.L.W. EXCEPT FOR BOILER (Sup. E, F)
To be weighed YES Material specifns B.L.W. (EXCEPT SUP. 3)
Certificate of boiler test THREE COPIES OF B. L. W. FORM 1036
Junior laws to 7-20-20 Shipment ON OWN WHEELS (See sup. 43)

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

B. L. W. NONE
Patents

Property plates NONE

Painting, style 220, OLIVE GREEN AND ALUMINUM

MARKING STYLE TO BE SIMILAR TO B.L.W. PHOTO. 5547.
Mark on TANK SIDES: HYDRO-ELECTRIC POWER COMMISSION

Road Nos. Pos.	Road Nos.	Name NONE
F. No. PLATE	41 TO 45	
F. SAND BOX		
CAB SIDES		
BACK OF FUEL BOX		

Actual Dimensions of Loco. Extreme height over all = 13'8½"
Extreme Width Over cab boards = 8'11½"
Over cylinders = 8'11"
Length outside face of front bumper to outside face of back bumper of engine = 27'0"

THE BALDWIN LOCOMOTIVE WORKS — As Specn. 34070
Inspection Book 2020
SPECIFICATION FOR LOCOMOTIVES 4-28-C-70 TO 74
FOR HYDRO-ELECTRIC POWER COMMISSION
HW PROVINCE OF ONTARIO. (CANADA) 7-19-20

Gen. as PHOTO. 5547 (EXCEPT SADDLE TANK NOT TO EXTEND OVER SMOKE BOX.)
Engine Drawing No. 22

Gauge of Road 4'8½" Play ¾"
Wheelbase, Rigid 7'6" Driving 7'6" Total 7'6"
Total wheelbase, engine and tend. (Actual —) (Limited to —)

Curves MAXIMUM 30 DEGREES.
AVERAGE CURVES, 10 AND 12 DEGREES
Limits, Height 14'0" Width 9'0"
Weight (approximate) in working order, Total 105,000 POUNDS.
On F. tr'k — lbs., Drivers 105,000 lbs., B. tr'k — lbs.

Tractive power 21,200 lbs., Ratio of adhesion 4.95
Work'g St'm Pres. 180 lbs., Service CONTRACTING
Fuel SOFT COAL

Boiler STEEL Thick 9/16" Bill 9182
Front Tube Sheet ½" Thick
Boiler, Diam. 52" Plan STRAIGHT TOP.
Allowable st'm pres. 180 lbs. With Factor of Safety of 3.5 **Tested to** 200 lbs. steam pres. 270 lbs. water pres.
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS, SEXTUPLE. RIVETED.
Dome, diam. 25" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE
Firebox, length 45 15/16" Width 50" Depth F. 54" B. 52½"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back ⅜"
Firedoor opening 16" DIAM.
Water space, Front 3" 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" DIAM. Sling stays front (TWO ROWS 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 (B.L.W. OPTION)
Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.
Number 154 Diam. 2" Length 12'9"

Heating Surface (Flues — Combus. Chamb. — Total 1091⁰)
(Tubes 1021⁰ Fire Box 70⁰ Fire Brick Tubes —)
Grate area 16⁰ Ratio to Heating Surface 1:68.2
Superheater —

Fire Brick ARCH, ON STUDS.

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 R.S. ONLY
Spark plates on hopper WITH
Netting and deflect. plates WITH
Exhaust nozzles DOUBLE RING
Stack STRAIGHT Dia. 14"

Safety Valves TWO COALE 2½" OPEN (Not Spec.)
Safety valves BOTH with relief lever, Set to 180 POUNDS
Whistle ONE 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 WITHOUT separate dry pipe to dome
Blower Valve ONE B.L.W.

Blow off Cock ONE B.L.W. POS:- FRONT
Cleaning Plugs ONE PLUG ABOVE FIRE DOOR.
Firebox, CORNERS DIAGONAL
Crown, ONE RIGHT SIDE, TWO LEFT SIDE AND TWO BACK.
Waist, ONE UNDER FRONT
Front tube sheet, ONE Fusible plug ONE

Pump NONE

Injectors TWO MONITOR (Not Spec.) No. 7
Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER
Pipes, Check IRON Feed IRON Overflow IRON
Check B.L.W. (SEE SUP. 38) Pos. RIGHT AND LEFT

Steam Heat NONE

Cab STEEL

Cab boards STEEL Nosing T-IRON
Running boards WOOD Nosing NONE
Hand rail IRON Located on TANK

Back Bumper OAK

Pilot NONE
Front Bumper OAK Bumper plate WITH
Steps ACROSS FRONT AND REAR, WITH HAND RAILS.
STEPS AND HAND HOLDS TO CONFORM TO I.C.C. REQUIREMENTS. (No Back)
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'd'l st'p WITH
Lamp shelf NONE Nosing —

Bell 85 POUNDS
Sand Box TWO Diam. 28" Body IRON PAINTED Pipes IRON
Sander (Not Spec.) LEACHAIR, 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.

SPECIFICATION FOR LOCOMOTIVES 4 28 C 70 TO 74

FOR HYDRO ELECTRIC POWER COMMISSION.

HS

1 BOILER TO BE BUILT FOR USE IN THE PROVINCE OF ONTARIO, CANADA AND TO BE DESIGNED TO PASS GOVERNMENT INSPECTION AND MUST CONFORM TO ONTARIO SPECIFICATION.

2 BOILER TO BE DESIGNED TO PASS ONTARIO INSPECTION FOR 180 LBS. PRESSURE. SPECIAL CARE TO BE TAKEN IN CAULKING. COPIES OF THE SPECIFICATION MUST BE FLLED OUT IN TRIPLICATE ON ONTARIO FORMS FOR LOCOMOTIVE BOILERS, AND, TOGETHER WITH PRINTS SHOWING COMPLETE FIGURED DETAILS OF BOILER CONSTRUCTION IN TRIPLICATE, MUST BESUBMITTED FOR APPROVAL TO THE CHIEF INSPECTOR, STEAM BOILER BRANCH, DEPARTMENT OF PUBLIC WORKS, TORONTO, ONTARIO. EACH PRINT SUBMITTED MUST HAVE ON ITS FACE, A WHITE SPACE 3" x 4" FOR THE DEPARTMENT STAMP.

3 BOILER MATERIAL:- STEEL PLATES ARE TO BE HOMOGENEOUS, MADE BY OPEN HEARTH PROCESS AND HAVING THE FOLLOWING QUALITIES:- SHELL PLATES OR PLATES ON WHICH FLANGING IS TO BE DONE MAY HAVE FROM 55,000 TO 65,000 (MAXIMUM) POUNDS PER SQUARE INCH TENSILESTRENGTH. ELASTIC LIMIT NOT LESS THAN ONE-HALF THE TENSILE STRENGTH. ELONGATION NOT LESS THAN 22% IN 8", COLD AND QUENCH BENDS 180 DEGREES FLAT ON ITSELF WITHOUT FRACTURE ON THE OUTSIDE OF BENT PORTION. MAXIMUM PHOSPHORUS .04%, MAXIMUM SULPHUR .05%

4 FIRE BOX STEEL:- PLATES SHALL HAVE FROM 52,000 TO 62,000 (MAXIMUM) POUNDS PER SQUARE INCH TENSILE STRENGTH, ELASTIC LIMIT NOT LESS THAN ONE-HALF THE ULTIMATE STRENGTH, ELONGATION NOT LESS THAN 26% IN 8", COLD AND QUENCH BENDS 180 DEGREES FLAT ON ITSELF WITHOUT FRACTURE ON OUTSIDE OF BENT PORTION. MAXIMUM PHOSPHORUS .035%, MAXIMUM SULPHUR .04%.

5 RIVET STEEL, STAYBOLT IRON, AND BRASS ROD STEEL TO BE B.L.W. SPECIFICATIONS EXCEPT THAT THE BENDING TESTS SPECIFIED IN ONTARIO BOOK OF BOILER CONSTRUCTION RULES ON P.81 AND 84 SHOULD BE MADE BY THE TEST DEPARTMENT.

6 EVERY PLATE IN BOILER AND FIREBOX MUST BE STAMPED WITH THE MAKERS NAME AND TENSILE STRENGTH. THIS STAMPING TO BE ENCIRCLED WITH A RING OF WHITE PAINT TO MAKE IT EASILY FOUND AND SO AVOID DELAY IN INSPECTION.

7 EACH BOILER TO BE STAMPED LEGIBLY AND FULLY INTO THE BOILER PLATE, ON RIGHT SIDE OF FIRE DOOR, CLEAR OF ATTACHMENT, IN FIGURES AT LEAST ½" IN SIZE, AS FOLLOWS:-

(1) THE BALDWIN LOCOMOTIVE WORKS (000)
(2) 0 ~~(000)~~ 3920 11/10/31.
(3) NORTH-FLANGE 00,000 S
(4) T. P. 000 W. P. 000
(5) 00.00. 00.
(6) INSPECTORS INITIALS.

(1) BUILDERS NAME AND CONSTRUCTION NUMBER OF LOCOMOTIVE.
(2) PROVINCIAL INITIALS, LETTERS AND REGISTRATION NUMBER OF DESIGN. (IF BOILER HAS NOT BEEN BUILT TO A REGISTERED DESIGN THIS SPACE IS TO BE LEFT BLANK.)
(3) THE NAME OF PLATE MANUFACTURER, QUALITY OF PLATE AND LOWEST TENSILE STRENGTH OF ANY PLATE IN THE CYLINDRICAL SHELL OF THE BOILER WITH "S" FOR STEEL AND "I" FOR IRON.
(4) WATER TEST PRESSURE AND WORKING STEAM PRESSURE FOR WHICH BOILER IS BUILT.
(5) THE DATE CONSTRUCTION OF BOILER WAS COMPLETED, DAY OF THE MONTH, NUMERICAL ORDER OF THE MONTH, LAST TWO FIGURES OF THE YEAR.
THEABOVE STAMPING IS IN ADDITION TO THE STAMPING REQUIRED ON EACH INDIVIDUAL PLATE.
(6) INSPECTOR'S INITIALS.

11 AFFIDAVITS ON ONTARIO FORM (WHICH WILL BE SUPPLIED BY THE DEPARTMENT ON REQUEST) MUST BE FILLED OUT BY SHOP FOREMAN AND MUST ACCOMPANY THE BOILER WHEN IT IS SHIPPED INTO ONTARIO. WHEN THE BOILER IS DELIVERED TO A PURCHASER HIS NAME AND ADDRESS MUST BE FILLED IN BY THE SALES AGENT AND THE FORM FORWARDED TO THE DEPARTMENT AT TORONTO. (MAKESURE THAT THE FIGURES ON THE AFFIDAVIT AGREE WITH THOSE STAMPED ON THE BOILER.)

12 DESIGN:- THE MINIMUM INSIDE RADIUS OF ALL BOILER FLANGES IS 1". THE BRIDGES BETWEEN TUBES SHALL NOT BE LESS THAN ⅞" WIDE ON 7/16" TUBE SHEET AND OVER, AND .8" BETWEEN TUBES IF ⅜" TUBE SHEETS ARE USED.
FIREBOX SURFACES OF 21" RADIUS OR OVER SHALL BE STAYED AS FLAT SURFACES.

13 TESTS, ETC:- STEAM TEST REGULAR B. L. W.
WATER TESTS WITH WATER OF TEMPERATURE OF 60 DEGREES FAHRENHEIT TO 50% ABOVE THE BOILER PRESSURE, AND THIS PRESSURE MUST BE MAINTAINED FOR AT LEAST 30 MINUTES, DURING WHICH TIME THE BOILER MUST BE TIGHT.

14 TO MEET REQUIREMENTS, IT WAS DETERMINED BY THE B.L.W. THAT BOILER SHOULD BE SUBJECTED TO THE FOLLOWING STEAM TEST BY FIRE:-
1ST TEST 200 LBS. LET DOWN TO 90 LBS. AFTER BOILER IS TIGHT.
2ND TEST 200 LBS. LET DOWN TO 45 LBS. AFTER BOILER IS TIGHT.
3RD TEST 200 LBS.
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 CONDITIONS IS THE PRESSURE TO BE LET DOWN BY BLOWING OFF, UNTIL ONE HALF HOUR HAS ELAPSED AFTER EACH AND EVERY TEST. THE SAFETY VALVES AND STEAM GAUGES MUST BE APPLIED TO BOILER DURING THE ABOVE TEST. BOILER PRESSURE IS 180 LBS. THE FINAL HYDROSTATIC TEST IS TO BE MADE PRIOR TO SHIPMENT, AFTER WHICH THE FIREBOX IS TO BE CLEANED AND PAINTED INSIDE.

15 BOILER SEAMS MUST BE AS ONTARIO STANDARD WHERE THE PITCH OF RIVETS OF B.L.W. SEAMS IS GREATER THAN ONTARIO PITCH AND ALSO WHERE THE WIDTH OF SEAMS OR DISTANCE BETWEEN ROWS OF RIVETS IS LESS IN B.L.W. THAN IN ONTARIO STANDARDS.
NO LONGITUDINAL SEAM IS ALLOWED ON THE SIDE CENTER OF BOILER AND SEAMS ON ADJACENT RINGS ARE TO BE PLACED AT LEAST 30 DEGREES APART, IF POSSIBLE, AND NOT IN LINE.

16 DOME TO BE OF ONE PIECE TYPE WHERE PRACTICABLE.

17 THE MAXIMUM AREA ON ONE STAY WITH A 5/16" PLATE EQUALS $\frac{2800}{\text{PRESSURE}}$ OR WITH 4" x 4" SPACING 5/16" PLATE IS GOOD FOR 175 POUNDS. THE MAXIMUM AREA ON ONE STAY WITH A ⅜" PLATE EQUALS $\frac{4032}{\text{PRESSURE}}$ OR WITH 4" x 4" SPACING ⅜" PLATE IS GOOD FOR 250 POUNDS. THE MAXIMUM STRESS ALLOWABLE ON SCREW STAYS IS 7,000 POUNDS PER SQUARE INCH AT THE REDUCED SECTION. THE MAXIMUM STRESS ON IRON BRACE RODS IS 5,000 POUNDS IF WELDED AND 7,000POUNDS UNWELDED, STEEL RODS UNWELDED, 8,000 POUNDS. THESE RODS MAY BE UPSET ON THE ENDS TO FORM AN EYE AS IN B.L.W. BOILER STAY CARD 563. THE SPACING OF CROWN STAYS AT THE BACK OF FIRE BOX SHOULD NOT BE LESS THAN 4" CENTER TO CENTER WHEN WELDLESS BUILT UP BRACES ARE USED, ON ACCOUNT OFCLEARANCE. BRACES MUST BE ARRANGED TO GIVE FREE ACCESS TO THE INTERIOR OF THE BOILER.
RIVETS FASTENING T'S OR CROW FEET TO BOILER MUST HAVE AN AREA 20% GREATER THAN THE STAY AREA ON "T" OR CROW FEET.

21 RADIAL STAYS MUST NOT DEPART MORE THAN 25 DEGREES FROM A TRUE RADIAL LINE TO THE OUTER SHEET NOR MORE THAN 5 DEGREES FROM A TRUE RADIAL TO THE INNER SHEET OF THE FIREBOX. IF NECESSARY, THE CAMBER OF THE CROWN MUST BE CHANGED TO SECURE THIS. SEE B.L.W. TRACING 27831.

22 TUBES ARE TO BE EXPANDED WITH A ROLLER EXPANDER, BOTH ENDS OF ALL TUBES TO BE BEADED OVER.

23 ALL OPENINGS IN BOILER, LARGER THAN ¾" PIPE TAP, DELOW, OR 1" PIPE TAP, ABOVE, THE WATER LINE ARE TO BE REINFORCED WITH A LINER OF THE SAME THICKNESS ASSHELL, OR MORE, AND EQUAL IN NET AREA TO THE SHELL SECTION REMOVED BY THE OPENING AND WELD TO THE SHELL BY RIVETS WHOSE AREA WILL AGGREGATE 220% OF THE SECTION REMOVED FROM THE SHELL.
IN THE CASE OF A DOME OPENING REINFORCEMENT, THE RIVETS HOLDING THE DOME TO THESHELL ARE NOT TO BE COUNTED IN THE NUMBER REQUIRED IN THE LINER.
CAST IRON REINFORCEMENTS TO OPENINGS IN BOILER WILL NOT BE ALLOWED, HENCE RINGS ON TUBE SEET MUST BESTEEL, OR WROT IRON.

24 FITTINGS MADE BY B. L. W. SHALL IF POSSIBLE, CONFORM TO CARDS THAT HAVE BEEN ALREADY SUBMITTED AND APPROVED, PRINTS OF WHICH WILL BE FOUND IN THE BOOK OF ONTARIO APPROVED DESIGN, IN WHICH CASE IT WILL ONLY BE NECESSARY TO SPECIFY THE RECORD NUMBER ON THE PRINT IN FILLING OUTTHE FORM FOR THE DEPARTMENT OF PUBLIC WORKS.
WHEN FITTINGS ARE PURCHASED OUTSIDE, SPECIFY "TO BE OF ONTARIO APPROVED DESIGN."
ALL BOILER FITTINGS FOR USE IN ONTARIO MUST HAVE STAMPED OR CAST ON THEM THE ONTARIO RECORD NUMBER.

25 FITTINGS:- ALL STEAM OUTLETS EXCEPT SAFETY VALVES, ARE TO BE PROVIDED WITH STOP VALVES.

26 ALL SAFETY VALVES MUST BE OF APPROVED DESIGN EACH PROVIDED WITH A LOCK CASING AND WITH A RELIEF LEVER. SAFETY VALVES LESS THAN 1" OR OVER 3" DIAMETER ARE NOT TO BE USED.

27 STEAM GAUGE MUST BE OF APPROVED MAKE, GRADUATED TO ONE AND ONE-HALF TIMES THE WORKING PRESSURE, CONNECTED DIRECTLY TO BOILER WITH A CUT-OUT COCK, WITH "T" OR LEVER HANDLE, BETWEEN GYPHON AND BOILER AND PROVIDED WITH A "T" FITTINGWITH A PLUGGED OPENING ¼" PIPE SIZE ABOVE GYPHON TO ADMIT OF APPLICATION OF THE INSPECTORS GAUGE.

28 WATER GAUGE OF APPROVED DESIGN TO HAVE OPENING AT LEAST ¾" DIAMETER.

29 GAUGE COCKS OF APPROVED DESIGN TO HAVE OPENING AT LEAST ¾" DIAMETER AND CONNECTED TO BOILER WITH ¾" PIPE TAP.

30 BLOW OFF COCK OF APPROVED DESIGN. THE END OF THE PLUG TO BE MARKED IN LINE WITH THE PASSAGE.

31 BOILER MUST BE PROVIDED WITH AT LEAST 12 WASHOUT OPENINGS, SO LOCATED THAT THE WHOLE INTERIOR OF THE BOILER MAY BE INSPECTED AND WASHED.

32 ONE FUSIBLE PLUG OF BRASS FILLED WITH BANCA TIN TO BE LOCATED AT HIGHEST PART OF CROWN SHEET, AND MUST BE SHOWN, AND POSITION FIGURED ON THE BOILER CARD. FUSIBLE PLUG CARD 1456 HAS BEEN APPROVED - RECORD 554.

33 INJECTOR ~~AND PUMP~~ CHECK:- ARE TO BE OF APPROVED DESIGN AND MUST BE PROVIDED WITH A STOP COCK OR VALVE BETWEEN THE CHECK AND THE BOILER. PROVIDE A PIPE TO DELIVER BELOW THE WATER LINE OF THE BOILER WHEN THE CHECK OPENINGS IS ABOVE THE WATER LINE.

34 STEAM VALVE STAND TO BE OF APPROVED DESIGN.

35 THE FOLLOWING PRINTS SUBMITTED TOTHE DEPARTMENT OF PUBLIC WORKS, STEAM BOILER BRANCH, PROVINCE OF ONTARIO, HAVE BEEN APPROVED:-

BOILER	TRACING 42755
BOILER	TRACING 42756
BOILER STAYING	TRACING 42746
BOILER STAYS	CARD 641 AND 643
THROAT STAYS	CARD 5736
DOME	CARD 2558
DOME CAP	CARD ~~2615~~ 2015"
COALS SAFETY VALVE	CARD 577
GAUGE COCK & FITTING	TRACING 27537
INJECTOR CHECK	CARD 1364

MANUFACTURERS BOILER SPECIFICATION HAS ALSO BEEN APPROVED.

32 Liners not required for cleaning plug holes in fire box at mud ring (Ref. 6/8/32) See sup. 28 11/10/31

33 For 4 28 C 70 & 71 only: Brackets to be shipped direct from manufacturers to destination of locomotives. To be applied by B.L.W. Engineers after delivery of locomotives. 11/10/31.

THE BALDWIN LOCOMOTIVE WORKS As Built, C-1207

Memorandum Specn 19030

SPECIFICATION FOR LOCOMOTIVES 4 10 ½ C 138

FOR INDIANA PORTLAND CEMENT CO.

P

Gen. as PHOTO. 3638 EXCEPT SOMEWHAT LOWER

Engine Drawing No. 35

7-14-19

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 ——

RAILS – 60 POUNDS
Curves AND GRADES AS Co's. PENCIL SKETCH

Limits, Height 6' 8" 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 4140 lbs., Ratio of adhesion 5.3
Work'g St'm Pres. 165 lbs., Service SWITCHING
Fuel SOFT COAL

FRONT TUBE SHEET 3/8" THICK
Boiler STEEL Thick 5/16" Bill 3630
Boiler, Diam. 28" Plan STRAIGHT TOP
{Boiler st'm pres. 165 lbs., Tested to 165 lbs. steam pres. / WITH FACTOR OF SAFETY OF 5.0 220 lbs. water pres.
Longitud. seams DOUBLE RIVETED, LAP JOINTS.

Dome, diam. 15½" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE
Firebox, length 28-13/16" Width 38⅜" Depth F. 30" B. 29½"
Firebox, Tube ⅜" Crown 5/16" Sides 5/16" Back 5/16"
Firedoor opening 14" DIAM.
Water space, Front 2" AND 2½" Sides 2" Back 2"
Water space, Frame SINGLE Riveted
Water space stays ⅞" DIAM. WITH 5/16" HOLES 1½" DEEP FROM O.S.

Radial stays ⅞" DIAM. Sling stays front NONE
Button heads below crown on NONE central rows
Crown bars NONE Placed —— above crown
Crown bolts ——

Flues ——
Tubes #13 W. G. CHARCOAL IRON OR STEEL (B.L.W. OPTION)
Tube ends SHAGED FOR COPPER FERRULES, FIRE BOX ENDS.
Number 48 Diam. 1¾" Length 7' 1⅝"

Heating Surface	Flues ——	Combus. Chamb. ——	Total	151.2
	Tubes 125.8	Fire Box 24.7	Fire Brick Tubes ——	
Grate area 7.82	Ratio to Heating Surface 1 : 19			
Superheater ——				

Fire Brick Anon; NONE

Grates PLAIN BARS AND DROP PLATES
Ash Pan, Dampers RIGHT AND LEFT

Throttle BALANCE Pos. DOME
Dry pipe STEEL

Superheater NONE

Smokebox extension DIAM. Cleaning hole and cap L.B. ONLY
Base ring or hopper NONE
Netting and netting plates WIRE
Diamond stack, Plain
Stack Extension, Plain Dia. 17"

Safety Valves TWO COALE 1½" OPEN (Not Spec)
Safety valves NONE with relief lever, Set to 195 POUNDS
Whistle ONE 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 NONE Pos. ——
Top chamb. —— Bottom chamb. ——
Feed Cock —— Feed pipes ——
Checks —— Check pipes ——

Injectors (Not Spec) 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. Pos. R. AND L.

Steam Heat NONE

Cab WOOD
FUEL BOX IN LEFT SIDE OF CAB, CAPACITY 500 POUNDS.

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 BACK WITH HAND RAILS.

T & B. Drawhead, Center above rail 21"
Coupler LINK AND PIN TYPE (SEE SUP 23 NEXT PAGE)

Signal fixtures NONE

Headlight NONE Reflector, To burn ——
Headlight, Nos. on sides —— 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 PTD. Bands IRON Style 9
Boiler Lagging MAGNESIA SECTIONAL

THE BALDWIN LOCOMOTIVE WORKS

M. GAMER August 1919.

SPECIFICATION FOR LOCOMOTIVES 4 10 ½ C 138

FOR INDIANA PORTLAND CEMENT CO.

P

172

Frames CAST STEEL

Cylinders, Diam. 8" Stroke 12"
St'm ports, Length 7½" Width 1½" Bridges ⅜"
Exh. ports, Length 7½" Width 1½" Valve lead 1/16"
Valve travel 2½" Steam lap ¾" Exhaust clearance ——
Eccentric ~~cranks~~ throw 2" By-pass valve NONE
S. F. Lubr. MICHIGAN DOUBLE BULLS 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~~ BEADS STEEL PAINTED
St'm chest valves PLAIN "D"
~~Met.~~ pkg. PISTON RODS / VALVE STEMS BRAIDED PACKING
PISTON RODS TO BE KEYED TO CROSSHEADS
Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD
Guides STEEL Oil cups NEEDLE
Crossheads CAST STEEL, WITH BEARINGS OF BRASS.
Wrist Pins STEEL Oil 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 wheel hub liners NONE
Drivers, O. S. Diam. 28" Cen. diam. 22" CENTRES CAST IRON

Tires STEEL Held by SHRINKAGE AND SHOULDER
Tires, Flanged, Pos. ALL Size 2" x 5½"
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 ——
Wheel hub liners ——
Wheels, Diam. —— Tread —— Kind ——
Tires ——
Tires held by ——

Back Engine Truck NONE Wheeled ——
To swing —— each side of cen., Cen. pin liners ——
Journals, Diam. —— Length —— Boxes ——
Wheel hub liners ——
Wheels, Diam. —— Tread —— Kind ——
Tires ——
Tires held by ——

Brake, position ON ALL DRIVING 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

Tank 200 Gallons, Bill 4902
SADDLE TANK LOCATED OVER TOP OF BOILER.

LOCOMOTIVE TO HAUL 70 TONS UP A 2% GRADE, PROVIDED FRICTIONAL
(1) RESISTANCE OF CARS DOES NOT EXCEED EIGHT POUNDS PER TON, AND GRADE IS STRAIGHT (NOT IN COMBINATION WITH CURVES)

COUPLERS AND CARS AS INSLEY MFG. CO'S. PRINTS L-564 AND T-1995.
(2) COUPLER ON LOCOMOTIVE NEED NOT BE SAME AS ON PRINT No. T-1995 BUT IS REQUIRED TO COUPLE WITH THIS TYPE OF COUPLER.
~~FURNISH OFF-SET DRAWBAR.~~

(3) Two offset drawbars similar to B.L.W. card 41618 and including one pin with each bar to be furnished on Extra Order 6721 dated 1919 to be shipped with loco. These drawbars are for use in coupling to M.C.B. standard cars.

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 1038
Junior laws to 8-1-17 Shipment ON CAR

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

B. L. W.
Patents NONE

Property plates NONE

Painting, style #23 OLIVE GREEN AND ALUMINUM.
MARK ON TANK SIDES, TRADE MARK IN COLORS, AS SHOWN ON ATTACHED LETTERHEAD. "HOOSIER" TO BE IN LETTERS ALL OF THE SAME SIZE, I. E. RECTANGULAR FORM INSTEAD OF OVAL. "TRADE" AND "MARK" ALSO TO BE IN UNIFORM SIZE LETTERS ON A STRAIGHT LINE.

Road Nos. Pos. Road Nos. Name NONE
F. No. PLATE 1
CAB SIDES

Actual Dimensions of Loco. Extreme height over all = 8' 8"
Extreme Width { Over cab boards 7' 3" / Over cylinders or valve motion = 7' 5½"
Length outside face of front bumper to outside face of back bumper of engine = 15' 5"

THE BALDWIN LOCOMOTIVE WORKS As Specified 0-5102

Memorandum Specn 18003

SPECIFICATION FOR LOCOMOTIVES 4 28 C 66

For INLAND STEEL COMPANY (INDIANA HARBOR WORKS)

Dec as Photo. 2584 | Except with back end of tank arranged to permit access to Tate stays and cab side near entrance.

Engine Drawing No. 21.

1-16-18.

Gauge of Road 3' 0" Play $\frac{3}{8}$"
Wheelbase, Rigid 5' 9" Driving 5' 9" Total 5' 9"
Total wheelbase, eng. and tend. { Actual ----- / Limited to -----

Curves 50 FEET RADIUS

Limits, Height 10' 7" Width 8' 11"
Weight (approximate) in working order, Total 91,000 POUNDS
On F. tr'k ---- lbs., Drivers 91000 lbs., B. tr'k ---- lbs.
{RATIO OF ADHESION, SADDLE TANK EMPTY, 3.8
{Tractive power 21,000 lbs., Ratio of adhesion 4.3
Work'g St'm Pres. 180 lbs., Service SWITCHING
Fuel SOFT COAL

FRONT TUBE SHEET TO BE $\frac{1}{2}$" THICK
Boiler STEEL Thick $\frac{9}{16}$" Bill 8293
Boiler, Diam. 52" Plan STRAIGHT TOP
{Boiler st'm pres. 180 lbs., Tested to { 200 lbs. steam pres.
{WITH FACTOR OF SAFETY OF 5.33 { 240 lbs. water pres.
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS

Dome, diam. 25" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE
Firebox, length 46$\frac{1}{8}$" Width 49$\frac{3}{4}$" Depth F. 57$\frac{7}{8}$" B. 56$\frac{3}{8}$"
Firebox, Tube $\frac{1}{2}$" Crown $\frac{3}{8}$" Sides $\frac{5}{16}$" Back $\frac{5}{16}$"
Firedoor opening 16 DIAM.
Water space, Front 3$\frac{1}{2}$" Sides 3" Back 3"
Water space, Frame SINGLE Riveted
{Water space stays TATE FLEXIBLE, 1" DIAM. ABOUT 460
{COMPLETE INSTALLATION IN THROAT, SIDES AND BACK.
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 -----
Tubes #12 W.G. CHARCOAL IRON OR STEEL (B.L.W.OPTION)
Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS
Number 158 Diam. 2" Length 10' 10"

Heating Surface	Flues ----	Combus. Chamb. ----	Total 965^{0}	
	Tubes 889^{0}	Fire Box 76^{0}	Fire Brick Tubes ----	
Grate area 16^{0}	Ratio to Heating Surface 1 : 60.3			
Superheater ----				

Fire Brick ARCH, NONE

Grates ROCKING BARS AND DROP PLATE
Ash Pan, Dampers R. AND L.

Throttle BALANCE Pos. DOME
Dry pipe STEEL

Superheater NONE

Smokebox extension WITH Cleaning hole and cap NONE
Front smokebox hopper WITH
Netting and deflect. plates WITH

Exhaust nozzles DOUBLE, HIGH

Stack Diameter Dia. 15" Hole in S. E. dia. 12$\frac{1}{2}$"

Safety Valves (As Specd) TWO CONSOLIDATED 1$\frac{1}{2}$"
Safety valves NONE with relief lever, Set to 180 POUNDS
Whistle B.L.W. PLAIN

Steam Gauge ONE IRON 7" MAKER:- ASHCROFT (As Specd)
Steam gauge stand IRON **Clock** NONE

①**Water Gauge** ONE B.L.W.(IRONCLAD) **Cab Lamps** TO BURN OIL
Gauge Cocks THREE BACK Surface valve NONE
Lowest gauge cock 3$\frac{1}{4}$" 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:- 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 (Specd) TWO SELLERS, TYPE "K" No. 6$\frac{1}{2}$
Injectors, Pos. R. AND L Steam pipes COPPER
Pipes, Check IRON Feed IRON Overflow IRON
Check SELLERS, WITH STOP VALVE Pos. R. AND L.

Steam Heat NONE

Cab STEEL (SEE SUP.②)
COAL BOX LOCATED IN LEFT SIDE OF CAB

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

Back Bumper CAST IRON

Pilot NONE Pushing shoes CAST IN BUMPERS
Front Bumper CAST IRON Bumper plate NONE
① **Steps** ACROSS FRONT AND BACK, WITH HANDRAILS

Front Drawhead, Center above rail
① **Coupler** THREE POCKET DRAW CASTING, Co's STANDARD TO BE APPLIED BY CO. AFTER DELIVERY OF LOCO. BUMPERS TO BE FURNISHED BLANK

Signal fixtures NONE

HEADLIGHT TO BE UNITED STATES
Headlight TWO ROUND CASE 12" Reflector, To burn KEROSENE
Headlight, Nos. on sides NONE H'd'l't step NONE
Lamp shelf NONE Nosing ----

Bell 85 POUNDS
Sand Box FOUR 10$\frac{1}{2}$" x 10" Body IRON PAINTED Pipes IRON
Sander HAND, IN EACH BOX, TO SAND FRONT AND BACK
SAND BOXES, TWO EACH SIDE, UNDER RUNNING BOARDS
Dome casing IRON PAINTED

Boiler Jacket #22 SOFT STEEL PtBands IRON Style 9 AND 14
Boiler Lagging MAGNESIA SECTIONAL
BOILERS TO BE LAGGED AND JACKETED.

SPECIFICATION FOR LOCOMOTIVES 4 28 C 66

For INLAND STEEL COMPANY (INDIANA HARBOR WORKS)

Frames CAST STEEL Braces SOLID

Cylinders, Diam. 17" Stroke 20"
St'm ports, Length 16" Width 1$\frac{1}{2}$" Bridges 1"
Exh. ports, Length 16" Width 2$\frac{1}{2}$" Valve load 1/16"
Valve travel 5$\frac{1}{2}$" O. S. lap $\frac{7}{8}$" Ins. lap ----
Eccentric crank throw 5" BY-PASS VALVE NONE
S. P. Lubr. (Specd) 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 RICHARDSON BALANCED, WITH VACUUM VALVES
Met. pkg (Specd) PISTON RODS, VALVE STEMS JEROME
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 BABBITTED
Wrist Pins STEEL Rod cups { GREASE CUPS ON ALL MAIN AND SIDE 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 TO HAVE HUB LINERS OF BRONZE
Drivers, O. S. Diam. 42" Cen. diam. 36" CENTRES CAST STEEL

Tires 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— 1/16" total
Driving Boxes CAST STEEL
Journals, Diam. 8$\frac{1}{2}$" 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

Brakes, position ON ALL DRIVING WHEELS (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 LUBRICATE STEAM BRAKE VALVE
BRAKE OPERATING EQUIPMENT TO BE LOCATED ON ENGINEER'S SIDE OF CAB

Tender NONE

Tank 1300 Gallons, Bill 4654
SADDLE TANK LOCATED OVER TOP OF BOILER, AND EXTENDING OVER SMOKE BOX
BACK END OF TANK TO BE ARRANGED TO PERMIT ACCESS TO TATE STAYS

①LOCO. TO BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE INTERSTATE COMMERCE COMMISSION.

②CAB TO BE ALL STEEL CONSTRUCTION WITH REAR ENTRANCE AND TO BE LINED THROUGHOUT WITH ASBESTOS BOARD LINING.
GLASS IN ALL WINDOWS TO BE WIRED TO WITHSTAND INTENSE HEAT.

ACTUAL DIMENSIONS OF LOCO.:- HEIGHT OVER ALL 10'-5$\frac{1}{2}$"
EXTREME WIDTH { OVER CAB BOARDS 6'-11"
{ OVER CYLINDER OR VALVE MOTION 6'-11$\frac{3}{4}$"
LENGTH OUTSIDE FACE FRONT BUMPER TO FACE OF BACK BUMPER 23'-8"

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 2.6.18 Shipment ON CAR

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

Patent Plates } NONE

Property plates NONE

②**Paintings**—Engine, style 220 OLIVE GREEN AND ALUMINUM
Painting:—Tender, style ----

Mark on TANK SIDES, INLAND STEEL COMPANY

No. Pos.	Road No.	Name NONE
F.No.Plate	25	
CAB SIDES		

THE BALDWIN LOCOMOTIVE WORKS As Spec'd C-5365

Memorandum Spec'n 19049

SPECIFICATION FOR LOCOMOTIVES 4-28-C-69

FOR LA BELLE IRON WORKS

RTL

Gen. as PHOTO 2584

Engine Drawing No. 21

7-11-19

Gauge of Road 3' 0" Play 3/8"
Wheelbase, Rigid 5' 9" Driving 5' 9" Total 5' 9"
Total wheelbase, eng. and tend. { Actual —— / Limited to ——

Curves ——
LENGTH OVER BUMPERS TO BE 23' 8".
Limits, Height 11' 0" Width 7' 6"
Weight (approximate) in working order, Total 91,000 POUNDS
On F. tr'k —— lbs., Drivers 91,000 lbs., B. tr'k —— lbs.
RATIO OF ADHESION, SADDLE TANK EMPTY - 3.8
Tractive power 21,000 lbs., Ratio of adhesion 4.3
Work'g St'm Pres. 180 lbs., Service SWITCHING
Fuel SOFT COAL
FRONT TUBE SHEET 1/2" THICK.
BOILER TO CONFORM TO OHIO STATE INDUSTRIAL BOILER LAW. SEE NEXT PAGE-③
Boiler STEEL Thick 9/16" Bill 8624
Boiler, Diam. 52" Plan STRAIGHT TOP
Boiler st'm pres. 180 lbs., Tested to { 200 lbs. steam pres. / 240 lbs. water pres.
WITH FACTOR OF SAFETY OF 5.4
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS.

Dome, diam. 25" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE
Firebox, length 46 13/16" Width 49 3/4" Depth F. 57 7/8" B. 56 5/8"
Firebox, Tube 1/2" Crown 3/8" Sides 5/16" Back 5/16"
Firedoor opening 16" DIAM.
Water space, Front 3 1/2" Sides 3" Back 3"
Water space, Frame SINGLE Riveted
Water space stays 7/8" DIAM. WITH 3/16" HOLES 1 1/2" DEEP FROM O.F.

Radial stays 1" DIAM. Sling stays front { TWO ROWS B.L.W. EXPANSION STAYS
Button heads below crown on 61 X central rows
Crown bars NONE Placed —— above crown
Crown bolts ——

Flues ——
Tubes #12 W. G. CHARCOAL IRON OR STEEL (B.L.W. OPTION)
Tube ends SWAGED FOR COPPER FERRULES, FIRE-BOX ENDS.
Number 158 Diam. 2" Length 10' 10"

Heating Surface	Flues ——	Combus. Chamb. ——	Total 965
	Tubes 889	Fire Box 76	Fire Brick Tubes ——
Grate area 16	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
Baffling and deflect. plates WITH
Exhaust nozzle DOUBLE HIGH
Nozzle STRAIGHT Dia. 10"

Safety Valves TWO CONSOLIDATED 1 1/2" OPEN (Not Spec)
Safety valves NONE with relief lever, Set to 180 POUNDS
Whistle ONE 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 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 MONITOR (Not Spec) 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

① **Cab** STEEL
FUEL BOX IN LEFT SIDE OF CAB, CAPACITY 900 POUNDS.

Cab boards STEEL Nosing T-IRON
Running boards NONE Nosing ——
Hand rail IRON Located on CAB.

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.

E.&B. Drawhead, Center above rail 17"
Coupler DRAWCASTING OF CAST STEEL, AS PENCIL SKETCH RECEIVED 8-2-19.
RADIAL DRAWBARS TO BE OMITTED.
Signal fixtures NONE

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

Bell 85 POUNDS
Sand Box FOUR 10" X 10" Body IRON PAINTED Pipes IRON
Sander HAND, IN EACH BOX, TO SAND FRONT AND BACK.
SAND BOXES, TWO EACH SIDE, UNDER TANK.
Dome casing IRON PAINTED

Boiler Jacket #22 SOFT STEEL PLAIN Bands IRON Style 9 AND 14
Boiler Lagging MAGNESIA SECTIONAL
EACH HEAD OF BOILER TO BE LAGGED AND JACKETED.

THE BALDWIN LOCOMOTIVE WORKS

P. W. STOUDT Aug. 1919.

SPECIFICATION FOR LOCOMOTIVES 4-28-C-69

FOR LA BELLE IRON WORKS

RTL

Frames CAST STEEL

Cylinders, Diam. 17" Stroke 20"
St'm ports, Length 16" Width 1 1/4" Bridges 1"
Exh. ports, Length 16" Width 2 1/2" Valve lead 1/16"
Valve travel 5 1/4" Steam lap 3/4" Exhaust clearance ——
Eccentric cranks throw 5" By-pass valve NONE
S. F. Lubr. (Not Spec) MICHIGAN DOUBLE BULL'S EYE, TWO 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 RICHARDSON BALANCED, WITH VACUUM VALVES.
Met. pkg. (PISTON ROD / VALVE STEMS) UNITED STATES, KING TYPE (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 WITH BEARINGS OF CAST IRON, TINNED.
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 wheel hub liners OF BRONZE
Drivers, O. S. Diam. 42" Cen. diam. 36" CENTERS CAST STEEL

Tires 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 = 1/10" TOTAL
Driving Boxes CAST STEEL
Journals, Diam. 8 1/2" 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 ——
Wheel hub liners ——
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 ——
Wheel hub liners ——
Wheels, Diam. —— Tread —— Kind ——
Tires —— Cen. diam. —— Size ——
Tires held by ——

Brake, position ON ALL DRIVING WHEELS (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. ——
SEPARATE LUBRICATOR FOR STEAM BRAKE VALVE.

Tender NONE

Tank 1300 Gallons, Bill 4654
SADDLE TANK OVER TOP OF BOILER AND EXTENDING OVER SMOKE BOX.

① CAB TO BE ALL STEEL CONSTRUCTION WITH REAR ENTRANCE AND TO BE LINED THROUGHOUT WITH ASBESTOS BOARD LINING.
GLASS IN ALL WINDOWS TO BE WIRED TO WITHSTAND INTENSE HEAT.

* BOILER TO BE INSPECTED BY THE HARTFORD STEAM BOILER INSPECTION AND INSURANCE CO.

③ BOILER TO BE STAMPED WITH THE WORDS :
OHIO STANDARD
NO. 26
BALDWIN
THIS STAMPING MUST BE DONE BY THE AUTHORIZED OHIO INSPECTOR.
THE HEIGHT OF THE LETTERS AND FIGURES MUST 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.

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 7-15-19 Shipment ON CAR

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

B. L. W. }
Patents { NONE

Property plates NONE

① **Painting,** style 220 OLIVE GREEN AND ~~ALUMINUM~~ GOLD.

Mark on TANK SIDES LA BELLE IRON WORKS, STEUBENVILLE, OHIO. No. 6

Road Nos. Pps.	Road Nos.	Name
F. NO. PLATE	6	NONE
TANK SIDES		

Actual Dimensions of Loco. Extreme height over all = 10' 4"
Extreme Width { Over cab boards = 8' 11" / Over cylinders or valve motion = 8' 11 1/2"
Length outside face of front bumper to outside face of back bumper of engine } = 25' 8"

THE BALDWIN LOCOMOTIVE WORKS Dup. 8 22 ½ C 42 WITH SAME EXTRAS EXCEPT WHERE OTHERWISE SPECIFIED.

Memorandum Spec'n 20057

SPECIFICATION FOR LOCOMOTIVES 8 22 ½ C 49 AND 50

MKS.

FOR MENGEL BOX COMPANY

HW.

3.1.20 **Engine Drawing No.** 14

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 7' 0" Driving 7' 0" Total 21' 7"
(Actual ~~11'-11"~~ 42°04" n.s.r.)
Total wheelbase, eng. and tend. Limited to ---

RAILS, 56 AND 60 LBS. PER YARD
Curves 46 DEGREES GRADES 1%
LOCO. WILL BE RUN AS MUCH BACKWARD AS FORWARD.
Limits, Height --- Width ---
Weight (approximate) in working order, Total 73,000 POUNDS
On F. tr'k 11,000 lbs., Drivers 53,000 lbs., B. tr'k 9,000 lbs.

Tractive power 13,300 lbs., Ratio of adhesion 4
Work'g St'm Pres. 160 lbs., Service SWITCHING
Fuel SOFT COAL

Boiler STEEL Thick ½" Bill 8951
Front Tube Sheet ½" Thick
Boiler, Diam 48" Plan STRAIGHT TOP.
Allowable st'm pres. 160 lbs. With Factor of Safety of 6. **Tested to** 180 lbs. steam pres 214 lbs. water pres.
Longitud. seams BUTT JOINTS, DOUBLE COVERING STRIPS.

Dome, diam. 25" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE
Firebox, length 53 11/16" Width 39½" Depth F. 53" B. 51⅞"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back 5/16"
Firedoor opening 16" DIAM. CROWN AND SIDES IN ONE SHEET.
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" DIAM. Sling stays front TWO ROWS B.L.W. EXPANSION STAYS
Button heads below crown on FOUR central rows
Crown bars NONE Placed --- above crown
Crown bolts ---

Flues ---
Tubes #12 W. G. ~~SPELLERIZED~~ SEAMLESS (½ Time) STEEL
Tube ends SWAGED FOR COPPER FERRULES FIRE BOX ENDS.
Number 145 Diam. 2" Length 10' 7½"

Heating Surface Flues --- Combus. Chamb. --- Total 871.5
Tubes 801.8 Fire Box 69.7 Fire Brick Tubes ---
Grate area 12.7 Ratio to Heating Surface 1: 68.6
Superheater ---

Fire Brick ARCH, ON STUDS.

Grates ROCKING BARS WITH DROP PLATES.
Ash Pan, Dampers RIGHT AND LEFT

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 stopper WITH
Netting and deflect. plates WITH

Exhaust nozzles DOUBLE HIGH

Stack STRAIGHT Dia 14"

Safety Valves TWO CONSOLIDATED 2" OPEN (Not Spec.)
Safety valves NONE with relief lever, Set to 160 POUNDS.
Whistle ONE 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 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

For Hencafter: Provide more clearance between combustion strap and throat sheet on these locos. Location strap had to be chipped away to clear boiler rivets. L.G.Tandy 5.28.20.

Pump NONE

LOCOMOTIVE TO BE OPERATED IN KENTUCKY

Injectors TWO HANCOCK, TYPE "A" (Not Spec.) 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 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 32"

Pilot NONE Pushing shoes AT FRONT
Front Bumper OAK Bumper plate WITH
Steps ACROSS FRONT WITH HAND RAIL

Coupler THREE POCKET CASTING WITH TOP POCKET OF SUITABLE HEIGHT TO COUPLE TO M. C. B. STANDARD CARS 33½" CEN. ABOVE RAIL. COUPLING PIN LIFTER TO BE PROVIDED. DO NOT FURNISH AUTO. COUPLER
Signal fixtures IRON ON BUMPER.

Headlight TWO ROUND CASE 14" 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 PAINTED Plates 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 May 1920.

L. G. Tandy

SPECIFICATION FOR LOCOMOTIVES 8 22 ½ C 49 AND 50

FOR MENGEL BOX COMPANY FURNISH DWGS. (SEE * BELOW)

HW

Frames CAST STEEL

Cylinders, Diam. 14" Stroke 22"
St'm ports, Length 13" Width 1¼" Bridges 1"
Exh. ports, Length 13" Width 2½" Valve lead 1/16"
Valve travel 4¾" Steam lap ⅞" Exhaust clearance ---
Eccentric ~~crank~~ throw 4½" By-pass valve NONE
S. F. Lubr. DETROIT TRIPLE No. 22 BULL'S EYE. (Not Spec.)
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 HEADS OF CAST IRON WITH RINGS OF CAST IRON SPRUNG IN
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 wheel hub liners NONE
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 = 3/16" TOTAL
Driving Boxes CAST IRON
Journals, Diam. 6½" Length 8"

Springs. Make STANDARD STEEL WORKS

Front Engine Truck TWO Wheeled SWING BOLSTER CENTER BEARING
To swing 4" each side of cen., Cen. pin liners NONE
Journals, Diam. 4½" Length 7½" Boxes CAST IRON
Wheel hub liners NONE
Wheels, Diam. 26" Tread 4½" Kind CHILLED CAST IRON
Tires --- Cen. diam. --- Size ---
Tires held by ---

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
Wheel hub liners NONE
Wheels, Diam. 26" Tread 4½" Kind CHILLED CAST IRON
Tires --- Cen. diam. --- Size ---
Tires held by ---

Brake, position ON ALL DRIVING AND TENDER WHEELS
Operating Parts: Engine, sch. No. 6 ET WESTG. COMBINED AUTO. AND STRAIGHT AIR.
Foundation Parts: Drivers, sch. HW-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 POUNDS.

Tender EIGHT Wheeled, Drawing No. 356
Weight, with fuel and water, about 50,000 POUNDS.
TENDER TO BE WEIGHED: YES
Tank 2,500 Gallons, Bill 2839
TANK "U" SHAPE, SLOPING BACK. FUEL CAP. 5 TONS.

Tool Boxes HARD WOOD, TOP.

Frame OAK AND YELLOW PINE

Front Drawbar height 28⅞"
Pilot NONE Pushing shoes AT REAR

Coupler THREE POCKET CASTING WITH TOP POCKET OF SUITABLE HEIGHT TO COUPLE TO M.C.B. STANDARD CARS. 33½" CENTRE ABOVE RAIL COUPLING PIN LIFTER TO BE PROVIDED. DO NOT FURNISH AUTO. COUPLER.
Steps ACROSS REAR WITH HAND RAIL.

Trucks ARCH BAR TYPE WITH WOOD BOLSTERS.
TRUCK CHANNEL BAR TO BE LAID FLAT
Springs ELLIPTIC, STANDARD STEEL WORKS.
Journals, Diam. 3½" Length 7" M.C.B. AXLE BOX ETC.
Wheels, Diam. 28" Tread 4½" Kind CHILLED CAST IRON
Tires --- Cen. diam. --- Size ---
Tires held by ---
Safety chains SINGLE

Brake Position ON ALL WHEELS
Brake sch. No. 6 ET WESTG. AUTO AND STRAIGHT AIR WITH 8" x 12" TENDER CYLINDER.
*FURNISH TO CO. AFTER COMPLETION OF LOCO PRINTS OF THE WEARING PARTS AND OF THE PRINCIPAL PARTS OF THE LOCO. (NOT A COMPLETE SET)
List of tools, sch 26
Photo sch. ~~No. 2~~ NONE Inspection B. L. W.
To be weighed NO Material specing B. L. W.
Certificate of boiler test THREE COPIES OF B.L.W. FORM 1036
Junior laws to 7-30-20 Shipment ON OWN WHEELS

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

B. L. W. Patents: FEED WATER STRAINER PAT'D SEPT. 1, 1903 (CAST ON)

Property plates NONE

Painting, style 291, OLIVE GREEN AND ALUMINUM

LETTERING ETC. TO BE SIMILAR TO 8 22 ½ C 42
Mark on TANK SIDES: C. C. MENGEL & BROTHER CO.

	Road Nos.	Name NONE
Road Nos. Pos.	1	
F. No. PLATE	2	
F. SAND BOX		
CAB SIDES		
BACK OF TANK		

Actual Dimensions of Loco. Extreme height over all 11'11"
Extreme Width: Cab boards 8'7" FRONT BUMPER PLATE 8'9"
Length outside face front bumper of engine to face of tender wedge 25'4½"
Length face of tender wedge to outside face back bumper of tender 20'11½"
Total length outside face front bumper of engine to outside face back bumper of tender 46'4½"

THE BALDWIN LOCOMOTIVE WORKS As Spec. 6-925 Loco. to be same as 6 32 D 1097 except to be heavier.

Memorandum Spec'n No. 20069

SPECIFICATION FOR LOCOMOTIVES 6 38 D 119

FOR MINNESOTA STEEL COMPANY

HW

Cert. as PHOTO. 3-3+

3.17.20 Engine Drawing No. 22

Gauge of Road 4'8½" Play 2" **Wheelbase,** Rigid 11'0" Driving 11'0" Total 11'0"

Total wheelbase, eng. and tend. {Actual 43'5½" {Limited to ---

Curves 300 FT. RADIUS GRADES 4%

RAILS 80 POUNDS.

Limits, Height 14'5" Width ---

Weight (approximate) in working order, Total 167,000 POUNDS.

On F. trk --- lbs., Drivers 167,000 lbs., B. trk --- lbs.

Tractive power 40,700 lbs., Ratio of adhesion 4.11

Work'g St'm Pres. 190 lbs., Service SWITCHING

Fuel SOFT COAL

1 **Boiler** STEEL Thick 25/32" Bill 9068

5 Front Tube Sheet 9/16" thick

Boiler, Diam. 78" Plan STRAIGHT-TOP

3 Allowable st'm pres. 200 lbs. **Tested to** 220 lbs. steam pres.

6 With Factor of Safety of 5.0 300 lbs. water pres.

Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS OCTUPLE RIVETED.

5 **Dome,** diam. 33" Pos. CENTRAL

5 **Firebox** STEEL Combustion chamb. NONE

Firebox, length 120⅛" Width 42" Depth F. 79⅜" B. 74⅜"

10 Firebox, Tube 9/16" Crown ⅜" Sides ⅜" Back ⅜"

Firedoor opening 16" DIAM.

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

Water space frame DOUBLE Riveted

7 26 Water space stays ⅜" DIAM. WITH 3/16" HOLES 1½" DEEP FROM O. S.

26 7/16 Radial stays 1" DIAM. Sling stays front {THREE ROWS B.L.W. EXPANSION STAYS

Button heads below crown on TEN central rows

Crown bars NONE Placed --- above crown

Crown bolts ---

Flues ---

11 **Tubes** #12 W. G. CHARCOAL IRON OR STEEL (B.L.W. OPTION)

18 Tube ends SWAGED FOR COPPER FERRULES FIRE BOX ENDS.

Number 374 Diam. 2" Length 10'6"

Heating Surface Flues --- Combus. Chamb. --- Total 2252⁰

Tubes 2040⁰ Fire Box 212⁰ Fire Brick Tubes ---

Grate area 39⁰ Ratio to Heating Surface 1: 64.4

Superheater ---

Fire Brick ARCH - NONE

27 **Grates** ROCKING GRATE AND DROP BAR

28 **Ash Pan,** Dampers FRONT AND BACK

Throttle BALANCE Pos. DOME

Dry pipe STEEL.

Superheater NONE

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

Spark ~~diaphragm~~ hopper WITH

30 Netting and deflect. plates WITH

Exhaust nozzles DOUBLE HIGH

Stack STRAIGHT Dia. 20"

8 **Safety Valves** TWO CROSBY 3" (Spec)

16 Safety valves BOTH with relief lever set at 190 POUNDS

8 **Whistle** ONE B.L.W. PLAIN

8 **Steam Gauge** ONE IRON 7" MAKER: ASHCROFT (Not Spec)

Steam gauge stand IRON **Clock** NONE

8 **Water Gauge** ONE B.L.W. IRONCLAD **Cab Lamps** ELECTRIC

8 **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

32 8 **Blower Valve** B. L. W.

32 8 **Blow off Cock** ONE POS: FRONT

17 **Cleaning Plugs** ONE PLUG ABOVE FIREDOOR.

Firebox, CORNERS DIAGONAL, SIDES, AND BACK.

31 Crown, THREE L.S. TWO in S. AND TWO BACK.

Waist (SEE SUP. 31)

Front tube sheet, ONE 10 Fusible plug ONE

Pump NONE

Injectors TWO NATHAN SIMPLEX (Spec) No. 10

Injectors, Pos. R. AND L. Steam pipes COPPER

35 Pipes, Check IRON Feed IRON Overflow IRON

15 8 Check HANCOCK (SEE SUP. 15, 34) Pos. R. AND L.

Steam Heat NONE

Cab STEEL, LINED WITH WOOD.

DROP SEATS NOT WANTED IN CAB.

Cab boards STEEL Nosing T-IRON

Running boards STEEL Nosing T-IRON

Hand rail IRON Located on BOILER

36 **Back Bumper** BAR STEEL Back drawhead height 30"

TENDER EDGE TO HAVE HARDENED FACE.

Pilot NONE Pushing shoes CAST IN BUMPER

Front Bumper CAST STEEL Bumper plate NONE

Steps ACROSS FRONT WITH HANDRAILS.

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

Front Drawhead, Center above rail 33½"

37 **Coupler** SHARON M.C.B. AUTOMATIC.

Signal fixtures NONE

38 **Headlight** TWO ROUND CASE 18" Reflector

Headlight, Nos. on sides WITH Front step WITH

Lamp shelf NONE Nosing ---

Bell 92 POUNDS

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 #16 SOFT STEEL Pto. Bands IRON Style 9

Boiler Lagging MAGNESIA SECTIONAL

JACKET OVER STAYBOLTS TO BE REMOVABLE.

THE BALDWIN LOCOMOTIVE WORKS

H.W. Harwick. June 1920.

SPECIFICATION FOR LOCOMOTIVES 6 38 D 119

FOR MINNESOTA STEEL COMPANY

HW

FURNISH DRAWINGS (SEE SUP. 21)

Frames CAST STEEL

Cylinders, Diam. 22" Stroke 26"

St'm ports, Length 16" Width 1⅜" Bridges 1⅛"

Exh. ports, Length 15" Width 2½" Valve lead 1/16"

Valve travel 5½" Steam lap 1" Exhaust clearance ---

Eccentric throw 4⅜" By-pass valve NONE

S. P. Lubr. NATHAN TRIPLE BULL'S EYE (Spec)

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

Cyl'r casings IRON PTD. Steam covers STEEL PAINTED

St'm chest casings IRON PAINTED Covers STEEL PAINTED

St'm chest valves RICHARDSON BALANCED, WITH VAQUUM VALVES

Mfd. pkg (Spec) PISTON ROD VALVE RODS PACKING U.S. KING TYPE (A/C TIMKEN)

PISTON RODS TO BE KEYED TO CROSSHEADS

Pistons HEADS OF CAST IRON, WITH RINGS OF CAST IRON SPRUNG IN

Guides LAIRD TYPE, STEEL Gib cups NEEDLE

Crossheads CAST STEEL, WITH BEARINGS OF PHOSPHOR BRONZE

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 wheel hub liners BRONZE

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 3/16" TOTAL

Driving Boxes CAST STEEL

Journals, Diam. 9" Length 12"

Springs. Make UNION SPRING AND MANUFACTURING COMPANY

Front Engine Truck NONE Wheels ---

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

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

Wheel hub liners ---

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 ---

Wheel hub liners ---

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 WESTG. COMBINED AUTO. AND STRAIGHT AIR.

Parts Exp. Trk. sch. ---

Foundation Drawing sch. AL-3 8C AMERICAN O.S. EQUALIZED

Parts Exp. Trk. sch. ---

Air pump ONE 8½" 2-CYL. CROSS COMPOUND

Train connections FRONT AND BACK

Train signal sch. NONE

AIR PUMP EXHAUST TO BE PIPED TO CYLINDER SADDLE.

Tender EIGHT Wheeled, Drawing No. 1648

Weight, with fuel and water, about 100,000 POUNDS.

TENDER TO BE WEIGHED: YES

Tank 5,000 Gallons Bill 4404

TANK "U" SHAPE, SLOPING BACK, FUEL CAPACITY, 8 TONS.

Tool Boxes OF WOOD, TOP.

Frame STEEL, 10" CHANNELS, WITH FRONT BUMPER OF WOOD AND STEEL PLATE. BACK BUMPER OF CAST STEEL.

Front Drawbar height 27/8"

Pilot NONE Pushing shoes CAST IN BACK BUMPER

Back drawhead, center above rail 33½"

Coupler SHARON M.C.B. AUTO. WITH B.L.W. EXTRA STRONG TWIN SPRING DRAFT GEAR OF HEAVY DESIGN.

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

Steps ACROSS BACK WITH HAND RAILS.

STEPS ON SLOPING BACK OF TANK, WITH HAND RAILS.

Trucks ARCH BAR TYPE, WITH CAST STEEL BOLSTERS

BOTH TRUCKS TO HAVE SIDE BEARINGS.

Springs ELLIPTIC, UNION SPRING MANUFACTURING COMPANY

Journals, Diam. 5" Length 9"

Wheels, Diam. 33" Tread 4½" Kind ROLLED STEEL

Tires NONE Cen. diam. --- Size ---

Tires held by --- WHEEL RIMS, 2½" THICK.

Safety chains SINGLE

50 **Brake** Position ON ALL WHEELS

Brake sch. No. 6 ET WESTG. AUTO. AND STRAIGHT AIR, WITH 10"x12" TENDER BRAKE CYLINDERS.

List of built sch. 29

Photo sch. No. 2 Inspection (SEE SUP. 23 pre and SUP 140)

To be weighed YES Material specs B.L.W. (SEE SUP. 4, 22)

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

Junior laws to 6.1.20 Shipment ON OWN WHEELS.

Brass shop finish No. 1

Machine shop finish D-165

B.L.W. Patents FEED WATER STRAINER PAT'D SEPT. 1, 1903 (CAST ON)

Property plates NONE

Painting, sup. 29, OLIVE GREEN AND ALUMINUM

LETTERING ETC. TO BE SAME AS FOR 6 32 D 1097

Mark on CAB SIDES, BELOW WINDOWS, M. S. CO.

MARK ON TANK SIDES, MINNESOTA STEEL COMPANY

Brass Nos. Pos. Name

F. NO. PLATE 13 NONE

F. SAND BOX

CAB PANEL

BACK OF TANK

CHANGED BY CUSTOMER TO No. 14 AFTER DELIVERY OF LOCO. SEE LETTER 9-5-23 - FROM C.K. RUBBER GEN. PUR. AGT., MINN. STEEL CO. (9-7-23)

Actual Dimensions of Loco.

Extreme Width {Cab 10'1" {Cylinders 10'3"

Length of tank

Length of frame

Total length of engine

Height of engine

1 BOILER TO BE OPERATED IN THE STATE OF MINNESOTA
BOILER TO BE BUILT TO CONFORM TO THE BOILER CODE OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS (1918), AND MUST BE INSPECTED DURING CONSTRUCTION AND UPON COMPLETION BY AN AUTHORIZED INSPECTOR WHO SHALL NOT BE INTERESTED EITHER DIRECTLY OR INDIRECTLY WITH THE MANUFACTURERS.

2 A DATA REPORT, ON FORMS FURNISHED BY THE ABOVE MENTIONED STATE SHALL BE FORWARDED TO THE PROPER OFFICIAL BEFORE THE BOILER LEAVES THE BUILDER'S WORKS.

3 A HYDROSTATIC TEST SHALL BE APPLIED EQUAL TO ONE-AND -ONE-HALF (1½) TIMES THE WORKING PRESSURE.

4 THE MATERIALS ENTERING INTO THE CONSTRUCTION SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS:-

BOILER AND FIRE BOX STEEL MATERIAL FOR ONE-PIECE DOME	A.S.M.E. SPEC. PAGE 11
BOILER RIVET STEEL	A.S.M.E. SPEC. PAGE 15
BOILER RIVET IRON	A.S.M.E. SPEC. PAGE 31
BOILER BRACE IRON	A.S.M.E. SPEC. PAGE 32
BOILER STAYBOLT IRON	A.S.M.E. SPEC. PAGE 34
BOILER TUBES	A.S.M.E. SPEC. PAGE 40

5 FRONT TUBE SHEET SHALL BE OF FIRE BOX STEEL.
ALL BOILER AND FIRE BOX STEEL, AND MATERIAL FOR ONE PIECE DOME SHALL BE MARKED BY THE MANUFACTURER WITH THE HEAT NUMBER, NAME OF MANUFACTURER, GRADE AND LOWEST TENSILE STRENGTH IN THE MANNER AND LOCATION DESCRIBED ON B.L.W. MARKING CARD 6859. SMOKE BOX STEEL MAY CONFORM TO B.L.W. SPECIFICATION.

6 THE MINIMUM FACTOR OF SAFETY SHALL BE FIVE. (1918)
LONGITUDINAL SEAMS SHALL BE OF BUTT AND DOUBLE STRAP CONSTRUCTION.

7 THE OUTSIDE ENDS OF SOLID STAYBOLTS, 8 IN. AND LESS IN LENGTH, SHALL BE DRILLED WITH A HOLE AT LEAST 3/16" DIA., TO A DEPTH EXTENDING AT LEAST ½" BEYOND THE INSIDE OF THE PLATES

8 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 OR CORRESPONDING TAPER TAP.	1" & 1¼"	1½" & 2"	2½" TO 4"
NO. OF THREADS PER INCH.	11½	11½	8
MINIMUM NO. OF THREADS REQUIRED IN OPENING.	4	5	7
MINIMUM THICKNESS OF MATERIAL REQUIRED TO GIVE ABOVE NO. OF THREADS.	⅞"	7/16"	⅞"

IF THICKNESS OF BOILER MATERIAL IS NOT SUFFICIENT TO GIVE THE ABOVE NUMBER OF THREADS, A LINER OR FLANGE MUST BE APPLIED.

9 EACH BOILER MUST BE PROVIDED WITH A CONNECTION ¼ PIPE SIZE FOR ATTACHING INSPECTOR'S TEST GAUGE.

10 A FUSIBLE PLUG MUST BE APPLIED. THE PLUG MUST BE FILLED WITH PURE TIN AND THE LEAST DIAMETER OF THE FUSIBLE METAL MUST BE NOT LESS THAN ½" EXCEPT FOR WORKING PRESSURE ABOVE 175 LBS., IN WHICH CASE THE LEAST DIAMETER SHALL NOT BE LESS THAN ⅝". (I.E. B.L. 1218 FUSIBLE PLUG CARD 6410 FOR PRESSURE ABOVE 175 LBS. AND FUSIBLE PLUG CARD 1219 FOR 175 LBS. AND LESS).

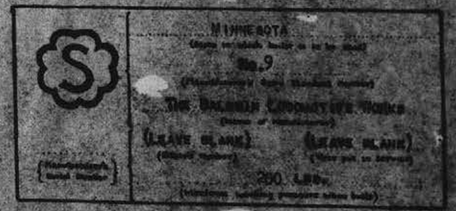
15 FEED WATER SHALL NOT DISCHARGE INTO A BOILER IN CLOSE PROXIMITY TO RIVETED JOINTS IN SHELL OR FURNACE SHEETS. EACH BOILER SHALL HAVE A FEED PIPE FITTED WITH A CHECK VALVE, AND ALSO A STOP VALVE OR STOP COCK BETWEEN THE CHECK VALVE AND THE BOILER.

16 SAFETY VALVES MUST MEET THE REQUIREMENTS OF THE A. S. M. E. BOILER CODE AND MUST BE PLAINLY STAMPED BY THE MANUFACTURER AS PER B. L. W. MARKING CARD 6859.
SAFETY VALVES OVER 3" IN DIAMETER SHALL HAVE FLANGED INLETS.
THESE FLANGES SHALL CONFORM TO THE AMERICAN STANDARD.
ALL SAFETY VALVES MUST BE PROVIDED WITH RELIEF LEVERS.

17 THERE SHALL BE NOT LESS THAN SIX BRACE 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 LEGS ALSO WHERE POSSIBLE ONE NEAR THE THROAT SHEET.

18 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 EXCEEDING 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.

19 UPON COMPLETION, EACH BOILER SHALL BE STAMPED IN THE PRESENCE OF THE AUTHORIZED INSPECTOR, WITH THE WORDS AS ARRANGED BELOW. THE HEIGHT OF THE LETTERS AND FIGURES SHALL NOT BE LESS THAN ½". THE LOCATION OF THE STAMP SHALL BE ON THE BACK HEAD ABOVE A PLUG HOLE.



187 182

21 FURNISH, AFTER COMPLETION OF ENGINE, BLUE PRINTS ILLUSTRATING THE WEARING PARTS AND PRINCIPAL PARTS OF LOCO. (NOT COMPLETE SET.)

22 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. COPIES OF ORDERS FOR MATERIALS PURCHASED FROM ANY OF THESE SUBSIDIARY COMPANIES TO BE FURNISHED TO MR. MACE, PURCHASING AGENT. (SEE SUP 4)

23 LOCOMOTIVE TO BE INSPECTED BY MR. C. F. W. RYS. CHIEF INSPECTOR FOR CARNEIGE STEEL CO., AND HE IS TO BE NOTIFIED TWO DAYS BEFORE WE BEGIN WORK ON BOILER AND BEFORE CYLINDERS ARE TESTED SO THAT HE MAY HAVE HIS INSPECTORS HERE TO MAKE INSPECTION. (SEE SUP 25)

24 LOCO. FOR OPERATION IN MINNESOTA.

25 BOILER TO COMPLY WITH THE A.S.M.E. CODE (SEE SUP. 1 TO 19)
BOILER TO BE INSPECTED BY THE HARTFORD STEAM BOILER INSPECTION AND INSURANCE COMPANY.

26 WATER SPACE AND RADIAL STAYBOLTS TO BE MADE OF ATLAS STAY BOLT IRON.

27 GRATE BARS TO BE OPERATED FROM CAB. DROP PLATE TO BE OPERATED FROM GROUND.

28 ASH PAN TO BE SELF DUMPING TYPE.

29 SMOKE BOX FRONT AND DOOR OF STEEL.

30 SMOKE BOX NETTING TO HAVE 2½ x 2½ MESH.

31 ONE PLUG EACH SIDE ABOVE TUBES, CLOSE TO FRONT TUBE SHEET.
ONE PLUG EACH SIDE ABOVE TUBES CLOSE TO BACK TUBE SHEET.
WAIST PLUGS - ONE PLUG EACH SIDE OF BOTTOM CENTER CLOSE TO FRONT TUBE SHEET.
ONE PLUG UNDER WAIST IN CENTER NEAR THROAT.

32 "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.

33 BLOW-OFF COCK AS CO'S PRINT 200-1 (HEREWITH)

34 INJECTOR CHECK TO BE COMBINED CHECK WITH STOP VALVE, AND TO HAVE SCREW SHANK.

35 SEDDON BOILER FEED DEVICE TO BE APPLIED.
ROYALTY, IF ANY, PAYABLE BY THE B. L. W.

36 SAFETY CHAINS BETWEEN ENGINE AND TENDER TO BE AMPLY LONG FOR CURVES.

37 ENGINE COUPLER POCKET TO BE ADJUSTABLE AS TO HEIGHT, I.E., HAVE OBLONG HOLE.

38 HEADLIGHT EQUIPMENT TO BE "PYLE NATIONAL ELECTRIC, TYPE K-2" 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.

48 CYLINDER COCKS TO BE SET TOWARD RAIL, AND TO BE AS HIGH ABOVE RAIL AS POSSIBLE. CYLINDER COCKS TO HAVE STANDARD PIPE THREADS.
GUARDS TO BE APPLIED IN FRONT OF CYLINDER COCKS.

47 ENGINE SPRINGS TO BE EXTRA STRONG TO GIVE AMPLE CAPACITY AND FREEDOM FROM BREAKAGE ACCOUNT OF ROUGH TRACK.

48 AIR RESERVOIR TO BE ENAMELLED, FROM THE WESTINGHOUSE AIR BRAKE COMPANY, AND TO HAVE HYDROSTATIC TEST OF 210 LBS. AIR RESERVOIR CAPACITY TO BE AMPLE TO PROVIDE FOR AIR DUMP.

49 FOUNDATION BRAKE FIXTURES BUSHED AND CASE HARDENED, A.B. CO'S SCHEDULE 6C.
DRIVING BRAKE SHOES TO BE PERFECTO.

50 LOCOMOTIVE TO BE EQUIPPED WITH APPARATUS FOR OPERATING AIR DUMP CARS WITH CONNECTIONS AT FRONT OF ENGINE AND REAR OF TENDER.

TENDER

55 SAFETY CHAINS BETWEEN ENGINE AND TENDER TO BE AMPLY LONG FOR CURVES.

56 LOCOMOTIVE TO BE EQUIPPED WITH APPARATUS FOR OPERATING AIR DUMP CARS WITH CONNECTIONS AT FRONT OF ENGINE AND REAR OF TENDER.

57 JOURNAL BOXES TO BE KENSINGTON PRESSED STEEL.

58 TENDER BRAKE BEAMS TO BE OF VERY SUBSTANTIAL TYPE, BEAMS AND RIGGING TO BE NOT LESS THAN 6" ABOVE RAIL. BRAKE SHOES TO BE STEEL BACK TYPE.

THE BALDWIN LOCOMOTIVE WORKS As Sold's 0-4-0

Specification Sheet 2000

SPECIFICATION FOR LOCOMOTIVES 6 28 D 332

FOR MISSISSIPPI STATE INSANE HOSPITAL

~~CHICAGO, NORTHERN PACIFIC COMPANY~~

ILL.

Order or Serial No. 2592

Engine Number No. 17

2.11.20

Gauge of Road 4ft 8½" Play ⅜"

Wheelbase, Rigid 10' 0" Driving 10' 0" Total 10' 0"

Total wheelbase, eng. and tend. {Actual 39' 0½" {Limited to —

{**Curves** NOT GREATER THAN NOW TRAVERSED BY LOCO. 1573
{B. L. W. CLASS 10 34 D 338 WHICH HAS 14 FT. WHEEL BASE

Limits, Height — Width —

Weight (approximate) in working order, Total 88,000 POUNDS

On F. tr'k — lbs., Drivers 88,000 lbs., B. tr'k — lbs.

Tractive power 21,438 lbs., Ratio of adhesion 4.1

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

Fuel SOFT COAL

Boiler STEEL Thick ⅜", 7/16", ½" Bill 6977

Front Tube Sheet ½" Thick

Boiler, Diam. 46" Plan EXTENDED WAGON TOP.

{Allowable st'm pres. 160 lbs. **Tested to** {180 lbs. steam pres.
{With Factor of Safety of 5.82 {214 lbs. water pres.

Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS, SEXTUPLE RIVETED, 90% SEAMS.

Dome, diam. 25" Pos. FORWARD OF FIRE BOX.

DOME - ONE PIECE TYPE.

Firebox STEEL Combustion chamb. NONE

Firebox, length 72-5/16" Width 34⅜" Depth F. 58½" B. 49"

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

Firedoor opening 16" DIAM.

Water space, Front 4" Sides 2½" Back 3"

Water space frame SINGLE Riveted

Water space stays 1" DIAM. WITH 3/16" HOLES 1⅛" 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 —

Flues —

Tubes #12 W.G. CHARCOAL IRON

Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.

Number 178 Diam. 2" Length 12' 0"

Heating {Flues — Combus. Chamb. — Total 1203.6
Surface {Tubes 1111.6 Fire Box 92.6 Fire Brick Tubes —
Grate area 17.3 Ratio to Heating Surface 1: 59.4
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 L.S. ONLY

Stack diaphragm or hopper WITH

Netting and deflect. plates WITH

Exhaust nozzles DOUBLE HIGH

Nozzle STRAIGHT Dia. 14"

Safety Valves TWO CROSBY 2½" OPEN

Safety valves HUNG with relief lever, Set to 160 POUNDS.

Whistle ONE B. L. W. CHIME

Steam Gauge 1 ONE 7" MAKER: ASHCROFT

Steam gauge stand IRON Clock NONE

Water Gauge ONE B. L. W. IRON CLAD Cole Locomotive ELECTRIC

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

Crown, TWO EACH SIDE AND TWO BACK.

Waist, ONE UNDER FRONT

Front tube sheet. TWO Fusible plug ONE

Pump NONE

LOCOMOTIVE TO BE OPERATED IN OKLAHOMA.

BOILER ORIGINALLY BUILT FOR 12-26 ST 2 IS TO BE PUT IN GOOD CONDITION - ON EXTRA ORDER No. 19487 DATED 2.21.20 AND IS TO BE USED FOR THIS LOCO.

BOILER MUST MEET I.C.C. REQUIREMENTS.

Injectors 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 27"

Pilot NONE Pushing shoes CAST IN BUMPER

Front Bumper CAST STEEL Bumper plate NONE

Steps ACROSS FRONT WITH HANDRAILS.

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 EQUIPMENT TO BE SCHROEDER ELECTRIC WITH INCANDESCENT HEADLIGHTS

Headlight TWO ROUND CASE 14" Reflector,

Headlight, Nos. on sides WITH Hd'l'ght WITH

Lamp shelf NONE Nosing —

Bell 85 POUNDS

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

Sander LEACH AIR TRAP A-1, 8 IN EACH BOX, TO SAND FRONT AND BACK.

Dome casing IRON PAINTED

Boiler Jacket #18 SOFT STEEL, PTD Bands IRON Style 9

Boiler Lagging MAGNESIA SECTIONAL

THE BALDWIN LOCOMOTIVE WORKS

184 184

SPECIFICATION FOR LOCOMOTIVES 6 28 D 332

FOR MISSISSIPPI STATE INSANE HOSPITAL

~~CHICAGO, NORTHERN PACIFIC COMPANY~~

ILL.

S-11-20

Frames CAST STEEL

ONE TOP RAIL FORGED FROM SK. 4/0 DEFECTIVE CASTING.

Cylinders, Diam. 17" Stroke 24"

St'm ports, Length 16" Width 1½" Bridges 1"

Exh. ports, Length 16" Width 2½" Valve lead 1/16"

Valve travel 5" Steam lap ¾" Exhaust clearance —

Eccentric ~~crank~~ throw 1⅛" By-pass valve NONE

S. F. Lubr. NATHAN TRIPLE BULL'S EYE

Cyl'r heads CAST IRON, LUGS. PIPES OF IRON, UNDER JACKET.

Cyl'r casings IRON PTD. 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 STEM UNITED STATES, KING TYPE.

PISTON RODS TO BE KEYED TO CROSSHEADS.

Pistons HEADS OF CAST IRON, WITH RINGS OF CAST IRON SPRUNG IN.

Guides STEEL Oil cups NEEDLE

Crossheads CAST STEEL WITH BEARINGS OF CAST IRON, TINNED.

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 wheel hub liners NONE

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 - 3/16" 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 —

Wheel hub liners —

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 —

Wheel hub liners —

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. WESTG. COMBINED AUTO AND STRAIGHT AIR.

Parts { Eng. Tr'k, sch. —

Foundation { Drivers, sch. No. 1 AMERICAN O. S. EQUALIZED

Parts { Eng. Tr'k, sch. —

Air pump ONE 9½" Pos. L. S.

Train connections FRONT AND BACK.

Train signal, sch. NONE

AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

Tender EIGHT Wheeled, Drawing No. 1903

Weight, with fuel and water, about 65,000 LBS.

TENDER TO BE WEIGHED: YES

Tank 3000 Gallons, Bill 5209

TANK "U" SHAPE, STRAIGHT TOP. FUEL CAP. 4½ TONS.

Tool Boxes HARD WOOD, TOP.

Frame STEEL 6" AND 8" CHANNELS, WITH BUMPERS OF WOOD REINFORCED WITH STEEL PLATE.

Front Drawbar height 28½"

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 BACK WITH HAND RAILS.

Trucks ARCH BAR TYPE WITH CAST STEEL BOLSTERS.

Springs ELLIPTIC, B. L. W.

Journals, Diam. 3½" Length 7"

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. WESTG. AUTO, AND STRAIGHT AIR WITH 10"x12" TENDER CYLINDERS.

List of tools, sch. 26

Photo sch. No. 2 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 2-24-20 Shipment ON OWN WHEELS.

Brass shop finish, No. 1

Machine shop finish D-165

B. L. W. Patents { FEED WATER STRAINER PAT'D SEPT. 1, 1903. (CAST ON)

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

Painting, style 291, OLIVE GREEN AND ALUMINUM

Mark on TANK COLLAR AT SIDES, O. N. RY. CO.

Road Nos. Pos.	Road Nos.	Name
TANK SIDES	2	
F. No. PLATE		
CAB SIDES		
BACK OF TANK.		

Actual Dimensions of Loco. Extreme height over all 13'10"

Extreme Width: Cab boards 8'11" ; Cylinders or valve motion 9'0"

Length outside face front bumper of engine to face of tender wedge 25'5"

Length face of tender wedge to outside face back bumper of tender 21'10"

Total length outside face front bumper of engine to outside face back bumper of tender 49'11"

THE BALDWIN LOCOMOTIVE WORKS As built: 6-32-0 1131

Locomotive Spec'n 19053

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1131 Gen. as. PHOTO. 6408

FOR NEW YORK SHIPBUILDING CORPORATION Engine Drawing No. 52

5-24-18

Gauge of Road 4' 8½" Play 2"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"
Total wheelbase, eng. and tend. {Actual ——— / Limited to ———

Curves 150 FT. RADIUS

Limits, Height ——— Width ———
Weight (approximate) in working order, Total 133000 POUNDS
On F. tr'k ——— lbs., Drivers 133000 lbs., B. tr'k ——— lbs.

Tractive power 29820 lbs., Ratio of adhesion 4.6
Work'g St'm Pres. 180 lbs., Service SWITCHING
Fuel SOFT COAL
LOCO. TO CONFORM TO I.C.C. REQUIREMENTS.
FRONT TUBE SHEET TO BE ½" THICK.
Boiler STEEL Thick 9/16" Bill 8389
Boiler, Diam. 56" Plan STRAIGHT TOP
Boiler st'm pres. 180 lbs., Tested to 200 lbs. steam pres. / WITH FACTOR OF SAFETY OF 4.55 — 240 lbs. water pres.
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS.

Dome, diam. 29" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE
Firebox, length 69-7/16" Width 42" Depth F. 55 5/8" B. 54 1/16"
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 (RADIAL) 7" DIAM. WITH 3/16" HOLES 1½" 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 ———

Tubes ———
Tubes, 312 S.D. CHARCOAL IRON OR STEEL (B.L.W. OPTION)
Tube ends SHEETED FOR COPPER FERRULES, FIRE BOX ENDS.
Number 198 Diam. 2" Length 12' 4"

Heating Surface				
	Flues ———	Combus. Chamb. ———	Total 1362
	Tubes 1270	Fire Box 92	Fire Brick Tubes ———
Grate area 20.3	Ratio of Heating Surface to		67
Superheater ———			

Fire Brick IRON-ON STUDS

Ash pan TRAPPED DAMP AND DROP PLATE
Ash Pan, Dampers (HAND) FRONT AND BACK

Safety Valves (Not Specd) TWO COALE 2½"
Safety valves NONE with relief lever, Set to 180 POUNDS
Whistle ONE B.L.W. PLAIN

Steam Gauge ONE IRON 7" MAKER: ASHCROFT (Not specd)
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 1/16" above highest part of crown
Lubricator steam valve TO HAVE separate dry pipe to dome
Blower Valve ~~(w.s.w.)~~ B.L.W.

Blow off Cock ONE B.L.W. POS.: L.S.
Cleaning Plugs
Firebox CORNERS DIAGONAL, R.S., 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 Specd) 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. R. AND L.

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 (WOOD) OAK

Pilot NONE Pushing shoes FRONT AND BACK
Front Bumper (WOOD) OAK Bumper plate NONE
Steps ARCHED FRONT AND REAR WITH HANDRAILS.
Steps, Handholds, etc. TO CONFORM TO I.C.C. REQUIREMENTS.
M.C.B. Drawhead, Center above rail 33½"
Coupler M. C. B. AUTO.

Signal Bracket NONE
Headlight Equipment to be PYLE NATIONAL TURBINE, TYPE "K" WITH UNDERCUT REFLECTOR.
Headlight, Two Bracket Lamp [illegible] Reflector
Marker Lights, Nos. or Kind, Rear [illegible] Front Head With
Lens and Lamp [illegible] Nosing ———

Bell (Cast) Location, SOUTHER AIR BELL RINGER
Bell Stand, Type, Diam. 28" Body IRON PAINTED Plate IRON
Bell Cord, Material and Size "A-1" IN EACH BOX, TO HAND FRONT AND BACK
Bell Ringing IRON PAINTED.

Sander Handles and Quadrants, Pipe, Brass Iron
Sander Levers, Material STEEL CASTINGS.

THE BALDWIN LOCOMOTIVE WORKS R. E. Johnston July 1918

SPECIFICATION FOR LOCOMOTIVES 6 32 0 1131 186

FOR NEW YORK SHIPBUILDING CORPORATION

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 5¼" Steam lap ⅞" Exhaust clearance ———
Eccentric sheave throw 5⅛" 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 PAINTED Covers STEEL PAINTED
St'm chest valves RICHARDSON BALANCED, WITH VACUUM VALVES.
Pist. rod (PISTON ROD VALVE STEMS) U. S. KING TYPE
PISTON RODS OF STEEL KEYED TO CROSSHEAD.
Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD.
Guides LAIDE TYPE, STEEL. Oil cups NEEDLE
Crossheads CAST STEEL, WITH ——GIBS OF CAST IRON, TINNED.
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.
DRIVING WHEELS WITHOUT HUB LINERS.
Drivers, O. S. Diam. 46" Cen. diam. 40" 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. 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 ———

Brakes, position ON ALL DRIVING WHEELS (NO TENDER)
Operating Engine, Sch. No. 6-ET WEST'G. COMBINED AUTO. AND STRAIGHT AIR
Parts Eng. Trk. sch. ———
Foundation Drivers, sch. No. 2 AMERICAN O. S. EQUALIZED
Parts Eng. Trk. sch. ———
Air pump One 9½" Pos. L.S.
Train connections FRONT AND BACK
Train signal sch. NONE
AIR ACCESSORIES TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

Tender ———

Tank 2250 Gallons, Bill 4471
SADDLE TANK LOCATED OVER TOP OF BOILER.

ACTUAL DIMENSION OF LOCO:—
EXTREME HEIGHT OVER ALL 13' 7"
EXTREME WIDTH {CAB BOARDS 10' 3" / CYLINDERS 9' 2"
LENGTH OUTSIDE FACE FRONT BUMPER TO OUTSIDE FACE BACK BUMPER 29' 1"

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 6 4 18 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: E. F. C. IN 7" LETTERS.

CAST LETTERING AND NUMBERS FROM CAB
Road Nos. Pos. Road Nos. Name NONE
F. No. PLATE 1001
BACK OF FUEL BOX

THE BALDWIN LOCOMOTIVE WORKS As Spec'n. C-5634

Memorandum Spec'n 19027

SPECIFICATION FOR LOCOMOTIVES 4 - 22 C 272

FOR PETOSKEY PORTLAND CEMENT CO.

R.

Gen'l as PHOTO. 6894

Engine Drawing No. 40

5-16-19

Gauge of Road 4' 8½" Play 3/8"
Wheelbase, Rigid 7' 0" Driving 7' 0" Total 7' 0"
Total wheelbase, eng. and tend. { Actual ——— / Limited to ———
GRADES - 6%
Curves ———

Limits, Height ——— Width ———
Weight (approximate) in working order, Total 79,000 POUNDS
On F. tr'k ——— lbs., Drivers 79,000 lbs., B. tr'k ——— lbs.

Tractive power 17,300 lbs., Ratio of adhesion 4.56
Work'g St'm Pres. 180 lbs., Service SWITCHING
Fuel BITUMINOUS COAL
~~BOILER TO CONFORM TO MICHIGAN STATE REQUIREMENTS~~ 4/24/19
FRONT TUBE SHEET TO BE ½" THICK
Boiler STEEL Thick 7/16" Bill 8481
Boiler, Diam. 42" Plan STRAIGHT TOP
Boiler st'm pres. 180 lbs., Tested to { 200 lbs. steam pres. / 240 lbs. water pres.
WITH FACTOR OF SAFETY OF 5.4
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS

Dome, diam. 22" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE
Firebox, length 46-3/16" Width 42½" Depth F. 44" B. 41½"
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 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. CHARCOAL IRON OR STEEL (B.L.W. OPTION)
Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.
Number 100 Diam. 2" Length 10' 9"

Heating Surface	Flues ———	Combus. Chamb. ———	Total	611⁰
	Tubes 559⁰	Fire Box 52⁰	Fire Brick Tubes	———
Grate area 13.5⁰	Ratio to Heating Surface 1 : 45.3			
Superheater ———				

Fire Brick ARCH, NONE

Grates ROCKING BARS WITH 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. S. ONLY
Spark arrester or hopper WITH
Netting and deflect. plates WITH

Exhaust nozzle DOUBLE HIGH

Stack STRAIGHT Dia. 12"

Safety Valves (Not Spec.) TWO COALE 1½"
Safety valves NONE with relief lever, Set to 180 POUNDS
Whistle ONE 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 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, ONE EACH SIDE AND TWO BACK
Waist, ONE UNDER FRONT
Front tube sheet, ONE Fusible plug ONE
ONE PLUG ON TOP OF FIREBOX OVER THROTTLE LEVER CONNECTION.

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

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, *Cab to have side doors.* Skelly
COAL BOX ACROSS BACK OF CAB, - CAPACITY 1600 POUNDS or more Skelly

Cab boards STEEL Nosing T-IRON
Running boards STEEL Nosing T-IRON
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 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 12" Reflector, To burn KEROSENE
Headlight, Nos. on sides WITH H'dl't step NONE
Lamp shelf NONE Nosing ———

Bell 85 POUNDS
Sand Box, (Not Spec.) TWO Diam. 22½" 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 Bands IRON Style 9
Boiler Lagging PLASTIC MAGNESIA FROM B.L.W. STOCK

THE BALDWIN LOCOMOTIVE WORKS

T.E. Barnes

SPECIFICATION FOR LOCOMOTIVES 4 - 22 C 272

FOR PETOSKEY PORTLAND CEMENT CO.

R.

Frames CAST STEEL Braces SOLID

Cylinders, Diam. 14" Stroke 22"
St'm ports, Length 13" Width 1⅝" Bridges 1"
Exh. ports, Length 13" Width 2½" Valve lead 1/16"
Valve travel 5" Steam lap 1 3/16" Exhaust clearance ———
Eccentric (Not Spec.) 'throw 4" By-pass valve NONE
S. P. Lubr. MICHIGAN TRIPLE 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 STEM) UNITED STATES, KING TYPE (Not Spec.)

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD
Guides STEEL Oil cups NEEDLE
Crossheads CAST STEEL WITH BEARINGS OF CAST IRON TINNED
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 bearings.

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. NONE 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 ———

Brake, position ON BOTH PAIR OF WHEELS (NO TENDER)
Operating Parts | Engine, Sch. No. 6-ET Westa. COMBINED AUTO. AND STRAIGHT AIR | Eng. Tr'k, sch. ———
Foundation Parts | Drivers, sch. BW-2 AMERICAN O. S. EQUALIZED | Eng. Tr'k, sch. ———
Air pump: One 9½" Pos. LEFT SIDE ON SMOKE BOX
Train connections FRONT AND BACK
Trainpipe, sch. NONE
AIR RESERVOIR TO HAVE SUPPLY CAPACITY AND TO HAVE HYDROSTATIC TEST OF 300 POUNDS.
DRIVING WHEELS SHOULD SLIP AIR VALVE WITH HOSE AND COUPLINGS ATTACHED TO FRONT AND BACK OF LOCO. FOR OPERATING SAME.

Tender NONE

Tank 1300 Gallons. Bill 4787
SADDLE TANK OVER TOP OF BOILER, AND TO EXTEND OVER SMOKE BOX

ACTUAL DIMENSIONS OF LOCO.-EXTREME HEIGHT OVER ALL - 11'10⅜"
EXTREME WIDTH :- { OVER CAB HANDLES - 8' 9⅜" / OVER FRONT BUMPER - 8' 9"
LENGTH OUTSIDE FACE OF FRONT BUMPER TO OUTSIDE FACE OF BACK BUMPER OF ENGINE - 23' 7½"
LENGTH OUTSIDE FACE FRONT BUMPER TO BACK OF COAL BOX - 24' 7½"

List of tools, sch. 26 NONE Spring Models
Photo sch. NONE X 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 5-17-19 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 TO BE IN LETTERS SAME TYPE AND SIZE AS PHOTO. 6894
Mark on TANK SIDES. PETOSKEY PORTLAND CEMENT CO.

Road Nos. Pos. ——— Road Nos. ——— Name NONE
F.No. PLATE 10
CAB SIDES

THE BALDWIN LOCOMOTIVE WORKS Dup. to 4-20 C 54, same extras except where otherwise specified.

Memorandum Spec'n 17108

SPECIFICATION FOR LOCOMOTIVES 4 - 20 C 55 — Gen. as Photo. 5002

FOR Philadelphia Suburban Gas & Electric Co. — **Engine Drawing No.** 16

R. 6-11-17

Gauge of Road 4' 8½" Play ¾"
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. (with factor of safety of 5) Tested to 185 lbs. steam pres. / 220 lbs. water pres.
Longitud. seams Double riveted lap joints

Dome, diam. 22" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 143" Width 33⅝" 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 1/16" 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 387⁰
	Tubes 344⁰	Fire Box 43⁰	Fire Brick Tubes -----
Grate area 10⁰	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 ~~deflector~~ 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, sides 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. Automatic

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 Pt. Bands Iron Style 9
Boiler Lagging Magnesia sectional

THE BALDWIN LOCOMOTIVE WORKS — See X 13290-24-Repair
E.H.C. Kalbach — Dec 1917.
SPECIFICATION FOR LOCOMOTIVES 4 - 20 C 55 — 140 190
FOR Philadelphia Suburban Gas & Electric Co.
R.

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 4" Steam lap ⅝" Exhaust clearance -----
Eccentric crank throw 3 1/32" By-pass valve None
S. P. Lubr. Michigan Double Bulls Eye, 2 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 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.
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 42½" on left side. 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 lbs.) up a straight 2% grade, estimated on the basis of 8 pounds frictional resistance

④ Customer is to be notified when loco. is nearly completed so representative can come to make inspection
Customer to be notified at Chester, Pa. when boiler is ready for hydrostatic test, so they can send man to witness the tests. 12/11/17

List of Tools, Sch. 26
Photo. Sch. None Inspection, B. L. W. (See note 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 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 -----

Lettering, etc. to be same as for 4-20 C 54
Mark on tank sides, PHILADELPHIA SUBURBAN GAS & ELECTRIC CO.

Road Nos. Pos.	Road Nos.	Name, None
F. No. Plate	5	
F. Sand Box		
Cab Sides		

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-5996

Memorandum Spec'n 19077

SPECIFICATION FOR LOCOMOTIVES 6 30 D 473

FOR PITTSBURGH PLATE GLASS COMPANY.

RTL

Gen. as PHOTO 2050

Engine Drawing No. 61

11-15-19.

Gauge of Road 4' 8½" Play ¾"

Wheelbase, Rigid 9' 6" Driving 9' 6" Total 9' 6"

Total wheelbase, eng. and tend. { Actual 37' 9½" / Limited to ——

Curves ——

Limits, Height 13' 6" Width ——

Weight (approximate) in working order, Total 105,000 POUNDS

On F. tr'k —— lbs., Drivers 105,000 lbs., R. tr'k —— lbs.

Tractive power 24,400 lbs., Ratio of adhesion 4.3

Work'g St'm Pres. 185 lbs., Service SWITCHING

Fuel SOFT COAL

1 **Boiler** STEEL Thick ⅝" Bill 8793

5 Front Tube Sheet ½" Thick

Boiler, Diam 58" Plan STRAIGHT TOP

3 Allowable st'm pres. 185 lbs. 205 lbs. steam pres.

6 With Factor of Safety of 5.46 **Tested to** 278 lbs. water pres.

6-18 Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS

5 **Dome,** diam. 29" Pos. CENTRAL

5 **Firebox** STEEL Combustion chamb. NONE

Firebox, length 66⅛" Width 41⅛" Depth F. 57¾" B. 55½"

10 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

7 Water space stays ⅞" DIAM. WITH 3/16" HOLES 1½" DEEP FROM O.S.

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

Button heads below crown on EIGHT central rows

Crown bars NONE Placed —— above crown

Crown bolts ——

Flues ——

4 **Tubes** #12 W. G. CHARCOAL IRON OR STEEL (B.L.W. OPTION)

18 Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS

Number 200 Diam. 2" Length 12' 6"

Heating Surface { Flues —— Combus. Chamb. —— Total 1395

Tubes 1300 Fire Box 95 Fire Brick Tubes ——

Grate area 18.9 Ratio to Heating Surface 1: 73.8

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

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

Spark ~~arrester~~ hopper WITH

Netting and deflect. plates WITH

Exhaust nozzles DOUBLE HIGH

Stack STRAIGHT Dia. 16"

8 **Safety Valves** TWO COALE 2½" OPEN (Not Spec.)

10 Safety valves BOTH with relief lever, Set to 185 POUNDS

8 **Whistle** ONE B.L.W. PLAIN

8-9 **Steam Gauge** ONE IRON 7" MAKER: ASHCROFT (Not Spec.)

Steam gauge stand IRON **Clock** NONE

8 **Water Gauge** ONE B.L.W. (IRONCLAD) **Cab Lamps** TO BURN OIL

8 **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

8 **Blower Valve** B.L.W.

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

17 **Cleaning Plugs**

Firebox, CORNERS, BACK ONES DIAGONAL; R. S., FRONT AND BACK

Crown, TWO EACH SIDE AND THREE BACK

Waist, ONE UNDER FRONT

Front tube sheet, ONE 10 Fusible plug ONE

LOCOMOTIVE FOR OPERATION AT CRYSTAL CITY, MISSOURI.

* BOILER TO MEET THE REQUIREMENTS OF THE I.C.C. AND THE STATE OF MISSOURI, INDIANA AND PENNSYLVANIA.

★ BOILER TO BE INSPECTED BY THE HARTFORD STEAM BOILER INSPECTION AND INSURANCE CO.; B.L.W. IS TO NOTIFY THE PURCHASER WHEN BOILER IS READY FOR THE HARTFORD INSPECTION.

Injectors (Spec.) TWO SELLERS CLASS "K" FOR HOT WATER, No. 8½

Injectors, Pos. R. AND L. Steam pipes COPPER

Pipes, Check IRON Feed IRON Overflow IRON

8-16 Check B.L.W. WITH STOP VALVE Pos. R. AND L.

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 33"

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 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 (Spec.) GOLLMAR AIR BELL RINGER.

Sand Box TWO Diam. 28" (Not Spec.) 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 PTD. Bands IRON Style 9

Boiler Lagging MAGNESIA SECTIONAL

THE BALDWIN LOCOMOTIVE WORKS

W. S. Moore Jan. 1920.

SPECIFICATION FOR LOCOMOTIVES 6 30 D 473

FOR PITTSBURGH PLATE GLASS COMPANY.

RTL

Frames CAST STEEL (See Sup. 17)

Cylinders, Diam. 18" Stroke 24"

St'm ports, Length 16" Width 1¼" Bridges 1"

Exh. ports, Length 16" Width 2½" Valve head 1/16"

Valve travel 4¾" Steam lap ¾" Exhaust clearance ——

Eccentric ~~crank~~ throw 5" By-pass valve NONE

S. F. Lubr. DETROIT TRIPLE NO. 22 BULL'S EYE (Not Spec.)

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

Cyl'r castings IRON PAINTED Head covers STEEL PAINTED

St'm chest castings IRON PAINTED Covers STEEL PAINTED

St'm chest valves BALANCED, WITH VACUUM VALVES

Met. pkg. (Lenton Horn & Walsh Sytem) UNITED STATES, KING TYPE (Not Spec.)

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD

Guides STEEL Oil cups NEEDLE

Crossheads CAST STEEL WITH BEARINGS OF CAST IRON, TINNED

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 so 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 wheel hub liners NONE

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 3/16" TOTAL

Driving Boxes 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 ——

Wheel hub liners ——

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 ——

Wheel hub liners ——

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 WESTG. 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 ONE 9½" Pos. 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. ~~921~~ 1002

Weight, with fuel and water, about 60000 POUNDS

TENDER TO BE WEIGHED: NO

Tank 3000 Gallons, Bill 4773

TANK "U" SHAPE, SLOPING BACK. FUEL CAPACITY 6 TONS

Tool Boxes HARD WOOD, TOP

Frame STEEL, 6" AND 8" CHANNELS, WITH BUMPERS OF WOOD, AND STEEL PLATE.

Front Drawbar height 32"

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.

STEPS WITH HAND RAIL ON SLOPING BACK OF TANK.

Trucks ARCH BAR TYPE WITH CAST STEEL BOLSTERS

Springs ELLIPTIC - B. L. W.

Journals, Diam. 3¾" Length 7"

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 WESTG. AUTO. AND STRAIGHT AIR BRAKE, WITH 8" x 12" TENDER CYLINDER.

List of tools, sch. 29

Photo sch. No. 2 Inspection B.L.W. (See ★ page 1) AND SEE SUP 1 PC.)

To be weighed NO Material specifications B.L.W. (EXCEPT SEE SUP 4)

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

Junior laws to 12-31-19 Shipment ON OWN WHEELS

Brass shop finish, No. 1

Machine shop finish D-165

B. L. W. Patents FEED WATER STRAINER, PATD. SEPT. 1, 1903 (CAST ON)

Property plates NONE

Painting, style —— BLACK, NO STRIPING

LETTERING AND NUMBERS TO BE IN WHITE.

Mark on TANK SIDES, PITTSBURGH PLATE GLASS COMPANY

Road Nos. Pos. Road Nos. Name NONE

F. No. PLATE 9

DOME

CAB SIDES

BACK OF TANK

Actual Dimensions of Loco. Extreme height over all 13' 5½"

Extreme Width: Cab boards 9' 7" ~~Cylinders~~ BUMPER 9' 4"

Length outside face front bumper of engine to face of tender wedge 27' 1"

Length face of tender wedge to outside face back bumper of tender 21' 6"

Total length outside face front bumper of engine to outside face back bumper of tender 48' 7"

SPECIFICATION FOR LOCOMOTIVES 6 30 D 473

FOR PITTSBURGH PLATE GLASS COMPANY

P

192 193

1 BOILER TO BE OPERATED IN THE STATE OF (SEE SUP. 19)
BOILER TO BE BUILT TO CONFORM TO THE BOILER CODE OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS (1918), AND MUST BE INSPECTED DURING CONSTRUCTION AND UPON COMPLETION BY AN AUTHORIZED INSPECTOR WHO SHALL NOT BE INTERESTED EITHER DIRECTLY OR INDIRECTLY WITH THE MANUFACTURERS.

2 A DATA REPORT, ON FORMS FURNISHED BY THE ABOVE MENTIONED STATE SHALL BE FORWARDED TO THE PROPER OFFICIAL BEFORE THE BOILER LEAVES THE BUILDER'S WORKS.

3 A HYDROSTATIC TEST SHALL BE APPLIED EQUAL TO ONE-AND -ONE-HALF (1½) TIMES THE WORKING PRESSURE.

4 THE MATERIALS ENTERING INTO THE CONSTRUCTION SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS:-

BOILER AND FIRE BOX STEEL / MATERIAL FOR ONE-PIECE DOME	A.S.M.E. SPEC. PAGE 11
BOILER RIVET STEEL	A.S.M.E. SPEC. PAGE 15
BOILER RIVET IRON	A.S.M.E. SPEC. PAGE 31
BOILER BRACE IRON	A.S.M.E. SPEC. PAGE 32
BOILER STAYBOLT IRON	A.S.M.E. SPEC. PAGE 34
BOILER TUBES	A.S.M.E. SPEC. PAGE 40

5 FRONT TUBE SHEET SHALL BE OF FIRE BOX STEEL.
ALL BOILER AND FIRE BOX STEEL AND MATERIAL FOR ONE PIECE DOME SHALL BE MARKED BY THE MANUFACTURER WITH THE HEAT NUMBER, NAME OF MANUFACTURER, GRADE AND LOWEST TENSILE STRENGTH IN THE MANNER AND LOCATION DESCRIBED ON B.L.W. MARKING CARD 6859. SMOKE BOX STEEL MAY CONFORM TO B.L.W. SPECIFICATION.

6 THE MINIMUM FACTOR OF SAFETY SHALL BE FIVE. (1918)
LONGITUDINAL SEAMS SHALL BE OF BUTT AND DOUBLE STRAP CONSTRUCTION.

7 THE OUTSIDE ENDS OF SOLID STAYBOLTS, 8 IN. AND LESS IN LENGTH, SHALL BE DRILLED WITH A HOLE AT LEAST 3/16" DIA., TO A DEPTH EXTENDING AT LEAST ½" BEYOND THE INSIDE OF THE PLATES

8 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 TABLES:

SIZE OF PIPE CONNECTION OR CORRESPONDING TAPER TAP.	1" & 1¼"	1½" & 2"	2½" TO 4"
NO. OF THREADS PER INCH.	11½	11½	8
MINIMUM NO. OF THREADS REQUIRED IN OPENING.	4	5	7
MINIMUM THICKNESS OF MATERIAL REQUIRED TO GIVE ABOVE NO. OF THREADS.	3/8"	7/16"	7/8"

IF THICKNESS OF BOILER MATERIAL IS NOT SUFFICIENT TO GIVE THE ABOVE NUMBER OF THREADS, A LINER OR FLANGE MUST BE APPLIED.

9 EACH BOILER MUST BE PROVIDED WITH A CONNECTION ¼ PIPE SIZE FOR ATTACHING INSPECTOR'S TEST GAUGE.

10 A FUSIBLE PLUG MUST BE APPLIED. THE PLUG MUST BE FILLED WITH PURE TIN AND THE LEAST DIAMETER OF THE FUSIBLE METAL MUST BE NOT LESS THAN ½" EXCEPT FOR WORKING PRESSURE ABOVE 175 LBS., IN WHICH CASE THE LEAST DIAMETER SHALL NOT BE LESS THAN ⅜", (I. E., USE FUSIBLE PLUG CARD 4144 FOR PRESSURE ABOVE 175 LBS. AND FUSIBLE PLUG CARD 4219 FOR 175 LBS. AND LESS).

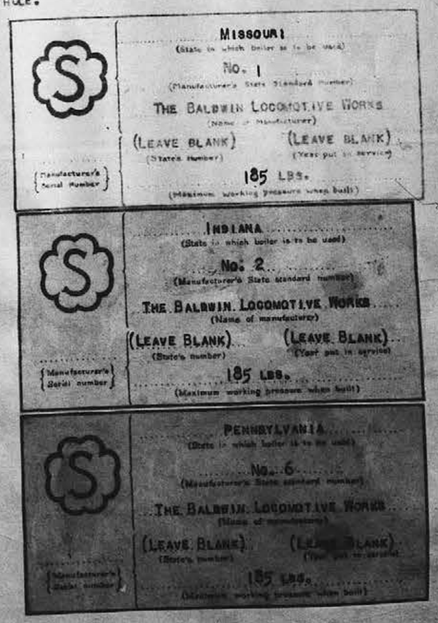
15 FEED WATER SHALL NOT DISCHARGE INTO A BOILER IN CLOSE PROXIMITY TO RIVETED JOINTS IN SHELL OR FURNACE SHEETS. EACH BOILER SHALL HAVE A FEED PIPE FITTED WITH A CHECK VALVE, AND ALSO A STOP VALVE OR STOP COCK BETWEEN THE CHECK VALVE AND THE BOILER, ~~THE FEED WATER TO DISCHARGE BELOW THE LOWEST SAFE WATER LINE.~~

16 SAFETY VALVES MUST MEET THE REQUIREMENTS OF THE A. S. M. E. BOILER CODE AND MUST BE PLAINLY STAMPED BY THE MANUFACTURER AS PER B. L. W. MARKING CARD 6858.
SAFETY VALVES OVER 3" IN DIAMETER SHALL HAVE FLANGED INLETS. THESE FLANGES SHALL CONFORM TO THE AMERICAN STANDARD.
ALL SAFETY VALVES MUST BE PROVIDED WITH RELIEF LEVERS.

17 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: ALSO WHERE POSSIBLE ONE NEAR THE THROAT SHEET.

18 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 4" LESS THAN FULL SIZE FOR PLATES OVER 5/8" IN THICKNESS, AND ⅛" LESS THAN FULL SIZE FOR PLATES 5/8" 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 2" LESS THAN FULL SIZE AND THEN DRILLED, REAMED OR FINISHED FULL SIZE WITH ROTATING CUTTER.

19 UPON COMPLETION, EACH BOILER SHALL BE STAMPED IN THE PRESENCE OF THE AUTHORIZED INSPECTOR, WITH THE WORDS AS ARRANGED BELOW. THE HEIGHT OF THE LETTERS AND FIGURES SHALL NOT BE LESS THAN 1/4". THE LOCATION OF THE STAMP SHALL BE ON THE BACK HEAD ABOVE A PLUG HOLE.



THE BALDWIN LOCOMOTIVE WORKS

Philadelphia, Spg'n 19077

DUP. 6 30 D 473, WITH SAME EXTRAS EXCEPT WHERE OTHERWISE SPECIFIED.

SPECIFICATION FOR LOCOMOTIVES 6 30 D 474

FOR PITTSBURGH PLATE GLASS COMPANY.

RTL

Gen. as PHOTO 7385

1-20-20. Engine Drawing No. 61

Gauge of Road 4' 8½" Play 3/8"
Wheelbase, Rigid 9' 6" Driving 9' 6" Total 9' 6"
Total wheelbase, eng. and tend. {Actual 37' 9½" {Limited to —

Curves 150 FEET RADIUS

Limits, Height 13' 6" Width —
Weight (approximate) in working order, Total 105,000 POUNDS
On F. tr'k — lbs., Drivers 105,000 lbs., B. tr'k — lbs.

Tractive power 24,400 lbs., Ratio of adhesion 4.3
Work'g St'm Pres. 185 lbs., Service SWITCHING
Fuel SOFT COAL

Boiler STEEL Thick 5/8" Bill 8793
Front Tube Sheet ½" Thick
Boiler, Diam. 56" Plan STRAIGHT TOP
{Allowable st'm pres. 185 lbs. **Tested to** { 205 lbs. steam pres.
{With Factor of Safety of 5.46 { 248 lbs. water pres.
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS

Dome, diam. 29" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE
Firebox, length 66⅛" Width 41 1/16" Depth F. 57¾" B. 55½"
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 3/16" HOLES 1¼" DEEP FROM O.S.

Radial stays 1" DIAM. Sling stays front {TWO ROWS 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 (B.L.W. OPTION)
Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS
Number 200 Diam. 2" Length 12' 6"

Heating Surface (Flues — Combus. Chamb. — Total 1395
Tubes 1300 Fire Box 95 Fire Brick Tubes —
Grate area 18.5 Ratio to Heating Surface 1: 73.8
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
Double diaphragm stack WITH
Netting and deflect. plates WITH

Exhaust nozzle DOUBLE HIGH

Stack STRAIGHT Dia. 16"

Safety Valves TWO COALE 2½" OPEN (Not Spec)
Safety valves BOTH with relief lever, Set to 185 POUNDS
Whistle ONE 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 BASE 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, BACK ONES DIAGONAL; R. S., FRONT AND BACK
Crown, TWO EACH SIDE AND THREE BACK
Waist, ONE UNDER FRONT
Front tube sheet, ONE Fusible plug ONE

LOCOMOTIVE FOR OPERATION AT KIRKWOOD, INDIANA.
✱BOILER TO MEET THE REQUIREMENTS OF THE I.C.C. AND THE STATE OF MISSOURI, INDIANA AND PENNSYLVANIA.
★BOILER TO BE INSPECTED BY THE HARTFORD STEAM BOILER INSPECTION AND INSURANCE CO.; B.L.W. IS TO NOTIFY THE PURCHASER WHEN BOILER IS READY FOR THE HARTFORD INSPECTION.

Injectors (Spec) TWO SELLERS CLASS "K" FOR HOT WATER, No. 8½
Injectors, Pos. R. AND L. Steam pipes COPPER
Pipes, Check IRON Feed IRON Overflow IRON
Check B.L.W. WITH STOP VALVE. Pos. R. AND L.

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 33"

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 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 stop WITH
Lamp shelf NONE Nosing —

Bell 92 POUNDS (Spec) 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 BACK

Dome casing IRON PAINTED

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

THE BALDWIN LOCOMOTIVE WORKS

N. B. Moore April-1920.

SPECIFICATION FOR LOCOMOTIVES 6 30 D 474

FOR PITTSBURGH PLATE GLASS COMPANY.

RTL

195 195.

Frames CAST STEEL

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 4¾" Steam lap ¾" Exhaust clearance —
Eccentric ~~crank~~ throw 5" By-pass valve NONE
S. F. Lubr. DETROIT TRIPLE No. 22 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 castings 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)

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD
Guides STEEL Oil cups NEEDLE
Crossheads CAST STEEL WITH BEARINGS OF CAST IRON, TINNED
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 stayboits) to be United States Standard
All finished movable nuts of steel or of iron case hardened

Wearing Bearings B. L. W.
Driving wheel hub liners NONE
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 3/16" TOTAL

Driving Boxes 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 —
Wheel hub liners —
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 —
Wheel hub liners —
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 WESTG. COMBINED AUTO. AND STRAIGHT AIR
{ Eng. Tr'k, sch. —
Foundation Parts { Drivers, sch. WH-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 RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

Tender EIGHT Wheeled, Drawing No. 1002
Weight, with fuel and water, about 60000 POUNDS
TENDER TO BE WEIGHED: NO
Tank 3000 Gallons, Bill 4773
TANK "U" SHAPE, SLOPING BACK. FUEL CAPACITY 6 TONS

Tool Boxes HARD WOOD, TOP

Frame STEEL, 6" AND 8" CHANNELS, WITH BUMPERS OF WOOD AND STEEL PLATE.
Front Drawbar height 32"
Pilot NONE Pushing shoes AT REAR
Back drawbar 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.
STEPS WITH HAND RAIL ON SLOPING BACK OF TANK.
Trucks ARCH BAR TYPE WITH CAST STEEL BOLSTERS

Springs ELLIPTIC - B. L. W.
Journals, Diam. 3½" Length 7"
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 WESTG. AUTO. AND STRAIGHT AIR BRAKE, WITH 8" x 12" TENDER CYLINDER.

List of inspectors 29
Photo sch. ~~No. 2~~ NONE Inspection B.L.W. (See ★ page 1)
To be painted NO Material testing B.L.W.
Certificate of boiler test THREE COPIES OF B.L.W. FORM 1036.
Junior flanges 12-31-19 Shipment ON OWN WHEELS

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

B. L. W. Patents FEED WATER STRAINER, PATD. SEPT. 1, 1903 (CAST ON)

Property plates NONE

Painting, style — BLACK, NO STRIPING

LETTERING AND NUMBERS TO BE IN WHITE.
Mark on TANK SIDES, PITTSBURGH PLATE GLASS COMPANY WORKS NO. 8

Road Nos. Pos. Road Nos. Name NONE
F. No. PLATE 1
DOME
CAB SIDES
BACK OF TANK

Actual Dimensions of Loco. Extreme height over all 13' 5½"
Extreme Width: Cab boards 9' 7" ~~Cylinders~~ BUMPERS 9' 4"
Length outside face front bumper of engine to face of tender wedge 27' 1"
Length face of tender wedge to outside face back bumper of tender 21' 6"
Total length outside face front bumper of engine to outside face back bumper of tender 48' 7"

SPECIFICATION FOR LOCOMOTIVES 6 30 D 474

FOR PITTSBURGH PLATE GLASS COMPANY

P

196 196

1 BOILER TO BE OPERATED IN THE STATE OF (SEE SUP. 19)
BOILER TO BE BUILT TO CONFORM TO THE BOILER CODE OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS (1918), AND MUST BE INSPECTED DURING CONSTRUCTION AND UPON COMPLETION BY AN AUTHORIZED INSPECTOR WHO SHALL NOT BE INTERESTED EITHER DIRECTLY OR INDIRECTLY WITH THE MANUFACTURERS.

2 A DATA REPORT, ON FORMS FURNISHED BY THE ABOVE MENTIONED STATE SHALL BE FORWARDED TO THE PROPER OFFICIAL BEFORE THE BOILER LEAVES THE BUILDER'S WORKS.

3 A HYDROSTATIC TEST SHALL BE APPLIED EQUAL TO ONE-AND -ONE-HALF (1½) TIMES THE WORKING PRESSURE.

4 THE MATERIALS ENTERING INTO THE CONSTRUCTION SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS:-

BOILER AND FIRE BOX STEEL MATERIAL FOR ONE-PIECE DOME	A.S.M.E. SPEC. PAGE 11
BOILER RIVET STEEL	A.S.M.E. SPEC. PAGE 15
BOILER RIVET IRON	A.S.M.E. SPEC. PAGE 31
BOILER BRACE IRON	A.S.M.E. SPEC. PAGE 37
BOILER STAYBOLT IRON	A.S.M.E. SPEC. PAGE 34
BOILER TUBES	A.S.M.E. SPEC. PAGE 40

TUBES MAY HAVE VARIATION IN GAUGE OF 10% EITHER WAY

5 FRONT TUBE SHEET SHALL BE OF FIRE BOX STEEL.
ALL BOILER AND FIRE BOX STEEL AND MATERIAL FOR ONE PIECE DOME SHALL BE MARKED BY THE MANUFACTURER WITH THE HEAT NUMBER, NAME OF MANUFACTURER, GRADE AND LOWEST TENSILE STRENGTH IN THE MANNER AND LOCATION DESCRIBED ON B.L.W. MARKING CARD 6859. SMOKE BOX STEEL MAY CONFORM TO B.L.W. SPECIFICATION.

6 THE MINIMUM FACTOR OF SAFETY SHALL BE FIVE. (1918)
LONGITUDINAL SEAMS SHALL BE OF BUTT AND DOUBLE STRAP CONSTRUCTION.

7 THE OUTSIDE ENDS OF SOLID STAYBOLTS, 8 IN. AND LESS IN LENGTH, SHALL BE DRILLED WITH A HOLE AT LEAST 3/16" DIA., TO A DEPTH EXTENDING AT LEAST ½" BEYOND THE INSIDE OF THE PLATES

8 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 OR CORRESPONDING TAPER TAP.	1" & 1¼"	1½" & 2"	2½" TO 4"
NO. OF THREADS PER INCH.	11½	11½	8
MINIMUM NO. OF THREADS REQUIRED IN OPENING.	4	5	7
MINIMUM THICKNESS OF MATERIAL REQUIRED TO GIVE ABOVE NO. OF THREADS.	⅜"	7/16"	½"

IF THICKNESS OF BOILER MATERIAL IS NOT SUFFICIENT TO GIVE THE ABOVE NUMBER OF THREADS, A LINER OR FLANGE MUST BE APPLIED.

9 EACH BOILER MUST BE PROVIDED WITH A CONNECTION ¼ PIPE SIZE FOR ATTACHING INSPECTOR'S TEST GAUGE.

10 A FUSIBLE PLUG MUST BE APPLIED. THE PLUG MUST BE FILLED WITH PURE TIN AND THE LEAST DIAMETER OF THE FUSIBLE METAL MUST BE NOT LESS THAN ½" EXCEPT FOR WORKING PRESSURE ABOVE 175 LBS., IN WHICH CASE THE LEAST DIAMETER SHALL NOT BE LESS THAN ⅜", (I. E., USE FUSIBLE PLUG GARD 4/11½ FOR PRESSURE ABOVE 175 LBS. AND FUSIBLE PLUG GARD 1219 FOR 175 LBS. AND LESS).

15 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.~~

16 SAFETY VALVES MUST MEET THE REQUIREMENTS OF THE A. S. M. E. BOILER CODE AND MUST BE PLAINLY STAMPED BY THE MANUFACTURER AS PER B. L. W. MARKING CARD 6858.
SAFETY VALVES OVER 3" IN DIAMETER SHALL HAVE FLANGED INLETS. THESE FLANGES SHALL CONFORM TO THE AMERICAN STANDARD.
ALL SAFETY VALVES MUST BE PROVIDED WITH RELIEF LEVERS.

17 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: ALSO WHERE POSSIBLE ONE NEAR THE THROAT SHEET.

18 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 2" LESS THAN FULL SIZE AND THEN DRILLED, REAMED OR FINISHED FULL SIZE WITH ROTATING CUTTER.

19 UPON COMPLETION, EACH BOILER SHALL BE STAMPED IN THE PRESENCE OF THE AUTHORIZED INSPECTOR, WITH THE WORDS AS ARRANGED BELOW. THE HEIGHT OF THE LETTERS AND FIGURES SHALL NOT BE LESS THAN ¼". THE LOCATION OF THE STAMP SHALL BE ON THE BACK HEAD ABOVE A PLUG HOLE.

S
MISSOURI
(State in which boiler is to be used)
No. 2
(Manufacturer's State Standard number)
THE BALDWIN LOCOMOTIVE WORKS
(Name of manufacturer)
(LEAVE BLANK) (State's number) (LEAVE BLANK) (Year put in service)
{Manufacturer's Serial number}
185 LBS.
(Maximum working pressure when built)

S
INDIANA
(State in which boiler is to be used)
No. 3
(Manufacturer's State standard number)
THE BALDWIN LOCOMOTIVE WORKS
(Name of manufacturer)
(LEAVE BLANK) (State's number) (LEAVE BLANK) (Year put in service)
{Manufacturer's Serial number}
185 LBS.
(Maximum working pressure when built)

S
PENNSYLVANIA
(State in which boiler is to be used)
No. 7
(Manufacturer's State standard number)
THE BALDWIN LOCOMOTIVE WORKS
(Name of manufacturer)
(LEAVE BLANK) (State's number) (LEAVE BLANK) (Year put in service)
{Manufacturer's Serial number}
185 LBS.
(Maximum working pressure when built)

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-5822

Memorandum Spec'n 19083

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1135

FOR The Procter and Gamble Company.

RTL

Gen. as Photo 5579

Engine Drawing No. 63

11-26-19.

Gauge of Road 4' 8½" Play ¾"

Wheelbase, Rigid 10' 6" Driving 10' 6" Total 10' 6"

Total wheelbase, eng. and tend. (Actual 39' 10" (Limited to ---

Curves 25 degrees

Limits, Height --- Width ---

Weight (approximate) in working order, Total 123,000 pounds

On F. tr'k --- lbs., Drivers 123,000 lbs., B. tr'k --- lbs.

Tractive power 28,160 lbs., Ratio of adhesion 4.3

Work'g St'm Pres. 180 lbs., Service Switching

Fuel Soft Coal

Boiler Steel Thick ⅝" & 11/16" Bill 8801

Front Tube Sheet ½" Thick

Boiler, Diam. 62" Plan Straight Top

(Allowable st'm pres. 200 lbs. **Tested to** 220 lbs. steam pres.

(With Factor of Safety of 5.16 300 lbs. water pres.

Longitud. seams {Butt jointed, double covering strips, sextuple riveted, 90% seam.

Dome, diam. 29" Pos. Central

Firebox Steel Combustion chamb. None

Firebox, length 88⅛" Width 41" Depth F. 60½" B. 57½"

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

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

Radial stays 1" diam. Sling stays front {Two rows 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 (B.L.W. Option)

Tube ends Swaged for copper ferrules, fire box ends

Number 229 Diam. 2" Length 11' 0⅛"

Heating Surface (Flues --- Combus. Chamb. --- Total 1433⁰

(Tubes 1310⁰ Fire Box 123⁰ Fire Brick Tubes ---

Grate area 25⁰ Ratio to Heating Surface 1: 57.3

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"

Safety Valves Two Coale 3" Open (Not Spec)

Safety valves Both with relief lever, Set to 180 pounds

Whistle One 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

Boiler to conform to the laws of the State of New York and to carry Manufacturer's State Standard Number 1. (Sup. 1, etc.)

Boiler to be inspected by the Hartford Steam Boiler Inspection and Insurance Co.

Injectors Two Ohio (Spec) No. 8

Injectors, Pos. Right and Left 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 35¼"

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 M. C. B. Automatic

Signal fixtures None

Headlights from U. S. Headlight Co.

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 Leach Air Trap A-1, in each box, to sand front and back.

Dome casing Iron painted

Boiler Jacket #18 Soft Steel Ptd. Bands Iron Style 9

Boiler Lagging Magnesia Sectional

THE BALDWIN LOCOMOTIVE WORKS

Jas. Bethericks

SPECIFICATION FOR LOCOMOTIVES 6 32 Jan. 1920. 1135

FOR The Procter and Gamble Company.

RTL

198 198

Frames Cast steel

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 5¼" Steam lap ¾" Exhaust clearance ---

Eccentric ~~crank~~ throw 5" By-pass valve None

S. F. Lubr. Detroit Triple No. 22 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) United States, King type (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, with bearings of cast iron tinned

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 stayboltts) to be United States Standard.

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

Wearing Bearings B. L. W.

Driving wheel hub liners None

Drivers, O. S. Diam. 51" Cen. diam. 44" Centers 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 = 3/16" total

Driving Boxes Steeled cast iron

Journals, Diam. 9½" 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 ---

Wheel hub liners ---

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 ---

Wheel hub liners ---

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 Westg. Combined Auto. and Straight Air

Parts (Eng. Trk. sch. ---

Foundation (Drivers, sch. W-2 American O.S. Equalized

Parts (Eng. Trk. sch. ---

Air pump One 9½" Pos. L. S.

Train connections Front and back

Train signal, sch. None

Air reservoirs to have hydrostatic test of 210 pounds.

~~Straight air valve to be 6-3.~~

Tender Eight Wheeled, Drawing No. 1480

Weight, with fuel and water, about 70000 pounds

Tender to be weighed: Yes

Tank 3500 Gallons, Bill 5130

Tank "U" shape, sloping back. Fuel Capacity 6 tons

Tool Boxes Hard Wood, Top

Frame Steel, 8" and 10" channels, with bumpers of wood and steel plates.

Front Drawbar height 33⅜"

Pilot None Pushing shoes Back

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.

Steps and hand rails on sloping back of tank.

Trucks Arch bar type with cast steel bolsters.

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. No. 6-ET Westg. Auto. and Straight Air, with 10" x 12" tender cylinder.

List of tools, sch. 29

Photo sch. None Inspection B.L.W. (See * previous page) Sur Itc

To be weighed No Material specifns B. L. W. Except See sur'd

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

Junior laws to 1-8-20 Shipment On own wheels

Brass shop finish, No. 1

Machine shop finish D-165

B. L. W. Patents (Feed Water Strainer - Pat'd Sept. 1, 1903 (Cxst on)

Property plates - None

Painting, style 291 Olive Green and Aluminum

Mark on sides of tank in large letters, two lines } The Procter & Gamble Manufacturing Company

Road Nos. Pos.	Road Nos.	Name None
F. No. Please	123	
Sand Box		
Cab Sides		
Back of Tank		

Actual Dimensions of Loco. Extreme height over all 14' 4½"

Extreme Width: Cab boards 9' 11" ; Cylinders ~~at valve station~~ 9' 2"

Length outside face front bumper of engine to face of tender wedge 28' 2⅛"

Length face of tender wedge to outside face back bumper of tender 23' 3½"

Total length outside face front bumper of engine to outside face back bumper of tender 51' 6"

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1135

FOR THE PROCTER AND GAMBLE COMPANY

P

1 BOILER TO BE OPERATED IN THE STATE OF NEW YORK
BOILER TO BE BUILT TO CONFORM TO THE BOILER CODE OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS (1918), AND MUST BE INSPECTED DURING CONSTRUCTION AND UPON COMPLETION BY AN AUTHORIZED INSPECTOR WHO SHALL NOT BE INTERESTED EITHER DIRECTLY OR INDIRECTLY WITH THE MANUFACTURERS.

2 A DATA REPORT, ON FORMS FURNISHED BY THE ABOVE MENTIONED STATE SHALL BE FORWARDED TO THE PROPER OFFICIAL BEFORE THE BOILER LEAVES THE BUILDER'S WORKS.

3 A HYDROSTATIC TEST SHALL BE APPLIED EQUAL TO ONE-AND -ONE-HALF (1½) TIMES THE WORKING PRESSURE.

4 THE MATERIALS ENTERING INTO THE CONSTRUCTION SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS:-

BOILER AND FIRE BOX STEEL / MATERIAL FOR ONE-PIECE DOME	A.S.M.E. SPEC. PAGE 11
BOILER RIVET STEEL	A.S.M.E. SPEC. PAGE 15
BOILER RIVET IRON	A.S.M.E. SPEC. PAGE 31
BOILER BRACE IRON	A.S.M.E. SPEC. PAGE 37
BOILER STAYBOLT IRON	A.S.M.E. SPEC. PAGE 34
BOILER TUBES	A.S.M.E. SPEC. PAGE 40

5 FRONT TUBE SHEET SHALL BE OF FIRE BOX STEEL.
ALL BOILER AND FIRE BOX STEEL AND MATERIAL FOR ONE PIECE DOME SHALL BE MARKED BY THE MANUFACTURER WITH THE HEAT NUMBER, NAME OF MANUFACTURER, GRADE AND LOWEST TENSILE STRENGTH IN THE MANNER AND LOCATION DESCRIBED ON B.L.W. MARKING CARD 6959. SMOKE BOX STEEL MAY CONFORM TO B.L.W. SPECIFICATION.

6 THE MINIMUM FACTOR OF SAFETY SHALL BE FIVE. (1918)
LONGITUDINAL SEAMS SHALL BE OF BUTT AND DOUBLE STRAP CONSTRUCTION.

7 THE OUTSIDE ENDS OF SOLID STAYBOLTS, 8 IN. AND LESS IN LENGTH, SHALL BE DRILLED WITH A HOLE AT LEAST 3/16" DIA., TO A DEPTH EXTENDING AT LEAST ½" BEYOND THE INSIDE OF THE PLATES

8 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 TABLES:

SIZE OF PIPE CONNECTION OR CORRESPONDING TAPER TAP.	1" & 1¼"	1½" & 2"	2½" TO 4"
NO. OF THREADS PER INCH.	11½	11½	8
MINIMUM NO. OF THREADS REQUIRED IN OPENING.	4	5	7
MINIMUM THICKNESS OF MATERIAL REQUIRED TO GIVE ABOVE NO. OF THREADS.	7/8"	7/16"	7/8"

IF THICKNESS OF BOILER MATERIAL IS NOT SUFFICIENT TO GIVE THE ABOVE NUMBER OF THREADS, A LINER OR FLANGE MUST BE APPLIED.

9 EACH BOILER MUST BE PROVIDED WITH A CONNECTION ¼ PIPE SIZE FOR ATTACHING INSPECTOR'S TEST GAUGE.

10 A FUSIBLE PLUG MUST BE APPLIED. THE PLUG MUST BE FILLED WITH PURE TIN AND THE LEAST DIAMETER OF THE FUSIBLE METAL MUST BE NOT LESS THAN ½" EXCEPT FOR WORKING PRESSURE ABOVE 175 LBS., IN WHICH CASE THE LEAST DIAMETER SHALL NOT BE LESS THAN ⅜", (i. e., USE FUSIBLE PLUG CARD 1414 FOR PRESSURE ABOVE 175 LBS. AND FUSIBLE PLUG CARD 1219 FOR 175 LBS. AND LESS).

15 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.

16 SAFETY VALVES MUST MEET THE REQUIREMENTS OF THE A. S. M. E. BOILER CODE AND MUST BE PLAINLY STAMPED BY THE MANUFACTURER AS PER B. L. W. MARKING CARD 6858.
SAFETY VALVES OVER 3" IN DIAMETER SHALL HAVE FLANGED INLETS. THESE FLANGES SHALL CONFORM TO THE AMERICAN STANDARD.
ALL SAFETY VALVES MUST BE PROVIDED WITH RELIEF LEVERS.

17 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: ALSO WHERE POSSIBLE ONE NEAR THE THROAT SHEET.

18 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 EXCEEDING ¼" LESS THAN FULL SIZE FOR PLATES OVER 5/8" IN THICKNESS, AND ⅛" LESS THAN FULL SIZE FOR PLATES 5/8" 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.

19 UPON COMPLETION, EACH BOILER SHALL BE STAMPED IN THE PRESENCE OF THE AUTHORIZED INSPECTOR, WITH THE WORDS AS ARRANGED BELOW. THE HEIGHT OF THE LETTERS AND FIGURES SHALL NOT BE LESS THAN ¼". THE LOCATION OF THE STAMP SHALL BE ON THE BACK HEAD ABOVE A PLUG HOLE.

(Manufacturer's Serial Number)	NEW YORK (State in which boiler is to be used) / No. 1 (Manufacturer's State Standard Number) / THE BALDWIN LOCOMOTIVE WORKS (Name of Manufacturer) / (LEAVE BLANK) (State's Number) / (LEAVE BLANK) (Year put in service) / 200 LBS. (Maximum working pressure when built)

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1135

FOR PROCTER AND GAMBLE COMPANY.

RTL

281 200

21 SPARK ARRESTOR IN SMOKE BOX TO HAVE SCREEN OF EITHER SQUARE OR OBLONG MESH WIRE NETTING OR ITS EQUIVALENT AND TO CONFORM TO THE FOLLOWING REQUIREMENTS:-
SQUARE MESH WIRE NETTING WITH OPENINGS NOT EXCEEDING THE OPENING IN WIRE NETTING 2½ MESHES PER LINEAL INCH IN BOTH DIRECTIONS, MADE OF WIRE NOT LESS THAN .135 INCHES IN DIAMETER OR OBLONG MESH WIRE NETTING WITH OPENINGS NOT EXCEEDING THE OPENING IN WIRE NETTING WITH WIDTH OF OPENING NOT EXCEEDING 3/16" AND LENGTH OF OPENING NOT EXCEEDING ¼" MADE OF WIRE NOT LESS THAN .135 INCHES IN DIAMETER. NO OPENING WILL BE PERMITTED AT ANY PLACE INSIDE OF EXTENSION FRONT WHICH IS LARGER THAN THE MAXIMUM OPENINGS SPECIFIED FOR WIRE NETTING. ALL JOINTS MUST BE SUBSTANTIALLY MADE AND REINFORCED TO PREVENT STRANDS OF WIRE IN NETTING BECOMING LOOSE AND FORMING LARGER THAN NORMAL OPENINGS. PARTICULAR ATTENTION MUST BE GIVEN TO THE FIT OF SPARK ARRESTOR AND PLATES AROUND STEAM PIPES, EXHAUST PIPES, BLOWER PIPES AND AIR PUMP EXHAUST PIPE (WHEN SAME IS LOCATED IN EXTENSION FRONT). THE MAN HOLE DOOR MUST HAVE A SUBSTANTIAL RIGID FRAME AND MUST BE PROPERLY FITTED AND FASTENED AGAINST THE MAIN PLATE OF THE SPARK ARRESTOR. PARTICULAR ATTENTION MUST BE GIVEN TO THE FIT OF PLATES AGAINST THE FLUE SHEET. NO OPENINGS CAN BE PERMITTED BETWEEN THE TOP OF DIAPHRAM AND THE FRONT FLUE SHEET, THIS JOINT TO BE PROTECTED WITH AN ANGLE IRON OR REINFORCEMENT.

22 ASH PAN SLIDES MUST BE PROPERLY ADJUSTED SO THAT THE SLIDE WILL PROJECT OVER OPENING IN ASH PAN AT LEAST ½" ON EACH SIDE.

23 THE FRONT AND BACK DAMPERS MUST BE PROVIDED WITH FLANGES ON BOTH SIDES AND BOTTOM OF DAMPERS WHICH WILL PROJECT OVER ASH PAN AT LEAST 1½". IN ADDITION TO THIS, THE ASH PAN MUST BE EQUIPPED WITH AUXILIARY DAMPERS MADE OF WIRE NETTING HAVING SQUARE MESH WITH OPENINGS NOT EXCEEDING THE OPENING IN WIRE NETTING 2½ MESHES PER LINEAL INCH IN BOTH DIRECTIONS, MADE OF WIRE NOT LESS THAN .135 INCHES IN DIAMETER OR OBLONG MESH WIRE NETTING WITH OPENING NOT EXCEEDING THE OPENING IN WIRE NETTING WITH WIDTH OF OPENING NOT EXCEEDING 3/16" AND LENGTH OF OPENING NOT EXCEEDING ¾", MADE OF WIRE NOT LESS THAN .135 INCHES IN DIAMETER.
THESE AUXILIARY WIRE DAMPERS MUST AT ALL TIMES BE SUBSTANTIALLY FASTENED IN POSITION EXCEPT WHEN LOCOMOTIVE IS HAVING ASH PAN CLEANED.

24 PARTICULAR ATTENTION MUST BE GIVEN SO THAT ALL JOINTS WILL BE PROPERLY PROTECTED AND REINFORCED, SO THAT WHEN WARPING TAKES PLACE THERE WILL NOT BE ANY UNREASONABLE OPENINGS.

THE BALDWIN LOCOMOTIVE WORKS As shown on Sheet No. 2

Memorandum Sheet No. 16018

SPECIFICATION FOR LOCOMOTIVES 6 38 D 110

Gen. as PHOTO. 6352.

FOR RAINEY-WOOD COKE COMPANY.

Engine Drawing No. 19.

3-26-19

Gauge of Road 4' 8½" Play DRIVERS 1", TENDER ⅞"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"
Total wheelbase, eng. and tend. {Actual 44' 1" / Limited to ——

Curves 100 FT. RADIUS

Limits, Height 14' 2" Width (SUP. 26)
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 TO BE ½" THICK
Boiler STEEL Thick 13/16" Bill 8826
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 5.47
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. 71⅞" B. 69¼"
Firebox, Tube ½" Crown ½" Sides ⅜" Back ⅜"
Firedoor opening 16" DIAMETER
Water space, Front 4" Sides 4" Back 4"
Water space, Frame DOUBLE Riveted
Water space stays ⅞" DIAM. WITH 3/16" HOLES, 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 SIX central rows
Crown bars NONE Placed —— above crown
Crown bolts ——

Flues ——
Tubes #12 W. G. CHARCOAL IRON OR STEEL (B.L.W. OPTION)
Tube ends SWAGED FOR COPPER FERRULES, FIREBOX ENDS
Number 330 Diam. 2" Length 11' 0"
TUBES TO HAVE ¾" SPACES

Heating Surface Flues —— Combus. Chamb. —— 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 ROCKING BARS WITH DROP PLATE
Ash Pan, Dampers NONE

Throttle BALANCE Pos. TOP
Throttle pipe STEEL

Superheater NONE

Smokebox extension WITH Cleaning hole and cap NONE
Front netting or hopper NONE
Spark arrester or deflect. plates WITH

Stack DOUBLE, HIGH

Stack: Straight Dia. 16" Hole in S. S., dia. 18"

Safety Valves (NOT SPEC) THREE COALE 3" ONE RUFFLED
Safety valves NONE with relief lever, Set to {180 LBS. RUFFLED / 183 LBS. OPEN
Whistle B. L. W. 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 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:- FRONT
Cleaning Plugs
Firebox CORNERS DIAGONAL AND SIDES
Crown, TWO EACH SIDE AND ONE BACK
Waist, TWO UNDER AND 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. 8) 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 32"

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 WITH SLOTTED KNUCKLE

Signal fixtures MALLEABLE IRON ON SMOKE BOX

Headlight TWO ROUND CASE 16" Reflector, To burn KEROSENE
Headlight, Nos. on sides WITH H'd'l step WITH
Lamp shelf NONE Nosing ——

Bell 92 POUNDS GOLDMAR 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 #18 STEEL PAINTED Bands IRON Style 9 AND 14
Boiler Lagging MAGNESIA SECTIONAL
BACK HEAD OF BOILER TO BE LAGGED AND JACKETED.

THE BALDWIN LOCOMOTIVE WORKS 6 38 D 110

FOR RAINEY-WOOD COKE COMPANY.

2082

Cylinders, Diam. 22" Stroke 26"
St'm ports, Length 19" Width 1⅞" Bridges 1⅛"
Exh. ports, Length 19" Width 2⅝" Valve lead ¼"
Valve travel 5½" Steam lap ⅞" Exhaust clearance ——
Eccentric cranks throw 12-7/32" By-pass valve NONE
S. P. Lubr. (NOT SPEC) DETROIT TRIPLE #22 BULLS EYE
Cyl. heads CAST IRON, LUBR. PIPES OF COPPER UNDER JACKET
Cyl. 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. pkg (PISTON ROD / VALVE STEM) UNITED STATES, 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 PLUMER, 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 stay-bolts) 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" Con. diam. 44" CENTRES, 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— 3/16" 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: Engine, Sch. AI-STR WEST'G. AUTO. AND STRAIGHT AIR
Parts: Eng. Tr'k, sch. ——
Foundation: Drivers, sch. 198-J AND BC, AMERICAN O. S. EQUALIZED
Parts: 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 LIGHT Wheeled, Drawing No. 435
Weight, with fuel and water, about 90,000 POUNDS

Tank 4500 Gallons, Cu. 4951
TANK "U" SHAPE, SLOPING BACK. FUEL CAPACITY 6 TONS
COAL GATES OF STEEL
Tool Boxes OF STEEL, BUILT INTO LEGS OF TANK

Frame STEEL, 10" CHANNELS, WITH WOOD BUMPERS
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 12½" HEAD AND WITH WEST'G.
FRICTION DRAFT GEAR. COUPLER TO HAVE SLOTTED KNUCKLE

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

Trucks ARCH BAR TYPE, WITH CAST STEEL BOLSTERS
TRUCK SPRING PLANKS TO BE OF CHANNEL IRON
Springs ELLIPTIC, B.L.W. MAKE
Journals, Diam. 5" Length 9"
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 SWB WEST'G. AUTO. 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 10.19.18. Shipment ON OWN WHEELS under steam 7-28-19

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: RAINEY-WOOD COKE COMPANY

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

Actual Dimensions of Loco. Extreme height over all 14' 0"
Extreme Width:—Cab boards 10' 3½" Cylinders or valve motion 10' 3½"
Length outside face front bumper of engine to face of tender wedge
Length face of tender wedge to outside face back bumper of tender
Total length outside to

SPECIFICATION FOR LOCOMOTIVES 6 38 D 110

FOR RAINEY-WOOD COKE COMPANY

J. 203 209

1 FLEXIBLE STAYBOLTS TO BE TATE 1" 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. DOOR 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.

5 INJECTORS TO BE SELF ACTING TYPE AND TO BE LOCATED AS LOW AS POSSIBLE.

6 CAB TOOL BOXES AND CAB SEAT BOXES TO BE MADE OF STEEL
CAB CURTAIN TO BE PROVIDED.

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. THIS STEP TO BE MADE IN SHORT SECTIONS, WITH SPACE BETWEEN TO CLEAR PILOT OF ANOTHER LOCOMOTIVE TO WHICH THIS LOCOMOTIVE MAY BE COUPLED.
ADDITIONAL STEPS ON BACK OF FRONT BUMPER BEAM.

9 ONE STEP ON RIGHT AND TWO STEPS ON LEFT SIDE OF SMOKE BOX

11 FRANKLIN RAILWAY SUPPLY CO.'S ~~CONOWY SERVICE CORPORATION~~ CAST STEEL (DOUBLE SPRING) RADIAL BUFFER TO BE APPLIED BETWEEN ENGINE AND TENDER

12 TOP AND SIDES OF FIRE BOX INSIDE OF CAB TO BE LAGGED AND JACKETED.

13 FRAMES TO BE THOROUGHLY ANNEALED AND TO HAVE DOUBLE FORWARD SECTION. FRAMES TO HAVE GOOD CROSS BRACES.

14 PEDESTAL WEDGES AND GIBS OF CAST IRON.

15 CYLINDERS TO BE BUSHED.

16 CROSSHEADS TO HAVE SIDE PLATES.
CROSSHEAD GIBS OF WROT IRON, BABBITTED.

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 BRONZE.

20 DRIVING BOXES TO HAVE HEAVY 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".

24 ~~LOCO. TO CONFORM TO CLEARANCE SHOWN ON H. KAPPER CO.'S PRINT F-3032 HEREWITH.~~
CLEARANCE AS P. L. W. TRACING 36214.

27 MATERIAL FOR THIS LOCO. TO BE APPROPRIATED FROM EXTRA ORDER NO. 9600 - 1918.
THIS LOCO. IS ALREADY BUILT, IS AT EDGYSTONE, AND CARRIES P. L. W. CONSTRUCTION NUMBER 50884

TENDER

50 STEPS TO BE PROVIDED AT REAR OF TENDER WITH BRACKETS OF STEEL, SUPPORTING A STEEL PLATE ON WHICH IS BOLTED AN OAK PLANK. THIS STEP TO BE MADE IN SHORT SECTIONS WITH SPACE BETWEEN TO CLEAR PILOT OF ANOTHER LOCO. TO WHICH THIS LOCO. MAY BE COUPLED.

51 SIDE STEPS TO BE PROVIDED AT REAR OF TENDER.

52 HANDRAIL ON TANK, ONLY 26" HIGH.

THE BALDWIN LOCOMOTIVE WORKS Dup. of 8 38 D 18 with same extras except where otherwise specified.

Memorandum Spec'n 18016.

SPECIFICATION FOR LOCOMOTIVES 8 38 D 19 Gen. as Photo. 5891.

FOR Republic Iron and Steel Company **Engine Drawing No.** 3.

J. 2-15-18.

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.
Curves 338 Ft. radius,- Frogs No.6.

Limits, Height ---- Width ----
Weight (approximate) in working order, Total 175,000 pounds
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 Switching
Fuel Soft Coal
Boiler to conform to the requirements of the Ohio State Railroad Commission, i.e., to conform to I.C.C. requirements.
Boiler Steel Thick ⅜" 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. 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 1½" deep from O.S.
Flexible staybolts, American of Ewald Iron, about 450 in breaking zone
Radial stays 1" diam. Sling stays front } three rows of B.L.W. expansion stays.
Button heads below crown on Eight central rows above crown
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, fire box ends
Number 346 Diam. 2" Length 12' 6"

Heating Surface	Flues ----	Combus. Chamb. ----	Total 2450
	Tubes 2249	Fire Box 201	Fire Brick Tubes ----
Grate area 35.1	Ratio to Heating Surface 1 : 69.8		
Superheater ----			

Fire Brick Arch, On Studs
Grate support to be arranged as Ry.Co's pencil sketch
Grate frame to be ¾" from side of firebox.
Grates Rocking bars to dump. (No dead grates.)
Ash Pan, Dampers Front and back
Take flexible stays (instead of American) to be applied in back head of boiler for 8 38 D 19 only to allow for error in drilling stay bolt holes. 1-22-18.
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 arrester or hopper With
Baffling and deflect. plates With
Blower nozzles Double high
Blower Straight Dia. 10" Pipe in C. B. dia. 3½"

Safety Valves (Not specd.) 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 specd.)
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 ----

Injectors (Not specd.) 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 detail 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 Gollmar Air Bell Ringer
Sand Box Two Diam. 28" Body Iron painted Pipes Iron
Sander Iron 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
Backhead of boiler to be lagged and jeckted.

THE BALDWIN LOCOMOTIVE WORKS

C W Finch July 1918. 5 205

SPECIFICATION FOR LOCOMOTIVES 8 38 D 19 Furnish to Company one set of prints of such parts as are different from 8 38 D 18.

FOR Republic Iron and Steel Company

J.

Frames Cast Steel Braces Solid.

Cylinders, Diam. 22" Stroke 26"
St'm ports, Length 19" Width 1⅜" 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 ----
S. F. Lubr. Michigan (Not specd.) 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) Jerome Elliott (Not specd.)

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"
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 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
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 ----

Brakes, position On all driving and tender wheels
Operating Parts: Engine, Sch. A-1 and SWA West'g. Auto. and Straight Air
Foundation Parts: Eng. Tr'k, sch. ---- Drivers, sch. 38-3 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 Length D.S. face front bumper of engine to face of tender bumper 44' 0"
Cylinder Cal. cock equipment, Engineer's brake valve D-6 with Length face of tender bumper to O.S. face back bumper of tender 30' 2"
Feed valve G-6, and Straight Air valve S-32" Total length outside face front bumper of engine to outside face back bumper of tender 74' 2"
Air to develop by test hydrostatic test of 210 pounds.

Tender Eight Wheeled, Drawing No. 435.
Weight, with fuel and water, about 100,000 pounds

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, with bumpers of wood.

Front Drawbar height 30½"
Pilot None Pushing shoes At rear
Back drawhead, center above rail 33½"
Coupler M.C.B. Automatic in 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 rails
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 spec'ns B. L. W.
Certificate of boiler test Three copies of B.L.W. form 1036
Junior laws to 2.21.18. 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 18
Mark on tank sides, R. I. & S. Co.

Road Nos. Pos. Road Nos. Name None
F.No.Plate 17
Dome
Cab Sides
Back of Tank.

Actual Dimensions of Loco.- Extreme Height overall 13'0"
Extreme Width:- Cab Bodies 10'2"; Cylinders or Valve Motion 9'8"
Tender Height 13'0" Width 10'2" Length 44'0"

THE BALDWIN LOCOMOTIVE WORKS Sp. Spec. 0-585

Memorandum Spec'n 19047

SPECIFICATION FOR LOCOMOTIVES 4 2B C 68 Class 59B

FOR RITER - CONLEY MANUFACTURING CO. Engine Drawing No. 20

P 7-7-19

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 ----
LOCO. TO BE NORMAL HEIGHT AND WIDTH.
Limits, Height ---- Width ----
Weight (approximate) in working order, Total 100,000 POUNDS
On F. tr'k ---- lbs., Drivers 100,000 lbs., R. tr'k ---- lbs.

Tractive power 20506 lbs., Ratio of adhesion 4.87
Work'g St'm Pres. 160 lbs., Service SWITCHING
Fuel SOFT COAL

FRONT TUBE SHEET ½" THICK
Boiler STEEL Thick 9/16" Bill 8618
Boiler, Diam. 52" 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. 25" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE
Firebox, length 45-15/16" Width 49⅞" Depth F. 54" B. 52½"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back ⅜"
Firedoor opening 16" DIAM.
Water space, Front 3" Sides 3" Back 3"
Water space, Frame SINGLE Riveted
Water space stays ⅞" DIAM. WITH 3/16" HOLES 1⅛" DEEP FROM O. S.
Radial stays 1" DIAM. Sling stays front { TWO ROW B. L. W. / EXPANSION STAYS
Button heads below crown on SIX central rows
Crown bars NONE Placed ---- above crown
Crown bolts ----

Flues ---- #13
Tubes ~~#10~~ W.G. CHARCOAL IRON OR STEEL (B.L.W. OPTION)
Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.
Number 154 Diam. 2" Length 12' 9"

Heating Surface | Flues ---- Combus. Chamb. ---- Total 1091⁵
Tubes 1021⁵ Fire Box 70⁵ Fire Brick Tubes ----
Grate area 16⁵ Ratio to Heating Surface 1 : 68
Superheater ----

Fire Brick ARCH, ON STUDS.

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

Throttle BALANCE Pos. DOME
Dry pipe STEEL

Superheater NONE

Smokebox extension WITH Cleaning hole and cap NONE
Smoke deflector hopper WITH
Nozzle and deflect. plates WITH

Exhaust nozzles DOUBLE, HIGH
Stack STRAIGHT Dia. 16"
Stack TO BE NORMAL HEIGHT

Safety Valves TWO CROSBY 2" OPEN (Not Spec)
Safety valves NONE with relief lever, Set to 160 POUNDS
Whistle ONE B. L. W. PLAIN

Steam Gauge ONE IRON 7" MAKER: ASHCROFT (Not Spec)
Steam gauge stand IRON Cock 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, JUST ABOVE MUD RING
Cleaning Plugs ONE PLUG ABOVE FIRE DOOR
Firebox CORNERS, DIAGONAL
Crown, ONE RIGHT SIDE, TWO LEFT SIDE, AND TWO BACK
Waist, ONE UNDER FRONT
Front tube sheet, ONE Fusible plug ONE
ONE PLUG EACH SIDE IN WAIST NEAR INJECTOR CHECK VALVES
ALL BLOW OFF COCKS AND CLEANING PLUGS TO BE 1½" PIPE TAP
Pump NONE Pos. ----
Top chamb. ---- Bottom chamb. ----
Feed Cock ---- Feed pipes ----
Checks ---- Check pipes ----

Injectors TWO MONITOR (Not Spec) 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
COAL BOX REAR EXTENSION OF ENGINE FRAME, BACK OF CAB
FUEL CAPACITY 2000 POUNDS
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. Crowhead, 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 shell NONE Nosing ----

Bell 85 POUNDS ON TOP OF TANK
Sand Box TWO Diam. 31" Body IRON PAINTED Pipes IRON
Sander HAND, IN EACH BOX, TO SAND FRONT AND BACK
SAND BOXES TO BE PLACED ON TOP OF TANK.
Dome casing IRON PAINTED

Boiler Jacket #22 SOFT STEEL Planish Iron Style 9
Boiler Lagging B. L. W. PLASTIC MAGNESIA (FINISH & COAT).

THE BALDWIN LOCOMOTIVE WORKS

W. O. Webster August 1919 207 207

SPECIFICATION FOR LOCOMOTIVES 4 2B C 68

FOR RITER - CONLEY MANUFACTURING CO.

P

Frames CAST STEEL

Cylinders, Diam. 17" Stroke 24"
St'm ports, Length 16" Width 1½" Bridges 1"
Exh. ports, Length 16" Width 2½" Valve lead 3/32"
Valve travel 1⅝" Steam lap ⅞" Exhaust clearance ----
Eccentric crank throw 4½" By-pass valve NONE
S. F. Lubr. (Not Spec) MICHIGAN DOUBLE BULLS EYE, TWO 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 RICHARDSON BALANCED, WITH VACUUM VALVES
Met. pkg. (PISTON ROD / VALVE STEM) UNITED STATES, KING TYPE. (Not Spec)
PISTON RODS TO BE KEYED TO CROSSHEADS.
Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD.
Guides LAIRD TYPE, STEEL Oil cups NEEDLE
Crossheads CAST STEEL, WITH BEARINGS OF CAST IRON, TINNED.
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 wheel hub liners NONE
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. NONE 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 ----
Wheel hub liners ----
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 ----
Wheel hub liners ----
Wheels, Diam. ---- Tread ---- Kind ----
Tires ---- Cen. diam. ---- Size ----
Tires held by ----

Brake, position ON ALL DRIVING WHEELS (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. ----
SEPARATE LUBRICATOR FOR STEAM BRAKE VALVE.
LOCO. TO BE PIPED FOR AIR BRAKE IN TRANSIT.

Tender NONE

Tank 1700 Gallons, Bill 4895
SADDLE TANK OVER TOP OF BOILER AND EXTENDING OVER SMOKE BOX

BOILER TO BE INSPECTED BY THE HARTFOR STEAM BOILER INSPECTION & INSURANCE CO.

BOILER TO CONFORM TO THE PENNSYLVANIA STATE LAWS, AND TO BE STAMPED ON THE BACK HEAD IN THE PRESENCE OF THE AUTHORIZED INSPECTOR, THUS: PENNA STD. 4 BALDWIN

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 7-14-19 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 OLIVE GREEN AND ALUMINUM

Mark on TANK SIDES RITER-CONLEY MANUFACTURING CO.

Road Nos. Pus	Road Nos.	Name
F. No. PLATE	4	NONE
CAB SIDES		
BACK OF FUEL BOX		

Actual Dimensions of Loco. Extreme height over all 12' 2"
Extreme Width { Over cab boards 9' 5" / Over cylinders or valve motion 8' 10"
Length outside face of front bumper to outside face of back bumper of engine 27' 0"

THE BALDWIN LOCOMOTIVE WORKS As Specfn. 0-5746 (see sup 26)

Memorandum Spec'n 20013

SPECIFICATION FOR LOCOMOTIVES 6 38 D 111

cy

FOR SHENANDO FURNACE COMPANY

P

Gen. as PHOTO. 6352

Engine Drawing No. 19

1-26-20

Gauge of Road 4' 8½" Play DRIVERS 1" TENDER ¾"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"
Total wheelbase, eng. and tend. {Actual 44' 1" / Limited to ---

Curves 100 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 4.24
Work'g St'm Pres. 180 lbs., Service SWITCHING (SUP 28)
Fuel BITUMINOUS COAL

Boiler STEEL Thick 13/16" Bill 8326
Front Tube Sheet, ½" Thick
Boiler, Diam. 74" Plan STRAIGHT TOP
{Allowable st'm pres. 180 lbs. **Tested to** 200 lbs. steam pres.
{With Factor of Safety of 5.49 240 lbs. water pres.
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS

Dome, diam. 33" Pos. FORWARD OF FIRE BOX
DOME TO BE LARGE FOR INSPECTION PURPOSES.
Firebox STEEL Combustion chamb. NONE
Firebox, length 96 1/8" Width 39" Depth F. 71½" B. 69½"
Firebox, Tube ½" Crown ½" Sides ⅜" Back ⅜"
Firedoor opening 16" DIAMETER
Water space, Front 4" Sides 4" Back 4"
Water space frame DOUBLE Riveted
1 Water space stays ⅜" DIAM. WITH 3/16" HOLES 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 SIX central rows
Crown bars NONE Placed --- above crown
Crown bolts ---

Flues ---
Tubes #12 W. G. CHARCOAL IRON OR STEEL (B.L.W. OPTION)
Tube ends SWAGED FOR COPPER FERRULES FIRE BOX ENDS.
Number 330 Diam. 2" Length 11' 0"
TUBES TO HAVE ¾" SPACES.

Heating Surface {Flues --- Combus. Chamb. --- 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 ROCKING BARS WITH DROP PLATE
2 **Ash Pan,** Dampers NONE

Throttle BALANCE Pos. DOME
Dry pipe STEEL

Superheater NONE

Smokebox extension WITH Cleaning hole and cap NONE
Spark arrester or stopper NONE
3 Netting and apron, poles WITH
Diaphragm casting DOUBLE, HIGH
Stack STRAIGHT Dia. 16"

Safety Valves THREE COALE 3" ONE MUFFLED
Safety valves NONE with relief lever. Set to {180 POUNDS MUFFLED / 183 POUNDS OPEN.
Whistle ONE B. L. W. 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** ELECTRIC
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 B. L. W. Pos: FRONT
Cleaning Plugs
1 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

Injectors TWO SELLERS, CLASS "N" (Not Spec.) No. 9½
5 Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER
Pipes, Check COPPER Suction IRON Overflow IRON
Check SELLERS, WITH STOP VALVE Pos. RIGHT AND LEFT

Steam Heat NONE

Cab STEEL (SEE SUP. 6) VENTILATOR IN CAB ROOF.

Cab boards STEEL PLATE Nosing T-IRON
7 Running boards STEEL PLATE Nosing T-IRON
Hand rail IRON Location BOILER

10 **Back Bumper** BAR STEEL Back drawbar height 32"

Pilot NONE Pushing shoes CAST IN BUMPER
Front Bumper CAST STEEL Bumper plate NONE
8 **Steps** ACROSS FRONT WITH HAND RAILS.
STEPS, HAND HOLDS ETC. TO CONFORM TO I. C. C. REQUIREMENTS.
Front Drawhead, Height above rail 34½".
Coupler SHARON M. C. B. AUTOMATIC WITH SLOTTED KNUCKLE.

Signal fixtures MALLEABLE IRON ON SMOKE BOX

11 **Headlight** TWO ROUND CASE 18" Reflector
Headlight, Nos. on sides WITH Half stop WITH
Lamp shelf NONE Number ---

Bell 92 POUNDS GOLLMAR AIR BELL RINGER
Sand Box TWO Diam. 28" Body IRON PAINTED Plate IRON
Sander LEACH AIR, TRAP A-1, IN EACH BOX TO SAND FRONT AND BACK. (Not Spec.)
Dome casing IRON PAINTED

Boiler Jacket #18 SOFT STEEL PTD. Lagging IRON Style 9 AND 14
12 **Boiler Lagging** MAGNESIA SECTIONAL
BACK HEAD OF BOILER TO BE LAGGED AND JACKETED.

H. J. Bramin Feb. 1920.

SPECIFICATION FOR LOCOMOTIVES 6 38 D 111

FOR SHENANDO FURNACE COMPANY

P

209

14 **Frames** CAST STEEL

15 **Cylinders,** Diam. 22" Stroke 26"
St'm ports, Length 19" Width 1⅞" Bridges 1⅛"
Exh. ports, Length 19" Width 2¾" Valve lead ¼"
Valve travel 5½" Steam lap ¾" Exhaust clearance ---
Eccentric crank throw 12-7/32" Cylinder valve NONE
S. P. Lubr. DETROIT TRIPLE No. 22 BULL'S EYE (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 castings IRON PAINTED, Covers STEEL PAINTED
St'm chest valves RICHARDSON BALANCED WITH VACUUM VALVES
Met. pkg. PATENT RING PISTON RODS UNITED STATES, KING TYPE (Not Spec.)

16 **Pistons** CAST IRON RINGS SPRING INTO SOLID HEAD
Guides TWO BAR TYPE, STEEL Oil cups NEEDLE
Crossheads ALLIGATOR TYPE, CAST STEEL (SEE SUP. 17)
18 **Wrist Pins** STEEL Rod cups PLUMER, 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 bushings, except nuts of steel or of iron case hardened.

Wearing Bearings B. L. W.
Driving wheel hub liners BRASS
Drivers, O. S. Diam. 51" Size of tires 4½" CENTRES CAST STEEL

Tires STEEL Held by SHRINKAGE AND SHOULDER
Tires, Flangeless, Pos. FRONT AND BACK Size 3½" x 5½"
21 Tires, Plain, Pos. MIDDLE Size 3½" x 6½"
Lateral play between driving boxes and wheel fame 3/16" TOTAL

22 **Driving Boxes** CAST STEEL
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 ---
Wheel hub liners ---
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 ---
Wheel hub liners ---
Wheels, Diam. --- Tread --- Kind ---
Tires --- Cen. diam. --- Size ---
Tires held by ---

24 **Brake,** position ON ALL DRIVING AND TENDER WHEELS
Operating {Engine, sch. AI-SMA WEST'G. AUTO. AND STRAIGHT AIR
Parts {Eng. Tr'k, for ---
25 Foundation {Drivers, sch. BD-3 AND BC, AMERICAN D.S. EQUALIZED
Parts {Eng. Tr'k, for ---
26 Air pump TWO 9½" RIGHT AND LEFT Post BOTH LEFT SIDE
Train connections FRONT AND BACK
Train signal, sch. NONE
23 AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

Tender EIGHT Wheeled, Drawing No 435
Weight, with fuel and water, about 90,000 POUNDS

27 **Tank** 4500 Gallons, Bill 4551
TANK "U" SHAPE, SLOPING BACK. FUEL CAPACITY 6 TONS.
COAL GATES OF STEEL
Tool Boxes OF STEEL, BUILT INTO LEGS OF TANK

Frame STEEL, 10" CHANNELS WITH WOOD BUMPERS
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 12½" HEAD AND WITH WEST'G.
FRICTION DRAFT GEAR. COUPLER TO HAVE SLOTTED KNUCKLE.
28 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
TRUCK SPRING PLANKS TO BE OF CHANNEL IRON.
Springs ELLIPTIC, B. L. W. MAKE
Journals, Diam. 5" Length 9"
Wheels, Diam. 33" Tread 1¼" Kind ROLLED STEEL
Tires NONE Centers --- Size ---
Tires held by --- WHEEL RING 2½" THICK
Safety chains SINGLE

Brake Position ON ALL WHEELS
Brake sch. FL-1212 AND SHD WEST'G. AUTO. AND STRAIGHT AIR

List of tools, sch. 29
Photo sch. NONE Inspection B. L. W.
To be weighed NO Material specfns B. L. W.
Certificate of boiler test THREE COPIES OF B. L. W. FORM 1036.
Junior laws to 10-19-18 Shipment ON OWN WHEELS

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

B. L. W. {
Patents {FEED PIPE STRAINER, PAT'D. SEPT. 1, 1903 (CAST ON)

Property plates NONE

Painting, style 291, OLIVE GREEN AND ALUMINUM

Mark on TANK SIDES: THE SHENANDO FURNACE CO.

Road Nos. Pos. Road Nos. Name NONE
F. No. PLATE 3
CAB SIDES
BACK OF TANK

Actual Dimensions of Loco. Extreme height over all 14' 0"
Extreme Width:- Cab boards 10' 3½"; Cylinders or valve motion 10' 5½"
Length outside face front bumper of engine to face of tender wedge 30' 2½"
Length face of tender wedge to outside face back bumper of tender 24' 9½"
Total length outside face front bumper of engine to outside face back bumper of tender 55' 0"

SPECIFICATION FOR LOCOMOTIVES 6 38 D 111

FOR SHENANGO FURNACE COMPANY

P

210

1 FLEXIBLE STAYBOLTS TO BE TATE (Not Spec.) 1" 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. DOOR 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 BEAMS.

5 INJECTORS TO BE SELF ACTING TYPE AND TO BE LOCATED AS LOW AS POSSIBLE.

6 CAB TOOL BOXES AND CAB SEAT BOXES TO BE MADE OF STEEL.
CAB TO HAVE SIDE CURTAINS.

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 FRONT OF ENGINE WITH BRACKETS OF STEEL, SUPPORTING A STEEL PLATE ON WHICH IS SLOTTED AN OAK PLANK. THIS STEP TO BE MADE IN SHORT SECTIONS, WITH SPACE BETWEEN TO CLEAR PILOT OF ANOTHER LOCOMOTIVE TO WHICH THIS LOCOMOTIVE MAY BE COUPLED.
ADDITIONAL STEPS ON BACK OF FRONT BUMPER BEAM.

9 ONE STEP ON RIGHT AND TWO STEPS ON LEFT SIDE OF SMOKE BOX.

10 FRANKLIN RADIAL SUPPLY CO'S. CAST STEEL (DOUBLE SPRING) RADIAL BUFFER TO BE APPLIED BETWEEN ENGINE AND TENDER.

11 HEADLIGHT EQUIPMENT TO BE PYLE NATIONAL ELECTRIC TYPE "K-2" WITH INCANDESCENT HEADLIGHTS.
IF NOT POSSIBLE TO APPLY HEADLIGHTS BEFORE SHIPMENT WITHOUT DELAYING SHIPMENT, THE ENGINE AND TENDER ARE TO BE WIRED COMPLETELY BEFORE SHIPMENT AND HAVE THE B. L. W. ENGINEER APPLY THE HEADLIGHTS AFTER DELIVERY OF LOCOMOTIVES.

12 TOP AND SIDES OF FIRE BOX INSIDE OF CAB TO BE LAGGED AND JACKETED.

13 FRAMES TO BE THOROUGHLY ANNEALED AND TO HAVE DOUBLE FORWARD SECTION. FRAMES TO HAVE GOOD CROSS BRACES.

14 PEDESTAL WEDGES AND GIBS OF CAST IRON.

15 CYLINDERS TO BE BUSHED.

16 PISTON RODS TO BE KEYED TO CROSSHEADS.

17 CROSSHEAD TO HAVE SIDE PLATES.
CROSSHEAD GIBS OF WROT IRON, BABBITTED.

18 WRIST PINS TO BE RIVETED OVER.

21 THE BLIND TIRES ON MIDDLE WHEELS TO BE AS WIDE AS PRACTICABLE.

22 DRIVING BOXES TO HAVE HEAVY BRONZE BEARINGS WITH SUITABLE OIL GROOVES.

23 MAIN RESERVOIRS TO HAVE DRAIN COCKS.

24 AIR PUMP EXHAUST TO BE PIPED INTO CYLINDER SADDLE.

25 DRIVING BRAKE CYLINDERS TO BE 14" x 10".

26 MATERIAL FOR THIS LOCO. TO BE APPROPRIATED FROM EXTRA ORDER No. 9600 DATED 1918, WITH CHANGES COVERED ON EXTRA ORDER No. 14873 DATED JANUARY 28, 1920. (NO CHARGE).
THIS LOCO. IS ALREADY BUILT, IS AT EDDYSTONE AND CARRIES B. L. W. CONSTRUCTION NUMBER 50885.

27 LOCO. TO BE PLACED IN FIRST-CLASS CONDITION, AS NEARLY AS POSSIBLE EQUAL TO NEW.

28 LOCO. TO BE USED IN I. C. C. SERVICE.

TENDER

50 STEPS TO BE PROVIDED AT REAR OF TENDER WITH BRACKETS OF STEEL, SUPPORTING A STEEL PLATE ON WHICH IS BOLTED AN OAK PLANK.
THIS STEP TO BE MADE IN SHORT SECTIONS WITH SPACE BETWEEN TO CLEAR PILOT OF ANOTHER LOCO. TO WHICH THIS LOCO. MAY BE COUPLED.

51 SIDE STEPS TO BE PROVIDED AT REAR OF TENDER.

52 HANDRAIL ON TANK, ONLY 26" HIGH.

THE BALDWIN LOCOMOTIVE WORKS As Spec'd C-6489

Memorandum Spec'n 20063

SPECIFICATION FOR LOCOMOTIVES 4 30 60

SP.

FOR SIMMONS COMPANY

Wk.

Gen. as PHOTO. 2193

Engine Drawing No. 6

3.15.20

Gauge of Road 4'8½" Play ¾"

Wheelbase, Rigid 7' 6" Driving 7' 6" Total 7' 6"

Total wheelbase, eng. and tend. {Actual 37' 11½" / Limited to ---

Curves 35 DEGREES RAILS 90 POUNDS.

Limits, Height --- Width---

Weight (approximate) in working order, Total 104,000 POUNDS.

On F. tr'k --- lbs., Drivers 104,000 lbs., R. tr'k --- lbs.

Tractive power 25,400 lbs., Ratio of adhesion 4.43

Work'g St'm Pres. 200 lbs., Service SWITCHING

Fuel SOFT COAL

Boiler STEEL (SEE SUP. 5) Thick ⅜" Bill 8953

Front Tube Sheet ½" Thick

Boiler, Diam. 60" Plan STRAIGHT TOP.

Allowable st'm pres. 200 lbs. **Tested to** { 220 lbs. steam pres. / 300 lbs. water pres.

With Factor of Safety of 5.21

Longitud. seams BUTT JOINTED, SEXTUPLE RIVETED, 90% SEAMS.

Dome, diam. 29" Pos. CENTRAL

Firebox STEEL (SEE SUP. 5) Combustion chamb. NONE

Firebox, length 71-11/16" Width 34⅛" Depth F. 72⅜" B. 70⅜"

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" DIAM. Sling stays front {TWO ROWS 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 (B. L. W. OPTION)

Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.

Number 220 Diam. 2" Length 12' 0"

Heating, Flues --- Combus. Chamb.--- Total 1496⁰

Surface Tubes 1372⁰ Fire Box 124⁰ Fire Brick Tubes ---

Grate area 17⁰ Ratio to Heating Surface 1: 79

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

Baffle ~~plate~~ hopper WITH

Netting and deflect. plates WITH

Exhaust nozzles DOUBLE, HIGH

Stack STRAIGHT Dia. 16"

Safety Valves TWO COALE 2½" OPEN (NOT SPEC)

Safety valves BOTH with relief lever, Set to 200 POUNDS.

Whistle ONE 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 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 AND BACK.

Crown, TWO EACH SIDE AND THREE BACK

Waist, ONE UNDER FRONT

Front tube sheet, ONE Fusible plug ONE

Pump NONE

LOCOMOTIVE FOR OPERATION IN KENOSHA, WISCONSIN.

BOILER TO CONFORM TO THE A. S. M. E. CODE.

BOILER TO BE INSPECTED BY THE HARTFORD STEAM BOILER INSPECTION AND INSURANCE Co.

Injectors TWO MONITOR (NOT SPEC) No. 8

Injectors, Pos. R. AND L. Steam pipes COPPER

Pipes, Check IRON Feed IRON Overflow IRON

Check B. L. W. WITH STOP VALVE (SUP. 15) 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 34"

Pilot NONE Pushing shoes CAST IN BUMPER.

Front Bumper CAST IRON 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 (M. C. B. HEIGHT I. E.) 33½"

Coupler M. C. B. AUTO.

Signal fixtures NONE

ELEC. HEADLIGHT EQUIPMENT, SCHROEDER, TYPE RE-3, 16" CASE, WITH INCANDESCENT HEADLIGHTS, FURNISHED ON EX. ORDER 23436, DATED 9-17-20.

Headlight TWO ROUND CASE 18" Reflector, To burn KEROSENE

Headlight, Nos. on sides WITH Hi-lift step WITH

Lamp shelf NONE Nosing ---

Bell 92 POUNDS

Sand Box TWO Diam. 28" Body IRON PAINTED Pipes IRON

SAND LEACH AIR, TRAP A-1 IN EACH BOX, TO SAND FRONT AND BACK.

Dome casing IRON PAINTED

Boiler Jacket #22 SOFT STEEL Pto. Bands IRON Style 9

Boiler Lagging MAGNESIA SECTIONAL

THE BALDWIN LOCOMOTIVE WORKS

M. V. McNeil. APRIL 1920

SPECIFICATION FOR LOCOMOTIVES 4 30 C 60

FOR SIMMONS COMPANY

Wk.

212

Frames CAST STEEL

Cylinders, Diam. 18" Stroke 24"

St'm ports, Length 16" Width 1¼" Bridges 1"

Exh. ports, Length 16" Width 2½" Valve lead 3/32"

Valve travel 5¼" Steam lap 1" Exhaust clearance ---

Eccentric ~~crank~~ throw 5" By-pass valve NONE

S. F. Lubr. NATHAN 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 ROD~~ VALVE STEM UNITED STATES, KING TYPE. (NOT SPEC)

Pistons HEADS OF CAST IRON, WITH RINGS OF CAST IRON SPRUNG IN

Guides STEEL Oil cups NEEDLE

Crossheads CAST STEEL WITH BEARINGS OF CAST IRON, TINNED.

Wrist Pins STEEL Rod cups FOR GREASE, FORGED ON RODS.

PARALLEL RODS TO HAVE SOLID ENDS.

Valve Motion STEPHENSON.

Links, sliding blocks, pins, lifting links and eccentric rod jaws to ~~be~~ 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 wheel hub liners BRASS

Drivers, O. S. Diam. 52" Cen. diam 46" 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 3/8" TOTAL

Driving Boxes STEELED CAST IRON

Journals, Diam. 9" 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 ---

Wheel hub liners ---

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 ---

Wheel hub liners ---

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 Westg. COMBINED AUTO. AND STRAIGHT AIR.

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

Foundation Drivers, sch. W-2 AMERICAN O. S. EQUALIZED.

Parts Eng. Tr'k sch. ---

Air pump ONE 9½" Pos. L. S.

Train connections FRONT AND BACK

Train signal, sch. NONE

AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

Tender EIGHT Wheeled, Drawing No. 1527

Weight, with fuel and water, about 72,000 POUNDS.

TENDER TO BE WEIGHED: YES

Tank 3,500 Gallons, Bill 3276

TANK "U" SHAPE, SLOPING BACK. FUEL CAPACITY 5½ TONS.

Tool Boxes OF HARD WOOD, TOP.

Frame STEEL, 6" AND 8" CHANNELS, WITH BUMPERS OF WOOD AND STEEL PLATE.

Front Drawbar height 32½"

Pilot NONE Pushing shoes AT REAR

Back drawbar, center above rail (M. C. B. HEIGHT I. E.) 33½"

Coupler M. C. B. AUTO.

STEPS AND HAND RAILS ON SLOPING BACK OF TANK.

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. 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 Westg. AUTOMATIC AND STRAIGHT AIR, WITH 10"x12" BRAKE CYLINDER.

List of tools, sch. 29

Photo sch. NONE Inspection B. L. W. EXCEPT FOR BOILER (SUP. 1 & R. 19)

To be weighed ~~YES~~ NO, Material specs B. L. W. EXCEPT FOR BOILER (SUP. 4)

Certificate of boiler test THREE COPIES OF B. L. W. FORM 1030

Junior flues in 3.15.20 Shipment ON O. N. 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, style 291, OLIVE GREEN AND ALUMINUM.

LETTERING TO BE SAME STYLE AS SHOWN ON CUT.

Mark on TANK SIDES, SIMMONS COMPANY

Road Nos. Pos.	Road Nos.	Name NONE
F. No. PLATE	1	
F. SAND BOX		
CAB SIDES		
BACK OF TANK.		

Actual Dimensions of Loco. Extreme height over all 13' 3⅛"

Extreme Width: Cab boards 9' 7½" Cylinders or valve chambers 9' 0"

Length outside face front bumper of engine to face of tender wedge 26' 11"

Length face of tender wedge to outside face back bumper of tender 23' 2"

Total length outside face front bumper of engine to outside face back bumper of tender 50' 1"

SPECIFICATION FOR LOCOMOTIVES 4 30 C 60

FOR SIMMONS COMPANY

P

213

1 BOILER TO BE OPERATED IN THE STATE OF WISCONSIN
BOILER TO BE BUILT TO CONFORM TO THE BOILER CODE OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS (1918), AND MUST BE INSPECTED DURING CONSTRUCTION AND UPON COMPLETION BY AN AUTHORIZED INSPECTOR WHO SHALL NOT BE INTERESTED EITHER DIRECTLY OR INDIRECTLY WITH THE MANUFACTURERS.

2 A DATA REPORT, ON FORMS FURNISHED BY THE ABOVE MENTIONED STATE SHALL BE FORWARDED TO THE PROPER OFFICIAL BEFORE THE BOILER LEAVES THE BUILDER'S WORKS.

3 A HYDROSTATIC TEST SHALL BE APPLIED EQUAL TO ONE-AND -ONE-HALF (1½) TIMES THE WORKING PRESSURE.

4 THE MATERIALS ENTERING INTO THE CONSTRUCTION SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS:-

BOILER AND FIRE BOX STEEL MATERIAL FOR ONE-PIECE DOME	A.S.M.E. SPEC. PAGE 11
BOILER RIVET STEEL	A.S.M.E. SPEC. PAGE 15
BOILER RIVET IRON	A.S.M.E. SPEC. PAGE 31
BOILER BRACE IRON	A.S.M.E. SPEC. PAGE 37
BOILER STAYBOLT IRON	A.S.M.E. SPEC. PAGE 34
BOILER TUBES	A.S.M.E. SPEC. PAGE 40

5 FRONT TUBE SHEET SHALL BE OF FIRE BOX STEEL.
ALL BOILER AND FIRE BOX STEEL AND MATERIAL FOR ONE PIECE DOME SHALL BE MARKED BY THE MANUFACTURER WITH THE HEAT NUMBER, NAME OF MANUFACTURER, GRADE AND LOWEST TENSILE STRENGTH IN THE MANNER AND LOCATION DESCRIBED ON B.L.W. MARKING CARD 6859. SMOKE BOX STEEL MAY CONFORM TO B.L.W. SPECIFICATION.

6 THE MINIMUM FACTOR OF SAFETY SHALL BE FIVE. (1918)
LONGITUDINAL SEAMS SHALL BE OF BUTT AND DOUBLE STRAP CONSTRUCTION.

7 THE OUTSIDE ENDS OF SOLID STAYBOLTS, 8 IN. AND LESS IN LENGTH, SHALL BE DRILLED WITH A HOLE AT LEAST 3/16" DIA., TO A DEPTH EXTENDING AT LEAST ½" BEYOND THE INSIDE OF THE PLATES

8 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 TABLES:

SIZE OF PIPE CONNECTION OR CORRESPONDING TAPER TAP.	1" & 1¼"	1½" & 2"	2½" TO 4"
No. OF THREADS PER INCH.	11½	11½	8
MINIMUM No. OF THREADS REQUIRED IN OPENING.	4	5	7
MINIMUM THICKNESS OF MATERIAL REQUIRED TO GIVE ABOVE No. OF THREADS.	⅜"	7/16"	⅞"

IF THICKNESS OF BOILER MATERIAL IS NOT SUFFICIENT TO GIVE THE ABOVE NUMBER OF THREADS, A LINER OR FLANGE MUST BE APPLIED.

9 EACH BOILER MUST BE PROVIDED WITH A CONNECTION ¼ PIPE SIZE FOR ATTACHING INSPECTOR'S TEST GAUGE.

10 A FUSIBLE PLUG MUST BE APPLIED. THE PLUG MUST BE FILLED WITH PURE TIN AND THE LEAST DIAMETER OF THE FUSIBLE METAL MUST BE NOT LESS THAN ½" EXCEPT FOR WORKING PRESSURE ABOVE 175 LBS., IN WHICH CASE THE LEAST DIAMETER SHALL NOT BE LESS THAN ⅜". (I. E., USE FUSIBLE PLUG CARD 1414 FOR PRESSURE ABOVE 175 LBS. AND FUSIBLE PLUG CARD 1219 FOR 175 LBS. AND LESS).

15 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.

16 SAFETY VALVES MUST MEET THE REQUIREMENTS OF THE A. S. M. E. BOILER CODE AND MUST BE PLAINLY STAMPED BY THE MANUFACTURER AS PER B. L. W. MARKING CARD 6858.
SAFETY VALVES OVER 3" IN DIAMETER SHALL HAVE FLANGED INLETS. THESE FLANGES SHALL CONFORM TO THE AMERICAN STANDARD.
ALL SAFETY VALVES MUST BE PROVIDED WITH RELIEF LEVERS.

17 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: ALSO WHERE POSSIBLE ONE NEAR THE THROAT SHEET.

18 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.

19 UPON COMPLETION, EACH BOILER SHALL BE STAMPED IN THE PRESENCE OF THE AUTHORIZED INSPECTOR, WITH THE WORDS AS ARRANGED BELOW. THE HEIGHT OF THE LETTERS AND FIGURES SHALL NOT BE LESS THAN 4".
THE LOCATION OF THE STAMP SHALL BE ON THE BACK HEAD ABOVE A PLUG HOLE.

S

WISCONSIN
(State in which boiler is to be used)
No. 2
(Manufacturer's State Standard number)
THE BALDWIN LOCOMOTIVE WORKS
(Name of manufacturer)
(LEAVE BLANK) (State's Number)
(LEAVE BLANK) (Year put in service)
200 LBS.
(Maximum working pressure when built)
(Manufacturer's Serial Number)

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-6108

Memorandum Spec'n 19076

SPECIFICATION FOR LOCOMOTIVES 4 4 C 31

FOR SMITH - McCUE COAL COMPANY

Gen. as PHOTO. 611 { EXCEPT TO HAVE SOLID END SIDE RODS.

11 - 11 - 19 **Engine Drawing No.** 7.

Gauge of Road 3' 8" Play 5/8"

Wheelbase, Rigid 3' 6" Driving 3' 6" Total 3' 6"

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

Curves ---

Limits, Height --- Width ---

Weight (approximate) in working order, Total 12,000 POUNDS.

On F. tr'k --- lbs., Drivers 12,000 lbs., B. tr'k --- lbs.

Tractive power 1600 lbs., Ratio of adhesion 7.55

Work'g St'm Pres. 150 lbs., Service MINING

Fuel SOFT COAL

LOCO. FOR SERVICE IN WEST VIRGINIA.

Boiler STEEL Thick 5/16" Bill 8775

Front Tube Sheet 3/8" Thick

Boiler, Diam. 20" Plan STRAIGHT TOP.

Tested to { Allowable st'm pres. 150 lbs. / 170 lbs. steam pres. / With Factor of Safety of 7.78 / 200 lbs. water pres.

Longitud. seams BUTT JOINTS, DOUBLE COVERING STRIPS, SINGLE RIVETED,

DOME, BUILT-UP TYPE.

Dome, diam. 12" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE

Firebox, length 20-13/16" Width 25 3/8" Depth F. 28 1/2" B. 28 1/2"

Firebox, Tube 5/8" Crown 5/16" Sides 5/16" Back 5/16"

Firedoor opening RECTANGULAR 7 1/2" x 12"

Water space, Front 2" Sides 1 3/4" Back 1 3/4"

Water space frame SINGLE Riveted

Water space stays 7/8" DIAM. WITH 3/16" HOLES 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 ---

Tubes #13 W.G. CHARCOAL IRON OR STEEL (B.L.W. OPTION)

Tube ends SWAGED FOR COPPER FERRULES FIRE BOX ENDS.

Number 32 Diam. 1 1/2" Length 5' 6"

Heating Surface { Flues --- Combus. Chamb. --- Total 85.4 sq. ft. / Tubes 69.1 sq. ft. Fire Box 16.3 sq. ft. Fire Brick Tubes ---

Grate area 3.7 sq. ft. Ratio to Heating Surface 1: 23

Superheater ---

Fire Brick ARCH, NONE

Grates PLAIN BARS.

Ash Pan, Dampers R. AND L.

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 SINGLE LOW

CLEANING PIPES WITH

STACK STRAIGHT Dia. 5"

Safety Valves TWO COALE 1 1/2" OPEN. (Not Spec.)

Safety valves NONE with relief lever, Set to 150 POUNDS

Whistle ONE B.L.W. PLAIN

Steam Gauge ONE IRON, 4 1/2" 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

Crown, ONE EACH SIDE.

Waist, ONE UNDER FRONT.

Front tube sheet, NONE Fusible plug ONE

Pump NONE

Injectors (Not Spec.) TWO SELLERS CLASS "N" No. 3-2/10

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

COAL BOX IN LEFT SIDE OF CAB, CAPACITY 200 POUNDS.

Cab boards WOOD Nosing NONE

Running boards NONE Nosing ---

Hand rail IRON Located on CAB.

Back Bumper YELLOW PINE FOR 31 ONLY

Pilot NONE Pushing shoes FRONT AND BACK

Front Bumper YELLOW PINE FOR 31 ONLY Bumper plate NONE

Steps ACROSS FRONT AND BACK, WITH HAND RAILS

E & B Drawhead, Center above rail 12"

Coupler SINGLE BAR DRAW CASTINGS FRONT AND BACK

Signal fixtures NONE

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 PTD. Bands IRON Style 9

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

THE BALDWIN LOCOMOTIVE WORKS

M.T. McNeil Dec 1919

SPECIFICATION FOR LOCOMOTIVES 4 4 C 31

FOR SMITH - McCUE COAL COMPANY

215 215

Frames CAST STEEL

Cylinders, Diam. 5" Stroke 10"

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

Exh. ports, Length 1 1/2" Width 1 1/4" Valve lead 1/32"

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

Eccentric-crank throw 2" By-pass valve NONE

S. F. Lubr. DETROIT DOUBLE NO. 5 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 PLAIN "D"

Mob pkg. PACKED POST LOCKUP STEMS BRAIDED PACKING.

PISTON RODS TO BE KEYED TO CROSSHEADS.

Pistons HOLLOW OF CAST IRON WITH CAST IRON RINGS SPRUNG IN.

Guides STEEL Oil cups NEEDLE

Crossheads CAST STEEL, WITH BEARINGS OF CAST IRON, TINNED.

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 wheel hub liners NONE

Drivers, O. S. Diam. 20" Cen. diam. 16" CENTERS CAST IRON

Tires STEEL Held by SHRINKAGE AND SHOULDER

Tires, Flanged, Pos. ALL Size 2" x 1 3/8"

Tires, Plain, Pos. NONE Size ---

Lateral play between driving boxes and wheel hubs = 1/8" TOTAL

Driving Boxes CAST IRON.

Journals, Diam. 3 1/2" Length 5"

Springs. Make B.L.W.

Front Engine Truck NONE Wheels ---

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

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

Wheel hub liners ---

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 ---

Wheel hub liners ---

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

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

Tires held by ---

Brakes, position ON BOTH PAIRS DRIVING 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

Tank 100 U.S. Gallons, Bill 3885

SADDLE TANK OVER TOP OF BOILER TO EXTEND TO FRONT OF SMOKE BOX SAME AS SHOWN ON PHOTO. 5226, CLASS 4 4 C 24.

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 1836

Junior laws to 11-15-19 Shipment ON CAR

Brass shop finish, No. 1

Machine shop finish D-165

B. L. W. { NONE

Patents

Property plates B.L.W. FOR ENGINE

FRONT NUMBER PLATE TO BE OMITTED AND BUILDER'S CARD IS TO BE APPLIED IN CENTER OF SMOKE BOX FRONT DOOR.

Painting, style 223, OLIVE GREEN AND ALUMINUM

Mark on TANKSIDES: S - M.COAL CO.

Road Nos. Pos. Road Nos. Name NONE

SAND BOX 6

CAB SIDES

Actual Dimensions of Loco. Extreme height over all = 7' 7 1/8"

Extreme Width { Over cab boards = 5' 10 1/2" / Over cylinders or valve motion = 5' 10"

Length outside face of front bumper to outside face of back bumper of engine = 11' 9 1/2"

THE BALDWIN LOCOMOTIVE WORKS (Spec. No. 6-28-0-330 WITH SAME CHANGES, EXCEPTS, AND/OR OTHERWISE SPECIFIED.)

Memorandum Specn 1901

SPECIFICATION FOR LOCOMOTIVES 6-28-0-330

Gen. Arr. Photo 2220

Engine Drawing No. 31

FOR STANDARD OIL COMPANY OF LOUISIANA

RTL 2.17.19

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 10' 6" Driving 10' 6" Total 10' 6"
Total wheelbase, eng. and tend. (Actual —— / Limited to ——

Curves ——

Limits, Height 12' 6" Width ——
Weight (approximate) in working order, Total 110,500 POUNDS
On F. tr'k —— lbs., Drivers 110,500 lbs., B. tr'k —— lbs.

Tractive power 24,120 lbs., Ratio of adhesion 4.6
Work'g St'm Pres. 180 lbs., Service SWITCHING
Fuel OIL

FRONT TUBE SHEET TO BE ½" THICK.
BOILER TO CONFORM TO I. C. C. REQUIREMENTS.

Boiler STEEL Thick 9/16" Bilt B&B
Boiler, Diam. 52" Plan STRAIGHT TOP
Boiler st'm pres. 180 lbs., Tested to 200 lbs. steam pres. / 240 lbs. water pres.
WITH FACTOR OF SAFETY OF 5.4
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS.

Dome, diam. 27½" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE
Firebox, length 85-3/16" Width 34⅛" Depth F. 57⅞" B. 51⅜"
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 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 180 Diam. 2" Length 11' 1½"

Heating Flues —— Combus. Chamb —— Total 1147.9
Surface Tubes 1040.6 Fire Box 107.3 Fire Brick Tubes ——
Grate area 20.3 Ratio to Heating Surface 1 : 57
Superheater ——

Fire Brick ARCH TO SUIT OIL BURNING ARRANGEMENT.
FIRE BOX LINED WITH FIRE BRICK FOR OIL BURNING.
FIRE BRICK PAVEMENT IN PAN.
Grates NONE
Ash Pan, Dampers FRONT ONLY

Throttle BALANCE Pos. ROOF
STEEL

SUPERHEATER NONE

Safety Valves TWO DOALE 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 RIGHT SIDE 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. POSITION: FRONT
Cleaning Plugs
Firebox CORNERS
Crown, ONE 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 TWO MONITOR (Not Spec) 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 TANK

Back Bumper OAK

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

Signal fixtures NONE

(46) FRONT HEADLIGHT ONLY TO HAVE SIDE MARKERS.
Headlight TWO ROUND CASE 16" Reflector, To burn KEROSENE
Headlight, Non-on-sides (46) Wiring WITH
Lamp stand NONE Bracing ——

Bell 75 POUNDS
Bell Box TWO OVAL 20" BOTH SIDES PAINTED. PLACED FRONT
Control Stand IN CAB ONE, TO HAND FRONT AND REAR.

Cylinder Jacket #22 Plate, Steel, Bands IRON Bolts &
Boiler Lagging MAGNESIA SECTIONS

Frames GAGE STEEL Brakes SOLID

Cylinders, Diam. 17" Stroke 24"
Str'm ports, Length 16" Width 1¼" Bridges 1"
Exh. ports, Length 16" Width 2½" Valve travel 1/16"
Valve travel 5½" O. S. 140 ¾" Ins. lap ——
Eccentric crank throw 5½"
B. P. Lubr. (Not Spec) BOSTONIAN DOUBLE BULL'S EYE, TWO PINTS CAPACITY.
Cyl'r heads CAST IRON LUBR. PIPES OF COPPER UNDER JACKETS
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)
PISTON RODS TO BE KEYED TO CROSSHEADS.
Pistons HEADS CAST IRON WITH ST. JOHN'S STEAM PACKING
Guides LAIRD TYPE, 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.
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 5¼"
Tires, Plain, Pos. MIDDLE Size 3" x 6⅝"
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 Wheels ——
Tr. wheels —— 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 ——
Tr. wheels —— each side of cen. Cen. pin liners ——
Journals, Diam. —— Length —— Boxes ——
Wheels, Diam. —— Tread —— Kind ——
Tires —— Cen. diam. —— Size ——
Tires held by ——

Tender STEEL

Tank OIL 600 WATER 1500 Gallons, Bill 4077 4796
SADDLE TANK OVER TOP OF BOILER.
OIL TANK ON REAR EXTENSION OF ENGINE FRAME, BACK OF CAB.

OIL BURNING ARRANGEMENT, B.L.W. STANDARD, WITH OIL BURNER PLACED IN FRONT END OF FIRE BOX.
ROYALTY, IF ANY ON OIL BURNING ARRANGEMENT, PAYABLE BY B.L.W.

ACTUAL DIMENSIONS OF LOCO.—EXTREME HEIGHT OVER ALL - 12'6"
EXTREME WIDTH:- OVER CAB BOARDS - 10'2¼" / CYLINDERS OR VALVE MOTION - 8'9½"
LENGTH OUTSIDE FACE FRONT BUMPER TO OUTSIDE FACE OF BACK BUMPER OF ENGINE } 30'4"

List of tools, sch. 31
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 3-1-19 Shipment ON OWN WHEELS

Brass shop finish, No. 1
Machine shop finish 0-165

Patent Plates NONE

Property plates NONE

PAINT STRIPING FROM CYLINDERS AND WHEELS.
Painting: Engine, style 221 BLACK, WITH YELLOW STRIPING
Painting:- Tender, style ——

LETTERING, ETC., AS IN YELLOW, SAME AS FOR 6-28-0-331.
MARK ON SIDES OF SADDLE TANK, S. O. CO. OF LA.
LETTERING, ETC., TO HAVE A GOOD COAT OF LINSEED VARNISH.

Box Pos.	Dead No.	Name Plate
F. SD. PLATE	1	
DOME		
CAB SIDES		
BACK OF TANK		

THE BALDWIN LOCOMOTIVE WORKS As Spec'n. C-6332

Memorandum Spec'n 20046

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1142

WKS

FOR STANDARD OIL COMPANY OF LOUISIANA

Gen. as PHOTO. 2220 EXCEPT WITH STEEL CAB.

Engine Drawing No. 59

HW. 2.23.20

Gauge of Road 4' 8½" Play ⅜"

Wheelbase, Rigid 10'0" Driving 10'0" Total 10'0"

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

Curves ---

Limits, Height 12'11" Width ---

Weight (approximate) in working order, Total 123,000 POUNDS.

On F. tr'k --- lbs., Drivers 123,000 lbs., B. tr'k --- lbs.

Tractive power 25,770 lbs., Ratio of adhesion 4.77

Work'g St'm Pres. 175 lbs., Service SWITCHING.

2 **Fuel** OIL

Boiler STEEL Thick ½" Bill 89¼

Front Tube Sheet ½" Thick

* Boiler, Diam. 54" Plan STRAIGHT TOP.

Allowable st'm pres. 175 lbs. **Tested to** 195 lbs. steam pres.

With Factor of Safety of 5.1 234 lbs. water pres.

Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS, SEXTUPLE RIVETED.

DOME ONE PIECE TYPE.

Dome, diam. 25" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE

Firebox, length 78" Width 39½" Depth F. 54⅝" B. 53¼"

Firebox, Tube ½" Crown ⅜" Sides ⅜" Back ⅜"

Firedoor opening OVAL 13"x18" CROWN AND SIDES IN ONE SHEET

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

Water space frame SINGLE Riveted

Water space stays ⅜" DIAM. WITH 3/16" HOLES 1½" DEEP FROM O.S.

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

Button heads below crown on SIX central rows

Crown bars NONE Placed --- above crown

Crown bolts ---

Flues ---

Tubes #12 B.W.G. CHARCOAL IRON OR STEEL (B.L.W. OPTION)

Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.

Number 160 Diam. 2" Length 10'9"

Heating Flues --- Combus. Chamb. --- Total 991.5

Surface Tubes 893.5 Fire Box 98 Fire Brick Tubes ---

Grate area 21.2 Ratio to Heating Surface 1: 46.7

Superheater ---

Fire Brick ARCH-NONE

FIRE BOX LINED WITH BRICK FOR OIL BURNING.

FIRE BRICK PAVEMENT IN PAN.

2 **Grates** NONE

Ash Pan, Dampers BACK 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 Dia. 17"

Safety Valves TWO COALE 2½" OPEN (Not Spec'n)

Safety valves NONE with relief lever, Set to 175 POUNDS

Whistle ONE B. L. W. PLAIN

Steam Gauge ONE IRON 7" MAKER: ASHCROFT (Not Spec'n)

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" 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 SIDES AND BACK.

Crown, ONE EACH SIDE AND TWO BACK.

Waist, ONE UNDER FRONT

Front tube sheet. ONE Fusible plug ONE

Pump NONE

LOCOMOTIVE FOR OPERATION IN LOUISIANA.

* BOILER DETAILS TO CONFORM TO I.C.C. REQUIREMENTS.

INJECTOR ON RIGHT SIDE PLACED ON BACK HEAD, A/C LIMITED SPACE.

Injectors TWO MONITOR (Not Spec'n) 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 STEEL

Cab boards STEEL Nosing T-IRON

Running boards STEEL Nosing T-IRON

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 WITH HAND RAILS.

STEPS, HANDHOLDS, ETC. TO CONFORM TO I.C.C. REQUIREMENTS.

E.& B. Drawhead, Center above rail 33½"

Coupler M. C. B. AUTO.

Signal fixtures NONE

HEADLIGHT EQUIPMENT TO BE ELECTRIC WITH SCHROEDER (Not Spec'n) TYPE HE-3 GENERATOR AND INCANDESCENT HEADLIGHTS.

Headlight TWO ROUND CASE 14" Reflector

Headlight, Nos. on sides WITH Hdlt'r step WITH

Lamp shelf NONE Nosing ---

Bell 92 POUNDS

Sand Box (Not Spec'n) TWO Diam. 31" Body IRON PAINTED Pipes IRON

Sanders LEACH AIR TRAP A-1, TO SAND FRONT AND BACK.

Dome casing IRON PAINTED

Boiler Jacket #22 SOFT STEEL PTD. Bands IRON Sets 9

Boiler Lagging MAGNESIA SECTIONAL

THE BALDWIN LOCOMOTIVE WORKS

H. C. Beehner May 1920.

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1142

WKS

FOR STANDARD OIL COMPANY OF LOUISIANA

HW

Frames CAST STEEL

Cylinders, Diam. 19" Stroke 24"

St'm ports, Length 16" Width 1½" Bridges 1"

Exh. ports, Length 16" Width 2½" Valve head 1⅛"

Valve travel 5¼" Steam lap ¾" Exhaust clearance ---

Eccentric crank throw 5" By-pass valve NONE

S.F. Lubr. NATHAN TRIPLE BULL'S EYE (Not Spec'n)

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. KING TYPE (Not Spec'n)

PISTON RODS TO BE KEYED TO CROSSHEAD

Pistons HEADS OF CAST IRON, WITH RINGS OF CAST IRON SPRUNG IN

Guides STEEL Oil cups NEEDLE

Crossheads CAST STEEL, WITH BEARINGS OF CAST IRON, TINNED.

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 wheel hub liners NONE

Drivers, O. S. Diam. 50" Cen. diam. 44" CENTRES CAST IRON

Tires STEEL Hold 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 = 3/16" 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 ---

Wheel hub liners ---

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 ---

Wheel hub liners ---

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

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

Tires held by ---

Brake, position ON ALL DRIVING WHEELS (NO TENDER)

Operating Engine, sch. No. 6 ET ESTD. COMBINED AUTO AND STRAIGHT AIR

Parts Eng. Trk. sch. ---

Foundation Drivers, sch. WH-2 AMERICAN O.S. EQUALIZED

Parts Eng. Trk. sch. ---

Air pump ONE 9½" Pos. L.S.

Train connections FRONT AND BACK

Train signal, sch. NONE

AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

Tender NONE

Tank {OIL 500 5267, WATER 1400 Gallons, Bill 5268

SADDLE TANK, LOCATED OVER TOP OF BOILER.

OIL TANK ON REAR EXTENSION OF ENGINE FRAME, BACK OF CAB.

2 OIL BURNING ARRANGEMENT BALDWIN STANDARD, WITH BURNER IN FRONT END OF FIRE BOX.

ROYALTY, IF ANY, PAYABLE BY THE B. L. W.

Hereafter Sect. of design of spring rigging is OK. Ordering shop had of Spindly, is to assemble rigging due to short upper spring hanger links - More clearance should be provided between rear of frame and back link. - Dwg. Beam Load 807 is applicable. Use also DK Springs for 6-32 D Std. and 1159 (R.G. Burke 11-9-20)

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 4.6.20 Shipment ON OWN WHEELS

Brass shop finish, No. 1

Machine shop finish D-165

B. L. W. {NONE

Patents

Property plates NONE

OMIT STRIPING FROM CYLINDERS AND WHEELS.

Painting, style 221, BLACK, WITH YELLOW STRIPING.

MARK IN YELLOW PAINT SAME AS FOR 6 28 D 324 WITH A GOOD OUTSIDE COAT OF VARNISH.

Mark on TANK SIDES: S. O. CO. OF LA.

Road Nos. Pos.	Road Nos.	Name
F. No. PLATE	4	NONE
~~DOME~~		
CAB SIDES		
BACK OF OIL TANK		

Actual Dimensions of Loco. Extreme height over all = 12'10½"

Extreme Width {Over cab boards = 9'3", Over cylinders or valve motion = 9'1½"

Length outside face of front bumper to outside face of back bumper of engine = 26'1"

THE BALDWIN LOCOMOTIVE WORKS { As Spec'n. 0-5956 Dup. of 6 32 D 1062 / Except where otherwise specified.

Memorandum Spec'n 19065

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1133 — Gen. as Photo. 5129

FOR Standard Oil Co., of New Jersey — **Engine Drawing No.** 97

P — 10-6-19

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 10' 6" Driving 10' 6" Total 10' 6"
Total wheelbase, eng. and tend. { Actual 42' 11⅛" / Limited to ---

Curves 16 degrees Grades 7%
Loco. to push cars up 7% grade while running backwards
Limits, Height 13' 0" Width ---
Weight (approximate) in working order, Total 108,000 pounds
On F. tr'k --- lbs., Drivers 108,000 lbs., B. tr'k --- lbs.

Tractive power 26,800 lbs., Ratio of adhesion 4.03
Work'g St'm Pres. 160 lbs., Service Switching
Fuel Oil (See Sup. 5yc)

Front Tube Sheet ½" Thick
1yc **Boiler** Steel Thick 9/16" Bill 8743
Boiler, Diam. 58" Plan Straight Top
3yc Boiler st'm pres. 160 lbs., Tested to { 180 lbs. steam pres. / 240 lbs. water pres.
With factor of Safety of 5.48
Longitud. seams Butt jointed, double covering strips

8 **Dome,** diam. 29" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 83-7/16" Width 60" Depth F. 51-1/2" B. 48-1/2"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back ⅜"
Firedoor opening Oval 13" x 18". Crown and sides in one sheet.
Water space, Front 4" Sides 3½" Back 3½"
Water space, Frame Double Riveted
Water space stays 15/16" diam. (See Sup. 9)
Full installation, about 538, American Flexible water space stays.
Radial stays 1" diam. Sling stays front { Two Rows B. L. W. Expansion Stays
Button heads below crown on Six central rows
Crown bars None Placed --- above crown
Crown bolts ---

7 Flues ---
Tubes #12 W.G. Charcoal Iron or Steel (B.L.W.Option)
Tube ends Swaged for copper ferrules, fire box ends
Number 208 Diam. 2" Length 11' 6"

Heating Surface	Flues ---	Combus. Chamb. ---	Total	1350 sq. ft.
	Tubes 1243 sq. ft.	Fire Box 107 sq. ft.	Fire Brick Tubes ---	
Grate area 35 sq. ft.	Ratio to Heating Surface 1 : 38.5			
Superheater ---				

Fire Brick Arch, None
Fire box lined with fire brick for oil burning.
Fire brick pavement in pan.
5yc **Grates** None
Ash Pan, Dampers Front only

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

5yc **Smokebox** extension Short 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 Straight Dia. 16"

(Spec)
Safety Valves Two Coale 3" Plain
Safety valve Bore with relief lever, Set to 160 pounds
Whistle One 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" 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 R. S., three L. S. 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 Monitor (Not Spec) No. 8
Injectors, Pos. R. and L Steam pipes Copper
10yc Pipes, Check. Iron Feed Iron Overflow Iron
Check B. L. W. Pos. R. and L

Steam Heat None

12yc **Cab** Wood

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

15yc **Back Bumper** Bar Steel Back drawbar height 28¾"

Pilot None Pushing shoes At front
Front Bumper Oak Bumper plate None
Steps Across front, with hand holds.
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
Headlights and Equipment to be Schroeder Electric (Not Spec), with Incandescent Headlights.
Headlight Two Round Case 18" Reflector,
Headlight, Nos. on sides With H'd'l't step With
Lamp shelf Iron Nosing None

Bell 92 pounds Gollmar 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 Soft Steel ptd. Bands: Iron Style 9
Boiler Lagging Magnesia Sectional

W. O. Webster — Dec. 1919.
SPECIFICATION FOR LOCOMOTIVES 6 32 D 1133
FOR Standard Oil Co., of New Jersey
P

Frames Cast Steel

Cylinders, Diam. 19" Stroke 24"
St'm ports, Length 16" Width 1½" Bridges 1"
Exh. ports, Length 16" Width 2½" Valve lead 1/10"
Valve travel 5¼" Steam lap ¾" Exhaust clearance ---
Eccentric throw 5" Bypass valve None
S. F. 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 castings Iron painted Covers Steel painted
St'm chest valves Richardson balanced, with vacuum valves
Met. pkg. United States, King Type (Not Spec)
Piston Rods to be keyed to crossheads.
Pistons Cast Iron Rings sprung into solid heads.
Guides Laird Type, Steel Oil cups Needle
Crossheads Cast Steel, with bearings of cast iron, tinned
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 of case hardened iron 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 wheel hub liners None
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 3/16" 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 ---
Wheel hub liners ---
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 ---
Wheel hub liners ---
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 Westg. Combined Auto. 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 pounds.

2yc **Tender** Eight Wheeled, Drawing No. 1456
Weight, with fuel and water, about 90,000 pounds
Tank { Oil 1600 / Water 4500 } Gallons, Bill 5037
Tank "U" shape sloping back. Coal space for 6 tons.

Tool Boxes Hard Wood, Top

23yc **Frame** Steel, 10" channels, with bumpers of wood and steel plate.
24yc 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 1½" Kind Chilled cast iron plate
Tires None Con'dem'n --- Size ---
Tires held by ---
Safety chains Single

Brake Position On all wheels
Brake sch. No. 6-ET Westinghouse Auto. and Straight Air, with 10" x 12" cylinder.

List of tools, sch. 31
Photo sch. None Inspection B. L. W. (See Sup. 2)
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 11-1-19 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, style 291, Olive Green and Aluminum

Lettering to be same as for 6 32 D 1062
Mark on Sides of Cab and Tank: Standard Oil Company of N. J., Inc. / Bayonne Works
Road number to be under center of mark on cab and tank
Road Nos. Pos. Road Nos. Name None
F. No. Plate 6
F. Sand Box
Cab Sides
Sides and Back of Tank

Actual Dimensions of Loco. Extreme height over all 12' 10½"
Extreme Width: Cab boards 9' 10"; Cylinders or valve motion 9' 3"
Length outside face front bumper of engine to face of tender wedge 27' 7½"
Length face of tender wedge to outside face back bumper of tender 25' 11½"
Total length outside face front bumper of engine to outside face back bumper of tender 53' 7½"

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1133

FOR STANDARD OIL CO. OF NEW JERSEY

P

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1 BOILER TO CONFORM TO THE 1918 A. S. M. E. CODE.

2 BOILER TO BE INSPECTED BY THE HARTFORD STEAM BOILER INSPECTION AND INSURANCE CO.

3 BOILER TO BE TESTED WITH HOT WATER TO ONE AND ONE-HALF TIMES THE BOILER PRESSURE.

4 BOILER MUST HAVE FACTOR OF SAFETY OF AT LEAST 5.

5 FUEL OIL TO BE MEXICAN OIL 18.4 DEGREES BAUME.
OIL BURNING ARRANGEMENT B. L. W. STANDARD WITH BURNER IN FRONT END OF FIRE BOX. ROYALTY, IF ANY, PAYABLE BY THE B. L. W.

6 DETAILS TO BE ARRANGED SO LOCO. CAN BE READILY CHANGED TO COAL BURNER.

7 TUBES TO BE ELECTRICALLY WELDED TO BACK TUBE SHEET.

8 PROVIDE A 2" CONNECTION IN DOME, CONSISTING OF A TEE WITH A 2" VALVE ON EACH OUTLET OF THE TEE FOR SUPPLYING STEAM TO FIRE PUMPS LOCATED ON TANK CARS WHICH ARE FILLED WITH CHEMICALS FOR EXTINGUISHING OIL FIRES.

9 ALL STAY BOLTS 8" OR LESS IN LENGTH TO HAVE 3/16" HOLES DRILLED TO A DEPTH EXTENDING AT LEAST 1/2" BEYOND THE INSIDE OF THE PLATE.

10 FIRE EXTINGUISHER AS LEHIGH VALLEY R. R. CO'S. PRINT 4890-C TO BE APPLIED TO ONE INJECTOR BRANCH PIPE.

11 BOILER TO BE REINFORCED AT INJECTOR CHECKS.

12 CANVAS ROLLED STORM CURTAIN AT REAR OF CAB.

13 CAB TO HAVE DROP SEAT ON ENGINEER'S SIDE.

14 HOSE CONNECTIONS BETWEEN ENGINE AND TENDER TO BE ARRANGED SO THERE WILL BE NO TROUBLE IN ROUNDING CURVES.

15 SPRING BUMPER BETWEEN ENGINE AND TENDER.
DRAWBAR AS RAILWAY CO'S. SKETCH D 6572.

TENDER

21 OIL TANK TO BE MOUNTED ON A PLATFORM OF CREOSOTED WOOD.

22 HOSE CONNECTION BETWEEN ENGINE AND TENDER ARRANGED SO THERE WILL BE NO TROUBLE IN ROUNDING CURVES.

23 SPRING BUMPER BETWEEN ENGINE AND TENDER.

24 DRAWBAR AS RAILWAY CO'S. SKETCH D 6572.

FOR HEREAFTER: CONNECTIONS BETWEEN ENGINE AND TENDER TO BE CHANGED TO MAKE PROVISION FOR LOCOMOTIVE TAKING CURVES SEE ENGINEER'S REPORT DATED NEW YORK, JAN. 9, 1920, AND SIGNED C. L. FRY. (REQUEST K.R. 1.13.20)

THE BALDWIN LOCOMOTIVE WORKS As Specn. 0-9956 Sup. 6 32 D 1133, with same extras, except where otherwise specd.

Memorandum Spec'n 20107

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1145

Gen. as Photo. 5129

FOR Standard Oil Company of New Jersey, (Bayonne Refinery)

Engine Drawing No. 97

Nos.

5-14-20

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 10'6" Driving 10'6" Total 10'6"
Total wheelbase, eng. and tend. {Actual 43'3½" / Limited to ---

Curves 46 degrees. Grades, 7%
Loco. to push cars up a 7% grade while running backwards.
Limits, Height 13'0" Width ---
Weight (approximate) in working order, Total 108,000 pounds.
On F. tr'k --- lbs., Drivers 108,000 lbs., B. tr'k --- lbs.

Tractive power 26,800 lbs., Ratio of adhesion 4.03
Work'g St'm Pres. 160 lbs., Service Switching
Fuel Mexican Oil (See Sup. 24 etc)

Boiler Steel Thick 9/16" Bill 9804
Front Tube Sheet ½" Thick
Boiler, Diam. 58" Plan Straight Top
Tested to {Allowable st'm pres. 160 lbs. / With Factor of Safety of 5.48 / 180 lbs. steam pres. / 240 lbs. water pres.
Longitud. seams Butt jointed double covering strips.

Dome, diam. 29" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 83⅜" Width 60" Depth F. 54½" B. 48½"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back ⅜"
Firedoor opening Oval 13" x 18" Crown and sides in one sheet.
Water space, Front 4" Sides 3½" Back 3½"
Water space frame Double Riveted
Water space stays 15/16" diam. (See Sup. 29) (Spec)
Full installation, about 538, American Flexible Water Space Stays.
Radial stays 1" diam. Sling stays front {Two rows 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 (B.L.W. Option)
Tube ends Swaged for copper ferrules, fire box ends.
Number 208 Diam. 2" Length 11'6"

Heating {Flues --- Combus. Chamb. --- Total 1350
Surface {Tubes 1243 Fire Box 107 Fire Brick Tubes ---
Grate area 35 Ratio to Heating Surface 1: 38.5
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 Only

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Smokebox extenstion Short Cleaning hole and cap L. S. Only
Spark ejector or hopper With
Netting and deflect. plates None

Exhaust nozzles Double Lor
Cleaning Pipe With
Stack Straight Dia. 16"

Safety Valves Two Coale 3" Plain (Spec)
Safety valves Both with relief lever, Set to 160 pounds
Whistle One B. L. W. Plain

Steam Gauge One Iron 7" Maker's name Ashcroft (Not Spec)
Steam gauge stahs 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 One plug above fire door.
Firebox, Corners diagonal, sides and back.
Crown, Two R.S. three L. S. and three back.
Waist, One under front
Front tube sheet, One Fusible plug One.

Pump None

Injectors Two Monitor (Not Spec) No. 8
Injectors, Pos. R. and L. Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B.L.W. with stop valve. 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 28⅜"

Pilot None Pushing shoes At front
Front Bumper Oak Bumper plate None
Steps across front with hand holds.
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 18" Reflector, To turn ---
Headlight, Nos. on sides With H'd'l't step With
Lamp shelf Iron Nosing None

Bell 92 pounds Bollman 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 Pto-Bands Iron Style 9
Boiler Lagging Magnesia Sectional

C. O. Elliott October 1920.

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1145

Spec 2214

FOR Standard Oil Company of New Jersey. (Bayonne Refinery)

Nos.

Frames Cast Steel

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 5½" Steam lap ⅜" 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 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 Richardson balanced with vacuum valves.
Met. pkg. piston rods United States, King type. (Not Spec)
Piston rods to be keyed to crossheads.
Pistons Cast iron rings sprung into solid heads.
Guides Laird type, steel Oil cups Needle
Crossheads Cast steel, with bearings of cast iron, tinned.
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

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.
Driving wheel hub liners None
Drivers, O. S. Diam. 44" 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. Middle Size 3" x 6½"
Lateral play between driving boxes and wheel hubs = 3/16" 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 ---
Wheel hub liners ---
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 ---
Wheel hub liners ---
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 Westg. combined auto. and straight air
Parts {Eng. Trk. sch. ---
Foundation {Drivers, sch. M-2 American outside equalized.
Parts {Eng. Trk. 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.

Tender Eight Wheeled, Drawing No. 1612
Weight, with fuel and water, about 90,000 pounds.
Tender to be weighed: Yes
Tank {Oil 1,600 / Water 4,500 Gallons, Bill 5041 5037
Tank "U" shape, sloping back. Coal space for 9 tons.

Tool Boxes of hard wood, top.

Frame Steel, 10" channels, with bumpers of wood and steel plate.
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. No. 6 ET Westinghouse combined automatic and straight air brake, with 10" x 12" cylinder.

List of tools, sch. 31
Photo sch. None Inspection B. L. W. except for boiler. See Sup. 1-23
To be weighed Yes Material specns B. L. W. except for boiler. (See Sup. 4)
Certificate of boiler test Three copies B. L. W. form 1036
Junior laws to 9-1-20 Shipment On own wheels.

Brass shop finish, No. 1
Machine shop finish 2-165

B. L. W. Patents None

Property plates None

Painting, style 291, Olive green and aluminum.

Lettering to be same as for 6 32 D 1133.
Mark on sides of cab and tank: Standard Oil Company of N. J., Inc. / Bayonne Works
Road number to be under centre of mark on cab and tank.
Road Nos. Pos. Road Nos. Name None
F. No. Plate 7
F. Sand Box
Cab Sides
Sides and back of tank

Actual Dimensions of Loco. Extreme height over all 12'10½"
Extreme Width Cab boards 9'9" Cylinders or valve motion 9'3"
Length outside face front bumper of engine to face of tender wedge 28'0"
Length face of tender wedge to outside face back bumper of tender 26'1½"
Total length outside face front bumper of engine to outside face back bumper of tender 54'1½"

1 BOILER TO BE OPERATED IN THE STATE OF NEW JERSEY

BOILER TO BE BUILT TO CONFORM TO THE BOILER CODE OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS (1918), AND MUST BE INSPECTED DURING CONSTRUCTION AND UPON COMPLETION BY AN AUTHORIZED INSPECTOR WHO SHALL NOT BE INTERESTED EITHER DIRECTLY OR INDIRECTLY WITH THE MANUFACTURERS.

2 A DATA REPORT, ON FORMS FURNISHED BY THE ABOVE MENTIONED STATE SHALL BE FORWARDED TO THE PROPER OFFICIAL BEFORE THE BOILER LEAVES THE BUILDER'S WORKS.

3 A HYDROSTATIC TEST SHALL BE APPLIED EQUAL TO ONE-AND -ONE-HALF (1½) TIMES THE WORKING PRESSURE.

4 THE MATERIALS ENTERING INTO THE CONSTRUCTION SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS:-

BOILER AND FIRE BOX STEEL MATERIAL FOR ONE-PIECE DOME	A.S.M.E. SPEC. PAGE 11
BOILER RIVET STEEL	A.S.M.E. SPEC. PAGE 15
BOILER RIVET IRON	A.S.M.E. SPEC. PAGE 31
BOILER BRACE IRON	A.S.M.E. SPEC. PAGE 32
BOILER STAYBOLT IRON	A.S.M.E. SPEC. PAGE 34
BOILER TUBES	A.S.M.E. SPEC. PAGE 40

5 FRONT TUBE SHEET SHALL BE OF FIRE BOX STEEL.

ALL BOILER AND FIRE BOX STEEL AND MATERIAL FOR ONE PIECE DOME SHALL BE MARKED BY THE MANUFACTURER WITH THE HEAT NUMBER, NAME OF MANUFACTURER, GRADE AND LOWEST TENSILE STRENGTH IN THE MANNER AND LOCATION DESCRIBED ON B.L.W. MARKING CARD 6859. SMOKE BOX STEEL MAY CONFORM TO B.L.W. SPECIFICATION.

6 THE MINIMUM FACTOR OF SAFETY SHALL BE FIVE. (1918)

LONGITUDINAL SEAMS SHALL BE OF BUTT AND DOUBLE STRAP CONSTRUCTION.

7 THE OUTSIDE ENDS OF SOLID STAYBOLTS, 8 IN. AND LESS IN LENGTH, SHALL BE DRILLED WITH A HOLE AT LEAST 3/16" DIA., TO A DEPTH EXTENDING AT LEAST ½" BEYOND THE INSIDE OF THE PLATES

8 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 OR CORRESPONDING TAPER TAP.	1" & 1¼"	1½" & 2"	2½" TO 4"
NO. OF THREADS PER INCH.	11½	11½	8
MINIMUM NO. OF THREADS REQUIRED IN OPENING.	4	5	7
MINIMUM THICKNESS OF MATERIAL REQUIRED TO GIVE ABOVE NO. OF THREADS.	⅜"	7/16"	½"

IF THICKNESS OF BOILER MATERIAL IS NOT SUFFICIENT TO GIVE THE ABOVE NUMBER OF THREADS, A LINER OR FLANGE MUST BE APPLIED.

9 EACH BOILER MUST BE PROVIDED WITH A CONNECTION ¼ PIPE SIZE FOR ATTACHING INSPECTOR'S TEST GAUGE.

10 A FUSIBLE PLUG MUST BE APPLIED. THE PLUG MUST BE FILLED WITH PURE TIN AND THE LEAST DIAMETER OF THE FUSIBLE METAL MUST BE NOT LESS THAN ½" EXCEPT FOR BOILING PRESSURE ABOVE 175 LBS., IN WHICH CASE THE LEAST DIAMETER SHALL NOT BE LESS THAN ⅜". (I.E. THE FUSIBLE PLUG CARD 4114 FOR PRESSURE ABOVE 175 LBS. AND FUSIBLE PLUG CARD 4219 FOR 175 LBS. AND LESS).

15 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.

16 SAFETY VALVES MUST MEET THE REQUIREMENTS OF THE A. S. M. E. BOILER CODE AND MUST BE PLAINLY STAMPED BY THE MANUFACTURER AS PER B. L. W. MARKING CARD 6858.
SAFETY VALVES OVER 3" IN DIAMETER SHALL HAVE FLANGED INLETS. THESE FLANGES SHALL CONFORM TO THE AMERICAN STANDARD.
ALL SAFETY VALVES MUST BE PROVIDED WITH RELIEF LEVERS.

17 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 LEGS ALSO WHERE POSSIBLE ONE NEAR THE THROAT SHEET.

18 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 EXCEEDING ¼" LESS THAN FULL SIZE FOR PLATES OVER ⅝" IN THICKNESS, AND ⅜" LESS THAN FULL SIZE FOR PLATES ⅝" 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.

19 UPON COMPLETION, EACH BOILER SHALL BE STAMPED IN THE PRESENCE OF THE AUTHORIZED INSPECTOR, WITH THE WORDS AS ARRANGED BELOW. THE HEIGHT OF THE LETTERS AND FIGURES SHALL NOT BE LESS THAN ¼". THE LOCATION OF THE STAMP SHALL BE ON THE BACK HEAD ABOVE A PLUG HOLE.

(Manufacturer's Serial Number)	NEW JERSEY (State in which boiler is to be used) No. 5 (Manufacturer's Serial Number) THE BALDWIN LOCOMOTIVE WORKS (Name of Manufacturer) (LEAVE BLANK) (Order number) (LEAVE BLANK) (Year put in service) 160 LBS. (Maximum working pressure when built)

21 LOCOMOTIVE TO OPERATE IN NEW JERSEY.

22 BOILER TO CONFORM TO THE (1918) A.S.M.E. CODE. (See Sups. 1 To 19)

23 BOILER TO BE INSPECTED BY THE HARTFORD STEAM BOILER INSPECTION AND INSURANCE COMPANY.

24 FUEL OIL TO BE MEXICAN OIL. (SEE SUP. 25)
OIL BURNING ARRANGEMENT B. L. W. STANDARD, WITH BURNER IN FRONT END OF FIRE BOX.
ROYALTY, IF ANY, PAYABLE BY THE B. L. W.

25 HEATING SYSTEM FOR OIL TANK TO CONSIST OF A COIL OF SUFFICIENT CAPACITY TO MAINTAIN MEXICAN FUEL OIL OF BOUT 12° DEGREE GRAVITY AT 150 DEGREES TO 160 DEGREES FAHRENHEIT.

26 OIL SUPPLY LINE FROM TENDER TO ENGINE TO HAVE FOUR-BALL UNIVERSAL JOINTS (INSTEAD OF 3.) AS PREVIOUSLY FURNISHED FOR 6 32 D 1062.
DO NOT FAIL TO PROVIDE FOUR-BALL OIL JOINTS.

27 DETAILS TO BE ARRANGED SO THAT LOCO. CAN READILY BE CHANGED TO COAL BURNER.

28 DETAILS, SUCH AS FUEL OIL, FIRE EXTINGUISHER, ETC., TO BE SAME AS FOR 6 32 D 1133.

29 ALL STAY BOLTS 8" OR LESS IN LENGTH TO HAVE 3/16" HOLES DRILLED TO A DEPTH EXTENDING AT LEAST ½" BEYOND THE INSIDE OF THE PLATE. (See Sup 7)

30 TUBES TO BE ELECTRICALLY WELDED TO BACK TUBE SHEET.

31 PROVIDE A 2" CONNECTION ON DOME, CONSISTING OF A TEE WITH A 2" VALVE ON EACH OUTLET OF THE TEE FOR SUPPLYING STEAM TO FIRE PUMPS LOCATED ON TANK CARS WHICH ARE FILLED WITH CHEMICALS FOR EXTINGUISHING OIL FIRES.

32 FIRE EXTINGUISHER LEHIGH VALLEY TYPE, AS LEHIGH VALLEY R. R. CO'S. PRINT 4890-C, TO BE APPLIED TO ONE INJECTOR BRANCH PIPE. (See Sup 23)

33 BOILER TO BE REINFORCED AT INJECTOR CHECKS.

34 CANVAS ROLLED STORM CURTAIN AT REAR OF CAB, SAME AS FOR 6 32 D 1133.
DROP WINDOWS TO BE INSTALLED IN BACK END OF ENGINE CAB.
CAB TO HAVE DROP SEAT ON ENGINEER'S SIDE.

35 HOSE CONNECTIONS BETWEEN ENGINE AND TENDER TO BE ARRANGED SO THERE WILL BE NO TROUBLE IN ROUNDING CURVES.

36 SPRING BUFFER BETWEEN ENGINE AND TENDER.
UNLIKE AS RAILWAY CO'S SKETCH 06572, (HEREWITH) MODIFIED TO SUIT TENDER HEDGE.

4 COMPANY HAD TO BUILD UP CHAFING BLOCK 4" AND LENGTHEN IT TO 23" FOR 6 32 D 1133. THIS GIVES APPROXIMATELY 18" BETWEEN ENGINE AND TENDER WHICH WAS NECESSARY TO PREVENT OUTSIDE OF BACK ENGINE BUMPER AND TENDER BUMPER FROM LOCKING AND DERAILING ON SHARP CURVES.
ADDITIONAL CLEARANCE TO BE PROVIDED BETWEEN ENGINE AND TENDER.
CLEAR DISTANCE BETWEEN ENGINE AND TENDER SHALL NOT BE LESS THAN 18".
CHANGES IN CHAFING PLATE AS SHOWN ON CO'S. SKETCH MADE NECESSARY BECAUSE OF SHARP CURVATURES OF TRACKAGE. PREVIOUS STYLE FURNISHED CAUSED LOCKING OF PLATES AND BUFFING CASTING WHICH IN TURN CAUSED THE TENDER TO DERAIL.

42 HEADLIGHT EQUIPMENT TO BE SUNBEAM ELECTRIC TYPE RE-3, WITH INCANDESCENT HEADLIGHTS.

TENDER

56 TANK TO BE FASTENED SECURELY TO PREVENT POSSIBILITY OF SHIFTING.

57 OIL SUPPLY TANK ON TENDER TO BE SET ON 8" x 10" CREOSOTED TIMBERS, BRACED WITH EXTRA HEAVY BRACES AND AMPLY RIVETED TO WATER TANK.

58 BRAKE BEAMS TO BE BUFFALO NO. 3.

THE BALDWIN LOCOMOTIVE WORKS As Spec'n. C-6194

Memorandum Spec'n 19087

SPECIFICATION FOR LOCOMOTIVES 6 - 36 D 313

FOR STANDARD OIL COMPANY OF OHIO

RD.

Gen. as PHOTO. 6308

12-11-19 **Engine Drawing No.** 11

Gauge of Road 4' 8½" Play 3/8"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"
Total wheelbase, eng. and tend. {Actual 41' 4" / Limited to ——

Curves 14 DEGREES. GRADES, 1%.

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 34,400 lbs., Ratio of adhesion 4.07
Work'g St'm Pres. 180 lbs., Service SWITCHING
Fuel SOFT COAL

Boiler STEEL Thick 11/16" Bill 8813
Front Tube Sheet ½" Thick
Boiler, Diam. 68" Plan STRAIGHT TOP
Allowable st'm pres. 180 lbs. **Tested to** 200 lbs. steam pres.
With Factor of Safety of 5.13 270 lbs. water pres.
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS.
DOME - ONE PIECE TYPE
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 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 B.L.W. EXPANSION STAYS
Button heads below crown on EIGHT central rows
Crown bars NONE Placed —— above crown
Crown bolts ——

Flues ——
Tubes No. 12 W.G. CHARCOAL IRON OR STEEL (B.L.W. OPTION)
Tube ends SWAGED 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 arrester hopper WITH
Netting and deflect. plates WITH

Exhaust nozzles DOUBLE, HIGH

Stack STRAIGHT Dia. 18"

Safety Valves TWO COALE 3" (Not Spec)
Safety valves BOTH with relief lever, Set to 180 POUNDS
Whistle ONE 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 ONE ABOVE FIRE DOOR
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

★ BOILER TO CONFORM TO THE STATE LAWS OF OHIO AND MUST BE STAMPED ON THE BACK HEAD IN THE PRESENCE OF THE AUTHORIZED INSPECTOR.

Injectors TWO MONITOR (Not Spec) No. 9
Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER
Pipes, Class IRON Feed IRON Overflow IRON
Check B. L. W. WITH STOP VALVE Pos. RIGHT AND LEFT

Steam Heat NONE

Cab STEEL, WITH CANVAS CURTAIN FOR BACK 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 34⅜"

BUMPERS TO BE GOOD AND STRONG
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 TOWER M. C. B. AUTO.

Signal fixtures, IRON ON BUMPER

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 PTD. Bands IRON Style 9
Boiler Lagging MAGNESIA SECTIONAL

THE BALDWIN LOCOMOTIVE WORKS

H.W. Howarth Jan. 1920.

SPECIFICATION FOR LOCOMOTIVES 6 - 36 D 313

FOR STANDARD OIL COMPANY OF OHIO

NO.

228

Frames CAST STEEL

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 5" Steam lap ⅞" Exhaust clearance ——
Eccentric ~~sheave~~-throw 5" By-pass valve NONE
S. F. Lubr. DETROIT TRIPLE, NO. 22 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 ROD / VALVE STEMS} UNITED STATES, KING TYPE (Not Spec)
PISTON RODS TO BE KEYED TO CROSSHEADS.

Pistons HEADS OF CAST IRON, WITH CAST IRON RINGS SPRUNG IN.
Guides STEEL Oil cups NEEDLE
Crossheads CAST STEEL, WITH BEARINGS OF CAST IRON, TINNED
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.
ECCENTRICS TO BE WELL KEYED TO AXLE.

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 wheel hub liners BRONZE, FOR MAIN WHEELS ONLY.
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 = 3/16" 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 ——
Wheel hub liners ——
Wheels, Diam. —— Tread —— King ——
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 ——
Wheel hub liners ——
Wheels, Diam. —— Tread —— King ——
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 ——
Foundation Drivers, sch. No. 2 AMERICAN O.S. EQUALIZED.
Parts Eng. Tr'k ——
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.

Tender EIGHT Wheeled, Drawing No. 1488
Weight, with fuel and water, about 83,000 POUNDS.
TENDER TO BE WEIGHED: YES
Tank 4,000 Gallons, Bill 5137
TANK "U" SHAPE, SLOPING BACK. FUEL CAPACITY 6 TONS.

Tool Boxes HARD WOOD, TOP.

Frame STEEL, 8" AND 10" CHANNELS, WITH BUMPERS OF WOOD AND STEEL PLATE.
Front Drawbar height 32⅜"
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.
STEPS AND HAND RAIL ON SLOPING BACK OF TANK.
Trucks ARCH BAR TYPE WITH CAST STEEL BOLSTERS.

Springs ELLIPTIC, B. L. W.
Journals, Diam. 5" Length 9" JOURNAL BOXES, M.C.B. TYPE
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. AUTOMATIC AND STRAIGHT AIR WITH 10" X 12" TENDER CYLINDER.

★ BOILER TO BE INSPECTED BY THE HARTFORD STEAM BOILER INSPECTION AND INSURANCE COMPANY.
List of tools, sch. 29
Photo sch. NONE Inspection B.L.W. (SEE PHOTO AND SUPPLT.) (EXCEPT SEE ★ ABOVE)
To be weighed No Material specifns B. L. W. (EXCEPT SEE SUPPLT.)
Certificate of boiler test THREE COPIES OF B.L.W. FORM 1036
Junior laws to 12-12-19 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, style 291, OLIVE GREEN AND ALUMINUM

Mark on TANK SIDES, THE STANDARD OIL COMPANY, OHIO

	Road Nos. Pos.	Road Nos.	Name NONE
F. NO. PLATE		1	
F. SAND BOX			
CAB SIDES			
BACK OF TANK			

Actual Dimensions of Loco. Extreme height over all 15' 10"
Extreme Width: Cab boards 10' 1" Cylinders or valve motion 11' 7"
Length outside face front bumper of engine to face of tender wedge = 29' 6"
Length face of tender wedge to outside face back bumper of tender = 23' 1"
Total length outside face front bumper of engine to outside face back bumper of tender = 53' 1"

SPECIFICATION FOR LOCOMOTIVES 6 36 D 313

FOR STANDARD OIL COMPANY OF OHIO

P

229

1 BOILER TO BE OPERATED IN THE STATE OF OHIO
BOILER TO BE BUILT TO CONFORM TO THE BOILER CODE OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS (1918), AND MUST BE INSPECTED DURING CONSTRUCTION AND UPON COMPLETION BY AN AUTHORIZED INSPECTOR WHO SHALL NOT BE INTERESTED EITHER DIRECTLY OR INDIRECTLY WITH THE MANUFACTURERS.

2 A DATA REPORT, ON FORMS FURNISHED BY THE ABOVE MENTIONED STATE SHALL BE FORWARDED TO THE PROPER OFFICIAL BEFORE THE BOILER LEAVES THE BUILDER'S WORKS.

3 A HYDROSTATIC TEST SHALL BE APPLIED EQUAL TO ONE-AND -ONE-HALF (1½) TIMES THE WORKING PRESSURE.

4 THE MATERIALS ENTERING INTO THE CONSTRUCTION SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS:-

BOILER AND FIRE BOX STEEL MATERIAL FOR ONE-PIECE DOME	A.S.M.E. SPEC. PAGE 11
BOILER RIVET STEEL	A.S.M.E. SPEC. PAGE 15
BOILER RIVET IRON	A.S.M.E. SPEC. PAGE 31
BOILER BRACE IRON	A.S.M.E. SPEC. PAGE 37
BOILER STAYBOLT IRON	A.S.M.E. SPEC. PAGE 34
BOILER TUBES	A.S.M.E. SPEC. PAGE 40

5 FRONT TUBE SHEET SHALL BE OF FIRE BOX STEEL.
ALL BOILER AND FIRE BOX STEEL AND MATERIAL FOR ONE PIECE DOME SHALL BE MARKED BY THE MANUFACTURER WITH THE HEAT NUMBER, NAME OF MANUFACTURER, GRADE AND LOWEST TENSILE STRENGTH IN THE MANNER AND LOCATION DESCRIBED ON B.L.W. MARKING CARD 6859. SMOKE BOX STEEL MAY CONFORM TO B.L.W. SPECIFICATION.

6 THE MINIMUM FACTOR OF SAFETY SHALL BE FIVE. (1918)
LONGITUDINAL SEAMS SHALL BE OF BUTT AND DOUBLE STRAP CONSTRUCTION.

7 THE OUTSIDE ENDS OF SOLID STAYBOLTS, 8 IN. AND LESS IN LENGTH, SHALL BE DRILLED WITH A HOLE AT LEAST 3/16" DIA., TO A DEPTH EXTENDING AT LEAST ½" BEYOND THE INSIDE OF THE PLATES

8 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 TABLES:

SIZE OF PIPE CONNECTION OR CORRESPONDING TAPER TAP.	1" & 1½"	1½" & 2"	2½" TO 4"
NO. OF THREADS PER INCH.	11½	11½	8
MINIMUM NO. OF THREADS REQUIRED IN OPENING.	4	5	7
MINIMUM THICKNESS OF MATERIAL REQUIRED TO GIVE ABOVE NO. OF THREADS.	⅞"	7/16"	⅞"

IF THICKNESS OF BOILER MATERIAL IS NOT SUFFICIENT TO GIVE THE ABOVE NUMBER OF THREADS, A LINER OR FLANGE MUST BE APPLIED.

9 EACH BOILER MUST BE PROVIDED WITH A CONNECTION ¼ PIPE SIZE FOR ATTACHING INSPECTOR'S TEST GAUGE.

10 A FUSIBLE PLUG MUST BE APPLIED. THE PLUG MUST BE FILLED WITH PURE TIN AND THE LEAST DIAMETER OF THE FUSIBLE METAL MUST BE NOT LESS THAN ½" EXCEPT FOR WORKING PRESSURE ABOVE 175 LBS., IN WHICH CASE THE LEAST DIAMETER SHALL NOT BE LESS THAN ⅜", (I. E., USE FUSIBLE PLUG CARD 4114 FOR PRESSURE ABOVE 175 LBS. AND FUSIBLE PLUG CARD 1219 FOR 175 LBS. AND LESS).

15 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.~~

16 SAFETY VALVES MUST MEET THE REQUIREMENTS OF THE A. S. M. E. BOILER CODE AND MUST BE PLAINLY STAMPED BY THE MANUFACTURER AS PER B. L. W. MARKING CARD 6858.
SAFETY VALVES OVER 3" IN DIAMETER SHALL HAVE FLANGED INLETS. THESE FLANGES SHALL CONFORM TO THE AMERICAN STANDARD.
ALL SAFETY VALVES MUST BE PROVIDED WITH RELIEF LEVERS.

17 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: ALSO WHERE POSSIBLE ONE NEAR THE THROAT SHEET.

18 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 ⅝" IN THICKNESS, AND ⅛" LESS THAN FULL SIZE FOR PLATES ⅝" 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 ¼" LESS THAN FULL SIZE AND THEN DRILLED, REAMED OR FINISHED FULL SIZE WITH ROTATING CUTTER.

19 UPON COMPLETION, EACH BOILER SHALL BE STAMPED IN THE PRESENCE OF THE AUTHORIZED INSPECTOR, WITH THE WORDS AS ARRANGED BELOW. THE HEIGHT OF THE LETTERS AND FIGURES SHALL NOT BE LESS THAN ¼" THE LOCATION OF THE STAMP SHALL BE ON THE BACK HEAD ABOVE A PLUG HOLE.

(MANUFACTURER'S SERIAL NUMBER)	OHIO (STATE IN WHICH BOILER IS TO BE USED)
	No. 27 (MANUFACTURER'S STATE STANDARD NUMBER)
	THE BALDWIN LOCOMOTIVE WORKS (NAME OF MANUFACTURER)
	(LEAVE BLANK) (STATE'S NUMBER) (LEAVE BLANK) (YEAR PUT IN SERVICE)
	180 LBS. (MAXIMUM WORKING PRESSURE WHEN BUILT)

THE BALDWIN LOCOMOTIVE WORKS As Spec. C-5678

Memorandum Spec'n 19021

SPECIFICATION FOR LOCOMOTIVES 4 6 C 19

FOR Standard Oil Company, Parkersburg, West Virginia

Gen. as Photo 6520

Engine Drawing No. 9

4.18.19

Gauge of Road 2' 6" Play 1/2"
Wheelbase, Rigid 3' 4" Driving 3' 4" Total 3' 4"
Total wheelbase, eng. and tend. { Actual ----- / Limited to -----

Curves -----
Rails 25 pound A.S.C.E. section, Grade 3%
Limits, Height 8' 0" Width -----
Weight (approximate) in working order, Total 13600 pounds
On F. tr'k ----- lbs., Drivers 13600 lbs., B. tr'k ----- lbs.

Tractive power 2448 lbs., Ratio of adhesion 5.5
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 8508
Boiler, Diam. 24" Plan Straight top
Boiler st'm pres. 160 lbs., Tested to 180 lbs. steam pres.
With factor of safety of 6.5 214 lbs. water pres.
Longitud. seams Single riveted, lap joints

Dome, diam. 12" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 20-13 3/16" Width 27 1/8" Depth F. 28" B. 28"
Firebox, Tube 3/8" Crown 5/16" Sides 5/16" Back 5/16"
Firedoor opening Rectangular, 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 1/4" deep from O.S.

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 #13 W.G. Charcoal Iron or Steel. (B.L.W. Option)
Tube ends Swaged for copper ferrules, fire box ends.
Number 46 Diam. 1 1/2" Length 6' 0"

Heating Surface | Flues ----- Combus. Chamb. ---- Total 1240
Tubes 1070 Fire Box 170 Fire Brick Tubes ---
Grate area 3.90 Ratio to Heating Surface 1 : 31.8
Superheater -----

Fire Brick Arch None

Grates Plain bars
Ash Pan, Dampers R. and L.

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Smoke box to have short extension.
Smokebox extension With Cleaning hole and cap None
Spark ejector or hopper None
Netting and deflect. plates With

Exhaust nozzles Single-high

Blast Straight Dia. 6" Hole in S. B. dia. 6 3/8"

Safety Valves Two Consolidated 1 1/2" (Not Spec)
Safety valves None with relief lever. Set to 160 pounds
Whistle One B. L. W. Plain

Steam Gauge One Iron 4 1/2" 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 One filling plug in top of boiler
Firebox Corners, front ones diagonal
Crown, One R.S. and one 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 ---

(Not Spec)
Injectors 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. Pos. R. and L.

Steam Heat None

Cab Wood
Fuel box in left side of cab, capacity 1/2 ton.

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 and back; with hand holds.

F. & B. Drawhead, Center above rail 14" to middle pocket.
Coupler Cast Iron Drawhead with three pockets for link and pin coupling, as Co's pt. No. 58-19

Signal fixtures None

Headlight One Round case 8" Reflector, To burn Kerosene
Headlight, Nos. on sides None H'd'l st'p None
Lamp shelf None Nosing -----

Bell 16 pounds
Sand Box One Diam. 15" Body Iron Ptd. Pipes Iron
Sander Hand, to sand front and back.

Dome casing Iron painted.

Boiler Jacket #22 Soft Steel Ptd. Bands Iron Style 9
Boiler Lagging Magnesia [illegible]

THE BALDWIN LOCOMOTIVE WORKS

C. W. Peech

SPECIFICATION FOR LOCOMOTIVES 4 6 C 19 19 MAY-1919

FOR The Standard Oil Company.

231

Frames Cast Steel Braces Solid

Cylinders, Diam. 6" Stroke 10"
St'm ports, Length 1 1/4" Width 3/8" Bridges 3/8"
Exh. ports, Length 1 1/4" Width 1 1/4" Valve lead 1/32"
Valve travel 3" Steam lap 1/4" Exhaust clearance -----
Eccentric crank throw 2" By-pass valve None
S. F. Lubr. Michigan Double Bull's Eye, 1/3 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 None
St'm chest valves Plain "D"
Valve stem [illegible] Braided
Piston rods to be keyed to crosshead

Pistons Cast Iron rings sprung into solid head
Guides Steel Oil cups Needle
Crossheads Cast Steel with bearings of Cast Iron tinned.
Wrist Pins Steel Rod cups Needle R-in, forged on side rods
Parallel rods to have solid ends. R.S.H.Z.

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 stayboltts) 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. 29" Cen. diam. 17" Centers Cast Iron

Tires Steel Held by Shrinkage and Shoulder
Tires, Flanged, Pos. All Size 1 1/2" x 4 3/8"
Tires, Plain, Pos. None Size -----
Lateral play between driving boxes and wheel hubs = 1/32" total
Driving Boxes Cast Iron
Journals, Diam. 3 1/4" 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 { Driver, 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. -----
Provide separate lubricator for steam brake valve

Tender None

Tank 150 Gallons. Bill 3939
Saddle tank over top of boiler and extending over smoke box.

Actual dimensions of Loco.- Extreme height over all 7'2 1/2"
Extreme width { Over Cab boards 5'11" / Over cylinders or valve motion 4'9"
Length outside face of front bumper to outside face of back bumper of engine 12'2"

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 5.2.19 Shipment On car

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

B. L. W. Patents } None

Property plates, None

Omit front number plate and apply Builders Card on smoke box front.

Painting: Engine, style 222 Black and Yellow
Painting:- Tender, style -----

Lettering in plain block letters 4" high.
Mark on Tank sides, Camden Refinery

Figures 4" high on cab.
Road Nos. Pos. Road Nos. Name None
Sand Box 2
Cab sides

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-5929

Memorandum Spec'n 19062

SPECIFICATION FOR LOCOMOTIVES 6 30 D-471

FOR The Steel and Tube Company of America.

RTL

Gen. as Photo 5088

Engine Drawing No. 62

8-28-19.

Gauge of Road 4' 8½" Play ¾"

Wheelbase, Rigid 9' 6" Driving 9' 6" Total 9' 6"

Total wheelbase, eng. and tend. { Actual 40' 4" / Limited to —

Curves —

Limits, Height (See Sup.1) Width (See Sup.1)

Weight (approximate) in working order, Total 101,600 pounds

On F. tr'k — lbs., Drivers 101,600 lbs., B. tr'k — lbs.

Tractive power 25,000 lbs., Ratio of adhesion 4.06

Work'g St'm Pres. 180 lbs., Service Switching

Fuel Soft Coal

Front Tube Sheet ½" thick.

Boiler Steel Thick ⅝" Bill 8700

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 5.05

Longitud. seams Butt jointed, double covering strips.

Dome, diam. 29" Pos. Central

Firebox Steel Combustion chamb. None

Firebox, length 66 11/16" Width 40⅜" Depth F. 57¾" B. 55¼"

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

Firedoor opening 16" diam. Crown and sides in one sheet.

Water space, Front 4" Sides 3½" Back 3½"

Water space, Frame Single Riveted

3 Water space stays ⅜" diam. with 3/16" holes 1¼" deep from O.S.

Radial stays 1" diam. Sling stays front { Two rows 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 (B.L.W. Option)

Tube ends Swaged for copper ferrules, fire box ends

Number 15 Diam. 5½" Length 12' 5"

96 2"

Heating Surface	Flues 2665	Combus. Chamb. —	Total 9895	
	Tubes 6205	Fire Box 945	Fire Brick Tubes 95	
Grate area 18.95	Ratio to Heating Surface 1 : 52.3			
Superheater 2215				

Fire Brick Arch, American Arch Co.'s Security Arch on two tubes of seamless steel, 3" outside diam. and .18" thick.

Grates Rocking bars and drop plate

Ash Pan, Dampers Front and Back

Throttle Balance Pos. Dome

Dry pipe Steel

Superheater Schmidt type (See Sup.4-c)

Smokebox extension With 8 Cleaning hole and cap L. S. only

Spark arrester on hopper With

Netting and deflect. plates With

Exhaust nozzles Single, High

2 Nozzle Straight Dia. 18"

(Spec'd) **Safety Valves** Two Coale 2½" Plain

Safety valves None with relief lever, Set to 180 pounds

Whistle One B. L. W. Plain

Steam Gauge One Iron 7" Maker: Ashcroft (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 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

7 **Cleaning Plugs**

Firebox Corners, back ones diagonal

Crown, Two each side and two back

Waist, Two under (See Sup.7)

Front tube sheet, Two Fusible plug One

Pump None Pos. —

Top chamb. — Bottom chamb. —

Feed Cock — Feed pipes —

Checks — Check pipes —

Injectors Two Monitor (Not Spec'd) 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

28 **Cab** Steel, lined with wood.

Cab boards Steel Nosing T-Iron

Running boards Steel Nosing T-Iron

Hand rail Iron Located on boiler

9 **Back Bumper** Bar Steel Back drawbar height 29½"

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 (See Sup.10)

Coupler (See Sup.10)

Signal fixtures None

Headlight Two Round Case 16" Reflector, To burn Kerosene

Headlight, Nos. on sides With Hd'l't stay 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 Air, Trap A-1, in each box, to sand front and back

Dome casing Iron painted

Boiler Jacket #22 Soft Steel planished Iron Style 9

Boiler Lagging Plastic Magnesia from B.L.W. Stock.

THE BALDWIN LOCOMOTIVE WORKS

C. Wagner Oct. 1919.

SPECIFICATION FOR LOCOMOTIVES 6 30 D 471

FOR The Steel and Tube Company of America.

RTL

{ Furnish to Company, One set of VanDyke Prints. 239 230

Frames Cast Steel

Cylinders, Diam. 18" Stroke 24"

St'm ports, Length 19.63" Width 1⅛" Bridges —

Exh. ports, Length — Width — Valve lead ⅛"

Valve travel 5" Steam lap ⅞" Exhaust clearance —

Eccentric crank throw 12⅞" By-pass valve None

(Spec.) S. F. 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 8" diam. Piston Valves

(Not Spec.) Met. pkg. Piston rods / Valve stems United States, King type

Piston rods to be keyed to crossheads.

Pistons Cast iron rings sprung into solid head.

Guides Laird type, steel Oil cups Needle

Crossheads Cast steel with bearings of cast iron, tinned.

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 wheel hub liners None

Drivers, O. S. Diam. 48" Cen. diam. 42" 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 = 1/8" 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 —

Wheel hub liners —

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 —

Wheel hub liners —

Wheels, Diam. — Tread — Kind —

Tires — Cen. diam. — Size —

Tires held by —

Brake, position On all driving and tender wheels

11 Operating { Engine, sch. No. 6-ET Westg. Combined Auto. and Straight Air / Parts / Eng. Tr'k, sch. —

Foundation { Drivers, sch. No. 2 American O.S. Equalized / Parts / Eng. Tr'k, sch. —

Air pump One 9½" Pos. Left Side

12 Train connections Front and Back

Train signal, sch. None

Air reservoirs to have hydrostatic test of 210 pounds.

24 **Tender** Eight Wheeled, Drawing No. 1444

Weight, with fuel and water, about 92,500 pounds

Tank 4500 Gallons, Bill 4986

Tank "U" shape, sloping back. Fuel Capacity 6 tons.

Coal gate of steel.

Tool Boxes Steel, Top

Frame Steel, 8" and 10" channels

Front and back bumpers of cast steel.

21 Front Drawbar height 27¼"

Pilot None Pushing shoes Cast in bumper

Back drawhead, center above rail (See Sup.28)

Coupler (See Sup.28)

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

Steps across rear with hand rail.

Steps on sloping back of tank with hand rail.

Trucks Arch bar type, with steel bolsters.

Springs Elliptic - B. L. W.

24 Journals, Diam. 4½" Length 8"

Wheels, Diam. 30" Tread 4¼" Kind Chilled cast iron plate

Tires None Cen. diam. — Size —

Tires held by —

Safety chains Single

30 **Brake** Position On all wheels

Brake sch. No. 6-ET Westg. Auto. with 10" x 12" cylinder.

List of tools, sch. 29

Photo sch. No. 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 9-20-19 Shipment On own wheels

Brass shop finish, No. 1

Machine shop finish D-165

B. L. W. Patents { Feed Water Strainer, Pat'd Sept. 1, 1903 (Cast on)

Property plates None

Painting, style 291 Olive Green and Aluminum

Mark on tank sides: { The Steel and Tube Company of America

Road Nos. Pos. Road Nos. Name None

F. No. Plate 8

F. Sand Box

Cab Panel

Back of Tank

Actual Dimensions of Loco. Extreme height over all 12' 9½"

Extreme Width: Cab boards 10' 1"; Cylinders or valve motion — 9' 4"

Length outside face front bumper of engine to face of tender wedge = 26' 10"

Length face of tender wedge to outside face back bumper of tender = 24' 4½"

Total length outside face front bumper of engine to outside face back bumper of tender = 51' 2½"

SPECIFICATION FOR LOCOMOTIVES 6 30 D 471

FOR THE STEEL AND TUBE COMPANY OF AMERICA.

RTL

1 CLEARANCE LIMITATIONS TO BE SAME AS FOR 6 36 D 236 AND 241.

2 TOP OF LOCOMOTIVE TO BE LINED UP SO STACK AND CAB WILL BE SYMETRICAL.

3 FLEXIBLE STAYS - (NOT SPEC) TATE, ABOUT 300, LOCATED IN BREAKING ZONE.

4 SUPERHEATER AS LOCO. SUPERHEATER CO.'S SPECIFICATION NO. S-45-060-C, DATED SEPT. 22, 1919 (COPY ATTACHED). SUPERHEATER TO CONNECT WITH TOP HEADER IN SMOKE BOX AND TO HAVE OUTSIDE STEAM PIPE CONNECTIONS TO VALVE CHAMBERS. ROYALTY PAYABLE BY THE B. L. W.

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

6 STACK TO BE SIMILAR TO PHOTO 5088.

7 WASHOUT PLUGS TO BE LOCATED AS FOLLOWS:
ONE TO BE 12" BACK OF FRONT FLUE SHEET, AND ONE 24" FORWARD OF BACK FLUE SHEET, IN BELLY OF BOILER.
ONE PLUG EACH SIDE OF BOILER IN FRONT OF INJECTOR CHECK.

8 CAB TO BE SIMILAR TO PHOTO 5088.

9 CHAFING PLATES OF CAST STEEL WITH SPRING BUFFER BETWEEN ENGINE AND TENDER.

10 COUPLERS, SHARON M. C. B. AUTO. 33½" CENTER ABOVE TOP OF RAIL, FITTED IN NATIONAL MALLEABLE CASTINGS COMPANY'S EXTENDED FLOOR POCKETS AND SHARON SMALL SPECIAL COUPLERS, 16" CENTER ABOVE TOP OF RAIL WITH RADIAL ATTACHMENT FOR USE WITH INGOT AND CHARGING CARS, AS SHOWN ON CO.'S DRAWING 69-008.

11 UNIONS OF MARK COLD DRAWN STEEL.

12 STEAM TRAIN LINE (1½) TO RUN TO FRONT OF ENGINE AND TO REAR OF TENDER TO SUPPLY STEAM AT FULL BOILER PRESSURE TO STEAM CYLINDERS OF LADLE CARS. THIS TRAIN LINE TO BE EQUIPPED WITH A STANDARD STEAM HEAT HOSE, EQUIPPED WITH AN M. C. B. STANDARD STEAM HEAT HOSE COUPLER, AND LOCATED IN REFERENCE TO SHANK OF M. C. B. COUPLER IN ACCORDANCE WITH M. C. B. RECOMMENDED PRACTICE AS OUTLINED ON SHEET Q-1.
NOT NECESSARY TO PROVIDE STEAM REDUCING VALVE IN CAB FOR STEAM LINE TO LADLE CARS.

TENDER

26 TENDER TO BE SIMILAR TO 6 36 D 236 AND 241 EXCEPT TRUCK FRAMES TO BE MADE TO SUIT HEIGHT OF ENGINE.

27 CHAFING PLATES OF CAST STEEL WITH SPRING BUFFER, BETWEEN ENGINE AND TENDER.

28 COUPLERS: SHARON M. C. B. AUTO. 33½" CENTER ABOVE TOP OF RAIL, FITTED IN NATIONAL MALLEABLE CASTINGS COMPANY'S EXTENDED FLOOR POCKETS AND SHARON SMALL SPECIAL COUPLERS, 16" CENTER ABOVE TOP OF RAIL, WITH RADIAL ATTACHMENT FOR USE WITH INGOT AND CHARGING CARS AS SHOWN ON CO.'S DRAWING 69-008.

29 NATIONAL MALLEABLE CASTINGS COMPANY'S JOURNAL BOXES FOR COIL SPRINGS.

30 UNIONS OF MARK COLD DRAWN STEEL.

L 235

SPECIFICATION FOR LOCOMOTIVES 6 30 D 471

FOR THE STEEL AND TUBE COMPANY OF AMERICA.

Specification for Type A Double Loop Superheater. SPEC'N. S-45-060-C, DATED SEPT. 22, 1919.

BOILER TUBES	96 in number 2" o. d. 12 ft. 5 in. over tube sheets. Tubes located between and adjacent to boiler flues are to be beaded over at front end. Tubes to be in accordance with the American Society for Testing Materials Specification A-28-18.
BOILER FLUES	15 in number 5½" o. d. #9 BWG of cold drawn seamless steel. Flues to be in accordance with the American Society for Testing Materials Specification A-28-18 Card 1524-D
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 Card 5048L
TUBE SHEET LAYOUT	
UNITS	15 units 1½" o. d. #9 BWG Pipes to be in accordance with the American Society for Testing Materials Specification A-28-18. Pipes united by return bends. Each unit to be tested, before being placed in boiler, with water under pressure of 500 lb. per sq. in.
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-A Card 1064-L
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 11249-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 SEE ABOVE
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 pipe or cylinder. Pipe to be well protected against freezing. Card 1149-J
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 40483
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 11049-Z	S. H. UNIT BOLT WASHER	Card 1071
DAMPER CYL. ARM	Card 1074	S. H. UNIT CLAMP	Card 1073
DAMPER CYL. PIPE FITTING	Card	S. H. UNIT CLAMP WASHER	Card 10805
DAMPER CYL. PIPE UNION	Card 1114	S. H. PIPE END	Card 1346
DAMPER CYL. PIPING DIAGRAM	Card 3261	S. H. PIPE BAND	Card 1988
DAMPER CYL. SUPPORT	Card	SPACING OF BANDS & SUPPORTS	Card 10759
DAMPER SHAFT	Card 1235-J & 1235-G	TYPE OF RETURN BENDS	FORGED
DAMPER SHAFT ARM	Card 1234 & 1226	RETURN BENDS	Card 11022
DAMPER SHAFT BEARING (O.S.)	Card 1223	LUBRICATOR CONNECTION	Card 3023
DAMPER SHAFT BEARING (I.S.)	Card 10386-B	DEFLECTING PLATE HANDLE	Card 1487
DAMPER SHAFT LINK	Card 1070-K	DEFLECTING PLATE STUDS	Card 10809
PAYMENT PLATE	Card 3274	DEFLECTING PLATE CLAMP	Card 10809-A
DAMPER SHAFT BEARING	Card 11277-E	PYROMETER	NONE

THE BALDWIN LOCOMOTIVE WORKS Dup 6-30 D 1457 Same Extras

Memorandum Spec'n 19074

SPECIFICATION FOR LOCOMOTIVES 6 - 30 D 1472

FOR The Steel & Tube Company of America

P

Gen. as Photo. 2048

Engine Drawing No. 49

11-5-19

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 9' 6" Driving 9' 6" Total 9' 6"
Total wheelbase, eng. and tend. {Actual 38' 0½" / Limited to ---

Curves 25 degrees Grade 1%

Limits, Height --- 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

Boiler Steel Thick ⅞" Bill 8760
Front Tube Sheet ½" Thick
Boiler, Diam. 56" Plan Straight Top
3/8" {Allowable st'm pres. 180 lbs. / With Factor of Safety of 5.6} **Tested to** {200 lbs. steam pres. / 270 lbs. water pres.}
Longitud. seams Butt jointed, double covering strips

Dome, diam. 29" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 66⅝" Width 39⅛" Depth F. 66" B. 63½"
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. (See Sup. 5)
Radial stays 1" diam. Sling stays front Two Rows 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. Steel
Tube ends Swaged for copper ferrules fire box ends
Number 202 Diam. 2" Length 12' 5"

Heating Surface (Flues ---- Combus. Chamb. ---- Total 1410⁵
Tubes 1305⁵ Fire Box 105⁵ Fire Brick Tubes ---
Grate area 15.9 Ratio to Heating Surface 1: 88
Superheater ---

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 Left Side Only
Spark ejector or hopper With
Netting and deflect. plates With

Exhaust nozzles Double, High

Stack Straight Dia. 16"

Safety Valves Two Consolidated 2½" (Not Spec.)
Safety valves Both 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 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, L. S. and back
Crown, Two each side and three back
Waist, One under front
Front tube sheet Two Fusible plug One

Pump None

Injectors Two Hancock Type "A" (Not Spec.) No. 8
Injectors, Pos. Right and Left 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 Steel Back drawbar height 34"

Pilot None Pushing shoes Front
Front Bumper Oak 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

6 **Headlight** Two Round Case 18" Reflector,
Headlight, Nos. on sides With H'd'l't step On Bumper and smoke-box
Lamp shelf ---- Nosing ---

Bell 92 pounds
Sand Box Two Diam. 28" Body, Iron painted Pipes Iron
Sander Leach Air, Trap A-1 (Not Spec.)

Dome casing Iron painted

Boiler Jacket #22 Soft Steel Ptd. Bands Iron Style 9
Boiler Lagging Magnesia Sectional.

THE BALDWIN LOCOMOTIVE WORKS

M. Garner June 1920.

SPECIFICATION FOR LOCOMOTIVES 6 30 D 1472

FOR The Steel and Tube Company of America

P

237 237

Frames Cast Steel
Frames to be securely braced
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 1½" Steam lap ¾" Exhaust clearance ---
Eccentric crank throw 5" By-pass valve None
S. F. Lubr. Detroit Triple No. 22 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 Balanced, with vacuum valves
Met. pkg. {Piston rod / 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, with brass gibs
Wrist Pins Steel Rod cups Plunger, forged on
Main 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.
Driving wheel hub liners None
Drivers, O. S. Diam. 48" Cen. diam. 42" 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 = 3/16" 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 ----
Wheel hub liners ----
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 ----
Wheel hub liners ----
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, Westinghouse Automatic Air / Eng. Tr'k, sch. ---
Foundation Parts { Drivers, sch. WA-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 reservoirs to have hydrostatic test of 210 pounds.

Tender Eight Wheeled, Drawing No. 356
Weight, with fuel and water, about 60,000 pounds

Tank 3000 Gallons, Bill 4521
Tank "U" shape sloping back. Fuel Capacity 7 tons.

Tool Boxes of hard wood, Top

Frame Oak and Yellow Pine, with bumpers of wood.

Front Drawbar height 30½"
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 back with handrail

Trucks Arch Bar Type with wood bolster

Springs Elliptic, B. L. W.
Journals, Diam. 3¾" Length 7"
Wheels, Diam. 30" 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. PL-1012 Westinghouse Automatic Air

List of tools, sch. 29
Photo-sch. None Inspection B. L. W. (Except See Sup. 2)
To be weighed Yes Material specns B. L. W.
Certificate of boiler test Three copies of B. L. W. form 1036
Junior laws to 11-5-19 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, style 29½, Olive Green and Aluminum

Mark on Tank Sides: THE STEEL & TUBE COMPANY OF AMERICA

Road Nos. Pos. Road Nos. Name None
F. No. Plate 103
F. Sand Box
Cab Panels
Back of Tank
Actual Dimensions of Loco. Extreme height over all 12' 11"
Extreme Width: Cab boards 9' 7"; Cylinders or valve motion = 9' 1½"
Length outside face front bumper of engine to face of tender wedge = 27' 0"
Length face of tender wedge to outside face back bumper of tender = 21' 7½"
Total length outside face front bumper of engine to outside face

SPECIFICATION FOR LOCOMOTIVES 6 30 D 472

FOR THE STEEL AND TUBE COMPANY OF AMERICA

P

238 238

1 LOCOMOTIVE IS FOR OPERATION IN WISCONSIN, AND BOILER IS TO CONFORM TO WISCONSIN STATE BOILER LAWS, I. E., THE A. S. M.E. CODE.

2 BOILER TO BE INSPECTED BY THE HARTFORD STEAM BOILER INSPECTION AND INSURANCE COMPANY.

3 BOILER TO BE TESTED WITH HOT WATER TO ONE AND ONE HALF TIMES THE BOILER PRESSURE.

4 BOILER MUST HAVE FACTOR OF SAFETY OF AT LEAST 5.

5 ALL STAY BOLTS 8" OR LESS IN LENGTH TO HAVE 3/16" HOLES DRILLED TO A DEPTH EXTENDING AT LEAST 1/2" BEYOND THE INSIDE OF PLATE.

6 HEADLIGHT EQUIPMENT TO BE PYLE NATIONAL ELECTRIC, TYPE #E-2, FOR SWITCHING SERVICE, SAME AS FURNISHED BY THE PYLE NATIONAL ELECTRIC HEADLIGHT CO. DIRECT TO THE ~~STEEL AND TUBE COMPANY OF AMERICA~~ NORTHWESTERN STEEL & WIRE Co ON THEIR ORDER #20794, EXCEPT TO PROVIDE FOR TWO HEADLIGHTS.

THE BALDWIN LOCOMOTIVE WORKS As Built No. C-2330

Memorandum Sheet in 1906

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1132

FOR The Steel and Tube Company of America.

P

Gen. as Photo. 6374 {Except Cab Roof and Oil Headlights.

Engine Drawing No. 108

B-28-19

Gauge of Road 4ft 8½in Play ¾in

Wheelbase, Rigid 8ft 6in Driving 8ft 6in Total 8ft 6in

Total wheelbase, eng. and tend. {Actual 44ft 9½in / Limited in ——

Curves ——

Limits, Height (See Sup. 1) Width (See Sup. 1)

Weight (approximate) in working order, Total 123,000 pounds

On F. trk —— lbs., Drivers 123,000 lbs., B. trk —— lbs.

Tractive power 28,900 lbs. Ratio of adhesion 4.25

Work'g St'm Pres. 180 lbs., Service Switching

Fuel Soft Coal

Front Tube Sheet ½in thick

Boiler Steel Thick 11/16in Dia. 870l

Boiler, Diam. 68in Plan Straight Top

Boiler st'm pres. 200 lbs. Tested to 220 lbs. steam pres.

With Factor of Safety of 4.6 267 lbs. water pres.

Longitud. seams Butt jointed, double covering strips

Dome, diam. 29in Pos. Central

Firebox Steel Combustion chamb. None

Firebox, length 90½in Width 40⅜in Depth F. 65⅞in B. 61⅜in

Firebox, Tube ½in Crown ⅜in Sides ⅜in Back ⅜in

Firedoor opening 16in diam.

Water space, Front 4in Sides 3½in Back 3½in

Water space, Frame Double Riveted

3 Water space stays ⅝in diam. with 3/16in holes 12in deep from O.S.

Radial stays 1in diam. Sling stays front {Two rows B. L. W. / Expansion Stays

Button heads below crown sht Eight central rows

Crown bars None Placed —— above crown

Crown bolts ——

Flues #9 W. G. Steel

Tubes #12 W. G. Charcoal Iron or Steel (B.L.W. Option)

Tube ends Swaged for copper ferrules, fire box ends

Number 22 Diam. 5½in Length 9ft 6in

144 2in

Heating Surface	Flues 2986	Combus. Chamb. ——	Total 1154
	Tubes 710	Fire Box 135	Fire Brick Tubes 11
Grate area 25.6		Ratio to Heating Surface 1 : 45.1	
Superheater 264			

Fire Brick Arch, American Arch Co's. Security Arch on two tubes of Seamless Steel 3in O. S. diam. and .18in thick.

Grates Rocking Bars and Drop Plate

Ash Pan, Dampers Front and Back

Throttle Balance Pos. Dome

Dry pipe Steel

Superheater Schmidt Type (See Sup. 40c)

Smokebox extension With 5 Cleaning hole and cap L. S. only

Spark arrester or hopper With

Netting and deflect. plates With

Exhaust nozzles Single, High

2 Stack Straight Dia. 18in

Safety Valves Two Coale 2½in Plain (Spec)

Safety valves None with relief lever, Set to 180 pounds

Whistle One B. L. W. Plain

Steam Gauge One Iron 7in 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 3in 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

7 Firebox Corners, diagonal and back

Crown, Three each side and three back.

Waist, Two under (See Sup. 7)

Front tube sheet, One Fusible plug One

Pump None Pos. ——

Top chamb. —— Bottom chamb. ——

Feed Cock —— Feed pipes ——

Checks —— Check pipes ——

Injectors Two "Monitor" (Not Spec) No. 9

Injectors, Pos. Right and Left Steam pipes Copper

13 Pipes, Check Iron Feed Iron Overflow Iron

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

Steam Heat None

2 Cab Steel, lined with wood (See Sup. 8)

Cab boards Steel Nosing T-Iron

Running boards Steel Nosing T-Iron

Hand rail Iron Located on Boiler

4 10 **Back Bumper** Bar Steel Back drawbar height 28½in

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 (See Sup. 11)

Coupler (See sup. 11)

Signal fixtures None

Headlight Two Round Case 16in Reflector, To burn Kerosene

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

Lamp shelf None Nosing ——

2 11 **Bell** 92 pounds Gollmar Air Bell Ringer

2 11 **Sand Box** Top Diam. 28in Body Iron painted Pipes Iron

11 Sander (Spec) Leach Air, Trap A-1 to sand front and back.

Dome casing Iron painted

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

Boiler Lagging Plastic Magnesia from B. L. W. stock

THE BALDWIN LOCOMOTIVE WORKS

L. G. Tandy Oct. 1919.

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1132

FOR The Steel and Tube Company of America

P

{Furnish to Company / One set of Vandyke Prints.

Revised 240

Frames Cast Steel

Cylinders, Diam. 19in Stroke 22in

St'm ports, Length 20.34in Width 1½in Bridges ——

Exh. ports, Length —— Width —— Valve lead 3/16in

Valve travel 5½in Steam lap ¾in Exhaust clearance ——

Eccentric crank throw 13⅜in By-pass valve None

S. F. Lubr. Nathan Five-feed Bulls Eye (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 —— Covers ——

St'm chest valves 9½in diam. Piston Type

Met. pkg. {Piston rods / Valve stems} United States, King Type (No. Spec)

Pistons Cast Iron rings sprung into solid head

Guides Laird type, Steel Oil cups Needle

Crossheads Cast Steel, with bearings of cast iron, tinned

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 wheel hub liners Bronze

Drivers, O. S. Diam. 42in Cen. diam. 36in Centers Cast Steel

Tires Steel Held by Shrinkage and Shoulder

Tires, Flanged, Pos. Front and Back Size 3in X 5½in

Tires, Plain, Pos. Middle Size 3in X 6½in

Lateral play between driving boxes and wheel hubs = 3/16in total

Driving Boxes Cast Steel

Journals, Diam. 8in Length 9in

Springs. Make B. L. W.

Front Engine Truck None Wheeled ——

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

Journals, Diam. —— Length —— Boxes ——

Wheel hub liners ——

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 ——

Wheel hub liners ——

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 Westg. Combined Auto. and Straight Air

Foundation Parts — Drivers, sch. WH-2 American O. S. Equalized

13 Eng. Trk, sch. ——

Air pump One 9½in Pos. Left Side

12 Train connections Front and Back

Train signal, sch. None

Air reservoirs to have hydrostatic test of 210 pounds.

2 Tender Eight Wheeled, Drawing No. 1143

Weight, with fuel and water, about 100,000 pounds

Tank 5,000 Gallons, Bill 4992

Tank "U" shape, sloping back. Fuel capacity 8 tons.

Coal gate of steel.

Tool Boxes Steel, Top.

Frame Steel, 10in Channels

Front and back bumpers of Cast Steel

2 Front Drawbar height 27½in

Pilot None Pushing shoes Cast in bumper

Back drawhead, center above rail (See Sup. 28)

Coupler (See Sup. 28)

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.

Springs Elliptic, B. L. W.

2 3 Journals, Diam. 5in Length 9in

Wheels, Diam. 30in Tread 1¼in Kind Chilled cast iron plat

Tires None Cen. diam. —— Size ——

Tires held by ——

Safety chains Single

Brake Position On all wheels

3 Brake sch. No. 6-ET Westinghouse Auto. and Straight Air with 12in X 12in tender cylinder.

List of tools, sch. 29

Photo sch. No. 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 1036

Junior laws to 9-22-19 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, style 291 Olive Green and Aluminum

Mark on Tank Sides: {The Steel and Tube Company of America

Road Nos. Pos. Road Nos. Name None

F. No. Plate 9

F. Sand Box

Cab Panel

Back of Tank

Actual Dimensions of Loco. Extreme height over all 14ft 0½in

Extreme Width: Cab boards 10ft 1in; Cylinders or valve motion 9ft 6in

Length outside face front bumper of engine to face of tender wedge 26ft 8in

Length face of tender wedge to outside face back bumper of tender 26ft 0½in

Total length outside face front bumper of engine to outside face back bumper of tender 52ft 8½in

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1132
FOR THE STEEL AND TUBE COMPANY OF AMERICA
P

1 CLEARANCE LIMITATIONS TO BE SAME AS FOR 6 36 D 236 AND 241.

2 TOP OF LOCOMOTIVE TO BE LINED UP SO STACK AND CAB WILL BE SYMMETRICAL.

3 FLEXIBLE STAYS - TATE, (Not Spec) ABOUT 3½, LOCATED IN BREAKING ZONE.

4 SUPERHEATER AS LOCO. SUPERHEATER CO'S SPECIFICATION NO. S-15-060-D DATED SEPTEMBER 22, 1919 (COPY ATTACHED). SUPERHEATER TO CONNECT WITH TOP HEADER IN SMOKE BOX AND TO HAVE OUTSIDE STEAM PIPE CONNECTIONS TO VALVE CHAMBERS. ROYALTY PAYABLE BY THE B. L. W.

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

6 STACK TO BE SIMILAR TO PHOTO. 5088.

7 WASHOUT PLUGS TO BE LOCATED AS FOLLOWS:-
ONE TO BE 12" BACK OF FRONT FLUE SHEET, AND ONE 24" FORWARD OF BACK FLUE SHEET IN BELLY OF BOILER.
ONE PLUG EACH SIDE OF BOILER IN FRONT OF INJECTOR CHECK.

8 CAB TO BE SIMILAR TO PHOTO. 5088.

9 FOOT PLATE OF CAST STEEL.

10 CHAFING PLATES OF CAST STEEL WITH SPRING BUFFER BETWEEN ENGINE AND TENDER.

11 COUPLERS, SHARON M. C. B. AUTO. 33½ CENTER ABOVE TOP OF RAIL, FITTED IN NATIONAL MALLEABLE CASTING COMPANY'S EXTENDED FLOOR POCKET; AND SHARON SMALL SPECIAL COUPLERS, 16" CENTER ABOVE TOP OF RAIL, WITH RADIAL ATTACHMENT FOR USE WITH INGOT AND CHARGING CARS, AS SHOWN ON CO'S. DRAWING 69-008.

12 STEAM TRAIN LINE (1½") TO RUN TO FRONT OF ENGINE AND TO REAR OF TENDER TO SUPPLY STEAM AT FULL BOILER PRESSURE TO STEAM CYLINDERS OF LADLE CARS. THIS TRAIN LINE TO BE EQUIPPED WITH A STANDARD STEAM HEAT HOSE, EQUIPPED WITH AN M. C. B. STANDARD STEAM HEAT HOSE COUPLER, AND LOCATED IN REFERENCE TO SHANK OF M. C. B. COUPLER IN ACCORDANCE WITH M. C. B. RECOMMENDED PRACTICE AS OUTLINED ON SHEET 8-1.
NOT NECESSARY TO PROVIDE STEAM REDUCING VALVE IN CAB FOR STEAM LINE TO LADLE CARS.

13 UNIONS OF MARK COLD DRAWN STEEL.

TENDER

26 TENDER AS 6 36 D 236 AND 241 EXCEPT TRUCK FRAMES TO BE MADE TO SUIT HEIGHT OF ENGINE BACK DECK.

27 CHAFING PLATES OF CAST STEEL WITH SPRING BUFFER BETWEEN ENGINE AND TENDER.

28 COUPLERS: SHARON M. C. B. AUTO. 33½ CENTER ABOVE TOP OF RAIL, FITTED IN NATIONAL MALLEABLE CASTING CO'S EXTENDED FLOOR POCKETS AND SHARON SMALL SPECIAL COUPLERS, 16" CENTER ABOVE TOP OF RAIL, WITH RADIAL ATTACHMENT FOR USE WITH INGOT AND CHARGING CARS, AS SHOWN ON COMPANY'S DRAWING 69-008.

29 NATIONAL MALLEABLE CASTING CO'S JOURNAL BOXES FOR COIL SPRINGS.

30 UNIONS OF MARK COLD DRAIN STEEL.

Don Hereafter Raise question about providing steam chest relief valves. (Verbal RSMcC 11/19/19)

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SPECIFICATION FOR LOCOMOTIVE 6 32 D 1132

THE STEEL & TUBE CO. OF AMERICA

Specification for Type A Double Loop Superheater. SPEAM. No. S 15-060-D SEPTEMBER 22, 1919

BOILER TUBES	114 in number 2 in. o. d. 9 ft. 6 in. over tube sheets. Tubes located between and adjacent to boiler flues are to be headed over at front end. Tubes to be in accordance with the American Society for Testing Materials Specification A-28-18.	
BOILER FLUES	22 in number 22 o. d. 5½ in. of cold drawn seamless steel. Flues to be in accordance with the American Society for Testing Materials Specification A-28-18. Card	10862-B
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	1137
TUBE SHEET LAYOUT	Card	5890-A
UNITS	22 units 13 o. d. 5½ in. Pipes to be in accordance with the American Society for Testing Materials Specification A-28-18. Pipes united by return heads. Each unit to be tested, before being placed in boiler, with water under pressure of 500 lb. per sq. in.	
UNIT PIPE SU. PORTS	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 Specifiation No. 12-A. Card	10644
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	11174
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 pipe or cylinder. Pipe to be well protected against freezing. Card	11494
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	40189
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 10648	S. H. UNIT BOLT WASHER	Card 1071
DAMPER CYL. ARM	Card 10774	S. H. UNIT CLAMP	Card 1073
DAMPER CYL. PIPE FITTING	Card	S. H. UNIT CLAMP WASHER	Card 10325
DAMPER CYL. PIPE UNION	Card 11145	S. H. PIPE END	Card 1075
DAMPER CYL. PIPING DIAGRAM	Card 3251	S. H. PIPE BAND	Card 1076
DAMPER CYL. SUPPORT	Card	SPACING OF BANDS & SUPPORTS	Card 10799
DAMPER SHAFT	Card 1234	TYPE OF RETURN BENDS	FORGED
DAMPER SHAFT ARM	Card 1234 & 1236	RETURN BENDS	Card 11022
DAMPER SHAFT BEARING (O.S.)	Card 1234 & 1236	LUBRICATOR CONNECTION	Card 1077
DAMPER SHAFT BEARING (I.S.)	Card 1234	DEFLECTING PLATE HANDLE	Card 1067
DAMPER SHAFT LINE	Card 1076	DEFLECTING PLATE STUDS	Card 10806
PISTON PLATE	Card 1234	DEFLECTING PLATE CLAMP	Card 10806-A
PISTON ROD	10648		

THE BALDWIN LOCOMOTIVE WORKS Dwg. 6 32 D 1132, WITH SAME EXCEPTIONS,
Succession Serial 2885. EXCEPT WHERE OTHERWISE SPECIFIED.

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1132

FOR The Steel and Tube Company of America.

Dwg. as Pattern 253
Engine Drawing No. 108

1.22.20

Gauge of Road 4' 8½" Play ½"
Wheels, Rigid 8' 6" Driving 6' 0" Trailing 8' 6"
Total wheelbase, eng. and tend. Actual 41' 9½" Limited to —

Curves —

Limits, Height (See sup. 32) Width (See sup. 32)
Weight (approximate) in working order, Total 123,000 pounds.
On F. truk — lbs., Drivers 123,000 lbs., R. truk — lbs.

Tractive power 28,500 lbs., Ratio of adhesion 4.25
Work'g St'm Pres. 180 lbs., Service Intermittent.
Fuel Soft Coal.

1 **Boiler** Steel Thick 11/16" Dia. 88¼
5 Front Tube Sheet ½" Thick
Boiler, Diam. 68" Plate Straight Top.
3½ Allowable stm pres. 200 lbs. **Tested to** 220 lbs. steam pres.
with Factor of Safety of 5.15 300 lbs. water pres.
6 Longitud. seams Butt jointed, double covering straps, 90° seams.

5 **Dome**, diam. 29" Pos. Central

5 **Firebox** Steel Combustion chamb. None
Firebox, length 96¼" Width 41¼" Depth F. 65¼" B. 64¾"
10 Firebox, Tube ½" Crown ⅜" Sides ⅜" Back ⅜"
Firebox opening 16" sq. air.
Water space, Front 4" Sides 3½" Back 3½"
7 Water space frame Double Riveted
Water space stays ⅝" dia. with 3/16" holes 1¼" deep from O.S.

7 Radial stays 1" o.d. Sling stays from Two Rows B.L.W. Expansion Stays.
Button heads below crown on Each vertical row
Crown bars None Placed — above crown
Crown bolts —

11 12 Flues #9 W.G. Steel
Tubes #12 W.G. Charcoal Iron or Steel (B.L.W. Option)
Tube ends Swaged for copper ferrules, fire box ends
Number 22 Diam. 5½" 2" Length 9' 6"

Heating Surface: Flues 298 sq. ft. Combus. Chamb. — Total 1134 sq. ft.
Tubes 710 sq. ft. Fire Box 137 sq. ft. Fire Brick Tubes 11 sq. ft.
Grate area 25.6 sq. ft. Ratio to Heating Surface 1: 45.1
Superheater 244 sq. ft.

Fire Brick Arch, American Arch Co's. Security Arch on Two tubes of seamless steel 3" O.S. diam. and .18" thick.

Checks Rocking Bars and Drop Plate.
Ash Pan, Dumped Front and Back

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater Schmidt Type (See sup. 35-a)

Connection with Chasing hole and cap L.S. Only
Back connection with
Fitting and deflect. plates with:
Cylinder saddle Steel, Rem.
Smokebox Diameter Dia. 78"

Safety Valves Two Consol 2½" Pops (Spec.)
Safety valves Dome with relief lever, Set at 180 pounds
Whistle One B.L.W. Plain

Steam Gauge One Iron 7" Make Ashcroft (Spec.)
Steam gauge stem Iron Check None

Water Gauge One B.L.W. (Ironclad) **Cab Lamps** to burn Oil
Gauge Cocks Three – Back Surface valve None
Lowest gauge mark 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
38 Firebox, Corners, throatsheet and back.
Crown, Three each side and three back.
Waist, Two under (See sup. 36)
Front tube sheet, One Fuel plug One

Pump None

Injectors Two "Hancock" (Not Spec.) No. 9
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 Steel, lined with wood (See sup. 33-34)

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

Back Bumper Bar Steel Back deadbeat height 28½"

Pilot None Pushing shoes Cast in Bumper
Front Bumper Cast Steel Bumper plate None
Steps across Front, with handrails.
Steps, hand holds etc. to conform to I.C.C. requirements.
Front Drawhead, Coupler above rail (See sup. 4-a)
Coupler (See sup. 4-a)

Signal fixtures None

Headlight Two Round Case 16" Reflector, To burn Kerosene
Headlight, Nos. on sides With Wind shut bars
Lamp shelf No. Mounting —

Bell 92 pounds Ordinary Air Bell Ringer
Signal Gun Toy Diam. 28" Body Iron painted Pos. Right
Sand Gravity Air, Trap A-1 to sand front and back.
Dome casing Iron painted.

Boiler Jacket #22 soft steel pto. Bands Iron Pos. Rd
Boiler Lagging Plastic Magnesia from B. L. W. stock.

March 1920

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1132

FOR The Steel and Tube Company of America.

Frames Cast Steel.

Cylinders, Diam. 19" Stroke 28"
St'm ports, Length 20.5" Width 1½" Bridges —
Exh. ports, Length — Width — Valve lead 3/16"
Valve travel 5½" Steam lap 1" Exhaust clearance —
Eccentric crank throw 13" By-pass valve None
S. F. Lubr. Nathan five-feed Bull's Eye (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 — Covers —
St'm chest valves 9½" 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, with bearings of cast iron tinned.
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 wheel hub liners Bronze
Drivers, O. S. Diam. 42" Cen. diam. 36" 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 = 3/16" total
Driving Boxes Cast Steel
Journals, Diam. 8" Length 9"

Springs, Make B. L. W.

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

Brakes, position On all driving and tender wheels.
Operating Parts { Engine, sch. No. 6 ET Horiz. Combined Auto. and Straight Air / Eng. Truk, sch. —
Foundation Parts { Drivers, sch. No. 2-C American O.S. Equalized / Eng. Truk, sch. —
Air pump Gua 9½" Pos. Left side
Train connections Front and Back.
Train signal, sch. None
Air reservoirs to have hydrostatic test of 210 pounds.

Tender 6 gut Wheeled, Drawing No. 943
Weight, with fuel and water, about 140,000 pounds.
Tender to be weighed Yes.
Tank 5,000 Gallons, Bill 1992
Tank "U" shape, sloping back. Fuel capacity 8 tons.
Coal gate of steel.
Tool Boxes Steel, top.

Frame Steel, 10" channels.
Front and back bumpers of cast steel.
Front Drawbar height 27½"
Pilot None Pushing shoes Cast in bumper.
Back drawhead, center above rail (See sup. 5-a)
Coupler (See sup. 5-a)

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 Cast Steel Bolsters.

Springs B. L. W. Elliptic.
Journals, Diam. 5" Length 9"
Wheels, Diam. 30" 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. 6 ET. Westinghouse auto and straight air brake with 12" x 12" tender cylinders.

List of tools, sch. 29
Photo sch. None Inspection B. L. W. (See sup. 1-3)
To be weighed No Material spec'ns B. L. W. Short Specs.
Certificate of boiler test Three copies of B.L.W. form 1036.
Junior laws to 9.22.19 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, style 29 Olive green and aluminum.
Lettering, etc., to be same as for 6 32 D 1132.

Mark on Tank Sides: { The Steel and Tube Company of America.

Road Nos. Pos. Road Nos. Name None
F. No. Plate 11
F. Sand Box
Cab Panel
Back of Tank

Actual Dimensions of Loco. Extreme height over all 13' 9½"
Extreme Width: Cab boards 10' 1"; Cylinders or valve casings 9' 6"
Length outside face front bumper of engine to face of tender wedge 26' 8"
Length face of tender wedge to outside face back bumper of tender 26' 0½"
Total length outside face front bumper of engine to outside face back bumper of tender 52' 8½"

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1140

FOR THE STEEL AND TUBE COMPANY OF AMERICA

P

1 BOILER TO BE OPERATED IN THE STATE OF INDIANA
BOILER TO BE BUILT TO CONFORM TO THE BOILER CODE OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS (1918), AND MUST BE INSPECTED DURING CONSTRUCTION AND UPON COMPLETION BY AN AUTHORIZED INSPECTOR WHO SHALL NOT BE INTERESTED EITHER DIRECTLY OR INDIRECTLY WITH THE MANUFACTURERS.

2 A DATA REPORT, ON FORMS FURNISHED BY THE ABOVE MENTIONED STATE SHALL BE FORWARDED TO THE PROPER OFFICIAL BEFORE THE BOILER LEAVES THE BUILDER'S WORKS.

3 A HYDROSTATIC TEST SHALL BE APPLIED EQUAL TO ONE-AND-ONE-HALF (1½) TIMES THE WORKING PRESSURE.

4 THE MATERIALS ENTERING INTO THE CONSTRUCTION SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS:-

BOILER AND FIRE BOX STEEL, MATERIAL FOR ONE-PIECE DOME	A.S.M.E. SPEC. PAGE 11
BOILER RIVET STEEL	A.S.M.E. SPEC. PAGE 15
BOILER RIVET IRON	A.S.M.E. SPEC. PAGE 31
BOILER BRACE IRON	A.S.M.E. SPEC. PAGE 32
BOILER STAYBOLT IRON	A.S.M.E. SPEC. PAGE 34
BOILER TUBES	A.S.M.E. SPEC. PAGE 40

TUBES MAY HAVE VARIATION IN GAUGE OF 10% EITHER WAY.

5 FRONT TUBE SHEET SHALL BE OF FIRE BOX STEEL.
ALL BOILER AND FIRE BOX STEEL AND MATERIAL FOR ONE PIECE DOME SHALL BE MARKED BY THE MANUFACTURER WITH THE HEAT NUMBER, NAME OF MANUFACTURER, GRADE AND LOWEST TENSILE STRENGTH IN THE MANNER AND LOCATION DESCRIBED ON B.L.W. MARKING CARD 6359. SMOKE BOX STEEL MAY CONFORM TO B.L.W. SPECIFICATION.

6 THE MINIMUM FACTOR OF SAFETY SHALL BE FIVE. (1918)
LONGITUDINAL SEAMS SHALL BE OF BUTT AND DOUBLE STRAP CONSTRUCTION.

7 THE OUTSIDE ENDS OF SOLID STAYBOLTS, 8 IN. AND LESS IN LENGTH, SHALL BE DRILLED WITH A HOLE AT LEAST 3/16" DIA., TO A DEPTH EXTENDING AT LEAST ½" BEYOND THE INSIDE OF THE PLATES

8 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 TABLES:

SIZE OF PIPE CONNECTION OR CORRESPONDING TAPER TAP.	1" & 1¼"	1½" & 2"	2½" TO 4"
NO. OF THREADS PER INCH.	11½	11½	8
MINIMUM NO. OF THREADS REQUIRED IN OPENING.	4	5	7
MINIMUM THICKNESS OF MATERIAL REQUIRED TO GIVE ABOVE NO. OF THREADS.	⅝"	7/10"	⅞"

IF THICKNESS OF BOILER MATERIAL IS NOT SUFFICIENT TO GIVE THE ABOVE NUMBER OF THREADS, A LINER OR FLANGE MUST BE APPLIED.

9 EACH BOILER MUST BE PROVIDED WITH A CONNECTION ¼ PIPE SIZE FOR ATTACHING INSPECTOR'S TEST GAUGE.

10 A FUSIBLE PLUG MUST BE APPLIED. THIS PLUG MUST BE FILLED WITH PURE TIN AND THE LEAST DIAMETER OF THE FUSIBLE METAL MUST BE NOT LESS THAN ½" EXCEPT FOR WORKING PRESSURE ABOVE 175 LBS., IN WHICH CASE THE LEAST DIAMETER SHALL NOT BE LESS THAN ⅜". (A.S.M.E. 1918 FUSIBLE PLUG CARD 1413 FOR PIPE SIZE ABOVE 175 LBS. AND FUSIBLE PLUG CARD 1415 FOR 175 LBS. AND LESS).

11 DIAGONAL BRACES OF BOILER MUST BE RIVETLESS; 9000# ALLOWED.

15 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.

16 SAFETY VALVES MUST MEET THE REQUIREMENTS OF THE A. S. M. E. BOILER CODE AND MUST BE PLAINLY STAMPED BY THE MANUFACTURER AS PER B. L. W. MARKING CARD 6358.
SAFETY VALVES OVER 3" IN DIAMETER SHALL HAVE FLANGED INLETS. THESE FLANGES SHALL CONFORM TO THE AMERICAN STANDARD.
ALL SAFETY VALVES MUST BE PROVIDED WITH RELIEF LEVERS.

17 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: ALSO WHERE POSSIBLE ONE NEAR THE THROAT SHEET.

18 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 EXCEEDING ¼" LESS THAN FULL SIZE FOR PLATES OVER ⅝" IN THICKNESS, AND ⅜" LESS THAN FULL SIZE FOR PLATES ⅝" 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.

19 UPON COMPLETION, EACH BOILER SHALL BE STAMPED IN THE PRESENCE OF THE AUTHORIZED INSPECTOR, WITH THE WORDS AS ARRANGED BELOW. THE HEIGHT OF THE LETTERS AND FIGURES SHALL NOT BE LESS THAN ⅜". THE LOCATION OF THE STAMP SHALL BE ON THE BACK HEAD ABOVE A PLUG HOLE.

(Manufacturer's Serial Number)	INDIANA (State in which boiler is to be used) No. 4 (Manufacturer's State Standard Number) THE BALDWIN LOCOMOTIVE WORKS (Name of Manufacturer) (LEAVE BLANK) (Owner's Number) (LEAVE BLANK) (Year put in Service) 200 LBS. (Maximum working pressure when built)

246

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1140.

THE STEEL AND TUBE COMPANY OF AMERICA

Specification for Type A Double Loop Superheater Spec. D-1287 - FEBRUARY 13TH, 1920.

BOILER TUBES	194 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. Tubes to be in accordance with the American Society for Testing Materials Specification A-28-18.
BOILER FLUES	22 in number 5½ in. o.d. #9 BWG of cold drawn seamless steel. Flues to be in accordance with the American Society for Testing Materials Specification A-28-18 ..... Card 10862R
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 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 ..... Card 5090A
TUBE SHEET LAYOUT	
UNITS	22 units 12 - o - 49 OWG ..... Pipes to be in accordance with the American Society for Testing Materials Specification A-28-18. Pipes united by return bends. Each unit to be tested, before being placed in boiler, with water under pressure of 500 lb. per sq. in.
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-A ..... Card 1094-L
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 pipe 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 seperately to the saturated and to the superheated steam passages, so as to insure soundness of all partition walls ..... Card 11174
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 323
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 ARRG
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 pipe or cylinder. Pipe to be well protected against freezing. Card 11314
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 MC573
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 11331-E	S. H. UNIT BOLT WASHER	Card 1071
DAMPER CYL. ARM	Card 1205	S. H. UNIT CLAMP	Card 1073
DAMPER CYL. PIPE FITTING	Card 11115	S. H. UNIT CLAMP WASHER	Card 10305
DAMPER CYL. PIPE UNION	Card 11114	S. H. PIPE END	Card 1300
DAMPER CYL. PIPING DIAGRAM	Card 1127	S. H. PIPE BANDS	Card 1800
DAMPER CYL. SUPPORT	Card	SPACING OF BANDS & SUPPORTS	Card #10759
DAMPER SHAFT	Card 1178-1	TYPE OF RETURN BENDS	FORGED
DAMPER SHAFT ARM	Card 1071	RETURN BENDS	Card 11022
DAMPER SHAFT BEARING (O.S.)	Card 11305-G	LUBRICATOR CONNECTION	Card 3023
DAMPER SHAFT BEARING (I.S.)	Card 1305-G	DEFLECTING PLATE HANDLE	Card 1487
DAMPER SHAFT LINK	Card 1070	DEFLECTING PLATE STUDS	Card 10809
PATENT PLATE	Card 1274	DEFLECTING PLATE CLAMP	Card 10809-A
PYROMETER	None		

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1140

FOR THE STEEL AND TUBE COMPANY OF AMERICA.

247 247

31 LOCOMOTIVE TO BE OPERATED IN INDIANA.
BOILER TO CONFORM TO THE INDIANA STATE BOILER LAWS, AND TO BE INSPECTED BY THE HARTFORD STEAM BOILER INSPECTION AND INSURANCE COMPANY.

32 CLEARANCE LIMITATIONS TO BE SAME AS FOR 6 36 D 236 AND 2H.

33 TOP OF LOCOMOTIVE TO BE LINED UP SO STACK AND CAB WILL BE SYMMETRICAL.

34 FLEXIBLE STAYS - TATE, ABOUT 3/8, LOCATED IN BREAKING ZONE.

35 SUPERHEATER AS LOCO. SUPERHEATER CO'S SPECIFICATION NO. O-12897 DATED FEBRUARY 13TH, 1920 (COPY ATTACHED). SUPERHEATER TO CONNECT WITH TOP HEADER IN SMOKE BOX AND TO HAVE OUTSIDE STEAM PIPE CONNECTIONS TO VALVE CHAMBERS ROYALTY PAYABLE BY THE B. L. W.

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

37 STACK TO BE SIMILAR TO PHOTO. 5088.

38 WASHOUT PLUGS TO BE LOCATED AS FOLLOWS:-
ONE TO BE 12" BACK OF FRONT FLUE SHEET, AND ONE 24" FORWARD OF BACK FLUE SHEET IN BELLY OF BOILER.
ONE PLUG EACH SIDE OF BOILER IN FRONT OF INJECTOR CHECK.

39 CAB TO BE SIMILAR TO PHOTO. 5088.

40 FOOT PLATE OF CAST STEEL.

41 CHAFING PLATES OF CAST STEEL WITH SPRING BUFFER BETWEEN ENGINE AND TENDER. (SEE SUP. 56.)

42 COUPLERS, SHARON M.C.B. AUTO. 33½" CENTER ABOVE TOP OF RAIL, FITTED IN NATIONAL MALLEABLE CASTING COMPANY'S EXTENDED FLOOR POCKET, AND SHARON SMALL SPECIAL COUPLERS, 16" CENTER ABOVE TOP OF RAIL, WITH RADIAL ATTACHMENT FOR USE WITH INGOT AND CHARGING CARS, AS SHOWN ON CO'S DRAWING 69-008. (SEE SUP. 57)

43 STEAM TRAIN LINE (1¼") TO RUN TO FRONT OF ENGINE AND TO REAR OF TENDER TO SUPPLY STEAM AT FULL BOILER PRESSURE TO STEAM CYLINDERS OF LADLE CARS. THIS TRAIN LINE TO BE EQUIPPED WITH A STANDARD STEAM HEAT HOSE, EQUIPPED WITH AN M.C.B. STANDARD STEAM HEAT HOSE COUPLER, AND LOCATED IN REFERENCE TO SHANK OF M.C.B. COUPLER IN ACCORDANCE WITH M.C.B. RECOMMENDED PRACTICE AS OUTLINED ON SHEET Q-1. NOT NECESSARY TO PROVIDE STEAM REDUCING VALVE IN CAB FOR STEAM LINE TO LADLE CARS.

44 UNIONS OF MARK COLD DRAWN STEEL.

TENDER

56 CHAFING PLATES OF CAST STEEL, WITH SPRING BUFFER BETWEEN ENGINE AND TENDER. (SEE SUP. 41)

57 COUPLERS:- SHARON M.C.B. AUTO. 33½" CENTRE ABOVE TOP OF RAIL, FITTED IN NATIONAL MALLEABLE CASTING CO'S EXTENDED FLOOR POCKET, AND SHARON SMALL SPECIAL COUPLERS, 16" CENTRE ABOVE TOP OF RAIL, WITH RADIAL ATTACHMENT, FOR USE WITH INGOT AND CHARGING CARS, AS SHOWN ON COMPANY'S DRAWING 69-008. (SEE SUP. 42)

58 NATIONAL MALLEABLE CASTING CO'S JOURNAL BOXES FOR COIL SPRINGS.

59 UNIONS OF MARK COLD DRAWN STEEL.

THE BALDWIN LOCOMOTIVE WORKS As Specn. B-6503

Memorandum Spec'n 30066

SPECIFICATION FOR LOCOMOTIVES 4-22-C 273 to 278

FOR ~~Stock~~ SEE REVERSE SIDE OF SHEET No. 2.

HW

Gen. as Photo. 6894

Engine Drawing No. 40

3-16-20

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 ---

Limits, Height --- Width ---

Weight (approximate) in working order, Total 77,500 POUNDS

On F. tr'k --- lbs., Drivers 77,500 lbs., B. tr'k --- lbs.

Tractive power 17,300 lbs., Ratio of adhesion 4.48

Work'g St'm Pres. 180 lbs., Service SWITCHING

Fuel SOFT COAL

Boiler STEEL (SEE SUP. 5) Thick 7/16" Bill 9076 for Kingsbury 9059

Front Tube Sheet ½" Thick

Boiler, Diam. 42" Plan STRAIGHT TOP

Allowable st'm pres. 180 lbs. **Tested to** 200 lbs. steam pres.

With Factor of Safety of 5.3 270 lbs. water pres.

Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS.

Dome, diam. 22" Pos. CENTRAL

Firebox STEEL (SEE SUP. 5) Combustion chamb. NONE

Firebox, length 46⅛" Width 42½" Depth F. 44" B. 43"

Firebox, Tube ½" Crown ⅜" Sides ⅜" Back ⅜"

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 ⅜" 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. CHARCOAL IRON OR STEEL (B.L.W. OPTION)

Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.

Number 100 Diam. 2" Length 10'9"

Heating Surface Flues --- Combus. Chamb. --- Total 612.6

Tubes 559.6 Fire Box 53.0 Fire Brick Tubes ---

Grate area 13.5 Ratio to Heating Surface 1: 45.3

Superheater ---

Fire Brick ARCH NONE

Grates ROCKING BARS WITH 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 arrester hopper WITH

Netting and deflect. plates WITH

Exhaust nozzles DOUBLE, HIGH

Stack STRAIGHT Dia. 12"

Safety Valves TWO COALE 2" OPEN (Not Spec)

Safety valves BOTH with relief lever, Set to 180 POUNDS

Whistle ONE 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: 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

Injectors TWO MONITOR (Not Spec) No. 5

Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER

Pipes, Check STEEL Feed STEEL Overflow STEEL

Check B.L.W. WITH STOP VALVE Pos. RIGHT AND LEFT

Steam Heat NONE

Cab WOOD

FUEL BOX IN LEFT SIDE OF CAB, CAPACITY 1600 POUNDS.

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 HANDRAILS.

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

F. & B. Drawhead, Center above rail 33½"

Coupler M.C.B. AUTO., FRONT AND BACK

Signal fixtures NONE

Headlight TWO ROUND CASE 14" Reflector, To burn KEROSENE

Headlight, Nos. on sides WITH H'dl't step NONE

Lamp shelf NONE Nosing ---

Bell 85 POUNDS

Sand Box TWO Diam. 22" 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

J. Daniel August 1920

SPECIFICATION FOR LOCOMOTIVES 4-22-C 273 to 278

FOR ~~Stock~~

HW

249

Frames CAST STEEL

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 1½" Steam lap 13/16" Exhaust clearance ---

Eccentric ~~crank~~ throw 4" By-pass valve NONE

S. F. Lubr. NATHAN DOUBLE BULL'S EYE (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 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 HEADS OF CAST IRON WITH RINGS OF CAST IRON SPRUNG IN

Guides STEEL Oil cups NEEDLE

Crossheads CAST STEEL WITH BEARINGS OF CAST IRON, TINNED

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 wheel hub liners NONE

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. NONE Size ---

Lateral play between driving boxes and wheel hubs = 3/16" 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 ---

Wheel hub liners ---

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 ---

Wheel hub liners ---

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

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

Tires held by ---

Brake, position ON BOTH PAIR OF WHEELS (NO TENDER)

Operating Engine, sch. U-1, B.L.W. STEAM

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

Foundation Drivers, sch. U-1, B.L.W.

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

Air pump --- Pos. ---

Train connections ---

Train signal, sch. ---

SEPARATE LUBRICATOR FOR STEAM BRAKE VALVE.

Tender NONE

Tank 1300 Gallons, Bill 5392

SADDLE TANK OVER TOP OF BOILER, AND EXTENDING OVER SMOKE BOX.

BOILER TO CONFORM TO THE A. S. M. E. CODE, AND TO CARRY PENNSYLVANIA STATE SERIAL NUMBERS 21 TO 26.

BOILER TO BE INSPECTED BY THE HARTFORD STEAM BOILER INSPECTION AND INSURANCE COMPANY.

List of tools, sch. 26

Photo sch. ~~None~~ No. 2 Inspection B.L.W. EXCEPT FOR BOILER (Sup. 5)

To be weighed No Material spec'ns B.L.W. EXCEPT FOR BOILER (Sup. 5)

Certificate of boiler test THREE COPIES OF B.L.W. FORM 1936

Junior laws to 5-25-20 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 OLIVE GREEN AND ALUMINUM

Mark on (SEE OTHER SIDE THIS PAGE)

Road Nos. Pos. Road Nos. (SEE OTHER SIDE THIS PAGE) Name NONE

Actual Dimensions of Loco. Extreme height over all = 11'10⅜"

Extreme Width Over cab boards = 8'6" Over cylinders ~~or valve motion~~ = 8'7⅛"

Length outside face of front bumper to outside face of back bumper of engine = 23'7½"

4 22 C 273, SOLD TO
KANSAS CITY POWER & LIGHT CO. OF KANSAS CITY, MISSOURI.
CHANGES AS FOLLOWS, COVERED ON EXTRA ORDER NO. 12297, DATED 1/23-21:-
MAXIMUM CURVE 21 DEGREES.
BOILER CERTIFICATES TO BE, THREE (3) COPIES OF B. L. W. FORM 1036, AND FIVE (5) COPIES B. L. W. FORM 1915.
CAB TO BE ALTERED TO HAVE COAL ~~SPACE~~ BOX IN REAR, AND TO HAVE SIDE ENTRANCES. Good like Jerrel
DROP SEAT FOR ENGINEER ON RIGHT SIDE OF CAB.
WINDOW SCREENS OVER BACK WINDOWS OF CAB.
PHOTO. SCHEDULE NO. 2, AFTER PAINTING.
MARK ON TANK SIDES, K. C. P. & L. CO.
ROAD NUMBER 2, ON F.NO. PLATE AND ON CAB PANEL.

Loco. 4-22 C 273 ~~State~~ State No. 21, Restamped No. 69
Letter 1/20/41 from Stanley Cherrington, Acting Chief of Div.
State of OHIO, Dept. of Industrial Relations 3/11/41

4 22 C 274, SOLD TO WESTMORELAND COAL CO., OF IRWIN, WESTMORELAND COUNTY, PA., WITH CHANGES AS FOLLOWS, COVERED ON EXTRA ORDER NO. 3485 DATED 1/23-22:-
ROAD NO. NONE F. NO. PLATE A STAR.
MARK ON TANK SIDES } WESTMORELAND COAL COMPANY, IRWIN, PA.

4 22 C 275, SOLD TO THE POWERS-WEIGHTMAN ROSENGARTEN CO. WITH CHANGES AS FOLLOWS COVERED ON EXTRA ORDER NO. 4391 DATED 2-24-22.
ROAD NUMBER: 1, ON F. NO. PLATE ONLY.
LETTERING, NONE.

4 22 C 276 AND 277, SOLD TO THE PARKLAP CONSTRUCTION CORPORATION, FOR THE INTERNATIONAL PAPER COMPANY, WITH CHANGES AS FOLLOWS, COVERED ON EXTRA ORDERS NO. 4650, DATED 3-7-22 FOR 276, AND NO. 5301 DATED 3-30-22 FOR 277.
LOCOMOTIVE FOR OPERATION IN THE STATE OF NEW YORK.
COUPLINGS: THREE POCKET DRAW CASTINGS AT FRONT AND BACK TO TAKE AN ADJUSTABLE M. C. B. AUTO. COUPLER. CENTER OF COUPLER WHEN IN TOP POCKET TO BE 34½" FROM TOP OF RAIL.
BUMPERS, FRONT AND BACK, TO BE BUILT DOWN TO MINIMUM RAIL CLEARANCE.
ROAD NUMBER, NONE.
FRONT NUMBER PLATE A STAR.
MARK ON TANK SIDES } PARKLAP CONSTRUCTION CORPORATION 84 PINE STREET, NEW YORK

4 22 C 278 SOLD TO THE PURE OIL CO., WITH CHANGES AS FOLLOWS, COVERED ON EXTRA ORDER NO. 6039 DATED 3-20-23, CO'S. ORDER NO. 16 - REQUISITION NO. 84998.
LOCO. FOR OPERATION AT SMITH'S BLUFF REFINING DIVISION OF THE HUMPHREY'S PURE OIL CO. AT SMITH'S BLUFF, STATE OF TEXAS.
STEAM COIL TO BE PROVIDED FOR OIL TANK. } FUEL OIL WITH ALL NECESSARY CHANGES TO SUIT.
OIL TANK, 140 GALLONS, BILL 6084.
TWO NEW HEADLIGHTS, 14" ROUND BABE TO BURN KEROSENE, SIDE NUMBERS, WITH. THESE HEADLIGHTS TO BE SHIPPED DIRECT TO PURCHASER, (ACCOUNT TIME).
PAINTING, STYLE 220, OLIVE GREEN AND ALUMINUM
ROAD NO. 1, ON FRONT NUMBER PLATE AND ON FRONT SAND BOX.
MARK ON CAB SIDES: HUMPHREYS PURE OIL CO.

THE MARK ON CAB SIDES, INCLUDING LETTERS AND TRIANGLES, TO BE SAME SIZE AS SHOWN ON CO'S. PRINT ON CROSS-SECTION PAPER HEREWITH.

SPECIFICATION FOR LOCOMOTIVES 4 22 C 273 TO 278
FOR ~~STOCK~~ P (SEE SHEET 1)

250

1 BOILER TO BE OPERATED IN THE STATE OF
BOILER TO BE BUILT TO CONFORM TO THE BOILER CODE OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS (1918), AND MUST BE INSPECTED DURING CONSTRUCTION AND UPON COMPLETION BY AN AUTHORIZED INSPECTOR WHO SHALL NOT BE INTERESTED EITHER DIRECTLY OR INDIRECTLY WITH THE MANUFACTURERS.

2 A DATA REPORT, ON FORMS FURNISHED BY THE ABOVE MENTIONED STATE SHALL BE FORWARDED TO THE PROPER OFFICIAL BEFORE THE BOILER LEAVES THE BUILDER'S WORKS.

3 A HYDROSTATIC TEST SHALL BE APPLIED EQUAL TO ONE-AND-ONE-HALF (1½) TIMES THE WORKING PRESSURE.

4 THE MATERIALS ENTERING INTO THE CONSTRUCTION SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS:-

BOILER AND FIRE BOX STEEL / MATERIAL FOR ONE-PIECE DOME	A.S.M.E. SPEC. PAGE 11
BOILER RIVET STEEL	A.S.M.E. SPEC. PAGE 15
BOILER RIVET IRON	A.S.M.E. SPEC. PAGE 31
BOILER GRADE IRON	A.S.M.E. SPEC. PAGE 37
BOILER STAYBOLT IRON	A.S.M.E. SPEC. PAGE 34
BOILER TUBES	A.S.M.E. SPEC. PAGE 40

5 FRONT TUBE SHEET SHALL BE OF FIRE BOX STEEL.
ALL BOILER AND FIRE BOX STEEL AND MATERIAL FOR ONE PIECE DOME SHALL BE MARKED BY THE MANUFACTURER WITH THE HEAT NUMBER, NAME OF MANUFACTURER, GRADE AND LOWEST TENSILE STRENGTH IN THE MANNER AND LOCATION DESCRIBED ON B.L.W. MARKING CARD 6859. SMOKE BOX STEEL MAY CONFORM TO B.L.W. SPECIFICATION.

6 THE MINIMUM FACTOR OF SAFETY SHALL BE FIVE. (1918)
LONGITUDINAL SEAMS SHALL BE OF BUTT AND DOUBLE STRAP CONSTRUCTION.

7 THE OUTSIDE ENDS OF SOLID STAYBOLTS, 8 IN. AND LESS IN LENGTH, SHALL BE DRILLED WITH A HOLE AT LEAST 3/16" DIA., TO A DEPTH EXTENDING AT LEAST ½" BEYOND THE INSIDE OF THE PLATES

8 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 OR CORRESPONDING TAPER TAP.	1" & 1¼"	1½" & 2"	2½" TO 4"
NO. OF THREADS PER INCH.	11½	11½	8
MINIMUM NO. OF THREADS REQUIRED IN OPENING.	4	5	7
MINIMUM THICKNESS OF MATERIAL REQUIRED TO GIVE ABOVE NO. OF THREADS.	⅜"	7/16"	½"

IF THICKNESS OF BOILER MATERIAL IS NOT SUFFICIENT TO GIVE THE ABOVE NUMBER OF THREADS, A LINER OR FLANGE MUST BE APPLIED.

9 EACH BOILER MUST BE PROVIDED WITH A CONNECTION ¼ PIPE SIZE FOR ATTACHING INSPECTOR'S TEST GAUGE.

10 A FUSIBLE PLUG MUST BE APPLIED. THE PLUG MUST BE FILLED WITH PURE TIN AND THE LEAST DIAMETER OF THE FUSIBLE METAL MUST BE NOT LESS THAN ½" EXCEPT FOR WORKING PRESSURE ABOVE 175 LBS., IN WHICH CASE THE LEAST DIAMETER SHALL NOT BE LESS THAN ⅜", (I. E., USE FUSIBLE PLUG CARD 1/13½ FOR PRESSURE ABOVE 175 LBS. AND FUSIBLE PLUG CARD 1219 FOR 175 LBS. AND LESS).

15 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.

16 SAFETY VALVES MUST MEET THE REQUIREMENTS OF THE A. S. M. E. BOILER CODE AND MUST BE PLAINLY STAMPED BY THE MANUFACTURER AS PER B. L. W. MARKING CARD 6858.
SAFETY VALVES OVER 3" IN DIAMETER SHALL HAVE FLANGED INLETS. THESE FLANGES SHALL CONFORM TO THE AMERICAN STANDARD.
ALL SAFETY VALVES MUST BE PROVIDED WITH RELIEF LEVERS.

17 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: ALSO WHERE POSSIBLE ONE NEAR THE THROAT SHEET.

18 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 ¼" LESS THAN FULL SIZE AND THEN DRILLED, REAMED OR FINISHED FULL SIZE WITH ROTATING CUTTER.

19 UPON COMPLETION, EACH BOILER SHALL BE STAMPED IN THE PRESENCE OF THE AUTHORIZED INSPECTOR, WITH THE WORDS AS ARRANGED BELOW. THE HEIGHT OF THE LETTERS AND FIGURES SHALL NOT BE LESS THAN ¼" THE LOCATION OF THE STAMP SHALL BE ON THE BACK HEAD ABOVE A PLUG HOLE.

S
PENNSYLVANIA (State in which boiler is to be used)
NOS. 21 TO 26 (Manufacturer's State Standard Number)
THE BALDWIN LOCOMOTIVE WORKS (Name of manufacturer)
(LEAVE BLANK) (State's number) (LEAVE BLANK) (Year put in service)
(manufacturer's serial number)
180 LBS. (Maximum working pressure when built)

THE BALDWIN LOCOMOTIVE WORKS As Spec'n. C-5280

Memorandum Spec'n 18072

SPECIFICATION FOR LOCOMOTIVES 4 32 C 5 Gen. as Photo. 4175

FOR ~~Stock for the Baldwin Loco Works~~ Midvale Steel and Ordnance Company (U. S. Midvale Gun Plant) **Engine Drawing No.** 1

F 10-28-18

Gauge of Road 4' 8½" Play 2" **Wheelbase,** Rigid 7' 0" Driving 7' 0" Total 7' 0"

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

Curves 70' 0" Radius

Length of locomotive over couplers not to exceed 30' 0"

Limits, Height 14' 0" Width 10' 0"

Weight (approximate) in working order, Total 128,000 pounds

On F. tr'k ----- lbs., Drivers 128,000 lbs., B. tr'k ----- lbs.

Tractive power 28820 lbs., Ratio of adhesion 4.2

Work'g St'm Pres. 180 lbs., Service Switching

Fuel Soft Coal

Front tube sheet to be ½" thick.

Boiler Steel Thick ⅝" Bill 8446

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 5.2

Longitud. seams Butt jointed, double covering strips

Dome, diam. 29" Pos. Central

Firebox Steel Combustion chamb. None

Firebox, length 55-15/16" Width 42" Depth F. 64⅛" B. 61⅛"

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 Double Riveted

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

Radial stays 1" dia. 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

Tube ends Swaged for copper ferrules, firebox ends.

Number 232 Diam. 2" Length 11' 0"

Heating Surface Flues ---- Combus. Chamb. ---- Total 1417"

Tubes 1326" Fire Box 91" Fire Brick Tubes ----

Grate area 16.3" Ratio to Heating Surface 1 : 87

Superheater -----

Fire Brick Arch, on studs

Grates Rocking Bars and Drop Plate

Ash Pan, Dampers Back only

Throttle Balance

Dry pipe Steel Pos. Dome

Superheater None

Smokebox extension with Cleaning hole and cap None

Front end hopper With

Netting and deflect. plates With

Exhaust nozzles Double High

Stack Straight

Dia. 18" Hole in S. B. dia. 19½"

Safety Valves (Not Spec) Two Coale 2½"

Safety valves None with relief lever, Set to 180 pounds

Whistle One 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 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

Crown, One R. S., Two L. S. 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 Two Monitor (Not Spec) 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 Steel

Coal box on rear extension of engine frame, back of cab, capacity 3000 pounds.

Cab boards Steel Nosing T-Iron

Running boards Steel Nosing T-Iron

Hand rail Iron Located on Tank

Back Bumper Cast Steel

Pilot None Pushing shoes Cast in Bumpers

Front Bumper Cast Steel Bumper plate None

Steps Across front and back, with handrails

Front and Back Draw-Castings of Cast Steel.

F. & B. Drawhead, Center above rail 33½"

Coupler M. C. B. Auto. - Radial Type - Coupling arrangement to be designed so Loco. can be coupled to cars standing on a 70 ft. radius curve.

Signal fixtures None

Headlight Two Round Case 14" 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 (Not Spec) Leach Air Trap A-1 in each box, to sand front and back.

Sand boxes to be placed on top of tank.

Dome casing Iron painted

Boiler Jacket #18 Soft Steel Ptd. Bands Iron Style 9

Boiler Lagging Magnesia Sectional

THE BALDWIN LOCOMOTIVE WORKS

W. O. Webster Jan'y 1919

SPECIFICATION FOR LOCOMOTIVES 4 32 C 5

FOR ~~Stock for the Baldwin Loco Works~~ Midvale Steel and Ordnance Company (U. S. Midvale Gun Plant)

Frames Cast Steel Braces Solid

Cylinders, Diam. 19" Stroke 24"

St'm ports, Length 25⅝" Width 1⅞" Bridges ----

Exh. ports, Length ---- Width ---- Valve lead ⅛"

Valve travel 5" Steam lap ⅞" Exhaust clearance ----

Eccentric crank throw 13½" By-pass valve None

S. F. Lubr. Michigan Triple Bulls Eye (Not Spec)

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

Cyl'r casings Iron Ptd. Head covers Steel Ptd.

St'm chest casings ---- Covers ----

St'm chest valves 12" diam. Piston Valves

Met. pkg {Piston Rods / Valve Stems U. S. King Type (Not Spec)

Piston Rods to be keyed to crosshead.

Pistons Cast Iron Rings sprung into solid head

Guides Alligator type - Steel Oil cups Needle

Crossheads Cast Steel, Gibs of Cast Steel-tinned

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 brass.

Drivers, O. S. Diam. 46" Cen. diam. 40" 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 = ⅛" 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 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. 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. None

Air Reservoir to have hydrostatic test of 210 pounds.

Tender None Wheeled, Drawing No. ----

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

Tank 2000 Gallons, Bill 4742

Saddle tank located over top of boiler.

Tool Boxes ----

Frame -----

Front Drawbar height -----

Pilot ---- Pushing shoes ----

Back drawhead, center above rail -----

Coupler ---- 4 32 C 5 Sold to Birmingham Rail & Locomotive Co.

Repairs and Alterations covered on Extra Work Order, No. 15236 - 1931.

Coupler Heights, F. & B., Brot. down to 34½" 5.22.31.

Trucks ---- Painting and Marking, None.

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. No. 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 12-1-18 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

Road Nos. Pos. Road Nos. Name

Actual Dimensions of Loco. Extreme height over all 13' 11"

Extreme Width: Cab boards 10' 0" Cylinders or valve motion 9' 4"

~~Length outside face front bumper of engine to face of tender wedge~~

~~Length face of tender wedge to outside face back bumper of tender~~

Total length outside face front bumper of engine to outside face back bumper of tender 25' 9"

THE BALDWIN LOCOMOTIVE WORKS Dup. 6 32 D 1063. Not to have extension

Memorandum Spec'n 20034

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1141

FOR Sun Company

No.

Gen. as Photo. 2220

Engine Drawing No. 59

2.14.20

Gauge of Road 4' 8½" Play 2"
Wheelbase, Rigid 10' 0" Driving 10' 0" Total 10' 0"
Total wheelbase, eng. and tend. {Actual —— / Limited to ——

Curves 150 FT. RADIUS, EXCEPT POSSIBLY ON TEMPORARY SWITCHES FOR BUILDING PURPOSES WHERE THE CURVES MAY BE SHARPER.
Limits, Height —— Width ——
Weight (approximate) in working order, Total 124,000 LBS.
On F. tr'k —— lbs., Drivers 124,000 lbs., B. tr'k —— lbs.

Tractive power 28,800 lbs., Ratio of adhesion 4.3
Work'g St'm Pres. 180 lbs., Service SWITCHING.
Fuel SOFT COAL

Boiler STEEL Thick 9/16" Bll 8904
Front Tube Sheet ½" Thick
Boiler, Diam. 54" Plan STRAIGHT TOP.
Allowable st'm pres. 180 lbs. **Tested to** 200 lbs. steam pres.
With Factor of Safety of 5.47 270 lbs. water pres.
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS, SEXTUPLE RIVETED.
Dome, diam. 28" Pos. CENTRAL.

Firebox STEEL Combustion chamb. NONE
Firebox, length 78" Width 39⅛" Depth F. 9⅝" B. 5⅜"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back ⅜"
Firedoor opening ONE OVAL 13" x 18".
Water space, Front 4" Sides 4" Back 4"
Water space frame SINGLE Riveted
Water space stays ⅞" DIAM. WITH 3/16" HOLE 12" 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. IRON
Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.
Number 160 Diam. 2" Length 10' 9"

Heating {Flues NONE Combus. Chamb. NONE Total 991.5
Surface {Tubes 893.5 Fire Box 98 Fire Brick Tubes ——
Grate area 21.2 Ratio to Heating Surface 1 : 47
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 arrester or hopper WITH
Netting and deflect. plates WITH, MESHING 3½ x 3½ #12 W. G.

Exhaust nozzles DOUBLE NOZ.
Stack STRAIGHT Top 17"

Safety Valves TWO CROSBY 3"
Safety valves BOTH 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** 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 AND SIDES
Crown, ONE EACH SIDE AND TWO BACK.
Waist, ONE UNDER FRONT.
Front tube sheet, ONE Fusible plug ONE

Pump NONE

(Spec.)
Injectors TWO SELLERS "1907" CLASS No. 10½
Injectors, Pos. BACKHEAD AND LEFT SIDE Steam pipes COPPER
Sizes, Check IRON Feed IRON Overflow IRON
Check B. L. W. WITH STOP VALVE Pos. RIGHT AND SIDE.

Steam Heat NONE

Cab WOOD VENTILATOR IN CAB ROOF.
FUEL BOX ON REAR EXTENSION OF ENGINE FRAME BACK OF CAB.
CAPACITY ONE (1) TON.
Cab boards WOOD Seating ANGLE IRON
Running boards WOOD Mesing ANGLE IRON
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 REAR WITH HAND RAILS.
STEPS, HAND HOLDS ETC. TO CONFORM TO I.C.C. REQUIREMENTS.
F.E.B Drawhead, Center above rail 33½"
Coupler STANDARD M. C. B. AUTO., AS B.L.W. BUMPER GARD 93½.

Signal fixtures NONE

Headlight TWO ADAMS CASE 12" Reflector To burn KEROSENE
Headlight, Nos. on sides NONE Front also WITH
Lamp shell NONE Rooms ——

Bell 92 Pounds.
Bell Stay Two Diam. 3" "Body" IRON PAINTED Plate IRON
Chain LONG ARM TANK 7x1 to EACH SIDE TO BAND FRONT AND REAR.

Bell ringer BACK PLANTED

THE BALDWIN LOCOMOTIVE WORKS

W. E. Moore April 1920.

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1141

FOR Sun Company

No.

Frames CAST STEEL

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 5½" Steam lap 1" Exhaust clearance ——
Eccentric sheave throw 5" By-pass valve NONE
S. F. Lubr. NATHAN TEMPLE BULLS EYE. (Spec.)
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 TINNED BEARINGS.
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 wheel hub liners NONE
Drivers, O. S. Diam. 46" Cen. diam. 40" 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 = 3/16" 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 ——
Wheel hub liners ——
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 ——
Wheel hub liners ——
Wheels, Diam. —— Tread —— Kind ——
Tires —— Cen. diam. —— Size ——
Tires held by ——

Brake, position ON ALL DRIVING WHEELS (NO TENDER)
Operating {Engine, sch. No. 6 ET WESTG. COMBINED AUTO. AND
Parts {Eng. Tr'k, sch. —— STRAIGHT AIR.
Foundation {Drivers, sch. 186-2 AMERICAN O. S. EQUALIZED.
Parts {Eng. Tr'k, sch. ——
Air pump ONE 9½" Pos. L. S.
Train connections FRONT AND BACK
Train signal, sch. NONE
AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

Tender NONE

Tank 1500 Gallons, Bill 4220
SADDLE TANK, LOCATED OVER TOP OF BOILER.
TANK TO HAVE LADDER AND STEPS LEADING TO SAND BOX.

Boiler. FOR SERVICE IN OHIO.
BOILER TO MEET THE REQUIREMENTS OF THE STATE OF OHIO, AND THE INTERSTATE COMMERCE COMMISSION. BOILER TO BE INSPECTED BY THE HARTFORD STEAM BOILER INSPECTION AND INSURANCE COMPANY

List of tools, sch. 29
Photo sch. NONE To be weighed YES
Certificate of boiler test THREE COPIES OF B.L.W. FORM 1036
Junior laws to 3.4.20
(SEE SUP 1½) Inspection B. L. W. EXCEPT SEE SUP 2X ABOVE)
Material specs. B. L. W. (EXCEPT SEE SUP 4)
Shipment ON OWN WHEELS.

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

B. L. W. {Numbers NONE
Patents {

Property plates NONE

Painting, style 220 OLIVE GREEN AND ALUMINUM.

LETTERING, ETC., TO BE SAME STYLE AS FOR O 32 D 1063.
Mark on TANK SIDES, THE BAY TERMINAL RAILROAD Co.
THE FIRST LETTER OF EACH WORD TO BE LARGER THAN OTHER LETTERS.

Road Nos. Fos —— Road Nos. —— Name NONE
F. No. PLATE 101
DOME AND
BACK OF COAL BOX.

Actual Dimensions of Loco. Extreme height over all = 12' 10½"
Extreme Width {Over tab boards = 9' 0" / Over cylinders or valve motion = 9' 2"
Length outside face of front bumper to outside face of back bumper of engine = 28' 1"

SPECIFICATION FOR LOCOMOTIVES 6 32 D 1141

FOR SUN COMPANY

P

253 255.

1 BOILER TO BE OPERATED IN THE STATE OF OHIO
BOILER TO BE BUILT TO CONFORM TO THE BOILER CODE OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS (1918), AND MUST BE INSPECTED DURING CONSTRUCTION AND UPON COMPLETION BY AN AUTHORIZED INSPECTOR WHO SHALL NOT BE INTERESTED EITHER DIRECTLY OR INDIRECTLY WITH THE MANUFACTURERS.

2 A DATA REPORT, ON FORMS FURNISHED BY THE ABOVE MENTIONED STATE SHALL BE FORWARDED TO THE PROPER OFFICIAL BEFORE THE BOILER LEAVES THE BUILDER'S WORKS.

3 A HYDROSTATIC TEST SHALL BE APPLIED EQUAL TO ONE-AND -ONE-HALF (1½) TIMES THE WORKING PRESSURE.

4 THE MATERIALS ENTERING INTO THE CONSTRUCTION SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS:-

BOILER AND FIRE BOX STEEL, MATERIAL FOR ONE-PIECE DOME	A.S.M.E. SPEC. PAGE 11
BOILER RIVET STEEL	A.S.M.E. SPEC. PAGE 15
BOILER RIVET IRON	A.S.M.E. SPEC. PAGE 31
BOILER BRACE IRON	A.S.M.E. SPEC. PAGE 37
BOILER STAYBOLT IRON	A.S.M.E. SPEC. PAGE 34
BOILER TUBES	A.S.M.E. SPEC. PAGE 40

5 FRONT TUBE SHEET SHALL BE OF FIRE BOX STEEL.
ALL BOILER AND FIRE BOX STEEL AND MATERIAL FOR ONE PIECE DOME SHALL BE MARKED BY THE MANUFACTURER WITH THE HEAT NUMBER, NAME OF MANUFACTURER, GRADE AND LOWEST TENSILE STRENGTH IN THE MANNER AND LOCATION DESCRIBED ON B.L.W. MARKING CARD 6859. SMOKE BOX STEEL MAY CONFORM TO B.L.W. SPECIFICATION.

6 THE MINIMUM FACTOR OF SAFETY SHALL BE FIVE. (1918)
LONGITUDINAL SEAMS SHALL BE OF BUTT AND DOUBLE STRAP CONSTRUCTION.

7 THE OUTSIDE ENDS OF SOLID STAYBOLTS, 8 IN. AND LESS IN LENGTH, SHALL BE DRILLED WITH A HOLE AT LEAST 3/16" DIA., TO A DEPTH EXTENDING AT LEAST ½" BEYOND THE INSIDE OF THE PLATES

8 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 TABLES:

SIZE OF PIPE CONNECTION OR CORRESPONDING TAPER TAP.	1" & 1¼"	1½" & 2"	2½" TO 4"
NO. OF THREADS PER INCH.	11½	11½	8
MINIMUM NO. OF THREADS REQUIRED IN OPENING.	4	5	7
MINIMUM THICKNESS OF MATERIAL REQUIRED TO GIVE ABOVE NO. OF THREADS.	⅜"	7/16"	½"

IF THICKNESS OF BOILER MATERIAL IS NOT SUFFICIENT TO GIVE THE ABOVE NUMBER OF THREADS, A LINER OR FLANGE MUST BE APPLIED.

9 EACH BOILER MUST BE PROVIDED WITH A CONNECTION ¼ PIPE SIZE FOR ATTACHING INSPECTOR'S TEST GAUGE.

10 A FUSIBLE PLUG MUST BE APPLIED. THE PLUG MUST BE FILLED WITH PURE TIN AND THE LEAST DIAMETER OF THE FUSIBLE METAL MUST BE NOT LESS THAN ½" EXCEPT FOR WORKING PRESSURE ABOVE 175 LBS., IN WHICH CASE THE LEAST DIAMETER SHALL NOT BE LESS THAN ⅝", (I. E., USE FUSIBLE PLUG CARD 4144 FOR PRESSURE ABOVE 175 LBS. AND FUSIBLE PLUG CARD 4219 FOR 175 LBS. AND LESS).

15 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.~~

16 SAFETY VALVES MUST MEET THE REQUIREMENTS OF THE A. S. M. E. BOILER CODE AND MUST BE PLAINLY STAMPED BY THE MANUFACTURER AS PER B. L. W. MARKING CARD 6858.
SAFETY VALVES OVER 3" IN DIAMETER SHALL HAVE FLANGED INLETS. THESE FLANGES SHALL CONFORM TO THE AMERICAN STANDARD.
ALL SAFETY VALVES MUST BE PROVIDED WITH RELIEF LEVERS.

17 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: ALSO WHERE POSSIBLE ONE NEAR THE THROAT SHEET.

18 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 ⅛" LESS THAN FULL SIZE FOR PLATES OVER 5/16" IN THICKNESS, AND ¼" 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.

19 UPON COMPLETION, EACH BOILER SHALL BE STAMPED IN THE PRESENCE OF THE AUTHORIZED INSPECTOR, WITH THE WORDS AS ARRANGED BELOW. THE HEIGHT OF THE LETTERS AND FIGURES SHALL NOT BE LESS THAN ¼" THE LOCATION OF THE STAMP SHALL BE ON THE BACK HEAD ABOVE A PLUG HOLE.

S
OHIO
(State in which boiler is to be used)
No. 29
(Manufacturer's State Standard number)
THE BALDWIN LOCOMOTIVE WORKS
(Name of manufacturer)
(LEAVE BLANK) (State's number)
(LEAVE BLANK) (Year put in service)
(Manufacturer's Serial Number)
180 LBS.
(Maximum working pressure when built)

THE BALDWIN LOCOMOTIVE WORKS As Built No. 5 5000

Memorandum Spec'n 12048

SPECIFICATION FOR LOCOMOTIVES 6 38 D 99 Gen. Sp. PHOTO. 6352

FOR TRUMBULL STEEL COMPANY Engine Drawing No. 19

I 2-20-18

Gauge of Road 4' 8½" Play 5/8"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"
Total wheelbase, eng. and tend. {Actual 44' 1" / Limited to ——

Curves ——

Limits, Height 14' 2" Width ——
Weight (approximate) in working order, Total 160,000 POUNDS
On F. tr'k —— lbs., Drivers 160,000 lbs., R. 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 TO BE ½" THICK
Boiler STEEL (SUP. 1) Thick 13/16" Bill 8326
Boiler, Diam. 74" Plan STRAIGHT TOP
Boiler st'm pres. 180 lbs., Tested to {200 lbs. steam pres. / 270 lbs. water pres.
WITH FACTOR OF SAFETY OF 5.47
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS

Dome, diam. 33" Pos. CENTRAL
DOME TO BE LARGE FOR INSPECTION PURPOSES.
Firebox STEEL (SUP. 1) Combustion chamb. NONE
Firebox, length 96 1/8" Width 39" Depth F. 71 25/32" B. 69 1/4"
Firebox, Tube ½" Crown ½" Sides 5/16" Back 5/16"
Firedoor opening 16" DIAMETER
Water space, Front 4" Sides 4" Back 4"
Water space, Frame DOUBLE Riveted
Water space stays 7/8" DIAM. WITH 3 1/16" HOLES, 1 1/4" 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 ——
Tubes #12 W.G. CHARCOAL IRON OR STEEL. (B.L.W. OPTION)
Tube ends SWAGED FOR COPPER FERRULES, FIREBOX ENDS.
Number 330 Diam. 2" Length 11' 0"
TUBES TO HAVE ¾" SPACES.

Heating Surface				
Flues ——	Combus. Chamb. ——	Total 2040 sq. ft.
Tubes 1886 sq. ft.	Fire Box 160 sq. ft.	Fire Brick Tubes ——
Grate area 29 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
STEEL

Superheater NONE

WITH Cleaning holes and cap NONE
NONE
WITH

DOUBLE HIGH

Pos. 16" Hole in Cab

(Not Specd)
Safety Valves THREE CROSBY 3", ONE MUFFLED
Safety valves NONE with relief lever, Set to {180 POUNDS MUFFLED / 183 POUNDS OPEN
Whistle B.L.W. CHIME

Steam Gauge ONE IRON 7" MAKER:- ASHCROFT (Not specd)
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 TWO SELLERS, CLASS "N" (Specd) No. 9½
Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER
Pipes, Check COPPER Feed IRON Overflow IRON
Check SELLERS' Pos. R. AND L.

Steam Heat NONE

Cab STEEL (SEE SUP. 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 32"

Pilot NONE Pushing shoes CAST IN BUMPER
Front Bumper CAST STEEL Bumper plate NONE
Steps, HAND HOLDS, ETC., TO CONFORM TO THE I.C.C. REQUIREMENTS

Front Drawhead, Center above rail 34½"
Coupler SHARON M. C. B. AUTOMATIC, WITH SLOTTED KNUCKLE.

Signal fixtures MALLEABLE IRON ON SMOKE BOX

Headlight TWO ROUND CASE 16" Reflector, To burn KEROSENE
Headlight, Nos. on sides WITH H'd'l't step WITH (SUP. 2c)
Lamp shelf NONE Nosing ——

Bell 92 POUNDS COLUMBIA AIR BELL RINGER
Sand Box TWO Diam. 28" Body IRON PAINTED Pipes IRON
Sander LEACH AIR TRAP A-1, IN EACH SAND BOX TO SAND FRONT AND BACK.

Dome Casing IRON PAINTED

Number Stacks #12 STEEL PTD. Bands IRON Style 9 and 14

Number Lagging NONE EXTERNAL

THE BALDWIN LOCOMOTIVE WORKS
H. J. Smith May 1918
SPECIFICATION FOR LOCOMOTIVES 6 38 D 99
FOR TRUMBULL STEEL COMPANY

4.57 257

Frames CAST STEEL Braces SOLID

Cylinders, Diam. 22" Stroke 26"
St'm ports, Length 19" Width 1 3/8" Bridges 1 1/8"
Exh. ports, Length 19" Width 2 1/4" Valve lead ¼"
Valve travel 5 1/4" Steam lap 1" Exhaust clearance ——
Eccentric crank throw 12-7/32" By-pass valve NONE
S. P. Lubr. 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} UNITED STATES, KING TYPE. (Spec'd)

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 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— ⅛" 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. A1 & SNA West'g. AUTO. AND
Eng. Tr'k, sch. —— STRAIGHT AIR.
Foundation Parts | Drivers, sch. 101-3 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 POUNDS

Tank 4500 Gallons, Bill 4551
TANK "U" SHAPE, SLOPING BACK, FUEL CAPACITY 6 TONS
COAL GATES OF STEEL.
Tool Boxes OF STEEL, BUILT INTO LEGS OF TANK.

Frame STEEL, 10" CHANNELS WITH FRONT AND BACK BUMPERS OF WOOD.
FRONT AND BACK BUMPERS TO HAVE ⅝" 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 12½" HEAD AND WITH WEST'G.
FRICTION DRAFT GEAR, COUPLER TO HAVE SLOTTED KNUCKLE.

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

Trucks ARCH BAR TYPE, WITH CAST STEEL BOLSTER.
TRUCK SPRING PLANKS TO BE OF CHANNEL IRON.
Springs ELLIPTIC, B. L. W. MAKE
Journals, Diam. 5" Length 9"
Wheels, Diam. 33" Tread 44" 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-SNB West'g. AUTO. AND STRAIGHT AIR.

List of tools, sch. 29
Photo sch. NONE Inspection B.L.W. (EXCEPT, SEE SUP. INC. 5c)
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 2-2-18 Shipment ON OWN WHEELS. *

Brass shop finish, No. 1.
Machine shop finish D-165
* FOR EXTRAS SHIPPED WITH LOCO. SEE ORDER No. 31441, DATED 4.5.18.

B. L. W. Patents | 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

Mark on TANK SIDES, THE TRUMBULL STEEL COMPANY

OMIT FRONT NUMBER PLATE. (ACCOUNT OF LOCATION OF THE HEADLIGHT)

Road Nos. Pos.	Road Nos.	Name
F. Sand Box	101	NONE
Cab Sides		
Back of Tank.		

ACTUAL DIMENSIONS OF LOCO. EXTREME HEIGHT OVER ALL 14' 0"
EXTREME WIDTH:- CAB BOARDS 10' 3⅛" ; CYLINDERS OR VALVE MOTION 10' 5¼"
LENGTH OUTSIDE FACE FRONT END BUMPER OF ENGINE TO FACE OF TENDER HEDGE 30' 2¾"
LENGTH FACE OF TENDER HEDGE TO OUTSIDE FACE BACK BUMPER OF TENDER 24' 9¼"
TOTAL LENGTH OUTSIDE FACE FRONT BUMPER OF ENGINE TO OUTSIDE FACE BACK BUMPER OF TENDER 55' 0"

THE BALDWIN LOCOMOTIVE WORKS (Dup. of 4 10 C 37 WITH SAME EXTRAS (EXCEPT WHERE OTHERWISE SPECIFIED.

Memorandum Spec'n. 18030.

SPECIFICATION FOR LOCOMOTIVES 4 10 C 39 & 40. Gen. as

FOR UNITED STATES METALS REFINING CO. CHROME PLANT **Engine Drawing No.** 11.

J. 3.25.18.

Gauge of Road 2' 0" Play 1/2"
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 POUNDS
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 3/8" Bill 8400
Boiler, Diam. 30" Plan STRAIGHT TOP
FRONT TUBE SHEET TO BE 1/2" 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. 15 5/8" Pos. FORWARD OF FIREBOX

Firebox STEEL Combustion chamb. -----
Firebox, length 25 1/2" Width 39 1/2" Depth F. 29 1/2" B. 29 1/2"
Firebox, Tube 1/2" Crown 3/8" Sides 3/8" Back 3/8"
Firedoor opening 14" DIAMETER.
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" HOLE 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 ---- Placed ---- above crown
Crown bolts ----

Flues -----
Tubes #13 W.G. CHARCOAL IRON OR STEEL
Tube ends SWAGED FOR COPPER FERRULES, FIREBOX ENDS
Number 66 Diam. 1 1/2" Length 6' 7"

Heating Surface | Flues ----- Combus. Chamb. ---- Total 1920
Tubes 1680 Fire Box 240 Fire Brick Tubes ----
Grate area 7.0 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 WHOT IRON OR STEEL

Superheater NONE

Smokebox extension NONE Cleaning hole and cap NONE
Spark ejector or hopper NONE
Netting and deflect. plates NONE — (PNP 8/16/21)
Exhaust nozzles SINGLE
Blower Structure Dia. 8" Hole in S. B. [illegible]

Safety Valves TWO CONSOLIDATED 1 1/2" (Not Spec)
Safety valves NONE with relief lever, Set to 150 POUNDS
Whistle B.L.W. PLAIN

Steam Gauge ONE IRON 6" MAKER:- ASHCROFT (Not Spec)
Steam gauge stand IRON **Clock** NONE

Water Gauge { ONE FORD & KENDIG #31 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 TWO PENBERTHY AUTOMATIC (Not Spec) 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" BACKBOARDS EACH SIDE WITH GLASS PANEL IN TOP OF SLIDING DOORS AT BACK. ONE DROP SEAT 12" WIDE, 14" LONG AND ABOUT 26" HIGH.
CAB 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'd'l't step NONE
Lamp shelf 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 PLY Bands IRON STYLE 9.
Boiler Lagging MAGNESIA SECTIONAL

THE BALDWIN LOCOMOTIVE WORKS

W. CONKLIN JULY-1918
SPECIFICATION FOR LOCOMOTIVES 4 10 C 39 & 40

FOR UNITED STATES METALS REFINING CO.

J. 260 260

Frames CAST STEEL Braces SOLID

Cylinders, Diam. 8" Stroke 12"
St'm ports, Length 7 1/2" Width 1 5/8" Bridges 5/8"
Exh. ports, Length 7 1/2" Width 1 1/4" Valve lead 1/32"
Valve travel 2-5 1/16" Steam lap 1" Exhaust clearance ---
Eccentric ~~crank~~ throw 2" By-pass valve NONE
S. F. Lubr. DETROIT DOUBLE #7 BULLS 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 PLAIN "D" (Spec)
Met. pkg { PISTON RODS FRANCE METALLIC; 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.
DRIVING WHEELS TO HAVE HUB LINERS OF BRASS
Drivers, O. S. Diam. 24" Cen. diam. 20" CENTERS CAST STEEL

Tires STEEL Held by SHRINKAGE AND SHOULDER
Tires, Flanged, Pos. ALL Size 2" x 4 1/2"
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 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.

Tender NONE

Tank 250 Gallons. Bill 4681
TANK SHAPE SADDLE, LOCATED OVER TOP OF BOILER AND EXTENDING OUT TO END OF SMOKE BOX.

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".

ACTUAL DIMENSIONS OF LOCO.-
EXTREME HEIGHT OVER ALL 7' 5 3/4"
EXTREME WIDTH { CAB BOARDS 4' 6" / CYLINDERS OF VALVE MOTION 4' 5"
LENGTH OUTSIDE FACE FRONT BUMPER OF ENGINE TO OUTSIDE FACE BACK BUMPER } 13' 0 1/8"

List of tools, sch. 26
Photo sch. NONE Inspection B.L.W. (EXCEPT SEE BOILER)
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 3.4.16. 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 -----

LETTERING, ETC. TO BE SAME AS FOR 4 10 C 37.
Mark on TANK SIDES, U. S. M. R. Co.

Road Nos. Pos.	Road Nos.	Name NONE
F.NO.PLATE	12	
CAB SIDES	13	

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-5274

Memorandum Spec'n 20006

SPECIFICATION FOR LOCOMOTIVES 6 20 D 4 - 42

FOR VIRGINIA ANTHRACITE COAL CORPORATION.

Gen. Arr. Photo 2570 (EXCEPT TO HAVE HEADLIGHT AT FRONT AND REAR AND UNIT COVER OVER CROSSHEAD.)

Engine Drawing No. 3

HW.

1-14-20

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

Wheelbase, Rigid 8' 6" Driving 8' 6" Total 8' 6"

Total wheelbase, eng. and tend. (Actual ---, Limited to ---)

Curves 21 DEGREES

Limits, Height --- Width ---

Weight (approximate) in working order, Total 61,000 POUNDS

On F. tr'k --- lbs., Drivers 61,000 lbs., B. tr'k --- lbs.

Tractive power 12,500 lbs., Ratio of adhesion 4.85

Work'g St'm Pres. 180 lbs., Service SWITCHING

Fuel ANTHRACITE COAL

Boiler STEEL Thick 7/16" Bill 8858

Front Tube Sheet 1/2" Thick

Boiler, Diam. 38" Plan STRAIGHT TOP

Allowable st'm pres. 180 lbs. **Tested to** 200 lbs. steam pres.

With Factor of Safety of 5.77 270 lbs. water pres.

Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS.

Dome, diam. 22" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE

Firebox, length 45 1/8" Width 23 1/2" Depth F. 38" B. 36 5/8"

Firebox, Tube 1/2" Crown 3/8" Sides 3/8" Back 3/8"

Firedoor opening 14" DIAM. CROWN AND SIDES IN ONE SHEET.

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" 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 --- Placed --- above crown ---

Crown bolts ---

Flues ---

Tubes #12 W.G. CHARCOAL IRON OR STEEL (B.L.W. OPTION)

Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.

Number 72 Diam. 2" Length 9' 0"

Heating Surface Flues --- Combus. Chamb. --- Total 376 sq. ft.

Tubes 336 sq. ft. Fire Box 40 sq. ft. Fire Brick Tubes ---

Grate area 7.4 sq. ft. Ratio to Heating Surface 1: 50.8

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

SMOKE BOX TO HAVE SHORT EXTENSION.

Smokebox extension SHORT Cleaning hole and cap NONE

Spark arrester-ee hopper WITH

Netting and deflect. plates NONE

Exhaust nozzles DOUBLE - LOW

DIAMOND PIPE - WITH

Diaphragm RADIATOR IMPROVED Dia. 13"

Safety Valves Two CROSBY 1 1/2" Open. (Nor Spec.)

Safety valves BOTH with relief lever, Set to 180 POUNDS.

Whistle ONE, B.L.W. PLAIN

Steam Gauge ONE IRON 7" MAKER: ASHCROFT (Nor 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" 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, ONE EACH SIDE AND TWO BACK

Waist, ONE UNDER FRONT

Front tube sheet, ONE Fusible plug ONE

Pump NONE

(Spec.)

Injectors TWO METROPOLITAN, CLASS "A" No. 3

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 STEEL

Cab boards STEEL Nosing T-IRON

Running boards STEEL Nosing T-IRON

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.

E & B Drawhead, Center above rail 22"

Coupler THREE-QUARTER SIZE SHORT SHANK AUTOMATIC, FRONT AND BACK.

Signal fixtures NONE

HEADLIGHT EQUIPMENT TO BE SCHROEDER ELECTRIC WITH INCANDESCENT HEADLIGHTS.

Headlight TWO ROUND CASE 14" Reflector,

Headlight, Nos. on sides WITH M'f't step NONE

Lamp shelf NONE Nosing ---

Bell 85 POUNDS.

Sand Box TWO Diam. 19" Body IRON PAINTED Plate 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

Dr. V. McNeil March - 1920.

SPECIFICATION FOR LOCOMOTIVES 6 20 D 4 - 42

FOR VIRGINIA ANTHRACITE COAL CORPORATION

262

Frames CAST STEEL

Cylinders, Diam. 13" Stroke 18"

St'm ports, Length 12" Width 1" Bridges 7/8"

Exh. ports, Length 12" Width 2" Valve lead 1/16"

Valve travel 4" Steam lap 1" Exhaust clearance ---

Eccentric crank throw 3 1/2" By-pass valve NONE

S. F. Lubr. MICHIGAN ~~DOUBLE~~ TRIPLE 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 BALANCED, WITH VACUUM VALVES

Met. pkg. PISTON RODS / VALVE STEMS HOLMES (Spec.)

PISTON RODS TO BE KEYED TO CROSSHEADS.

Pistons HEADS OF CAST IRON WITH RINGS OF CAST IRON SPRUNG IN.

Guides ALLIGATOR TYPE, STEEL Oil cups NEEDLE

Crossheads CAST STEEL, WITH GIBS OF CAST IRON TINNED.

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

TIRES MAY HAVE VARIATION IN BRAKE OF 1/32 EITHER WAY.

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 wheel hub liners NONE

Drivers, O. S. Diam. 37" Cen. diam. 32" CENTERS CAST IRON

Tires STEEL Held by SHRINKAGE AND SHOULDER

Tires, Flanged, Pos. FRONT AND BACK Size 2 1/2" x 5"

Tires, Plain, Pos. MIDDLE Size 2 1/2" x 6"

Lateral play between driving boxes and wheel hubs = 1/8" TOTAL

Driving Boxes CAST IRON

Journals, Diam. 6" Length 7"

Springs, Make B. L. W.

Front Engine Truck NONE Wheeled ---

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

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

Wheel hub liners ---

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

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

Tires held by ---

* Front Engine truck added - See Extra Order No. 21568, dated 8.19.20. on Recessing Curves 11/17/20 Last 3/14/24

Back Engine Truck NONE Wheeled ---

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

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

Wheel hub liners ---

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

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

Tires held by ---

Brake, position ON ALL DRIVING WHEELS. (NO TENDER.)

Operating: Engine, sch. A-1 WESTG. AUTO. AIR.

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

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

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

Air pump ONE 8" Pos. LEFT SIDE

Train connections FRONT AND BACK

Train signal, sch. NONE

Tender NONE

Tank 1000 Gallons, Bill 5195

SADDLE TANK OVER TOP OF BOILER.

SYPHON UNDER CAB BOARD ON LEFT SIDE, WITH 20 FT. OF SUCTION HOSE.

FUEL BOX ON REAR EXTENSION OF ENGINE FRAMES, BACK OF CAB. CAPACITY 64 CUBIC FEET.

LOCO. TO OPERATE IN VIRGINIA.

BOILER TO CONFORM TO THE A.S.M.E. CODE EXCEPT OMIT STATE INSPECTION AND THE A.S.M.E. STAMPING.

FIRE EXTINGUISHER SOME SIMPLE ATTACHMENT FOR USE IN CONNECTION WITH THE INJECTORS, AND WITH 20 FEET OF HOSE.

WESTINGHOUSE STRAIGHT AIR BRAKE FURNISHED ON EXTRA ORD. 21612, DATED JULY 26, 1920.

List of tools, sch. 26

Photo sch. NONE Inspection B.L.W.

To be weighed YES Material spec'ns B.L.W. except see sht. 11

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

Junior laws to 1.24.20 Shipment ON CAR

Brass shop finish, No. 1

Machine shop finish D-165

B. L. W. NONE

Patents

Property plates NONE

ONE B.L.W. PROPERTY PLATE ON EACH ENGINE FURNISHED ON EXTRA ORDER 25928 DATED 12-2-20.

Painting, style --- BLACK, NO STRIPING.

Mark on TANK SIDES: VIRGINIA ANTHRACITE COAL CORP.

Road Nos. Pos.	Road Nos.	*Name NONE
F. NO. PLATE	1	
CAB SIDES	2	
BACK OF FUEL BOX		

*NAME PLATES OF BRASS FOR EACH SIDE OF CAB, MARKED ZENAIDE FOR 41 AND KITTY FOR 42, FURNISHED ON EX. ORDER 18022 DATED 4.16.20.

Actual Dimensions of Loco. Extreme height over all = 12' 3 1/4"

Extreme Width: Over cab boards = 8' 1"

Over cylinders or valve motion = 6' 4 3/8"

Length outside face of front bumper to outside face of back bumper of engine = 23' 6"

SPECIFICATION FOR LOCOMOTIVES VIRGINIA ANTHRACITE COAL CORPORATION

FOR 6 20 D 41 AND 42

P

263 263

11 ~~BOILER TO BE OPERATED IN THE STATE OF~~
BOILER TO BE BUILT TO CONFORM TO THE BOILER CODE OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS (1918), ~~AND MUST BE INSPECTED DURING CONSTRUCTION AND UPON COMPLETION BY AN AUTHORIZED INSPECTOR WHO SHALL NOT BE INTERESTED EITHER DIRECTLY OR INDIRECTLY WITH THE MANUFACTURER.~~

12 ~~A DATA REPORT, ON FORMS FURNISHED BY THE ABOVE MENTIONED STATE SHALL BE FORWARDED TO THE PROPER OFFICIAL BEFORE THE BOILER LEAVES THE BUILDER'S WORKS.~~

13 A HYDROSTATIC TEST SHALL BE APPLIED EQUAL TO ONE-AND -ONE-HALF (1½) TIMES THE WORKING PRESSURE.

14 THE MATERIALS ENTERING INTO THE CONSTRUCTION SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS:-

BOILER AND FIRE BOX STEEL / MATERIAL FOR ONE-PIECE DOME	A.S.M.E. SPEC. PAGE 11
BOILER RIVET STEEL	A.S.M.E. SPEC. PAGE 15
BOILER RIVET IRON	A.S.M.E. SPEC. PAGE 31
BOILER BRACE IRON	A.S.M.E. SPEC. PAGE 37
BOILER STAYBOLT IRON	A.S.M.E. SPEC. PAGE 34
BOILER TUBES	A.S.M.E. SPEC. PAGE 40

TUBES MAY HAVE VARIATION IN GAUGE OF 10% EITHER WAY.

15 FRONT TUBE SHEET SHALL BE OF FIRE BOX STEEL.
ALL BOILER AND FIRE BOX STEEL AND MATERIAL FOR ONE PIECE DOME SHALL BE MARKED BY THE MANUFACTURER WITH THE HEAT NUMBER, NAME OF MANUFACTURER, GRADE AND LOWEST TENSILE STRENGTH IN THE MANNER AND LOCATION DESCRIBED ON B.L.W. MARKING CARD 6859. SMOKE BOX STEEL MAY CONFORM TO B.L.W. SPECIFICATION.

16 THE MINIMUM FACTOR OF SAFETY SHALL BE FIVE. (1918)
LONGITUDINAL SEAMS SHALL BE OF BUTT AND DOUBLE STRAP CONSTRUCTION.

17 THE OUTSIDE ENDS OF SOLID STAYBOLTS, 8 IN. AND LESS IN LENGTH, SHALL BE DRILLED WITH A HOLE AT LEAST 3/16" DIA., TO A DEPTH EXTENDING AT LEAST ½" BEYOND THE INSIDE OF THE PLATES

18 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 OR CORRESPONDING TAPER TAP.	1" & 1¼"	1½" & 2"	2½" TO 4"
NO. OF THREADS PER INCH.	11½	11½	8
MINIMUM NO. OF THREADS REQUIRED IN OPENING.	4	5	7
MINIMUM THICKNESS OF MATERIAL REQUIRED TO GIVE ABOVE NO. OF THREADS.	⅜"	7/16"	⅞"

IF THICKNESS OF BOILER MATERIAL IS NOT SUFFICIENT TO GIVE THE ABOVE NUMBER OF THREADS, A LINER OR FLANGE MUST BE APPLIED.

19 EACH BOILER MUST BE PROVIDED WITH A CONNECTION ¼ PIPE SIZE FOR ATTACHING INSPECTOR'S TEST GAUGE.

20 A FUSIBLE PLUG MUST BE APPLIED. THE PLUG MUST BE FILLED WITH PURE TIN AND THE LEAST DIAMETER OF THE FUSIBLE METAL MUST BE NOT LESS THAN ½" EXCEPT FOR WORKING PRESSURE ABOVE 175 LBS., IN WHICH CASE THE LEAST DIAMETER SHALL NOT BE LESS THAN ⅜", (I. E., USE FUSIBLE PLUG CARD 4144 FOR PRESSURE ABOVE 175 LBS. AND FUSIBLE PLUG CARD 1219 FOR 175 LBS. AND LESS).

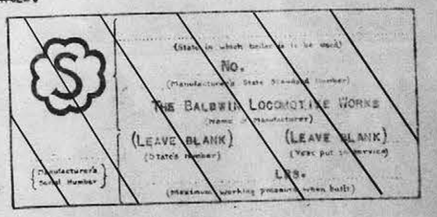
25 FEED WATER SHALL NOT DISCHARGE INTO A BOILER IN CLOSE PROXIMITY TO RIVETED JOINTS IN SHELL OR FURNACE SHEETS. EACH BOILER SHALL HAVE A FEED PIPE FITTED WITH A CHECK VALVE, AND ALSO A STOP VALVE OR STOP COCK BETWEEN THE CHECK VALVE AND THE BOILER, ~~THE FEED WATER TO DISCHARGE BELOW THE LOWEST SAFE WATER LINE.~~

26 SAFETY VALVES MUST MEET THE REQUIREMENTS OF THE A. S. M. E. BOILER CODE AND MUST BE PLAINLY STAMPED BY THE MANUFACTURER AS PER B. L. W. MARKING CARD 6858.
SAFETY VALVES OVER 3" IN DIAMETER SHALL HAVE FLANGED INLETS. THESE FLANGES SHALL CONFORM TO THE AMERICAN STANDARD.
ALL SAFETY VALVES MUST BE PROVIDED WITH RELIEF LEVERS.

27 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: ALSO WHERE POSSIBLE ONE NEAR THE THROAT SHEET.

28 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.

29 ~~UPON COMPLETION, EACH BOILER SHALL BE STAMPED IN THE PRESENCE OF THE AUTHORIZED INSPECTOR, WITH THE WORDS AS ARRANGED BELOW. THE HEIGHT OF THE LETTERS AND FIGURES SHALL NOT BE LESS THAN ¼". THE LOCATION OF THE STAMP SHALL BE ON THE BACK HEAD ABOVE A PLUG HOLE.~~



THE BALDWIN LOCOMOTIVE WORKS Dup 4 14 C 269

Memorandum Spec'n 18052

SPECIFICATION FOR LOCOMOTIVES 4 14 C 298

FOR VIRGINIA SHIPBUILDING CORPORATION

Gen. as PHOTO 4698 (SEE SUP. ①

Engine Drawing No. 41

5 23 18

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 -----

Curves -----

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

Weight (approximate) in working order, Total 39,000 POUNDS

On F. tr'k ---- lbs., Drivers 39,000 lbs., B. tr'k ---- lbs.

Tractive power 7250 lbs., Ratio of adhesion 4.4 TANK EMPT

Work'g St'm Pres. 160 lbs., Service SWITCHING (SUP. ①)

Fuel SOFT COAL

FRONT TUBE SHEET TO BE 7/16" THICK

Boiler STEEL Thick 5/16" & 3/8" Bill 8377

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

Longitud. seams DOUBLE RIVETED, LAP JOINTS

Dome, diam. 19" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE

Firebox, length 32½" Width 3 3/16" Depth F. 42½" B. 42½"

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

Firedoor opening 14" DIAM.

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

Water space, Frame SINGLE Riveted

Water space stays ⅞" DIAM. WITH 3/16" HOLE 1¼" DEEP FROM O.S.

Radial stays ⅞" 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

Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.

Number 73 Diam. 1¾" Length 9' 2½"

Heating Surface	Flues ----	Combus. Chamb. ----	Total 343.0
	Tubes 303.4	Fire Box 38.6	Fire Brick Tubes ----
Grate area 7.6	Ratio to Heating Surface 1 : 45		
Superheater ----			

Fire Brick ARCH, NONE

Grates ROCKING BARS AND DROP PLATE.

Ash Pan, Dampers RIGHT AND LEFT

Throttle BALANCE Pos. DOME

Dry pipe CAST IRON

Superheater NONE

SMOKE BOX TO HAVE SHORT EXTENSION

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. 9" Hole in S. B. dia. 10½"

Safety Valves TWO ~~CONSOLIDATED~~ ASHTON (Not Spec) 1½" ~~STANDARD~~

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. RIGHT SIDE

Cleaning Plugs PLUGS 1½" PIPE TAP.

Firebox CORNERS L.S. FRONT AND BACK

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 TWO MONITOR (Not Spec) No. 4

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

COAL BOX LOCATED IN LEFT SIDE OF CAB, ABOUT 30" HIGH AND EXTENDING FULL WIDTH OF CAB, BUILT OF IRON WITH SCOOP DOOR AT BOTTOM.

Cab boards WOOD Nosing NONE

Running boards WOOD Nosing NONE

Hand rail IRON Located on TANK

Back Bumper OAK, SEE SUP ③

Pilot NONE Pushing shoes FRONT AND BACK

Front Bumper OAK, (SEE SUP. ③) Bumper plate NONE

Steps AND HAND RAILS, (SEE SUP. ④)

F. & B. Drawhead, Center above rail 33½"

Coupler M. C. B. AUTO.

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 TWO DIAM. 15" Body IRON PTD. Pipes IRON

Sander HAND, 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

R. E. Johnston June 1918

SPECIFICATION FOR LOCOMOTIVES 4 14 C 298

FOR VIRGINIA SHIPBUILDING CORPORATION

265 265

Frames CAST STEEL (SEE SUP. ②) Braces SOLID

Cylinders, Diam. 10" Stroke 16"

St'm ports, Length 9" Width 1" Bridges ⅞"

Exh. ports, Length 9" Width 1⅝" Valve lead 1/16"

Valve travel 1½" Steam lap ⅞" Exhaust clearance ----

Eccentric throw 2½" By-pass valve ----

S. P. Lubr. MICHIGAN DOUBLE BULLS EYE, TWO 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"

Piston pkg {PISTON RODS / VALVE STEMS} BRAIDED PACKING

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD

Guides SINGLE BAR, STEEL Oil cups NEEDLE

Crossheads CAST IRON, BEARINGS CAST IRON, BABBITTED.

Wrist Pins STEEL Rod cups NEEDLE

CONNS. AND PARRALLEL 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 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 5½"

Tires, Plain, Pos. NONE Size -------

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

Driving Boxes CAST IRON

Journals, Diam. 5" 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 PAIR OF WHEELS (NO TENDER)

Operating Parts: Engine, Sch. UO, B.L.W. STEAM

Foundation Parts: Drivers, sch. UO B.L.W. / Eng. Tr'k, sch. ----

Air pump ---- Pos. ---

Train connections ----

Train signal, sch. ----

SEPARATE LUBRICATOR FOR STEAM BRAKE VALVE.

ALL PARTS OF BRAKE TO BE KEPT ABOVE LOWER LINE OF BUMPERS.

SHOES TO BE DETACHABLE FROM HEADS.

Tender NONE

Tank 700 Gallons. Bill 4710

SADDLE TANK LOCATED OVER TOP OF BOILER, AND EXTENDING TO FRONT OF SMOKEBOX EXTENSION. CLEANING HOLE IN FRONT END OF TANK.

① DESIGN:- LOCO. TO BE DESIGNED WITH A VIEW TO PROVIDING STRONG AND SERVICABLE MACHINE, HAVING AMPLE MATERIAL FOR STRENGTH, WITH A MINIMUM AMOUNT OF "FINISHED" WORK. ALL MACHINE FINISHING TO BE OMITTED EXCEPT WHERE NECESSARY FOR JOINTS. ALL PARTS TO BE EXTRA HEAVY TO WITHSTAND ROUGH USAGE AND FREQUENT DERAILMENTS. ALL PARTS POSSIBLE TO BE KEPT ABOVE THE LOWER LINE OF BUMPERS.

② FRAMES TO BE 3" WIDE WITH UPPER BAR ABOUT 2¾" DEEP. FRAMES WITH DOUBLE RAILS EXTENDING TO BOTH FRONT AND BACK BUMPERS, HANGERS AND KNEES WHERE POSSIBLE, CAST INTEGRAL WITH FRAMES.

③ BUMPERS FRONT AND BACK TO EXTEND FULL WIDTH OF ENGINE, 22" DEEP, ABOUT 6¾" THICK, AND PLACED OVER 6" ABOVE RAIL.

④ STEPS ACROSS FRONT AND REAR OF ENGINE NEAR BOTTOM OF BUMPERS WITH HANDRAILS ABOUT 10" ABOVE TOP OF BUMPERS.

ACTUAL DIMENSIONS OF LOCO. — HEIGHT OVER ALL = 9' 8⅝"

EXTREME WIDTH:- {Over Cab Boards 7' 9" / Over Cylinder or Valve Motion 7' 8⅝"

LENGTH O.S. FACE FRONT BUMPER TO O.S. FACE OF BACK BUMPER 18' 1"

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 24 18 Shipment ON CAR

① 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 CAB SIDES, Co's EMBLEM, AS SHOWN ON THEIR LETTERHEAD. COPY (HEREWITH)

MARK ON TANK SIDES, { VIRGINIA SHIPBUILDING CORPORATION / ALEXANDRIA, VIRGINIA

Road Nos. Pos. Road Nos. Name NONE

F. No. PLATE 2

F. SAND BOX

THE BALDWIN LOCOMOTIVE WORKS — As Spec'n. 6-037 Sup. 6-36 D 138 to 138 except where otherwise specified.

Memorandum Specn 19032

SPECIFICATION FOR LOCOMOTIVES 6 36 D 309 - 310 — Gen. ns Photo. 2141

FOR Winston - Dear Company — **Engine Drawing No.** 20

R. — 5-27-19.

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"
Total wheelbase, eng. and tend. { Actual 42' 10" / Limited to -----

11 **Curves** 40 degrees

Limits, Height 13' 6" Width -----
Weight (approximate) in working order, Total 155,700 pounds
On F. tr'k ----- lbs., Drivers 155,700 lbs., B. tr'k ----- lbs.

Tractive power 35,000 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 13/16" Bill 8558
Boiler, Diam. 76" Plan Straight Top
Boiler st'm pres. 180 lbs., Tested to { 200 / 240 } lbs. steam pres. / lbs. water pres.
with factor of safety of 5.0
Longitud. seams Butt jointed, double covering strips

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

Firebox Steel Combustion chamb. None
Firebox, length 120⅛" Width 42⅛" Depth F. 71¼" B. 69½"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back ⅜"
Firedoor opening 16" diameter
Water space, Front 4" Sides 3" Back 4"
Water space, Frame Double Riveted
12 Water space stays 1" diam. with 3/16" holes 1⅛" deep from O.S.

Radial stays 1⅛" diam. Sling stays front { Three rods B.L.W. Expansion Stays
Button heads below crown on Ten central rows
Crown bars None Placed ----- above crown
Crown bolts -----

Flues -----
Tubes #11 W. G. Charcoal Iron
Tube ends Swaged for copper ferrules, fire box ends
Number 350 Diam. 2" Length 10' 6"

Heating Surface — Flues ----- Combus. Chamb. ----- Total 2109 sq
Tubes 1909 sq Fire Box 200 sq Fire Brick Tubes -----
Grate area 35 sq Ratio to Heating Surface 1 : 60.1
Superheater -----

Fire Brick Arch On Studs

2 **Grates** Rocking bars and drop plate front and back
Ash Pan, Dampers Front and Back; Ash-pan drop bottom type.
Ash-pan to conform to I.C.C. requirements, and arranged for dumping by levers operated from cab.
3 **Throttle** Balanced Pos. Dome
Dry pipe Steel

Superheater None

Smokebox extension With Cleaning hole and cap R. and L.
Spark ejector or hopper With
Netting and deflector plates With
Exhaust nozzles Double High
Stack Straight Dia. 18"

Safety Valves Two Crosby 3" (Spec)
Safety valves None with relief lever, Set to 180 pounds
Whistle One B. L. W. Plain

Steam Gauge One Iron 7" Thermostatic. Maker:-Crosby (Spec)
Steam gauge stand Iron **Clock** None
Water glass to be Improved type Klinger Reflex.
Water Gauge One **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 Johnstone Pos.-Front
4 **Cleaning Plugs**
Firebox Corners diagonal, sides and back
Crown, Four 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 "1887" (Spec) No. 10½
5 Injectors, Pos. Right and Left Steam pipes Copper
8 Pipes, Check Iron Feed Iron Overflow Iron
Check (See Sup. 6-c) Pos. Right and Left

Steam Heat None

10 **Cab** Steel. Ventilator in cab roof.

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

11 **Back Bumper** Bar Steel Back drawbar height 30"
Spring buffer between engine and tender, to take up play.
Front bumper of engine to be reinforced with steel plates.
Pilot None Pushing shoes Cast in bumper
Front Bumper Oak Bumper plate None
13 **Steps** across front, with hand rail.
Steps, hand holds, etc. to conform to I.C.C. requirements.
Front Drawhead, Center above rail 33½" Solid 6-20-19
14 **Coupler** Shoreg W. C. B. Automatic, with slotted knuckle

Signal fixtures None

Headlight Two Round Case 16" Reflector, To burn Kerosene
Headlight, Nos. on sides With Hdlt step With
Lamp shelf None Nosing -----

Bell 85 pounds
Sand Box Two Diam. 28" Body Iron Painted Pipes Iron
(See Sander "Sie" Air, in each box, with pipes leading to front of forward and back of rear driving wheels only.
Doors casing Iron Painted

Boiler Jacket #22 Plan. Steel Bands Iron Style 9
Boiler Lagging Magnesia Sectional

THE BALDWIN LOCOMOTIVE WORKS

F. L. Bird — June-1919

SPECIFICATION FOR LOCOMOTIVES 6 - 36 D 309 - 310

FOR Winston - Dear Company

R.

Frames Cast Steel Braces Solid

16 **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 4⅛" By-pass valve None
15 S. F. Lubr. Nathan four-feed bull's eye (Spec)
Cyl'r heads Cast Iron; Lubr. pipes of copper under jacket
Cyl'r casings Iron Ptd. Head covers Steel Painted
16 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 (No. Spec)
Piston Rods of Coffin Process Steel, keyed to crosshead.
17 **Pistons** Cast Iron rings sprung into solid cast iron head
Guides Laird Type, Steel Oil cups Needle
21 **Crossheads** Cast Steel
Wrist Pins (Sup. 22) Rod cups for grease
Parallel rods to have solid ends.

23 **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 well fastened to axles.

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.

31 **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. All Size 3" X 5½"
Tires, Plain, Pos. None Size -----
Lateral play between driving boxes and wheel hubs = 1/16" total
31 **Driving Boxes** Cast Steel
Journals, Diam. 9" Length 12"
Driving axles of Coffin Process Steel.

34 **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 -----

25 **Brake,** position On all Driving and Tender Wheels
9 Operating Parts | Engine, Sch. No. 6-ET West'g. Combined Auto. and Straight Air
Eng. Tr'k, sch. -----
Foundation Parts | Drivers, sch. W/-3, American Outside Equalized
Eng. Tr'k, sch. -----
15 Air pump and Pos. (See Sup. 25)
Train connections Front and Back
Train signal, sch. None

Tender Eight Wheeled, Drawing No. 435
Weight, with fuel and water, about 84,000 pounds

36 **Tank** 4,000 Gallons, Bill 4832
Tank "U" shape, sloping back. Fuel capacity 6 Tons.
Tank man hole to be larger.
Tool Boxes Hard Wood, top.

Frame Steel 10" channels, with front and back bumpers of wood.
Spring buffer between engine and tender, to take up play.
Front Drawbar height 29½"
Pilot None Pushing shoes at rear.
Back drawhead, center above rail 33½" Solid 6-20-19
37 **Coupler** Shoreg W. C. B. Automatic with slotted knuckle.

38 Steps, handholds, etc. to conform to I. C. C. requirements.
Bolster plates of cast steel.
Trucks Arch Bar type with steel bolsters.
Tender springs to be amply strong, particularly front ones.
Springs Elliptic. B. L. W.
Journals, Diam. 4½" Length 8" Axles Coffin Process Steel.
Wheels, Diam. 33" Tread 4½" Kind Solid Forged Rolled Steel
Tires ----- Cen. diam.----- Size -----
Tires held by ----- Wheel Rims 1" thick.
Safety chains Double
Safety chains to be placed on back of tender trucks.
Brake Position On all wheels.
Brake sch. No. 6 ET West'g. Auto. and Straight Air with 10" X 12" tender cylinder.
Drain cocks to be provided at low points of all piping.

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 B.L.W. form 1036
Junior laws to 6-1-19 Shipment On own wheels

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

B. L. W. Patents { Feed Water Strainer, Pat'd Sept. 1, 1903 (Cast on) / Ventilator, No. 722539, Pat'd Mar. 10, 1903 (Brass Plate)

Property plates None

Painting: Engine, style ----- Plain Black, No Striping
Painting: Tender, style ----- Plain Black, No Striping

Lettering, etc. in Silver.
Mark on tank sides: Winston-Dear Company, Contractors

Road Nos. Pos.	Road Nos.	Name None
F. No. Plate	119	
F. Sand Box	120	
Cab Sides		

Actual Dimensions of Loco. Extreme height over all 13' 5"
Extreme Width:- Cab boards 10' 3" Cylinders or valve motion 9' 8"
Length outside face front bumper of engine to face of tender wedge 31' 0"
Length face of tender wedge to outside face back bumper of tender 23' 11½"
Total length outside face front bumper of engine to outside face back bumper of tender 54' 11½"

SPECIFICATION FOR LOCOMOTIVES 6-36 D 309 - 310

FOR WINTON-DEAR COMPANY

R.

1 STAYBOLTS:- SPECIAL ATTENTION TO BE PAID TO APPLICATION OF ALL STAYBOLTS.
STAYBOLTS HOLES IN FIRE-BOX SIDE SHEETS TO BE DRILLED.
STAYBOLTS TO BE DRILLED ON OUTSIDE SO THAT LEAKS MAY BE MORE EASILY DETECTED.

2 GRATE FRAMES TO BE ARRANGED FOR AT LEAST $\frac{3}{4}$" CLEARANCE FROM FIRE-BOX SIDE SHEETS.

3 THROTTLE STUFFING BOX TO BE BRASS BUSHED TO GIVE MORE BEARING TO THROTTLE ROD.

4 CLEANING PLUGS TO INCLUDE THE FOLLOWING:-
ONE PLUG IN EACH SIDE, JUST ABOVE MID RING, BACK OF BACK DRIVING SPRING AND AHEAD OF EXPANSION PLATE.
ONE PLUG INSIDE AND ONE OUTSIDE OF CAB, OVER CROWN SHEET, ON LEFT SIDE.
TWO PLUGS OUTSIDE OF CAB, OVER CROWN SHEET, ON RIGHT SIDE.

5 SYPHON COCKS, WITH HOSE CONNECTIONS, PLACED IN TOP OF DOME.

6 INJECTOR CHECKS TO BE HANCOCK IMPROVED, REGRINDING TYPE.
BOILER SHELL TO BE REINFORCED AT OPENINGS FOR CHECK VALVES ~~TO PROVIDE FOR MORE THREADS AND TO MAKE CHECKS TIGHT IN BOILER SHELL~~ 4/c check having flange connections (Sup. 7) T.P.14 (For Record)

7 INJECTOR CHECKS TO BE EQUIPPED WITH SEDDON BOILER FEED DEVICE, ROYALTY PAYABLE BY THE S. L. W.

8 BRANCH PIPES OF IRON, CONNECTED TO CHECKS WITH A TEE, ONE RUN OF THE TEE SERVING THE BRANCH PIPE, THE SIDE OUTLET SERVING THE CHECK, AND THE OTHER RUN OF THE TEE FITTED WITH A VALVE SO THAT HOSE MAY BE ATTACHED IN ORDER TO SET HOT WATER UNDER INJECTOR PRESSURE.

9 DRAIN COCKS TO BE PROVIDED AT LOW POINTS OF ALL PIPING.

10 FOUNTAIN HEAD (STEAM TURRET) FOR STEAM CONNECTIONS TO BE SAME AS FOR 6-36 D 90 AND 136 TO 138.

11 AMPLE CLEARANCE TO BE PROVIDED BETWEEN THE FRONT OF TANK AND THE BACK OF CAB, WHEN ROUNDING SHARP CURVES, SUFFICIENT FOR A MAN TO STAND THERE WITHOUT BEING PINCHED. (Sup. 36)

12 BACK END RUB CASTING ON ENGINE TO BE ROUNDED OFF, INSTEAD OF SQUARE, TO PERMIT THE ENGINE AND TENDER TO PASS CURVES MORE EASILY.

13 STEP ACROSS FRONT TO BE IN TWO SECTIONS, OMITTING THE PORTION BELOW COUPLER.

14 COUPLER KNUCKLE TO HAVE 15" FACE. (Sup. 37)
~~POCKET FOR COUPLER TO BE ABOUT 2" DEEPER THAN SHANK AND TO HAVE TWO 1" SHIMS INSERTED ABOVE SHANK~~
DRAW CASTING TO BE NATIONAL MALLEABLE CASTING CO'S PT. 15373

15 LUBRICATOR:- THE FOURTH FEED OF THE LUBRICATOR TO BE USED FOR OILING THE CROSS-COMPOUND AIR-PUMP.

16 PRESSURE PLATE TO BE SEPARATE FROM STEAM-CHEST COVER.
CHANNEL COCKS TO BE APPLIED TO DRAIN CHANNELS IN SADDLE CASTING, THESE TO BE REGULAR BALDWIN CYLINDER-COCKS, FITTED UP INDEPENDENT.

17 PISTON TO BE ARRANGED SO THAT PACKING RINGS IN THE HEAD CAN BE RENEWED WITHOUT DISCONNECTING THE PISTON ROD FROM CROSSHEADS.

21 CROSSHEAD GIBS TO BE SAME TYPE AS FOR 6-36 D 90 AND 136 TO 138.

22 WRIST PINS OF COFFIN PROCESS STEEL.

23 TUMBLING SHAFT TO BE SAME STYLE AS 6-36 D 90 AND 136 TO 138
COIL SPRING IS NOT DESIRED.

24 EQUAL. BEAMS OF WROT IRON.
SPRINGS TO BE MADE AMPLY STRONG.
SPRING HANGERS TO BE $4\frac{1}{2}$" X 1"

25 POWER BRAKES:- ONE $9\frac{1}{2}$" WESTINGHOUSE AIR PUMP, FOR THE REGULAR AIR-BRAKE SERVICE, LOCATED ON LEFT SIDE OF ENGINE, IN ADDITION TO (THERE WILL BE FURNISHED) ONE $8\frac{1}{2}$" WESTINGHOUSE CROSS-COMPOUND AIR PUMP, LOCATED ON LEFT SIDE OF ENGINE, WITH RESERVOIR LOCATED UNDER RUNNING BOARD ON RIGHT SIDE OF ENGINE TO SUPPLY AIR TO DUMP LINES.
PUMPS TO BE WELL BRACED ON BOILER, (ALL STUDS HOLDING PUMP ON ENGS. 39386, 88, 89 - 6-36 D 136 TO 138 BROKE).
AIR-PUMP GOVERNOR TO BE SO PLACED THAT PIPING DOES NOT INTERFERE WITH HEATER VALVE TO INJECTOR.
EXHAUST FROM BOTH PUMPS TO BE BROUGHT TOGETHER AND PIPED INTO THE CYLINDER SADDLE.

26 TWO AIR RESERVOIRS FOR STORAGE, SO CONNECTED THAT ENGINEER CAN TURN THEM TOGETHER OR RETAIN STORAGE SEPARATELY.
AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

27 IN LOCATING RESERVOIRS AND PUMPS, CONSIDERATION OF ACCESSIBILITY TO STAY-BOLTS TO BE GIVEN.

28 WESTERN WHEELED SCRAPER CO'S ENGINEER VALVE FOR OPERATING DUMP LINES, TO BE SET UP IN CAB IMMEDIATELY AHEAD OF ENGINEER'S STRAIGHT AIR BRAKE VALVE, WITH ITS EXHAUST CARRIED THROUGH SIDE OF CAB.
EXTRA GAUGE TO BE PLACED ON GAUGE STAND TO RECORD PRESSURE IN DUMP LINE RESERVOIR. GAUGE TO BE WEST'G. $3\frac{1}{2}$" SINGLE POINTER, NO. 10839.
DUMP LINES TO BE CARRIED TO FRONT OF ENGINE AND TO BACK OF TENDER.

31 DRIVING BOXES TO HAVE FACES BABBITTED NEXT TO HUBS OF WHEELS AND LINERS TO BE OMITTED FROM HUBS OF WHEELS.

TENDER

36 AMPLE CLEARANCE TO BE PROVIDED BETWEEN THE FRONT OF TANK AND THE BACK OF CAB, WHEN ROUNDING SHARP CURVES, SUFFICIENT FOR A MAN TO STAND THERE WITHOUT BEING PINCHED. (Sup. 11)

37 COUPLER KNUCKLE TO HAVE 15" FACE. (Sup. 14)
DRAW CASTING TO BE NATIONAL MALLEABLE CASTING CO.'S, AS PRINT 15369.

38 STEP ACROSS REAR OF TENDER WITH HAND RAIL; STEP TO BE IN TWO SECTIONS, OMITTING THE PORTION BELOW COUPLER.
STEPS ON SLOPING BACK OF TANK.

THE BALDWIN LOCOMOTIVE WORKS | Dup. 6-36 D 309, 310, WITH SAME EXTRAS, EXCEPT WHERE OTHERWISE SPECIFIED.

Modification Spec'n 20001

SPECIFICATION FOR LOCOMOTIVES 6 36 D 315, 316

FOR WINSTON-DEAR COMPANY

P

Gen. as PHOTO. 21[illegible]

Engine Drawing No. 20

1-7-20

Gauge of Road 4' 8½" Play 3/8"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 11' 0"
Total wheelbase, eng. and tend. {Actual 42' 2⅝" / Limited to —

Curves 10 DEGREES

Limits, Height 13' 6" Width —
Weight (approximate) in working order, Total 155,700 POUNDS
On F. tr'k — lbs., Drivers 155,700 lbs., B. tr'k — lbs.

Tractive power 35,000 lbs., Ratio of adhesion 4.5
Work'g St'm Pres. 180 lbs., Service SWITCHING
Fuel SOFT COAL

1 **Boiler** STEEL Thick 13/16" Ball 8852
5 Front Tube Sheet 2" Thick
Boiler, Diam. 76" Plan STRAIGHT TOP
3 {Allowable st'm pres. 180 lbs. **Tested to** 200 lbs. steam pres.
6 {With Factor of Safety of 5.08 **Tested to** 270 lbs. water pres.
6 Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS

5 **Dome,** diam. 33" Pos. CENTRAL

5 **Firebox** STEEL Combustion chamb. NONE
Firebox, length 120 1/16" Width 42" Depth F. 71 1/4" B. 69 1/4"
Firebox, Tube 9 1/16" Crown 3/8" Sides 3/8" Back 3/8"
Firedoor opening 16" DIAMETER
Water space, Front 4" Sides 3" Back 4"
Water space frame DOUBLE Riveted
Water space stays 1" DIAM. WITH 3/16" HOLES 1½" DEEP FROM O. S.
Radial stays 1 1/8" DIAM. Sling stays front {THREE ROWS B. L. W. / EXPANSION STAYS
Button heads below crown on TEN central rows
Crown bars NONE Placed — above crown
Crown bolts —

Flues —
Tubes #11 W. G. CHARCOAL IRON
Tube ends STAGED FOR COPPER FERRULES, FIRE BOX ENDS
Number 350 Diam. 2" Length 10' 6"

Heating Surface {Flues — Combus. Chamb. — Total 2109
{Tubes 1909 Fire Box 200 Fire Brick Tubes —
Grate area 35 Ratio to Heating Surface 1: 60.1
Superheater —

Fire Brick ARCH - ON STUDS

Grates ROCKING BARS AND DROP PLATE FRONT AND BACK
Ash Pan, Dampers FRONT AND BACK, ASH-PAN DROP BOTTOM TYPE
ASH PAN TO CONFORM TO I. C. C. REQUIREMENTS, AND ARRANGED FOR DUMPING BY LEVERS OPERATED FROM CAB.
Throttle BALANCE Pos. DOME
Dry pipe STEEL

Superheater NONE

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 Dia. 18"

Safety Valves TWO CROSBY 3"
Safety valves BOTH with relief lever, Set to 180 POUNDS
Whistle ONE B. L. W. PLAIN

Steam Gauge ONE IRON 7" THERMOSTATIC MAKER: CROSBY
Steam gauge stand IRON Clock NONE

Water Gauge ONE WILTSHIRE #8X **Cab Lamps** TO BURN OIL
Gauge Cocks THREE - BACK Surface valve NONE
Lowest gauge cock 3¼" 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 ONE PLUG ABOVE FIRE DOOR
Firebox, CORNERS DIAGONAL, SIDES AND BACK
Crown, THREE RIGHT SIDE, FOUR LEFT SIDE, AND TWO BACK
Waist, ONE UNDER FRONT
Front tube sheet ONE Fusible plug ONE

Pump NONE
LOCOMOTIVE FOR USE IN MINNESOTA.
BOILER TO MEET THE A. S. M. E. CODE.
BOILER TO BE INSPECTED BY THE HARTFORD STEAM BOILER INSPECTION AND INSURANCE COMPANY.
Injectors TWO SELLERS "1887" No. 10½
Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER
Pipes, Check IRON Feed IRON Overflow IRON
Check (SEE SUP. 15-3rd) Pos. RIGHT AND LEFT

Steam Heat NONE
FOUNTAIN HEAD (STEAM TURRET) FOR STEAM CONNECTIONS TO BE SAME AS FOR 6 36 D 90 AND 136 TO 138.
Cab STEEL VENTILATOR IN CAB 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 30"
SPRING BUFFER BETWEEN ENGINE AND TENDER TO TAKE UP PLAY.
FRONT BUMPER OF ENGINE TO BE REINFORCED WITH STEEL PLATES.
Pilot NONE Pushing shoes. CAST IN BUMPER
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. AUTOMATIC WITH SOLID KNUCKLE
DRAW CASTING TO BE NATIONAL MALLEABLE CASTING CO'S. PT. 15373
COUPLER KNUCKLE TO HAVE 15" FACE.
Signal fixtures NONE

Headlight TWO ROUND CASE 16" Reflector, To burn KEROSENE
Headlight, Nos. on sides WITH H'd'l step WITH
Lamp shelf NONE Nosing —

Bell 85 POUNDS
Sand Box TWO Diam. 28" Body IRON PAINTED Pipes IRON
Sander "SHW" AIR IN EACH BOX, WITH PIPES LEADING TO FRONT OF FORWARD AND BACK OF REAR DRIVING WHEELS ONLY.
Dome casing IRON PAINTED

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

THE BALDWIN LOCOMOTIVE WORKS

J. V. Applin

SPECIFICATION FOR LOCOMOTIVES 6 36 D 315, 316

FOR WINSTON - DEAR COMPANY

P

270 270

Frames CAST STEEL

Cylinders, Diam. 21" Stroke 26"
St'm ports, Length 19" Width 1 7/8" Bridges 1 3/8"
Exh. ports, Length 19" Width 3" Valve lead 1/16"
Valve travel 5" Steam lap 7/8" Exhaust clearance —
Eccentric-crank throw 1 5/8" By-pass valve NONE
S. F. Lubr. NATHAN, FOUR-FEED 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
St'm chest valves BALANCED, WITH VACUUM VALVES
Met. pkg. {PISTON RODS / VALVE STEMS UNITED STATES,
PISTON RODS OF COFFIN PROCESS STEEL, KEYED TO CROSSHEAD.
Pistons CAST IRON RINGS SPRUNG INTO SOLID CAST IRON HEAD.
Guides LAIRD TYPE, STEEL Oil cups NEEDLE
Crossheads CAST STEEL
Wrist Pins (SUP. 49) Rod cups FOR GREASE
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.
ECCENTRICS TO BE WELL FASTENED TO AXLES.

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.
Driving wheel hub liners (SEE. SUP. 58)
Drivers, O. S. Diam. 50" Cen. diam 4 1/4"
WHEEL CENTERS: MAIN, CAST STEEL, OTHERS CAST IRON.
Tires STEEL Held by SHRINKAGE AND SHOULDER
Tires, Flanged, Pos. ALL Size 3" x 5 1/2"
Tires, Plain, Pos. NONE Size —
Lateral play between driving boxes and wheel hubs 3/16" TOTAL
Driving Boxes CAST STEEL
Journals, Diam. 9" Length 12"
DRIVING AXLES OF COFFIN PROCESS STEEL

Springs. Make B. L. W.

Front Engine Truck NONE Wheels —
To swing — each side of cen. Cen. pin liners —
Journals, Diam. — Length — Boxes —
Wheel hub liners —
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 —
Wheel hub liners —
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 WESTG. COMBINED AUTO. AND
Parts {Eng. Tr'k — STRAIGHT AIR
Foundation {Drivers, sch. AM-3-80 AMERICAN OUTSIDE EQUALIZED
Parts {Eng. Tr'k, sch. —
Air pump AND Pos. (SEE SUP. 59)
Train connections FRONT AND BACK
Train signal, sch. NONE

Tender EIGHT Wheeled, Drawing No. 435
Weight, with fuel and water, about 84,000 POUNDS
TENDER TO BE WEIGHED: YES
Tank 4,000 Gallons, Bill 4832
TANK "U" SHAPE, SLOPING BACK FUEL CAPACITY, 6 TONS.
TANK MAN HOLE TO BE LARGE
Tool Boxes HARD WOOD, TOP

Frame STEEL, 10" CHANNELS, WITH FRONT AND BACK BUMPERS OF WOOD.
SPRING BUFFER BETWEEN ENGINE AND TENDER TO TAKE UP PLAY.
Front Drawbar height 29½"
Pilot NONE Pushing shoes AT REAR
Back drawhead, center above rail 33½"
Coupler SHARON M. C. B. AUTOMATIC WITH SOLID KNUCKLE
DRAW CASTING TO BE NATIONAL MALLEABLE CASTING COMPANY'S AS PRINT 15369-A. COUPLER KNUCKLE TO HAVE 15" FACE.
Steps HAND HOLDS ETC., TO CONFORM TO I. C. C. REQUIREMENTS.

Trucks ARCH BAR TYPE WITH CAST STEEL BOLSTERS.
TENDER SPRINGS TO BE AMPLY STRONG, PARTICULARLY FRONT ONES.
Springs ELLIPTIC, B. L. W.
Journals, Diam. 4½" Length 8" AXLES COFFIN PROCESS STEEL
Wheels, Diam. 33" Tread 1 1/4" Kind SOLID FORGED ROLLED STEEL
Tires NONE Cen. diam. — Size —
Tires held by — WHEEL RIMS 2½" THICK
Safety chains DOUBLE
SAFETY CHAINS TO BE PLACED ON BACK OF TENDER TRUCKS.
Brake Position ON ALL WHEELS
Brake sch. No. 6-ET WESTG. AUTO. AND STRAIGHT AIR, WITH 10" x 12" TENDER CYLINDER. ONE TENDER DRAIN CUP WITH ½" COCK, SIDE OUTLET CLOSED, PIECE No. 9333.

List of tools, sch. 29
Photo sch. NONE - Inspection B. L. W. EXCEPT (SEE SUP. 4)
To be weighed NO Material spec'ns B. L. W. EXCEPT (SEE SUP. 4)
Certificate of boiler test THREE COPIES B. L. W. FORM 1036
Junior laws to 3-1-20 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, style — PLAIN BLACK, NO STRIPING

LETTERING ETC. IN SILVER SAME AS FOR 6 36 D 309, 310
Mark on TANK SIDES: WINSTON-DEAR COMPANY, CONTRACTORS.

Road Nos. Pos	Road Nos.	Name
F. No. PLATE	121	NONE
F. SAND BOX	122	
CAB SIDES		

Actual Dimensions of Loco. Extreme height over all 13' 6"
Extreme Width: Cab boards 10' 1": Cylinders or valve motion 9' 9"
Length outside face front bumper of engine to face of tender weight 30' 7 1/16"
Length face of tender weight to outside face back bumper of tender 23' 2"
Total length outside face front bumper of [illegible] 53' 9½"

SPECIFICATION FOR LOCOMOTIVES

FOR

P

1 BOILER TO BE OPERATED IN THE STATE OF

BOILER TO BE BUILT TO CONFORM TO THE BOILER CODE OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS (1913), AND MUST BE INSPECTED DURING CONSTRUCTION AND UPON COMPLETION BY AN AUTHORIZED INSPECTOR WHO SHALL NOT BE INTERESTED EITHER DIRECTLY OR INDIRECTLY WITH THE MANUFACTURERS.

2 A DATA REPORT, ON FORMS FURNISHED BY THE ABOVE MENTIONED STATE SHALL BE FORWARDED TO THE PROPER OFFICIAL BEFORE THE BOILER LEAVES THE BUILDER'S WORKS.

3 A HYDROSTATIC TEST SHALL BE APPLIED EQUAL TO ONE-AND-ONE-HALF (1½) TIMES THE WORKING PRESSURE.

4 THE MATERIALS ENTERING INTO THE CONSTRUCTION SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS:-

BOILER AND FIRE BOX STEEL MATERIAL FOR ONE-PIECE DOME	A.S.M.E. SPEC. PAGE 11
BOILER RIVET STEEL	A.S.M.E. SPEC. PAGE 15
BOILER RIVET IRON	A.S.M.E. SPEC. PAGE 31
BOILER BRACE IRON	A.S.M.E. SPEC. PAGE 37
BOILER STAYBOLT IRON	A.S.M.E. SPEC. PAGE 34
BOILER TUBES	A.S.M.E. SPEC. PAGE 40

5 FRONT TUBE SHEET SHALL BE OF FIRE BOX STEEL.

ALL BOILER AND FIRE BOX STEEL AND MATERIAL FOR ONE PIECE DOME SHALL BE MARKED BY THE MANUFACTURER WITH THE HEAT NUMBER, NAME OF MANUFACTURER, GRADE AND MINIMUM TENSILE STRENGTH IN THE MANNER AND LOCATION DESCRIBED ON B.L.W. MARKING CARD 6859. SMOKE BOX STEEL MAY CONFORM TO B.L.W. SPECIFICATION.

6 THE MINIMUM FACTOR OF SAFETY SHALL BE FIVE. (1918)

LONGITUDINAL SEAMS SHALL BE OF BUTT AND DOUBLE STRAP CONSTRUCTION.

7 THE OUTSIDE ENDS OF SOLID STAYBOLTS, 8 IN. AND LESS IN LENGTH, SHALL BE DRILLED WITH A HOLE AT LEAST 1/16" DIA., TO A DEPTH EXTENDING AT LEAST ½" BEYOND THE INSIDE OF THE PLATES

8 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 OR CORRESPONDING TAPER TAP.	1" & 1¼"	1½" & 2"	2½" TO 4"
NO. OF THREADS PER INCH.	11½	11½	8
MINIMUM NO. OF THREADS REQUIRED IN OPENING.	4	5	7
MINIMUM THICKNESS OF MATERIAL REQUIRED TO GIVE ABOVE NO. OF THREADS.	⅞"	7/10"	⅞"

IF THICKNESS OF BOILER MATERIAL IS NOT SUFFICIENT TO GIVE THE ABOVE NUMBER OF THREADS, A LINER OR FLANGE MUST BE APPLIED.

9 EACH BOILER MUST BE PROVIDED WITH A CONNECTION ¼ PIPE SIZE FOR ATTACHING INSPECTOR'S TEST GAUGE.

10 A FUSIBLE PLUG MUST BE APPLIED. THE PLUG MUST BE FILLED WITH PURE TIN AND THE LEAST DIAMETER OF THE FUSIBLE METAL MUST BE NOT LESS THAN ½" EXCEPT FOR BOILERS PRESSURE ABOVE 175 LBS., IN WHICH CASE THE LEAST DIAMETER SHALL NOT BE LESS THAN ⅜". (See Sup. 108 FUSIBLE PLUG CARD 4114 FOR PRESSURE ABOVE 175 LBS. AND FUSIBLE PLUG CARD 4210 FOR 175 LBS. AND LESS).

15 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.

16 SAFETY VALVES MUST MEET THE REQUIREMENTS OF THE A. S. M. E. BOILER CODE AND MUST BE PLAINLY STAMPED BY THE MANUFACTURER AS PER B. L. W. MARKING CARD 6859.
SAFETY VALVES OVER 3" IN DIAMETER SHALL HAVE FLANGED INLETS. THESE FLANGES SHALL CONFORM TO THE AMERICAN STANDARD.
ALL SAFETY VALVES MUST BE PROVIDED WITH RELIEF LEVERS.

17 THERE SHALL BE NOT LESS THAN SIX BRASS WASH-OUT 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: ALSO WHERE POSSIBLE ONE NEAR THE THROAT SHEET.

18 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 EXCEEDING 1/16" LESS THAN FULL SIZE FOR PLATES OVER ⅝" IN THICKNESS, AND ⅛" LESS THAN FULL SIZE FOR PLATES ⅝" 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 1/16" LESS THAN FULL SIZE AND THEN DRILLED, REAMED OR FINISHED FULL SIZE WITH ROTATING CUTTER.

19 UPON COMPLETION, EACH BOILER SHALL BE STAMPED IN THE PRESENCE OF THE AUTHORIZED INSPECTOR, WITH THE WORDS AS ARRANGED BELOW. THE HEIGHT OF THE LETTERS AND FIGURES SHALL NOT BE LESS THAN ½". THE LOCATION OF THE STAMP SHALL BE ON THE BACK HEAD ABOVE A PLUG HOLE.

(State in which boiler is to be used)
No.
(Manufacturer's State Standard Number)
THE BALDWIN LOCOMOTIVE WORKS
(Name of manufacturer)
(LEAVE BLANK) (Shop number) (LEAVE BLANK) (Year put in service)
(Manufacturer's Serial Number)
LBS.
(Maximum working pressure taken here)

SPECIFICATION FOR LOCOMOTIVES 6 36 D 315, 316

FOR WINSTON - DEAR COMPANY

E

271 272

31 BOILER AND FIRE BOX SEAMS AND TUBES TO RECEIVE CAREFUL ATTENTION, AS THESE PARTS ARE LEAKING BADLY ON 6 36 D 309 AND 310.

32 STAYBOLTS: SPECIAL ATTENTION TO BE PAID TO APPLICATION OF ALL STAYBOLTS.
STAYBOLT HOLES IN FIRE BOX SIDE SHEETS TO BE DRILLED.
STAYBOLTS TO BE DRILLED ON OUTSIDE SO THAT LEAKS MAY BE MORE EASILY DETECTED.

33 GRATE FRAMES TO BE ARRANGED FOR AT LEAST ¾" CLEARANCE FROM FIRE-BOX SIDE SHEETS.

34 THROTTLE STUFFING BOX TO BE BRASS BUSHED TO GIVE AMPLE BEARING TO THROTTLE ROD.

35 CLEANING PLUGS TO INCLUDE THE FOLLOWING:-
ONE PLUG IN EACH SIDE JUST ABOVE MUD RING, BACK OF BACK DRIVING SPRING AND AHEAD OF EXPANSION PLATE.
ONE PLUG INSIDE AND ONE OUTSIDE OF CAB, OVER CROWN SHEET, ON LEFT SIDE.
TWO PLUGS OUTSIDE OF CAB, OVER CROWN SHEET, ON RIGHT SIDE.

36 SYPHON COCKS, WITH HOSE CONNECTIONS, PLACED IN TOP OF DOME.

37 INJECTOR CHECKS TO BE HANCOCK IMPROVED REGRINDING TYPE.
BOILER SHELL TO BE REINFORCED AT OPENINGS FOR CHECK VALVES TO PROVIDE FOR MORE THREADS TO MAKE CHECKS TIGHT IN BOILER SHELL.

38 INJECTOR CHECKS TO BE EQUIPPED WITH SEDDON BOILER FEED DEVICE. ROYALTY PAYABLE BY THE B. L. W.

39 BRANCH PIPES OF IRON CONNECTED TO CHECKS WITH A TEE, ONE RUN OF THE TEE SERVING THE BRANCH PIPE, THE SIDE OUTLET SERVING THE CHECK, AND THE OTHER RUN OF THE TEE FITTED WITH A VALVE SO THAT HOSE MAY BE ATTACHED IN ORDER TO SET HOT WATER UNDER INJECTOR PRESSURE.

40 DRAIN COCKS TO BE PROVIDED AT LOW POINTS OF ALL PIPING.

41 AMPLE CLEARANCE TO BE PROVIDED BETWEEN THE FRONT OF TANK AND THE BACK OF CAB, WHEN ROUNDING SHARP CURVES, SUFFICIENT FOR A MAN TO STAND THERE WITHOUT BEING PINCHED.

42 BACK END RUB CASTING ON ENGINE TO BE ROUNDED OFF TO PERMIT ENGINE AND TENDER TO PASS CURVES EASILY.

43 ENGINE BUFFER CASTING TO HAVE LONG SWEEP AND TO BE DEEP ENOUGH TO TAKE CARE OF CONSIDERABLE VERTICAL MOTION ON ROUGH TRACK.

44 STEP ACROSS FRONT TO BE IN TWO SECTIONS, OMITTING THE PORTION BELOW COUPLER. (See Sup. 86)

45 LUBRICATOR: THE FOURTH FEED OF THE LUBRICATOR TO BE USED FOR OILING THE CROSS-COMPOUND AIR PUMP. (See sup. 60)

46 PRESSURE PLATE TO BE SEPARATE FROM STEAM CHEST COVER.
CHANNEL COCKS TO BE APPLIED TO DRAIN CHANNELS IN SADDLE CASTING, THESE TO BE REGULAR BALDWIN CYLINDER-COCKS FITTED UP INDEPENDENT.

47 PISTON TO BE ARRANGED SO THAT PACKING RINGS IN THE HEAD CAN BE RENEWED WITHOUT DISCONNECTING THE PISTON ROD FROM CROSS-HEADS.

48 CROSSHEAD GIBS TO BE SAME TYPE AS FOR 6 36 D 90 AND 136 TO 138.

49 WRIST PINS OF COFFIN PROCESS STEEL.

54 TUMBLING SHAFT TO BE SAME STYLE AS 6 36 D 90 AND 136 TO 138. COIL SPRING IS NOT DESIRED.

55 EQUAL. BEAMS OF WROT IRON.
SPRINGS TO BE MADE AMPLY STRONG.
SPRING HANGERS TO BE 1½" x 1".

58 DRIVING BOXES TO HAVE FACES BABBITTED NEXT TO HUBS OF WHEELS AND LINERS TO BE OMITTED FROM HUBS OF WHEELS.

59 POWER BRAKES:- ONE 9½" WESTINGHOUSE AIR PUMP, ~~FOR THE REGULAR AIR-BRAKE SERVICE,~~ LOCATED ON LEFT SIDE OF ENGINE, ~~IN ADDITION THERE WILL BE FURNISHED~~ ONE 8½" WESTINGHOUSE CROSS-COMPOUND AIR PUMP, LOCATED ON LEFT SIDE OF ENGINE, ~~WITH~~ RESERVOIRS LOCATED UNDER RUNNING BOARD ~~ON RIGHT SIDE OF ENGINE TO SUPPLY AIR TO DUMP LINES.~~ (R.S.M.C. 3/25/10)
PUMPS TO BE WELL BRACED ON BOILER.
SPECIAL ATTENTION TO BE GIVEN TO SECURING AIR PUMP BRACKET TO THE BOILER FOR BOTH PUMPS.
AIR PUMPS TO HAVE ONE #54 AIR STRAINER, Pc. No. 51426.
AIR PUMP GOVERNOR TO BE SO PLACED THAT PIPING DOES NOT INTERFERE WITH HEATER VALVE TO INJECTOR.
PIPE FITTINGS FOR COMPRESSOR DISCHARGE PIPE, CONNECTING PIPE AND BRAKE PIPE, TO BE "EXTRA QUALITY PIPE FITTINGS" AS LISTED IN WESTINGHOUSE PUBLICATION #902]: OR CRANE Co's. SPECIAL TESTED AIR BRAKE FITTINGS AS LISTED ON PAGE 65 OF CRANE Co's. SPECIAL RAILWAY CATALOGUE, #43-B OF OCTOBER 1913.
EXHAUST FROM BOTH PUMPS TO BE BROUGHT TOGETHER AND PIPED INTO THE CYLINDER SADDLE.

60 ONE DETROIT TRIPLE-FEED SELF-OILOSING TYPE COMPRESSOR AIR CYLINDER LUBRICATOR COMPLETE, WITH AN EMERGENCY VALVE SUITABLE FOR FOUR-FEED LUBRICATION. (See sup. 45)

61 ~~TWO AIR-RESERVOIRS FOR STORAGE, SO CONNECTED THAT ENGINEER CAN TURN THEM TOGETHER OR RETAIN STORAGE SEPARATELY.~~ (R.S.M.C. 3/25/10)
AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS.
IN LOCATING RESERVOIRS AND PUMPS, CONSIDERATION OF ACCESSIBILITY TO STAYBOLTS TO BE GIVEN.

62 FOUNDATION BRAKE RIGGING TO HAVE ALL HOLES BUSHED WITH CASE HARDENED PINS.

63 WESTERN WHEELED SCRAPER Co's. ENGINEER VALVE FOR OPERATING DUMP LINES, TO BE SET UP IN CAB IMMEDIATELY AHEAD OF ENGINEER'S STRAIGHT AIR BRAKE VALVE, WITH ITS EXHAUST CARRIED ~~OVER~~ THROUGH SIDE OF CAB.
~~EXTRA GAUGE TO BE PLACED ON GAUGE STAND TO RECORD PRESSURE IN DUMP LINE RESERVOIR. GAUGE TO BE WESTINGHOUSE 2½" SINGLE POINTER No. 10639.~~ (R.S.M.C. 3.25.10)
DUMP LINES TO BE CARRIED TO FRONT OF ENGINE AND TO BACK OF TENDER. AIR FOR DUMP LINE TO BE TAKEN FROM AIR BRAKE SYSTEM (R.S.M.C.)

TENDER

66 STEP ACROSS REAR OF TENDER WITH HAND RAILS. STEP TO BE IN TWO SECTIONS OMITTING THE PORTION BELOW COUPLER.
STEPS ON SLOPING BACK OF TANK. (See Sup. 14)

67 TENDER TRUCK BOLSTER CENTER PLATES TO BE OF CAST STEEL INSTEAD OF CAST IRON AS FURNISHED IN ERROR FOR 6 36 D 309 AND 310.

THE BALDWIN LOCOMOTIVE WORKS Dup. 4 11 C 415, with same extras except as otherwise specified.

Memorandum Spec'n 17101.

SPECIFICATION FOR LOCOMOTIVES 4 11 C 420. Gen. as

FOR Alan Wood Iron & Steel Company. **Engine Drawing No.** 54.

L. 6-8-17.

Gauge of Road 3' 0" Play $\frac{3}{8}$"
Wheelbase, Rigid 4' 6" Driving 4' 6" Total 4' 6"
Total wheelbase, eng. and tend. Actual ----------
Limited to --------

Curves ----------

Limits, Height ---------- Width 5' 9"
Weight (approximate) in working order, Total 24,000 pounds.
On F. tr'k ----- lbs. Drivers 24,000 lbs., B. tr'k ----- lbs.

Tractive power 5160 lbs., Ratio of adhesion 4.65
Work'g St'm Pres. 150 lbs. Service Switching.
Fuel Soft Coal.

Front tube sheet to be $\frac{3}{8}$" thick.
Boiler Steel Thick $\frac{5}{16}$" Bill 8198.
Boiler, Diam. 32" Plan Straight Top.
Boiler st'm pres. 150 lbs., Tested to 170 lbs. steam pres.
With factor of safety of 5.4 200 lbs. water pres.
Longitud. seams double riveted.

Dome, diam. 19" Pos. Central.

Firebox Steel Combustion chamb. None
Firebox, length 30-13/16" Width 24$\frac{3}{8}$" Depth F. 34$\frac{3}{4}$" B. 33"
Firebox, Tube $\frac{3}{8}$" Crown $\frac{5}{16}$" Sides $\frac{5}{16}$" Back $\frac{5}{16}$"
Firedoor opening 14" 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 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 ---- central rows
Crown bars None Placed ----- above crown
Crown bolts ------

Flues None
Tubes #12 W. G. Iron or Steel.
Tube ends Swaged for copper ferrules, firebox ends.
Number 74 Diam. 1$\frac{1}{2}$" Length 7' 7$\frac{3}{8}$"

Heating Surface Flues ----- Combus. Chamb. ---- Total 245.1 sq.
Tubes 218.9 sq. Fire Box 26.2 sq. Fire Brick Tubes ----------
Grate area 5.1 sq. Ratio to Heating Surface 1 : 48
Superheater ----------

Fire Brick Arch, None.

Grates Plain bars and dead plates.
Ash Pan, Dampers Right and Left.

Throttle Balance Pos. Dome
Dry pipe Wrot Iron.

Superheater None.

Smokebox extension Short Cleaning hole and cap Right Side and Underneath.
Spark ejector or hopper None
Netting and deflick plates With.
Exhaust nozzles Single High.
Nozzle Taper Dia. 8" Holes in S. B. dia. 9"

Safety Valves (not spec) Two Consolidated 1$\frac{1}{2}$"
Safety valves None with relief lever, Set to 150 pounds.
Whistle B. L. W. plain.

Steam Gauge One Iron 6" 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 without separate dry pipe to dome
Blower Valve B. L. W.

Blow off Cock One B. L. W. POS:- Back.
Cleaning Plugs
Firebox Corners 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 (Specd) Two Sellers Improved Class "N" No. 4$\frac{3}{10}$
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 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 Oak Bumper plate None
Steps across Front and Back.

F. & B. Drawhead, Center above rail 18" to upper pocket.
Coupler Two Pocket drawcastings

Signal 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.
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
E. H. C. Kalbach Nov 1917.
SPECIFICATION FOR LOCOMOTIVES 4 11 C 420. 274 2714

FOR Alan Wood Iron & Steel Company.
L.

Frames Cast Steel Braces Solid.

Cylinders, Diam. 9" Stroke 14"
St'm ports, Length 7$\frac{1}{2}$" Width $\frac{3}{8}$" Bridges $\frac{5}{8}$"
Exh. ports, Length 7$\frac{1}{2}$" Width 1$\frac{1}{4}$" Valve lead 1/16"
Valve travel 3" Steam lap $\frac{1}{2}$" Exhaust clearance -----
Eccentric ~~crank~~ throw 2$\frac{1}{2}$" By-pass valve None
S. F. Lubr. Nathan Double, No. 8, Bulls Eye. (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".
~~stem~~ 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 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.
Driving Wheels without hub liners.
Drivers, O. S. Diam. 28" Cen. diam. 24" Centres Cast Iron.
Tire flanges to be 1" x 1$\frac{1}{8}$"
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 --------

Brake, position On all drivers. (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 300 Gallons, Bill 4226.
Saddle tank over top of boiler.
Cleaning hole to be provided in end 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. -------

Locomotive to be blown out before shipment.
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 9-1-17 Shipment on car.

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 ---------

Lettering, etc., to be same as for 4 11 C 295 and 415.
Mark on tank sides, Alan Wood Iron & Steel Co.

Road Nos. Pos. Road Nos. Name None
F. No. Plate 1
Cab Sides.

THE BALDWIN LOCOMOTIVE WORKS Dup. of 4-18 C 73 WITH SAME EXTRAS EXCEPT AS OTHERWISE SPECIFIED.

Memorandum Sheet 17102

SPECIFICATION FOR LOCOMOTIVES 4 18 C 115

FOR ALAN WOOD IRON & STEEL COMPANY

R.

Engine Drawing No. 19

6-8-17

Gauge of Road 3' 0" Play 2"
Wheelbase, Rigid 5' 0" Driving 5' 0" Total 5' 0"
Total wheelbase eng. and tend. (Actual ----- (Limited to -----

Curves -----

Limits, Height ------ Width -----
Weight approximate in working order, Total 45,000 POUNDS
On F. truck ----- lbs. On rear 45,000 lbs. On B. truck ----- lbs.

Tractive power 8900 lbs. Ratio of adhesion 5.
Work'g St'm Pres. 150 lbs. Service SWITCHING
Fuel SOFT COAL
DETAILS OF LOCO. TO CONFORM TO MODERN PRACTICE
FRONT TUBE SHEET TO BE ½" THICK
Boiler STEEL Thick 7/16" Bill 8187
Boiler, Diam. 40" Plan STRAIGHT TOP
Boiler st'm pres. 150 lbs. Tested to 170 lbs. steam pres.
WITH FACTOR OF SAFETY OF 5-8 200 lbs. water pres.
Longitud. seams DOUBLE RIVETED, LAP JOINTS

Dome, Diam. 19" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE
Firebox, length 36-7/16" Width 35¼" Depth F 45½" B. 45½"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back 5/16"
Firedoor opening 16" DIAM.
Water space, Front 2" & 2½" Sides 2" Back 2"
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 NONE
Button heads below crown sh. NONE 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 127 Diam. 2" Length 8'-1⅞"

Heating Surface Flues NONE Combus. Chamb. NONE Total 445⁶
Tubes 401⁶ Fire Box 45⁶ Fire Brick Tubes -----
Grate area 8.9⁰ Ratio to Heating Surface 1 : 50
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 R. S. AND 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"

(not spec'd)
Safety Valves TWO CONSOLIDATED 1½"
Safety valves NONE with relief lever, Set to 150 POUNDS
Whistle B. L. W. PLAIN

Steam Gauge ONE IRON 6" MAKER:-ASHCROFT (not spec'd)
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 WITHOUT 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 AND ONE 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'd)
Injectors TWO SELLERS, IMPROVED CLASS "U" 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

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

Back Bumper WROT IRON

Pilot NONE Pushing shoes FRONT AND BACK
Front Bumper CAST IRON Bumper plate NONE
Steps ACROSS FRONT AND REAR, WITH HAND HOLDS.
PIN BOX AT FRONT BUMPER
F.& B. Drawhead, Center above rail 19½", 23" AND 26½"
Coupler THREE POCKET DRAW - CASTING, AS B.L.W. PRINT 8566

Signal fixtures NONE

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 BACK

Dome casing IRON PAINTED

Boiler Jacket #22 SOFT STEEL PtBands IRON Style 9
Boiler Lagging MAGNESIA SECTIONAL

THE BALDWIN LOCOMOTIVE WORKS
E.H.C. Kalbach Nov. 1917
SPECIFICATION FOR LOCOMOTIVES 4 18 C 115
FOR ALAN WOOD IRON & STEEL COMPANY
R.

276 1276

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 4⅛" Steam lap ⅞" Exhaust clearance -----
Eccentric throw 3½" By-pass valve NONE
(not spec'd)
S. F. Lubr. NATHAN DOUBLE No. 8 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 STEMS) UNITED STATES (not spec)

Pistons CAST IRON RINGS SPRUNG SOLID HEAD
Guides STEEL Oil cups NEEDLE
Crossheads CAST STEEL
Wrist Pins STEEL Rod cups PLUNGER
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 HUB LINERS.
Drivers, O. S. Diam. 33" Cen. diam. 28" CENTRES CAST IRON
TIRE FLANGES TO BE 1" X 1⅝"
Tires STEEL Held by SHRINKAGE AND SHOULDER
Tires, Flanged, Pos ALL Size 2½" X 5"
Tires, Plain, Pos. ----- Size -----
Lateral play between driving boxes and wheel hubs 1/32" TOTAL
Driving Boxes CAST IRON
Journals, Diam. 5½" 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-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 500 Gallons, Bill 4566
TANK SADDLE, 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 YES Material spec'ns B. L. W.
Certificate of boiler test THREE COPIES OF B.L.W. FORM 1036
Junior laws to 6-18-17 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 ALUMINUM
Painting: Tender, style ---------

LETTERING, ETC. TO BE SIMILAR TO 4 - 18 C 73
Mark on TANK SIDES, ALAN WOOD IRON & STEEL CO.

Road Nos. Pos. Road Nos. Name NONE
F. No. PLATE 5
F. SAND BOX
CAB SIDES

THE BALDWIN LOCOMOTIVE WORKS Dup. 4 - 22 C 190 WITH SAME EXTRAS EXCEPT AS OTHERWISE SPECIFIED.

Memorandum Spec'n 17103

SPECIFICATION FOR LOCOMOTIVES 4 22 C 269

FOR ALAN WOOD IRON & STEEL COMPANY
R.

Gen. as PHOTO. 2154

Engine Drawing No. 32

6-8-17

Gauge of Road 3' 0" Play 3/8"
Wheelbase, Rigid 5' 9" Driving 5' 9" Total 5' 9"
Total wheelbase, eng. and tend. { Actual ----- / Limited to -----

Curves 30 FEET RADIUS

Limits, Height 9' 4" Width 8' 6"
Weight (approximate) in working order, Total 62,000 POUNDS
On F. tr'k ----- lbs., Drivers 62,000 lbs., B. tr'k ----- lbs.

Tractive power 12,970 lbs., Ratio of adhesion 4.7
Work'g St'm Pres. 160 lbs., Service SWITCHING
Fuel SOFT COAL

FRONT TUBE SHEET TO BE 1/2" THICK
Boiler STEEL Thick 7/16" Bill 7645
Boiler, Diam. 44" Plan STRAIGHT TOP
{Boiler st'm pres. 160 lbs., Tested to { 180 lbs. steam pres. / 214 lbs. water pres.
{WITH FACTOR OF SAFETY OF 4.62
Longitud. seams DOUBLE RIVETED, LAP JOINTS

Dome, diam. 22" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE
Firebox, length 41-11/16" Width 35 3/8" Depth F. 51" B. 48"
Firebox, Tube 1/2" Crown 3/8" 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" HOLE 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 NONE
Tubes #12 W. G. CHARCOAL IRON OR STEEL
Tube ends SWAGED FOR COPPER FERRULES, FIREBOX ENDS
Number 112 Diam. 2" Length 9' 9"

Heating Surface Flues NONE Combus. Chamb. NONE Total 620.5
Tubes 566.8 Fire Box 53.7 Fire Brick Tubes -----
Grate area 10.1 Ratio to Heating Surface 1 : 60
Superheater -----

Fire Brick ARCH, NONE

Grates ROCKING BARS AND DROP PLATE, OF CAST IRON
Ash Pan, Dampers FRONT AND BACK
THROTTLE LEVER TO BE ARRANGED SO THAT HANDLE WILL BE 13" FROM BACK HEAD WHEN IN CLOSED POSITION
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 STRAIGHT Dia. 14" Hole in S. B., dia. 14 3/4"

Safety Valves TWO CONSOLIDATED 2" (not a pec)
Safety valves NONE with relief lever, Set to 160 POUNDS
Whistle B. L. W. PLAIN

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

Water Gauge ONE MAUGER **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:-RIGHT 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 (a pec) TWO SELLERS IMPROVED, CLASS "M" No. 6 1/2
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 OF STEEL WITH FRONT AND BACK ENDS REDESIGNED TO PROVIDE BETTER VENTILATION AT ROOF. VENTILATOR TO BE OMITTED FROM ROOF ON ACCOUNT OF LIMITED HEIGHT, BUT TO BE APPLIED TO FRONT AND BACK OF CAB UNDER ROOF. FUEL BOX IS NOT REQUIRED. CAB SIDE WINDOWS TO BE ARRANGED TO PROVIDE MORE ROOM FOR ENG'R.

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

Back Bumper CAST IRON

Pilot NONE Pushing shoes FRONT AND BACK
Front Bumper CAST IRON Bumper plate NONE
Steps ACROSS FRONT AND REAR, WITH HAND RAILS

F. & B. Drawhead, Center above rail 19", 22 1/2" AND 26"
Coupler THREE POCKET DRAW CASTING, WITH MIDDLE POCKET ENLARGED AS SHOWN ON PENCIL SKETCH

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 45 POUNDS
Sand Box TWO Diam. 23" 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. H. C. Kalbach Nov. 1917.
SPECIFICATION FOR LOCOMOTIVES 4 - 22 C 269
FOR ALAN WOOD IRON & STEEL COMPANY
R.

278 278

Frames CAST STEEL Braces SOLID

Cylinders, Diam. 14" Stroke 18"
St'm ports, Length 12" Width 1" Bridges 7/8"
Exh. ports, Length 12" Width 2" Valve lead 1/16"
Valve travel 4 1/2" Steam lap 7/8" Exhaust clearance -----
Eccentric ~~throw~~ throw 3 1/2" By-pass valve NONE
(not a pec)
S. F. Lubr. NATHAN DOUBLE No. 8 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} UNITED STATES (not a pec)

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 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 HUB LINERS
Drivers, O. S. Diam. 37" Cen. diam. 32" CENTRES CAST IRON
TIRE FLANGES TO BE 1" X 1 1/8"
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 STEEL
Journals, Diam. 6 1/2" Length 7"

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. U-1 B. L. W. STEAM / Parts { Eng. Tr'k, sch. -----
Foundation { Drivers, sch. U-1 B. L. W. / Parts { Eng. Tr'k, sch. -----
Air pump ----- Pos. -----
Train connections -----
Train signal, sch. -----
SEPARATE LUBRICATOR FOR STEAM BRAKE VALVE

TENDER, NONE

TANK 950 GALLONS, BILL { 4098 - RIGHT SIDE / 4099 - LEFT SIDE
TANK RECTANGULAR SHAPE, LOCATED ON SIDES OF BOILER.
TANK ON RIGHT SIDE TO HAVE SLOPING TOP AND TO BE EXACTLY SAME AS FOR LOCOMOTIVE #7, 4-22 C 181 AND 190
TANK DASH PLATES TO BE DESIGNED TO PREVENT LEAKING OF RIVETS AT SIDES.
CARE TO BE TAKEN WITH BRACING INSIDE OF TANK ON RIGHT SIDE OF LOCOMOTIVE. COMPANY STATES THAT RIVETS IN TANK ON PREVIOUS LOCOMOTIVE HAVE BECOME LOOSE AND CORRECTIONS CANNOT BE MADE ON ACCOUNT OF STYLE OF INSIDE BRACING WHICH WILL NOT PERMIT MAN TO ENTER THE TANK.
TANK ON RIGHT SIDE TO BE PROVIDED WITH A STOP AT FRONT END.

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 9. 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 222 OLIVE GREEN AND ALUMINUM

LETTERING ETC. TO BE SIMILAR TO 4 - 22 C 190
MARK ON TANK SIDES, ALAN WOOD IRON & STEEL CO.
MARK ON TANK TO BE IN 6" LETTERS.

ROAD NOS. POS. ROAD NOS. NAME, NONE
F. NO. PLATE 8
F. SAND BOX
CAB SIDES

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-5751

Memorandum Spec'n 19036

SPECIFICATION FOR LOCOMOTIVES 4 28 C 67

FOR R. D. Wood and Company (Florence, N. J.)

RTL

6-5-19

Gen. as Photo 5547

Engine Drawing No. 19

Gauge of Road 4' 8½" Play ⅞"
Wheelbase, Rigid 7' 6" Driving 7' 6" Total 7' 6"
Total wheelbase, eng. and tend. {Actual ---, Limited to ---

Curves ---

Limits, Height --- 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 21,220 lbs., Ratio of adhesion 4.68
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 8584
Boiler, Diam. 52" Plan Straight Top
Boiler st'm pres. 180 lbs., Tested to {200 lbs. steam pres., 240 lbs. water pres.
with factor of safety of 5.4
Longitud. seams Butt jointed, double covering strips

Dome, diam. 25" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 46" Width 50" Depth F. 54" B. 52½"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening 16" diam.
Water space, Front 3" 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 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 (B.L.W. Option)
Tube ends Swaged for copper ferrules, fire box ends.
Number 154 Diam. 2" Length 12' 9"

Heating Flues --- Combus. Chamb. --- Total 1091.0
Surface Tubes 1021.0 Fire Box 70.0 Fire Brick Tubes ---
Grate area 16.0 Ratio to Heating Surface 1 : 68
Superheater ---

Fire Brick Arch None

Grates Rocking bars and drop plates
Ash Pan, Dampers (With) 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 Straight Dia. 14"

Safety Valves Two Coale 2" (Not Spec)
Safety valves None with relief lever, Set to 180 pounds
Whistle One 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
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 Two Monitor (Not Spec) 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 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 bumper
Front Bumper Cast Iron Bumper plate None
Steps across front and rear, with hand rails.
Steps, hand holds, etc., to conform to I.C.C. requirements.
Er&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 shell None Nosing ---

Bell 85 pounds
Sand Box Two Diam. 31½" Body Iron painted Pipes Iron
Sander Hand, in each box, to sand front and back.

Dome casing Iron painted

Boiler Jacket #22 Soft Steel, #18 Bands Iron Style 9
Boiler Lagging Magnesia Sectional

THE BALDWIN LOCOMOTIVE WORKS

W. W. Stevenson

SPECIFICATION FOR LOCOMOTIVES 4 28 C 67 July-1919.

FOR R. D. Wood and Company (Florence, N. J.)

RTL

4322 280

Frames Cast Steel Braces Solid

Cylinders, Diam. 17" Stroke 24"
St'm ports, Length 16" Width 1½" Bridges 1"
Exh. ports, Length 16" Width 2½" Valve lead 3/32"
Valve travel 4⅜" Steam lap 1" Exhaust clearance ---
Eccentric crank throw 4½" By-pass valve None
S. P. Lubr. (Not Spec) Michigan Double Bull's Eye, two 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 Richardson Balanced, with vacuum valves
Met. pkg. {piston rods / valve stems} United States, King type (Not Spec)
Piston rods to be keyed to crossheads.
Pistons Cast iron rings sprung into solid head.
Guides Laird type, steel Oil cups Needle
Crossheads Cast steel, with bearings of cast iron, tinned.
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
{welf 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 wheel hub liners None
Drivers, O. S. Diam. 50" Cen. diam. 44" 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 = 1/16" 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 ---
Wheel hub liners ---
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 ---
Wheel hub liners ---
Wheels, Diam. --- Tread --- Kind ---
Tires --- Cen. diam. --- Size ---
Tires held by ---

Brake, position On all wheels (no tender)
Operating {Engine, sch. 11-2, B. L. W. Steam
Parts {Eng. Tr'k, sch. ---
Foundation {Drivers, sch. 11-2, B. L. W. Equalized
Parts {Eng. Tr'k, sch. ---
Air pump --- Pos. ---
Train connections ---
Train signal, sch. ---
Separate lubricator for steam brake valve.
Loco. to be piped to provide for use of air brakes in train
during shipment to destination.

Tender None

Tank 1500 Gallons, Bill 4005
Saddle tank located over top of boiler, extending to front of smoke box extension.

Fuel box to extend the full width across back end of engine.
Fuel capacity 2200 pounds

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 7-9-19 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, Olive Green and Aluminum

mark on Tank sides, R. D. Wood & Co.

Road Nos. Pos. Road Nos. Name None
F. No. Plate 5
Cab Sides
Back of Fuel Box

Actual Dimensions of Loco. Extreme height over all = 11' 4"
Extreme Width {Over cab boards = 9' 1"
{Over cylinders, ~~valve motion~~ = 8' 10"
Length outside face of front bumper to outside face of back bumper of engine = 28' 11"

THE BALDWIN LOCOMOTIVE WORKS | Spec. 10 30 D 637, WITH SAME EXTRAS, EXCEPT WHERE OTHERWISE SPECIFIED.

Memorandum Spec'n 20074

SPECIFICATION FOR LOCOMOTIVES 10 30 D 672

Gen. as Nos. 2252 | EXCEPT TO HAVE RUSHTON IMPROVED STACK.

Engine Drawing No. 97

Ex

FOR THE ALGER-SULLIVAN LUMBER COMPANY

3.22.20

HE.

Gauge of Road 4'8½" Play 2"
Wheelbase, Rigid 11'4" Driving 11'4" Total 21'8"
Total wheelbase, eng. and tend. {Actual 49'6½" {Limited to ---

Curves EASY
RAILS 45 POUNDS ROUGH TRACK
Limits, Height --- Width ---
Weight (approximate) in working order, Total 116,000 POUNDS
On F. trk 26,000 lbs., Drivers 90,000 lbs., B. trk --- lbs.

Tractive power 22,410 lbs., Ratio of adhesion 3.93
Work'g St'm Pres. 180 lbs., Service FREIGHT
Fuel WOOD

Boiler STEEL Thick 9/16 & 5/8" Bill 9046
Front Tube Sheet Thick
Boiler, Diam. 56" Plan EXTENDED WAGON TOP
{Allowable st'm pres. 200 lbs. **Tested to** {220 lbs. steam pres.
{With Factor of Safety of 4.5 {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. 67½" B. 57⅛"
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 1⅛" DIAM. Sling stays front {TWO RODS 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
Tube ends SWAGED FOR COPPER FERRULES FIRE BOX ENDS.
Number 229 Diam. 2" Length 12'6"

Heating {Flues --- Combus. Chamb. --- Total 1627
Surface {Tubes 1489 Fire Box 138 Fire Brick Tubes ---
Grate area 22.2 Ratio to Heating Surface 1: 73
Superheater ---

Fire Brick ARCH NONE

Grates (SEE SUP. 3)
Ash Pan, Dampers FRONT AND BACK

Throttle BALANCE Pos. DOME
Dry pipe STEEL

Superheater NONE

Smokebox Extension WITH Cleaning hole and cap NONE
Spark deflector or hopper NONE
Netting and deflect. plates NONE

Exhaust nozzles DOUBLE LOW
CLEANING PIPE-WITH
Stack RUSHTON IMPROVED Dia. 18"

Safety Valves TWO STAR 3" ONE MUFFLED (Spec)
Safety valves NONE with relief lever, Set to {180 POUNDS, MUFFLED {185 POUNDS, OPEN
Whistle ONE B.L.W. CHIME

Steam Gauge ONE IRON 7" MAKER: STAR (Spec)
Steam gauge stand IRON **Clock** NONE

Water Gauge ONE REFLEX **Cab Lamps** ELECTRIC
Gauge Cocks THREE 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 B. L. W., ONE Pos:- FRONT
Cleaning Plugs
Firebox, CORNERS, BACK ONES DIAGONAL AND SIDES
Crown, THREE EACH SIDE AND TWO BACK
Waist, ONE UNDER FRONT
Front tube sheet, ONE Fusible plug ONE

Pump NONE

Injectors TWO SELLERS, CLASS "F" (Spec) No. 8½
Injectors, Pos. R. AND L. Steam pipes COPPER
Pipes, Check IRON Feed IRON Overflow IRON
Check SELLERS COMB'D WITH STOP VALVE. Pos. R. AND L.

Steam Heat NONE

Cab STEEL, LINED WITH WOOD. TRAP 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 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. AUTO. OF STEEL WITH SLOTTED KNUCKLE

Signal fixtures IRON ON BUMPER

Headlight ONE ROUND CASE Reflector,
Headlight, Nos. on sides WITH Heat shield WITH
Lamp shelf NONE Casing ---

Bell 92 POUNDS
Sand Box ONE Diam. 28" Body IRON PTD. Pipes IRON
Sander LEACH AIR TRAP A-10 DOUBLE, TO SAND TO SAND FRONT AND BACK (Spec)

Dome casing IRON PAINTED

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

THE BALDWIN LOCOMOTIVE WORKS

C. Powell JUNE-1920.

SPECIFICATION FOR LOCOMOTIVES 10 30 D 672

FOR THE ALGER-SULLIVAN LUMBER COMPANY

HE.

28%

Frames CAST STEEL
ENGINE FRAMES TO BE EXTRA HEAVY SECTION FOR ROUGH TRACK
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 4½" Steam lap ¾" Exhaust clearance ---
Eccentric cranks throw 12⅞" By-pass valves NONE
S. P. Lubr. DETROIT BULL'S EYE #22, THREE FEED (Spec)
Cyl'r heads CAST IRON Lubr. PIPES OF IRON UNDER JACKET
Cyl'r casings IRON PTD. Head covers STEEL PAINTED
St'm chest covers IRON PTD. Covers STEEL PAINTED
St'm chest valves RICHARDSON BALANCED, WITH VACUUM VALVES
Metallic packing MARTEL, STYLE 315 (Spec)

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD
Guides LAIRD TYPE, STEEL
Crossheads CAST STEEL, WITH BEARINGS OF CAST IRON TINNED. Guide and NEEDLE
Wrist Pins STEEL Rod ends PLUNGER FORGED ON
PARALLEL RODS TO HAVE SOLID ENDS.

Valve Motion WALSCHAERTS
(Links, sliding blocks, pins, lifting links and eccentric rod pins to be
shaft case hardened or to have hardened bearings

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

Wearing Bearings DAMASCUS BRONZE
Driving wheel tire liners BRONZE, RECESSED INTO WHEELS
Drivers, O. S. Diam. 53" Cen. diam. 46"
WHEEL CENTERS, MAIN, CAST STEEL; OTHERS, 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 shoes, total 3/16" TOTAL
Driving Boxes CAST STEEL
Journals, Diam. 7½" Length 8"

Springs. Make B. L. W.

Front Engine Truck FOUR WHEELED SWING BOLSTER
To swing 3" each side of cen. Cen. pin loss NONE
Journals, Diam. 5" Length 10" Boxes CAST IRON
Wheel hub liners NONE
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 Wheels ---
To swing --- each side of cen. Cen. pin loss ---
Journals, Diam. --- Length --- Boxes ---
Wheel hub liners ---
Wheels, Diam. --- Tread --- Kind ---
Tires --- Cen. diam. --- Size ---
Tires held by ---

Brake, position ON ALL DRIVING AND TENDER WHEELS
Operating { Engine and No. 6 ET TESTG. COMB. AUTO. AND
Parts { Eng. Tk. --- STRAIGHT AIR
Foundation { Drivers, 8-WHEEL AMERICAN OUTSIDE EQUALIZED
Parts { Eng. Tk. ---
Air pump ONE 9½" Pos. L. S.
Train connections FRONT AND BACK
Train signal pipe NONE
AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

Tender EIGHT Wheeled, Drawing No. 1572 | TENDER TO BE WEIGHED: YES
Weight, with fuel and water, about 80,000 POUNDS
TENDER OF LONG, LOW DESIGN, SAME AS FOR 10 30 D 635 AND 637
Tank 4,000 Capacity, Gals. 3540
TANK "U" SHAPE, STRAIGHT TOP. FUEL CAPACITY 3½ CORDS
FUEL RACK AROUND TOP OF TANK.
Tank Bolts HAND WOOD, TOP.

Frame TENDER FRAME OF BEST HEART PINE
WOODEN FRAME SILLS TO BE TREATED WITH CARBOLIUM BEFORE ERECTION
Front Drawbar height 30½"
Pilot NONE Pushing shoes NONE
Back Drawbar center above rail 33½"
Coupler M.C.B. AUTO. OF STEEL, WITH SLOTTED KNUCKLE.

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

Trucks ARCH BAR TYPE WITH CAST STEEL BOLSTER
TENDER JOURNAL BOXES TO BE NATIONAL MALLEABLE, WITH TOP HUNG LID.
Springs ELLIPTIC, B. L. W.
Journals, Diam. 4½" Length 8"
Wheels Diam. 33" Tread 1¾" Kind CHILLED CAST IRON PLATE
Tires NONE Cen. diam. --- Size ---
Tires held by ---
Safety chains SINGLE

Brake position ON ALL WHEELS.
Brake equipment No. 6 ET TESTG. AUTO. WITH STRAIGHT AIR, WITH 10"x12" TENDER CYLINDER.

List of tools, etc. 30 (OMITTED A/C MISTAKE)
Photo, etc. ~~No. 2~~ NONE Inspection B. L. W.
To be weighed YES Material supervision B. L. W.
Certificate of boiler test THREE COPIES OF B.L.W. FORM 1936
Joiner bills to S. 17.20 Shipment ON OWN WHEELS

Brass ship finish, for I
Machine ship finish D-165

B. L. W. Patents NONE

Property mark NONE

Painting, 291, OLIVE GREEN AND ALUMINUM

LETTERING ETC. TO BE SIMILAR TO 10 30 D 637
Mark on TANK SIDES { ESCAMBIA RAILWAY OPERATED BY THE ALGER-SULLIVAN LUMBER CO.

Road Nos. For Tank Sides and Cab NONE
F. No. Plate 103
Sand Box
Cab Sides
BACK OF TANK
Actual Dimensions of Loco. WIDTH OVER CAB HANDLES 10' 5"
Extreme Width, Cab Sides 9'11" Boiler 9'11"
Length over Pilot Beam 31'0½"
Length over Deadwood 23'0½"
Total height 9'2"
Engine to center line of boiler

SPECIFICATION FOR LOCOMOTIVES 10 30 D 672,

FOR THE ALGER-SULLIVAN LUMBER COMPANY

HW

283 283

1 LOCOMOTIVE FOR OPERATION IN FLORIDA.
BOILER TO CONFORM TO ALL I. C. C. REQUIREMENTS.

2 TATE FLEXIBLE STAYBOLTS IN BREAKING ZONE.

3 GRATES TO BE THOMAS WOOD BURNING TYPE, CONNECTED FOR DUMPING SIMILAR TO COAL BURNING GRATES.
LEVER TO BE PROVIDED FOR OPERATING SHAKER GRATES FROM CAB AS COAL WILL PROBABLY BE USED IN THE NEAR FUTURE.

4 CAB SASH TO BE DIVIDED INTO SMALL GLASS.
CAB WINDOW OPENING TO BE ARRANGED APPROXIMATELY AS ON NEGATIVE No. 4126 TO PROVIDE ROOM FOR AN ENGINEER OF LARGE STATURE.

5 DRAWBAR CONNECTION BETWEEN ENGINE AND TENDER TO BE HEAVY WITH STEEL CHAFING IRONS HAVING 10" VERTICAL FACE AND LONG SWEEP TO PROVIDE FOR EXTRA ROUGH SERVICE.

6 PILOT TO BE LONG AND SLOPING OF DIMENSIONS SHOWN ON Co's SKETCH (HEREWITH)
PILOT 36" HIGH WITH BOTTOM OF PILOT 4½" ABOVE RAIL.
TOP OF PILOT WILL NOT BE ABOVE TOP OF BUMPER.

7 HEADLIGHT EQUIPMENT TO BE SCHROEDER ELECTRIC, WITH R-3 GENERATOR AND No. 1414 CASE.

8 CYLINDERS TO BE MADE FROM 19" PATTERN SO THEY CAN BE BORED TO 19" LATER.

9 CROSSHEAD TO BE REINFORCED.

10 CHICAGO FOUR-FEED FLANGE LUBRICATOR TO BE CONNECTED TO FRONT AND BACK DRIVERS.

11 MARK ON TANK TO BE IN TWO LINES, WITH LETTERS 8" HIGH IN UPPER LINE AND 2½" HIGH IN LOWER LINE, BOTH LINES TO BE ARRANGED SO THAT THE UPPER LINE OVER-LAPS THE LOWER LINE AN EXACTLY EQUAL DISTANCE AT EACH END.

TENDER

12 TENDER TRUCK ARCH BARS, 4" x 1¼"
TENDER BOTTOM CENTRE PLATE TO BE CAST STEEL.
TENDER TRUCK COLUMNS OF MALLEABLE IRON OR CAST STEEL.

13 DRAWBAR CONNECTION BETWEEN ENGINE AND TENDER TO BE HEAVY WITH STEEL CHAFING IRONS HAVING 10" VERTICAL FACE AND LONG SWEEP TO PROVIDE FOR EXTRA ROUGH SERVICE.

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-52**

Memorandum Spec'n 20016

SPECIFICATION FOR LOCOMOTIVES 10 26 ½ D 169

FOR ARKANSAS LAND AND LUMBER COMPANY.

Gen. as PHOTO. 583+ {EXCEPT TO HAVE ELECTRIC HEAD-LIGHT AND WALSCHAERTS VALVE GEAR.

Engine Drawing No. 42

1.29.20

Gauge of Road 4' 8½" Play ¾" EXCEPT 1" FOR MIDDLE DRIVERS

Wheelbase, Rigid 9' 0" Driving 9' 0" Total 24' 6"

Total wheelbase, eng. and tend. {Actual 48' 3½" {Limited to ---

Curves ---

Limits, Height --- Width ---

Weight (approximate) in working order, Total 102,000 POUNDS.

On F. tr'k 10,500 lbs., Drivers 81,000 lbs., B. tr'k 10,500 lbs.

Tractive power 20,400 lbs., Ratio of adhesion 4

Work'g St'm Pres. 180 lbs., Service LOGGING

Fuel SOFT COAL

Boiler STEEL Thick 9/16" Bill 8879

5 Front Tube Sheet ½" Thick

Boiler, Diam. 56" Plan EXTENDED WAGON TOP.

3 {Allowable st'm pres. 180 lbs. **Tested to** 200 lbs. steam pres.

6 {With Factor of Safety of 5.1 270 lbs. water pres.

6.18 Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS, SEXTUPLE RIVETED, 90% SEAM.

Dome, diam. 29" Pos. FORWARD OF FIRE BOX.

DOME - ONE PIECE TYPE.

Firebox STEEL Combustion chamb. NONE

Firebox, length 55⅞" Width 41⅜" Depth F. 39½" B. 52"

10 Firebox, Tube ½" Crown ⅜" Sides ⅜" Back ⅜"

Firedoor opening 16" DIAM. CROWN AND SIDES IN ONE SHEET.

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

Button heads below crown on EIGHT central rows

Crown bars NONE Placed --- above crown

Crown bolts ---

Flues ---

4 **Tubes** #12 W.G. CHARCOAL IRON OR STEEL (B.L.W. OPTION)

18 Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.

Number 218 Diam. 2" Length 12'9"

Heating {Flues --- Combus. Chamb. --- Total 4529

Surface {Tubes 1446 Fire Box 83 Fire Brick Tubes ---

Grate area 16.2 Ratio to Heating Surface 1 : 95

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 arrester hopper WITH

Netting and deflect. plates WITH

Exhaust nozzles DOUBLE-HIGH

Stack STRAIGHT Dia. 16"

Cylinder saddle as for 8 28 D 326, but [illegible]

The rest of the number illegible

Safety Valves TWO COALE 3" OPEN (Not Spec.)

1 Safety valves BOTH with relief lever. Set to 180 POUNDS.

8 **Whistle** ONE B.L.W. PLAIN, IN SIDE OF DOME.

8-9 **Steam Gauge** ONE IRON 7" MAKER: ASHCROFT (Not Spec.)

Steam gauge stand IRON **Clock** NONE

8 **Water Gauge** ONE B.L.W. IRONCLAD **Cab Lamps** ELECTRIC (SEE @ BELOW)

8 **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

8 **Blower Valve** B. L. W.

8 **Blow off Cock** ONE B. L. W. POS: FRONT

17 **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 ONE PLUG ABOVE FIRE DOOR.

Front tube sheet, ONE Fusible plug ONE

Pump NONE

LOCO. TO BE OPERATED IN ARKANSAS.

@ BOILER TO CONFORM TO A.S.M.E. CODE.

BOILER TO BE INSPECTED BY THE HARTFORD STEAM BOILER INSPECTION AND INSURANCE COMPANY.

Injectors TWO MONITOR (Not Spec.) No. 8

Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER

* Pipes, Check IRON Feed IRON Overflow IRON

15 Check B.L.W. WITH STOP VALVE Pos. RIGHT AND LEFT.

Steam Heat NONE

FOR HEREAFTER: RAISE QUESTION ABOUT USE OF LAGGING AND JACKET ON BACK HEAD OF BOILER. OMITTED FROM THIS LOCO. BY MISTAKE. (K.R. 5.7.20)

FOR HEREAFTER: FRONT ENGINE TRUCK BOLSTER TO BE MADE OF CAST STEEL. (R.S.McC. 4.8.21)

Cab STEEL

2 {CAB TO HAVE FIVE LIGHTS, ONE FOR STEAM GAUGE, ONE FOR WATER GAUGE, ONE FOR LUBRICATOR, ONE OVER ENGINEER AND ONE OVER COAL DECK.

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 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.

2 HEADLIGHT EQUIPMENT TO BE ELECTRIC WITH INCANDESCENT HEADLIGHTS.

Headlight TWO ROUND CASE 18" Reflector.

Headlight, Nos. on sides WITH Hdlt. 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 A-1, IN EACH BOX TO SAND FRONT AND BACK.

Dome casing IRON PAINTED.

~~BOILER TO BE LAGGED AND JACKETED.~~

{Boiler Jacket #22 SOFT STEEL PTD. Bands IRON Style 9

{Boiler Lagging MAGNESIA SECTIONAL.

BLOW OFF PIPE ON LEFT SIDE WITH PIPE CONNECTION TO TANK AND WITH

THE BALDWIN LOCOMOTIVE WORKS

L.G. Dandy April 1920.

SPECIFICATION FOR LOCOMOTIVES 10 26 ½ D 169

FOR ARKANSAS LAND AND LUMBER COMPANY.

285

Frames CAST STEEL

Cylinders, Diam. 16" Stroke 24"

St'm ports, Length 15" Width 1½" Bridges 1"

Exh. ports, Length 15" Width 2½" Valve seats ⅝"

Valve travel 4⅜" Steam lap ¾" Exhaust clearance ---

Eccentric crank throw 10" By-pass valve NONE

S. F. Lubr. NATHAN TRIPLE BULL'S EYE. (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 RICHARDSON BALANCED, WITH VACUUM VALVES.

Met. pkg. {PISTON ROD / VALVE STEM} U. S. KING TYPE. (Not Spec.)

PISTON RODS TO BE KEYED TO CROSSHEADS.

Pistons HEADS OF CAST IRON WITH RINGS OF CAST IRON SPRUNG IN.

Guides STEEL Oil cups NEEDLE

Crossheads CAST STEEL, WITH BEARINGS OF CAST IRON BABBITTED.

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 wheel hub liners NONE

Drivers, O. S. Diam. 46" Cen. diam. 40" CENTERS CAST IRON.

MIDDLE PAIR DRIVERS TO BE SET IN ½"

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 = 3/16" 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 12" each side of cen., Cen. pin liners NONE

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

Wheel hub liners NONE

Wheels, Diam. 26" Tread 4½" Kind CHILLED CAST IRON PLATE

Tires NONE Cen. diam. --- Size ---

Tires held by ---

Back Engine Truck TWO Wheeled SWING BOLSTER SIDE BEARING

To swing 24" each side of cen., Cen. pin liners NONE

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

Wheel hub liners NONE

Wheels, Diam. 26" Tread 4½" Kind CHILLED CAST IRON PLATE

Tires NONE Cen. diam. --- Size ---

Tires held by ---

Brake, position ON ALL DRIVING AND TENDER WHEELS.

Operating {Engine, sch. No. 5 ET WESTG. COMBINED AUTO. AND Parts {Eng. Tr'k, sch. --- STRAIGHT AIR.

Foundation {Drivers, sch. 1-A AMERICAN O.S. EQUALIZED. Parts {Eng. Tr'k, sch. ---

Air pump TWO 9½" Pos. LEFT SIDE

Train connections FRONT AND BACK.

Train signal, sch. NONE

AIR RESERVOIR TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

Tender EIGHT Wheeled, Drawing No. 1502

Weight, with fuel and water, about 81,000 POUNDS.

TENDER TO BE WEIGHED: YES.

Tank 4,000 Gallons Bill 5057

TANK "U" SHAPE STRAIGHT TOP. FUEL CAPACITY 5 TONS.

Tool Boxes HARD WOOD, TOP.

SYPHON CONNECTION TO LEFT SIDE OF TANK.

Frame STEEL 8" AND 10" CHANNELS WITH BUMPERS OF WOOD WITH PLATE BACKING.

Front Drawbar height 29¾"

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.

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 WESTG. AUTO AND STRAIGHT AIR WITH 10"x12" TENDER CYLINDER.

TWO WRECKING FROGS FOR 45 LB. RAILS FURNISHED ON Ex. Ord. No. 6615 DATED 3.7.21.

List of tools, sch. 26 ONE PAIR WRECKING FROGS.

Photo sch. No. 2 Inspection B. L. W. EXCEPT FOR BOILER {See Page 1 / See 2nd Tw.}

To be weighed YES Material specns B. L. W. Except See Sup. 4**

Certificate of boiler test THREE COPIES OF B.L.W. FORM 1030.

Junior laws to 1.29.20 Shipment ON OWN WHEELS.

Brass shop finish, No. 1

Machine shop finish D-165

B. L. W. Patents FEED WATER STRAINER PAT'D SEPT. 1, 1903 (CAST ON)

Property plates NONE {B.L.W. PROPERTY PLATES FOR ENGINE AND TENDER TO BE ORDERED ON Ex. ORDER 19968 DATED 6-8-20 AND TO BE FURNISHED TO MR. KELLY, ASST. TRAFFIC MANAGER TO BE APPLIED TO LOCOMOTIVE AFTER DELIVERY. (NO CHARGE)

Painting, style 291, OLIVE GREEN AND ALUMINUM.

MARK ON CAB PANELS: FERQ

Mark on TANK COLLAR AT SIDES: TRAPP MOUNTAIN RAILWAY

ROAD NUMBER ON SIDES OF TANK TO BE LARGE.

Road Nos. Pos.	Road Nos.	Name NONE
F. No. PLATE	9	
F. SAND BOX		
SIDES OF TANK		
BACK OF TANK		

Actual Dimensions of Loco. Extreme height over all 13' 1"

Extreme Width: Cab boards 9' 9" Cylinders --- 9' 5½"

Length outside face front bumper of engine to face of tender wedge 30' 0"

Length face of tender wedge to outside face back bumper of tender 24' 0"

Total length outside face front bumper of engine to outside face back bumper of tender 54' 0"

SPECIFICATION FOR LOCOMOTIVES 10 26 ¢ D 169

FOR ARKANSAS LAND AND LUMBER COMPANY

P

1 BOILER TO BE OPERATED IN THE STATE OF ARKANSAS
BOILER TO BE BUILT TO CONFORM TO THE BOILER CODE OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS (1918), AND MUST BE INSPECTED DURING CONSTRUCTION AND UPON COMPLETION BY AN AUTHORIZED INSPECTOR WHO SHALL NOT BE INTERESTED EITHER DIRECTLY OR INDIRECTLY WITH THE MANUFACTURERS.

2 A DATA REPORT, ON FORMS FURNISHED BY THE ABOVE MENTIONED STATE SHALL BE FORWARDED TO THE PROPER OFFICIAL BEFORE THE BOILER LEAVES THE BUILDER'S WORKS.

3 A HYDROSTATIC TEST SHALL BE APPLIED EQUAL TO ONE-AND -ONE-HALF (1½) TIMES THE WORKING PRESSURE.

4 THE MATERIALS ENTERING INTO THE CONSTRUCTION SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS:-

BOILER AND FIRE BOX STEEL / MATERIAL FOR ONE-PIECE DOME	A.S.M.E. SPEC. PAGE 11
BOILER RIVET STEEL	A.S.M.E. SPEC. PAGE 15
BOILER RIVET IRON	A.S.M.E. SPEC. PAGE 31
BOILER BRACE IRON	A.S.M.E. SPEC. PAGE 37
BOILER STAYBOLT IRON	A.S.M.E. SPEC. PAGE 34
BOILER TUBES	A.S.M.E. SPEC. PAGE 40

TUBES MAY HAVE VARIATION IN GAUGE OF 10% EITHER WAY.

5 FRONT TUBE SHEET SHALL BE OF FIRE BOX STEEL.
ALL BOILER AND FIRE BOX STEEL AND MATERIAL FOR ONE PIECE DOME SHALL BE MARKED BY THE MANUFACTURER WITH THE HEAT NUMBER, NAME OF MANUFACTURER, GRADE AND LOWEST TENSILE STRENGTH IN THE MANNER AND LOCATION DESCRIBED ON B.L.W. MARKING CARD 6859. SMOKE BOX STEEL MAY CONFORM TO B.L.W. SPECIFICATION.

6 THE MINIMUM FACTOR OF SAFETY SHALL BE FIVE. (1918)
LONGITUDINAL SEAMS SHALL BE OF BUTT AND DOUBLE STRAP CONSTRUCTION.

7 THE OUTSIDE ENDS OF SOLID STAYBOLTS, 8 IN. AND LESS IN LENGTH, SHALL BE DRILLED WITH A HOLE AT LEAST 3/16" DIA., TO A DEPTH EXTENDING AT LEAST ½" BEYOND THE INSIDE OF THE PLATES

8 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 TABLES:

SIZE OF PIPE CONNECTION OR CORRESPONDING TAPER TAP.	1" & 1¼"	1½" & 2"	2½" TO 4"
NO. OF THREADS PER INCH.	11½	11½	8
MINIMUM NO. OF THREADS REQUIRED IN OPENING.	4	5	7
MINIMUM THICKNESS OF MATERIAL REQUIRED TO GIVE ABOVE NO. OF THREADS.	3/8"	7/16"	7/8"

IF THICKNESS OF BOILER MATERIAL IS NOT SUFFICIENT TO GIVE THE ABOVE NUMBER OF THREADS, A LINER OR FLANGE MUST BE APPLIED.

9 EACH BOILER MUST BE PROVIDED WITH A CONNECTION ¼ PIPE SIZE FOR ATTACHING INSPECTOR'S TEST GAUGE.

10 A FUSIBLE PLUG MUST BE APPLIED. THE PLUG MUST BE FILLED WITH PURE TIN AND THE LEAST DIAMETER OF THE FUSIBLE METAL MUST BE NOT LESS THAN ½" EXCEPT FOR WORKING PRESSURE ABOVE 175 LBS., IN WHICH CASE THE LEAST DIAMETER SHALL NOT BE LESS THAN 3/8", (I. E., USE FUSIBLE PLUG CARD 1414 FOR PRESSURE ABOVE 175 LBS. AND FUSIBLE PLUG CARD 1219 FOR 175 LBS. AND LESS).

15 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.~~

16 SAFETY VALVES MUST MEET THE REQUIREMENTS OF THE A. S. M. E. BOILER CODE AND MUST BE PLAINLY STAMPED BY THE MANUFACTURER AS PER B. L. W. MARKING CARD 6858.
SAFETY VALVES OVER 3" IN DIAMETER SHALL HAVE FLANGED INLETS. THESE FLANGES SHALL CONFORM TO THE AMERICAN STANDARD.
ALL SAFETY VALVES MUST BE PROVIDED WITH RELIEF LEVERS.

17 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: ALSO WHERE POSSIBLE ONE NEAR THE THROAT SHEET.

18 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 5/8" IN THICKNESS, AND ¼" LESS THAN FULL SIZE FOR PLATES 5/8" 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 ¼" LESS THAN FULL SIZE AND THEN DRILLED, REAMED OR FINISHED FULL SIZE WITH ROTATING CUTTER.

19 UPON COMPLETION, EACH BOILER SHALL BE STAMPED IN THE PRESENCE OF THE AUTHORIZED INSPECTOR, WITH THE WORDS AS ARRANGED BELOW. THE HEIGHT OF THE LETTERS AND FIGURES SHALL NOT BE LESS THAN ¼". THE LOCATION OF THE STAMP SHALL BE ON THE BACK HEAD ABOVE A PLUG HOLE.

	ARKANSAS (State in which boiler is to be used)
	No. 1 (Manufacturer's State Standard number)
	THE BALDWIN LOCOMOTIVE WORKS (Name of manufacturer)
	(LEAVE BLANK) (State number) (LEAVE BLANK) (Year put in service)
(Manufacturer's Serial Number)	180 LBS. (Maximum working pressure when built)

THE BALDWIN LOCOMOTIVE WORKS Dwgs. 10 20 & 0 30 WITH SAME EXTRAS EXCEPT WHERE OTHERWISE SPECIFIED.

Memorandum Spec'n 20026

SPECIFICATION FOR LOCOMOTIVES 10 20 & 0 30

FOR BARFIELD LUMBER CO.

Gen. as PHOTO. 4411

Engine Drawing No. 4

HW.

2.9.20

Gauge of Road 4' 8½" Play ¾"

Wheelbase, Rigid 8' 0" Driving 8' 0" Total 22' 9"

Total wheelbase, eng. and tend. {Actual 46' 1" / Limited to ---

RAILS, 30 POUNDS PER YARD.

Curves NEGATIVE. GRADES, INDETERMINABLE

LENGTH OF HAUL 6 TO 10 MILES.

Limits, Height --- Width ---

Weight (approximate) in working order, Total 76,400 POUNDS.

On F. tr'k 10,000 lbs., Drivers 56,400 lbs., B. tr'k 10,000 lbs.

Tractive power 13,550 lbs., Ratio of adhesion 4.16

Work'g St'm Pres. 180 lbs., Service LOGGING

Fuel WOOD

Boiler STEEL (SUP. H. SPEC.) Thick 7/16" & ½" Bill 8919

Front Tube Sheet ½" Thick

Boiler, Diam 44" Plan EXTENDED WAGON TOP.

Allowable st'm pres. 200 lbs. {With Factor of Safety of 5.08 Tested to 220 / 300} lbs. steam pres. / lbs. water pres.

Long'l seams BUTT JOINTED, DOUBLE COVERING STRIPS.

Dome, diam 25" Pos. FORWARD OF FIRE BOX.

Firebox STEEL (SUP. H. SPEC.) Combustion chamb. NONE

Firebox, length 55⅝" Width 39½" Depth F. 56" B. 54⅜"

Firebox, Tube ½" Crown ⅜" Sides ⅜" Back ⅜"

Firedoor opening 16" DIAM. CROWN AND SIDES IN ONE SHEET.

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

Water space frame SINGLE Riveted

Water space stays ⅜" DIAM. WITH 3/16" HOLES 1½" DEEP FROM O. S.

Radial stays 1" DIAM. Sling stays front {TWO ROWS 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 116 Diam 2" Length 11' 6"

Heating Surface Flues --- Combus. Chamb. --- Total 767⁰

Tubes 693⁰ Fire Box 74⁰ Fire Brick Tubes ---

Grate area 13.3⁰ Ratio to Heating Surface 1: 58

Superheater ---

Fire Brick ARCH—NONE

Grates PLAIN BARS AND DEAD PLATES

Ash Pan, Dampers RIGHT AND LEFT

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-LOG

CLEANING PIPE—WITH

Stack RADITON IMPROVED Dia. 13"

SYPHON UNDER CAB BOARD ON LEFT SIDE WITH PIPE CONNECTIONS TO TANK AND WITH 25 FEET OF SUCTION HOSE.

SYPHON TO BE ARRANGED ALSO AS AN EJECTOR WITH 25 FEET OF DELIVERY HOSE TO DISCHARGE WATER FROM TENDER TANK TO BOILER, WHEN, ALWAYS LEAVING A SUPPLY OF 8" OF WATER IN SUCTION TANK.

Safety Valves TWO STAR 2" OPEN (Spec)

Safety valves BOTH with relief lever, Set to 180 POUNDS.

Whistle ONE CHIME

Steam Gauge ONE IRON 7" MAKER: STAR (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 same

Blower Valve B. L. W.

Blow off Cock ONE B.L.W. Pos:- FRONT

Cleaning Plugs ONE FILLING PLUG IN TOP OF BOILER.

Firebox CONNER, BACK INCLINATIONAL, SIDES AND BACK.

Crown, TWO EACH SIDE AND TWO BACK

Waist, ONE UNDER FRONT

Front tube sheet TWO Fusible plug ONE

Pump NONE

LOCOMOTIVE TO BE OPERATED IN GEORGIA.

BOILER TO CONFORM TO A.S.M.E. CODE EXCEPT OMIT STATE INSPECTION AND OMIT STAMPING AND FURNISH TUBES TO B.L.W. MATERIAL SPECIFICATION.

Injectors TWO SELLERS, CLASS "N" (Spec) No. 0½

Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER

Pipes, Check COPPER Feed IRON Overflow IRON

Check SELLERS, COMBINED WITH STOP VALVES, R. AND L.

Steam Heat NONE

Cab STEEL 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 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" AND 25½"

Coupler TWO-POCKET CAST STEEL DRAWHEAD, TOP POCKET FITTED WITH REMOVABLE M.C.B. AUTO. COUPLER HAVING SPLIT KNUCKLE, AND THE LOWER POCKET FOR LINK AND PIN CONNECTION.

Signal fixtures IRON ON BUMPER

HEADLIGHTS TO BE DRESSEL.

Headlight TWO ROUND CASE 16" Reflector, To burn KEROSENE

Headlight, Nos. on sides WITH H'dl't step NONE

Lamp shelf NONE Nosing ---

Bell 85 POUNDS.

Sand Box TWO Diam. 19" Body IRON PAINTED Pipes IRON

Sander HAND, IN EACH B. S., 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

W. D. Stevenson May-1920.

SPECIFICATION FOR LOCOMOTIVES 10 20 & 0 30

FOR BARFIELD LUMBER CO.

HW.

288

Frames CAST STEEL

Cylinders, Diam 13" Stroke 22"

St'm ports, Length 12" Width 1" Bridges ⅞"

Exh. ports, Length 12" Width 2" Valve bars 1/16"

Valve travel 4" Steam lap 1" Exhaust clearance ---

Eccentric throw 4½" By-pass valve NONE

S. F. Lubr. DETROIT DOUBLE #12 BULLS EYE (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. FRICTION HOOD PISTON RODS UNITED STATES (Not Spec.)

Pistons HEADS OF CAST IRON, RINGS OF CAST IRON, SPRUNG IN.

Guides STEEL Oil cups NEEDLE

Crossheads CAST STEEL

Wrist Pins STEEL Rod caps 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

Driving wheel hub liners NONE

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 3/16" TOTAL

Driving Boxes STEELED CAST IRON

Journals, Diam. 5½" Length 8"

Springs. Make B. L. W.

Front Engine Truck TWO Wheeled SWING BOLSTER, CENTER BEARING

To swing 2" each side of cen. Cen. pin liners NONE

Journals, Diam. 4½" Length 8" Boxes CAST IRON

Wheel hub liners NONE

Wheels, Diam 24" Tread 4½" Kind CHILLED CAST IRON PLATE

Tires NONE Cen. diam. --- Size ---

Tires held by ---

Back Engine Truck TWO Wheeled SWING BOLSTER, SIDE BEARING

To swing 2½" each side of cen. Cen. pin liners NONE

Journals, Diam. 4½" Length 8" Boxes CAST IRON

Wheel hub liners NONE

Wheels, Diam 24" Tread 4½" Kind CHILLED CAST IRON PLATE

Tires NONE Cen. diam. --- Size ---

Tires held by ---

Brake, position ON ALL DRIVING AND TENDER WHEELS

Operating { Engine, sch. U-7 B.L.W. STEAM

Parts { Eng. f'k. sch. ---

Foundation { Drivers, sch. U-7 B.L.W.

Parts { Eng. f'k. sch. ---

Air pump --- Pos. ---

Train connections ---

Train signal, sch. ---

SPRAGUE LUBRICATOR FOR STEAM BRAKE VALVE.

Tender EIGHT Wheel, Drawing No. 406 {TENDER TO BE WEIGHED: No.

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

TANK STEEL TO BE ¼" THICK.

Tank 3,000 Gallons Bill 4174

TANK "U" SHAPE, STRAIGHT TOP. FUEL CAPACITY 3 CORDS

WOOD RACK AROUND TOP OF TANK.

Tool Box OF HARD WOOD, TOP.

SYPHON CONNECTION TO LEFT SIDE OF TANK.

Frame STEEL 8" CHANNELS WITH BUMPERS OF WOOD AND STEEL PLATE.

Front Drawbar height 26⅛"

Pilot NONE Pushing shoes NONE

Back drawhead, center above rail 33½" AND 25½"

Coupler TWO-POCKET CAST STEEL DRAWHEAD, TOP POCKET FITTED WITH REMOVABLE M.C.B. AUTO. COUPLER HAVING SPLIT KNUCKLE, AND THE LOWER POCKET FOR LINK AND PIN CONNECTION.

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 28" 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

Photo sch. NONE Inspection B.L.W.

To be weighed YES Material specns. B.L.W. (SUP. H. SPEC.) AND PROP'L

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

Junior flues to 2.9.20 Shipment ON OWN WHEELS.

Brass shop finish, sch. 1

Machine shop finish D-165

B. L. W. Patents: FEED PIPE STRAINER, PAT'D SEPT. 1. 1903 (CAST ON)

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

Painting, style 291, OLIVE GREEN AND ALUMINUM.

Mark on TANK SIDES: BARFIELD LUMBER CO.

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

Actual Dimensions of Loco. Extreme height over all 12'10"

Extreme Width, Cab {HANDLES 8'11" / A --- Cylinders or valve motion 8'4"

Length outside face front bumper of engine to face of tender wedge 27'8"

Length face of tender wedge to outside face back bumper of tender 23'4½"

Total length outside face front bumper of engine to outside face back bumper of tender 51'0½"

SPECIFICATION FOR LOCOMOTIVES 10 20 & D 30

FOR BARFIELD LUMBER CO.

P

289

1 BOILER TO BE OPERATED IN THE STATE OF GEORGIA

BOILER TO BE BUILT TO CONFORM TO THE BOILER CODE OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS (1918), ~~AND MUST BE INSPECTED DURING CONSTRUCTION AND UPON COMPLETION BY AN AUTHORIZED INSPECTOR WHO SHALL NOT BE INTERESTED EITHER DIRECTLY OR INDIRECTLY WITH THE MANUFACTURERS.~~

2 ~~A DATA REPORT, ON FORMS FURNISHED BY THE ABOVE MENTIONED STATE SHALL BE FORWARDED TO THE PROPER OFFICIAL BEFORE THE BOILER LEAVES THE BUILDER'S WORKS.~~

3 A HYDROSTATIC TEST SHALL BE APPLIED EQUAL TO ONE-AND-ONE-HALF (1½) TIMES THE WORKING PRESSURE.

4 THE MATERIALS ENTERING INTO THE CONSTRUCTION SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS:-

BOILER AND FIRE BOX STEEL MATERIAL FOR ONE-PIECE DOME	A.S.M.E. SPEC. PAGE 11
BOILER RIVET STEEL	A.S.M.E. SPEC. PAGE 15
BOILER RIVET IRON	A.S.M.E. SPEC. PAGE 31
BOILER BRACE IRON	A.S.M.E. SPEC. PAGE 37
BOILER STAYBOLT IRON	A.S.M.E. SPEC. PAGE 34
~~BOILER TUBES~~	~~A.S.M.E. SPEC. PAGE 40~~

5 FRONT TUBE SHEET SHALL BE OF FIRE BOX STEEL.

ALL BOILER AND FIRE BOX STEEL AND MATERIAL FOR ONE PIECE DOME SHALL BE MARKED BY THE MANUFACTURER WITH THE HEAT NUMBER, NAME OF MANUFACTURER, GRADE AND LOWEST TENSILE STRENGTH IN THE MANNER AND LOCATION DESCRIBED ON B.L.W. MARKING CARD 6859. SMOKE BOX STEEL MAY CONFORM TO B.L.W. SPECIFICATION.

6 THE MINIMUM FACTOR OF SAFETY SHALL BE FIVE. (1918)

LONGITUDINAL SEAMS SHALL BE OF BUTT AND DOUBLE STRAP CONSTRUCTION.

7 THE OUTSIDE ENDS OF SOLID STAYBOLTS, 8 IN. AND LESS IN LENGTH, SHALL BE DRILLED WITH A HOLE AT LEAST 3/16" DIA., TO A DEPTH EXTENDING AT LEAST ½" BEYOND THE INSIDE OF THE PLATES

8 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 TABLES:

SIZE OF PIPE CONNECTION OR CORRESPONDING TAPER TAP.	1" & 1¼"	1½" & 2"	2½" TO 4"
NO. OF THREADS PER INCH.	11½	11½	8
MINIMUM NO. OF THREADS REQUIRED IN OPENING.	4	5	7
MINIMUM THICKNESS OF MATERIAL REQUIRED TO GIVE ABOVE NO. OF THREADS.	⅜"	7/16"	½"

IF THICKNESS OF BOILER MATERIAL IS NOT SUFFICIENT TO GIVE THE ABOVE NUMBER OF THREADS, A LINER OR FLANGE MUST BE APPLIED.

9 EACH BOILER MUST BE PROVIDED WITH A CONNECTION ¼ PIPE SIZE FOR ATTACHING INSPECTOR'S TEST GAUGE.

10 A FUSIBLE PLUG MUST BE APPLIED. THE PLUG MUST BE FILLED WITH PURE TIN AND THE LEAST DIAMETER OF THE FUSIBLE METAL MUST BE NOT LESS THAN ½" EXCEPT FOR WORKING PRESSURE ABOVE 175 LBS., IN WHICH CASE THE LEAST DIAMETER SHALL NOT BE LESS THAN ⅜", (I. E., USE FUSIBLE PLUG GARD 4114 FOR PRESSURE ABOVE 175 LBS. AND FUSIBLE PLUG GARD 4219 FOR 175 LBS. AND LESS).

15 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.

16 SAFETY VALVES MUST MEET THE REQUIREMENTS OF THE A. S. M. E. BOILER CODE AND MUST BE PLAINLY STAMPED BY THE MANUFACTURER AS PER B. L. W. MARKING CARD 6858.

SAFETY VALVES OVER 3" IN DIAMETER SHALL HAVE FLANGED INLETS. THESE FLANGES SHALL CONFORM TO THE AMERICAN STANDARD.

ALL SAFETY VALVES MUST BE PROVIDED WITH RELIEF LEVERS.

17 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.

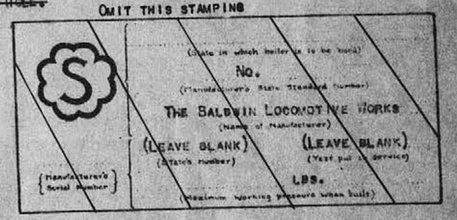
FOUR IN THE LOWER PART OF THE WATER LEG: ALSO WHERE POSSIBLE ONE NEAR THE THROAT SHEET.

18 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 ¼" LESS THAN FULL SIZE AND THEN DRILLED, REAMED OR FINISHED FULL SIZE WITH ROTATING CUTTER.

19 ~~UPON COMPLETION, EACH BOILER SHALL BE STAMPED IN THE PRESENCE OF THE AUTHORIZED INSPECTOR, WITH THE WORDS AS ARRANGED BELOW. THE HEIGHT OF THE LETTERS AND FIGURES SHALL NOT BE LESS THAN ¼" THE LOCATION OF THE STAMP SHALL BE ON THE BACK HEAD ABOVE A PLUG HOLE.~~

OMIT THIS STAMPING



THE BALDWIN LOCOMOTIVE WORKS — As Spec. 0-6172, Oct. 15 20/46 ½ DD 10 Except such deviations as are noted

Locomotive Spec's 1098

SPECIFICATION FOR LOCOMOTIVES 16 28/46 ½ DD 10 — Class 2-8-8-2 T.E. 148,000 lbs.

FOR THE BOOTH KELLY LUMBER COMPANY — Engine Drawing No. 3

P

12-31-19

Gauge of Road 4' 8½" Play ⅞" **Wheelbase,** Rigid 8' 0" Driving 23' 8" Total 37' 9"

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

Curves AND **Grades** (SEE SUP. 2)

Limits, Height —— Width ——

Weight (approximate) in working order, Total 208,000 POUNDS

On F. tr'k 12,000 lbs. Drivers 176,000 lbs. B. tr'k 20,000 lbs.

Tractive power ~~37500~~ 37,500 lbs. Ratio of adhesion ~~4.7~~ 4.7 TANK EMPTY 4.26

Work'g St'm Pres. 200 lbs. Service LOGGING

Fuel OIL (SEE SUP. 3 ETC.)

Boiler STEEL Thick ⅜" Bill 8835

Front Tube Sheet ½" Thick

Boiler, Diam. 60" Plan STRAIGHT TOP

{Allowable st'm pres. 210 lbs. / With Factor of Safety of 4.87 — Tested to 230 lbs. steam pres. / 280 lbs. water pres.

Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS, 90% SEAMS

6-1 **Dome,** diam. 29" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE

Firebox, length 90-3/16" Width ½" Depth F. 65⅞" B. 59⅜"

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

8 Firedoor opening OVAL 16" x 20" CROWN AND SIDES IN ONE SHEET

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. {TWO ROWS B. L. W. EXPANSION STAYS

Radial stays 1½" DIAM. Sling stays front

Button heads below crown on EIGHT central rows

Crown bars NONE Placed —— above crown

Crown bolts ——

Flues —— Sill (To use stock)

Tubes #12 W. G. SEAMLESS STEEL

Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS

Number 221 Diam. 2" Length 17' 0"

Heating Surface {Flues —— Combus. Chamb. —— Total 2083⁴ / Tubes 1957⁰ Fire Box 126⁰ Fire Brick Tubes ——

Grate area 26.2 Ratio to Heating Surface 1 : 80

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 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 SINGLE — LOW

Nozzle tips — WITH

Nozzle stability Dia. 17"

7 **Safety Valves** TWO CONSOLIDATED 2½" OPEN

Safety valves NONE with relief lever, Set to 200 POUNDS

Whistle ONE B. L. W. PLAIN

Steam Gauge ONE INCH 7" Makers ASHCROFT (Nathan)

Steam gauge stands IRON Clock NONE

Water Gauge ONE KLINGER Cab Lamps ELECTRIC

Gauge Cocks FOUR BACK Surface valve NONE

10 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 (SEE SUP. 11) 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 ONE Fusible plug ONE

Pump NONE

Injectors TWO NATHAN "MONITOR" (Nathan) 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 STEEL

Cab boards STEEL Nosing NONE

Running boards NONE Nosing ——

Hand rail IRON Located on SMOKE BOX

Back Bumper OAK

12 **Pilot** WOOD, FRONT AND BACK Pushing shoes NONE

Front Bumper OAK Bumper plate WITH

Steps (SEE SUP. 12)

E. & B. Drawhead, Center above rail 33½"

Coupler M. C. B. AUTO. FRONT AND BACK

HAND RAIL ACROSS FRONT AND BACK, I. E., COUPLING PIN LIFTER SHAFT.

Signal fixtures IRON ON BUMPER

13 **Headlight** TWO ROUND CASE 16" Reflector,

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

Lamp shelf NONE Nosing ——

Bell 85 POUNDS

Sand Box TWO Diam. (Support) Body IRON PAINTED Pipes IRON

Sander (SEE SUP. 14)

Dome casing IRON PAINTED

Boiler Jacket #22 SOFT STEEL PTD. Bands IRON Dim. 9

Boiler Lagging MAGNESIA SECTIONAL

THE BALDWIN LOCOMOTIVE WORKS

E. Steele — April 1920. — S 291

SPECIFICATION FOR LOCOMOTIVES 16 28/46 ½ DD 10

FOR THE BOOTH-KELLY LUMBER COMPANY

P

15-16 **Frames** CAST STEEL

21 **Cylinders,** Diam. {H.P. 17" / L.P. 26" Stroke 24" Width —— Bridges

St'm ports, Length —— Width —— Valve lead (SEE SUP. 21-24)

Exh. ports, Length —— Width —— Valve travel —— Steam lap —— Exhaust clearance

Eccentric crank throw (SUP. 21) By-pass valve NONE

S. F. Lubr. (SEE SUP. 25)

Cyl'r heads (SEE SUP. 23-26)

Cyl'r casings IRON PAINTED Head-covers STEEL PAINTED

St'm chest casings IRON PAINTED Covers STEEL PAINTED

St'm chest valves (Nat Lee) RICHARDSON BALANCED, WITH VACUUM VALVES

Wint. Pat. UNITED STATES, KING TYPE.

Pistons (SEE SUP. 28)

Guides STEEL Oil cups NEEDLE

Crossheads CAST STEEL, WITH BEARINGS OF CAST IRON, TINNED

Wrist Pins STEEL Rod cups FOR GREASE

Valve Motion (SEE SUP. 30)

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 wheel hub liners BRONZE

Drivers, O. S. Diam. 44" Cen. diam. 38" 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 — 3/16" TOTAL

Driving Boxes CAST STEEL

Journals, Diam. {MAIN 7½" Length 8" / OTHERS 7"

32 **Springs.** Make B. L. W.

34 **Front Engine Truck** TWO Wheeled SWING BOLSTER, CENTER BEARING

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

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

Wheel hub liners NONE

Wheels, Diam. 24" Tread 1¼" Kind CHILLED CAST IRON SPOKE

Tires NONE Cen. diam. —— Size ——

Tires held by ——

Back Engine Truck TWO Wheeled RUSHTON SIDE BEARING

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

Journals, Diam. 5" Length 8" Boxes CAST IRON

Wheel hub liners NONE

Wheels, Diam. 26" Tread 1¼" Kind CHILLED CAST IRON SPOKE

Tires NONE Cen. diam. —— Size ——

Tires held by ——

36 **Brake,** position ON ALL DRIVING WHEELS (NO TENDER)

Operating — Engine, sch. No. 6-ET WESTINGHOUSE COMBINED AUTO. AND STRAIGHT AIR

Parts — Eng. Tr'k, sch. ——

Foundation — Drivers, sch. 98-1 AMERICAN D. S. EQUALIZED

Parts — Eng. Tr'k, sch. ——

Air pump AND Pos. (SEE SUP. 35)

Train connections FRONT AND BACK

Train signal, sch. NONE

AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

Tender NONE

37 **Tank** {OIL 1,000 5163 / WATER 2,000 Gallons, Bill 5198

TANK RECTANGULAR, ON SIDES OF BOILER.

OIL TANK ON REAR EXTENSION OF ENGINE FRAME, BACK OF CAB.

OIL TANK TO HAVE LUGS FOR LIFTING TANK.

OIL TANK TO BE ARRANGED SO IT CAN BE READILY REMOVED IN CASE IT IS DESIRED TO CHANGE TO WOOD FUEL.

MEASURING ROD FOR ASCERTAINING QUANTITY OF OIL IN TANK.

FOR HEREAFTER: Recommendation as to making connecting rods with the side and jaw as shown on Connecting Rod Card 4890 instead of 6153, so that jaw will clear the brake hanger. RSMcC. 1-21-21

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 B. L. W. FORM 1036

Junior laws to 3-1-20 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, OLIVE GREEN AND ALUMINUM

LETTERING ETC. TO BE SAME AS FOR 16 28/46 ½ DD 4

Mark on TANK SIDES: THE BOOTH-KELLY LUMBER COMPANY

Road Nos. Pos	Road Nos.	Name
F. No. PLATE	6	NONE
CAB SIDES		
BACK OF OIL TANK		

Actual Dimensions of Loco. Extreme height over all — 13' 10½"

Extreme Width {Over cab boards — 9' 1" / Over cylinders —— 9' 10½"

Length outside face of front bumper to outside face of back bumper of engine — 43' 9"

SPECIFICATION FOR LOCOMOTIVES 16 28/46 ¼ DD 10

FOR: THE BOOTH KELLY LUMBER COMPANY

P

1 LOCOMOTIVE FOR OPERATION IN OREGON, I. E., BOILER TO CONFORM TO ALL I. C. C. REQUIREMENTS.

2 CURVES - 40 DEGREES.
MAXIMUM GRADES - 8%. GRADES 6½% COMBINED WITH CURVES OF APPROXIMATELY 35 DEGREES COMPENSATED.
RAILS 56 POUNDS PER YARD.

3 OIL BURNING ARRANGEMENT SOUTHERN PACIFIC STYLE, WITH BURNER IN FRONT OF FIRE-BOX.
ROYALTY, IF ANY, PAYABLE BY THE B. L. W.

4 FUEL OIL FROM ASSOCIATED OIL COMPANY.
TESTS: GRAVITY 13½ DEG. TO 16 DEG. BAUME
FLASH 285 AT 13½ DEG. GRAVITY
FIRE TESTS RUN 25 POINTS HIGHER THAN FLASH.

5 PROVISION TO BE MADE FOR READILY CHANGING DETAILS TO BURN WOOD FUEL.

6 DOME CAP OF FORGED STEEL.

7 AUXILIARY DOME FOR SAFETY VALVES AND WHISTLE.

8 FIRE DOOR TO BE LARGE OVAL PATTERN, LOCATED AS HIGH AS POSSIBLE, FOR WOOD FUEL.

9 STEAM PIPES OF EXTRA STRONG STEEL PIPE.
RECEIVER PIPE OF WROT IRON CONNECTING H. P. AND L. P. CYLINDERS.
FLANGES ON STEAM PIPES BETWEEN HIGH AND LOW PRESSURE CYLINDERS TO BE BOLTED TOGETHER WITH ⅞" BOLTS.

10 WATER GAUGE 12" LONG ON BACK HEAD, L. S. WITH BOTTOM OF GAUGE ON LINE OF SECOND GAUGE COCK, OR 6" ABOVE CROWN.

11 BLOW-OFF COCK TO BE SAME STYLE AS IN USE BY HARRIMAN LINES, AND TO BE OPERATED FROM CAB.

12 PILOTS OF SHORT DESIGN HAVING STEPS ON PILOT WITH HAND RAILS

13 HEADLIGHTS TO BE SCHROEDER ELECTRIC, "SUNBEAM" TYPE, WITH 12" MIRROR GLASS REFLECTOR. HEADLIGHTS, No. 1442, WITH SIDE NUMBERS, AT FRONT OF ENGINE: AND No. 1212, WITHOUT SIDE NUMBERS AT REAR OF ENGINE.
REAR HEADLIGHT TO BE LOCATED ON TOP OF CAB.

14 SAND BOX ON FRONT DECK PLATE OF ENGINE WITH LEACH AIR SANDER B-6, TO DELIVER SAND TO FRONT OF FRONT GROUP OF DRIVERS. (Not Specd)
ONE SAND BOX 28" DIAMETER, ON TOP OF BOILER, WITH LEACH AIR SANDER, TRAP A-10, TO DELIVER SAND TO FRONT AND BACK OF BACK GROUPS OF DRIVERS. (Not Specd)

15 FRAME TO BE REINFORCED AT CONNECTION TO TOP RAIL.

16 FRAME BOLTS TO BE LARGER THAN FOR PREVIOUS LOCOMOTIVE, 16 28/46 ¼ DD 4. THIS REFERS TO BOLTS IN THE FRAME FOR BRAKE RIGGING AND BRAKE HANGERS, AS THOSE ON THE PREVIOUS LOCOMOTIVE WERE TOO SMALL AND GAVE CONSIDERABLE TROUBLE.

21 HIGH PRESSURE CYLINDERS TO BE CAST SEPARATE AND ATTACHED TO AN INTERMEDIATE SADDLE.
STEAM PORTS, LENGTH 16", WIDTH 1½", BRIDGES 1"
EXHAUST PORTS, LENGTH 16" WIDTH 3" VALVE LEAD 3/16"
VALVE TRAVEL 5½", STEAM LAP 1 3/16" EXHAUST CLEARANCE ⅛"
ECCENTRIC CRANK THROW 10".

22 HIGH PRESSURE CYLINDERS AND AIR PUMPS OILED BY DETROIT FOUR-FEED BULL'S-EYE LUBRICATOR, WITH IRON PIPES UNDER JACKET. (Not Specd)

23 CYLINDER HEADS: HIGH PRESSURE, CAST IRON.

24 EACH LOW PRESSURE CYLINDER TO BE CAST IN ONE PIECE AND BOLTED TOGETHER AT CENTER.
STEAM PORTS, LENGTH 18" WIDTH 1½" BRIDGES 1⅛"
EXHAUST PORTS, LENGTH 18", WIDTH 3", VALVE LEAD ¼"
VALVE TRAVEL 5½", STEAM LAP 1 3/16" EXHAUST CLEARANCE ⅛"
ECCENTRIC CRANK THROW 12½"

25 LOW PRESSURE CYLINDER OILED BY TWO SCHLAGK FORCE SIGHT FEED OIL PUMPS.
FURNISH LUBRICATOR TO BE APPLIED TO EACH LOW PRESSURE CYLINDER FOR EMERGENCY USE.

26 CYLINDER HEADS: LOW PRESSURE, CAST STEEL

27 CYLINDER COCKS FOR LOW PRESSURE CYLINDERS TO BE PNEUMATICALLY OPERATED.

28 PISTONS: HIGH PRESSURE HEADS, CAST IRON, WITH CAST IRON RINGS SPRUNG IN.
LOW PRESSURE HEADS: CAST STEEL, WITH CAST IRON WEARING SURFACES.
PISTON RODS TO BE KEYED TO CROSSHEADS.

29 PARALLEL RODS TO HAVE SOLID ENDS.

30 WALSCHAERT'S VALVE MOTION: TWO SETS, ONE FOR EACH PAIR OF CYLINDERS.

31 FLANGE LUBRICATORS TO BE APPLIED TO FRONT AND REAR DRIVING WHEELS. CUSTOMER USES LUBRICATOR COMPOSED OF A PIECE OF HOSE FILLED WITH WASTE AND OIL POURED IN UPON THE WASTE.

32 EQUALIZING BEAMS OF WROUGHT STEEL AND CAST STEEL.
DRIVER SPRINGS TO HAVE LEAVES ½" THICK.

33 SPRINGS UNDER FIRE BOX TO BE LARGER THAN FOR PREVIOUS LOCOMOTIVE, 16 28/46 ¼ DD 4.
SPRINGS UNDER BACK ENGINE TRUCK TO BE ⅞" DIAMETER.

34 FRONT ENGINE TRUCK FRAME OF CAST STEEL.

35 AIR PUMPS: ONE 11" ON R. S., AND ONE 8½" CROSS COMPOUND ON LEFT SIDE.

36 BRAKE SHOES TO BE APPLIED IN SUCH A WAY THAT WHEN BACKING UP THE ENGINE WILL DO MOST OF THE BRAKING.

37 WATER TANKS TO BE CONNECTED BY TWO 5" PIPES ON BOTTOM AND BETWEEN ENDS ON EACH SIDE AT BOTTOM BY 6" PIPES.

THE BALDWIN LOCOMOTIVE WORKS As Specn. C-6029

Memorandum Spec'n 19073

SPECIFICATION FOR LOCOMOTIVES 12 30 ½ E 48

FOR BROOKS-SCANLON LUMBER COMPANY

P

10-31-19

(Except back engine truck and strap end side rods and with narrow fire box.)

Genl'as Photo. 6029

Engine Drawing No. 10

Gauge of Road 4' 8½" Play ¾" **Wheelbase,** Rigid 12'0" Driving 12'0" Total 27' 7" (L.L.d. 12/31/19)

Total wheelbase, eng. and tend. { Actual 50' 2" / Limited to —

Grades 5% Rails 60 pounds per yard

Curves 25 degrees

Limits, Height — Width —

Weight (approximate) in working order, Total 115,000 pounds

On F. tr'k 13,500 lbs., Drivers 114,000 lbs., B. tr'k 17500 lbs.

Tractive power 27,000 lbs., Ratio of adhesion 4.22

Work'g St'm Pres. 180 lbs., Service Logging

Fuel Oil

Boiler Steel Thick ¾" Bill 8776

Front Tube Sheet ½" Thick

Boiler, Diam. 70" Plan Straight Top

{ Allowable st'm pres. 200 lbs. / With Factor of Safety of 4.65 } **Tested to** { 220 lbs. steam pres. / 267 lbs. water pres.

Longitud. seams Butt jointed, double covering strips, sextuple riveted

Auxiliary Dome — None

Dome, diam. 33" Pos. Central

Firebox Steel Combustion chamb. None

Firebox, length 89-11/16" Width 41" Depth F. 68" B. 53"

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

Firedoor opening 16" diam. Crown and sides in one sheet.

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

Water space frame Single Riveted

Water space stays (Spec.) 1" diam. of Falls Hollow Iron

Flexible Staybolts, Tate, about 350 in breaking zone.

Radial stays 1" diam. Sling stays front { Three rows B. L. W.

Button heads below crown on Eight central rows Expansion Stays

Crown bars None Placed — above crown

Crown bolts —

Flues #9 W. G. Steel

Tubes #12 W. G. Charcoal Iron or Steel (B.L.W. Option)

Tube ends Swaged for copper ferrules, fire box ends.

Number 24 / 164 Diam. 5⅝" / 2" Length 12' 1"

Heating Surface { Flues 405 sq. ft. / Tubes 1030 sq. ft. } Combus. Chamb. — Fire Box 141 sq. ft. Fire Brick Tubes — Total 1576 sq. ft.

Grate area 25.5 sq. ft. Ratio to Heating Surface 1: 61.8

Superheater 328 sq. ft.

Fire Brick Arch, None

Fire box lined with fire brick for oil burning

Fire brick pavement in pan

Grates None

Ash Pan, Dampers Front

Throttle to have auxiliary drifting valve.

Throttle Balance Pos. Dome

Dry pipe Steel

Superheater Schmidt Type (See Sup. 5)

Smokebox extension With Cleaning hole and cap None

Spark ejector or hopper None

Netting and deflect. plates With

Exhaust nozzles Double - Lor

Cleaning Pipe - With

Stack Cast Iron, Straight Dia. 18"

Safety Valves (Spec.) Two Consolidated 3" Open

Safety valves None with relief lever, Set to 180 pounds

Whistle One Large Online

Steam Gauge One Iron 7" Maker: Ashcroft (Spec.)

Steam gauge stand Iron Cock: None

Water Gauge One - Sargent Safety Cab Lamps Electric

Gauge Cocks Three - Back Surface valve None

Lowest gauge cock 3" above highest part of crown

Lubricator steam valve — 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 and sides

Crown, Two each side and two back

Waist, One under front

Front tube sheet, One Fusible plug One

One plug above fire door

Pump None

Injectors Two, Sellers, Class "B" (Spec.) No. 8½

Injectors, Pos. R. and L. Steam pipes Copper

Pipes, Check Iron Feed Iron Overflow Iron

Check Sellers, combined with stop valves. Pos: R. and L

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 35"

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., with 11" knuckle.

Signal fixtures Iron on bumper

Headlight Two 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. 31" Body Iron painted Pipes Iron

Sander (Spec.) Graham White, 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

J. S. Worcester December 1919.

SPECIFICATION FOR LOCOMOTIVES 12 30 ½ E 48

FOR BROOKS-SCANLON LUMBER COMPANY

P

294

Frames Cast Steel

Cylinders, Diam. 18" Stroke 24"

St'm ports, Length 19.63" Width 1-3/16" Bridges —

Exh. ports, Length — Width — Valve lead ⅛"

Valve travel 1¾" Steam lap 1 3/16" Exhaust clearance —

Eccentric crank throw 1⅞" By-pass valve None

S. F. Lubr. Schlacks System (Spec.)

Cyl'r heads Cast Iron

Cyl'r casings Iron painted Head covers Steel painted

St'm chest casings — Covers —

St'm chest valves 8" diam. Piston Type

Met. pkg. (Piston rods valve stems) United States, King Type (Spec.)

Piston rods to be keyed to crossheads

Pistons Cast iron rings sprung into solid head

Guides Laird Type, Steel Oil cups Needle

Crossheads Cast Steel, with bearings of cast iron, tinned

Wrist Pins Steel Rod cups Plunger

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 valve motion to be bushed

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 wheel hub liners Brass, for main wheels only.

Drivers, O. S. Diam. 44" Cen. diam. 38"

Wheel Centers, Main Cast Steel. Others, Cast Iron

Tires Steel Held by Shrinkage and Shoulder

Tires, Flanged, Pos. Front and Back Size 3" x 6½"

Tires, Plain, Pos. Intermediate Size 3" x 7½"

Lateral play between driving boxes and wheel hubs = 3/16" total

Driving Boxes Cast Steel

Journals, Diam. 7½" Length 8"

Springs. Make B. L. W.

Front Engine Truck Two Wheeled Swing bolster, center bearing

To swing 4" each side of cen., Cen. pin liners None

Journals, Diam. 4½" Length 7½" Boxes Cast Iron

Wheel hub liners — None

Wheels, Diam. 28" Tread — Kind Cast Iron Spoke Center

Tires 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 4" each side of cen., Cen. pin liners None

Journals, Diam. 4½" Length 7½" Boxes Cast Iron

Wheel hub liners None

Wheels, Diam. 28" Tread — Kind Cast Iron Spoke Center

Tires Steel Cen. diam. 23" Size 2½" x 5½"

Tires held by Bolted Type Fastening

Brake, position On all driving and tender wheels

Operating Parts { Engine, sch. No. 6-ET Westg. Combined Auto. and Straight Air / Eng. Tr'k, sch. —

Foundation Parts { Drivers, sch. Nu-1 American C. S. Equalized / Eng. Tr'k, sch. —

Air pump One 8½" C. C. Pos. L. S.

Train connections Front and Back

Train signal, sch. None

Air reservoirs to have hydrostatic test of 210 pounds.

Tender Eight Wheeled, Drawing No. 1468

Weight, with fuel and water, about 70,000 pounds

Tank { Oil 2,000 / Water 4,000 Gallons, Bill 5065

Tank "U" shape, straight top.

Tool Boxes Hard Wood, Top

Frame Steel, 10" channels, with bumpers of wood and steel plate.

Front Drawbar height 30½"

Pilot None Pushing shoes None

Back drawhead, center above rail 33½"

Coupler Sharon M. C. B. Auto. with 11" knuckle

Steps Hand holds etc. to conform to I. C. C. requirements

Trucks Square Wrought Iron Equalized Frames

Springs Elliptic, B. L. W.

Journals, Diam. 5" Length 9"

Wheels, Diam. 28" 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 Westinghouse Auto. Air with 10" & 12" tender cylinder.

List of tools, sch. 31 One pair Alexander steel wrecking frogs

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 11-28-19 Shipment On own wheels

Brass shop finish, No. 1

Machine shop finish D-165

B. L. W. Patents { Feed Water Strainer, Patented September 1, 1903 (cast on)

Property plates None

Painting, style 29A, Olive Green and Aluminum

Mark on sides of cab and on back of tank: B-S. L. CO.

Name on tank sides: Brooks-Scanlon Lumber Company

Road Nos. Pos. — Road Nos. — Name None

F. No. Plate —

F. Sand Box —

Back of Tank —

Actual Dimensions of Loco. Extreme height over all 14' 0"

Extreme Width: Cab boards 9' 11" Cylinders or valve motion 9' 1"

Length outside face front bumper of engine to face of tender wedge 32' 8½"

Length face of tender wedge to outside face back bumper of tender 23' 3½"

Total length outside face front bumper of engine to outside face back bumper of tender 56' 0"

SPECIFICATION FOR LOCOMOTIVES 12 30½ E 48

FOR BROOKS-SCANLON LUMBER COMPANY

P

1 LOCOMOTIVE TO BE OPERATED IN OREGON.

2 FIRE BOX GROWN TO BE ARRANGED FOR ⅝ GRADE.

3 FUEL OIL GRAVITY 14 TO 16, FLASH 160; FIRE 300.
OIL BURNING ARRANGEMENT TO BE SOUTHERN PACIFIC STYLE, WITH VON BOREN-ANGELS BURNER IN FRONT OF FIRE PAN.
BURNER TO BE PURCHASED FROM MANUFACTURER.
CAST IRON AIR INTAKE IN FRONT OF PAN.
ROYALTY ON OIL-BURNING ARRANGEMENT PAYABLE BY THE B.L.H.

4 OIL AND STEAM CONNECTION BETWEEN ENGINE AND TENDER TO BE McLAUGHLIN FLEXIBLE CONDUITS.

5 SUPERHEATER AS LOCOMOTIVE SUPERHEATER COMPANY'S SPEC. No. C-12373 DATED NOV. 15, 1919 (COPY HEREWITH)
SUPERHEATER TO CONNECT WITH TOP HEADER IN SMOKE BOX AND TO HAVE OUTSIDE STEAM PIPE CONNECTIONS TO VALVE CHAMBERS.
ROYALTY, IF ANY, PAYABLE BY THE B. L. H.

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

7 WHISTLE TO SCREW INTO SIDE OF DOME.

8 CENTER OF STACK AND CYLINDERS 31" FROM FRONT TUBE SHEET.

9 SUITABLE VALVES TO BE APPLIED ON BLOWER PIPE FOR ROUND HOUSE CONNECTIONS.

10 C. B. & Q. WATER DEFLECTOR TO BE APPLIED INSIDE OF BOILER AT INJECTOR CHECK.

11 ONE FIRE EXTINGUISHER "P" WITH STOP VALVES TO BE APPLIED TO INJECTOR CHECK PIPE.

12 HEADLIGHT EQUIPMENT TO BE PYLE-NATIONAL ELECTRIC, ARC TYPE, COMPLETE, WITH GENERATOR LOCATED IN FRONT OF CAB.
HEADLIGHT CASED TO HAVE LONG FRONT EXTENSION TO PREVENT SMEARING GLASS.
SWITCH TO BE PROVIDED IN CAB FOR CUTTING OUT HEADLIGHT.

13 CYLINDER FLANGE LUBRICATORS TO BE APPLIED TO FRONT AND BACK CYLINDERS.

14 DRIVING BOXES TO HAVE REGULAR B. L. H. OIL CELLARS.

15 SPOKES AND WHEELS OF FRONT AND BACK ENGINE TRUCKS TO BE INTERCHANGEABLE.

16 AIR PUMP TO HAVE METALLIC PACKING AND STRAINER No. 9.

17 DETROIT SINGLE FEED SIGHT FEED LUBRICATOR FOR AIR PUMP STEAM CYLINDER.

TENDER

21 TANK COLLAR TO BE ABOUT 3" HIGH IN BACK, TO PROVIDE GOOD VIEW FOR ENGINE MAN IN BACKING UP.

22 DRAIN PIPE 2" DIAMETER EACH SIDE OF TANK FUNNEL, TO CARRY WASTE WATER TO TRACK.

23 LIFTING LUGS TO BE PROVIDED ON EACH CORNER OF OIL TANK.

24 STEPS TO BE APPLIED IN FRONT OF OIL TANK.

25 MEASURING CHART TO BE FURNISHED IN FRONT OF OIL TANK, GIVING CAPACITY IN INCHES. MEASURING RODS ALSO TO BE FURNISHED.

26 OIL AND STEAM CONNECTIONS BETWEEN ENGINE AND TENDER TO BE McLAUGHLIN FLEXIBLE CONDUITS.

27 ABOUT 18" TO BE ALLOWED BETWEEN BACK OF TANK AND REAR BUMPER FOR SERVING MATERIAL.

28 STEPS ACROSS REAR OF TENDER WITH HANDRAIL.

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SPECIFICATION FOR LOCOMOTIVES 12 30½ E 48

FOR: BROOKS-SCANLON LUMBER COMPANY.

Specification for Type A Double Loop Superheater.... Spec. No. C-12373, NOVEMBER 15, 1919

BOILER TUBES	184 in number 2 o. d 12 ft 1 in. over tube sheets. Tubes located between and adjacent to boiler flues are to be beaded over at front end. Tubes to be in accordance with the American Society for Testing Materials Specification A-29-18.
BOILER FLUES	24 in number 5-3/8 o. d .49 BWG of cold drawn seamless steel. Flues to be in accordance with the American Society for Testing Materials Specification A-28-18. Card 1106-V
BOILER FLUE SETTING	½ in. radius on both edges of flue holes in flue 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 prosserd except for copper sheets. Front end to be rolled and beaded. Rollers to have at least 3 rolls. Prosser to have at least 12 sections. Card 1136 Card 10815
TUBE SHEET LAYOUT	Card
UNITS	units o. d Pipes to be in accordance with the American Society for Testing Materials Specification A-28-18. Pipes united by return bends. Each unit to be tested, before being placed in boiler, with water under pressure of 500 lb. per sq. in.
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 1082
UNIT CLAMP BOLT	To be in accordance with requirements of Locomotive Superheater Company Material Specification No. 12-A. Card 1094-L
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 pieces or chaplets allowed in ball joint seats. Headers must not be treated with sal ammoniac. Header casting to be tight under water pressure of 280 lb. Test pressure to be applied separately to the nonsmoke and to the superheated steam passages, so as to insure soundness of all partition walls. Card 1117-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 APPRTS.
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 pipe or cylinder. Pipe to be well protected against freezing. Card 1119-H
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 10818
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 11318-B	S. H. UNIT BOLT WASHER	Card 1071
DAMPER CYL. ARM	Card 1078	S. H. UNIT CLAMP	Card 1073
DAMPER CYL. PIPE FITTING	Card 11115	S. H. UNIT CLAMP WASHER	Card 10309
DAMPER CYL. PIPE UNION	Card 11116	S. H. PIPE BEND	Card 1085
DAMPER CYL. PIPING DIAGRAM	Card 2058	S. H. PIPE BAND	Card 1086
DAMPER CYL. SUPPORT	Card 1058	SPACING OF BANDS & SUPPORTS	Card 10792
DAMPER SHAFT	Card 1059	TYPE OF RETURN BENDS	FORGED
DAMPER SHAFT ARM	Card 1076	RETURN BENDS	Card 11022
DAMPER SHAFT BEARING (O.S.)	Card 10336-B	LUBRICATOR CONNECTION	Card 3023
DAMPER SHAFT BEARING (I.S.)	Card 1070	DEFLECTING PLATE HANDLE	Card 1087
DAMPER SHAFT LINK	Card 3272	DEFLECTING PLATE STUDS	Card 10809
PATENT PLATE	Card None	DEFLECTING PLATE CLAMP	Card 10809-A
CYLINDERS			

Gauge of Hand, 1st 9½" Ply 2"
Wheelbase, Rigid 12' 0" Driving 12' 0" Total 18' 10"
Total wheelbase, eng. and tender, Locked ---

Clearance ---

Limits, Height --- Width ---
Weight (approximate) in working order, Total 74,000 LBS.
On F. tr'k 12,000 lbs., Drivers 62,000 lbs., B. tr'k --- lbs.

Tractive power 14,800 lbs. Ratio of adhesion 4.18
Work'g St'm Pres. 170 lbs. Service LOGGING
Fuel SOFT COAL.

1 Boiler STEEL Thick 1/2" & 9/16" Ell 8878
5 Front Tube Sheet 1/2" Thick
Boiler, Diam. 48" Plan EXTENDED WAGON TOP.
3 Allowable st'm pres. 180 lbs. Tested to 200 lbs. steam pres.
With Factor of Safety of 5.32 270 lbs. water pres.
6 Longitd. seams BUTT JOINTED, DOUBLE COVERING STRIPS.
DOME - ONE PIECE TYPE.
5 Dome, diam. 25" Pos. FORWARD OF FIRE BOX.

5 Firebox STEEL Combustion chamb. NONE
Firebox, length 49 3/16" Width 39 3/8" Depth F. 69" B. 69"
10 Firebox, Tube 1/2" Crown 3/8" Sides 5/16" Back 5/16"
Firebox opening 16" DIAMETER
Water space, Front 4" Sides 3" Back 3"
Water space frame SINGLE Riveted
7/8 Water space stays 7/8" DIAM. WITH 3/16" HOLES 1 1/16" DEEP FROM O.S.
7/8 Radial stays 1" DIAM. Sling stays front TWO RODS B. L. W. EXPANSION STAYS.
Button heads below crown on SIX central rows
Crown bars NONE Placed --- above crown ---
Crown bolts ---

Flues NONE
11 Tubes 112 W.G. CHARCOAL IRON OR STEEL (B.L.W. OPTION)
15 Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.
Number 150 Diam. 2" Length 9' 2 1/2"

Heating Surface: Flues NONE Combus. Chamb. NONE Total 800
Tubes 715 Fire Box 85 Fire Brick Tubes ---
Grate area 11.7 Ratio to Heating Surface 1:68.4
Superheater ---

Fire Brick ARCH NONE

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

Throttle BALANCE Pos. DOME
Dry pipe STEEL

Superheater NONE

5 Smokebox extension WITH Cleaning hole and cap L.S. ONLY.
Spark eliminator hopper WITH
Netting and deflect. plates WITH

Exhaust nozzles DOUBLE - HIGH

Stack STRAIGHT Dia. 14 1/2"

Safety Valves TWO CROSBY 3" Diam.
Safety valve Style with relief lever; Set to 170 Lbs.
Whistle, BALL PLAIN

Steam Gauge ONE Ashcroft 7" Ashcroft Adjustable (Not Spec)
Steam gauge stand TRIPP Cock NONE

Water Gauge ONE B.L.W. IRONCLAD Gage 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 ONE FILLING PLUG IN TOP OF BOILER.
Firebox, CORNERS, AND BACK.
Crown, TWO EACH SIDE AND TWO BACK
Waist, ONE UNDER FRONT.
Front tube sheet, ONE 1" Fusible plug ONE

Pumps NONE

Injectors TWO SELLERS, CLASS "N" (Spec) No. 6 1/2
Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER
Pipes, Check IRON Feed IRON Overflow IRON
15 Check B. L. W. WITH STOP VALVE Pos. RIGHT AND LEFT.
6 3/8

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 29"

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. 33 1/2" CENTER ABOVE TOP OF RAIL AND LINK AND PIN TYPE 22" AND 26" CENTER ABOVE RAIL FOR LOGGING CARS.

Signal fixtures IRON ON BUMPER.
HEADLIGHT EQUIPMENT TO BE PYLE-NATIONAL ELECTRIC TYPE 16" (2 14")
WITH INCANDESCENT HEADLIGHTS.
Headlight TWO ROUND CASE 18 Reflector.
Headlight, Nos. on sides WITH Mfr'r stop WITH
Lamp shell NONE Nosing ---

Bell 85 POUNDS.
Sand Box ONE Diam. 23" Body IRON PAINTED Pipes IRON
(Not Spec) Sander 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 MAGNESIA SECTIONAL.

THE BALDWIN LOCOMOTIVE WORKS

J. DANIEL APRIL - 1920

SPECIFICATION FOR LOCOMOTIVES 8 22 D 356

FOR W. P. BROWN & SONS LUMBER COMPANY. INC.

HW.

298 298

Frames CAST STEEL

Cylinders, Diam. 14" Stroke 22"
St'm ports, Length 13" Width 1 1/2" Bridges 1"
Exh. ports, Length 13" Width 2 1/2" Valve lead 1/16"
Valve travel 4 1/2" Steam lap 1" Exhaust clearance ---
Eccentric-crank throw 4" By-pass valve ---
S. F. Lubr. MICHIGAN TRIPLE BULL'S EYE. (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 BALANCED WITH VACUUM VALVES.
Met. pkg. PISTON ROD / VALVE STEM UNITED STATES & KING TYPE. (Not Spec)
PISTON RODS TO BE KEYED TO CROSSHEADS.

Pistons HEADS OF CAST IRON WITH RINGS OF CAST IRON SPRUNG IN. PIN TYPE 22" AND 26" CENTRE ABOVE RAIL, FOR LOGGING CARS.
Guides LAIRD TYPE, STEEL Oil cups NEEDLE
Crossheads CAST STEEL, WITH BEARINGS OF CAST IRON TINNED.
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 wheel hub liners NONE
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 5 1/2"
Tires, Plain, Pos. MIDDLE Size 3" x 6 1/2"
Lateral play between driving boxes and wheel hubs = 3/16" TOTAL
Driving Boxes CAST IRON, WITH ELVIN GREASE LUBRICATOR.
Journals, Diam. 6" Length 8"

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. 4" Length 6" Boxes CAST IRON
Wheel hub liners NONE
Wheels, Diam. 24" Tread 4-3/16" Kind CHILLED CAST IRON PLATE.
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 ---
Wheel hub liners ---
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 WESTG. COMBINED AUTO AND STRAIGHT AIR
Parts Eng. Trk, sch. ---
Foundation Drivers, sch. M-1 AMERICAN O. S. EQUALIZED
Parts Eng. Trk, sch. ---
Air pump ONE 9 1/2" Pos. L. S.
Train connections FRONT AND BACK.
Train signal, sch. NONE
AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

Tender EIGHT Wheeled, Drawing No. 1501
Weight, with fuel and water, about (55,500) POUNDS.
TENDER TO BE WEIGHED: YES
Tank 3500 Gallons, Bill 5208
TANK "U" SHAPE, STRAIGHT TOP. FUEL CAPACITY 7 TONS.

Tool Boxes OF HARD WOOD, TOP.

Frame OAK AND YELLOW PINE, WITH BUMPERS OF WOOD.

Front Drawbar height 25 1/2"
Pilot NONE Pushing shoes NONE

Coupler M.C.B. AUTO. 33 1/2" CENTRE ABOVE TOP OF RAIL, AND LINK AND PIN TYPE 22" AND 26" CENTRE ABOVE RAIL, FOR LOGGING CARS.

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. 3 1/2" Length 7"
Wheels, Diam. 28" Tread 1 1/2" 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. WESTG. AUTO AND STRAIGHT AIR, WITH 10"x12" TENDER CYLINDER.

List of tools, sch. 26 ONE PAIR WRECKING FROGS.
Photo sch. 2 Inspection B.L.W. (see sup. 12c-19)
To be weighed YES Material spec'ns B.L.W. (EXCEPT SEE Sup. 4)
Certificate of boiler test THREE COPIES OF B.L.W. FORM 1035.
Junior laws to 2.5.20 Shipment ON OWN WHEELS (SEE SUP.

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

B. L. W. Patents FEED WATER STRAINER PAT'D SEPT. 1, 1903, (CAST ON)

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

Painting, style 291, OLIVE GREEN AND ALUMINUM.
LETTERING ETC. AS SHOWN ON CO'S PENCIL SKETCH.
MARK ON CAB PANEL, - M & G R R
Mark on TANK SIDES M & G RAILROAD / W. P. BROWN & SONS LUMBER CO. INC.

Road Nos. Pos.	Road Nos.	Name NONE
F. No. PLATE	9	
SAND BOX		

Actual Dimensions of Loco. Extreme height over all 11'11 3/8"
Extreme Width: Cab boards 8'7" Cylinders 8'6 3/8"
Length outside face front bumper of engine to face of tender wedge 24'11"
Length face of tender wedge to outside face back bumper of tender 23'5 1/2"
Total length outside face front bumper of engine to outside face back bumper of tender 48' 4 1/2"

1 ~~BOILER TO BE CONSTRUCTED IN THE STATE OF ALABAMA.~~
BOILER TO BE BUILT TO CONFORM TO THE BOILER CODE OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS (1918), ~~AND MUST BE INSPECTED DURING CONSTRUCTION AND UPON COMPLETION BY AN AUTHORIZED INSPECTOR WHO SHALL NOT BE INTERESTED EITHER DIRECTLY OR INDIRECTLY WITH THE MANUFACTURERS.~~

2 A DATA REPORT, ON FORMS FURNISHED BY THE ABOVE MENTIONED STATE SHALL BE FORWARDED TO THE PROPER OFFICIAL BEFORE THE BOILER LEAVES THE BUILDER'S WORKS.

3 A HYDROSTATIC TEST SHALL BE APPLIED EQUAL TO ONE-AND -ONE-HALF (1½) TIMES THE WORKING PRESSURE.

4 THE MATERIALS ENTERING INTO THE CONSTRUCTION SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS:-

BOILER AND FIRE BOX STEEL / MATERIAL FOR ONE-PIECE DOME	A.S.M.E. SPEC. PAGE 11
BOILER RIVET STEEL	A.S.M.E. SPEC. PAGE 15
BOILER RIVET IRON	A.S.M.E. SPEC. PAGE 31
BOILER BRACE IRON	A.S.M.E. SPEC. PAGE 37
BOILER STAYBOLT IRON	A.S.M.E. SPEC. PAGE 34
BOILER TUBES	A.S.M.E. SPEC. PAGE 40

TUBES MAY HAVE VARIATION IN GAUGE OF 10% EITHER WAY.

5 FRONT TUBE SHEET SHALL BE OF FIRE BOX STEEL.
ALL BOILER AND FIRE BOX STEEL AND MATERIAL FOR ONE PIECE DOME SHALL BE MARKED BY THE MANUFACTURER WITH THE HEAT NUMBER, NAME OF MANUFACTURER, GRADE AND LOWEST TENSILE STRENGTH IN THE MANNER AND LOCATION DESCRIBED ON B.L.W. MARKING CARD 6859. SMOKE BOX STEEL MAY CONFORM TO B.L.W. SPECIFICATION.

6 THE MINIMUM FACTOR OF SAFETY SHALL BE FIVE. (1918)
LONGITUDINAL SEAMS SHALL BE OF BUTT AND DOUBLE STRAP CONSTRUCTION.

7 THE OUTSIDE ENDS OF SOLID STAYBOLTS, 8 IN. AND LESS IN LENGTH, SHALL BE DRILLED WITH A HOLE AT LEAST 3/16" DIA., TO A DEPTH EXTENDING AT LEAST ½" BEYOND THE INSIDE OF THE PLATES

8 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 OR CORRESPONDING TAPER TAP.	1" & 1¼"	1½" & 2"	2½" TO 4"
NO. OF THREADS PER INCH.	11½	11½	8
MINIMUM NO. OF THREADS REQUIRED IN OPENING.	4	5	7
MINIMUM THICKNESS OF MATERIAL REQUIRED TO GIVE ABOVE NO. OF THREADS.	⅜"	7/10"	⅞"

IF THICKNESS OF BOILER MATERIAL IS NOT SUFFICIENT TO GIVE THE ABOVE NUMBER OF THREADS, A LINER OR FLANGE MUST BE APPLIED.

9 EACH BOILER MUST BE PROVIDED WITH A CONNECTION ¼ PIPE SIZE FOR ATTACHING INSPECTOR'S TEST GAUGE.

10 A FUSIBLE PLUG MUST BE APPLIED. THE PLUG MUST BE FILLED WITH PURE TIN AND THE LEAST DIAMETER OF THE FUSIBLE METAL MUST BE NOT LESS THAN ½" EXCEPT FOR BOILING PRESSURE ABOVE 175 LBS., IN SUCH CASE THE LEAST DIAMETER SHALL NOT BE LESS THAN ⅝". (I. E., THE FUSIBLE PLUG CARD 1410 FOR PRESSURE ABOVE 175 LBS. AND FUSIBLE PLUG CARD 1215 FOR 175 LBS. AND LESS).

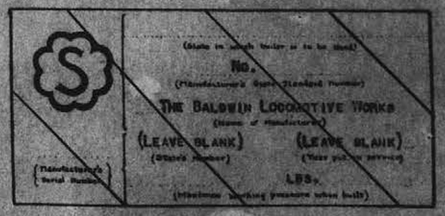
15 FEED WATER SHALL NOT DISCHARGE INTO A BOILER IN CLOSE PROXIMITY TO RIVETED JOINTS IN SHELL OR FURNACE SHEETS. EACH BOILER SHALL HAVE A FEED PIPE FITTED WITH A CHECK VALVE, AND ALSO A STOP VALVE OR STOP COCK BETWEEN THE CHECK VALVE AND THE BOILER.

16 SAFETY VALVES MUST MEET THE REQUIREMENTS OF THE A. S. M. E. BOILER CODE AND MUST BE PLAINLY STAMPED BY THE MANUFACTURER AS PER B. L. W. MARKING CARD 6858.
SAFETY VALVES OVER 3" IN DIAMETER SHALL HAVE FLANGED INLETS. THESE FLANGES SHALL CONFORM TO THE AMERICAN STANDARD.
ALL SAFETY VALVES MUST BE PROVIDED WITH RELIEF LEVERS.

17 THERE SHALL BE NOT LESS THAN SIX GRADE 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: ALSO WHERE POSSIBLE ONE NEAR THE THROAT SHEET.

18 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 EXCEEDING ¼" LESS THAN FULL SIZE FOR PLATES OVER ⅝" IN THICKNESS, AND ⅛" LESS THAN FULL SIZE FOR PLATES ⅝" 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.

19 ~~UPON COMPLETION, EACH BOILER SHALL BE STAMPED IN THE PRESENCE OF THE AUTHORIZED INSPECTOR, WITH THE SCALE AS ARRANGED BELOW. THE HEIGHT OF THE LETTERS AND FIGURES SHALL NOT BE LESS THAN ½". THE LOCATION OF THE STAMP SHALL BE ON THE BACK HEAD ABOVE A PLUG HOLE.~~ OMIT A. S. M. E. STAMPING



300 / 300

31 LOCOMOTIVE TO BE OPERATED IN ALABAMA.

32 BOILER TO MEET THE A.S.M.E. CODE.

33 INJECTOR CHECKS TO BE FITTED WITH SHUT OFF VALVES TO PERMIT GRINDING OF CHECKS WHILE THERE IS STEAM IN THE BOILER.

34 APRON BETWEEN CAB AND TENDER TO BE APPROVED ROUGHENED TYPE TO PREVENT SLIPPING.

35 PILOT TO BE AT LEAST 6" ABOVE TOP OF RAIL.

36 CENTRE POCKET OF COUPLER TO BE CHIPPED OUT ABOUT ⅜" TO 1" VERTICALLY.

37 ~~HEADLIGHTS TO HAVE GLASS REFLECTORS.~~ 1.6.21.

38 ECCENTRICS TO BE KEYED ON AXLES.

39 KING PIN OVER AXLE OF FRONT TRUCK OF LOCOMOTIVE No.37893, CLASS 8 20 D 145, BREAKS ACCOUNT OF ROUGH TRACK, CORRECT ON THE NEW LOCOMOTIVE.

40 BRAKE SHOES AS HIGH AS CONSISTENT.

41 DRIVER BRAKE SHOES OF THE QUICK CHANGING, TYPE, I.E., SHOES OF CENTER FASTENING TYPE, SECURED TO BRAKE HEAD WITH A KEY.

42 ONE EXTRA SET OF GRATE BARS FURNISHED THROUGH EXTRA WORK DEPARTMENT ON EXTRA ORDER No. 14815 - DATED 2-20-20 TO BE SHIPPED WITH LOCOMOTIVE (NO CHARGE)

TENDER

50 TENDER TO BE RECTANGULAR WITH SLOPING BOSOM IN COAL SPACE AS SHOWN ON PAGE 22 OF RECORD OF RECENT CONSTRUCTION 8+ EXCEPT TO HAVE INCREASED WATER AND COAL CAPACITY AND NOT TO BE MORE THAN 6" GREATER HEIGHT THAN LOCOMOTIVE CONSTRUCTION NUMBER 37893, B.L.W. CLASS 8 20 D 145.

51 CENTRE POCKET OF COULER TO BE CHIPPED OUT ABOUT ⅜" TO 1" VERTICALLY.

52 APRON BETWEEN CAB AND TENDER TO BE APPROVED ROUGHENED TYPE TO PREVENT SLIPPING.

THE BALDWIN LOCOMOTIVE WORKS Dup. 10 26 ½ D 127 WITH SAME EXTRAS EXCEPT WHERE OTHERWISE SPECIFIED.

Memorandum Spec'n 20068

SPECIFICATION FOR LOCOMOTIVES 10 26 ½ D 173 Gen. as PHOTO. 4952

WKS **FOR** J. R. BUCKWALTER LUMBER CO. **Engine Drawing No.** 27

H'W. 3.17.20 (Not Spec.)

Gauge of Road 4'8½" Play ¾"
Wheelbase, Rigid 10'0" Driving 10'0" Total 25'3"
Total wheelbase, eng. and tend. (Actual 46'10½" / Limited to ---

Curves ABOUT 20 DEGREES GRADES 3%
TRACK IS EXTREMELY ROUGH.
Limits, Height --- Width ---
Weight (approximate) in working order, Total 101,000 POUNDS
On F. tr'k 12,000 lbs., Drivers 77,000 lbs., B. tr'k 12,000 lbs.

Tractive power 21,350 lbs., Ratio of adhesion 3.6
Work'g St'm Pres. 180 lbs., Service LOGGING
Fuel SOFT COAL
LOCOMOTIVE FOR OPERATION IN MISSISSIPPI
Boiler STEEL Thick 5/8" Bill 8978
Front Tube Sheet ½" Thick
Boiler, Diam. 56" Plan STRAIGHT TOP
(Allowable st'm pres. 200 lbs. **Tested to** 220 lbs. steam pres.
(With Factor of Safety of 5.05 267 lbs. water pres.
Longitud. seams BUTT JOINTED, DOUBLE DOVERING STRIPS.

Dome, diam. 29" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE
Firebox, length 60 7/16" Width 33⅜" Depth F. 60" B. 56½"
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" HOLES 1½" DEEP FROM O.S.

Radial stays ½" DIAM. Sling stays from (TWO ROWS 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
Tube ends SWAGED FOR COPPER FERRULES FIRE BOX ENDS
Number 215 Diam. 2" Length 13'6½"

Heating (Flues --- Combus. Chamb. --- Total 1597.5
Surface (Tubes 1514.5 Fire Box 83 Fire Brick Tubes ---
Grate area 16.9 Ratio to Heating Surface 1:114
Superheater ---

Fire Brick ARCH ON STUDS

Grates ROCKING BARS AND DROP PLATE
Ash Pan, Dampers FRONT AND BACK
ASH PAN 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 STRAIGHT Dia. 19"

Safety Valves TWO DOALE 2½" OPEN (Not Spec.)
Safety valves NONE with relief lever, Set to 180 POUNDS
Whistle ONE 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 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 ONE FILLING PLUG IN TOP OF BOILER
Firebox, CORNERS, R.S. FRONT AND BACK
Crown, TWO EACH SIDE AND TWO BACK
Waist, ONE UNDER FRONT
Front tube sheet. ONE Fusible plug ONE

Pump NONE
COLLS 4" SYPHON UNDER CAB BOARD ON LEFT SIDE, WITH 20 FT. OF SUCTION HOSE WITH 4" CAST IRON SPRINGS. SYPHON ARRANGEMENT TO BE SIMILAR TO B.L.W. TRAC. 23395.
THIS INJECTOR CAN BE PURCHASED FROM WOODWARD WIGHT, CO. (Not Spec.)
Injectors TWO MONITOR THREE HANDLED 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 STEEL, LINED WITH WOOD.
DROP SEAT ON ENGINEER'S SIDE OF CAB.

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

Back Bumper IRON Back drawbar height 34½"
CHAFING IRON BETWEEN ENGINE AND TENDER TO HAVE EXTRA WIDE FACE ON ACCOUNT OF EXTREMELY ROUGH TRACK.
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" FOR AUTO. COUPLER
Coupler M.C.B. AUTOMATIC, IN TOP POCKET OF THREE POCKET DRAW CASTING.

Signal fixtures IRON ON BUMPER
HEADLIGHT EQUIPMENT TO BE SCHROEDER ELECTRIC, WITH INCANDESCENT HEADLIGHTS. REAR HEADLIGHT ON TOP OF CAB.
Headlight TWO ROUND CASE 16" Reflector,
Headlight, Nos. on sides WITH H'd'l step NONE
Lamp shelf IRON Nosing ANGLE IRON

Bell 65 POUNDS
Sand Box TWO Diam. 28" Body IRON PTD. Pipes IRON
Sander (Not Spec.) 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

J. Daniels August 1920.

SPECIFICATION FOR LOCOMOTIVES 10 26 ½ D 173 302

FOR J. R. BUCKWALTER LUMBER CO.

H'W. 304

Frames CAST STEEL

Cylinders, Diam 16" Stroke 24"
St'm ports, Length 15" Width 1½" Bridges 1"
Exh. ports, Length 15" Width 2½" Valve lead ⅛"
Valve travel 4¼" Steam lap ¾" Exhaust clearance ---
Eccentric throw 1" By-pass valve NONE (Not Spec.)
S. P. Valve MICHIGAN TRIPLE 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 castings IRON PTD. Covers STEEL PAINTED
St'm chest valves RICHARDSON BALANCED, WITH VACUUM VALVES.
Met. in (Not Spec.) U. S.
PISTON RODS TO BE KEYED TO CROSSHEADS.
Pistons HEADS OF THE FOLLOWER TYPE - NOT SOLID
Guides LAIRD TYPE, STEEL Oil cups ADJUSTABLE NEEDLE
Crossheads CAST STEEL, WITH BEARINGS OF CAST IRON TINNED.
Wrist Pins STEEL Pilot cups HARD GREASE CUPS FORGED ON RODS
GUDE YOKE OF STEEL.
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 wheel hub liners NONE
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 = 3/16" TOTAL
Driving Boxes CAST IRON
Journals, Diam. 7" Length 8"
DRIVING SPRINGS TO BE SAME WEIGHT AND DIMENSIONS AS FURNISHED ON B.L.W. EXTRA ORDER 9551 OF 1919.
Springs. Make B. L.W. EQUAL BEAMS OF WROT IRON.
ENGINE TRUCK FRAME OF CAST STEEL.
Front Engine Truck TWO Wheeled SWING BOLSTER CENTER BEARING
To swing 4" each side of cen., Cen. pin liners NONE
Journals, Diam. 4½" Length 7½" Boxes CAST IRON
Wheel hub liners (SEE ★ BELOW)
Wheels, Diam. 28" Tread 1½" Kind ROLLED STEEL
Tires --- Cen. diam. --- Size ---
Tires held by --- WHEEL RIMS 2½" THICK.
ENGINE TRUCK FRAME OF CAST STEEL
Back Engine Truck TWO Wheeled SWING BOLSTER SIDE BEARING
To swing 4" each side of cen., Cen. pin liners NONE
Journals, Diam. 4½" Length 7½" Boxes CAST IRON
Wheel hub liners (SEE ★ BELOW)
Wheels, Diam. 28" Tread 1½" Kind ROLLED STEEL
Tires --- Cen. diam. --- Size ---
Tires held by --- WHEEL RIMS 2½" THICK.

Brake, position ON ALL DRIVING AND TENDER WHEELS.
Operating (Engine, sch. No. 6 ET. WESTG. COMP. AUTO. AND STRAIGHT AIR.
Parts (Eng. Trk, sch. ---
Foundation (Drivers, sch. PM-1 AMERICAN O.S. EQUALIZED
Parts (Eng. Trk, sch. ---
Air pump ONE 11" Pos. LEFT SIDE
Train connections FRONT AND BACK
Train signal, sch. NONE
AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS.
★ LINER ⅜" THICK TO BE APPLIED ON INSIDE HUB FACE OF FRONT AND BACK ENGINE TRUCK WHEELS, ON ACCOUNT OF INABILITY OF ROLLED STEEL MANUFACTURER TO FURNISH WHEELS WITH REQUIRED HUB PROJECTION

Tender EIGHT Wheeled, Drawing No. 594
Weight, with fuel and water, about 60,000 POUNDS
TENDER TO BE WEIGHED: YES
Tank 3,000 Gallons, Bill 4969
TANK "U" SHAPE, STRAIGHT TOP. (FUEL CAPACITY 3 CORDS OF WOOD OR 7 TONS OF COAL.
PROVIDE WOOD RACK ON TANK.
Tool Boxes OF HARD WOOD, TOP.

Frame STEEL 8" CHANNELS, WITH BUMPERS OF WOOD AND STEEL PLATE

Front Drawbar height 30½"
Pilot OF WOOD AT REAR Pushing shoes NONE
Back drawhead, center above rail 33½" FOR AUTO. COUPLER
Coupler M.C.B. AUTO. IN TOP POCKET OF THREE POCKET DRAWCASTING.

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

Trucks ARCH BAR TYPE WITH CAST STEEL BOLSTER
TRUCKS TO HAVE STEEL SIDE BARS
Springs ELLIPTIC B. L. W.
Journals, Diam. 3½" Length 7"
Wheels, Diam 28" Tread 1¼" Kind CHILLED CAST IRON PLATE
Tires --- Cen. diam. --- Size ---
Tires held by ---
Safety chains SINGLE

Brake Position ON ALL WHEELS
Brake sch. No. 6 ET WESTG. AUTO. AND STRAIGHT AIR WITH 10"x12" CYL.
SYPHON CONNECTION TO TANK ON LEFT SIDE TO BE SIMILAR TO B.L.W. TRACING 23395

List of tools, sch. 27 ONE PAIR HEAVY CAR REPLACERS.
Photo sch. No. 2 Inspection B. L. W.
To be weighed NO Material specins B. L. W.
Certificate of boiler test THREE COPIES OF B.L.W. FORM 1036
Junior laws to 3-26-20 Shipment ON OWN WHEELS (SEE ✱ BELOW)

Brass shop finish, No 1
Machine shop finish D-165
BACK EQUAL BEAM FULCRUM INDICATED ON PHOTO. 4952 HEREWITH TO BE MADE STRONGER THAN FOR 10 26 ½ D 127.
B. L. W. Patents FEED PIPE STRAINER PAT'D. SEPT. 1, 1903 (CAST ON)

PROPERTY PLATES - NONE
✱ EXTRAS ORDERED THROUGH EXTRA WORK DEPARTMENT, ORDER No. 17312 DATED 4.19.20 AND 18183 DATED 5.18.20 TO BE SHIPPED WITH LOCOMOTIVE.
Painting, style --- OLIVE GREEN, NO STRIPING.

LETTERING, ETC. TO BE IN WHITE PAINT SAME AS FOR 10 26 ½ D 127
Mark on TANK SIDES: J.R. BUCKWALTER LUMBER CO.

Road Nos. Pos. Road Nos. 6 Name NONE
F. No. PLATE
F. SAND BOX
SIDES OF CAB
BACK OF TANK

Actual Dimensions of Loc. Extreme height over all 12'3½"
Extreme Width: Cab boards 8'0½" Cylinders or BUMPER 9'10"
Length outside face front bumper of engine to face of tender wedge = 22'5"
Length face of tender wedge to outside face back bumper of tender = 21'4½"
Total length outside face front bumper of engine to outside face back bumper of tender = 43'9½"

THE BALDWIN LOCOMOTIVE WORKS [Spec. 10-25-½ D 134 except where otherwise specified]

Memorandum Spec'n 19025

SPECIFICATION FOR LOCOMOTIVES 10 - 26 ½ D 149 Cost or Photo. 3817

FOR Burton – Swartz Cypress Company of Florida **Engine Drawing No.** 30

B. 5-7-19

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 9' 2" Driving 9' 2" Total 24' 8"
Total wheelbase, eng. and tend. {Actual 46' 11" / Limited to ——

Curves ——

Limits, Height —— Width ——
Weight (approximate) in working order, Total 114,000 pounds
On F. tr'k 12,000 lbs., Drivers 88,000 lbs., B. tr'k 14,000 lbs.

Tractive power 21,400 lbs., Ratio of adhesion 4.11
Work'g St'm Pres. 180 lbs., Service Logging
Fuel Wood

From tube sheet to be ½" thick
Boiler Steel Thick 11/16" Bill 8531
Boiler, Diam. 60" Plan Extended Wagon Top
{Boiler st'm pres. 200 lbs. Tested to 220 lbs. steam pres. / With factor of safety of 5.2 at 180 (working) 267 lbs. water pres.
Longitud. seams Butt jointed, double covering strips

Dome, diam. 29" Pos. Forward of Firebox

Firebox Steel Combustion chamb. None
Firebox, length 67⅛" Width 34⅜" Depth F. 67⅛" B. 65⅜"
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 1⅛" diam. Sling stays Front {Two rows 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
Tube ends Swaged for copper ferrules, firebox ends.
Number 240 Diam. 2" Length 11' 10½"

Heating Surface | Flues —— Combus. Chamb. —— Total 1594⁰
Tubes 1462⁰ Fire Box 112⁰ Fire Brick Tubes ——
Grate area 16⁰ Ratio to Heating Surface 1 : 99.6
Superheater ——

Fire Brick Arch, None

Grates Plain bars and dead plates
Ash Pan, Dampers Front and Back
Ash pan to conform to the requirements of the Interstate Commerce Commission.
Throttle Balance Pos. Dome
Dry pipe Inside Iron or Steel

Superheater None

Smokebox extension Short Cleaning hole and cap None
Diaphragm or nipper None
Netting and deflector plates None

Exhaust nozzle Double, Lee
Nozzle tips, Plain
Nozzle diameters tapering Dia. 16"
Exhaust nozzle is furnished on Extra Order 5294 dated 5-17-17

Safety Valves (Spec) Two Star 2½". One muffled
Safety valves None with relief lever, Set to 180 lbs. muffled / 183 lbs. open
Whistle B. L. W. Plain

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

Water Gauge One B.L.W. (Ironclad) **Cab Lamps** Electric
Gauge Cocks Three Back Surface valve No-46
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:-Left Side
Cleaning Plugs One filling plug in top of boiler
Firebox Corners, 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 ——
Provide syphon of large capacity under cab board on left side with 20 feet of suction hose.
Injectors Two Sellers Class "N" (Spec) No. 8½
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check Sellers Combined Main Check and Stop Valves Pos. Right and Left

Steam Heat None

Cab Steel, with wood lining. 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 31½"

Pilot Wood Pushing shoes At front
Front Bumper Cast Iron 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 15" face and slotted knuckles

Signal fixtures Iron on Bumper
Headlight to be Pyle National Electric, Type "E"
Rear headlight to be set on swivel base on top of cab.
Headlight Two Round Case 18" Reflector,
Headlight, Nos. on sides With Hood step With
Lamp shelf Iron Nosing Angle Iron

Bell 85 pounds
Sand Box Two Diam. 28" Body Iron Painted Pipes Iron
(Spec) Valve Mathers / for Single, 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

Memorandum.

SPECIFICATION FOR LOCOMOTIVES 10 - 26 ½ D 149 June-1919

FOR Burton-Swartz Cypress Co. of Florida

No. 304

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 throw 4¾" By-pass valve None
S. F. Lubr. (Spec) 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 stem} United States (No. 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 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 Damascus Bronze
Driving Wheels – all to have hub liners of Bronze
Drivers, O. S. Diam. 44" Cen. diam. 38"
Wheel centers – Main cast steel, Others, 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
Journals, Diam. 7" Length 8"

Springs. Make B. L. W.

Front Engine Truck Two Wheeled Swing Bolster {Center Bearing}
To swing 2" each side of cen., Con. 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
Front Engine truck wheels without hub liners
Back Engine Truck Two Wheeled Swing Bolster {Side Bearing}
To swing 2½" each side of cen., Con. 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 wheels without hub liners

Brakes, position On all driving and tender wheels
Operating Engine, Sch. No. 6-ET Westg. Comp. Auto. and Straight Air
Pumps Emp. Trk. sch. ——
Foundation Drivers, pos. 1&4-1, American O. S. Equalized
Pumps Emp. Trk. sch. ——
Air pump Cap. 9½" Pos. Left Side
Train pipe Through cylinders, Front and Back
Train hose, sch. 1½"
Air reservoir capacity 140,000 cubic inches.
Air reservoirs to have hydrostatic test of 210 pounds

Tender Eight-Wheeled, Drawing No. 435
Weight, with fuel and water, about 70,000 pounds
Tender to be of the long, low design
Tank 3500 Gallons, Bill 3861
Tank "U" shape, straight top. {Fuel capacity, 4 cords
Wood rack around top of tank. {Provide syphon connection to left side of tank.
Tool Boxes Hard Wood, top.
Tender floor to be on level with cab floor
Frame Steel 10" channels, with bumpers of wood

Front Drawbar height 30½"
Pilot None Pushing shoes None
Back drawhead, center above rail 33½"
Coupler M. C. B. Auto. with 15" face and slotted knuckle

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. 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. No. 6-ET Westg. Auto. and Straight Air with 10" x 12" tender cylinder.

List of tools, sch. 27 One pair wrecking frogs.
Photo sch. None 2 5/4 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 5-13-19 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 10-26½ D 134
Mark on Tank Sides {B. S. C. Co. / Of Florida}

Road Nos. Pos. F.No. Plate F. Sand Box Cab Sides Back of Tank — Road Nos. 16 — Name None

Actual Dimensions of Loco. – Extreme height over all — 13' 0½"
Extreme Width – Cab Between 10' 8" Cylinders or valve motion 9' 6"
Length outside from front to rear of engine to face of tender bumper — 49' 0"
Length face of tender bumper to rear of engine from back bumper of tender to 29' 0½"
Total length outside from front to rear of [illegible]

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-5341

Memorandum Spec'n 19008

SPECIFICATION FOR LOCOMOTIVES 10 28 ½ D 137

FOR CADDO RIVER LUMBER COMPANY.

RTL

Gen as PHOTO 3555 { EXCEPT WITH WALSCHAERTS VALVE MOTION, SOLID END SIDE RODS AND TO OMIT HEADLIGHTS AT REAR.

Engine Drawing No: 30

1-31-19.

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 10' 3" Driving 10' 3" Total 26' 10"
Total wheelbase, eng. and tend. { Actual 50' 8¼" / Limited to ——

Curves ---
RAILS 56 POUNDS PER YARD
Limit. , Height --- Width ---
Weight (approximate) in working order, Total 125,000 POUNDS
On F. tr'k 13,000 lbs., Drivers 96,000 lbs., B. tr'k 16,000 lbs.

Tractive power 23,100 lbs., Ratio of adhesion 4.15
Work'g St'm Pres. 180 lbs., Service FREIGHT
Fuel SOFT COAL

FRONT TUBE SHEET TO BE ½" THICK.
Boiler STEEL Thick ⅝" AND 11/16 Bill 8472
Boiler, Diam. 56" 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 5.14
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS.

6 **Dome,** diam. 29" Pos. FORWARD OF FIRE BOX.

Firebox STEEL Combustion chamb. NONE
Firebox, length 64⅛" Width 42" Depth F. 63½" B. 60½"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back ⅜"
Firedoor opening 16" DIAM. CROWN AND SIDES IN ONE SHEET.
Water space, Front 4" Sides 3" Back 3"
Water space, Frame SINGLE Riveted
1 Water space stays ⅞" DIAM. WITH 3/16" HOLES 1¼" DEEP FROM O.S.

Radial stays 1" DIAM. Sling stays front { TWO ROWS 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
Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.
Number 200 Diam. 2" Length 14' 9"

Heating Surface	Flues ---	Combus. Chamb. ---	Total 1637⁰
	Tubes 1536⁰	Fire Box 101⁰	Fire Brick Tubes ---
Grate area 18.7⁰	Ratio to Heating Surface 1 : 86.9		
Superheater ---			

Fire Brick ARCH, NONE

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

Throttle BALANCE Pos. DOME
3 Dry pipe STEEL

Superheater NONE

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

Exhaust nozzles DOUBLE HIGH

Stack STRAIGHT Dia. 16" Hole in S. B., dia. 24"

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

Steam Gauge ONE IRON 7" MAKER: ASHCROFT (Kor 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 3¼" 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. R. S.
Cleaning Plugs ONE FILLING PLUG IN TOP OF BOILER.
Firebox CORNERS AND BACK
Crown, TWO EACH SIDE AND THREE BACK
Waist, ONE UNDER FRONT
Front tube sheet, ONE Fusible plug TWO , Pos. F. & B. of crown

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

5 **Injectors** TWO SELLERS 1887 CLASS "K" (Spec) No. 7½
6 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 ONE LARGE WINDOW IN SIDE OF CAB.
VENTILATOR IN CAB ROOF.

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 36¼"

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 TOWER M.C.B. AUTO. WITH SLOTTED KNUCKLE.

Signal fixtures IRON ON BUMPER

8 **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 TWO Diam. 28" Body IRON PAINTED Pipes IRON
(Spec) Sander LEACH AIR TRAP A-1. IN EACH BOX, TO SAND FRONT AND BACK.

9 Dome casing IRON PAINTED

Boiler Jacket #22 SOFT STEEL PTBands IRON Style 9 AND 14
Boiler Lagging B. L. W. PLASTIC MAGNESIA FROM STOCK.
BACK HEAD OF BOILER TO BE LAGGED AND JACKETED.

THE BALDWIN LOCOMOTIVE WORKS

P. W. STOUDT

SPECIFICATION FOR LOCOMOTIVES 10 28 ½ D 137 JUNE 1919.

FOR CADDO RIVER LUMBER CO.

RTL

306 306

Frames CAST STEEL Braces SOLID

Cylinders, Diam. 17" Stroke 24"
10 St'm ports, Length 20.84" Width 1¼" Bridges ---
Exh. ports, Length --- Width --- Valve lead ¼"
Valve travel 5½" Steam lap ⅞" Exhaust clearance ——
Eccentric crank throw 11½" By-pass valve NONE
S. F. Lubr. NATHAN TRIPLE BULLS EYE (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 --- Covers ---
St'm chest valves 9½ DIAM., PISTON VALVE
Met. pkg { PISTON RODS / VALVE STEMS U. S. KING TYPE (Spec)
PISTON RODS TO BE KEYED TO CROSSHEAD.
11 **Pistons** CAST IRON RINGS SPRUNG INTO SOLID HEAD.
12 **Guides** LAIRD TYPE, STEEL Oil cups NEEDLE
Crossheads CAST STEEL WITH BEARINGS OF BRASS
13 **Wrist Pins** STEEL Rod cups GREASE CUPS 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.
DRIVING WHEELS TO HAVE HUB LINERS OF BRONZE.
Drivers, O. S. Diam. 46" Cen. diam. 40" CENTERS 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 = 1/16" TOTAL
Driving Boxes CAST STEEL WITH ELVIN LUBRICATORS
Journals, Diam. 8" Length 9"

Springs. Make B. L. W.

15 **Front Engine Truck** TWO Wheeled SWING BOLSTER, CENTER BEARING
To swing 4" each side of cen., Cen. pin liners NONE
16 Journals, Diam. 5" Length 10" Boxes CAST STEEL
17 Wheels, Diam. 28" Tread 4¼" Kind CHILLED CAST IRON SPOKE
Tires NONE Cen. diam. --- Size ---
Tires held by ---

18 **Back Engine Truck** TWO Wheeled SWING BOLSTER, SIDE BEARING
To swing 4" each side of cen., Cen. pin liners NONE
19 Journals, Diam. 5" Length 10" Boxes CAST STEEL
20 Wheels, Diam. 28" Tread 4¼" 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. NO. 6-ET WESTG. AUTO. COMB. 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 11" Pos. 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. 1367
Weight, with fuel and water, about 80,000 POUNDS
TANK TO BE OF STEEL ¼" THICK.
Tank 4000 Gallons, Bill 4767
TANK U SHAPE, STRAIGHT TOP. FUEL CAP. 6 TO 7 TONS

Tool Boxes HARD WOOD, TOP

Frame STEEL, 10" CHANNELS, WITH BUMPERS OF WOOD.

Front Drawbar height 32"
Pilot OF WOOD Pushing shoes NONE
Back drawhead, center above rail 33½"
Coupler TOWER M.C.B. AUTO. WITH SLOTTED KNUCKLE.

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. 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. No. 6-ET WESTG. AUTO. AND STRAIGHT AIR, WITH 10" x 12" TENDER CYLINDER.

List of tools, sch. 29 ONE PAIR WRECKING FROGS.
Photo sch. 2 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 2-3-19 Shipment ON OWN WHEELS

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

B. L. W. Patents FEED WATER STRAINER, PAT'D, 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 SIMILAR TO 10 28 ½ D 33 & 12 34 ½ E 30.
Mark on TANK SIDES, CADDO & CHOCTAW RAILROAD COMPANY

ROAD NUMBER ON BACK OF TANK TO BE LARGE.

Road Nos. Pos.	Road Nos.	Name
F. No. Plate	8	NONE
F. Sand Box		
Back of Tank		

Actual Dimensions of Loco. Extreme height over all 13'6" over safety valves
Extreme Width Cab boards 9'11" Cylinders or valve motion 9'2"
Length outside face front bumper of engine to face of tender wedge 31'6"
Length face of tender wedge to outside face back bumper of tender 24'5¼"
Total length outside face front bumper of 55'11½"

SPECIFICATION FOR LOCOMOTIVES 10 28 ½ D Nos. 137

FOR CADDO RIVER LUMBER CO.

307

1 FLEXIBLE STAYS, TATE 1" DIAM. ABOUT 430 IN NUMBER, LOCATED IN THREE FRONT AND THREE BOTTOM ROWS OF SIDE SHEETS, UNDER RUNNING BOARDS, CAB, THROAT AND IN OTHER INACCESSIBLE PLACES.

2 ASH PAN SLIDES TO BE OPERATED BY LEVER.

3 STEAM PIPES TO HAVE OUTSIDE CONNECTIONS TO STEAM CHESTS.

4 SMOKE BOX TO BE SELF CLEANING TYPE.

5 INJECTORS TO BE SELF ACTING TYPE FOR USE WITH HOT WATER.

6 VALVE IN LEFT SIDE OF DOME TO OPERATE SYPHON ON TENDER. STEAM LINE TO TENDER TO HAVE McLAUGHLIN METALLIC CONNECTION BETWEEN ENGINE AND TENDER

7 RADIAL BUFFER BETWEEN ENGINE AND TENDER.

8 HEADLIGHT EQUIPMENT TO BE PYLE NATIONAL ELECTRIC, TYPE "K-2" WITH INCANDESCENT HEADLIGHT.

9 DOME CASING TO HAVE PRESSED STEEL BOTTOM RING AND PRESSED STEEL TOP RING.

10 CYLINDERS TO HAVE BUSHINGS OF HUNT SPILLER IRON.

11 PISTON ROD TO BE LONG ENOUGH TO ENABLE THE RENEWAL OR EXAMINING OF PISTON PACKING RINGS WITHOUT DISCONNECTING CROSSHEAD.

12 GUIDE YOKE TO BE OF MILD WROUGHT STEEL.

13 BACK WRIST PINS TO HAVE NUTS AND WASHERS TO FASTEN RODS.

14 PARALLEL RODS TO HAVE SOLID ENDS.

15 FRONT ENGINE TRUCK FRAME OF WROUGHT STEEL.

16 FRONT ENGINE TRUCK JOURNALS TO BE EQUIPPED FOR OIL INSTEAD OF GREASE LUBRICATION.

17 FRONT ENGINE TRUCK WHEELS TO HAVE HUB LINERS OF BRASS.

18 BACK ENGINE TRUCK FRAME OF WROUGHT STEEL.

19 BACK ENGINE TRUCK JOURNALS TO BE EQUIPPED FOR OIL INSTEAD OF GREASE LUBRICATION.

20 BACK ENGINE TRUCK WHEELS TO HAVE HUB LINERS OF BRASS.

TENDER.

51 HANCOCK SYPHON LOCATED UNDER TENDER BETWEEN 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 THE SYPHON.
SYPHON TO HAVE 4" SUCTION.
R. I. W. TO FURNISH HOSE 4" DIAM., 50' 0" LONG.
McLAUGHLIN METALLIC CONNECTION BETWEEN ENGINE AND TENDER FOR SYPHON.

52 RADIAL BUFFER BETWEEN ENGINE AND TENDER.

53 ADDITIONAL BEARINGS AT SIDES OF BOTH TRUCKS.

THE BALDWIN LOCOMOTIVE WORKS | Dup 10 28½ D 139 AUGUST WHERE OTHERWISE SPECIFIED

Memorandum Spec'n 19034

SPECIFICATION FOR LOCOMOTIVES 10 28½ D 139 Sim. as Photo 7049

FOR CADDO RIVER LUMBER COMPANY Engine Drawing No. 30

6-4-19

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 10' 3" Driving 10' 3" Total 26' 10"
Total wheelbase, eng. and tend. { Actual 50' 8¼" / Limited to ---

Curves ----
RAILS 56 POUNDS PER YARD
Limits, Height ---- Width ----
Weight approximate in working order, Total 125,000 POUNDS
On F. tr'k 13,000 lbs., Drivers 96,000 lbs., B. tr'k 16,000 lbs.

Tractive power 23,100 lbs. Ratio of adhesion 4.15
Work'g St'm Pres. 180 lbs., Service FREIGHT
Fuel SOFT COAL

FRONT TUBE SHEET TO BE ½" THICK
Boiler STEEL Thick ⅝" AND 1 1/16" Bill 8472
Boiler, Diam. 56" Plan EXTENDED WAGON TOP
Boiler st'm pres. 200 lbs., Tested to 220 lbs. steam pres. / WITH FACTOR OF SAFETY OF 5.14 267 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 64 1/8" Width 42" Depth F. 63½" B. 60½"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back ⅜"
Firedoor opening 16" DIAM. CROWN AND SIDES IN ONE SHEET.
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 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
Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.
Number 200 Diam. 2" Length 14' 9"

Heating Surface | Flues --- Combus. Chamb. --- Total 1637⁰
Tubes 1336⁰ Fire Box 101⁰ Fire Brick Tubes ---
Grate area 18.7⁰ Ratio to Heating Surface 1 : 86.9
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 U. S. ONLY
Spark arrester hopper WITH
Netting and deflect. plates WITH

Exhaust nozzles DOUBLE ANN
Stack STRAIGHT Dia. 16" Height above S. H. 24"

Safety Valves TWO CROSBY 3" (Spec)
Safety valves NONE with relief lever. Set to 180 POUNDS
Whistle ONE 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 3¼" 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: R. S.
Cleaning Plugs ONE FILLING PLUG IN TOP OF BOILER
Firebox CORNERS AND BACK
Crown, TWO EACH SIDE AND THREE BACK
Waist, ONE UNDER FRONT
Front tube sheet, ONE Fusible plug TWO, Pos. F. & B. of crown

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

Injectors (Spec) TWO SELLERS 1897 CLASS "K" 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 STEEL ONE LARGE WINDOW IN SIDE OF CAB. 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 36½"

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 TOWER M. C. B. AUTO. WITH SLOTTED KNUCKLE

Signal fixtures IRON ON BUMPER

Headlight ONE ROUND CASE 18" Reflector
Headlight, Nos. on sides WITH Hdlt shade WITH
Lamp shell NONE Mounting ---

Bell 92 POUNDS
Sand Box TWO Diam. 28" Body IRON PAINTED Pipes IRON
Sander LEACH AIR TRAP 2-1½ IN CAB BOX, TO SAND FRONT AND BACK.

Dome casing IRON PAINTED

Boiler Jacket #22 PLAIN. STEEL Bands IRON Style 9 and 14
Jacket Lagging MAGNESIA SECTIONAL
Bare weld of boiler to be lagged and jacketed.

THE BALDWIN LOCOMOTIVE WORKS

P. W. Stoudt AUGUST 1919.

SPECIFICATION FOR LOCOMOTIVES 10 28½ D 139

FOR CADDO RIVER LUMBER COMPANY

309

Frames CAST STEEL Braces SOLID

10 **Cylinders,** Diam. 17" Stroke 24"
St'm ports, Length 20.84" Width 1¼" Bridges ---
Exh. ports, Length --- Width --- Valve lead ¼"
Valve travel 5½" Steam lap ⅞" Exhaust clearance ---
Eccentric crank throw 11½" By-pass valve NONE
S. F. Lubr. NATHAN TRIPLE BULLSEYE (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 --- Covers ---
St'm chest valves 9½" DIAM. PISTON VALVE
Met. pkg { PISTON RODS / VALVE STEMS } UNITED STATES, KING TYPE (Spec)
11 PISTON RODS TO BE KEYED TO CROSSHEAD
Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD
12 **Guides** LAIRD TYPE, STEEL Oil cups NEEDLE
Crossheads CAST STEEL WITH BEARINGS OF BRASS
13 **Wrist Pins** STEEL Rod cups GREASE CUPS 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.
DRIVING WHEELS TO HAVE HUB LINERS OF BRONZE.
Drivers, O. S. Diam. 46" Cen. diam. 40" CENTERS 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 — 1/16" TOTAL
Driving Boxes CAST STEEL WITH ELVIN LUBRICATOR
Journals, Diam. 8" Length 9"

Springs. Make B. L. W.

15 **Front Engine Truck** TWO Wheeled SWING BOLSTER, CENTER BEARING
To swing 4" each side of cen., Cen. pin liners NONE
16 Journals, Diam. 5" Length 10" Boxes CAST STEEL
17 Wheels, Diam. 28" Tread --- Kind CAST IRON SPOKE CENTERS
Tires STEEL Cen. diam. 23" Size 2½" x 5½"
Tires held by SHRINKAGE AND SHOULDER

18 **Back Engine Truck** TWO Wheeled SWING BOLSTER, SIDE BEARING
To swing 4" each side of cen., Cen. pin liners NONE
19 Journals, Diam. 5" Length 10" Boxes CAST STEEL
20 Wheels, Diam. 28" Tread --- Kind CAST IRON SPOKE CENTERS
Tires STEEL Cen. diam. 23" Size 2½" x 5½"
Tires held by SHRINKAGE AND SHOULDER.

Equalizing position ON ALL DRIVING AND TENDER WHEELS
Operating Parts { Engine, Sch. No. 6-ET-RIGHTO. COMBINED AUTO. AND STRAIGHT AIR / Eng. Tr'k arr. ---
Foundation Parts { Drivers, sch. No. 1 AMERICAN O. S. EQUALIZED. / Eng. Tr'k, sch. ---
21 Air pump One 11" Pos. LEFT SIDE
Train connections FRONT AND BACK
Train signal, sch. NONE
AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS

54 **Tender** EIGHT Wheeled, Drawing No. 1367
Weight, with fuel and water, about 80,000 POUNDS
TANK TO BE OF STEEL, ¼" THICK.
Tank 4,000 Gallons, Bill 4767
TANK "U" SHAPE, STRAIGHT TOP. FUEL CAPACITY 6 TO 7 TONS

Tool Boxes HARD WOOD, TOP

57 **Frame** STEEL, 10" CHANNELS, WITH BUMPERS OF WOOD.

Front Drawbar height 32"
Pilot OF WOOD Pushing shoes NONE
Back drawhead, center above rail 33½"
Coupler TOWER M. C. B. AUTO. WITH SLOTTED KNUCKLES.

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

58 **Trucks** ARCH BAR TYPE WITH STEEL BOLSTERS.

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. No. 6-ET WESTG. AUTO. AND STRAIGHT AIR BRAKE WITH 10" X 12" TENDER CYLINDER.

ONE PAIR JOHNSON CAR REPLACERS, TYPE "C" AS BUT.
List of tools, sch. 29
Photo sch. No. 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 6-1-19 Shipment ON OWN WHEELS (SEE SUP. 22)

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

LETTERING TO BE SAME AS FOR 10 28 ½ D 137
Mark on TANK SIDES, CADDO & CHOCTAW RAILROAD COMPANY
MARK ON CAB PANELS: C. & C. R. R. Co.
ROAD NUMBER ON BACK OF TANK TO BE LARGE

Road Nos. Pos.	Road Nos.	Name NONE
F. No. PLATE	9	
F. SAND BOX		
BACK OF TANK		

Actual Dimensions of Loco. Extreme height over all 13'6" (SEE SUP. 22)
Extreme Width: Cab boards 9' 11" Cylinders or valve motion 9' 2"
Length outside [illegible] 31' 6"
Length face of [illegible] 24' 5½"
Total length [illegible]

SPECIFICATION FOR LOCOMOTIVES 10 28 ½ D 139

FOR Cadoo River Lumber Co.

P

210 210

1 Flexible Stays, Tate 1" diam. about 430 in number, located in three front and three bottom rows of side sheets, under running boards, cab throat and in other inaccessible places.

2 Ash Pan slides to be operated by lever.

3 Steam pipes to have outside connections to steam chests.

4 Smoke box to be self cleaning type.

5 Injectors to be self acting type for use with hot water.

6 Valve in left side of dome to operate syphon on tender. Steam line to tender to have McLaughlin metallic connection between engine and tender.

7 Radial buffer between engine and tender.

8 Headlight equipment to be Pyle National Electric, Type "K-2" with incandescent headlight.

9 Dome casing to have pressed steel bottom ring and pressed steel top ring.

10 Cylinders to have bushings of Hunt Spiller Iron.

11 Piston rod to be long enough to enable the renewal or examining of piston packing rings without disconnecting crosshead.

12 Guide yoke to be of mild brought steel.

13 Back brist pins to have nuts and washers to fasten rods

14 Parallel rods to have solid ends.

15 Front Engine Truck Frame of brought steel.

16 Front Engine Truck journals to be equipped for oil instead of grease lubrication.

17 Front Engine Truck wheels to have hub liners of brass.

18 Back Engine Truck Frame of brought steel.

19 Back Engine Truck Journals to be equipped for oil instead of grease lubrication.

20 Back Engine truck wheels to have hub liners of brass.

21 Air pump exhaust to be piped under cylinder saddle instead of up stack.

22 Extras ordered on Extra Order No. 5802 dated 7-21-19 to be shipped with loco.

TENDER

51 Hancock Syphon located under tender between 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 the syphon.
Syphon to have 4" suction.
B. L. W. to furnish hose 4" diam. 50'0" long.
McLaughlin metallic connection between engine and tender for Syphon.

52 Radial buffer between engine and tender.

53 Additional bearings at sides of both trucks.

Gauge of Road 4ft 8½" Play 2"
Wheelbase, Right 12ft 6" Driving 12ft 6" Total 30ft 10"
Total wheelbase, eng. and tend. {Actual 50ft 6" / Limited to ——

Curves —— GRADES, HEAVY
RAILS 60 LBS. PER YARD WITH ABOUT 16 TIES TO EACH 30 FT. RAIL.
Limits, Height —— Width ——
Weights (approximate) in working order, Total 151,000 POUNDS
On F. truck 18,000 lbs., Drivers 133,000 lbs., R. truck —— lbs.

Tractive power 35,200 lbs., Ratio of adhesion 3.78
Work'g St'm Pres. 180 lbs., Service PASSENGER
Fuel SOFT COAL

FRONT TUBE SHEET TO BE ½" THICK.
Boiler STEEL Thick 11/32" & ¾" Built 8389
Boiler, Diam. 66" Plan EXTENDED WAGON TOP
{Boiler st'm pres. 180 lbs., Tested to 200 lbs. steam pres. / WITH FACTOR OF SAFETY OF 5.03 240 lbs. water pres.}
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS

Dome, diam. 29" Pos. FORWARD OF FIREBOX

Firebox STEEL Combustion chamb. NONE
Firebox, length 96" Width 66" Depth F. 68" B. 59½"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firedoor opening OVAL 13" x 18"
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 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 ——
Tubes #12 W.G. CHARCOAL IRON OR STEEL
Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS
Number 330 Diam. 2" Length 13' 3"

Heating Surface: Flues —— Combus. Chamb. —— Total 2127⁰
Tubes 2275⁰ Fire Box 152⁰ Fire Brick Tubes ——
Grate area 18⁰ Ratio to Heating Surface 1 : 55.3
Superheater ——

Fire Brick ARCH, NONE

Safety Valves TWO CROSBY 3"
Valve values type with relief lever, set to 185 LBS.
Whistle B. L. W. PLAIN

Steam Gauge ONE IRON 7" MAKER'S NAME ASHCROFT (Special)
Brass gauge stand IRON Check NONE

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

Blow off Cock ONE B.L.W. POS:- LEFT SIDE
Cleaning Plugs
Firebox CORNERS DIAGONAL SIDES AND BACK
Crown, THREE EACH SIDE AND FOUR 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 ——

(Special)
Injectors TWO SELLERS CLASS "N" -1887 No. 10½
Injectors, Pos. R. AND L. Steam pipes COPPER
Pipes, Check IRON Feed IRON Overflow IRON
Check B. L. W. Pos. R. AND L.

Steamer Heat NONE

Cab WOOD.

Cab boards WOOD Shutters NONE
Running boards WOOD Seating WOOD
Hand rail IRON Located on DOUBLE

Back Bumper IRON Back drawbar height 28"

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

Buffers.
COUPLINGS,- FOUR POCKET DRAWHEAD WITH M.C.B. AUTO. COUPLER 33½" CEN. ABOVE RAIL AND WITH LINK AND PIN CONNECTION TO LOCOMOTIVE CARS 24" CENTRE ABOVE RAIL (COUPLING TO BE MADE WITHOUT USE OF A BROKEN LINK)

SIGNAL FITTINGS, IRON OR BRASS

Headlight OIL BURNER CASE 16" Reflector TO BURN GASOLENE
Headlight Bracket BOTH Headlight BOTH
Lamp shelf NONE Number ——

Bell 27 POUNDS
Bell Stand OAK CROSS 31" Body IRON PATENTED Plunger IRON
Bell Ringer "IRON AGE TYPE PATENT" AS USED FRONT AND BACK

Cross Heads IRON PATENTED

Number Required 22 Make STEEL Manufacturer IRON Style ——
Outfit Lacking Brackets Electrical

Engine CAST STEEL Brace SOLID

Cylinders, Diam. 21" Stroke 24"
Slide valves, Length 19" Width 12⅜" Bridges 1⅜"
Exh. ports, Length 19" Width 3" Valve lead 1/16"
Valve travel 5⅛" Steam lap ⅞" Exhaust clearance ——
Eccentric crank throw 5" By-pass valve NONE
S. F. Lubr. DETROIT TRIPLE NO. 22 BULLS EYE
Cyl'r heads CAST IRON LUBRICATOR PIPES OF IRON UNDER JACKET
Cyl'r casings IRON PAINTED Head covers STEEL PAINTED
Steam chest casings IRON PAINTED Covers STEEL PAINTED
Steam chest valves RICHARDSON BALANCED, WITH VACUUM VALVES
Mat. pkg (valve rods, valve stems) UNITED STATES (each specs)

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD
Guides STEEL Oil cups NEEDLE
Crossheads CAST STEEL, WITH BEARINGS OF CAST IRON LINED WITH BRASS.
Wrist Pins STEEL Rod cups PLUNGER
PARALLEL RODS TO HAVE SOLID ENDS.

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

All threads on bolts (except stayboltts) 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 BRASS
Drivers, O. S. Diam. 56" Cen. diam. 40"
WHEEL CENTERS: MAIN CAST STEEL, OTHERS CAST IRON
Tires STEEL Held by SHRINKAGE AND SHOULDER
Tires, Flanged, Pos. 1ST, 3RD & 4TH Size 3" x 5½"
Tires, Plain, Pos. SECOND Size 3" x 6⅝"
Lateral play between driving boxes and wheel hubs— 1/16" TOTAL
Driving Boxes STEELED CAST IRON
Journals, Diam. MAIN 9" Length 10"
OTHERS 8"

Springs. Make B. L. W.

Front Engine Truck Two Wheels SWING BOLSTER
To move 5" each side of cen. Centre pin Diam. NONE
Journals, Diam. 5" Length 8" Brass 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
Centre Truck WHEELS WITHOUT HUB LINERS
Back Engine Truck NONE Wheels ——
To move —— each side of cen. Cen. pin Diam. ——
Journals, Diam. —— Length —— Boxes ——
Wheels, Diam. —— Tread —— Kind ——
Tires —— Cen. diam. —— Size ——
Tires held by ——

Tender EIGHT Wheeled, Drawing No. 365-
Weight, with fuel and water about 100,000 POUNDS

Tank SOOD Gallons, Std 4663.
TANK "U" SHAPE, STRAIGHT TOP; FUEL CAPACITY 8 TONS

Tool Boxes HARD WOOD, TOP

Frame YELLOW PINE WITH OAK BUMPERS

Front Drawbar height 29⅞"
Pilot NONE Pushing shoes NONE

COUPLINGS,- FOUR POCKET DRAWHEAD WITH M.C.B. AUTO. COUPLER 33½" CENTRE ABOVE RAIL AND WITH LINK AND PIN CONNECTION TO LOCOMOTIVE CARS 24" CENTRE ABOVE RAIL (COUPLING TO BE MADE WITHOUT USE OF A BROKEN LINK)
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. 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. NO. 6-ET WEST'G. AUTO. AND STRAIGHT AIR WITH 10" x 12" CYLINDER.

List of tools; sch. 29
Photo scn. 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 I. 8-18- 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 Marks NONE

Painting Engine, style 291 OLIVE GREEN & ALUMINUM
Painting Tender, style 291 OLIVE GREEN & ALUMINUM
LETTERING ETC. TO BE SAME AS FOR 10 36 E CSH
Marks, CAB SIDES OVER NUMBER, C. R. R. & L. Co.
MARK ON TANK SIDES, CHENNY RIVER ROAD & LUMBER CO.

THE BALDWIN LOCOMOTIVE WORKS

As Spec'n. C-5562
Dup. of 12 30 ½ E 42, 43.

Memorandum Spec'n 19031

SPECIFICATION FOR LOCOMOTIVES 12 30½ E 46

Gen. as 6039

FOR P CHERRY VALLEY TIMBER COMPANY

Engine Drawing No. 9

5-22-19

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 12' 1" Driving 12' 1" Total 27' 3"
Total wheelbase, eng. and tend. { Actual 50'1⅜" / Limited to ---
GRADES, (SEE SUP. 3)
Curves 30 DEGREES
RAILS 56 TO 60 POUNDS PER YARD
Limits, Height ---- Width ----
Weight (approximate) in working order, Total 140,800 POUNDS
On F. tr'k 15,400 lbs., Drivers 113,400 lbs., B. tr'k 12,000 lbs.

Tractive power 27,000 lbs., Ratio of adhesion 4.2
Work'g St'm Pres. 180 lbs., Service LOGGING
Fuel OIL (SEE SUP. 7 ETC.)

FRONT TUBE SHEET TO BE ½" THICK
Boiler STEEL Thick 1 1/16" Bill 8561
Boiler, Diam. 70" Plan STRAIGHT TOP
1 Boiler st'm pres. 200 lbs., Tested to 220 lbs. steam pres. / WITH FACTOR OF SAFETY OF 4.65 267 lbs. water pres.
Longitud. seams (SEE SUP 2)
AUXILIARY DOME NONE
Dome, diam. 33" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE
Firebox, length 89-1 1/16" Width 41" Depth F. 67¾" B. 57¾"
3 Firebox, Tube ½" Crown ⅜" Sides ⅜" Back 5/16"
Firedoor opening 16" DIAM. (SEE SUP. 4)
Water space, Front 4" Sides 3" Back 3"
Water space, Frame SINGLE Riveted
5 Water space stays ⅞" DIAM. WITH 3/16" HOLE 1¼" DEEP FROM O.S.
Radial stays 1" Sling stays front THREE ROWS 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 (B.L.W.OPTION)
Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.
Number 291 Diam. 2" Length 13' 0"

Heating Surface Flues --- Combus. Chamb. --- Total 2108 sq.ft.
Tubes 1968 sq.ft. Fire Box 140 sq.ft. Fire Brick Tubes ---
Grate area 25.5 sq.ft. Ratio to Heating Surface 1 : 82
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 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 SINGLE LOW
CLEANING PIPE WITH
Stack CAST IRON, STRAIGHT Dia. 18"

Safety Valves TWO CONSOLIDATED 3" (No. Spec)
Safety valves NONE with relief lever, Set to 180 POUNDS
10 **Whistle** LARGE CHIME

Steam Gauge ONE IRON 7" MAKER: ASHCROFT (Not Spec)
Steam gauge stand IRON **Clock** NONE

Water Gauge ONE (SUP.11 ETC.) **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
13 **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 ---

Injectors TWO SELLERS (Spec) No. 8½
Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER
Pipes, Check STEEL Feed STEEL Overflow STEEL
Check B. L. W. (SUP. 14 ETC.) Pos. RIGHT AND LEFT

Steam Heat NONE

17 **Cab** STEEL, LINED WITH WOOD. VENTILATOR IN CAB ROOF.

18 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 35⅝"

Pilot WOOD Pushing shoes NONE
21 **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. WITH 11" SLOTTED KNUCKLE

Signal fixtures IRON ON BUMPER

19 **Headlight** TWO ROUND CASE 18" Reflector,
Headlight, Nos. on sides WITH H'd'l't step NONE
Lamp shelf NONE Nosing ----

Bell 92 POUNDS
Sand Box TWO Diam. 31" Body IRON PAINTED Pipes IRON
(Not Spec) 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

THE BALDWIN LOCOMOTIVE WORKS

L. HANCE
SPECIFICATION FOR LOCOMOTIVES 12 30½ E 46 July-1919.

314 314

FOR P CHERRY VALLEY TIMBER COMPANY

FURNISH ONE COMPLETE SET OF PRINTS.

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 ~~cranks~~ throw 4½" By-pass valve NONE
S. F. Lubr. DETROIT TRIPLE No. 22 BULL'S EYE. (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 ROD / VALVE STEMS) UNITED STATES, KING TYPE (Spec)
PISTON RODS TO BE KEYED TO CROSSHEADS.
Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD.
Guides LAIRD TYPE, STEEL Oil cups NEEDLE
Crossheads CAST STEEL, WITH BEARINGS OF CAST IRON, BABBITTED
Wrist Pins STEEL Rod cups GREASE CUPS FORGED ON STRAPS
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 VALVE MOTION WORK TO BE BUSHED.

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.
ALL DRIVING WHEELS TO HAVE HUB LINERS OF BRASS OR BRONZE.
Drivers, O. S. Diam. 44" Cen. diam. 38"
WHEEL CENTERS: MAIN, CAST STEEL, OTHERS CAST IRON
20 **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
Journals, Diam. 7½" Length 8"

Springs. Make B. L. W.

21 **Front Engine Truck** TWO Wheeled, SWING BOLSTER, CENTER BEARING
To swing 4½" each side of cen., Cen. pin liners NONE
26 Journals, Diam. 4½" Length 7½" Boxes CAST IRON
Wheels, Diam. 28" Tread --- Kind CAST IRON SPOKE CENTER
Tires STEEL Cen. diam. 23" Size 2½" x 5½"
Tires held by BOLTED TYPE FASTENING.

22 **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
26 Wheels, Diam. 28" Tread --- Kind CAST IRON SPOKE CENTER.
Tires STEEL Cen. diam. 23" Size 2½" x 5½"
Tires held by BOLTED TYPE FASTENING

Brake, position ON ALL DRIVING AND TENDER WHEELS
Operating Parts: Engine, Sch. No. 6-ET WESTG. COMBINED AUTO. AND STRAIGHT AIR.
Eng. Tr'k, sch. ---
Foundation Parts: Drivers, sch. WN-1 AMERICAN O. S. EQUALIZED
Eng. Tr'k, sch. ---
27 Air pump ONE 8½" CROSS COMPOUND Pos: L. S.
Train connections FRONT AND BACK
Train signal, sch. NONE
AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS

3½ **Tender** EIGHT Wheeled, Drawing No. 435
Weight, with fuel and water, about 70,000 POUNDS
3½ **Tank** { OIL 1600 / WATER 3500 } Gallons. Bill { 4844 / 4845 }
TANK "U" SHAPE, STRAIGHT TOP.

Tool Boxes OF HARD WOOD, TOP.

A01 **Frame** STEEL, 10" CHANNELS, WITH BUMPERS OF WOOD AND STEEL PLATE

Front Drawbar height 32½"
Pilot NONE Pushing shoes NONE
Back drawhead, center above rail 33½"
Coupler M. C. B. AUTO. WITH 11" SLOTTED KNUCKLE

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

Trucks SQUARE WROUGHT IRON EQUALIZED FRAMES. (SEE SUP. 43)

Springs ELLIPTIC B. L. W.
Journals, Diam. 5" Length 9"
Wheels, Diam. 28" Tread --- 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 WESTINGHOUSE AUTO. AND STRAIGHT AIR WITH 10" x 12" TENDER CYLINDER.

List of tools, sch. 31 ONE PAIR STEEL 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 7-21-19 Shipment ON OWN WHEELS (SUP. 28)

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

LETTERING ETC., TO BE SAME AS FOR 12 34½ E 26
Mark on TANK SIDES, CHERRY VALLEY RAILWAY CO.
MARK ON BACK OF TANK: 3500 GALS.

	Road Nos. Pos.	Road Nos.	Name
F. No. Plate		4	
F. Sand Box			
Cab Sides			
Back of Tank			

Actual Dimensions of Loco. Extreme height over all 12' 0"
Extreme Width:—Cab boards 10' 0" Cylinders or valve motion 9' 9"
Length outside face front bumper of engine to face of tender wedge 32' 8⅝"
Length face of tender wedge to outside face back bumper of tender 23' 3½"
Total length outside face front bumper of engine to outside face back bumper of tender } 56' 0⅛"

SPECIFICATION FOR LOCOMOTIVES 12 30¼ E 46.

FOR CHERRY VALLEY TIMBER COMPANY

P

1 BOILER TEST PRESSURE PLATE TO SHOW THAT BOILER IS DESIGNED FOR WORKING PRESSURE OF 200 POUNDS.

2 LONGITUDINAL SEAMS OF BOILER TO BE BUTT JOINTED WITH DOUBLE COVERING STRIPS, SEXTUPLE RIVETED.

3 CROWN OF FIRE BOX TO BE ARRANGED FOR GRADES OF 7%
CROWN AND SIDES OF FIRE BOX IN ONE PIECE.

4 FIRE DOOR TO BE HOOD TYPE.

5 FLEXIBLE STAYBOLTS TO BE TATE ABOUT 350 IN NUMBER, LOCATED IN BREAKING ZONE.

6 TUBES TO BE SPACED ¾" APART AND TO BE APPLIED WITH PROSSER EXPANDER.

7 OIL BURNING ARRANGEMENT, SOUTHERN PACIFIC STYLE, WITH VON BODEN INGLES BURNER PLACED IN FRONT OF FIRE PAN.
CAST IRON AIR INTAKE, IN FRONT OF PAN.
ROYALTY ON OIL BURNING ARRANGEMENT PAYABLE BY THE B. L. W.

8 OIL BURNING ARRANGEMENT SAME AS FOR Co's PRESENT LOCOMOTIVES
Co. DOES NOT DESIRE TO GIVE ANY OTHER INFORMATION REGARDING OIL, AS OIL CHANGES WITH THE RENEWAL OF THEIR CONTRACT.

9 OIL AND STEAM CONNECTIONS BETWEEN ENGINE AND TENDER TO BE McLAUGHLIN FLEXIBLE CONDUITS.

10 WHISTLE TO BE SCREWED INTO SIDE OF DOME.

11 WATER GAUGE TO BE KLINGER REFLEX WITH REFLECTOR.

12 MIRROR TO BE PROVIDED FOR WATER GAUGE SO THAT GAUGE CAN BE SEEN BY BOTH THE ENGINEER AND THE FIREMAN.

13 BLOWER PIPE TO HAVE SUITABLE VALVES FOR ROUND HOUSE CONNECTION.

14 PLUG STOP VALVE TO BE PROVIDED BETWEEN INJECTOR CHECK AND BOILER.

15 WATER DEFLECTOR, C. B. & Q. STYLE, TO BE APPLIED INSIDE OF BOILER AT INJECTOR CHECKS.

16 ONE FIRE EXTINGUISHER "Y" WITH STOP VALVES, TO BE APPLIED TO INJECTOR CHECK PIPE.

17 DROP SEAT FOR ENGINEER ON RIGHT SIDE OF CAB, AND TOOL BOX FOR FIREMAN ON LEFT SIDE.

18 CAB BOARDS TO BE COVERED WITH WOOD IN CAB.

19 HEADLIGHT EQUIPMENT TO BE PYLE NATIONAL ELECTRIC, TYPE "E" WITH ARC HEADLIGHTS.
HEADLIGHT CASES TO HAVE LONG FRONT EXTENSION, TO PREVENT BREAKING OF GLASS.
SWITCH TO BE PROVIDED IN CAB FOR CUTTING OUT HEADLIGHTS.
ALL WIRING TO BE APPLIED IN CONDUITS.
GENERATORS TO BE LOCATED IN FRONT OF CAB.

20 FLANGE LUBRICATORS, C. B. & N. STYLE, TO BE APPLIED TO FRONT OF FRONT DRIVERS AND TO BACK OF REAR DRIVERS.

21 FRONT FOOT PLATE FOR FRONT TRUCK KING PIN TO BE CAST STEEL

22 FRONT AND BACK ENGINE TRUCK BOLSTERS OF CAST STEEL.

26 WHEELS AND AXLES OF FRONT AND BACK ENGINE TRUCKS TO BE INTERCHANGEABLE. TRUCK WHEELS WITHOUT HUB LINERS.

27 AIR PUMP TO HAVE SPECIAL No. 5 AIR STRAINER.
AIR PUMP EXHAUST TO BE PIPED INTO EXHAUST CAVITY OF CYLINDER SADDLE.

28 EXTRAS TO BE ORDERED THROUGH EXTRA WORK DEPARTMENT, ORDER No. 4203, DATED 7-1-19 TO BE CHARGED EXTRA AND SHIPPED WITH LOCO. AS FOLLOWS:
ONE PAIR DRIVING SPRINGS.
ONE SET FRONT ENGINE TRUCK SPRINGS.
ONE SET BACK ENGINE TRUCK SPRINGS.

TENDER

36 DRAIN PIPES 2" DIAMETER ON EACH SIDE OF TANK FUNNEL TO CARRY WASTE WATER TO TRACK.

37 TANK COLLAR TO BE LOW IN BACK TO GIVE ENGINEMEN GOOD VIEW IN BACKING UP.

38 OIL TANK TO BE RECTANGULAR AND TO BE DESIGNED TO GIVE ENGINEMEN GOOD VIEW.
OIL TANK TO BE SET 18" ABOVE FLOOR OF TENDER TO SECURE GOOD GRAVITY ON GRADES.
LIFTING LUGS TO BE PROVIDED ON EACH CORNER OF OIL TANK.

39 MEASURING CHART TO BE FASTENED IN FRONT OF OIL TANK, GIVING CAPACITY IN INCHES; MEASURING ROD ALSO TO BE PROVIDED.

40 TENDER SAND BOXES TO BE SECURED TO FLOOR OF TENDER.

41 STEPS TO BE APPLIED ON FRONT OF OIL TANK.

42 ABOUT 18" TO BE PROVIDED BETWEEN BACK OF TANK AND REAR OF THE BUMPER FOR CARRYING MATERIAL.

43 TENDER TRUCKS TO BE NORTHERN PACIFIC STYLE.

THE BALDWIN LOCOMOTIVE WORKS As Spec'n HD-1 (HEREWITH)

Memorandum Spec'n 20022

SPECIFICATION FOR LOCOMOTIVES 10 24 ± D 13+

vs.

FOR CROWELL AND SPENCER LUMBER CO., LTD.,

HW.

Gen. 25 PHOTO. 7198

Engine Drawing No. 36

2.6.20

Gauge of Road 4' 8½" Play ⅜"

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

Total wheelbase, eng. and tend. {Actual 45' 6½" / Limited to ——

Curves ——

Limits, Height —— Width ——

Weight (approximate) in working order, Total 92,000 POUNDS.

On F. tr'k 10,000 lbs., Drivers 71,000 lbs., B. tr'k 11,000 lbs.

Tractive power 18,700 lbs., Ratio of adhesion 3.7

Work'g St'm Pres. 180 lbs., Service LOGGING

Fuel WOOD

1-2 **Boiler** STEEL Thick 9/16" Bill 8849

Front Tube Sheet ½" Thick

Boiler, Diam. 52" Plan EXTENDED WAGON TOP.

Allowable st'm pres. 200 lbs. **Tested to** 220 lbs. steam pres.

With Factor of Safety of 4.4 **Tested to** 267 lbs. water pres.

Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS.

DOME - ONE PIECE TYPE.

Dome, diam. 29" Pos. FORWARD OF FIRE BOX.

Firebox STEEL Combustion chamb. NONE

Firebox, length 59-3/16" Width 34⅜" Depth F. 60⅜" 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 SINGLE Riveted

Water space stays ⅞" DIAM. WITH 3/16" HOLES 1½" DEEP FROM O. S.

TATE FLEXIBLE STAYS - 252 IN BREAKING ZONE.

Radial stays 1" DIAM. Sling stays front {TWO ROWS 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

Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.

Number 160 Diam. 2" Length 11' 10½"

Heating Surface Flues —— Combus. Chamb. —— Total 1074⅝

Tubes 988⅝ Fire Box 83⅝ Fire Brick Tubes ——

Grate area 14.1⅝ Ratio to Heating Surface 1: 76.2

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

SMOKE BOX TO HAVE FULL EXTENSION

Smokebox Diameter WITH Cleaning hole door ring NONE

Spark arrester or hopper NONE

Netting and screen plates NONE

Exhaust nozzles DOUBLE -LOW

CLEANING PIPE - WITH

Stack DIBLTON IMPROVED Dia. 15"

Safety Valves TWO OCHLE 2½" OPEN (Not Spec)

Safety valves NONE with relief lever, Set to 180 POUNDS.

Whistle ONE (SEE SUP. 3)

Steam Gauge ONE IRON 7" MAKER: ASHCROFT (Spec)

Steam gauge stand IRON **Clock** NONE

Water Gauge ONE B. L. W. SAFETY **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 INTOP 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

Injectors Two MONITOR (Not Spec) No. 7

Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER

Pipes, Check IRON Feed IRON Overflow IRON

5 Check B. L. W. (SEE SUP. 4) 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

6 **Back Bumper** BAR STEEL Back drawbar height 33"

BACK FOOT PLATE OF CAST STEEL

Pilot WOOD (SEE SUP. 7) 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. WITH KNUCKLE HAVING 15" FACE AND WIDE SLOT, SO THAT DRAW IRONS CAN BE USED FOR LINK AND PIN COUPLINGS.

Signal fixtures IRON ON BUMPER.

8 **Headlight** TWO ROUND CASE 14" Reflector

Headlight, Nos. on sides WITH Hdlt step WITH

Lamp shelf NONE Casing ——

Bell 85 POUNDS

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

(Not Spec) LEACH AIR, TRAP A-1 IN EACH BOX TO SAND FRONT AND BACK.

Sandboxing IRON PAINTED, WITH PRESSED STEEL BOTTOM RING.

Boiler Jacket #22 PLANISHED STEEL Bands IRON Style 9

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

THE BALDWIN LOCOMOTIVE WORKS

Jas. Brotherick

SPECIFICATION FOR LOCOMOTIVES 10 24 ± D 13+ APRIL 1920

FOR CROWELL AND SPENCER LUMBER CO., LTD.

HW.

Frames CAST STEEL

Cylinders, Diam. 15" Stroke 24"

St'm ports, Length 13" Width 1½" Bridges 1"

Exh. ports, Length 13" Width 2½" Valve lead ⅛"

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

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

S. P. Lubr. DETROIT TRIPLE No. 22 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

Stm chest casings IRON PAINTED Covers STEEL PAINTED

St'm chest valves BALANCED, WITH VACUUM VALVES

Met. pkg. UNITED STATES, KING TYPE. (Not Spec)

Pistons HEADS OF CAST IRON WITH RINGS OF CAST IRON SPRUNG IN.

Guides LAIRD TYPE, STEEL Oil cups NEEDLE

Crossheads CAST STEEL

10 **Wrist Pins** STEEL Roll cubs FOR GREASE

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 stayboits) to be United States Standard.

All finished movable nuts of steel or of iron case hardened

Wearing Bearings B. L. W.

Driving wheel hub liners BRASS

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 - 3/16" TOTAL

Driving Boxes CAST STEEL

Journals, Diam. 6" Length 8"

11 **Springs.** Make STANDARD STEEL WORKS

FRONT ENGINE TRUCK SWING BOLSTERS OF CAST STEEL

Front Engine Truck TWO Wheeled SWING BOLSTER, CENTER BEARING

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

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

Wheel hub liners (SEE SUP. 12)

Wheels, Diam. 24" Tread —— Kind {STANDARD STEEL WORKS / ROLLED STEEL.

Tires NONE Cen. diam. —— Size

Tires held by —— WHEEL RIMS 2½" THICK

BACK ENGINE TRUCK SWING BOLSTERS OF CAST STEEL.

Back Engine Truck TWO Wheeled SWING BOLSTER, SIDE BEARING.

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

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

Wheel hub liners (SEE SUP. 13)

Wheels, Diam. 24" Tread —— Kind {STANDARD STEEL WORKS / ROLLED STEEL.

Tires NONE Cen. diam. —— Size ——

Tires held by —— WHEEL RIMS 2½" THICK

Brake, position ON ALL DRIVING AND TENDER WHEELS.

Operating { Engine, sch. No. 6 ET TESTG. COMBINED AUTOP AND STRAIGHT AIR,

Parts { Eng. Tr'k, sch. ——

Foundation { Drivers, sch. WM-1 AMERICAN O.S. EQUALIZED.

Parts { Eng. Tr'k, sch. ——

Air pump ONE 9½" Pos. L. S.

Train connections FRONT AND BACK

Train signal, sch. NONE

AIR RESERVOIR TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

2 **Tender** EIGHT Wheeled, Drawing No. 1507

Weight, with fuel and water, about 80,000 POUNDS.

TENDER TO BE WEIGHED: YES

Tank 4,000 Gallons, Bill 5222

TANK "U" SHAPE, STRAIGHT TOP. FUEL CAPACITY 3 CORDS.

WOOD RACK AROUND TOP OF TANK.

Tool Boxes OF HARD WOOD, TOP.

5 SYPHON CONNECTION TO LEFT SIDE OF TANK.

Frame STEEL, 6" AND 8" CHANNELS, WITH FRONT BUMPERS OF WOOD.

26 BACK BUMPER OF CAST STEEL.

Front Drawbar height 28½"

Pilot NONE Pushing shoes CAST IN BUMPER.

Back drawhead, center above rail 33½"

Coupler M.C.B. AUTO. WITH KNUCKLE HAVING 15" FACE AND WIDE SLOT, SO THAT DRAW IRONS CAN BE USED FOR LINK AND PIN COUPLINGS. (SUP 27

28 Steps ACROSS REAR WITH HAND RAIL.

29 **Trucks** ARCH BAR TYPE WITH CAST STEEL BOLSTERS.

30 Springs ELLIPTIC, STANDARD STEEL WORKS

Journals, Diam. 4½" Length 8"

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

Tires NONE Cen. diam. —— Size ——

Tires held by ——

Safety chains SINGLE

Brake Position ON OWN WHEELS

Brake sch. No. 6 ET WESTG. AUTO AND STRAIGHT AIR WITH 10"x12" TENDER CYLINDERS.

14 List of tools, sch. 27

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 3.20.20 Shipment ON OWN WHEELS.

Brass shop finish, No. 1

Machine shop finish D-165

B. L. W. Patents FEED WATER STRAINER PAT'D. SEPT. 1, 1903 (CAST ON)

Property plates NONE

Painting, style 291, OLIVE GREEN AND ALUMINUM.

LETTERING ETC. TO BE CO'S STANDARD SAME AS FOR 10 32 D 1167

Mark on CAB SIDES, THE C. & S. L. Co. LTD.

MARK ON THE TANK COLLAR) THE CROWELL & SPENCER LUMBER COMPANY, LIMITED

Road Nos. Pos. Road Nos. Name NONE

F. No. PLATE 200

F. SAND BOX

SIDES OF TANK

BACK OF TANK

Actual Dimensions of Loco. Extreme height over all 13' 1½"

Extreme Width: Cab boards 9'0", Cylinders ~~as valve motion~~ 9' 1⅝"

Length outside face front bumper of engine to face of tender wedge - 29' 1⅝"

Length face of tender wedge to outside face back bumper of tender - 21' 8⅜"

Total length outside face front bumper of engine to outside face back bumper of tender - 50' 10"

SPECIFICATION FOR LOCOMOTIVES 10 24 ± D 13+

FOR CROWELL AND SPENCER LUMBER CO., LTD.

317 318

1 LOCO. IS FOR SERVICE IN LOUISIANA.

2 LOCOMOTIVE TO CONFORM WITH ALL I.C.C. REQUIREMENTS.

3 WHISTLE TO BE ILLINOIS CENTRAL FREIGHT TYPE AS BLUE PRINT C-5-3521, HEREWITH.

4 INJECTOR CHECKS TO BE REGRINDING TYPE WITH CUT OUT TO PERMIT RESEATING WHILE ENGINE IS UNDER STEAM.

5 SYPHON (32") UNDER CAB BOARD ON LEFT SIDE WITH PIPE CONNECTIONS TO TANK AND WITH 25 FEET OF SUCTION HOSE.

6 BACK BUMPER OF ENGINE TO BE STRONGLY REINFORCED. THE SINGLE BAR WITH WHICH CO'S PREVIOUS LOCOMOTIVES HAVE BEEN EQUIPPED BENDS WHEN ENGINE IS JACKED UP AT BACK END.

7 PILOT TO CLEAR RAIL 6".

8 HEADLIGHT AND EQUIPMENT TO BE PYLE-NATIONAL ELECTRIC, TYPE K-2, WITH INCANDESCENT HEADLIGHTS.
HEADLIGHT TO HAVE GLASS REFLECTORS.
REAR HEADLIGHTS TO BE MOUNTED ON TOP OF CAB, ON SWIVELING BASE.

9 TWO LIGHTS TO BE PROVIDED UNDER RUNNING BOARD.

10 BACK END OF MAIN ROD TO HAVE A #EDGE SAME AS FOR ENGINE #400 B. L. H. CLASS 10 32 D 1167.
PARALLEL RODS TO HAVE SOLID ENDS.

11 ALL SPRINGS AND SPRING HANGERS TO BE EXTRA HEAVY TO CARE FOR ROUGH TRACK.
SPRING HANGERS TO STRADDLE FRAME. CHAFING PLATES TO BE APPLIED ON FRAME TO PROTECT FRAMES FROM WEAR.

12 FRONT ENGINE TRUCK BOX TO HAVE BABBITT ON FACE NEXT TO HUB OF WHEEL.

13 BACK ENGINE TRUCK BOX TO HAVE BABBITT ON FACE, NEXT TO HUB OF WHEEL.

14 ONE PAIR JOHNSON TYPE "Z" WRECKING FROGS. THE TYPE "Z" WRECKING FROGS MAYBE SHIPPED DIRECT IF THEY CANNOT BE DELIVERED TO THESE WORKS IN TIME FOR SHIPMENT OF LOCO.

TENDER

26 TENDER BUMPER TO BE SIMILAR TO LOCO. #400, B. L. H. CLASS 10 32 D 1167.

27 COUPLER TO HAVE DRAFT GEAR WITH FOLLOWER PLATE LUGS SAME AS FOR 10 32 D 1298.

28 STEPS, HAND HOLDS ETC., TO CONFORM TO I.C.C. REQUIREMENTS.

29 TENDER TRUCK CENTER BEARING OF CAST STEEL.

30 ALL SPRINGS AND SPRING HANGERS TO BE EXTRA HEAVY TO CARE FOR ROUGH TRACK.

THE BALDWIN LOCOMOTIVE WORKS As Spec'n. C-5108

Memorandum Spec'n 17126

SPECIFICATION FOR LOCOMOTIVES 10 32 D 1167 Gen. as PHOTO. 6222 (EXCEPT TO HAVE TWO HAND BOXES AND ELECTRIC HEADLIGHTS, AND TO OMIT AUXILIARY DOME.

FOR THE CROWELL & SPENCER LUMBER COMPANY, LTD. **Engine Drawing No.** 117

F 10-24-17

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 11' 4" Driving 11' 4" Total 21' 10"
Total wheelbase, eng. and tend. (Actual 51' 3" (Limited to ——

RAILS 60 POUNDS
Curves ——

Limits, Height —— Width ——
Weight (approximate) in working order, Total 140,000 POUNDS
On F. tr'k 30,000 lbs., Drivers 110,000 lbs., B. tr'k —— lbs.

Tractive power 27,700 lbs., Ratio of adhesion 3.97
Work'g St'm Pres. 180 lbs., Service LOGGING
Fuel WOOD Changed to coal See Xord 15978 - 1920.

FRONT TUBE SHEET TO BE ½" THICK.
Boiler STEEL Thick ⅝" & 11/16" Bill 8263
Boiler, Diam. 60" Plan EXTENDED WAGON TOP
Boiler st'm pres. 200 lbs., Tested to 220 lbs. steam pres.
WITH FACTOR OF SAFETY OF 4.8 267 lbs. water pres.
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS
DOME ONE PIECE TYPE
Dome, diam. 29" Pos. FORWARD OF FIREBOX

Firebox STEEL Combustion chamb. NONE
Firebox, length 96-3/16" Width 42⅜" Depth F. 65-3/16" B. 63-3/16"
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 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 EIGHT central rows
Crown bars NONE Placed —— above crown
Crown bolts ——

Flues #9 W. G. STEEL
Tubes #11 W. G. CHARCOAL IRON OR STEEL (B.L.W. OPTION)
Tube ends BEAGED FOR COPPER FERRULES, FIRE BOX ENDS
Number 21 148 Diam. 2⅜" 2" Length 13' 6"

Heating Surface	Flues	396.0	Combus. Chamb ——	Total	1574.0
	Tubes	1040.0	Fire Box 138.0	Fire Brick Tubes ——	
Grate area		28.3	Ratio to Heating Surface 1 :		55.5
Superheater		332.0			

Fire Brick ARCH, NONE

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

THROTTLE TO HAVE AUXILIARY DRIFTING VALVE
Throttle BALANCE Pos. DOME
Dry pipe STEEL

Superheater SCHMIDT TYPE (SEE SUP. 3)

Smokebox extension WITH Cleaning hole and cap L. S. ONLY
Door, spark-arrester hopper WITH
Netting and deflect. plates NONE

Exhaust nozzles SINGLE - Lge
CLEANING PIPE, WITH
HARLEY & HUNTER
Dia. 19" Hole in S. B., dia. 20½"
See H 11-9-17 Coal Burner

(NOT SPEC) **Safety Valves** TWO COALE 2½".
Safety valves NONE with relief lever, Set to 180 POUNDS
Whistle B. L. W. ~~PLAIN CHIME~~ 2.1.19.

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.:- L. S.
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 ——

Injectors TWO MONITOR (NOT SPEC) 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, Roof LINED WITH WOOD (Kr-ins. wrk'o)
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 32"

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. WITH OPEN KNUCKLE, HAVING WIDE SLOT FOR USE WITH LINK AND PIN. KNUCKLE TO HAVE FACE 15" DEEP.

Signal fixtures IRON ON BUMPER

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 BACK.

Dome casing IRON PAINTED

Boiler Jacket #18 SOFT STEEL Bands IRON Style 9
Boiler Lagging MAGNESIA SECTIONAL
LAGGING OVER STAYBOLTS TO BE REMOVABLE.

SPECIFICATION FOR LOCOMOTIVE ID. 32 D 1167

FOR THE CROWELL & SPENCER LUMBER COMPANY, LIMITED.

F

1 HOLLOW STAYBOLTS TO BE APPLIED WHERE THE ENGINE FRAMES INTERFER WITH INSPECTION OF SAME.

2 ALL JACKET AND BEARER PADS, ETC. TO BE APPLIED SO THAT STAYBOLTS CAN BE INSPECTED WITHOUT REMOVING.

3 SUPERHEATER AS LOCOMOTIVE SUPERHEATER CO.'S SPECIFICATION NO. C83-1460-A, DATED NOV. 1, 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.

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

5 PROVISION TO BE MADE SO THAT RY. CO. CAN CHANGE TO COAL BURNING ROCKING GRATES. FURNISH AND APPLY LEVERS AND RIGGING FOR OPERATING ROCKING GRATES, BUT DO NOT FURNISH THE GRATES.

6 SMOKE BOX TO BE EXTENDED SO LOCOMOTIVE CAN BE CHANGED TO BURN COAL, BUT DO NOT FURNISH HIGH EXHAUST NOR NETTING, ETC. FOR COAL.

7 CHAFING PLATES BETWEEN ENGINE AND TENDER TO BE GIVEN SPECIAL ATTENTION FOR OPERATION ON ROUGH TRACK.

8 LOCOMOTIVE TO BE BUILT TO CONFORM TO THE NECESSARY REQUIREMENTS OF THE INTERSTATE COMMERCE COMMISSION FOR MAIN LINE SERVICE.

9 HEADLIGHT EQUIPMENT TO BE PYLE NATIONAL ELECTRIC TYPE "E" WITH ARC HEADLIGHTS, WITH SWITCHES CONVENIENTLY LOCATED IN CAB TO CONTROL SAME.

10 CROSSHEADS TO HAVE BEARINGS OF CAST STEEL, TINNED.

11 WHEEL CLEARANCE TO BE AMPLE TO PREVENT RUBBING OUTSIDE OF FIREBOX AND FRAMES WHEN ENGINE HAS WORN TO LIMIT OF LATERAL MOTION.

T E N D E R

21 CHAFING PLATES BETWEEN ENGINE AND TENDER TO BE GIVEN SPECIAL ATTENTION FOR OPERATION ON ROUGH TRACK.

22 DRAFT RIGGING TO BE MADE EXTRA HEAVY WITH STANDARD DRAWHEAD SPRINGS, ETC. TO ABSORB SHOCK AND TO WITHSTAND HARD SERVICE.

23 LOCOMOTIVE TO BE BUILT TO CONFORM TO THE NECESSARY REQUIREMENTS OF THE INTERSTATE COMMERCE COMMISSION FOR MAIN LINE SERVICE.

Sk 322

SPECIFICATION FOR LOCOMOTIVE 10 32 D 1167

FOR THE CROWELL & SPENCER LUMBER COMPANY, LIMITED

Specification for Type A Double Loop Superheater. SPEC. No. C83-1460-A, DATED Nov. 1, 1917.

BOILER TUBES	148 in number 2 o. d. 13 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	1409-M
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	5871
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	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	10893
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. 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	4901
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 10916	DAMPER SHAFT LINK	Card 1070
DAMPER CYL. ARM	Card 1074	PATENT PLATE	Card 3272
DAMPER CYL. PIPE FITTING	Card 1069-A	S. H. UNIT BOLT WASHER	Card 1071
DAMPER CYL. PIPE ENDS	Card 1287	S. H. UNIT CLAMP	Card 1073
DAMPER CYL. PIPING DIAGRAM	Card 3258	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 1288
DAMPER SHAFT ARM	Card 1065	RETURN BENDS	Card 11022
DAMPER SHAFT BEARING (S)	Card 1148	DEFLECTING PLATE HANDLE	Card 1487
DAMPER SHAFT BEARING (L.S.)	Card 1275-H	LUBRICATOR CONNECTION	Card 3023
SPACING OF BANDS & SUPPORTS	Card 10759	DEFLECTING PLATE STUDS	Card 10809
TYPE OF RETURN BENDS	FORGED	DEFLECTING PLATE CLAMP	Card 10809-A

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-5108

Memorandum Spec'n 30021

SPECIFICATION FOR LOCOMOTIVES 10 32 D 1298

FOR CROWELL & SPENCER LUMBER COMPANY, LTD.

Gen. as PHOTO. 6222 EXCEPT TO OMIT AUXILIARY DOME AND TO HAVE TWO SAND BOXES AND ELECTRIC HEADLIGHTS.

Engine Drawing No. 121

2-6-20 (Mar. 1922)

Gauge of Road 4'8½" Play ⅜"

Wheelbase, Rigid 11'4" Driving 11'4" Total 21'10"

Total wheelbase, eng. and tend. {Actual 51' 3½" {Limited to ---

RAILS - 60 POUNDS.

Curves -----

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

Weight (approximate) in working order, Total 140,000 POUNDS

On F. tr'k 30,000 lbs., Drivers 110,000 lbs., B. tr'k ------ lbs.

Tractive power 27,700 lbs., Ratio of adhesion 3.97

Work'g St'm Pres. 180 lbs., Service LOGGING

Fuel SOFT COAL.

1-12 **Boiler** STEEL Thick ⅞" AND 1 1/16" Bill 8895

Front Tube Sheet ½" Thick

Boiler, Diam. 60" Plan EXTENDED WAGON TOP.

{Allowable st'm pres. 200 lbs. **Tested to** {220 lbs. steam pres.

{With Factor of Safety of 4.45 {267 lbs. water pres.

Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS.

DOME, ONE PIECE TYPE. AUXILIARY DOME - NONE.

Dome, diam. 29" Pos. FORWARD OF FIRE BOX.

2 **Firebox** STEEL Combustion chamb. NONE

Firebox, length 96-3/16" Width 42⅜" Depth F. 65-3/16" B. 63-3/16"

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.

Radial stays 1" DIAM. Sling stays front {TWO ROWS 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. CHARCOAL IRON OR STEEL (B.L.W. OPTION)

Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.

Number 21 148 Diam. 5⅜" 2⅜" Length 13' 6"

Heating Surface Flues 396 sq. ft. Combus. Chamb. --- Total 1574 sq. ft.

Tubes 1040 sq. ft. Fire Box 138 sq. ft. Fire Brick Tubes ---

Grate area 28.3 sq. ft. Ratio to Heating Surface 1: 55.6

Superheater 325 sq. ft.

Fire Brick ARCH, ON STUDS.

Grates ROCKING BARS AND DROP PLATE.

Ash Pan, Dampers (WITH) FRONT AND BACK

THROTTLE TO HAVE AUXILIARY DRIFTING VALVE.

Throttle BALANCE Pos. DOME

Dry pipe STEEL

Superheater SCHMIDT TYPE (SEE SUP. 3)

Smokebox extension WITH 13" cleaning hole and cap L.S. ONLY

Spark arrester in hopper WITH

Netting and deflect. plates WITH

Exhaust nozzle SINGLE - HIGH

Stack STRAIGHT Dia. 16"

Safety Valves TWO COALE 2½" OPEN.

Safety valves NONE with relief lever, Set to 180 POUNDS.

Whistle ONE - ILLINOIS CENTRAL STANDARD FREIGHT TYPE. AS PRINT D-5-3521 (HEREWITH)

Steam Gauge ONE IRON 7" MAKER:- ASHCROFT (Not Specified)

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: L.S.

Cleaning Plugs ONE FILLING PLUG IN TOP OF BOILER.

Firebox, CORNERS, BACK ONES DIAGONAL, SIDES AND BACK.

Crown, TWO EACH SIDE AND FOUR BACK.

Waist, ONE UNDER FRONT. ONE PLUG ABOVE FIREDOOR

Front tube sheet, ONE Fusible plug ONE

Pump NONE

Injectors TWO MONITOR (Not Specified) No. 8

Injectors, Pos. R. AND L. Steam pipes COPPER

5 Pipes, Check IRON Feed IRON Overflow IRON

6 Check B. L. W. Pos. R. AND L.

Steam Heat NONE

7 **Cab** STEEL,

CAB TO BE LARGE AND ROOMY.

8 ROOF LINED WITH WOOD

Cab boards STEEL Nosing T-IRON

Running boards STEEL Nosing T-IRON

Hand rail IRON Located on BOILER

9 **Back Bumper** BAR STEEL Back drawbar height 32"

9 **Pilot** WOOD Pushing shoes NONE

Front Bumper OAK Bumper plate WITH

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

10 **Front Drawhead,** Center above rail 33½"

11 **Coupler** M. C. B. AUTO.

Signal fixtures IRON ON BUMPER.

11½ **Headlight** TWO ROUND CASE 14" Reflector,

Headlight, Nos. on sides WITH Head stop WITH

Lamp shell NONE Nosing ---

Bell 92 POUNDS.

Sand Box TWO Diam. 28" Body IRON PAINTED Pipes IRON

Sanders {TWO AIR TRAP M., IN EACH BOX TO SAND FRONT AND BACK.

Dome casing, IRON, PAINTED.

Boiler Jacket #18 PLAIN STEEL. Bands IRON Style 9

Boiler Lagging MAGNESIA SECTIONAL.

THE BALDWIN LOCOMOTIVE WORKS

By W. Crowell March 1920.

SPECIFICATION FOR LOCOMOTIVES 10 32 D 1298

FOR CROWELL & SPENCER LUMBER COMPANY, LTD.

HW.

1 **Frames** CAST STEEL.

FRAMES TO BE EXTRA HEAVY FOR HARD SERVICE.

Cylinders, Diam. 19" Stroke 26"

St'm ports, Length 19.0" Width 1-3/8" Bridges ---

Exh. ports, Length --- Width --- Valve lead ⅛"

Valve travel 5½" Steam lap ⅞" Exhaust clearance ---

Eccentric crank throw 14" By-pass valve NONE

St'f. Lubr. DETROIT FIVE FEED No. 42 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 --- Covers ---

16 St'm chest valves PISTON TYPE.

Mot. plug (Not Specified) UNITED STATES KING TYPE.

17 PISTON RODS TO BE KEYED TO CROSSHEADS.

Pistons HEADS OF CAST IRON, WITH CAST IRON RINGS SPRUNG IN.

Guides LAIRD TYPE STEEL Oil cups NEEDLE

Crossheads CAST STEEL WITH BEARINGS OF CAST IRON TINNED.

Wrist Pins STEEL Rod cups FOR GREASE.

PARALLEL RODS TO HAVE SOLID ENDS.

18 **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.

Driving wheel hub liners BRASS

21 **Drivers,** O. S. Diam. 52" Cen. diam. 44" CENTRES 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 = 3/16" TOTAL.

Driving Boxes CAST STEEL.

Journals, Diam. 8" Length 10"

22 SPRINGS TO BE EXTRA HEAVY FOR HARD SERVICE.

Springs. Make B. L. W.

23 **Front Engine Truck** FOUR Wheeled SWING BOLSTER, CENTER BEARING

To swing 12" each side of cen., Cen. pin liners NONE

Journals, Diam. 5½" Length 10" Boxes CAST STEEL.

Wheel hub liners (SEE SUP.

Wheels, Diam. 28" Tread 4-11/32" Rolled STEEL

Tires NONE Cen. diam. --- Size ---

Tires held by 2½" THICK WHEEL RIMS.

Back Engine Truck NONE Wheeled ---

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

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

Wheel hub liners ---

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 WESTG. COMBINED AUTO AND STRAIGHT AIR

Parts { Eng. Tr'k. sch. ---

Foundation { Drivers, sch. No. 8 AMERICAN O.S. EQUALIZED

Parts { Eng. Tr'k. sch. ---

Air pump Two 9½" Pos. BOTH L. S.

Train connection FRONT AND BACK.

Train signal, sch. None

AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 310 POUNDS

Tender EIGHT Wheeled, Drawing No. 1305 (TENDER TO BE WEIGHED:- YES.

Weight, with fuel and water, about 100,000 POUNDS.

TANK PLATES TO BE EXTRA GAUGE.

Tank 5,000 Gallons, Bill 5211

TANK "U" SHAPE, STRAIGHT TOP. FUEL GAP. 4 CORBS.

WOOD RACK AROUND TOP OF TANK.

Tool Boxes HARD WOOD - TOP.

SYPHON CONNECTION TO TANK ON LEFT SIDE.

Frame STEEL 8" AND 10" CHANNELS WITH FRONT BUMPER OF WOOD AND BACK BUMPER OF CAST STEEL.

Front Drawbar height 30½"

Pilot NONE Pushing shoes CAST IN BUMPER.

9 Back drawhead, center above rail 33½"

11 **Coupler** M. C. B. AUTO.

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

Steps ACROSS REAR OF TENDER WITH HANDRAILS.

TRUCK CENTRE BEARINGS OF CAST STEEL.

TYNCKS 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. No. 6 ET WESTG. AUTO AND STRAIGHT AIR WITH 12" x 12" TENDER CYLINDER.

List of tools, sch. 29 ONE PAIR JOHNSON WRECKING FROGS.

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 lawe to 2-16-20 Shipment ON OWN WHEELS (SEE SUP. 2)

Brass shop finish, No. 1

Machine shop finish D-165

B. L. W. Patents { FEED WATER STRAINER, PAT'D. SEPT. 1, 1903 (CAST ON)

Property plates NONE

Painting, style 291, OLIVE GREEN AND ALUMINUM.

LETTERING TO BE CO'S STANDARD SAME AS FOR 10 32 D 1167

Mark on CAB SIDES, THE C. & S. L. CO. LTD.

MARK ON THE TANK COLLAR THE CROWELL & SPENCER LUMBER COMPANY, LIMITED.

Road Nos. Pos. Road Nos. Name NONE

F. No. PLATE 300

F. SAND BOX

SIDES OF TANK

BACK OF TANK

Actual Dimensions of Loco. Extreme height over all 14' 8"

Extreme Width: Cab boards 10' 3", Cylinders

Length outside face front bumper of engine to face of tender wedge

Length face of tender wedge to outside face back bumper of tender

Total length outside face front bumper of engine to outside face back bumper of tender 56' 8"

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-5108

Memorandum Spec'n 20021

SPECIFICATION FOR LOCOMOTIVES 10 32 D 1298

FOR Crowell & Spencer Lumber Company, Ltd.

Except to omit auxiliary dome and to have two sand boxes and electric headlights.

Gen. as Photo. 6222

Engine Drawing No. 121

2.6.20

Gauge of Road 4'8½" Play ⅜"

Wheelbase, Rigid 11'4" Driving 11'4" Total 21'10"

Total wheelbase, eng. and tend. {Actual 51' 3¼" / Limited to ---

Rails - 60 pounds.

Curves -----

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

Weight (approximate) in working order, Total 140,000 pounds

On F. tr'k 30,000 lbs., Drivers 110,000 lbs., B. tr'k ----- lbs.

Tractive power 27,700 lbs., Ratio of adhesion 3.97

Work'g St'm Pres. 180 lbs., Service Logging

Fuel Soft Coal.

1-12 **Boiler** Steel Thick ⅝" and 11/16" Bill 8895

Front Tube Sheet ½" Thick

Boiler, Diam. 60" Plan Extended Wagon Top.

{Allowable st'm pres. 200 lbs. / With Factor of Safety of 4.45} **Tested to** {220 lbs. steam pres. / 267 lbs. water pres.}

Longitud. seams Butt jointed, double covering strips.

Dome, one piece type. Auxiliary Dome - None.

Dome, diam. 29" Pos. Forward of fire box.

2 **Firebox** Steel Combustion chamb. None

Firebox, length 96-3/16" Width 42⅜" Depth F. 65-3/16" B. 63-3/16"

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 1¼" deep from O.S.

Radial stays 1" diam. Sling stays front {Two rows B. L. W. Expansion Stays.

Button heads below crown on Eight contral rows

Crown bars None Placed --- above crown

Crown bolts ---

Flues #9 W. G. Steel

Tubes #11 W.G. Charcoal Iron or Steel (B.L.W. Option)

Tube ends Swaged for copper ferrules, fire box ends.

Number 21 / 148 Diam. 5⅜" / 2⅜" Length 13' 6"

Heating Surface	Flues	396 sq. ft.	Combus. Chamb. ---	Total	1574 sq. ft.
	Tubes	1040 sq. ft.	Fire Box 138 sq. ft.	Fire Brick Tubes	---
Grate area		28.3 sq. ft.	Ratio to Heating Surface 1 :		55.6
Superheater		325 sq. ft.			

Fire Brick Arch, on studs.

Grates Rocking bars and drop plate.

Ash Pan, Dampers (With) Front and Back

Throttle to have auxiliary drifting valve.

Throttle Balance Pos. Dome

Dry pipe Steel

Superheater Schmidt type (See sup. 3)

Smokebox extension With 13 Cleaning hole and cap L.S. Only

Spark arrester or hopper With

Netting and deflect. plates With

Exhaust nozzle Single - High

Stack Straight Dia. 16"

Safety Valves Two Coale 2½" Opng.

Safety valves None with relief lever, Set to 180 pounds.

Whistle One - Illinois Central Standard Freight type. As print C-5-3521 (herewith)

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: L.S.

Cleaning Plugs One filling plug in top of boiler.

Firebox, Corners, back ones diagonal, sides and back.

Crown, Two each side and four back.

Waist, One under front. One plug above firedoor

Front tube sheet, One Fusible plug One

Pump None

Injectors Two Monitor (Not Spec.) No. 8

Injectors, Pos. R. and L. Steam pipes Copper

5 Pipes, Check Iron Feed Iron Overflow Iron

4 Check B. L.W. Pos. R. and L.

Steam Heat None

* **Cab** Steel.

Cab to be large and roomy.

* Roof lined with wood

Cab boards Steel Nosing T-Iron

Running boards Steel Nosing T-Iron

Hand rail Iron Located on Boiler

8 **Back Bumper** Bar Steel Back drawbar height 32"

9 **Pilot** Wood Pushing shoes None

Front Bumper Oak Bumper plate With

Steps Hand holds etc. to conform to I.C.C. requirements.

10 **Front Drawhead,** Center above rail 33½"

11 **Coupler** M. C.B. Auto.

Signal fixtures Iron on bumper.

11a **Headlight** Two round case 14" Reflector,

Headlight, Nos. on sides With Hd'l stop With

Lamp shell None Nosing ---

Bell 92 pounds.

Sand Box Two Diam. 28" Body Iron painted Pipes Iron

Sanders Each air trap 41, in each box to sand front and back.

Dome casing Iron painted.

Boiler Jacket #18 Plan. Steel. Bands Iron Style 9

Boiler Lagging Magnesia sectional.

THE BALDWIN LOCOMOTIVE WORKS

SPECIFICATION FOR LOCOMOTIVES 10 32 D 1298 March 1920.

FOR Crowell & Spencer Lumber Company, Ltd.

HW.

1 **Frames** Cast Steel.

Frames to be extra heavy for hard service.

Cylinders, Diam. 19" Stroke 26"

St'm ports, Length 19.8" Width 1-3/8" Bridges ---

Exh. ports, Length --- Width --- Valve lead ⅛"

Valve travel 5½" Steam lap ⅞" Exhaust clearance ---

Eccentric crank throw 11" By-pass valve None

St'm Lubr. Detroit five feed No. 42 Bull's 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 --- Covers ---

16 St'm chest valves Piston type.

Mot. peg (Not Spec.) United States King Type.

17 Piston rods to be keyed to crossheads.

Pistons Heads of cast iron, with cast iron rings sprung in.

Guides Laird type Steel Oil cups Needle

Crossheads Cast Steel with bearings of cast iron tinned.

Wrist Pins Steel Rod cups for grease.

Parallel rods to have solid ends.

18 **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.

Driving wheel hub liners Brass

21 **Drivers,** O. S. Diam. 52" Cen. diam. 44" Centres 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 - 3/16" total.

Driving Boxes Cast Steel.

Journals, Diam. 8" Length 10"

22 Springs to be extra heavy for hard service.

Springs. Make B. L. W.

23 **Front Engine Truck** Four Wheeled Swing bolster, center bearing

To swing 12" each side of cen., Cen. pin liners None

Journals, Diam. 5½" Length 10" Boxes Cast Steel.

Wheel hub liners (See sup.

Wheels, Diam. 28" Tread 4-11/32" Rolled Steel

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

Tires held by 2½" thick wheel rims.

Back Engine Truck None Wheeled ---

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

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

Wheel hub liners ---

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

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

Tires held by ---

Brakes, position On all driving and tender wheels.

Operating {Engine, sch. No. 6 ET Westg. Combined Auto and Parts / Eng. Tr'k. sch. Straight Air

Foundation {Drivers, wt. on --- American O.S. Equalized

Parts / Eng. Tr'k. sch. ---

Air pump Two 9½" Pos. Both L. S.

Train connections Front and Back.

Train signal, sch. None

All reservoirs to have hydrostatic test of 210 pounds

Tender Eight Wheeled, Drawing No. 1905 (Tender to be weighed:- Yes.)

Weight, with fuel and water, about 100,000 pounds.

Tank plates to be extra gauge.

Tank 5,000 Gallons, Bill 5211

Tank "U" shape, straight top. Fuel cap. 4 cords.

Wood rack around top of tank.

Tool Boxes Hard wood - top.

Syphon connection to tank on left side.

Frame Steel 8" and 10" channels with front bumper of wood and back bumper of cast steel.

Front Drawbar height 30½"

Pilot None Pushing shoes Cast in bumper.

9a Back drawhead, center above rail 33½"

3 **Coupler** M. C. B. Auto.

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

Steps across rear of tender with handrails.

Truck centre bearings of cast steel.

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 4⅝" 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 Westg. Auto and straight air with 12" x 12" tender cylinder.

List of tools, sch. 29-one pair Johnson Wrecking frogs.

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 2-16-20 Shipment On own wheels (See sup. 2d)

Brass shop finish, No. 1

Machine shop finish D-165

B. L. W. Patents: Feed Water Strainer, Pat'd. Sept. 1, 1903 (cast on)

Property plates None

Painting, style 291, Olive green and aluminum.

Lettering to be Co's standard same as for 10 32 D 1167

Mark on Cab sides, The C. & S. L. Co. Ltd.

Mark on the Tank Collar The Crowell & Spencer Lumber Company, Limited.

Road Nos. Pos. Road Nos. Name None

F. No. Plate 300

F. Sand Box

Sides of Tank

Back of Tank

Actual Dimensions of Loco. Extreme height over all 14' 8"

Extreme Width: Cab boards 10' 3", Cylinders [illegible]

Length outside face front bumper of engine to face of tender wedge [illegible]

Length face of tender wedge to outside face back bumper of tender [illegible]

Total length outside face front bumper of engine to outside face back bumper of tender 58' 8"

SPECIFICATION FOR LOCOMOTIVES - 10 32 D 1298

FOR CROWELL & SPENCER LUMBER COMPANY, LTD.

Specification for Type A Double Loop Superheater SPEC. D-12993 - FEB. 19TH, 1920.

BOILER TUBES	148 ...in number... 2 ...o.d... 13 ...ft... 6 ...in. over tube sheets. Tubes located between and adjacent to boiler flues are to be headed over at front end. Tubes to be in accordance with the American Society for Testing Materials Specification A-28-18.
BOILER FLUES	21 ...in number... 5½ ...o.d. #9 B.W.G. ...of cold drawn seamless steel. Flues to be in accordance with the American Society for Testing Materials Specification A-28-18 ..... Card 1409-M
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 wet pitt copper ferrule, rolled, headed and prossered except for copper sheets. Front end to be rolled and headed. Rollers to have at least 5 rolls. Prosser to have at least 12 sections ..... Card 1136
TUBE SHEET LAYOUT	..... Card 5871
UNITS	21 ...units... 15 ...o.d... #9 B.W.G. ...Pipes to be in accordance with the American Society for Testing Materials Specification A-28-18. Pipes united by return bends. Each unit to be tested, before being placed in boiler, with water under pressure of 500 lb. per sq. in.
UNIT PIPE SUPPORTS	Of steel fastened securely on superheater pipes so as not to slide ..... Card 1077
UNIT PIPE JOINT	To be made in best possible manner to insure absolutely tight joints in accordance with the notation on ..... Card 1049
UNIT CLAMP BOLT	To be in accordance with requirements of Locomotive Superheater Company Material Specification No. 13-A ..... Card 10895
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 metal number cast on in which 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 oil ammonia. 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 10893
HEADER SUPPORTS	To be securely fastened to boiler shell with studs or turned bolts fitted to 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 pipe or cylinder. Pipe to be well protected against freezing. Card 11314
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 4901-ME
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 1016	S. H. UNIT BOLT WASHER	Card 1071
DAMPER CYL. ARM	Card ~~1065~~ 1065-A	S. H. UNIT CLAMP	Card 1073
DAMPER CYL. PIPE FITTING	Card 11115	S. H. UNIT CLAMP WASHER	Card 10305
DAMPER CYL. PIPE UNION	Card 11114	S. H. PIPE END	Card 1348
DAMPER CYL. PIPING DIAGRAM	Card 11274	S. H. PIPE BAND	Card 1988
DAMPER CYL. SUPPORT	Card	SPACING OF BANDS & SUPPORTS	Card 10759
DAMPER SHAFT	Card 1038	TYPE OF RETURN BENDS	Forged
DAMPER SHAFT ARM	Card ~~1065~~ 1074-C	RETURN BENDS	Card 11022
DAMPER SHAFT BEARING (O.S.)	Card 1148	LUBRICATOR CONNECTION	Card 3023
DAMPER SHAFT BEARING (I.S.)	Card 1275-A	DEFLECTING PLATE HANDLE	Card 1087
DAMPER SHAFT LINK	Card 1070	DEFLECTING PLATE STUDS	Card 10801
PATENT PLATE	Card 3272	DEFLECTING PLATE CLAMP	Card 10809-A
PYROMETER	NONE	DAMPER RIGGING	Card 11288-B

SPECIFICATION FOR LOCOMOTIVES 10 32 D 1298

FOR CROWELL & SPENCER LUMBER COMPANY LTD.

1 BOILER TO BE OPERATED IN LOUISIANA, AND TO CONFORM TO I.C.C. REQUIREMENTS. (SEE SUP. 12)

2 ALL BEARER PADS, ETC. TO BE APPLIED SO THAT STAYBOLTS CAN BE INSPECTED WITHOUT REMOVING.

3 SUPERHEATER AS LOCOMOTIVE SUPERHEATER CO'S SPECN. No. D-12993 DATED FEB. 19, 1920. (COPY ATTACHED)
SUPERHEATER TO CONNECT WITH TOP HEADER IN SMOKE BOX AND TO HAVE OUTSIDE STEAM PIPE CONNECTIONS TO VALVE CHAMBERS.
SUPERHEATER DAMPER TO BE SWITCH ENGINE TYPE, TO GIVE BEST RESULTS AT SLOW SPEEDS, AT WHICH LOCOMOTIVE IS TO BE OPERATED.
ROYALTY PAYABLE BY THE B. L. W.

4 INJECTOR CHECK VALVES TO BE OF REGRINDING TYPE, WITH CUT OUT TO PERMIT RESEATING WHILE ENGINE IS UNDER STEAM.

5 SYPHON (5") UNDER CAB BOARD ON LEFT SIDE WITH PIPE CONNECTION TO TANK AND WITH 25 FEET OF SUCTION HOSE.

6 RAIL WASHER TO BE PROVIDED.

7 REAR END OF ENGINE FRAMES TO BE PROVIDED WITH AN EXTRA HEAVY TIE BAR STRONGLY REINFORCED, TO PERMIT JACKING UP OF ENGINE AT THIS POINT.

8 TENDER WEDGE DRAWER BETWEEN ENGINE AND TENDER TO BE CAST STEEL.

9 PILOT TO CLEAR RAILS 6".

~~10 DRAFT RIGGING TO BE MADE EXTRA HEAVY AND TO HAVE STANDARD DRAW HEAD SPRINGS, ETC., TO ABSORB SHOCK AND WITH STAND HARD SERVICE. FOLLOWER PLATES IN DRAFT RIGGING OF CAST STEEL WITH LUGS TO HOLD SPRINGS IN CENTRAL POSITION.~~ DOES NOT APPLY TO ENGINE T. HAMMER. APP. RS. MCC. 9-28-22

11 COUPLER TO HAVE SLOTTED OR OPEN KNUCKLE SO THAT DRAW IRONS CAN BE USED FOR LINK AND PIN COUPLINGS.
KNUCKLES TO HAVE 15" FACE WITH WIDE SLOT.

12 LOCOMOTIVE TO BE BUILT IN ACCORDANCE WITH THE NECESSARY REQUIREMENTS OF THE INTERSTATE COMMERCE COMMISSION FOR MAIN LINE SERVICE.

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

14 HEADLIGHT EQUIPMENT TO BE PYLE-NATIONAL ELECTRIC, TYPE K-2 WITH ARC-INCANDESCENT HEADLIGHTS AND WITH SWITCHES CONVENIENTLY LOCATED IN CAB TO CONTROL SAME. ELECTRIC HEADLIGHTS TO BE PROVIDED WITH INCANDESCENT BULBS AND GLASS REFLECTORS. REAR HEADLIGHT TO BE MOUNTED ON TOP OF CAB ON SWIVELING BASE.

15 TWO LIGHTS TO BE PLACED UNDER RUNNING BOARDS.

16 STEAM CHEST VALVES TO BE SET FOR 1/8" LEAD WITH 7/8" STEAM LAP.

17 BACK END OF MAIN ROD TO HAVE A WEDGE SAME AS FOR LOCOMOTIVE No. 400, B.L.W. CLASS 10 32 D 1167.

18 VALVE GEAR TO BE OF SAME TYPE AS COMPANY'S ENGINE No. 104 B. L. W. CLASSIFICATION 8 24 C 221, I.E., CONNECTION TO CROSSHEAD IS TO BE MADE AT CENTER OF CROSSHEAD AND NOT FROM BOTTOM.

21 DRIVING WHEEL CLEARANCE TO BE AMPLE TO PREVENT RUBBING OUT SIDE OF FIRE BOX AND FRAMES WHEN THE ENGINE HAS WORN TO THE LIMIT OF LATERAL MOTION.

22 EQUALIZING BEAMS TO BE EXTRA HEAVY FOR HARD SERVICE.
SPRINGS AND HANGERS TO BE EXTRA HEAVY FOR ROUGH SERVICE.
SPRING HANGERS ON MIDDLE LOCATIONS TO BE SAME AS ON ENGINE No. 102, TO B. L. W. CLASS 10 30 D 655 TO PREVENT CHAFING.

23 ENGINE TRUCK BOXES TO HAVE FACES BABBITTED NEXT TO HUBS OF WHEELS, OMIT LINERS FROM HUBS OF WHEELS.

24 MATERIAL ON EXTRA ORDERS NOS. 15978, 16045 AND 16256 DATED MAR. 1920, TO BE SHIPPED WITH LOCOMOTIVE.

25 BRAKE SHOES AND KEYS FOR MIDDLE DRIVERS TO BE SHIPPED DIRECT.

FOR HEREAFTER: When Laird guides are specified look into clearance between guid bars and No. 3 wrist pin. See that pin in upper end of combining lever clears valve rod crosshead guide. See that clearance is provided between outside of guide bar and reverse link in its full forward swing motion.
That error discovered in Erecting Shop when erecting this locomotive.

K.R. - J.S.K. 4.12.20.

TENDER

36 DRAFT RIGGING TO BE MADE EXTRA HEAVY, AND TO HAVE STANDARD DRAWHEAD SPRINGS, ETC., TO ABSORB SHOCK AND WITHSTAND HARD SERVICE. FOLLOWER PLATES IN DRAFT RIGGING OF CAST STEEL WITH LUGS TO HOLD SPRINGS IN CENTRAL POSITION. OK. S.S.H. 9-28-22.

37 COUPLER TO HAVE SLOTTED OR OPEN KNUCKLE, SO THAT DRAW IRONS CAN BE USED FOR LINK AND PIN COUPLINGS.
KNUCKLES TO HAVE 15" FACE WITH WIDE SLOT.

38 WEDGE BLOCK BETWEEN ENGINE AND TENDER TO BE CAST STEEL.

THE BALDWIN LOCOMOTIVE WORKS As Spec'n. C-6001

Memorandum Spec'n 19080

SPECIFICATION FOR LOCOMOTIVES 10 30 D 669

FOR J. F. Darby Lumber Company

P

Gen. as Photo. 5372

Engine Drawing No. 95

11-24-19 (Spec)

Gauge of Road 4' 8½" Play ¾"

Wheelbase, Rigid 11' 4" Driving 11' 4" Total 22' 2"

Total wheelbase, eng. and tend. Actual 50' 1" / Limited to MAY BE 53 FEET.

DRIVING WHEEL BASE AS SPECIFIED MUST NOT BE EXCEEDED

Curves ---

Limits, Height --- Width ---

Weight (approximate) in working order, Total 126,500 POUNDS

On F. tr'k 28,000 lbs., Drivers 98,500 lbs., R. tr'k --- lbs.

Tractive power 23,200 lbs., Ratio of adhesion 4.24

Work'g St'm Pres. 185 lbs., Service FREIGHT

Fuel SOFT COAL

Boiler STEEL Thick ⅜"&11/16" Bill 8792

Front Tube Sheet ½" Thick

Boiler, Diam. 58" Plan EXTENDED WAGON TOP

Allowable st'm pres. 200 lbs. **Tested to** 220 lbs. steam pres.

With Factor of Safety of 5. 267 lbs. water pres.

Longitud. seams BUTT JOINTED, WITH DOUBLE COVERING STRIPS, SEXTUPLE RIVETED, 90% SEAMS.

Dome, diam. 29" Pos. FORWARD OF FIRE BOX

DOME ARRANGED FOR INSPECTION OF BOILER, WITHOUT REMOVING THROTTLE BOX OR STAND PIPE.

Firebox STEEL Combustion chamb. NONE

Firebox, length 86-15/16" Width 41⅜" Depth F. 61¼" B. 59¾"

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" DIAM Sling stays front TWO ROWS 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 (B.L.W. OPTION)

Tube ends SHAGED FOR COPPER FERRULES, FIRE BOX ENDS.

Number 230 Diam. 2" Length 13' 10"

Heating Surface Flues --- Combus. Chamb. --- Total 1783

Tubes 1658 Fire Box 127 Fire Brick Tubes ---

Grate area 25.1 Ratio to Heating Surface 1: 71.2

Superheater ---

Fire Brick ARCH - NONE

Grates ROCKING BARS, FINGER TYPE, WITH 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. 16"

Safety Valves TWO "STAR" 3", ONE MUFFLED.

Safety valves NONE with relief lever. Set to 185 POUNDS, MUFFLED / 188 POUNDS, OPEN

Whistle ONE 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

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 ABOVE FIRE-DOOR

Firebox, CORNERS DIAGONAL

Crown, THREE L. S., TWO R. S., TWO BACK.

Waist, ONE UNDER FRONT.

Front tube sheet, TWO Fusible plug ONE

Pump NONE

LOCO. WILL OPERATE PART OF THE TIME OVER THE TRACKS OF THE GEORGIA & FLORIDA RY., IN THE STATE OF GEORGIA.

Injectors TWO SELLERS CLASS "N" (Spec) No. 9½

Injectors, Pos. R. AND L. Steam pipes COPPER

Pipes, Check IRON Feed IRON Overflow IRON

Check SELLERS MAIN CHECK WITH STOP VALVES. Pos. R. AND L.

Steam Heat NONE

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 33½"

Pilot WOOD Pushing shoes FRONT

Front Bumper OAK Bumper plate WITH

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

Front Drawhead, Center above rail 33½"

Coupler M. C. B. AUTO.

Signal fixtures IRON ON BUMPER (Not Spec)

HEADLIGHT EQUIPMENT TO BE PYLE NATIONAL ELECTRIC, TYPE "K" WITH INCANDESCENT HEADLIGHTS.

Headlight TWO ROUND CASE 18" Reflector.

Headlight, Nos. on sides WITH Hdlt sting WITH

Lamp shelf NONE Nosing NONE

Bell 85 POUNDS

Sand Box ONE Diam. 85" Body IRON PAINTED Pipes IRON

Sanders LEACH AIR, DOUBLE, TRIP A-10, 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

W. O. Webster

SPECIFICATION FOR LOCOMOTIVES 10 30 June 1920. 669

FOR J. F. Darby Lumber Company

328

Frames CAST STEEL

Cylinders, Diam. 18" Stroke 26"

St'm ports, Length 16" Width 1¼" Bridges 1"

Exh. ports, Length 16" Width 2½" Valve legs ¼"

Valve travel 5½" Steam lap ¾" Exhaust clearance ---

Eccentric crank throw 12¾" By-pass valve NONE

S. F. Lubr. DETROIT TRIPLE No. 22 BULL'S EYE (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. UNITED STATES, KING TYPE (Spec)

PISTON RODS TO BE KEYED TO CROSSHEADS

Pistons HEADS CAST IRON, WITH CAST IRON RINGS SPRUNG IN

Guides STEEL Oil cups NEEDLE

Crossheads CAST STEEL, WITH BEARINGS OF CAST IRON, TINNED

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 wheel hub liners NONE

Drivers, O. S. Diam. 57" Cen. diam. 50" CENTERS 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 = 3/16" TOTAL

Driving Boxes STEELED CAST IRON

Journals, Diam. 8¼" Length 8½"

Springs. Make B. L. W.

Front Engine Truck FOUR Wheeled SWING BOLSTER, CENTER BEARING

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

Journals, Diam. 5" Length 10" Boxes CAST IRON

Wheel hub liners NONE

Wheels, Diam. 28" Tread 1¼" Kind CHILLED CAST IRON PLATE

Tires NONE Cen. diam. --- Size ---

Tires held by ---

Back Engine Truck NONE

* LOCOMOTIVE TO BE BUILT TO BURN COAL, AND NECESSARY PARTS INCLUDING GRATES, STACK, NETTING ETC., TO PROVIDE FOR CHANGE TO WOOD FUEL TO BE ORDERED THROUGH EXTRA WORK DEPARTMENT, ORDER No. 11355 DATED 12-31-19, AND SHIPPED WITH LOCO. AND CHARGED FOR.

Brake, position ON ALL DRIVING AND TENDER WHEELS.

Operating Parts: Engine, sch. No. 6-ET WESTG. COMBINED AUTO. AND STRAIGHT AIR / Eng. Tr'k, sch. ---

Foundation Parts: Drivers, sch. US-1 AMERICAN O. S. EQUALIZED. / Eng. Tr'k sch. ---

Air pump ONE 9½" Pos. L. S.

Train connections FRONT AND BACK

Train signal, sch. "L"

AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

Tender EIGHT Wheeled, Drawing No. 1475 TENDER TO BE WEIGHED: YES

Weight, with fuel and water, about 100,000 POUNDS

TENDER TO BE LONG, LOW DESIGN, GEN. AS PHOTO. 6038

Tank 5,000 Gallons, Bill 4830

TANK "U" SHAPE, STRAIGHT TOP. FUEL CAPACITY 8 TONS

WOOD RACK AROUND TOP OF TANK

Tool Boxes HARD WOOD, TOP

Frame STEEL, 8" AND 10" CHANNELS, WITH BUMPERS OF WOOD AND STEEL PLATE

Front Drawbar height 31⅞"

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 BOLSTERS

Springs ELLIPTIC, B. L. W.

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 WESTINGHOUSE AUTOMATIC 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 spec'ns B. L. W.

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

Junior laws to 1-5-20 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 B. L. W. FOR ENGINE AND TENDER

Painting, style 291, OLIVE GREEN AND ALUMINUM

MARK ON CAB SIDES: J. F. D. L. CO.

Mark on TANK SIDES J. F. DARBY LUMBER COMPANY

Road Nos. Pos. Road Nos. Name NONE

F. No. PLATE 167

CAB SIDES

BACK OF TANK

Actual Dimensions of Loco. Extreme height over all 13' 11"

Extreme Width: Cab boards 9' 11": Cylinders or valve motion 9' 1"

Length outside face front bumper of engine to face of tender wedge = 31' 7"

Length face of tender wedge to outside face back bumper of tender = 23' 7½"

Total length outside face front bumper of engine to outside face back bumper of tender = 55' 2½"

For Hereafter: Pls note the spec. for this loco was changed to provide for the bottom portion of drawhead to be 25" center above rail instead of 27". Before this change could be made in the shops the drawhead previously specified and ordered had been made and had been applied to the loco, and the loco was ready for delivery. In order to avoid delay in the delivery Mr. Pilcher authorized the Shops to ship the loco. with the old drawhead without making any change in the Drawing Room Specs.

THE BALDWIN LOCOMOTIVE WORKS

Memorandum Specn 19017

SPECIFICATION FOR LOCOMOTIVES 10 18 ½ 0 36

FOR Deep River Lumber Corporation

B.

Gen as Photo. 4330 with step at front

Engine Drawing No. 16

3-18-19

Gauge of Road 4' 8½" Play 3"
Wheelbase, Rigid 7' 10" Driving 7' 10" Total 20' 7"
Total wheelbase, eng. and tend. { Actual —— / Limited to 39' 9½"

Curves ——
Rails = 30 pounds
Limits, Height —— Width ——
Weight (approximate) in working order, Total 95,000 pounds
On F. Trk 7,000 lbs. Drivers 40,000 lbs., B. Trk 8,000 lbs.

Tractive power 9900 lbs., Ratio of adhesion 4.08
Work'g St'm Pres. 180 lbs., Service Logging
Fuel Wood

FRONT TUBE SHEET TO BE ½" THICK
Boiler Steel Thick ½" Bill 8526
Boiler, Diam. 56" 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 4.5
Longitud. seams Butt jointed, double covering strips

Dome, Diam. 22" Pos. Forward of fire box

Firebox Steel Combustion chamb. None
Firebox, length 53-1 5/16" Width 39⅜" Depth F. 46" S. 39"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firebox opening 16" diam. Firebox to be large
Water space, Front 3½" Sides 3½" Back 3½"
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 sh. Four Material Iron
Crown bars None Pitch —— above crown
Crown bolts ——

Tubes —— Material ——
Tubes #12 n. s. Diamond, Iron Spacing ——
Tube ends Beads for copper ferrules, Tinned ends
Number 72 Diam. 2" Length 10' 1"

Washout Plugs —— Opposite Openings —— Total ——
Surface Tubes —— Fire Box —— Fire Brick Tubes ——
Grate area 14" Ratio of Heating Surface to 30.7
Superheater ——

Fire Brick Arch, None

Combustion Chamber Plate and Arch Plate
Arch Pipe, Diameter, Front and Back
Arch Tubes, Diameter, Front and Back
Arch Tubes to be well expanded to prevent admission of air.

Throttle, Diameter Pos. Dome
Throttle Valve

Superheater None

Throttle Valve to work between superheater
Throttle Pipe, Diameter Material Wrought Iron and Cast Steel
Throttle Pipe to have Drain

Safety Valves Two Star 2" (Spec)
Safety valves None with relief lever, Set to 180 pounds
Whistle One 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 Two B.L.W. Pos.- Right and Left
Cleaning Plugs One filling plug in top of boiler
Firebox Corners,
Crown, One R S., Two 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 plates ——
One 2½" Syphon under Cab Board on left side with 25 feet of suction hose.
Injectors Two Sellers (Spec) 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 Steel

Cab boards Rock Supply Tank
Running boards Wood Water Tank
Hand rail Iron Located on Boiler

Sand Dumper Sun Steel Sand dumper height 82"

Pilot None Pushing shoes None
Front Bumper Oak Bumper plate Iron
Steps across front with handrail.
Brake, hand holds etc. to conform to I.C.C. requirements

Coupler M.C.B. Auto. with slotted knuckle, 33½" centre above rail, and cast steel drawhead for link and pin coupling 22" 2.5" centre above rail.
Steps, hand holds, etc. to conform to I.C.C. requirements.

Front Coupler M.C.B. Auto. with slotted knuckle, 33½" centre above rail, and cast steel drawhead for link and pin coupling 22" 2.5" centre above rail.
Steps, hand holds, etc. to conform to I.C.C. requirements.

Coupler Pocket Cast Steel, Pos. Front and Back
Coupler Lifter Iron, Pos. Front and Back
Arch Bar to be well reinforced to prevent admission of air.

Throttle Valve Pos. Dome
Throttle Lever

Superheater None

Throttle Valve to work between superheater
Throttle Lever Material Wrought Iron and Cast Steel, Tinning Nuts and Lag Bolts
Throttle Lever to have Drain

Throttle Pipe, Diameter Material Wrought Iron and Cast Steel
Throttle Pipe to have Drain

Sand Box Top Diam. 27" Body Plate Thickness Plate Steel
Sand Box to have cleats and hasp

Sand Pipes, Diameter
Sand Pipes

Sand Box Top Diam. 27" Body Plate Thickness Plate Steel
Sand Box to have cleats and hasp

Sand Pipes, Diameter
Sand Pipes

Bell Yoke
Bell Ring Top Diam. 17" Body Plate Thickness Plate Steel
Bell Ringer to have cleats and hasp

Bell Ringer, Diameter
Bell Ringer

Bell Yoke
Bell Ring Top Diam. 17" Body Plate Thickness Plate Steel
Bell Ringer to have cleats and hasp

Bell Ringer, Diameter
Bell Ringer

Headlight Pos. Front Back Diameter Reflector, Diameter
Headlight Bracket, Diameter Wiring
Lamp Shell —— Wiring ——

Headlight Pos. Front Back Diameter Reflector, Diameter
Headlight Bracket, Diameter Wiring
Lamp Shell —— Wiring ——

Bell Yoke
Bell Ring Top Diam. 17" Body Plate Thickness Plate Steel
Bell Ringer to have cleats and hasp

Bell Ringer, Diameter
Bell Ringer

Headlight Pos. Front Back Diameter Reflector, Diameter
Headlight Bracket, Diameter Wiring
Lamp Shell —— Wiring ——

THE BALDWIN LOCOMOTIVE WORKS

G.P. Brock Mar. 1919

SPECIFICATION FOR LOCOMOTIVES 10 18 ½ D 36

FOR Deep River Lumber Corporation

B.

330

Frames Cast Steel Braces Solid

C. Indors, 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 ⅞" Exhaust clearance ——
Eccentric throw 3½" By-pass valve None
S. F. Lubr. Michigan Double Bull's 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) U. S. King Type (Not Spec)
Piston Rods to be keyed to crosshead
Pistons Cast iron rings sprung into solid head
Guides Alligator type, Steel Oil cups Needle
Crossheads Cast Steel with bearings of cast iron, tinned
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.
Parted eccentrics held together with solid forged key

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 5/16"
Tires, Plain, Pos. None Size ——
Lateral play between driving boxes and wheel hubs – 1/32" total
Driving Boxes Cast Iron
Journals, Diam. 5" Length 6"

Springs to be extra heavy for logging service
Springs. Make B. L. W.

Front Engine Truck Two Wheeled Swing bolster
To swing 2" 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 Spoke
Tires None Con. diam. —— Size ——
Tires held by ——
Front engine truck wheels without hub liners
Back Engine Truck Two Wheeled Swing bolster
To swing 2" 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 Spoke
Tires None Con. diam. —— Size ——
Tires held by ——
Back engine truck wheels without hub liners

Brakes, position On all driving wheels (No tender)
Operating Parts { Engine, Sch. B-5 B.L.W. Steam / Eng. Trk. sch. ——
Foundation Parts { Drivers, sch. B-5 B.L.W. / Eng. Trk., sch. ——
Air pump None Pos. ——
Train connections None
Train signal, sch. None
Separate lubricator for steam brake valve.
One set Running Gearer for burning coal, with all necessary fixtures for operation to be ordered through Extra Work Dept. Order No. 2894 dated 3-4-19 and to be shipped with Loco. (No brakes). This equipment to be fitted to Loco. as for as possible so as to make future application convenient.

Tender Eight Wheeled, Drawing No. 1381
Weight, with fuel and water, about 45,000 pounds

Tank 2,000 Gallons, Bill 2705
Tank "U" shape, straight top. Fuel capacity – 2 Cords
Woodrack around top of tank
Tool Boxes Hard Wood, Top.
Syphon connection to be provided to tank on left side
Frame Steel 6" Channel, with front bumper of channel formed from side channels turned in towards centre. Back bumper of wood
Front Drawbar height 29⅜"
Pilot None Pushing shoes None

Coupler M.C.B. Auto. with slotted knuckle, 33½" centre above rail, and cast steel drawhead for link and pin coupling 22" 2.5" centre above rail.
Steps, hand holds, etc. to conform to I.C.C. requirements.
Steps across rear with handrail
Trucks Arch Bar type with steel bolsters
Springs to be extra heavy for logging service
Springs Elliptic. B. L. W.
Journals, Diam. 3½" Length 7"
Wheels, Diam. 24" Tread 4½" Kind Chilled Cast Iron Plate
Tires None Con. diam. —— Size ——
Tires held by ——
Safety chains Single

Brake Position On all wheels
Brake sch. B. L. W. Hand

* Mr. Z.H. Powell, President, is to be notified by telegraph, three days before locomotive is to be shipped so he may come here and make inspection.
List of tools, sch. 27 One pair wrecking frogs
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 5-15-19 Shipment On own wheels (See also below)

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 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, Deep River Lumber Corp.

Road Nos. Pos.	Road Nos.	Name None
F. No. Plate	4	
F. Sand Box		
Cab Sides		
Back of Tank		

Actual Dimensions of Loco.—Extreme height over all = 11' 08"
Extreme Width:—Cab boards 7' 6" Cylinders or valve motion 7' 11"
Length outside face front bumper of engine to face of tender wedge 25' 6⅞"
Length face of tender wedge to outside face back bumper of tender 18' 4"
Total length outside face front bumper of engine to outside face back bumper of tender = 43' 10⅞"

THE BALDWIN LOCOMOTIVE WORKS Dup. 10 24 + 0 111 WITH BAR GUARDS EXCEPT AS OTHERWISE SPECIFIED

Memorandum Specn. 1905

SPECIFICATION FOR LOCOMOTIVES 10 24 + 0 124

FOR FLORALA SAW MILL COMPANY

Gen. as Photo. 5891

Engine Drawing No. 28

7-16-19 (Rod Spec.)

Gauge of Road 4' 8½" Play 3" **Wheelbase,** Rigid 9' 2" Driving 9' 2" Total 35' 9"

Total wheelbase, eng. and tend. { Actual 45' 9½" / Limited to —

Curves —

Limits, Height — — Width —

Weight approximate in working order, Total 98000 pounds

On F. truck 30,000 lbs., Drivers 71,000 lbs., B. truck 14,000 lbs.

Tractive power 18,700 lbs. Ratio of adhesion 3.7

Work'g St'm Pres. 180 lbs., Service LOGGING

Fuel Wood

FRONT TUBE SHEET ½" THICK

Boiler STEEL Thick 9/16" Bld. 3849

Boiler, Diam. 52" Plan EXTENDED WAGON TOP

Boiler st'm pres. 200 lbs., Tested to { 220 lbs. steam pres. / 287 lbs. water pres.

WITH FACTOR OF SAFETY OF 4.4

Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS

Dome, diam. 28" Pos. FORWARD OF FIRE BOX

Firebox STEEL Combustion chamb. NONE

Firebox, length 59-5/16" Width 34⅜" Depth F. 50⅞" B. 58"

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

Firedoor opening 15" DIA.

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

Water space, Frame SINGLE Riveted

Water space stays ⅜" DIA. WITH 3/16" HOLES 1½" DEEP FROM O.S.

TATE FLEXIBLE STAYS - 252 IN BREAKING ZONE

Radial stays 1" DIA. Sling stays from { TWO ROWS B.L.W. EXPANSION STAYS

Button heads below crown on EIGHT 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 160 Diam. 2" Length 11' 10½"

Heating Flues — Combus. Chamb. — Total 1074

Surface Tubes 993 Fire Box 96 Fire Brick Tubes —

Grate area 14.1 Ratio to Heating Surface 1 : 78

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

SMOKE BOX TO HAVE FULL EXTENSION

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

Stack RADIATOR IMPROVED Dia. 15"

STACK OF THE SAME TYPE AS APPLIED TO 10 24½ D 135

Safety Valves TWO COALE 2½" OPEN

Safety valves NONE with relief lever. Set to 180 POUNDS

Whistle B. L. W. PLAIN

Steam Gauge ONE IRON, 7" MAKER: ASHCROFT (Rod 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 5/16" 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 3" SYPHON UNDER CAB BOARD ON LEFT SIDE WITH 20 FEET OF SUCTION HOSE

Injectors TWO "MONITOR" (Rod Spec.) 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 33"

BACK FOOT PLATE OF CAST STEEL.

Pilot WOOD Pushing shoe 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

REAR HEADLIGHT TO BE APPLIED ON TOP OF CAB

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. 28" Body IRON PAINTED Pipes IRON

Sander HAND. 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)

August-1919.

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SPECIFICATION FOR LOCOMOTIVES 10 24 + 0 124

FOR FLORALA SAW MILL COMPANY

Frames CAST STEEL

Cylinders, Diam. 18" Stroke 24" **Bridges** 1"

St'm ports, Length 18" Width 1½" **Valve lead** 5/16"

Exh. ports, Length 18" Width 2½" Exhaust clearance —

Valve travel 4½" Steam lap ¾" By-pass valve NONE

Eccentric crank throw 5-7/16" (Spec.)

S. P. Lubr. DETROIT TRIPLE No. 23 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 BALANCED, WITH VACUUM VALVES

Met. pkg { PISTON RODS / VALVE STEMS } UNITED STATES (Rod Spec.)

Pistons CAST IRON RINGS SPRING INTO SOLID HEAD

Guides STEEL Oil cups NEEDLE

Crossheads CAST STEEL

Wrist Pins STEEL Rod cups PLUNGER

SIDE ROD BRASSES TO BE SPLIT (NOT SOLID)

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 WHEEL HUB LINERS - NONE

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

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 - 1/32" TOTAL

Driving Boxes CAST IRON

Journals, Diam. 6" Length 8"

Springs. Make STANDARD STEEL WORKS

FRONT TRK. WHEEL HUB LINERS - BRASS

Front Engine Truck TWO Wheeled SWING BOLSTER, CENTER BEARING

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

Journals, Diam. 6½" Length 7½" Boxes CAST IRON

Wheels, Diam. 24" Tread — Kind { STANDARD STEEL WORKS / ROLLED STEEL

Tires NONE Cen. diam. — Size —

Tires held by — WHEEL RIMS 2½" THICK

BACK ENGINE TRUCK WHEEL BOLSTER OF CAST STEEL

Back Engine Truck TWO Wheeled SWING BOLSTER, SIDE BEARING

To swing 5" each side of cen., Cen. pin liners NONE

Journals, Diam. 6½" Length 7½" Boxes CAST IRON

Wheels, Diam. 24" Tread — Kind { STANDARD STEEL WORKS / ROLLED STEEL

Tires NONE Cen. diam. —

Tires held by — WHEEL RIMS 2½" THICK

BACK TRK. WHEEL HUB LINERS - BRASS

Brakes, position ON ALL DRIVING AND TENDER WHEELS.

Operating { Engine, Sch. U-6, B. L. W. STEAM. / Parts Eng. Trk. sch. —

Foundation { Drivers, sch. U-6 B. L. W. / Parts Eng. Trk. sch. —

Air pump — Pos. —

Train connections —

Train signal, sch. —

AIR PUMP FEED FROM CYLINDER LUBRICATOR TO BE PIPED TO STEAM BRAKE VALVE.

Tender EIGHT Wheeled, Drawing No. 821

Weight, with fuel and water, about 70,000 POUNDS

Tank 3500 Gallons, Bill 4284

TANK "U" SHAPE, STRAIGHT TOP. FUEL CAPACITY, 3 CORDS

WOOD RACK AROUND TOP OF TANK

Tool Boxes OF HARD WOOD, TOP.

PROVIDE SYPHON CONNECTION TO TOP OF TANK ON LEFT SIDE

Frame STEEL, 6" AND 8" CHANNELS, WITH BUMPERS OF WOOD

Front Drawbar height 28¾"

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 HAND RAIL

Trucks ARCH BAR TYPE WITH CAST STEEL BOLSTERS

Springs ELLIPTIC, STANDARD STEEL WORKS

Journals, Diam. 4½" Length 8" STANDARD STEEL WORKS

Wheels, Diam. 30" 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. U-6, B. L. W. STEAM

* EXTRAS TO BE SHIPPED ON EXTRA ORDER No. 5959 DATED 7-31-19 TO BE SHIPPED WITH LOCO. CHARGE.

List of tools, sch. 27 ONE PAIR OF WRECKING FROGS

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 7-30-19 Shipment ON OWN WHEELS (SEE * ABOVE)

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 B. L. W. FOR ENGINE AND TENDER.

Painting: Engine, style 29½ OLIVE GREEN AND ALUMINUM

Painting: Tender, style 29½ OLIVE GREEN AND ALUMINUM

Mark on TANK SIDES, FLORALA SAW MILL COMPANY

	Road Nos. Pos.	Road Nos.	Name
F. No. PLATE		100	
F. SAND BOX			
CAB SIDES			
BACK OF TANK			

Actual Dimensions of Loco. Extreme height over all 13' 1½"

Extreme Width: Cab boards 9' 0" Cylinders or valve motion 9' 1½"

Length outside face front bumper of engine to face of tender wedge 29' 1½"

Length face of tender wedge to outside face back bumper of tender 21' 8½"

Total length outside face front bumper of engine to outside face back bumper of tender 50' 10"

THE BALDWIN LOCOMOTIVE WORKS

SPECIFICATION FOR LOCOMOTIVES

FOR

Gauge of Road — **Pitch** —

Wheelbase, Rigid — Driving — Total —

Total wheelbase engine and tender —

Curves —

Limits, Height — Width —

Weight, approximate working order, Total — pounds

On F. W. — lbs. On Drivers — lbs. On Trailer — lbs.

Tractive power — lbs. Ratio of adhesion —

Worst Slope, — lbs. Service —

Fuel —

Boiler —

Boiler Diam. — Plate —

Boiler tubes — No. — Diam. —

Length of tubes — No. of superheater —

Heating surface, tubes — sq. ft. Superheater —

Grate area — sq. ft. Water space —

Firebox —

Firebox, length — Width — Depth —

Firebox, Tube — Crown — Sides — Back —

Water space, Front — Sides — Back —

Water space, Frame — Bottom —

Water space, stays — Thickness of —

Fuel —

Grate —

Tubes —

Number — Diam. — Length —

Heating Fire — Combustion chamber — Total —

Surface Tubes — Fire Box — Fire Brick Tubes —

Grate area — Heating surface, sq. ft. —

Superheater —

Cylinders, Diam. — Stroke —

St'm ports, Length — Width — Bridges —

Exh. ports, Length — Width — Valve head —

Valve travel — Steam lap — Exhaust clearance —

Eccentric crank throw — By-pass valve —

S. P. Lubr. —

Cyl'r heads — Cyl'r casings — Head covers —

St'm chest casings — Covers —

St'm chest valves —

Met. pkg — Piston rod, valve stems —

Pistons —

Guides —

Crossheads —

Wrist Pins — Rod cups —

Side rod brasses —

Valve Motion —

Links, sliding blocks, pins, lifting links and eccentric rod jaws to be —

Wearing Bearings —

Driving Wheel Hub Liners —

Drivers, O. S. Diam. — Cen. diam. — Centers —

Tires — Held by —

Tires, Flanged, Pos. — Size —

Tires, Plain, Pos. — Size —

Lateral play between driving boxes and wheel hubs —

Driving Boxes —

Journals, Diam. — Length —

Springs, Make —

Front truck wheel hub liners —

Front Engine Truck — Wheeled — Bolster, — Bearing

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

Journals, Diam. — Length — Boxes —

Wheels, Diam. — Tread — Kind —

Tires — Cen. diam. —

Tires held by — Size —

Back engine truck wheel bolsters of —

Back Engine Truck — Wheeled — Bolster, — Bearing

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

Journals, Diam. — Length — Boxes —

Wheels, Diam. — Tread — Kind —

Tires — Cen. diam. —

Tires held by — Size —

Back truck wheel hub liners —

Brakes, position —

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

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

Air pump — Pos. —

Train connections —

Train signal, sch. —

Air reservoir to have hydrostatic test of — pounds.

Safety Valves — Size —

Safety valves — Set at — lbs. Seats —

Whistle —

Steam Gauge — Size —, — **Maker:** —

Steam gauge from — **Clock** —

Water Gauge — **Gauge Cocks** — **Cab Lamps** —

Lowest gauge cock — above highest part of crown

Lubricator steam valve — to have separate stop valve to dome

Blower Valve —

Blow off Cock — Pos. —

Cleaning Plugs —

Firebox —, Crown —, Throat —, Back —

Water —

Front tube sheet —, Flue sheet —

Pump — Pos. —

Type and No. — Pos. —

Feed Cock — Feed pipe —

Checks — Check pipe —

Position of Syphon — on left side with — feet of —

Suction Hose —

Injectors — No. —

Injectors, Pos. — Steam pipe —

Pipe Check — Feed Hose — Overflow Hose —

Check B. L. W. — Pos. —

Steam Heat —

Cab Steel

Cab boards — Roof —

Floor — Seat —

Back Sheet — Material —

Back Bumper — Back coupler height —

Front Bumper —

Pilot — Pushing shoes —

Front Bumper — Coupler pocket —

Steps —

Front Knuckle, — pin —

Coupler M. C. B. Auto.

Headlight —

Headlight — Reflector, — Generator —

Headlight, Mounted on — With — Wiring —

Lamp shell —

Bell — Pos. —

Sand Box — Pos. —

Sanders —

Driver Brake — Size —

Driver Leading — Trailing —

THE BALDWIN LOCOMOTIVE WORKS

SPECIFICATION FOR LOCOMOTIVES — August-1919

FOR FLORALA SAW MILL COMPANY

Frames CAST STEEL

Cylinders, Diam. 15" Stroke 24"
St'm ports, Length 13" Width 1¼" Bridges 1"
Exh. ports, Length 13" Width 2½" Valve head 5/16"
Valve travel 4½" Steam lap 1" Exhaust clearance —
Eccentric crank throw 9-7/16" By-pass valve NONE
S. P. Lubr. 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 BALANCED, WITH VACUUM VALVES
Met. pkg PISTON ROD, VALVE STEMS UNITED STATES (Not Specified)

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD
Guides STEEL Oil cups NEEDLE
Crossheads CAST STEEL
Wrist Pins STEEL Rod cups PLUNGER
SIDE ROD BRASSES TO BE SPLIT (NOT SOLID)

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 WHEEL HUB LINERS - NONE
Drivers, O. S. Diam. 44" Cen. diam. 38" CENTERS CAST IRON

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 — 1/53" TOTAL
Driving Boxes CAST IRON
Journals, Diam. 8" Length 8"

Springs, Make STANDARD STEEL WORKS
FRONT TRUCK WHEEL HUB LINERS - BRASS.
Front Engine Truck TWO Wheeled SWING BOLSTER, CENTER BEARING
To swing 4½" each side of cen. Cen. pin liners NONE
Journals, Diam. 4½" Length 7½" Boxes CAST IRON
Wheels, Diam. 30" Tread — Kind STANDARD STEEL WORKS / ROLLED STEEL
Tires NONE Cen. diam. —
Tires held by — WHEEL RIMS 2½" THICK
BACK ENGINE TRUCK WHEEL BOLSTERS OF CAST STEEL
Back Engine Truck TWO Wheeled SWING BOLSTER, SIDE BEARING
To swing 3" each side of cen., Cen. pin liners NONE
Journals, Diam. 4½" Length 7½" Boxes CAST IRON
Wheels, Diam. 24" Tread — Kind STANDARD STEEL WORKS / ROLLED STEEL
Tires NONE Cen. diam. —
Tires held by — WHEEL RIMS 2½" THICK
BACK TRUCK WHEEL HUB LINERS - BRASS.

Brakes, position ON ALL DRIVING AND TENDER WHEELS
Operating Parts — Engine, Sch. No. 6-ET WESTG. COMBINED AUTO. AND STRAIGHT AIR
Foundation Parts — Eng. Tr'k, sch. —
Drivers, sch. W-1 AMERICAN C. S. EQUALIZED
Eng. Tr'k, sch. —
Air pump ONE 9½" Pos. L. S.
Train connections FRONT AND BACK
Train signal, sch. NONE
AIR RESERVOIR TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

Tender EIGHT Wheeled. Drawing No. 921
Weight, with fuel and water, about 70,000 POUNDS

Tank 3500 Gallons, Bill 4934
TANK "U" SHAPE, STRAIGHT TOP. FUEL CAPACITY, 5 CORDS.
WOOD RACK AROUND TOP OF TANK
Tool Boxes OF HARD WOOD, TOP.
PROVIDE SYPHON CONNECTION TO TOP OF TANK ON LEFT SIDE.
Frame STEEL, 6" AND 8" CHANNELS, WITH BUMPERS OF WOOD.

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.
Steps ACROSS REAR WITH HANDRAIL

Trucks ARCH BAR TYPE WITH CAST STEEL BOLSTERS

Springs ELLIPTIC, STANDARD STEEL WORKS
Journals, Diam. 4½" Length 8" STANDARD STEEL WORKS
Wheels Diam. 30" 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. No. 8-ET WESTG. AUTO. AND STRAIGHT AIR WITH 10" x 12" TENDER CYLINDERS.

* EXTRAS TO BE SHIPPED ON EXTRA ORDER No. 5959 DATED 7-31-19 TO BE SHIPPED WITH LOCO. CHARGE.

List of tools, sch. 27 ONE PAIR OF WRECKING FROGS
Photo sch. No. 2 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 7-30-19 Shipment ON OWN WHEELS (SEE * ABOVE)

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 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 YANK SIDES, FLORALA SAW MILL COMPANY

Road Nos. Pos	Road Nos.	Name
F. No. PLATE	101	—
F. SAND BOX		
CAB SIDES		
BACK OF TANK		

Actual Dimensions of Loco. Extreme height over all 13' 1¾"
Extreme Width — Cab boards 9' 0" Cylinders or valve motion 9' 1⅝"
Length outside face front bumper of engine to face of tender wedge 29' 1⅝"
Length face of tender wedge to outside face back bumper of tender 21' 8⅝"
Total length outside face front bumper of engine to outside face back bumper of tender 50' 10"

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-2532

Memorandum Spec'n 19088 {Dup. 12 30 ¼ E 36, WITH SAME EXTRAS EXCEPT WHERE OTHERWISE SPECIFIED.

SPECIFICATION FOR LOCOMOTIVES 12 30 ¼ E 45 Gen. as PHOTO 5311

FOR FROST JOHNSON LUMBER COMPANY **Engine Drawing No.** 8

RTL 5-20-19

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 12' 1" Driving 12' 1" Total 27' 3"
Total wheelbase, eng. and tend. {Actual 51' 11½" / Limited to ---

Curves ---

Limits, Height --- Width ---
Weight (approximate) in working order, Total 143,400 POUNDS
On F. tr'k 15,900 lbs., Drivers 113,050 lbs., B. tr'k 14,450 lbs.

Tractive power 27,040 lbs., Ratio of adhesion 4.2
Work'g St'm Pres. 180 lbs., Service LOGGING
Fuel OIL
GRAVITY OR OIL RUNS FROM .26 TO .30, - AROUND .28 OR .29.
FRONT TUBE SHEET TO BE ½" THICK.
Boiler STEEL Thick 21/32" Bill 8553
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 5.}
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS, 90% SEAM.
DOME TO BE PRESSED OUT IN ONE PIECE.
Dome, diam. 33" Pos. CENTRAL
AUXILIARY DOME - NONE
Firebox STEEL Combustion chamb. NONE
Firebox, length 89-1 1/16" Width 41" Depth F. 68" B. 62"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back 5/16"
Firedoor opening 16" DIAM. CROWN AND SIDES IN ONE PIECE.
Water space, Front DIA. Sides 3" Back 3"
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 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. PITTSBURGH STEEL PRODUCTS CO. (A-K Tube) STEEL
Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.
Number 291 Diam. 2" Length 13' 0"

Heating Surface Flues --- Combus. Chamb. --- Total 2111.6
Tubes 1968.0 Fire Box 143.0 Fire Brick Tubes ---
Grate area 25.5.0 Ratio to Heating Surface 1 : 82
Superheater ---

Fire Brick ARCH NONE
FIRE BOX LINED WITH FIRE BRICK FOR OIL BURNING.
FIRE BRICK PAVEMENT IN PAN.
Grates NONE {GRATE RESTS TO BE APPLIED TO FIRE BOX TO
Ash Pan, Dampers FRONT only {FACILITATE FUTURE APPLICATION OF GRATES.

Throttle BALANCE Pos. DOME
Dry pipe STEEL

Superheater NONE
SMOKE BOX DOOR OF CAST IRON, SUPPORTED BY CLAMPS.
SMOKE BOX TO HAVE SHORT EXTENSION.
Smokebox extension SHORT Cleaning hole and cap NONE
Spark ejector or hooper NONE
Netting and deflect. plates NONE

Exhaust nozzles DOUBLE LOW
CLEANING PIPE, WITH
Stack CAST IRON, STRAIGHT Dia. 18"

Safety Valves TWO CONSOLIDATED 3" (Not Spec)
Safety valves NONE with relief lever, Set to 180 POUNDS
Whistle CHIME

Steam Gauge ONE IRON 7" MAKER: ASHCROFT (Not Spec)
Steam gauge stand IRON **Clock** NONE
WATER GAUGE TO HAVE CARBERRY'S SHIELD.
Water Gauge ONE B. L. W. **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 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 ---

Injectors TWO OHIO (Spec) No. 9
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 STEEL, WITH WOOD LINING THROUGHOUT.
CAB SIDE WINDOWS TO BE LARGE TO PROVIDE 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 35½"
LONG CHAFING CASTING BETWEEN ENGINE AND TENDER.

Pilot WOOD, SHORT NOSE PATTERN 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., WITH SLOTTED KNUCKLE.

Signal fixtures IRON ON BUMPER
HEADLIGHT EQUIPMENT TO BE PYLE NATIONAL ELECTRIC, TYPE "K-2" WITH INCANDESCENT REGULAR CASES.
REAR HEADLIGHT TO BE PLACED ON TOP OF CAB, ON SWIVEL BASE.
Headlight TWO ROUND CASE 18" Reflector,
Headlight, Nos. on sides WITH H'dl't step WITH
Lamp shell NONE Nosing ---

Bell 92 POUNDS GOLLMAR AIR BELL RINGER.
Sand Box TWO Diam. 31" Body IRON PAINTED Pipes IRON (Not Spec)
Sander LEACH AIR, TRAP A-1, IN COMBINATION WITH HAND SANDER 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

W. O. WEBSTER JUNE-1919.

SPECIFICATION FOR LOCOMOTIVES 12 30 ¼ E 45

FOR FROST JOHNSON LUMBER COMPANY

RTL

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 ⅛"
Valve travel 5" Steam lap 13/16" Exhaust clearance ---
Eccentric crank throw 9-15/16" By-pass valve NONE
S. F. Lubr. CHICAGO 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)
PISTON RODS TO BE KEYED TO CROSSHEAD.
Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD.
Guides STEEL, YOKE OF STEEL Oil cups ADJUSTABLE NEEDLE
Crossheads CAST STEEL, WITH BEARINGS OF BRONZE
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 WITHOUT HUB LINERS.
Drivers, O. S. Diam. 44" Cen. diam. 37" CENTERS CAST IRON
RAIL WASHERS TO BE APPLIED TO FRONT AND REAR OF ENGINE.
Tires STANDARD STEEL Held by SHRINKAGE AND SHOULDER
Tires, Flanged, Pos. 1st, 3d AND 4TH Size 3½" x 5½"
Tires, Plain, Pos. 2d Size 3½" x 6½"
Lateral play between driving boxes and wheel hubs = 1/16" TOTAL
Driving Boxes STEELED CAST IRON
Journals, Diam. 7½" Length 8"
CHICAGO FLANGE OILER TO BE APPLIED TO BACK OF FRONT AND FRONT OF REAR DRIVING WHEEL TIRES.
Springs. Make STANDARD STEEL WORKS
EQUALIZING BEAMS OF CAST STEEL.
Front Engine Truck TWO Wheeled SWING BOLSTER, CENTER BEARING
To swing 4¾" each side of cen., Cen. pin liners NONE
Journals, Diam. 4¼" Length 7½" Boxes CAST IRON
Wheels, Diam. 28" Tread --- Kind CAST IRON SPOKE CENTER
Tires STANDARD STEEL Cen. diam. 23" Size 2½" x 5½"
Tires held by SHRINKAGE AND SHOULDER WHEELS FROM STANDARD.
FRONT AND BACK TRUCK WHEELS WITHOUT HUB LINERS.
Back Engine Truck TWO Wheeled SWING BOLSTER, SIDE BEARING
To swing 5" each side of cen., Cen. pin liners NONE
Journals, Diam. 4¼" Length 7½" Boxes CAST IRON
Wheels, Diam. 28" Tread --- Kind CAST IRON SPOKE CENTER
Tires STANDARD STEEL Cen. diam. 23" Size 2½" x 5½"
Tires held by SHRINKAGE AND SHOULDER WHEELS FROM STANDARD.

Brake, position ON ALL DRIVING AND TENDER WHEELS
Operating Parts {Engine, Sch. No. 6-ET WESTG. COMBINED AUTO. AND STRAIGHT AIR / Eng. Tr'k, sch. ---
Foundation Parts {Drivers, sch. WN-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 RESERVOIR TO HAVE HYDROSTATIC TEST OF 210 POUNDS.
BACK ENGINE TRUCK EQUALIZER SPRINGS TO BE HEAVIER THAN FOR 12 30 ¼ E 36, AS SPRINGS OF ORIGINAL DESIGN GAVE TROUBLE BREAKING. SPRINGS TO HAVE ONE PLATE ADDED TO INCREASE STRENGTH.

Tender EIGHT Wheeled, Drawing No. 777
Weight, with fuel and water, about 90,000 POUNDS

Tank {OIL 2000 / WATER 4500 Gallons, Bill {OIL 4829 / WATER 4827
TANK "U" SHAPE, STRAIGHT TOP
MANHOLE TO BE LARGE ENOUGH TO ENABLE A MAN TO ENTER EASILY.
Tool Box— HARD WOOD, TOP AND BACK. SYPHON VALVE IN TANK.

Frame STEEL. 10" CHANNELS, WITH FRONT AND RACK BUMPERS OF WOOD.
LONG CHAFING CASTING BETWEEN ENGINE AND TENDER.
Front Drawbar height 33"
Pilot NONE Pushing shoes NONE
Back drawhead, center above rail 33½"
Coupler M.C.B. AUTO. WITH SLOTTED KNUCKLE AND WITH FARLOW DRAFT RIGGING.
STEPS, HAND HOLDS, ETC., TO CONFORM TO I.C.C. REQUIREMENTS.
Steps ACROSS REAR WITH HAND RAIL.
TENDER TRUCK CENTER PLATES OF CAST STEEL.
Trucks STANDARD ARCH BAR TYPE WITH CAST STEEL BOLSTERS.
TENDER TRUCKS OF STEEL CONSTRUCTION THROUGHOUT.
Springs ELLIPTIC, STANDARD STEEL WORKS.
Journals, Diam. 5" Length 9" SYMINGTON JOURNAL BOXES
Wheels, Diam. 30" Tread 4¼" Kind SOLID FORGED ROLLED STEEL
Tires --- Cen. diam. --- Size --- {WHEELS FROM
Tires held by --- WHEEL RIMS 2½" THICK. STANDARD.
Safety chains SINGLE

Brake Position ON ALL WHEELS
Brake sch. No. 6-ET WESTG. AUTO. AND STRAIGHT AIR WITH 12" x 12" TENDER CYLINDER.
OIL TANK TO BE A SEPARATE UNIT TO ENABLE CUSTOMER TO LIFT IT OUT OF THE TANK, IN EVENT OF CHANGING FUEL.

List of tools, sch. 31 ONE PAIR OF WRECKING FROGS.
Photo sch. No. 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 6-1-19 Shipment ON OWN WHEELS

B. L. W. {REAR END SUSP. TRUCK 1095929-MAY 5, 1914-(BRASS PLATE)
Patents {FEED WATER 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., TO BE SAME AS FOR 10 24 ¼ D 88.
Mark on TANK SIDES, FROST - JOHNSON LUMBER CO.

Road Nos. Pos. Road Nos. Name NONE
F. No. PLATE 11
F. SAND BOX
CAB PANEL
BACK OF TANK

Actual Dimensions of Loco.—Extreme height over all 14' 8½"
Extreme Width:—Cab boards 10' 0" Cylinders or valve motion 9' 9½"
Length outside face front bumper of engine to face of tender wedge 32' 2½"
Length face of tender wedge to outside face back bumper of tender 25' 6½"
Total length outside face front bumper of engine to outside face back bumper of tender 57' 9"

THE BALDWIN LOCOMOTIVE WORKS — DUP. 8 14 ¼ C 32 EXCEPT WHERE OTHERWISE SPECIFIED

Memorandum Spec'n 19072

SPECIFICATION FOR LOCOMOTIVES 8 14 ¼ C 35

Gen. as PHOTO. 5636

FOR GALE LUMBER COMPANY — **Engine Drawing No.** 14

P — 10-30-19

Gauge of Road 4' 8½" — Play ¾" — **Wheelbase,** Rigid 5' 0" — Driving 5' 0" — Total 15' 11"

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

Curves —

Limits, Height — Width —

Weight (approximate) in working order, Total 40,000 POUNDS

On F. tr'k 6,000 lbs., Drivers 26,000 lbs., B. tr'k 8,000 lbs.

Tractive power 5620 lbs., Ratio of adhesion 4.6

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

Fuel SOFT COAL

FRONT TUBE SHEET ⅜" THICK

Boiler STEEL — Thick ⅜" — Bill 8758

Boiler, Diam. 30" — Plan STRAIGHT TOP

Boiler st'm pres. 170 lbs., Tested to { 190 lbs. steam pres. / 227 lbs. water pres.

WITH FACTOR OF SAFETY OF 5.89

Longitud. seams DOUBLE RIVETED, LAP JOINTS.

Dome, diam. 19" — Pos. CENTRAL

Firebox STEEL — Combustion chamb. NONE

Firebox, length 32-13/16" — Width 34⅜" — Depth F. 39⅛" B. 39¼"

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

Firedoor opening 14" 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 ⅞" DIAM. — Sling stays front NONE

Button heads below crown on NONE 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 74 — Diam. 1½" — Length 7' 8"

Heating Surface				
	Flues —	Combus. Chamb. —	Total 254⁰	
	Tubes 220⁰	Fire Box 34⁰	Fire Brick Tubes —	
Grate area 7.8	Ratio to Heating Surface 1 : 32.5			
Superheater —				

Fire Brick ARCH, NONE

Grates PLAIN BARS AND DROP PLATE

Ash Pan, Dampers FRONT AND BACK

✱ **Throttle** BALANCE — Pos. DOME

Dry pipe STEEL

Superheater NONE

Smoke-stack extension SHORT — Cleaning hole and cap L. S. ONLY

Smoke-stack hopper WITH

Netting and deflect. plates WITH

Exhaust nozzles DOUBLE, TIER

Blower SPARTAN — Dia. 9"

Safety Valves (Not Spaced) TWO COALE 1½" PLAIN

Safety valves NONE with relief lever, Set to 170 POUNDS

Whistle B. L. W. PLAIN

Steam Gauge ONE IRON 6" — MAKER: 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 B. L. W. — Pos: R. S.

Cleaning Plugs ONE FILLING PLUG IN TOP OF BOILER

Firebox CORNERS, BACK ONES 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 —

SYPHON UNDER CAB BOARD ON LEFT SIDE WITH 10 FT. OF SUCTION HOSE.

SUCTION AND DISCHARGE HOSE 2½" DIAM.

Injectors TWO SELLERS CLASS "N" (Spaced) — No. 4-3/10

Injectors, Pos. RIGHT AND LEFT — Steam pipes COPPER

Pipes, Check IRON — Feed IRON — Overflow IRON

Check B. L. W. — Pos. R. AND L.

Steam Heat NONE

Cab STEEL

COAL BOX ON REAR EXTENSION OF ENGINE FRAMES, 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 WITH

Steps ACROSS FRONT AND REAR, WITH HAND RAILS

STEPS AND HAND HOLDS ETC., TO CONFORM TO I.C.C. REQUIREMENTS

E & B Drawhead, Center above rail (SEE SUP. 2)

Coupler SEE SUP. 2)

Signal fixtures NONE

Headlight ONE ROUND CASE 10" — Reflector, To burn KEROSENE

Headlight, Nos. on sides NONE — H'd'l't step HEAVY

Lamp shelf NONE — Nosing —

Bell 28 LBS. ON FRONT SAND BOX

Sand Box TWO — Diam. 15" — Body IRON PAINTED, Pipes IRON

Sander HAND, IN EACH BOX, TO SAND FRONT AND BACK

Dome casing IRON PAINTED

Boiler Jacket (No Sort Steel Pfd. Bands) Iron Style 9

Boiler Lagging PLASTIC MAGNESIA (From B. L. W. stock)

THE BALDWIN LOCOMOTIVE WORKS

G. P. Zucke — Dec. 1919.

SPECIFICATION FOR LOCOMOTIVES 8 14 ¼ C 35

FOR GALE LUMBER COMPANY

P

338 338

✱ **Frames** CAST STEEL

Cylinders, Diam. 10" — Stroke 14"

St'm ports, Length 9" — Width 1" — Bridges ⅞"

Exh. ports, Length 9" — Width 1¾" — Valve lead 1/16"

Valve travel 4½" — Steam lap ⅞" — Exhaust clearance —

Eccentric-crank throw 3½" (Not Spaced) — By-pass valve NONE

S. F. Lubr. MICHIGAN DOUBLE BULL'S EYE, 1½ 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 PAINTED

St'm chest valves PLAIN "D"

Met. pkg. (Not Spaced) PISTON RODS / VALVE STEMS — UNITED STATES

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD

Guides STEEL — Oil cups NEEDLE

Crossheads CAST STEEL, WITH BRASS GIBS

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 wheel hub liners NONE

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 5"

Tires, Plain, Pos. NONE — Size —

Lateral play between driving boxes and wheel hubs = 3/16" TOTAL

Driving Boxes CAST IRON

Journals, Diam. 6½" — Length 6"

Springs. Make B. L. W.

Front Engine Truck TWO Wheeled SWING BOLSTER, CENTER BEARING

✱ To swing 4" each side of cen., Cen. pin liners NONE

Journals, Dia ... 3½" — Length 6" — Boxes CAST IRON

Wheel hub liners NONE

Wheels, Diam. 22" — Tread 1½" — Kind CHILLED CAST IRON PLATE

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. 3½" — Length 6" — Boxes CAST IRON

Wheel hub liners NONE

Wheels, Diam. 22" — Tread 1½" — Kind CHILLED CAST IRON PLATE

Tires NONE — 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 400 — Gallons, Bill 5079

SADDLE TANK LOCATED OVER TOP OF BOILER

✱ For Hereafter and Duplicates. - Front rail to be extended 4" to get sufficient clearance for truck to swing. Throttle stuffing box to be located in cab for convenience when packing. J.S.Keen. 3/14/20

1 LOCOMOTIVE TO BE INSPECTED AFTER ERECTION BY MR. DAVID BAIRD. SALES DEPARTMENT TO BE ADVISED ONE WEEK IN ADVANCE OF THE TIME HE SHOULD BE HERE.

2 COUPLERS: M. C. B. AUTO. WITH SLOTTED KNUCKLES 33½" CENTER ABOVE RAIL AND DRAWHEAD FOR LINK AND PIN COUPLING 18" CENTER ABOVE RAIL, FRONT AND BACK. THE AUTO. COUPLER AND DRAWBAR TO BE HELD IN POSITION BY SINGLE PIN: I. E., PINS TO BE OF SUFFICIENT LENGTH TO EXTEND THROUGH BOTH POCKETS OF DRAWHEAD.

3 EXTRAS ORDERED THROUGH EXTRA WORK DEPARTMENT, ORDER No. 9870, DATED 11-11-19, TO BE SHIPPED WITH LOCO.

List of tools, sch. 26 — ONE PAIR WRECKING FROGS

Photo sch. NONE — Inspection B. L. W. (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 11-4-19 — Shipment ON CAR (SEE SUP. 3)

Brass shop finish, No. 1

Machine shop finish D-165

B. L. W. / Patents NONE

Property plates NONE

Painting, style 222, OLIVE GREEN AND ALUMINUM

Mark on TANK SIDES: GALE LUMBER COMPANY

Road Nos. Pos. — Road Nos. 2 — Name NONE

F. No. PLATE

CAB SIDES

BACK OF FUEL BOX

Actual Dimensions of Loco. Extreme height over all = 9' 8⅛" (STACK) / 9' 11½" (BELL)

Extreme Width { Over cab boards = 7' 7" / Over cylinders or valve motion = 7' 8"

Length outside face of front bumper to outside face of back bumper of engine = 21' 1⅛"

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-5771

Memorandum Spec'n 19023

SPECIFICATION FOR LOCOMOTIVES 10 30 D 667

FOR Giles Bay Lumber Co., Inc.

RTL

5-3-19

Gen. as Photo 4145 {With headlight on back of tender.}

Engine Drawing No. 91

Gauge of Road 4' 8½" Play ¾"

Wheelbase, Rigid 14' 0" Driving 14' 0" Total 24' 4"

Total wheelbase, eng. and tend. {Actual 54'11¼" / Limited to ---}

Curves ---

Limits, Height --- Width ---

Weight (approximate) in working order, Total 140,000 pounds

On F. tr'k 32,000 lbs., Drivers 108,000 lbs., B. tr'k --- lbs.

Tractive power 23,850 lbs., Ratio of adhesion 4.52

Work'g St'm Pres. 190 lbs., Service Logging

Fuel Soft Coal

Front tube sheet to be ½" thick.

Boiler Steel Thick 9/16" & ⅝" Bill 8542

Boiler, Diam. 58" 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 4.5

Longitud. seams {Butt jointed double covering strip / Sextuple riveted - 90% seams}

* **Dome,** diam. 29" Pos. Forward of fire box

Firebox Steel Combustion chamb. None

Firebox, length 107 15/16" Width 42¼" Depth F. 67" B. 58½"

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

Firedoor opening 16" diam. Crown and sides in one sheet.

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 B.L.W. Expansion Stays} Button heads below crown on six central rows

Crown bars None Placed --- above crown

Crown bolts ---

* Dome to be arranged for inspection of boiler without removing throttle box or stand pipe.

Flues ---

Tubes #12 W. G. Charcoal Iron or Steel (B.L.W. Option)

Tube ends Swaged for copper ferrules, fire box ends.

Number 294 Diam. 2" Length 14' 1"

Heating Surface	Flues ---	Combus. Chamb. ---	Total	1937 sq. ft.
	Tubes 1788 sq. ft.	Fire Box 149 sq. ft.	Fire Brick Tubes ---	

Grate area 31.7 sq. ft. Ratio to Heating Surface 1 : 61

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. 15"

Safety Valves Two Star 2½", one muffled (Spec)

Safety valves None with relief lever. Set to {190 lbs. Muffled / 193 lbs. Open}

Whistle B. L. W. 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

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. 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" (Spec) No. 9½

Injectors, Pos. R. and L. Steam pipes Copper

Pipes, Check Steel Feed Steel Overflow Steel

Check Sellers Pos. R. and L.

Steam Heat None

Cab Steel Plate

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 34¼"

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. with slotted knuckle.

Signal fixtures Iron on bumper

Headlight equipment to be Pyle National Electric, Type "K" with incandescent headlights.

Headlight Two Round Case 18" Reflector,

Headlight, Nos. on sides With Hdl't step With

Lamp shelf None Nosing ---

Bell 92 pounds

Sand Box One Diam. 28" Body Iron painted Pipes Iron

Sander Leach Air Trap A and D combination, to sand front and back.

Dome casing Iron painted

Boiler Jacket 22 Soft Steel pt'd Bands Iron Style 9

Boiler Lagging Magnesia Sectional for fire box.

Lagging by L. W. Plastic Magnesia from stock for barrel.

THE BALDWIN LOCOMOTIVE WORKS

H.W. Howitz July-1919.

SPECIFICATION FOR LOCOMOTIVES 10 30 D 667

FOR Giles Bay Lumber Co., Inc.

RTL

3rd 340

Frames Cast Steel Braces Solid

Cylinders, Diam. 18" Stroke 26"

St'm ports, Length 16" Width 1½" Bridges 1"

Exh. ports, Length 16" Width 2½" Valve lead ¼"

Valve travel 5½" Steam lap ⅞" Exhaust clearance ---

Eccentric crank throw 11 1/16" By-pass valve None

S. F. Lubr. Detroit Triple No. 22 Bull's Eye (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. King type (No. Spec)

Piston rods to be keyed to crosshead.

Pistons Cast iron rings sprung into solid head.

Guides Alligator type steel Oil cups Needle

Crossheads Cast steel with bearings of cast steel, tinned.

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 wheel without hub liners.

Drivers, O. S. Diam. 57" Cen. diam. 50" Centers 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

Journals, Diam. {Main 8½" Length 9" / Others 8"}

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. 5" Length 10" Boxes Cast Iron

Wheels, Diam. 28" Tread 4¼" Kind Cast iron plate centers

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. No. 6-ET Westg. Combined Auto. and Straight Air; Eng. Tr'k. sch. ---

Foundation Parts: Drivers, sch. M-2 American O.S. Equalized; Eng. Tr'k, sch. ---

Air pump One 9½" Pos. L. S.

Train connections Front and back

Train signal, sch. L

Air reservoirs to have hydrostatic test of 210 pounds.

Tender Eight Wheeled, Drawing No. 1391

Weight, with fuel and water, about 100,000 pounds

Tank 5000 Gallons, Bill 4830

Tank "U" shape, straight top. Fuel Cap. 8 tons

Tool Boxes Hard wood, top

Frame Steel 8" and 10" channels, with bumpers of wood and steel plate.

Front Drawbar height 33½"

Pilot None Pushing shoes None

Back drawhead, center above rail 33½"

Coupler M. C. B. Auto. with slotted knuckle

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 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 Westg. 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'ns B. L. W.

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

Junior laws to 5-12-19 Shipment On own wheels

Brass shop finish, No. 1

Machine shop finish D-165

B. L. W. Patents Feed Water Strainer, Patented, September 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, J. E. J.

Mark on tank sides, JOHN ELZIE JUSTICE

Road Nos. Pos. Road Nos. Name None

F. No. Plate 1

Sand Box

Back of Tank

Actual Dimensions of Loco. Extreme height over all 15'0"

Extreme Width: Cab boards 10' 0" Cylinders 10' 0"

Length outside face front bumper of engine to face of tender wedge 33' 11"

Length face of tender wedge to outside face back bumper of tender 26' 2½"

Total length outside face front bumper of engine to outside face back bumper of tender 60' 1¾"

THE BALDWIN LOCOMOTIVE WORKS — As Built. 0-6-6 - Dr. 8 20 D 143 — Engr. as Recm. 1405 — Engine Drawing No. 58

Memorandum Specn 1903

SPECIFICATION FOR LOCOMOTIVES — 8 20 D 143

FOR Caledonia Lumber Company

P — 13-31-19

EXEMPT WHERE OTHERWISE SPECIFIED.

EXEMPT TO HAVE WOOD CAB, HEADLIGHT, AND CONNECTING RODS WITH STRAP ENDS.

Gauge of Road 4' 8½" Ptes P

Wheelbase, Right 12' 0" Driving 10' 0" Total 17' 0"
Actual 40' 7½"
Total wheelbase, eng. and tend. Limited to —

Curves: ← 8 degrees with clearance inside of 51 degrees.

Limits, Height — Width —

Weight (approximate) in working order, Total 76,000 pounds
On F. truck 13,500 lbs. Drivers 62,500 lbs. B. truck — lbs.

Tractive power 14,250 lbs. Ratio of adhesion 4.38
Wrkt'g St'm Pres. 180 lbs. Service Logging
Fuel Coal

Boiler Steel Thick 11/16" 3/4" Slit 3/8"
Front Tube Sheet ½" Thick
Boiler, Diam. 48" Plan Extended Wagon Top
Allowable st'm pres. 180 lbs. Tested to 200 lbs. steam pres.
With Factor of Safety of 5.22 240 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 96-15/16" Width 42" Depth F. 37" B. 37"
Firebox, Tube ½" Crown ⅜" Sides 5/16" Back 5/16"
Firebox opening 18" diam.
Water space, Front 4" Sides 3" Back 3"
Water space frame Single Riveted
Water space stays ⅜" diam. with 3/16" holes 14" deep from O. S.
Radial stays 1" diam. Sling stays front Two Rows S. L. W. Extension Studs
Button heads below crown on Side 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 194 Diam. 2" Length 9' 7"

Heating { Flues — Combus. Chamb. — Total 300
Surface { Tubes 716 Fire Box 84 Fire Brick Tubes —
Grate area 14 Ratio to Heating Surface 1: 27.1
Superheater —

Fire Brick Arch — None

Grate Shaking Table with Drop Plate
Ash Pan, Dampers Front and Back
Ash Pan to be self cleaning type to conform to I. C. C. requirements.
Blower Drums Pos. Side
Dry pipe Steel

Superheater None

Smokebox extension 18in Cleaning hole and cap S. L. Wilt
Back connection 18in
Netting or grid plate 18in

Exhaust nozzle Single — Nozzle
Stack Diameter Ex. 17"

Safety Valves Two Consolidated 2" Ones
Safety valves Brass with relief lever. Set to 180 pounds
Whistle One S. L. W. Plain

Steam Gauge One 7" Inch Recm. Ashton (Not Approved)
Steam gauge stand Iron Clock None

Water Gauge One S. L. W. Imperial Cab Lamps to burn Acetylene
Gauge Cocks Three Sizes Surface valve None
Lowest gauge cock 3" above highest part of crown
Lubricator steam valve Integral separate dry pipe to dome

Blower Valve S. L. W.

Blow off Cock One S. L. W. Pos. Front

Cleaning Plugs One filling plug in top of boiler
Firebox, Corners Sediment
Crown, Two each side and two back
Waist, One under front
Front tube sheet, One Fusible plug One
Dome to be large enough to allow inspection of boiler brakes without having to remove the stand pipes.

Pump None
Lubr. to operate in North Carolina, and must conform to I. C. C. requirements.
Sprinkler under cab sound on left side with pipe connection to tank and with 20 feet of Suction Hose

Injectors Two Hancock (Not Approved) No. No. 7
Injectors, Pos. R. and L. Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check S. L. W. Pos. R. and L.
Injection overflow pipe to discharge into Ash Pan.

Sheet Metal None

Cab limits to be same as for 8 20 D 143
Cab Iron, with steel panels

Cab boards Iron Roofing None
Running boards Wood Nosing Wood
Hand rail Iron Located on Boiler

Back Bumper Bar Steel Back drawbar height 25½"

Pilot None Pushing shoes None
Front Bumper One Bumper plate Iron
Steps Hand holds, etc. to conform to I.C.C. requirements.

Front Drawhead, Center above rail 33½"
Coupler M.C.B. Auto. with slotted knuckle for link and pin connection.

Signal fixtures Iron on boiler
Headlight Equipment to be Commercial Type with generator that will furnish sufficient current for lights required.
Extra Acetylene Tank of large capacity to be furnished.
Headlight One Round Case 12" Reflector, Solar Acetylene
Headlight, Nos. on sides Iron Bell stay Iron
Lamp shelf Iron Nosing —

Bell 35 pounds
Sand Box One Diam. 28½" Body Iron painted Pipes Iron
Sanding Two Sets Air Double Tube A-1D, to sand front of front drivers and rear of main drivers
Sand casting Iron painted

Boiler Jacket (22 Gage Steel, Pitts. Iron Style 9
Boiler Lagging Russian Sectional

THE BALDWIN LOCOMOTIVE WORKS

SPECIFICATION FOR LOCOMOTIVES 8 20 D 143

FOR Caledonia Lumber Company

P

Frames Cast Steel

Cylinders, Diam. 14" Stroke 20"
St'm ports, Length 13" Width 1½" Bridges 1"
Exh. ports, Length 13" Width 2½" Valve head 1"
Valve travel 1¼" Steam lap ⅞" Exhaust clearance —
Eccentric crank throw 10⅞" By-pass valve None
S. F. Libr. Nathan Taffle 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 Balanced, with vacuum valves
Met. pkg. (Not Approved) UNITED STATES, King Type.

Pistons Heads of Cast Iron with rings of Cast Iron sprung in.
Guides Steel Oil cups Needle
Crossheads Cast Steel, with bearings of Cast Iron, tinned.
Wrist Pins Steel Rod cups Plumber, forged on.
Parallel rods to have strap ends.

Valve Motion Baldwin Gear
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 S. L. W.
Driving wheel hub liners None
Drivers, O. S. Diam. 42" Cen. diam. 36" Centers Cast Iron

Tires Steel Held by Shrinkage and Shoulder
Tires, Flanged, Pos. Front and Back Size 3" x 5/16"
Tires, Plain, Pos. Middle Size 3" x 6½"
Lateral play between driving boxes and wheel hubs = 3/16" total.
Driving Boxes Steeled Cast Iron
Journals, Diam. 6" Length 8"

Tender Eight Wheeled, Drawing No. 1407
Weight, with fuel and water, about 56,000 pounds
Tender to be lettered Yes
Tank 2500 Gallons, Std 5107
Tank "U" shape, Straight Top. Fuel capacity, 5 tons.
Stiffen connection to left side of tank
Tool Boxes Hose Box, Top

Frame Steel, 6" and 8" Channels, with dumpers of wood and steel plate.
Front Drawbar height 25⅝"
Pilot None Pushing shoes None
Back drawhead, center above rail 33½"
Coupler M.C.B. Auto. with slotted knuckle for link and pin connection.

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

Trucks Arch bar type, with cast steel bolsters

Springs Elliptic - S. L. W.
Journals, Diam. 3½" Length 7" Symington Journal Boxes
Wheels, Diam. 28" 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. FL-1012 Westinghouse Automatic Air.
Tender Brake Beams to be Buffalo.

Front Engine Truck Two Wheeled Swing Bolster, Center Bearing
To swing 3" each side of cen., Cen. pin liners None
Journals, Diam. 4½" Length 6" Boxes Cast Iron
Wheel hub liners None
Wheels, Diam. 28" Tread 1¼" Kind Chilled Cast Iron Plate
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 —
Wheel hub liners —
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 Westg. Automatic Air
Foundation Parts: Drivers, sch. 98-1 American O.S. Equalized
Eng. Tr'k, sch. —
Eng. Tr'k, sch. —
Air pump One 9½" Pos. L. S.
Train connections Front and Back
Train signal, sch. —
Air reservoir to have hydrostatic test of 210 pounds.

B. L. W. Feed Water Strainer, Patd. September 1, 1903 (cast on)
Patents

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

Painting, style 25½, Olive Green and Aluminum

Lettering etc. to be same as for 8 20 D 143
Mark on Tank Sides Dover & South Bound

Road Nos. Pcs. 1
Road Nos. 9
Name None
F. No. Plate
Sand Box
Back of Tank

Actual Dimensions of Loco. Extreme height over all 12' 6"
Extreme Width: Cab boards 8' 7"; Cylinders or valve motion 9' 3½"
Length outside face front bumper of engine to face of tender wedge = 28' 3½"
Length face of tender wedge to outside face back bumper of tender = 20' 9½"
Total length outside face front bumper of engine to outside face back bumper of tender 49' 12½"

List of tools, sch. 25 One pair Shoeing Frogs
Photo sch. No. 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 1036
Junior laws to 2-2-20 Shipment On Own Wheels

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

THE BALDWIN LOCOMOTIVE WORKS Dup. 10 2⁴ ½ D 128-129, WITH SOME EXTRAS EXCEPT WHERE OTHERWISE SPECIFIED.

Memorandum Spec'n 19028

SPECIFICATION FOR LOCOMOTIVES 10 2⁴ ½ D 128-129 AND 131 [illegible]

FOR W. B. HARBESON LUMBER COMPANY

RTL

Gen. as Photo 5691

Engine Drawing No. 28

11-17-19

Gauge of Road 4ft 8½" Plus 2"

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

Total wheelbase, eng. and tend. Actual 46ft 6" Limited to —

Curves —

Limits, Height — Width —

Weight (approximate) in working order, Total 92,000 POUNDS

On F. tr'k 10,000 lbs., Drivers 71,000 lbs., B. tr'k 11,000 lbs.

Tractive power 18,700 lbs., Ratio of adhesion 3.7

Work'g St'm Pres. 180 lbs., Service LOGGING

Fuel Wood ~~See Engine Builders' Specification Fuel Supply Records~~ [illegible]

LOGS. TO BE OPERATED IN FLORIDA.

Boiler STEEL Thick 9/16" Bill 8649

Front Tube Sheet ½" Thick

Boiler, Diam. 52" Plan EXTENDED WAGON TOP

Allowable st'm pres. 200 lbs. **Tested to** 220 lbs. steam pres.

With Factor of Safety of 4.4 267 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 59 3/16" Width 39⅜" Depth F. 60⅞" 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 SINGLE Riveted

Water space stays ⅞" diam., WITH 3/16" HOLES 1½" DEEP FROM O.S.

TATE FLEXIBLE STAYS - 252 IN BREAKING ZONE.

Radial stays 1" diam. Sling stays front TWO ROWS B.L.W. EXPANSION STAYS

Button heads below crown on EIGHT central rows

Crown bars NONE Plates — above crown

Crown bolts —

Flues —

Tubes #12 W. G. CHARCOAL IRON OR STEEL

Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS

Number 160 Diam. 2" Length 11' 10½"

Heating Flues — Combus. Chamb. — Total 1074

Surface Tubes, 688 Fire Box, 86 Fire Brick Tubes —

Grate area 14.1 Ratio to Heating Surface 1:78

Superheater —

Fire Brick ARCH - NONE

Grates PLAIN BARS AND DEAD PLATES

Ash Pan, Dampers FRONT AND BACK

Throttle BALANCE Pos. TOP

Dry pipe STEEL

Superheater NONE

SMOKE BOX TO HAVE FULL EXTENSION.

Smokebox extension 18" ins. Cleaning hole and cap SAME

Spark ejector or hopper NONE

Netting and deflector plates NONE

Exhaust nozzles, DOUBLE LOW

CLEARANCE, FRONT - WITH

STEEL BUSHING REMOVABLE Dia. 15"

SHAPE OF THE SAME TYPE AS APPLIED TO 10 2⁴ ½ D 105.

Safety Valves TWO CROSBY 2½" OPEN (Not Spec)

Safety valves Bolton with relief lever. Set to 180 pounds

Whistle ONE B. L. W. PLAIN

Steam Gauge ONE 1 MDL 7" MAKER: ASHCROFT (Not Spec)

Steam gauge stand IRON Check NONE

Water Gauge ONE B.L.W. (1 MODEL 08) Cab Lamps TO HOLD OIL

Gauge Cocks THREE BASE 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 ONE FILLING PLUG IN TOP OF BOILER

Firebox, CORNERS AND SIDES

Crown, TWO EACH SIDE AND TWO BACK

Waist, ONE UNDER FRONT

Front tube sheet, ONE Fusible plug ONE

★ THE CARRYING GRACE WHICH IS ATTACHED TO THE BOTTOM SIDE OF THE MUD RING ON WHICH THE SADDLE FROM THE REAR TRUCK FRAME TO THE POINT WHERE IT FASTENS JUST FORWARD OF THE FIRE BOX TO BE FASTENED WITH THREE 1" STUDS ⅞" DEEP INTO THE MUD RING.

PROVIDE 3" SIPHON UNDER CAB BOARD ON LEFT SIDE WITH 20 FEET SUCTION HOSE.

Injectors TWO MONITOR (Not Spec) No. 7

Injectors, Pos. RIGHT AND LEFT 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 WOOD Nosing NONE

Running boards WOOD Nosing NONE

Hand rail IRON Located on BOILER

Back Bumper BAR STEEL Back drawbar height 33"

BACK FOOT PLATE OF CAST STEEL.

Pilot WOOD Pushing shoes NONE

Front Bumper OAK Bumper plate IRON

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

Front Drawhead, Center above rail 33½"

Coupler M.C.B. AUTO., WITH SHORT SHANK, ARRANGED TO BE READILY REMOVED FROM DRAWHEAD, AND TO HAVE SLOTTED KNUCKLE.

Signal fixtures IRON OR SUPPLY

BEAR HEADLIGHT TO BE APPLIED ON TOP OF CAB.

Headlight, TWO STAR CADE 16" Reflector, To burn KEROSENE

Headlight, Mac. or other WITH MOUNTED WITH

Lamp shell NONE Lining —

Bell 85 POUNDS

Bell Cast Yes Diam. 25" Bell hung IRON Plate IRON

Sander MADE, TO SAND FRONT AND BACK

Sand casing IRON PAINTED

Boiler Jacket #22 SHEET STEEL PER Shells IRON Style 9

Boiler Lagging B.L.W. PLASTIC MAGNESIA (WHERE GIVEN)

THE BALDWIN LOCOMOTIVE WORKS

W. CONKLIN Jan-1920

SPECIFICATION FOR LOCOMOTIVES 10 2⁴ ½ D 128-129 AND 131 [illegible]

FOR W. B. HARBESON LUMBER COMPANY

RTL

344 344

Frames CAST STEEL

Cylinders, Diam. 15" Stroke 24"

St'm ports, Length 13" Width 1¼" Bridges 1"

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

Valve travel 4½" Steam lap 1" Exhaust clearance —

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

S. P. Lubr. DETROIT TRIPLE NO. 22 BULL'S EYE (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 BALANCED, WITH VACUUM VALVES

Met. pkg. UNITED STATES (Not Spec)

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD

Guides STEEL Oil cups NEEDLE

Crossheads CAST STEEL, WITH BEARINGS OF BRONZE.

Wrist Pins STEEL Rod cups PLUNGER

SIDE ROD BRASSES TO BE SPLIT (NOT SOLID).

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 stayboltz) to be United States Standard.

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

Wearing Bearings B. L. W.

Driving wheel hub liners NONE

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

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 3/16" TOTAL

Driving Boxes CAST IRON

Journals, Diam. 6" Length 8"

Springs. Make STANDARD STEEL WORKS

Front Engine Truck TWO Wheeled SWING BOLSTER, CENTER BEARING

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

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

Wheel hub liners NONE; BOX TO HAVE BABBITTED FACE

Wheels, Diam. 24" Tread — Kind {STANDARD STEEL WORKS / ROLLED STEEL}

Tires NONE Cen. diam. —

Tires held by — WHEEL RIMS 2½" THICK

BACK ENGINE TRUCK BOLSTER OF CAST STEEL

★ **Back Engine Truck** TWO Wheeled SWING BOLSTER, SIDE BEARING

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

Journals, Diam. 4¼" Length 7½" Boxes CAST IRON

Wheel hub liners NONE; BOX TO HAVE BABBITTED FACE

Wheels, Diam. 24" Tread — Kind {STANDARD STEEL WORKS / ROLLER STEEL}

Tires NONE Cen. diam. —

Tires held by — WHEEL RIMS 2½" THICK

Brake, position ON ALL DRIVING AND TENDER WHEELS

Operating Engine, sch. U-8, B. L. W. STEAM

Parts Eng. Trk. sch. —

Foundation Drivers, sch. U-8 B. L. W.

Parts Eng. Trk. sch. —

Air pump — Pos. —

Train connections —

Train signal, sch. —

AIR PUMP FEED FROM CYLINDER LUBRICATOR TO BE PIPED TO STEAM BRAKE VALVE.

Tender EIGHT Wheeled, Drawing No. 921

Weight, with fuel and water, about 70000 POUNDS

Tank 3500 Gallons, Bill 4934

TANK "U" SHAPE, STRAIGHT TOP. FUEL CAPACITY 3 CORDS

WOOD RACK AROUND TOP OF TANK.

Tool Boxes HARD WOOD, TOP

PROVIDE SYPHON CONNECTION TO TOP OF TANK ON LEFT SIDE.

Frame STEEL, 6" AND 8" CHANNELS, WITH BUMPERS OF WOOD

Front Drawbar height 28¾"

Pilot NONE Pushing shoes NONE

Back drawhead, center above rail 33½"

Coupler M.C.B. AUTO., WITH SHORT SHANK, ARRANGED TO BE READILY REMOVED FROM DRAWHEAD AND TO HAVE SLOTTED KNUCKLE.

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-STANDARD STEEL WORKS

Journals, Diam. 4½" Length 8"

Wheels, Diam. 30" Tread 4½" 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. U-8 B.L.W. STEAM

One extra set of grates for wood and one set of grates for coal for each engine to be ordered on Extra Order No. 11893 dated 9/9/19 to be shipped with loco.

★ EXTRAS ON EXTRA ORDER NO. 10778, DATED 12-1-19 TO BE SHIPPED WITH LOCO.

List of tools, sch. 27 ONE PAIR OF WRECKING FROGS.

Photo sch. No. 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 11-18-19 Shipment ON OWN WHEELS (SEE ★ ABOVE)

Brass shop finish, No. 1

Machine shop finish D-166

B. L. W. FEED WATER STRAINER, PATENTED SEPT. 1, 1903 (CAST ON)

Patents

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

Painting, style 291 OLIVE GREEN AND ALUMINUM

LETTERING TO BE SAME STYLE AS FOR 10 2⁴ ½ D 105.

Mark on TANK SIDES, BAGDAD LAND & LUMBER COMPANY

	Road Nos.	Name
Pos		NONE
F. No. PLATE	14 TO 16	
F. SAND BOX		
CAB SIDES		
BACK OF TANK		

Actual Dimensions of Loco. Extreme height over all 13ft 1¾"

Extreme Width, Cab boards 9ft 0" Cylinders or valve motion 9ft 1½"

Length outside face front bumper of engine to face of tender wedge 29ft 1½"

Length face of tender wedge to outside face back bumper of tender 21ft 8½"

Total length outside face front bumper of engine to outside face back bumper of tender 50ft 10"

THE BALDWIN LOCOMOTIVE WORKS — Dup. 10 2½ D 131, WITH SOME EXTRAS EXCEPT WHERE OTHERWISE SPECIFIED.

Memorandum Specn 1908

SPECIFICATION FOR LOCOMOTIVES 10 2½ D 132

FOR W. B. HARRESON LUMBER COMPANY — Gen. as Photo. 5591

P — Engine Drawing No. 28

12-9-19

Gauge of Road 4' 8½" — Play ¾"

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

Total wheelbase, eng. and tend. {Actual 45' 6" / Limited to —

Curves ——

Limits, Height — Width —

Weight (approximate) in working order, Total 92,000 POUNDS

On F. tr'k 10,000 lbs. Drivers 71,000 lbs. B. tr'k 11,000 lbs.

Tractive power 18,700 lbs., Ratio of adhesion 3.7

Work'g St'm Pres. 180 lbs., Service LOGGING

Fuel OIL, WITH SPECIFIC GRAVITY OF 16 TO 17

LOCOMOTIVE TO BE OPERATED IN FLORIDA.

Boiler STEEL — Thick 9/16" — Bill 8843

Front Tube Sheet ½" Thick

Boiler, Diam. 52" — Plan EXTENDED WAGON TOP

Allowable st'm pres. 200 lbs. — **Tested to** 220 lbs. steam pres.

With Factor of Safety of 4.4 — 287 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 99-3/16" — Width 39⅛" — Depth F. 60⅞" B. 58"

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

Firedoor opening 16" DIAM. — CROWN AND SIDES IN ONE SHEET.

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

★ Water space frame SINGLE — Riveted

Water space stays ⅜" DIAM. WITH 3/16" HOLES 1½" DEEP FROM O. S.

TATE FLEXIBLE STAYS - 252 IN BREAKING ZONE.

Radial stays 1" DIAM. — Sling stays front {TWO RODS B. L. W. / EXPANSION STAYS

Button heads below crown on EIGHT central rows

Crown bars NONE — Plated —— above crown

✱ OIL BURNING ARRANGEMENT, B.L.W. STANDARD, WITH BURNER IN FRONT OF FIRE BOX. ROYALTY IF ANY, PAYABLE BY THE B.L.W.

Tubes #12 W. G. CHARCOAL IRON OR STEEL

Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.

Number 160 — Diam. 2" — Length 11' 10½"

Heating Surface — Flues —— — Combus. Chamb. —— — Total 1074⁵

Tubes 988⁵ — Fire Box 86⁵ — Fire Brick Tubes ——

Grate area 14.1 sq. ft. — Ratio to Heating Surface 1: 78

Superheater ——

Fire Brick ARCH - NONE

FIRE BOX LINED WITH FIRE BRICK FOR OIL BURNING.

✱ FIRE BRICK FURNISHED IN PAN.

Grates NONE

Ash Pan, Dampers BACK ONLY

Throttle BALANCE — Pos. DOME

Dry pipe STEEL

Superheater NONE

SMOKE BOX TO HAVE FULL EXTENSION.

Smokebox extension WITH — Cleaning hole and cap NONE

Front nozzle or hopper NONE

Netting and deflect. plates NONE

Exhaust nozzles DOUBLE - LOW

Steam Pipe - WITH

Stack DIAMOND — Dia. 15"

Safety Valves TWO CROSBY 2½" OPEN (Not Spec)

Safety valves BOTH with relief lever, Set to 180 POUNDS

Whistle ONE 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: 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

★ THE CARRYING BRACE WHICH IS ATTACHED TO THE BOTTOM SIDE OF THE MUD RING ON WHICH THE BRIDLE FROM THE REAR TRUCK FRAME TO THE POINT WHERE IT FASTENS JUST FORWARD OF THE FIRE BOX TO BE FASTENED WITH THREE 1" STUDS ⅞" DEEP INTO THE MUD RING.

PROVIDE 3" SYPHON UNDER CAB BOARD ON LEFT SIDE WITH 20 FEET SUCTION HOSE.

Injectors TWO MONITOR (Not Spec) — No. 7

Injectors, Pos. RIGHT AND LEFT — 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 WOOD — Nosing NONE

Running boards WOOD — Nosing NONE

Hand rail IRON — Located on BOILER

Back Bumper BAR STEEL — Back drawbar height 33"

BACK FOOT PLATE OF CAST STEEL.

Pilot NONE — 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. WITH SHORT SHANK, ARRANGED TO BE READILY REMOVED FROM DRAW HEAD, AND TO HAVE SLOTTED KNUCKLE.

Signal fixtures IRON ON BUMPER

REAR HEADLIGHT TO BE APPLIED ON TOP OF CAB.

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 HAND, TO SAND FRONT AND BACK

Dome casing IRON PAINTED

Roller Jacket #22 SOFT STEEL PYRO Bands IRON — Style 9

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

THE BALDWIN LOCOMOTIVE WORKS

W. CONKLIN — FEB-1920

SPECIFICATION FOR LOCOMOTIVES 10 2½ D 132

FOR W. B. HARRESON LUMBER COMPANY

P

Sht 346

Frames CAST STEEL

Cylinders, Diam. 15" — Stroke 24"

St'm ports, Length 13" — Width 1½" — 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. DETROIT TRIPLE No. 22 BULL'S EYE (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 BALANCED, WITH VACUUM VALVES

Met. pkg. {PISTON ROD / VALVE STEM} UNITED STATES (Not Spec)

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD

Guides STEEL — Oil cups NEEDLE

Crossheads CAST STEEL, WITH BEARINGS OF BRONZE,

Wrist Pins STEEL — Rod cups PLUNGER

SIDE ROD BRASSES TO BE SPLIT (NOT SOLID)

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 wheel hub liners NONE

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

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 = 3/16" TOTAL

Driving Boxes CAST IRON

Journals, Diam. 6" — Length 8"

Springs. Make STANDARD STEEL WORKS

Front Engine Truck TWO Wheeled SWING BOLSTER, CENTER BEARING

To swing 4" each side of cen., Cen. pin liners NONE

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

Wheel hub liners NONE: BOX TO HAVE BABBITTED FACE.

Wheels, Diam. 24" — Tread —— — Kind {STANDARD STEEL WORKS / ROLLED STEEL}

Tires NONE — Cen. diam.—

Tires held by —— — WHEEL RING 2½" THICK

BACK ENGINE TRUCK BOLSTER OF CAST STEEL.

★ **Back Engine Truck** TWO Wheeled SWING BOLSTER, SIDE BEARING

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

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

Wheel hub liners NONE: BOX TO HAVE BABBITTED FACE.

Wheels, Diam. 24" — Tread —— — Kind {STANDARD STEEL WORKS / ROLLED STEEL}

Tires NONE — Cen. diam.—

Tires held by —— — WHEEL RING 2½" THICK

Brake, position ON ALL DRIVING AND TENDER WHEELS

Operating { Engine, sch. U-8 B. L. W. STEAM

Parts { Eng. Tr'k, sch. ——

Foundation { Drivers, sch. U-8 B. L. W.

Parts { Eng. Tr'k, sch. ——

Air pump —— — Pos. ——

Train connections ——

Train signal, sch. ——

AIR PUMP FEED FROM CYLINDER LUBRICATOR TO BE PIPED TO STEAM BRAKE VALVE.

Tender EIGHT Wheeled, Drawing No. 921 — {TENDER TO BE WEIGHED? YES}

Weight, with fuel and water, about 70,000 POUNDS

✱ **Tank** {OIL 1200 — 5175 / WATER 3500 Gallons, Bill 1093}

TANK "U" SHAPE, STRAIGHT TOP

WOOD RACK AROUND TOP OF TANK

Tool Boxes HARD WOOD, TOP

PROVIDE SYPHON CONNECTION TO TOP OF TANK ON LEFT SIDE

Frame STEEL 6" AND 8" CHANNELS, WITH BUMPERS OF WOOD.

Front Drawbar height 28½"

Pilot NONE — Pushing shoes NONE

Back drawhead, center above rail 33½"

Coupler M. C. B. AUTO. WITH SHORT SHANK, ARRANGED TO BE READILY REMOVED FROM DRAW HEAD AND TO HAVE SLOTTED KNUCKLE.

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 - STANDARD STEEL WORKS

Journals, Diam. 4½" — Length 8" — Wheels, Diam. 30" — Tread 4½" — Kind {STANDARD STEEL WORKS / ROLLED STEEL}

Tires NONE — Cen. diam.—

Tires held by —— — WHEEL RING 2½" THICK.

Safety chains SINGLE

Brake Position ON ALL WHEELS

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

✱ {NECESSARY PARTS TO CHANGE LOCOMOTIVE TO BURN COAL FURNISHED THRU EXTRA WORK DEPT., ORDER No. 6287, DATED 3-3-21.

List of tools, sch. 28 — ONE PAIR OF 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 fawns to 11-18-19 — 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 B. L. W. FOR ENGINE AND TENDER.

Painting, style 291, OLIVE GREEN AND ALUMINUM

LETTERING TO BE SAME STYLE AS FOR 10 2½ D 105

NAME ON TANK SIDES BAGDAD LAND & LUMBER COMPANY

Road Nos. Pos.	Road Nos.	Name NONE
F. No. PLATE	17	
F. SAND BOX		
CAB SIDES		
BACK OF TANK		

Actual Dimensions of Loco. Extreme height over all 13' 12"

Extreme Width: Cab boards 9' 0" ; Cylinders or valve motion — 9' 4½"

Length outside face front bumper of engine to face of tender wedge — 29' 1½"

Length face of tender wedge to outside face back bumper of tender — 21' 8½"

Total length outside face front bumper of engine to outside face back bumper of tender — 50' 10"

THE BALDWIN LOCOMOTIVE WORKS As Specn C-6230

Memorandum Spec'n 19079

SPECIFICATION FOR LOCOMOTIVES 10 28 ¼ D 144

FOR W. B. Harbeson Lumber Company

P

Gen. as **PHOTO. 7049**

Engine Drawing No. 32

11-17-19

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 10' 3" Driving 10' 3" Total 26' 10"
Total wheelbase, eng. and tend. {Actual 50' 4½" {Limited to ---

Curves ---

Limits, Height --- Width ---
Weight (approximate) in working order, Total 127,800
On F. tr'k 13,800 lbs., Drivers 98,000 lbs., B. tr'k 16,000 lbs.

Tractive power 21,300 lbs., Ratio of adhesion 4.6
Work'g St'm Pres. 180 lbs., Service Logging
Fuel Soft Coal

Boiler Steel Thick ⅝" & 11/16" Bill 8790
Front Tube Sheet ½" Thick
Boiler, Diam. 56" Plan Extended Wagon Top
{Allowable st'm pres. 200 lbs. **Tested to** {220 lbs. steam pres.
{With Factor of Safety of 5.04 {300 lbs. water pres.
Longitud. seams Butt jointed, double covering strips.
Dome - One piece type
Dome, diam. 29" Pos. Forward of fire box.

Firebox Steel Combustion chamb. None
Firebox, length 61⅛" Width 42" Depth F. 63½" B. 60½"
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 3/16" holes 1¼" deep from O. S.
(Spec) Tate Flexible Stays, about 300, in breaking zone
Radial stays 1" diam. Sling stays front {Two Rows 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 (B. L. W. Option)
Tube ends Swaged for copper ferrules, fire box ends
Number 18 / 112 Diam. 5⅜" / 2" Length 13' 9"

Heating Surface Flues 3468" Combus. Chamb. --- Total 1248"
Tubes 802" Fire Box 100" Fire Brick Tubes ---
Grate area 18.7" Ratio to Heating Surface 1: 66.7
Superheater 292"

Fire Brick Arch - None

Grates Rocking bar and drop plate
Ash Pan, Dampers ~~Front and Back~~ Back only

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater Schmidt Type (See Sup. 2-c)

Smokebox extension With 3 Cleaning hole and cap L.S. only
Spark ejector or hopper With
Netting and deflect. plates With (See Sup. 4)

Exhaust nozzles Single, high

Stack Straight Dia. 16"

Safety Valves Two Coale (Spec) 2½" Open
Safety valves Both with relief lever. Set to 180 pounds
Whistle One 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) to **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: R. S.
Cleaning Plugs One filling plug in top of boiler
Firebox, Corners, L. S., Front and Back.
Crown, Two each side and three back
Waist, One under front
Front tube sheet One Fusible plug One

Pump None

5 **Injectors** Two Monitor (Spec) 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 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"

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 M. C. B. Auto. with short shank, arranged to be readily removed from drawhead and to have slotted knuckle.

Signal fixtures Iron on bumper

6 **Headlight** One Round Case 18" Reflector,
Headlight, Nos. on sides With H'd'lt step With
Lamp shelf None Nosing ---

Bell 92 pounds
Sand Box Two Diam. 28" Body Iron painted Pipes Iron
Sanding (Nor Spec) 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)

THE BALDWIN LOCOMOTIVE WORKS

Geo. P. Luck Feb. 1920.

SPECIFICATION FOR LOCOMOTIVES 10 28 ¼ D 144 348 348

FOR W. B. Harbeson Lumber Company.

P

Frames Cast Steel

Cylinders, Diam. 17" Stroke 24"
St'm ports, Length 20.34" Width 1¼" Bridges ---
Exh. ports, Length --- Width --- Valve lead ¼"
Valve travel 5½" Steam lap ⅞" Exhaust clearance ---
Eccentric crank throw 11½" By-pass valve None
S. P. Lubr. (Spec) Detroit Five Feed No. 42 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 9½" diam., Piston Type
Met. pkg. (Spec) Piston rods, valve stems United States, King Type
Piston rods to be keyed to crossheads
Pistons Cast Iron rings sprung into solid heads
Guides Laird Type, Steel Oil cups Needle
Crossheads Cast Steel, with bearings of cast iron, tinned
Wrist Pins Steel Rod cups Plunger, 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.
Driving wheel hub liners None
Drivers, O. S. Diam 50". Cen. diam. 4½" Centers Cast Iron

Tires Steel (Sup. 9) 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 3/16" total
Driving Boxes Cast Iron
Journals, Diam 8" Length 9"

Springs. Make (See Sup. 9

Front Engine Truck Two Wheeled Swing bolster, center bearing
To swing 2 1/16" each side of cen. Cen. pin liners None
Journals, Diam. 4¼" Length 7½" Boxes Cast Iron (Sup. 7)
Wheel hub liners None (See Sup. 7)
Wheels, Diam. 24" Tread --- Kind Rolled Steel (Sup. 9)
Tires None Cen. diam. --- Size ---
Tires held by --- Wheel rims 2½" thick.

Back Engine Truck Two Wheeled Swing bolster, side bearing
To swing 3⅛" each side of cen. Cen. pin liners None
Journals, Diam. 4¼" Length 7½" Boxes Cast Iron (Sup. 8)
Wheel hub liners None (See Sup. 8)
Wheels, Diam. 24" Tread --- Kind Rolled Steel (Sup. 9)
Tires None Cen. diam. --- Size ---
Tires held by --- Wheel rims, 2½" thick

Brake, position On all driving and tender wheels
Operating Parts { Engine, sch. No. 6-ET Westg. Combined Auto. and Straight Air
{ Eng. Tk'k, sch. ---
10 Foundation Parts { Drivers, sch. W-1 American O. S. Equalized
{ Eng. Tk'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

Tender Eight Wheeled. Drawing No. 1472
Weight, with fuel and water, about 80,000 pounds
Tender to be weighed: Yes.
Tank 4,000 Gallons Bbl. 5081
Tank "U" shape, straight top. Fuel capacity 8 tons.
Tank to have Lindstrom Syphon Valve
Tool Boxes Hard Wood, Top
Syphon connection to tank on left side
Frame Steel, 8" and 10" channels, with bumpers of wood and steel plate.
Front Drawbar height 32⅛"
Pilot of wood, at rear Pushing shoes None
Back drawbar, center above rail 33½"
Coupler M. C. B. Automatic, with short shank, arranged to be readily removed from draw head and to have slotted knuckle.

Steps Hand holds etc. to conform to I. C. C. requirements

Trucks Equalized type with cast steel bolsters

Springs Elliptic, Standard Steel Works
Journals, Diam. 5" Length 9"
Wheels, Diam. 33" Tread --- Kind {Standard Steel Works / Rolled Steel
Tires None Cen. diam.
Tires held by --- Wheel rims 2½" thick
Safety chains Single

Brake Position On all wheels
Brake sch. No. 6-ET Westinghouse Auto. and Straight Air, with 10" x 12" tender cylinder. Brake shoes of cast iron, with steel inserts.

List of tools, sch. 29 One pair wrecking frogs
Photo sch. No. 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 1036
Junior laws to 12-20-19 Shipment On own wheels (See Sup. 11)

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

B. L. W. Patents { Feed Water Strainer, Patd. Sept. 1, 1903 (cast on)

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

Painting, sch. 291, Olive Green and Aluminum

Lettering to be same style as for 10 24 ¼ D 105
Mark on Tank Sides: F. & A. R. R. - In large letters.

Road Nos. Pos. F. No. Plate, F. Sand Box, Cab Sides, Back of Tank — Road Nos. 18 — Name None

Actual Dimensions of Loco. Extreme height above rail 13' 4"
Extreme Width Cab boards 9' 11" Cylinder saddle casting 9' 2"
Length outside face front bumper to outside face back bumper 31' 11½"
Length face of tender wedge to outside face back bumper of tender 24' 5"
Total length outside face front bumper of engine to outside face back bumper of tender 56' 4¼"

SPECIFICATION FOR LOCOMOTIVES: 10 28 ½ D 144

FOR: W. B. HARBESON LUMBER COMPANY

P

1 LOCOMOTIVE TO OPERATE IN FLORIDA.

2 SUPERHEATER AS LOCOMOTIVE SUPERHEATER CO'S. SPECIFICATION No. O-1244, DATED NOVEMBER 21ST, 1919 (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 B. L. W.

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

4 SPECIAL CARE TO BE TAKEN TO PREVENT THE THROWING OF SPARKS.

5 SYPHON (3") UNDER CAB BOARD ON LEFT SIDE WITH PIPE CONNECTION TO TANK AND WITH 20 FEET OF SUCTION HOSE.

6 HEADLIGHT EQUIPMENT TO BE PYLE NATIONAL ELECTRIC, TYPE "K-2" WITH INCANDESCENT HEADLIGHTS.

7 FRONT ENGINE TRUCK BOX TO HAVE FACE BABBITTED NEXT TO HUB OF WHEEL.

8 BACK ENGINE TRUCK BOX TO HAVE FACE BABBITTED NEXT TO HUB OF WHEEL.

9 TIRES, SPRINGS, AND ENGINE AND TENDER TRUCK WHEELS FROM STANDARD STEEL WORKS.

10 BRAKE SHOES OF CAST IRON, WITH STEEL INSERTS.

11 EXTRAS ORDERED ON EXTRA ORDER No. 10777, DATED, 12-29-19 TO BE SHIPPED WITH LOCO.
ONE EXTRA SET OF GRATES TO BE ORDERED ON EXTRA ORDER No. 11894, DATED 12-31-19, AND TO BE SHIPPED WITH LOCO.

350

SPECIFICATION FOR LOCOMOTIVES: 10 28 ½ D 144

FOR: W. B. HARBESON LUMBER COMPANY.

New York, ... 191...

Specification for Type A Double Loop Superheater.... SPECN. O-1244, NOVEMBER 21, 1919

BOILER TUBES	112 in number 2 o. d. 13 ft. 9 in. over tube sheets. Tubes located between and adjacent to boiler flues are to be beaded over at front end. Tubes to be in accordance with the American Society for Testing Materials Specification A-28-18.	
BOILER FLUES	18 in number 5-3/8 o. d. #9 BWG of cold drawn seamless steel. Flues to be in accordance with the American Society for Testing Materials Specification A-28-18	Card. 11025-E
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 Card. 50519
TUBE SHEET LAYOUT UNITS	18 units 13 o. d. #9 BWG Pipes to be in accordance with the American Society for Testing Materials Specification A-28-18. Pipes united by return bends. Each unit to be tested, before being placed in boiler, with water under pressure of 500 lb. per sq. in.	Card. 10773
UNIT PIPE SUPPORTS	Of steel fastened securely on superheater pipes so as not to slide	Card. 1052
UNIT PIPE JOINT	To be made in best possible manner to insure absolutely tight joints in accordance with the notation on	Card. 1084
UNIT CLAMP BOLT	To be in accordance with requirements of Locomotive Superheater Company Material. Specification No. 12-A	Card. 10774
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. 11031-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 pipe or cylinder. Pipe to be well protected against freezing.	Card. 11314
DAMPER SHAFT COUNTERWEIGHT	To be painted a light color to render it easily visible by the engineer	Card. 1067 Card. 40524
S. H. ARRANGEMENT	To be in accordance with	
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. 11318-H	S. H. UNIT BOLT WASHER	Card. 1077
DAMPER CYL. ARM	Card. 1327	S. H. UNIT CLAMP	Card. 10309
DAMPER CYL. PIPE FITTING	Card. 11115	S. H. UNIT CLAMP WASHER	Card. 1314
DAMPER CYL. PIPE UNION	Card. 11114	S. H. PIPE END	Card. 1988
DAMPER CYL. PIPING DIAGRAM	Card. 11274	S. H. PIPE BAND	Card. 10759
DAMPER CYL. SUPPORT	Card. 1068-D	SPACING OF BANDS & SUPPORTS	FORGED
DAMPER SHAFT	Card. 1226-B	TYPE OF RETURN BENDS	Card. 11022
DAMPER SHAFT ARM	Card. 11277-L (R.S. ONLY	RETURN BENDS	Card. 3023
DAMPER SHAFT BEARING (O.S.)	Card. 1275-G (L.S. "	LUBRICATOR CONNECTION	Card. 1167
DAMPER SHAFT BEARING (I.S.)	Card. 1070-K	DEFLECTING PLATE HANDLE	Card. 10809
DAMPER SHAFT LINK	Card 3272	DEFLECTING PLATE STUDS	Card. 10809-A
PATENT PLATE	Card NONE	DEFLECTING PLATE CLAMP	
PYROMETER			

THE BALDWIN LOCOMOTIVE WORKS Dup. 10 28 ½ D 148, WITH SAME EXTRAS EXCEPT WHERE OTHERWISE SPECIFIED.

Memorandum Spec'n 19079

SPECIFICATION FOR LOCOMOTIVES 10 28 ½ D 148

FOR W. B. HARBESON LUMBER COMPANY.

RTL

Gen. as PHOTO 7049

Engine Drawing No. 32

12-6-19.

Gauge of Road 4' 8½" Play 3/4"

Wheelbase, Rigid 10' 3" Driving 10' 3" Total 26' 10"

Total wheelbase, eng. and tend. {Actual 50' 4½" / Limited to ---

Curves ---

Limits, Height --- Width ---

Weight (approximate) in working order, Total 127,800 POUNDS

On F. tr'k 13,800 lbs.. Drivers 98.000 lbs., B. tr'k 16,000 lbs.

Tractive power 21,300 lbs., Ratio of adhesion 4.6

Work'g St'm Pres. 180 lbs., Service LOGGING

2 **Fuel** OIL, WITH SPECIFIC GRAVITY OF 16 TO 17. (Spec) SEE EX ORDER No. 6287 - 1921 - COAL BURNING PARTS FOR 148 -

1 **Boiler** STEEL Thick 7/8" & 11/16" Bill 8790

Front Tube Sheet 1" Thick

Boiler, Diam. 56" Plan EXTENDED WAGON TOP

Allowable st'm pres. 200 lbs. **Tested to** 220 lbs. steam pres

With Factor of Safety of 5.04 300 lbs. water pres.

Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS.

DOME - ONE PIECE TYPE.

Dome, diam. 29" Pos. FORWARD OF FIRE BOX

Firebox STEEL Combustion chamb. NONE

Firebox, length 84 1/8" Width 42" Depth F. 63½" B. 60½".

Firebox, Tube ½" Crown 3/8" Sides 3/8" Back 3/8"

Firedoor opening 16" DIAM. CROWN AND SIDES IN ONE SHEET.

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

Water space frame SINGLE Riveted

Water space stays ¾" DIAM. WITH 3/16" HOLES 1¼" DEEP, FROM O.S. (Spec) TATE FLEXIBLE STAYS, ABOUT 300, IN BREAKING ZONE.

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

Button heads below crown pl. EIGHT central rows

Crown bars NONE Placed --- above crown

Crown bolts —

Flues #9 W. G. STEEL

Tubes #12 W. G. CHARCOAL IRON OR STEEL (B.L.W. OPTION)

Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS

Number 18 / 112 Diam. 5 3/8" / 2" Length 13' 9"

Heating Surface — Flues 3460 Combus. Chamb. — Total 1248⁰

Tubes 8020 Fire Box 100⁰ Fire Brick Tubes —

Grate area 18.7⁰ Ratio to Heating Surface 1: 66.7

Superheater 292⁰

Fire Brick ARCH - NONE

FIRE BOX LINED WITH FIRE BRICK FOR OIL BURNING.

FIRE BRICK PAVEMENT IN PAN.

Grates NONE

Ash Pan, Dampers FRONT ONLY.

Throttle BALANCE Pos. DOME

Dry pipe STEEL

Superheater SCHMIDT TYPE (SEE SUP. 3rd)

Smokebox extension WITH Cleaning hole and cap NONE

Spark ejector or hopper NONE

Netting and deflect. plates WITH

Exhaust nozzles SINGLE LOW

CLEANING PIPE - WITH

Stack STRAIGHT Dia. 16"

Safety Valves TWO COALE 2½" OPEN (Spec)

Safety valves BOTH WITH relief lever, Set to 180 POUNDS

Whistle ONE 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.: R. S.

Cleaning Plugs ONE FILLING PLUG IN TOP OF BOILER

Firebox, CORNERS, L. S., FRONT AND BACK

Crown, TWO EACH SIDE AND THREE BACK

Waist, ONE UNDER FRONT

Front tube sheet, ONE Fusible plug ONE

Pump NONE

5 **Injectors** (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 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"

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 M.C.B. AUTO., WITH SHORT SHANK, ARRANGED TO BE READILY REMOVED FROM DRAWHEAD AND TO HAVE SLOTTED KNUCKLE.

Signal fixtures IRON ON BUMPER

6 **Headlight** ONE ROUND CASE 18" Reflector

Headlight, Nos. on sides WITH Hdlt step WITH

Lamp shelf NONE Nosing —

Bell 92 POUNDS

Sand Box TWO Diam. 28" Body IRON PAINTED Pipes IRON

Sanding (Spec) EACH 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)

THE BALDWIN LOCOMOTIVE WORKS Feb. 1920.

Geo. P. Trick

SPECIFICATION FOR LOCOMOTIVES 10 28 ½ D 148

FOR W. B. HARBESON LUMBER COMPANY.

RTL

352

Frames CAST STEEL

Cylinders, Diam. 17" Stroke 24"

St'm ports, Length 20.8" Width 1½" Bridges —

Exh. ports, Length — Width — Valve lead ¼"

Valve travel 5½" Steam lap 1" Exhaust clearance —

Eccentric crank throw 11½" By-pass valve NONE

S. F. Lubr. (Spec) DETROIT FIVE-FEED No. 42 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 9½" DIAM., PISTON TYPE

Metallic pkg. (Spec) UNITED STATES, KING TYPE

PISTON RODS TO BE KEYED TO CROSSHEADS.

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEADS.

Guides LAIDE TYPE, STEEL Oil cups NEEDLE

Crossheads CAST STEEL, WITH BEARINGS OF CAST IRON, TINNED

Wrist Pins STEEL Rod cups PLUNGER, 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.

Driving wheel hub liners NONE

Drivers, O. S. Diam. 50" Cen. diam. 44" CENTERS CAST IRON

Tires STEEL (Sup. 9) 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 - 3/16" TOTAL

Driving Boxes CAST IRON

Journals, Diam. 8" Length 9"

Springs. Make (SEE SUP. 9)

Front Engine Truck TWO Wheeled SWING BOLSTER, CENTER BEARING

To swing 2" each side of cen. Cen. pin liners NONE

Journals, Diam. 4½" Length 7½" Boxes CAST IRON (SUP. 7)

Wheel hub liners NONE (SEE SUP. 7)

Wheels, Diam. 24" Tread — Kind ROLLED STEEL (SUP. 9)

Tires NONE Cen. diam. — Size —

Tires held by — WHEEL RIMS 2½" THICK

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 (SUP. 8)

Wheel hub liners NONE (SEE SUP. 8)

Wheels, Diam. 24" Tread — Kind ROLLED STEEL (SUP. 9)

Tires NONE Cen. diam. — Size —

Tires held by — WHEEL RIMS 2½" THICK

Brake, position ON ALL DRIVING AND TENDER WHEELS

Operating Parts: Engine, sch. No. 6-ET WESTG. COMBINED AUTO. AND STRAIGHT AIR

Eng. Tr'k. sch. —

Foundation Parts: Drivers, sch. No. 1 NUTTING 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 POUNDS.

Tender EIGHT Wheeled, Drawing No. 1472 {TENDER TO BE WEIGHED: YES

Weight, with fuel and water, about 80000 LBS.

Tank {OIL 1800 / WATER 4000 Gallons, Bill 5780 / 5081

TANK "U" SHAPE, STRAIGHT TOP.

TANKS TO HAVE LUNDSTROM SYPHON VALVE.

Tool Boxes HARD WOOD, TOP

SYPHON CONNECTION TO TANK ON LEFT SIDE.

Frame 8" AND 10" CHANNELS, WITH BUMPERS OF WOOD AND STEEL PLATE.

Front Drawbar height 32½"

Pilot OF WOOD, AT REAR Pushing shoes NONE

Back drawhead, center above rail 33½"

Coupler M.C.B. AUTO., WITH SHORT SHANK, ARRANGED TO BE READILY REMOVED FROM DRAWHEAD AND TO HAVE SLOTTED KNUCKLE.

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

Trucks EQUALIZED TYPE WITH CAST STEEL BOLSTERS.

Springs ELLIPTIC - STANDARD STEEL WORKS

Journals, Diam. 5" Length 9"

Wheels, Diam. 33" Tread — Kind {STANDARD STEEL WORKS / ROLLED STEEL

Tires NONE Cen. diam. — Size

Tires held by — WHEEL RIMS 2½" THICK

Safety chains SINGLE

List of tools, sch. 31 ONE PAIR WRECKING FROGS

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 12-20-19 Shipment ON OWN WHEELS

Brass shop finish, No. 1

Machine shop finish Sup 165

B. L. W. {Patents: FEED WATER STRAINER, DATED SEPT. 1, 1903 (CAST ON)

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

Painting, style 291 OLIVE GREEN AND ALUMINUM

LETTERING TO BE SAME STYLE AS FOR 10 24 ½ D 105.

Mark on TANK SIDES, F. & A. R. R. - IN LARGE LETTERS

Road Nos. Pos. F. No. PLATE / F. SAND BOX / CAB SIDES / BACK OF TANK Road Nos. 19 Name NONE

Actual Dimensions of Loco. Extreme height over all 13' 9"

Extreme Width: Cab boards 9' 11". Cylinders or valve motion 10' 2"

Length outside face front bumper of engine to face of tender sandbox 31' 11½"

Length face of tender sandbox to outside face back bumper of tender 26' 5"

Total length outside face front bumper of engine to outside face back bumper of tender 58' 4½"

SPECIFICATION FOR LOCOMOTIVES 10 28 ½ n 148

FOR W. B. HARBESON LUMBER COMPANY.
RTL

1 LOCOMOTIVE TO OPERATE IN FLORIDA.

2 OIL BURNING ARRANGEMENT B. L. W. STANDARD, WITH BURNER IN FRONT OF FIRE BOX. ROYALTY, IF ANY, PAYABLE BY THE B.L.W.

3 SUPERHEATER AS LOCOMOTIVE SUPERHEATER CO.'S SPECIFICATION NO. O-12441, DATED NOVEMBER 21, 1919 (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 B. L. W.

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

5 SYPHON (3") UNDER CAB BOARD ON LEFT SIDE WITH PIPE CONNECTION TO TANK AND WITH 20 FEET OF SUCTION HOSE.

6 HEADLIGHT EQUIPMENT TO BE PYLE NATIONAL ELECTRIC, TYPE K-2, WITH INCANDESCENT HEADLIGHTS.

7 FRONT ENGINE TRUCK BOX TO HAVE FACE BABBITTED NEXT TO HUB OF WHEEL.

8 BACK ENGINE TRUCK BOX TO HAVE FACE BABBITTED NEXT TO HUB OF WHEEL.

9 TIRES, SPRINGS, AND ENGINE AND TENDER TRUCK WHEELS FROM STANDARD STEEL WORKS.

10 BRAKE SHOES OF CAST IRON, WITH STEEL INSERTS.

357 354

SPECIFICATION FOR LOCOMOTIVES 10 28 ½ D 148

FOR: W. B. HARBESON LUMBER COMPANY.

Specification for Type A Double Loop Superheater SPEC. O-12441, NOVEMBER 21, 1919

BOILER TUBES	112 in number 2 in. o.d. 13 ft. 9 in. over tube sheets. Tubes located between and adjacent to boiler flues are to be beaded over at front end. Tubes to be in accordance with the American Society for Testing Materials Specification A-28-18.	
BOILER FLUES	18 in number 5-3/4 in. o.d. #9 B.W.G. of cold drawn seamless steel. Flues to be in accordance with the American Society for Testing Materials Specification A-28-18	Card 11025-E
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 prosserved except for copper sheets. Front end to be rolled and beaded. Rollers to have at least 5 rolls.	Card 1136
	Pressure to have at least 12 sections	Card 50519
TUBE SHEET LAYOUT UNITS	18 units 12 in. o.d. #9 B.W.G. Pipes to be in accordance with the American Society for Testing Materials Specification A-28-18. Pipes united by return bends.	
	Each unit to be tested, before being placed in boiler, with water under pressure of 500 lb. per sq. in.	Card 10773
UNIT PIPE SUPPORTS	Of steel fastened securely on superheater pipes so as not to slide	Card 1052
UNIT PIPE JOINT	To be made in best possible manner to insure absolutely tight joints in accordance with the notation on	Card 1064
UNIT CLAMP BOLT	To be in accordance with requirements of Locomotive Superheater Company Material Specification No. 12-A	
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 position 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 350 lb. Test pressure to be applied seperately to the saturated end to the superheated steam passages, so as to insure soundness of all partition walls.	Card 11031-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 pipe or cylinder. Pipe to be well protected against freezing.	Card 11314
		Card 1057
DAMPER SHAFT COUNTERWEIGHT	To be painted a light color to render it easily visible by the engineer	Card 10[illegible]
S. H. ARRANGEMENT	To be in accordance with	
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	1316	S. H. UNIT BOLT WASHER Card 1071
DAMPER CYL. ARM	Card	1317	S. H. UNIT CLAMP Card 1054
DAMPER CYL. PIPE FITTING	Card	1115	S. H. UNIT CLAMP WASHER Card 1345
DAMPER CYL. PIPE UNION	Card	1114	S. H. PIPE END Card 1055
DAMPER CYL. PIPING DIAGRAM	Card	11274	S. H. PIPE BAND Card 10752
DAMPER CYL. SUPPORT	Card	1055-D	SPACING OF BANDS & SUPPORTS FURNISH
DAMPER SHAFT	Card	1318	TYPE OF RETURN BENDS Card 11022
DAMPER SHAFT ARM	Card	1319-A (R.S. Only)	RETURN BENDS Card 1023
DAMPER SHAFT BEARING (O.S.)	Card	1320 (L.S. Only)	LUBRICATOR CONNECTIONS Card 1061
DAMPER SHAFT BEARING (I.S.)	Card	1070-A	DEFLECTING PLATE HANDLE Card 10609
DAMPER SHAFT LINK	Card	1072	DEFLECTING PLATE STUDS Card 10672-A
PATENT PLATE	Card	NONE	DEFLECTING PLATE CLAMP

P. TRACING 1 & D.

THE BALDWIN LOCOMOTIVE WORKS Dup. 10 28 ¼ D 42, with sale extras
Except where otherwise specified.
Memorandum Spec'n 19085
SPECIFICATION FOR LOCOMOTIVES 10 28 ¼ D 146, 147
Gen. as Photo. 4128
FOR Henderson-Waits Lumber Company **Engine Drawing No.** 18
P 12-5-19

Gauge of Road 4' 8½" Play ¾" except 1" for F. & B. drivers
Wheelbase, Rigid 10' 3" Driving 10' 3" Total 26' 10"
Total wheelbase, eng. and tend. {Actual 50' 6½" {Limited to ---

1 **Curves** ---

Limits, Height ---- Width ---
Weight (approximate) in working order, Total 120,800 pounds
On F. tr'k 13,200 lbs., Drivers 92,400 lbs., B. tr'k 15,200 lbs.

Tractive power 22,780 lbs., Ratio of adhesion (3.8) 4.06
Work'g St'm Pres. 170 lbs., Service Logging
Fuel Wood
Loco. to be operated in Florida.
Boiler Steel Thick ⅜" & 11/16" Bill 8806
Front Tube Sheet ½" Thick
Boiler, Diam. 56" Plan Extended Wagon Top
{Allowable st'm pres. 200 lbs. **Tested to** {220 lbs. steam pres.
{With Factor of Safety of 5.04 {267 lbs. water pres.
Longitud. seams Butt jointed, double covering strips.

2 **Dome,** diam. 29" Pos. Forward of fire-box

Firebox Steel Combustion chamb. None
Firebox, length 76-3/16" Width 34⅜" Depth F. 68¾" B. 65¾"
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" dia with 3/16" holes 1¼" deep from O. S.
Radial stays 1⅛" diam. Sling stays front {Two rows 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. Tyler Diamond ◈ Special Quality Charcoal Iron
Tube ends Swaged for copper ferrules fire-box ends.
Number 200 Diam. 2" Length 13' 9"

Heating Surface {Flues --- Combus. Chamb. --- Total 1552
{Tubes 1431 Fire Box 121 Fire Brick Tubes ---
Grate area 18.2 Ratio to Heating Surface 1: 85
Superheater ---

Fire Brick Arch, None

Grates Plain bars and dead plate.
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 None
Spark ejector or hopper None
Netting and deflect. plates None

Exhaust nozzles Double - Low
Cleaning Pipe - With
Stack Rushton Improved Dia. 16"

Safety Valves Two Consolidated 3" (Not Spec.)
Safety valves None with relief lever, Set to 170 pounds
Whistle 6" Deep Tone 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** 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 Crosby (Johnstone) (from SR Sheet) **Pos.** Right Side
Cleaning Plugs One filling plug in top of boiler
Firebox, Corners, back ones diagonal, Left Side, Front and Back
Crown, Two each side and three back
Waist, One under Front
Front tube sheet, One Fusible plug One

Pump None

Injectors to be placed inside of cab. (a/c mistake)
Injectors Two Monitor, Screen Type (Spec.) No. 7
Injectors, Pos. R. and L. Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
Check B. L. W. Pos. Right and Left

Steam Heat None

4 **Cab** Steel, lined with Wood.

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

23 **Back Bumper** Bar Steel Back drawbar height 34½"

Pilot Wood Pushing shoes None
29 **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. Automatic, 13" knuckle face, same style as for 10 30 D 609. Coupler head to be fastened with 1½" bolts.
Signal fixtures Iron on bumper

6 **Headlight** Two Round Case 18" Reflector,
Headlight, Nos. on sides With H'dl't step With
Lamp shelf Wood, on Cab Nosing ---

Bell 92 pounds
Sand Box Two Diam. 28" Body Iron painted Pipes Iron
Sander Hand sanders only, in each box. (Air sander is not wanted)

Dome casing Iron painted

Boiler Jacket #22 Plain. Steel Bands Iron Style 9
Boiler Lagging Magnesia Sectional

THE BALDWIN LOCOMOTIVE WORKS
J.J. Bird February 1920.
SPECIFICATION FOR LOCOMOTIVES 10 28 ¼ D 146, 147 356 357.
FOR Henderson-Waits Lumber Company
P

Frames Cast Steel

Cylinders, Diam. 17" Stroke 24"
Stm ports, length 16" Width 1½" Bridge 1"
Exh. ports, Length 16" Width 2½" Valve bdg 3/16"
Valve travel 5" Steam lap ¾" Exhaust clearance ---
Eccentric crank throw 5½" By-pass valve None
7 S. F. Lubr. (Spec.) Detroit Triple No. 22 Bulls-Eye
Cyl'r bushings Front, Cast Iron Back, Cast Steel
Cyl'r casings Iron painted Jackets Steel painted
Stm chest casings Iron painted Covers Steel painted
Stm chest valves Richardson balanced, with vacuum valves.
Motion bushings Used United States (Not Spec.)

Pistons Cast iron rings sprung into solid head.
Guides Laird Type, Steel Guide yoke Needle
Crossheads Cast Steel, with bearings of cast iron, tinned.
9 **Wrist Pins** Steel (See Sup. 8)

Valve Motion Walschaerts
Links, slide blocks and eccentric straps 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 pins of steel or of iron case hardened.

Wearing Bearings B. L. W.
Driving wheel hub liners of Brass
Drivers, L. S. Diam. 44" Centers 38" Centers Cast Iron
10 **Tires** Steel Held by Shrinkage and Shoulder
Tires, Flange, Pos. All Size 3" x 5½"
Tires, Plain, Pos. None Size ---
Lateral play between driving boxes and wheel fits 3/16" total
Driving Boxes Cast Steel
Journals, Diam. 8" Length 9"

26 **Springs,** Make B. L. W.

Front Engine Truck Two Wheels Swing bolster
Tr. swing 3" Max. swing at tire, Clearance allowance None
Journals, Diam. 5" Length 10" Boxes Cast Steel
Wheel hub liners Brass
14 Wheels, Diam. 28" Tread --- Kind Cast Iron spoke center.
10 Tires Steel Center diam. 23" Size 2½" x 5½"
Tires held by Bolted type fastening

11 **Back Engine Truck** Two Wheels Swing bolster
Tr. swing 4" Max. swing at tire, Clearance allowance None
Journals, Diam. 5" Length 10" Boxes Cast Steel
Wheel hub liners Brass
14 Wheels, Diam. 28" Tread --- Kind Cast Iron spoke center
10 Tires Steel Center diam. 23" Size 2½" x 5½"
Tires held by Bolted type fastening

28 **Brake,** position On all driving and tender wheels
Operating Engine, schedule No. 6-ET Westg. Combined Auto. and Straight Air
Parts Eng. Truck sch. ---
Foundation Drivers, sch. WM-1 American Outside Equalized
Parts Eng. Truck sch. ---
28 Air pump One 9½" Pos. Left Side
Train connections Front and Back
Train signal, sch. None

36 **Tender** Eight Wheels, Drawing No. 435 {Tender to be weighed: Yes
Weight, with fuel and water, about 90,000 pounds

36 **Tank** 4500 Gallons, Bill 5127
Tank "U" shape, straight top. Fuel Capacity 2½ Cords
Wood Rack around top of Tank
Tool Boxes Hard Wood, Top

Frame Built-up steel channels, with bumpers of wood and steel plate.
39 Front Drawbar height 32"
Pilot None Pushing shoes None
Back drawbar, center above rail 33½"
Coupler Sharon M. C. B. Automatic, 13" knuckle face, same style as for 10 30 D 609. Coupler head to be fastened with 1½" bolts.
38 Steps Across rear with hand rails.

Trucks Arch bar type with cast steel bolsters

Springs Extra heavy, elliptic, B. L. W.
Journals, Diam. 5" Length 9"
Wheels, Diam. 33" Tread 1⅛" Kind Chilled cast iron plate
Tires None Cent. diam. --- Size ---
Tires held by ---
31 Safety chains Double

Brake Position On all wheels
Brake sch. No. 6-ET Westinghouse Auto. and Straight Air Brake, with 12" x 12" tender cylinder.

List of tools, sch. 27
Piloting 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 1076
Journal bxs. ord. 12-15-19 Shipment On own wheels

Brass engine feet, Pedestal Liners
Machine shop forms D-165

B. L. W. Feed Water Strainer, Patented Sept. 1, 1903 (cast on)
Patents

Property plate B. L. W. on Engine and Tender

Painting, style 291, Olive Green and Aluminum

Mark on cab panel below windows: H-W. L. Co.
Mark Tank sides: Henderson-Waits Lumber Co.

Road Nos. Pos.	Road Nos.	Name None
F. No. Plate	37	
Front Sand Box	38	
Cab Sides		
Back of Tank		

Actual Dimensions of Loco. Extreme height over all 12' 4⅝"
Extreme Width: Cab boards 9' 11" Cylinders or valve motion 9' 10"
Length outside face front bumper of engine to face of tender wedge 32' 0⅛"
Length face of tender wedge to outside face back bumper of tender 24' 1½"
Total length outside face front bumper of engine to outside face back bumper of tender 56' 2"

SPECIFICATION FOR LOCOMOTIVES 10 28 & D 144, 145

FOR: HENDERSON-WAITS LUMBER COMPANY

P

357 357

1 ENGINE TO OPERATE OVER ROUGH TRACK.
SHORT GRADES OF 6%. PREVAILING GRADES 1% TO 3%.

2 DOME OF THE ONE-PIECE TYPE.

3 ASH-PAN TO HAVE SOLID BOTTOM AND LARGE SIDE DOORS.

4 CAB TO BE LARGE AND ROOMY, MADE ENTIRELY OF STEEL WITH WOOD LINING. LARGE WINDOWS, AND VENTILATORS IN ROOF.

5 RUNNING BOARDS OF STEEL TO EXTEND FULL LENGTH.

6 HEADLIGHT EQUIPMENT TO BE PYLE NATIONAL ELECTRIC WITH INCANDESCENT HEADLIGHTS. REAR HEADLIGHT TO BE MOUNTED ON SWIVEL BASE ON TOP OF CAB. HEADLIGHT CASINGS TO BE EQUIPPED WITH OLD GLASS.

7 LUBRICATOR PIPES OF COPPER UNDER JACKET.

8 GREASE CUPS FORGED SOLID ON RODS FOR COMPRESSION GREASE.

9 MAIN RODS I SECTION.
MAIN AND SIDE RODS WITH WRIST PIN FASTENINGS TO BE MADE WITH HEXAGON NUTS ON OUTSIDE.

10 TIRES FOR ALL WHEELS TO BE OF HARDEST GRADE.
FRONT AND BACK DRIVING TIRES TO BE SET IN.

11 TRAILER TRUCK TO BE PROVIDED WITH IMPROVED EQUALIZERS.

12 ENGINE TRUCK WHEELS TO HAVE LARGE HUBS.

13 RAIL WASHER PLACED ON BACK OF REAR TRUCK WHEELS.

27 SPRING RIGGING THROUGHOUT ENGINE AND TENDER TO BE EXTRA HEAVY FOR VERY ROUGH SERVICE AND TRACK.
INSURE AMPLE ROOM BETWEEN TOP OF SPRING HANGERS AND BOILER JACKET, BOILER SHELL AND FIRE-BOX.

27 CAST STEEL DECK PLATE WITH EXTRA HEAVY DRAWBAR CONNECTION BETWEEN ENGINE AND TENDER, AND STEEL CHAFING IRONS WITH 10" VERTICAL FACE AND LONG SWEEP TO PROVIDE FOR EXTRA ROUGH SERVICE.

28 AIR PUMP TO HAVE UNITED STATES METALLIC PACKING.
AIR RESERVOIR TO HAVE LARGE CAPACITY, AND TO HAVE HYDROSTATIC TEST OF 210 POUNDS. TWO LARGE RESERVOIRS TO BE LOCATED UNDER CAB AND RUNNING BOARD, ONE EACH SIDE OF ENGINE. RUN AIR PIPES WITH CONDENSING RADIATOR UNDER RUNNING BOARD ON LEFT SIDE.

29 ALL SAFETY APPLIANCE REQUIREMENTS TO BE STRICTLY FOLLOWED.

TENDER

36 TANK OF LONG LOW DESIGN WITH STRAIGHT TOP.

37 PROVIDE EIGHT 1" SAFETY CHAINS FOR TENDER TRUCK.

38 ALL SAFETY APPLIANCE REQUIREMENTS TO BE STRICTLY FOLLOWED.
STEPS, HAND HOLDS ETC. TO CONFORM TO I. C. C. REQUIREMENTS.

39 EXTRA HEAVY DRAWBAR CONNECTION BETWEEN ENGINE AND TENDER, AND STEEL CHAFING IRONS WITH 10" VERTICAL FACE AND LONG SWEEP TO PROVIDE FOR EXTRA ROUGH SERVICE.

THE BALDWIN LOCOMOTIVE WORKS Dup. 10-28½-D 117 and 144 with slight extras, except as otherwise specified.
Memorandum Spec'n. 19052
SPECIFICATION FOR LOCOMOTIVES 10 28½ D 155, 156 Gen. as Photo. 4076
FOR Industrial Lumber Co. **Engine Drawing No. 35**
P 7-16-19

Gauge of Road 4' 8½" Play ½"
Wheelbase, Rigid 10' 0" Driving 10' 0" Total 25' 7"
Total wheelbase, eng. and tend. { Actual 47' 3" / Limited to ——
Rails, 35 lbs. per yard.
Curves About 200° 0" radius.

Limits, Height —— Width ——
Weight (approximate) in working order, Total 107,800 pounds
On F. tr'k 14,500 lbs., Drivers 80,000 lbs., B. tr'k 13,300 lbs.

Tractive power 21,350 lbs., Ratio of adhesion 3.75
Work'g St'm Pres. 180 lbs., Service Logging
Fuel Wood

Front tube sheet to be ½" thick
Boiler Steel Thick ⅜" Bill 3654
Boiler, Diam. 56" Plan Straight Top
Boiler st'm pres. 200 lbs., Tested to 220 lbs. steam pres.
With factor of safety of 5.05 237 lbs. water pres.
Longitud. seams Butt jointed, double covering strips.

Dome, diam. 29" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 80-7/16" Width 33⅜" Depth F. 66" 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 1⅜" diam. Sling stays front { Two rows 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 Staged for Copper Ferrules, Firebox ends.
Number 215 Diam. 2" Length 13' 6¼"

Heating Surface	Flues ——	Combus. Chamb. ——	Total	1608.5
	Tubes 1514.5	Fire Box 94	Fire Brick Tubes	——
	Grate area 14	Ratio to Heating Surface 1 :		112
	Superheater ——			

Fire Brick Arch, None

Grates to be in gross sections same as for 10 26½ D 144
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, Low
Cleaning Pipes With
Stack Rushton Improved Dia. 16"
One Rushton Improved wood burning smoke stack to be ordered on Extra Order No. 5913 dated 7-23-19 for 10 28½ D 117, and shipped with 10 28½ D 155. (Charge)

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" Makes: Ashcroft (Not Spec)
Steam gauge stand Iron **Clock** None

Water Gauge One S.L.W. (Ironclad) **Cab Lamps** Electric
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 B. L. W. Pos: Left Side
Cleaning Plugs One filling plug in top of boiler
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 "N" Improved 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
Drop seat on engineer's side of cab.

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

Back Bumper Bar Steel Back drawbar height 36½"

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

Front Drawhead, Center above rail 35½"
Coupler M. C. B. Automatic.
Headlight Equipment to be Pyle National Electric, Type "K-2" with incandescent headlights.
Signal fixtures Iron on Boiler
Provide proper switches in cab, arranged so either headlight can be turned off at will and so both may burn at same time if desire
Headlight Two Round Cabs 18" Reflector,
Headlight, Nos. on sides With Hdl't step None
Lamp shelf Iron Nosing Angle Iron

Bell 65 pounds
Sand Box Two Diam. 29" Body Iron painted Pipes Iron
(Not Spec) Sander Leach Air, Trap A-1, in both boxes.

Dome casing Iron painted

Boiler Jacket #22 soft steel plate Bands: Iron Style 9
Boiler Lagging Magnesia Sectional

W. A. Bardsley August-1919. 359
SPECIFICATION FOR LOCOMOTIVES 10 28½ D 155, 156
FOR Industrial Lumber Co.
P

Frames Cast Steel

Cylinders, Diam. 18" Stroke 24"
St'm ports, Length 15" Width 1½" Bridges 1"
Exh. ports, Length 15" Width 2½" Valve lead ⅛"
Valve travel 4½" Steam lap ¾" Exhaust clearance ——
Eccentric crank throw 9-7/16" Bypass valve None
S. F. Lubr. Detroit Triple, Bull's Eye (Not Spec) No. 22
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 Heads of follower type - Not solid
Guides Laird Type - Steel Oil cups Adjustable needle
Crossheads Cast Steel
Wrist Pins Steel Rod cups Hard 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.
Driving wheel hub liners - None
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 Cast Iron
Journals, Diam. 7" Length 8"

Equal beams of wrot iron
Springs, Make B. L. W.
Engine truck frame of cast steel. Wheel hub liners - None
Front Engine Truck Two Wheeled Swing Bolster, Center Bearings
To swing 6" 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 ——
Engine truck frame of cast steel. Wheel hub liners - None
Back Engine Truck Two Wheeled Swing Bolster, Side Bearing
To swing 6" 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 ——

Brake, position On all driving and tender wheels.
Operating Parts: Engine, Sch. No. 6-ET Westg. Combined Auto. and Straight Air. / Eng. Tr'k, sch. ——
Foundation Parts: Drivers, sch. WS-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 pounds

Tender Eight Wheeled, Drawing No. 356
Weight, with fuel and water, about 60,000 pounds

Tank 5,000 Gallons. Bill 3887
Tank "U" shape, straight top. Fuel capacity 3 cords
Wood rack around top of tank, same as for 10 28 ½ D 117 and 144
Tool Boxes Hard Wood, Top
Headlight on rear to be well protected from injury.
Frame Oak and Yellow Pine, with bumpers of wood

Front Drawbar height 29½"
Pilot None Pushing shoes None
Back drawhead, center above rail 35½"
Coupler M. C. B. Automatic

Steps hand holds, etc. to conform to I.C.C. requirements.
Foot board across rear full width, with handrail
Trucks Arch Bar Type with steel bolster.
Trucks to have steel side bars.
Springs Elliptic, B. L. W. make
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. No. 6-ET Westg. Automatic and Straight Air with 10" x 12" tender cylinder.

List of tools, sch. 27 One pair wrecking frogs
Photo sch. No. 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 7-14-19 Shipment On own wheels (See ★ page 1)

Brass shop finish, No. 1
Machine shop finish D-185

B. L. W. Patents } Feed Pipe Strainer, Patented September 1, 1903 (cast on) / Back Engine Truck 1085929 Patd. May 5, 1914 (Brass plt)

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 10 28 ½ D 117 and 144
Mark on cab sides, I. L. Co.
Mark on tank sides, Industrial Lumber Co.

Road Nos. Pos.	Road Nos.	Name None
F. No. Plate	108	
Sides of Cab	107	
below mark		
Back of Tank		

Actual Dimensions of Loco.—Extreme height over all 13' 11½"
Extreme Width:—Cab boards 9' 9½" Cylinders or valve motion 8'9½"
Length outside face front bumper of engine to face of tender wedge 30' 10¾"
Length face of tender wedge to outside face back bumper of tender 21' 7½"
Total length outside face front bumper of —— } 52' 6¼"

THE BALDWIN LOCOMOTIVE WORKS — As Spec'n. C-5698 / Dup. 10-24½ D 72, with same extras except where otherwise spec'd

Memorandum Spec'n 19014

SPECIFICATION FOR LOCOMOTIVES 10 24½ D 123 — Gen. as Photo. 1890

FOR King – Ryder Lumber Company — **Engine Drawing No.** 34

R. — 3-4-19

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 9' 2" Driving 9' 2" Total 23' 9"
Total wheelbase, eng. and tend. { Actual 47' 11½" / Limited to ——

Curves ——

Limits, Height —— Width ——
Weight (approximate) in working order, Total 84,000 pounds
On F. tr'k. 10,500 lbs. Drivers 62,000 lbs. B. tr'k 11,500 lbs.

Tractive power 14,950 lbs. Ratio of adhesion 4.14
Work'g St'm Pres. 180 lbs., Service Logging
Fuel Wood

Front tube sheet to be ½" thick.
Boiler Steel Thick ½" Bill 8529
Boiler, Diam. 50" 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. 25" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 59-3/16" Width 33½" Depth F. 59½" B. 57½"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back 5/16"
Firedoor opening 18" diam. Crown and sides in one sheet
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 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 (B.L.W. Option)
Tube ends Swaged for copper ferrules, fire box ends
Number 147 Diam. 2" Length 11' 10½"

Heating Surface	Flues ——	Combus. Chamb. ——	Total	991
	Tubes 908	Fire Box 83	Fire Brick Tubes ——	
Grate area 13.7	Ratio to Heating Surface 1 : 72.4			
Superheater ——				

Fire Brick None

Grates { Plain bars crosswise of fire box / with 10" of dead plate at front end
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 – Lob
Cleaning Pipe – With
Stack Rushton – Improved Dia. 15"

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 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 Lunkenheimer Pos. R. and L.
Cleaning Plugs
Firebox Corners
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 2" angle valve with iron pipe connections in right side of Dome.
Injectors Two Monitor Improved (Spec) 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 Ventilator in Cab roof
Engineer's seat to be a drop seat.

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

Back Bumper Steel Plate Back drawbar height 31⅞"
Chafing Castings to be wider and deeper than for 10-24½ D 67 &68
Bottom of pilot to be standard height above rail.
Pilot Wood Pushing shoes at front
Front Bumper Oak Bumper plate With
Steps Both sides of pilot
Steps, hand holds, etc. to conform to I. C. C. requirements
Front Drawhead, Center above rail 33½" and 21"
Coupler M. C. B. Auto. with slotted knuckle at standard height with pocket below for logging cars, same as for 10-24½ D 45.

Signal fixtures Iron on Bumper

Headlight Two Round Case 14" 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 Painted Pipes Iron
Sander Hand in each box, to sand front and back

Dome casing Iron painted

Boiler Jacket #22 Plan. Steel Bands Iron Style 9
Boiler Lagging Plastic Magnesia from B. L. W. stock

THE BALDWIN LOCOMOTIVE WORKS

W. A. Bardsley — June-1919. — 361

SPECIFICATION FOR LOCOMOTIVES 10 24½ D 123

FOR King – Ryder Lumber Company

R.

Frames Cast Steel Braces Solid

Cylinders, Diam. 15" Stroke 20"
St'm ports, Length 13" Width 1½" Bridges 1¼"
Exh. ports, Length 13" Width 2½" Valve lead 1/32"
Valve travel 5" Steam lap ⅞" Exhaust clearance ——
Eccentric ~~crank~~ throw 1¼" By-pass valve None
S. F. Lubr. Detroit Triple No.22 Bulls Eye (Not Spec)
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 Allen – Balanced, with vacuum valves
Met. pkg (Piston rods / Valve stems) U. S. King Type (Spec)
Piston rods to be keyed to crossheads

Pistons Cast iron rings sprung into solid head
Guides Alligator type Steel Oil cups Needle
Crossheads Cast Steel with brass gibs
Wrist Pins Steel Rod cups Plunger, forged on rods
Parallel rods to have solid ends

Valve Motion Stephenson – Skeleton links
Links, sliding blocks, pins, lifting links and eccentric rod jaws to be well case hardened or to have hardened bushings.
For Hereafter: Change guide bearers so that side rod can be removed without removing bearer. (KR)
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 Box Bearings to be 1¾" thick at crown
Drivers, O. S. Diam. 46" Cen. diam. 40" Centres Cast Iron
Driving Wheels to have hub liners of Brass
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 = ~~⅛~~ 1/32" total
Driving Boxes Cast Steel with phosphor bronze bearings
Journals, Diam. 6" Length 8"
Equalizer Stand of Cast Steel
Springs to be heavier than for 10-24½ D 72
Springs. Make B. L. W. Back equal beam to be placed under fire box to give points of contact on the line.
Front Engine Truck Two Wheeled Swing Bolster, Centre bearing
To swing 3⅜" each side of cen. Cen. pin liners None
Journals, Diam. 4½" Length 7½" Boxes Cast Iron
Wheels, Diam. 26" Tread 1¼" Kind Double plate, chilled
Tires None Cen. diam. —— Size ——
Tires held by ——
Front truck wheels without hub liners
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 1¼" Kind Double plate, chilled
Tires None Cen. diam. —— Size ——
Tires held by ——
Back truck wheels without hub liners
Ample clearance to be provided for equalizer
Brake, position On all driving and tender wheels
Operating Parts { Engine, Sch. S – American Steam / Eng. Tr'k, sch. ——
Foundation Parts { Drivers, sch. YM-1 American O.S. Equalized / Eng. Tr'k, sch. ——
Air pump None Pos. ——
Train connections None
Train signal, sch. None
Brake to be same as for 10-24½ D 45 as far as possible.
Spring equalizer between second and third drivers to be placed between top and bottom rails of frame.

Tender Eight Wheeled, Drawing No. 1383
Weight, with fuel and water, about 80,000 pounds

Tank 4,000 Gallons, Bill 4806
Tank "U" shape, straight top, about 48" high.
Wood Rack around top of tank. Fuel cap. 3½ cords.
Tool Boxes of Hard Wood, Top.

Frame Steel 8" and 10" channels, with F. & B. bumpers of wood.
Chafing Castings to be wider and deeper than for 10-24½ D 67& 68
Front Drawbar height 29"
Pilot None Pushing shoes at rear
Back drawhead, center above rail 33½" and 21"
Coupler M.C.B.Auto. with slotted knuckles at standard height, with cast iron coupler casting No.38 below for logging cars, same as for 10-24½ D 45.
Steps, hand holds, etc. to conform to I. C. C. requirements
Steps across rear, with hand rail on bumper
Trucks Arch bar type, with steel bolster
Truck channel bar laid flat
Springs Elliptic, B. L. W.
Journals, Diam. 4½" Length 8" Brass and key,- M.C.B. Std.
Wheels, Diam. 30" Tread 1¼" Kind Chilled plate
Tires None Cen. diam. —— Size ——
Tires held by ——
Safety chains Single

Brake Position On all wheels
Brake ~~sch.~~ Sch. "T", American Steam, same as for 10-24½ D 45

Push pole and Switching Chain.
Boiler to have Royal Inspection
List of tools, sch. 27 Two Wrecking Frogs
Photo sch. 2 Inspection B.L.W. (except * 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 4-2-19 Shipment On own wheels (See * below)

Brass shop finish, No. 1
Machine shop finish D-165
For Hereafter: All equal beam fulcrums cast steel. KR - 6/25/20

B. L. W. Patents | Feed Water Strainer, Pat'd, Sept. 1, 1903 (Cast on)

Property plates None

* Extras ordered on Extra Order No. 5045 dated 6-23-19 to be shipped with loco.

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

Mark on Tank Sides. KING RYDER LUMBER COMPANY

	Road Nos.	Name
Road Nos. Pos.	48	None
F. No. Plate		
F. Sand Box		
Cab Panel		
Back of Tank		

Actual Dimensions of Loco. Extreme height over all – 13' 0⅞"
Extreme Width:– Cab boards 8' 7" Cylinders or valve motion 8' 7"
Length outside face front bumper of engine to face of tender wedge – 29' 2½"
Length face of tender wedge to outside face back bumper of tender – 24' 7½"
Total length outside face front bumper of engine to outside face back bumper of tender – 53' 9½"

THE BALDWIN LOCOMOTIVE WORKS No Specs C-583

Memorandum Spec'n 19009

SPECIFICATION FOR LOCOMOTIVES 10 20 ½ D 27

FOR LOGAN OR LUMBER COMPANY.

RTL

Gen. or. Photo 4310 (Except to have straight top tender.)

Engine Drawing No. 4

8-28-19.

Gauge of Road 4' 8½" Play 3"

Wheelbase, Rigid 8' 0" Driving 8' 0" Total 22' 9"

Total wheelbase, eng. and tend. (Actual 46' 1" Limited to —

Curves —

Limits, Height — Width —

Weight (approximate) in working order, Total 79,000 pounds.

On F. tr'k. 10,500 lbs. Drivers 57,500 lbs. B. tr'k 11,000 lbs.

Tractive power 12,800 lbs. Ratio of adhesion 4.49

Work'g St'm Pres. 180 lbs., Service LOGGING

Fuel SOFT COAL

FRONT TUBE SHEET ½" THICK.

Boiler STEEL Thick 7/16" & ½" Bill 8692

Boiler, Diam. 64" Plan EXTENDED WAGON TOP

Boiler st'm pres. 200 lbs., Tested to 220 lbs. steam pres. (WITH FACTOR OF SAFETY OF 4.61) 267 lbs. water pres.

Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS.

Dome, diam. 25" Pos. FORWARD OF FIRE BOX.

Firebox STEEL Combustion chamb. NONE

Firebox, length 55 15/16" Width 39⅜" Depth F. 56" B. 54⅜"

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" DIAM. Sling stays front (TWO ROWS 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 (B. L. W. OPTION)

Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.

Number 116 Diam. 2" Length 11' 6"

Heating Surface	Flues —	Combus. Chamb. —	Total 767⁰
	Tubes 693⁰	Fire Box 74⁰	Fire Brick Tubes —
Grate area 13.3⁰	Ratio to Heating Surface 1 : 58		
Superheater —			

Fire Brick ARCH - NONE

Grates ROCKING BARS AND DROP PLATES

Ash Pan, Dampers RIGHT AND LEFT

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"

Safety Valves TWO CONSOLE 2" (Not Spec)

Safety valves NONE with relief lever, Set to 180 pounds

Whistle ONE 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. (ENGLAND) **Cab Lamps** ELECTRIC

Gauge Cocks THREE TWIN 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 FILLING PLUG IN TOP OF BOILER

Firebox CORNERS, BACK ONES DIAGONAL, SIDES 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 TWO KORTING (Not Spec) No. 6

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, HAND HOLDS, 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 ON BUMPER

HEADLIGHT EQUIPMENT TO BE PYLE NATIONAL ELECTRIC, TYPE "K-2" WITH INCANDESCENT HEADLIGHTS.

Headlight TWO ROUND CASE 18" Reflector

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

Lamp shelf NONE Nosing —

Bell 85 POUNDS

Sand Box TWO Diam. 19" Body IRON PAINTED Pipes IRON

(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 PTD Bands IRON Style 9

Boiler Lagging MAGNESIA SECTIONAL

THE BALDWIN LOCOMOTIVE WORKS

H. E. BEEHLER Oct. 1919.

SPECIFICATION FOR LOCOMOTIVES 10 20 ½ D 27

363 363

FOR LODWICK LUMBER COMPANY.

RTL

Frames CAST STEEL

Cylinders, Diam. 13" Stroke 22"

St'm ports, Length 12" Width 1" Bridges ⅞"

Exh. ports, Length 12" Width 2" Valve lead 1/16"

Valve travel 6" (Not Spec) Steam lap ⅞" Exhaust clearance —

Eccentric ~~cranks~~ throw 4½" By-pass valve NONE

S. F. 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) UNITED STATES, KING TYPE. (Not Spec)

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD.

Guides STEEL Oil cups NEEDLE

Crossheads CAST STEEL, WITH BEARINGS OF CAST IRON, TINNED.

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 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 wheel hub liners NONE

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 3/16" TOTAL

Driving Boxes CAST IRON

Journals, Diam. 5½" Length 8"

Springs. Make B. L. W.

Front Engine Truck TWO Wheeled SWING BOLSTER, CENTER BEARING

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

Journals, Diam. 4½" Length 8" Boxes CAST IRON

Wheel hub liners NONE

Wheels, Diam. 24" Tread 4¼" 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 8" Boxes CAST IRON

Wheel hub liners NONE

Wheels, Diam. 24" Tread 4¼" Kind CHILLED CAST IRON SPOKE

Tires NONE Cen. diam. — Size —.

Tires held by —

Brake, position ON ALL DRIVING AND TENDER WHEELS

Operating Engine, sch. No. 6-ET WEST. COMBINED AUTO. AND STRAIGHT AIR

Parts Eng. Tr'k. sch. —

Foundation Drivers, sch. WM-1 AMERICAN O.S. EQUALIZED

Parts Eng. Tr'k. sch. —

Air pump ONE 9½" Pos. L. S.

Train connections FRONT AND BACK

Train signal, sch. NONE

AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

Tender EIGHT Wheeled, Drawing No. 1446

Weight, with fuel and water, about 50,000 POUNDS

Tank 3,000 Gallons. Bill 4991

TANK "U" SHAPE, STRAIGHT TOP. FUEL CAPACITY 5 TONS.

Tool Boxes HARD WOOD, TOP.

Frame STEEL 8" CHANNELS, WITH BUMPERS OF WOOD, REINFORCED WITH STEEL PLATE.

Front Drawbar height 28⅛"

Pilot NONE Pushing shoes NONE

Back drawhead, center above rail 33⅛"

Coupler M. C. B. AUTO. WITH SLOTTED KNUCKLE.

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.

Journals, Diam. 3¾" Length 7"

Wheels, Diam. 28" 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. AUTO. AND STRAIGHT AIR WITH 8" x 12" TENDER CYLINDER.

List of tools, sch. 26 ONE PAIR WRECKING FROGS.

Photo sch. No. 2 Inspection B. L. W.

To be weighed YES Material specifns B. L. W.

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

Junior laws to 9-9-19 Shipment ON OWN WHEELS

Brass shop finish, No. 1

Machine shop finish D-165

Feed Water Strainer, Pat'd Sept. 1, 1903 (CAST ON)

Patents

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

Painting, style 291 OLIVE GREEN AND ALUMINUM

MARKING TO BE SIMILAR TO PHOTO. 4310.

Mark on CAB SIDES, E. T. & G.

MARK ON TANK SIDES, EAST TEXAS & GULF RY.

Road Nos. Pos. Road Nos. Name NONE

F. No. PLATE 52

DOME

BACK OF TANK

Actual Dimensions of Loco. Extreme height over all 11' 11½"

Extreme Width: Cab boards 8'7" Cylinders or valve motion 8' 5"

Length outside face front bumper of engine to face of tender wedge 27' 8"

Length face of tender wedge to outside face back bumper of tender 23' 4½"

Total length outside face front bumper of engine to outside face back bumper of tender 51' 0½"

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-8422

Memorandum Spec'n 20055

SPECIFICATION FOR LOCOMOTIVES 8 30 D 711

EB/

FOR Long Bell Company

HW

Gen. as Photo. 7239 except to have chilled cast iron plate engine truck wheels and to omit tender oil tank.

Engine Drawing No. 85

2-28-20

Gauge of Road 4' 8½" Play 2"

Wheelbase, Rigid 11' 6" Driving 11' 6" Total 19' 4"

Total wheelbase, eng. and tend. (Actual ~~46' 5"~~ 46' 6" (Limited to ---

Curves 8 degrees

Limits, Height --- Width ---

Weight (approximate) in working order, Total 112,000 pounds

On F. trk 16,000 lbs., Drivers 96,000 lbs., B. trk --- lbs.

Tractive power 23,000 lbs., Ratio of adhesion 4.1

Work'g St'm Pres. 180 lbs., Service Logging

Fuel Coal

Boiler Steel Thick 9/16" Bill 8945

Front Tube Sheet ½" Thick

Boiler, Diam. 54" Plate Extended wagon top

Tested to (Allowable st'm pres. 200 lbs. With Factor of Safety of 4.5) 220 lbs. steam pres. 267 lbs. water pres.

Longitud. seams Butt jointed, double covering strips.

Dome - One piece type.

Dome, diam. 29" Pos. Forward of Fire Box

Firebox Steel Combustion chamb. None

Firebox, length 74-3/16" Width 41½" Depth F. 59½" B. 57½"

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" holes 1¼" deep from O.S.

Radial stays 1" diam. Sling stays front Two rows B. L. W. Expansion Stays.

Button heads below crown sh. 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 213 Diam. 2" Length 11' 0"

Heating Surface Flues --- Combus. Chamb. --- Total 1355 sq. ft.

Tubes 1252 sq. ft. Fire Box 103 sq. ft. Fire Brick Tubes ---

Grate area 21.3 sq. ft. Ratio to Heating Surface 1: 63.6

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 L. S. Only

Spark ~~arrester~~ hopper With

Netting and deflect. plates With

Exhaust nozzles Double-High

Stack Straight Dia. 16"

Safety Valves Two Coale 2½" Plain (Not Spec)

Safety valves None with relief lever, Set to 180 pounds

Whistle One B. L. W. ~~Bundy~~ 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** Electric

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 Okadee Pos:- Front

Cleaning Plugs One filling plug in top of boiler

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

Locomotive for operation in Mississippi. Boiler to meet all rules of the I. C. C. effective March 1, 1921.

Injectors (Spec) Two Sellers, Class "N" improved 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

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"

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.

Signal fixtures Iron on Bumper

✱**Headlight** Two round case 18" Reflector,

Headlight, Nos. on sides With H'rail'r step With

Lamp shelf None Nosing ---

Bell 92 pounds

Sand Box Two Diam. 28" Body Iron Painted Pipes Iron

(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 Pto. Bands Iron Style 9

Boiler Lagging Magnesia Sectional

✱Headlight equipment to be Pyle-National Electric, type K-2, with 1500 watt generator and incandescent headlights.

Rear headlight to be placed on back board of cab as Co's sketch (herewith)

THE BALDWIN LOCOMOTIVE WORKS 1

W.W. Stevenson April-1920

SPECIFICATION FOR LOCOMOTIVES 8 30 D 711 363 365

FOR Long Bell Company

HW

Frames Cast Steel

Cylinders, Diam. 18" Stroke 24"

St'm ports, Length 16" Width 1½" Bridges 1"

Exh. ports, Length 16" Width 2½" Valve head ¼"

Valve travel 5½" Steam lap ¾" Exhaust clearance ---

Eccentric crank throw 9-3/16" By-pass valve None

S. F. Lubr. Nathan Triple Bull's Eye. (Not Spec)

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 Balanced, with vacuum valves

Met. pkg. (piston rods / valve stems) United States, King Type (Spec)

Piston rods to be keyed to crossheads

Pistons heads of cast iron, with rings of cast iron sprung in

Guides Steel Oil cups Needle

Crossheads Cast Steel, with bearings of cast iron tinned.

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.

Driving wheel hub liners None

Drivers, O. S. Diam. 52" Cen. diam. 46" Centre Cast Iron

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 3/16" total

Driving Boxes Steeled Cast Iron

Journals, Diam. 7½" Length 9"

Springs. Make B. L. W.

Front Engine Truck Two Wheeled Swing bolster, centre bearings

To swing 4" each side of cen., Cen. pin liners None

Journals, Diam. 5" Length 10" Boxes Cast Iron

Wheel hub liners None

Wheels, Diam. 28" Tread --- Kind Chilled Cast Iron Plate

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 ---

Wheel hub liners ---

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 Westg. combined auto and straight air; Eng. Trk, sch. ---

Foundation Parts: Drivers, sch. M-1 American O.S. Equalized; Eng. Trk, 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.

Tender Eight Wheeled, Drawing No. 1523

Weight, with fuel and water, about 65,000 pounds

Tender to be weighed: Yes

Tank 3,000 Gallons Bill 4825

Tank "U" shape, straight top. Fuel capacity 6 tons

Tool Boxes of hard wood top

Frame Steel, 6" and 8" channels, with bumpers of wood and steel plate

Front Drawbar height 33"

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 cast steel bolsters.

Springs Elliptic, B. L. W.

Journals, Diam. 3¾" Length 7"

Wheels, Diam. 33" Tread --- 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 Westinghouse automatic and straight air with 8" x 12" tender cylinder.

List of tools, sch. 29 One pair wrecking frogs

Photo sch. No. 2 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 10-3-19 Shipment On own wheels.

Brass shop finish, No. 1

Machine shop finish D-165

Patents B. L. W. Feed water strainer, Pat'd Sept. 1, 1903 (cast on)

Property plates None

Painting, style 291, Olive Green and Aluminum

Mark in aluminum leaf with a faint red line around the edge

letters of style shown on Co's cut (herewith), capital

letters 12" high, and other letters 8" high proportioned accordingly.

Mark on tank sides, Long - Bell Company

Road Nos. Pos. Road Nos. Name None

F. No. Plate 7

F. Sand Box

Cab Sides

Back of tank

Actual Dimensions of Loco. Extreme height over all 13' 3½"

Extreme Width - Cab boards 9' 7" ; Cylinders or valve motion 9' 9½"

Length outside face front bumper of engine to face of tender wedge 28' 10"

Length face of tender wedge to outside face back bumper of tender 21' 2½"

Total length outside face front bumper of engine to outside face back bumper of tender 50' 0½"

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-5933, Dec. 10 24 ½ D 99. Except where otherwise specified.

Memorandum Spec'n 19081

SPECIFICATION FOR LOCOMOTIVES 10 24 ½ D 130

FOR Lufkin Land and Lumber Company

RTL

Gen. as Photo 4642

Engine Drawing No. 25

11-25-19 (Spec)

Gauge of Road 4' 8½" Play ¾"

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

Total wheelbase, eng. and tend. {Actual 45' 0" / Limited to —

Curves —

Limits, Height — Width —

Weight (approximate) in working order, Total 89,000 pounds

On F. tr'k 9,500 lbs., Drivers 68,000 lbs., R. tr'k. 11,500 lbs.

Tractive power 15,200 lbs., Ratio of adhesion 4.47

Work'g St'm Pres. 175 lbs., Service Logging

Fuel Oil, same quality as for 10 26 ½ D 157 & 10 30 ½ D 141

Boiler Steel Thick ½" & ⅝" Bill 8797

Front Tube Sheet ½" Thick

Boiler, Diam. 50" Plan Extended Wagon Top

{Allowable st'm pres. 200 lbs. / With Factor of Safety of 4.61} **Tested to** 220 lbs. steam pres. / 267 lbs. water pres.

Longitud. seams Butt jointed, double covering strips

Circ. seams One-piece type

Dome, diam. 25" Pos. Central

Firebox Steel Combustion chamb. None

Firebox, length 59 3/16" Width 39¼" Depth F. 61¼" B. 59½"

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

Firedoor opening 16" diam. Crown and sides in one sheet.

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 1⅛" diam. Sling stays front {Two rows 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. Iron

Tube ends Swaged for copper ferrules, fire box ends

Number 147 Diam. 2" Length 11' 10½"

Heating Surface {Flues — / Tubes 908 / Fire Box 87 / Fire Brick Tubes — / Total 995 / Grate area 14.1 / Ratio to Heating Surface 1: 70.6 / Superheater —}

Fire Brick Arch - None

Fire box lined with fire brick, for oil burning.

Fire brick pavement in pan.

Grates None Grate rests in fire box.

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 Double Low

Cleaning Pipe - With

Stack Straight Dia. 15"

Headlight equipment to be Pyle National Electric, type "K-2", with incandescent headlights. Rear headlight on swivel base on top of cab.

Safety Valves Two Consolidated 2½" Open (Spec)

Safety valves None with relief lever, Set to 175 pounds

Whistle One R. 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" 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 One filling plug in top of boiler

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 One

Pump None

Locos. to be operated in Texas.

Boiler to conform to all I.C.C. requirements.

Specialties to be same as for 10 24 ½ D 99.

Injectors Two Monitor (Spec) 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 Steel, not wood lined. 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 32¾"

Chafing castings of cast steel, between engine and tender, same as for 10 24 ½ D 99.

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" and 25"

Coupler Tower M.C.B. Auto. with slotted knuckle.

Coupler to be adjustable, i. e., arranged in a slot to be raised and lowered at will. Couplers and draw castings to be strongly reinforced same as for 10 24 ½ D 99.

Signal Fixtures - Iron on bumper

Complete set of classification lamps, same as for 10 24 ½ D 99.

Headlight Two Round Case 18" Reflector, (Spec)

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

Lamp shelf None Nosing —

Bell 65 pounds

Sand Box Two Diam. 23" Body Iron painted Pipes Iron

Sander Leach Air Trap A-1, to sand front and back

Dome casing Iron painted, with pressed steel top and bottom rings.

Boiler Jacket #22 Plan. Steel Bands Iron Style 9

Boiler Lagging Magnesia Sectional

Frames Cast steel

Cylinders, Diam. 15" Stroke 20"

St'm ports, Length 13" Width 1½" Bridges 1"

Exh. ports, Length 13" Width 2½" Valve head 1/16"

Valve travel 4½" Steam lap ¾" Exhaust clearance —

Eccentric throw 4½" By-pass valve None

S. P. Lubr. Nathan Triple Bull's Eye (Spec)

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

Cyl'r casings Iron painted Heads Steel painted

St'm chest casings Iron painted Covers Steel painted

St'm chest valves Richardson balanced, with vacuum valves

Met. pkg. United States (Spec)

Pistons Cast iron rings sprung into solid head

Guides Laird type, Steel Oil cups Needle

Crossheads Cast steel, with bearings of cast iron, tinned

Wrist Pins Steel Pipe cups Plunger

Parallel rods to have solid heads.

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 studs) to be United States Standard.

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

Wearing Bearings B. L. W.

Driving wheel hub liners Brass

Drivers, O. S. Diam. 44" Inside 36" Centers cast iron

Rail washer front and back of drivers.

Tires Standard Steel Shrinkage and shoulder

Tires, Flanged, Pos. All Size 4" x 5½"

Tires, Plain, Pos. None Size —

Lateral play between driving boxes and wheel hubs 3/16" total

Driving Boxes Cast steel

Journals, Diam. 6" Length 8"

Spring rigging to be extra heavy for rough service.

Springs. Make Standard Steel

Front Engine Truck Two Wheeled Swing bolster, center bearing

To swing 4½" each side of ctrs. Ctrs. pin liners None

Journals, Diam. 4¼" Length 7½" Boxes Cast steel

Wheel hub liners Brass

Wheels, Diam. 26" Tread 4½" Kind Chilled cast iron plate

Tires None Ctr. diam. — Size —

Tires held by —

Back Engine Truck Two Wheeled Swing bolster, side bearing

To swing 3½" each side of ctrs. Ctrs. pin liners None

Journals, Diam. 4¼" Length 7½" Boxes Cast steel

Wheel hub liners Brass

Wheels, Diam. 26" Tread 4½" Kind Chilled cast iron plate

Tires None Ctr. diam. — Size —

Tires held by —

Brake, position On all driving and tender wheels

Operating Parts: Engine, sch. A-1 and SWA Westg. 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 9½" Pos. Left Side

Train connections Front and back

Train signal, sch. None

Air reservoirs to have liberal capacity, and to have hydrostatic test of 210 pounds.

Tender Eight Wheeler, Drawing No. 573-X

Weight, with fuel and water, about 60,000 pounds

Tank {Oil 1500 / Water 3000} Gallons, Bbl. 3350 / 5100

Tender to be weighed: Yes

Tank "U" shape, straight top.

Complete set of marker lamps, same as for 10 24 ½ D 99.

Tool Box Hard Wood, Top

★ **Frame** Steel, 5" channels, with bumpers of wood and steel plate.

Front Drawbar height 26¾"

Pilot None Pushing shoes None

Back drawhead, Center above rail 33½" and 25"

Coupler Tower M.C.B. Auto. with slotted knuckle.

Coupler to be adjustable, i. e., arranged in a slot to be raised and lowered at will. Couplers and draw castings to be strongly reinforced same as for 10 24 ½ D 99.

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

Trucks Arch bar type with cast steel bolsters.

Spring rigging to be extra heavy for rough service.

Springs Elliptic - Standard Steel Works

Journals, Diam. 4½" Length 8"

Wheels, Diam. 30" Tread 4½" Kind Chilled cast iron plate

Tires None Ctr. diam. — Size —

Tires held by —

Safety chains Single

Brake Position On all wheels

Brake gear FL-1012 and SWA Westg. Auto. and Straight Air

★ Chafing castings of cast steel, between engine and tender, same as for 10 24 ½ D 99.

List of tools, sch. 28

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 12-3-19 Shipment On own wheels

Brass shop finish, No. 1

Machine shop finish D-105

Patents Feed water strainer, Pat'd Sept. 1, 1903 (Cast on)

Property plates None

★ Mark on tank as shown on sketch herewith except the bell to be made one half as wide as shown on sketch maintaining same length and with the words "Long" and "Bell" in same location but to have about two letters of each word extending beyond the edges of the bell itself.

Painting, style 291 Olive Green and Aluminum

★ Mark to be same as for 10 24 ½ D 99, except to have on each side of tank, in addition to Co.'s name, an elongated bell with the words "Long Bell" in small letters across the center.

Mark on tank sides: "Lufkin Land & Lumber ~~Company~~ Co."

Road Nos. Pos. Road Nos. Name None

F. No. Plate 17

F. Sand Box

Back of Tank

Actual Dimensions of Loco. Extreme height over all {14' 0⅛" (Top of Headlight) / 12' 6½" (Stack)}

Extreme Width, Cab bodies 9' 0" Cylinders — 8' 7"

Length outside face front bumper of engine to face of tender wedge 29' 0"

Length face of tender wedge to outside face back bumper of tender 21' 3½"

Total length outside face front bumper of engine to outside face back bumper of tender 50' 3½"

THE BALDWIN LOCOMOTIVE WORKS As Spec'n. C-6052

Memorandum Spec'n 19089

SPECIFICATION FOR LOCOMOTIVES 10 - 24½ D 133

FOR MARDEZ LUMBER COMPANY

V.

12-29-19

Gen. as PHOTO. 6749 (EXCEPT BOILER LARGER IN DIAMETER WITH DEEPER THROAT, FIREBOX LONGER AND WITH FUEL RACK AROUND TENDER.)

Engine Drawing No. 35

Gauge of Road 4' 8½" Play ¾"

3 **Wheelbase,** Rigid 10' 0" Driving 10' 0" Total 23' 9"

Total wheelbase, eng. and tend. {Actual 46' 7½" / Limited to ——

Curves ——

Limits, Height —— Width ——

Weight (approximate) in working order, Total 101,500 POUNDS

On F. tr'k 11,000 lbs., Drivers 78,000 lbs., B. tr'k 12,500 lbs.

Tractive power 18,777 lbs., Ratio of adhesion 4.15

Work'g St'm Pres. 180 lbs., Service LOGGING

Fuel WOOD

2-10 **Boiler** STEEL Thick ⅜" & 1 1/16" Bill 8837

Front Tube Sheet ½" Thick

Boiler, Diam. 60" Plan EXTENDED WAGON TOP

{Allowable st'm pres. 200 lbs. **Tested to** 220 lbs. steam pres.

{With Factor of Safety of 4.67 267 lbs. water pres.

Longitud. seams BUTT JOINTED DOUBLE COVERING STRIPS, SEXTUPLE RIVETED

DOME TO BE ONE PIECE TYPE.

11 **Dome,** diam. 29" Pos. FORWARD OF FIRE BOX

10 **Firebox** STEEL Combustion chamb. NONE

4 Firebox, length 76-3/16" Width 40⅛" Depth F. 65 7/16" B. 64½"

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 ⅞" DIAM. WITH 3/16" HOLES 1½" DEEP FROM O.S.

Radial stays 1" DIAM. Sling stays from {TWO ROWS 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

Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS

Number 241 Diam. 2" Length 11' 4"

Heating Surface (Flues —— Combus. Chamb. —— Total 1549.8"

(Tubes 1420" Fire Box 129.8" Fire Brick Tubes ——

Grate area 21.22" Ratio to Heating Surface 1: 73

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 WITH Cleaning hole and cap L.B.&M.'s

Spark-deflector hopper WITH

Netting and deflect. plates WITH

SMOKE BOX ARRANGEMENT TO BE SIMILAR TO 8 24 D 236

Exhaust nozzles DOUBLE HIGH

Stack STRAIGHT Dia. 15"

STACK OF CAST IRON, SIMILAR TO 8 24 D 236

Safety Valves TWO CONSOLIDATED 2" OPEN (Spec.)

Safety valves NONE with relief lever, Set to 180 POUNDS

Whistle ONE 5" 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** 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 OKADEE POS: FRONT

Cleaning Plugs ONE FILLING PLUG IN TOP OF BOILER

Firebox, CORNERS DIAGONAL

Crown, TWO EACH SIDE AND THREE BACK

Waist, ONE UNDER FRONT

Front tube sheet, ONE Fusible plug ONE

Pump NONE

Injectors TWO MONITOR (Not Spec.) No. 8

Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER

5 Pipes, Check IRON Feed IRON Overflow IRON

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

Steam Heat NONE

Cab STEEL, LINED INSIDE 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 32¾"

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"

6 **Coupler** (SEE SUP. 6)

Signal fixtures IRON ON BUMPER

1 **Headlight** TWO ROUND CASE 16" Reflector, Tobura

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

Lamp shelf NONE Nosing ——

Bell BY PYONEE

Bell Stand TWO Diam. 22" Body IRON PAINTED Pipes IRON

Cylinder AMERICAN AIR TRAP A-1, IN EACH CAB, TO BLOW FRONT AND BACK.

Dome casing IRON PAINTED; WITH PRESSED STEEL BOTTOM RING.

Boiler Jacket .062 SOFT STEEL PTD. Bands .062 Style 9

Boiler Lagging MANVILLE SECTIONAL

THE BALDWIN LOCOMOTIVE WORKS

W. E. Moore March-1920.

SPECIFICATION FOR LOCOMOTIVES 10 - 24½ D 133

FOR MARDEZ LUMBER COMPANY

V.

8-10 12 **Frames** CAST STEEL

Cylinders, Diam. 15" Stroke 24"

St'm ports, Length 13" Width 1½" Bridges 1"

Exh. ports, Length 13" Width 2½" Valve lead ¼"

Valve travel 5" Steam lap ¾" Exhaust clearance ——

Eccentric crank throw 10-1/16" By-pass valve NONE

S. F. Lubr. NATHAN TRIPLE BULL'S EYE (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 RICHARDSON BALANCED, WITH VACUUM VALVES

Met. pkg. {PISTON ROD / VALVE STEM} UNITED STATES, KING TYPE (Spec.)

PISTON RODS TO BE KEYED TO CROSSHEADS.

Pistons HEAD OF CAST IRON WITH RINGS OF CAST IRON SPRUNG IN.

Guides STEEL Oil cups NEEDLE

Crossheads CAST STEEL, WITH BEARINGS OF CAST IRON, TINNED

Wrist Pins STEEL Rod cups GREASE CUPS, FORGED SOLID 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.

Driving wheel hub liners NONE

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 = 3/16" TOTAL.

Driving Boxes CAST IRON

Journals, Diam. 7" Length 8"

4 **Springs.** Make B.L.W.

Front Engine Truck TWO Wheeled SWING BOLSTER, CENTER BEARING.

To swing 14" each side of cen., Cen. pin liners NONE

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

Wheel hub liners NONE

Wheels, Diam. 26" Tread —— Kind CAST IRON PLATE CENTERS

Tires STEEL Cen. diam. 21" Size 2½" x 5½"

Tires held by SHRINKAGE AND SHOULDER

Back Engine Truck TWO Wheeled SWING BOLSTER, SIDE BEARING

To swing 14" each side of cen., Cen. pin liners NONE

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

Wheel hub liners NONE

Wheels, Diam. 26" Tread —— Kind CAST IRON PLATE CENTERS

Tires STEEL Cen. diam. 21" 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 WESTG. COMBINED AUTO AND STRAIGHT AIR / Eng. Trk. sch. ——

Foundation Parts { Drivers, sch. WA-1 AMERICAN O.S. EQUALIZED / Eng. Trk. sch. ——

Air pump ONE 9½" Pos. L.S.

Train connections FRONT AND BACK

Train signal, sch. NONE

AIR RESERVOIR TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

2 6 **Tender** EIGHT Wheeled, Drawing No. 1491 {TENDER TO BE WEIGHED: YES.

Weight, with fuel and water, about 80,000 POUNDS

TENDER TO BE LONG, LOW DESIGN

Tank 4000 Gallons, B.L.W. 5161

TANK "U" SHAPE STRAIGHT TOP. FUEL CAPACITY 30 CORDS.

FUEL RACK AROUND TOP OF TANK.

Tool Boxes HARD WOOD, TOP

SYPHON CONNECTION TO LEFT SIDE OF TANK

2 7 **Frame** STEEL 8" AND 10" CHANNELS WITH FRONT AND BACK BUMPERS OF STEEL PLATE SAME AS FOR 8 24 D 236.

Front Drawbar height 29¼"

Pilot NONE Pushing shoes NONE

Back drawhead, center above rail 33½"

7 9 **Coupler** (SEE SUP. 29)

STEPS: (SEE SUP. 30)

Trucks ARCH BAR TYPE WITH CAST STEEL BOLSTERS

31 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 WESTG. AUTO. AND STRAIGHT AIR WITH 10" x 12" TENDER CYLINDER.

List of tools, sch. 27 ONE PAIR WRECKING FROGS

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 3-1-20 Shipment ON OWN WHEELS

Brass shop finish, No. 1

Machine shop finish D-165

B. L. W. Patents { FEED WATER STRAINER, PATD. SEPT. 1, 1903 (CAST ON)

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

Painting, style 291 OLIVE GREEN AND ALUMINUM

LETTERING ETC., TO BE SAME AS FOR 8 24 D 236

Mark on CAB PANELS; M. L. Co.

MARK ON TANK SIDES; MARDEZ LUMBER COMPANY

Road Nos. Pos.	Road Nos.	Name
F. No. Plate	6	NONE
F. Sand Box		
Back of Tank		

Actual Dimensions of Loco. Extreme height over all 13' 6½"

Extreme Width Cab inside 9' 0" Cylinders or valve motion 9' 1½"

Length outside face front bumper of engine to face of tender wedge 28' 6½"

Length face of tender wedge to outside face back bumper of tender 23' 7½"

Total length outside face front bumper of engine to outside face back bumper of tender 52' 1¾"

SPECIFICATION FOR LOCOMOTIVES 10 24 & D 133

FOR Mandez Lumber Company.

HR

370 370

— TENDER —

1 APPEARANCE OF LOCOMOTIVE TO BE SIMILAR TO 10 30 & D 35.

2 LOCOMOTIVE FOR OPERATION IN TEXAS, I.E., BOILER TO CONFORM TO I. C. C. REQUIREMENTS.

3 RIGID WHEEL BASE TO BE 10' 0" OR AT LEAST AS GREAT AS FOR 8 24 D 236.

4 BOILER AND FIRE BOX TO BE MOUNTED ON TOP OF ENGINE FRAMES, NOT BETWEEN ENGINE FRAMES.

5 DEPTH OF FIRE BOX TO BE ABOUT SAME AS FOR 10 26 & D 138 AND 8 24 D 236.

6 ONE SAND BOX NEXT TO CAB, THEN STEAM DOME, THEN SECOND SAND BOX.

7 SYPHON OF SAME TYPE AND SIZE AND APPLIED IN SAME MANNER AS FOR 8 24 D 236, I.E. LIMA 5" SYPHON LOCATED UNDERNEATH CAB BOARD ON LEFT SIDE WITH PIPE CONNECTIONS TO TENDER AND WITH TWENTY-FIVE (25) FEET OF SIX PLY SUCTION HOSE STRONGLY REINFORCED. STEAM PIPE FROM BOILER TO SYPHON TO BE EQUIPPED WITH TWO VALVES, ONE IN THE ~~CAB~~ AT Dome AND ONE NEAR THE SYPHON, SO IT CAN BE OPERATED FROM THE ~~CAB~~ RUNNING BOARD OR FROM THE GROUND. M.C. 4/8/24 Apr. K.R.
LIMA SYPHON TO BE SHIPPED BY MANUFACTURER DIRECT TO DESTINATION OF LOCOMOTIVE TO SAVE TIME.

8 COUPLER TO BE M. C. B. AUTO. WITH SLOTTED KNUCKLE AND KNUCKLE TO BE REMOVABLE FOR USE WITH LINK AND PIN.

9 HEADLIGHT EQUIPMENT TO BE PYLE NATIONAL (Spec) ELECTRIC TYPE K-2 WITH INCANDESCENT HEADLIGHTS. REAR HEADLIGHT ON SWIVEL BASE ON TOP OF CAB.

10 ENGINE FRAMES TO BE EXTRA HEAVY, ACCOUNT OF ROUGH TRACK AND HEAVY WORK.
ENGINE FRAME TO BE PROPORTIONATELY AS HEAVY AS FOR 8 24 D 236.

11 SPRINGS AND HANGERS TO BE EXTRA HEAVY FOR ROUGH SERVICE.

26 TANK CAPACITY INCREASE TO BE OBTAINED IN ADDITIONAL HEIGHT, NOT LENGTH.

27 TENDER FRAME CHANNELS TO BE SAME AS FOR 8 24 D 236.

28 BRACKETS OR HOOKS TO BE PROVIDED TO CARRY SUCTION HOSE AROUND TENDER FRAME, WHEN NOT IN USE.
SYPHON HOSE CARRIER AT SIDE OF TENDER TO BE MADE OF THREE STRIPS OF $\frac{1}{8}$" BY 1" IRON RUNNING LONGITUDINALLY.
THIS IS TO PREVENT HOSE BREAKING DOWN WHERE IT RESTS ON THE HOOKS AS PROVIDED FOR 8 24 D 236.

29 COUPLER TO BE M. C. B. AUTO. WITH SLOTTED KNUCKLE, AND KNUCKLE TO BE REMOVABLE FOR USE WITH LINK AND PIN.

30 STEPS, HAND HOLDS, ETC., TO CONFORM TO I.C.C. REQUIREMENTS.
STEPS AT REAR OF TENDER WITH HAND RAILS.

31 SPRINGS AND SPRING HANGERS TO BE EXTRA HEAVY FOR ROUGH SERVICE.

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-6395, dup. 10 2½ D 125 with same extras except where otherwise spec'd.

Memorandum Spec'n 20039

SPECIFICATION FOR LOCOMOTIVES 10 24 ½ D 135

WS **FOR** Meredith Lumber Company.

HW.

Gen. as Photo. 7198

Engine Drawing No. 28

2-20-20

Gauge of Road 4'8½" Play ⅜"

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

Total wheelbase, eng. and tend. {Actual 45' 5⅝" {Limited to ---

Curves ---

Limits, Height --- Width ---

Weight (approximate) in working order, Total 92,000 pounds.

On F. tr'k 12,000 lbs., Drivers 67,800 lbs., B. tr'k 12,200 lbs.

Tractive power 16,690 lbs., Ratio of adhesion 4.06

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

Fuel Wood

Boiler Steel Thick 9/16" Bill 8649

Front Tube Sheet ½" Thick

Boiler, Diam. 52" Plan Extended Wagon Top.

Tested to {Allowable st'm pres. 200 lbs. {220 lbs. steam pres. {With Factor of Safety of 4.4 {267 lbs. water pres.

Longitud. seams butt jointed, double covering strips.

Dome - One piece type.

Dome, diam. 29" Pos. Forward of Fire Box.

Firebox Steel Combustion chamb. None

Firebox, length 59-3/16" Width 34⅜" Depth F. 60⅝" 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 Single Riveted

Water space stays ⅞" diam. with 3/16" holes 1¼" deep from O. S. (Spec) Taper flexible stays, about 252, in breaking zone.

Radial stays 1" diam. Sling stays front {Two Rows 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 (B. L. W. Option)

Tube ends Swaged for copper ferrules, fire box ends.

Number 160 Diam. 2" Length 11' 10½"

Heating Surface: Flues --- Combus. Chamb. --- Total 1074⁰⁰

Tubes 988⁰⁰ Fire Box 86⁰⁰ Fire Brick Tubes ---

Grate area 14.1 Ratio to Heating Surface 1: 76.2

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 extenstion With Cleaning hole and cap None

Spark ejector or hopper None

Netting and deflect. plates None

Exhaust nozzles Double - Low

Cleaning Pipe - With

Stack Rushton - Improved Dia. 15"

Safety Valves Two Star 2½" Open (Spec)

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 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 Star

Blow off Cock One Everlasting 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

Loco. to be operated in Florida.

Provide 3" Syphon under cab board on left side with pipe connection to tank and with 20 feet of suction hose.

Injectors (Spec) Two Sellers Improved, Class "N" No. 7½

Injectors, Pos. Right and Left 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 Wood Nosing None

Running boards Wood Nosing None

Hand rail Iron Located on Boiler

Back Bumper Bar steel Back draw bar 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"

Coupler M. C. B. Auto.

Signal fixtures Iron on bumper.

Headlight equipment to be Pyle-National Electric Type K-2 with incandescent headlights. Rear headlight on top of cab at rear.

Headlight Two Round Case 18" Reflector, To burn

Headlight, Nos. on sides With Hdlt. step With

Lamp shelf None Nosing ---

Bell 85 pounds

Sand Box Two Diam. 23" Body Iron Painted Pipes Iron

Sander (Spec) Watters Air Single, 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)

THE BALDWIN LOCOMOTIVE WORKS

J. A. Pfeiffer June-1920.

SPECIFICATION FOR LOCOMOTIVES 10 24 ½ D 135

S.V. 372

FOR Meredith Lumber Company

HW.

Frames Cast Steel.

Cylinders, Diam. 15" Stroke 24"

St'm ports, Length 13" Width 1½" Bridges 1"

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

Valve travel 4½" Steam lap 1" Exhaust clearance ---

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

S. (Spec) Lubr. 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

Stm chest valves Balanced, with Vacuum Valves

Mtl. pkg. (Piston rods / Valve stems) United States, King Type.

Piston Rods to be keyed to crossheads.

Pistons Head of cast iron, with rings of ~~cast iron sprung in.~~

Guides Steel Oil cups Needle

Crossheads Cast Steel, with bearings of brass.

Wrist Pins Steel Rod cups Plunger

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.

Driving wheel hub liners None

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 = 3/16" total

Driving Boxes Cast Iron

Journals, Diam. 6" Length 8"

Springs. Make B. L. W.

Front Engine Truck Two Wheeled Swing Bolster, Center Bearing

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

Journals, Diam. 4½" Length 7½" Boxes Cast Iron

Wheel hub liners None

Wheels, Diam. 24" Tread 1½" Kind Chilled Cast Iron Plate

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

Tires held by ---

Back engine truck wheel bolsters of cast steel.

Back Engine Truck Two Wheeled Swing Bolster, Side Bearing

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

Journals, Diam. 4½" Length 7½" Boxes Cast Iron

Wheel hub liners None

Wheels, Diam. 24" Tread 1½" 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 Westg. 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 9½" Pos. L. S.

Train connections Front and Back

Train signal, sch. None

Air reservoir to have hydrostatic test of 210 pounds.

Tender Eight Wheeled, Drawing No. 921

Weight, with fuel and water, about 71,500 pounds.

Tender to be weighed: Yes

Tank 3500 Gallons, Bill 493+

Tank "U" shape, straight top. Fuel Capacity 3 cords.

Wood rack around top of tank.

Tool Boxes 1 hard wood, top.

Syphon connection to top of tank on left side.

Frame Steel 6" and 8" channels, with bumpers of wood.

Front Drawbar height 28½"

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 hand rail.

Trucks Arch bar type with cast steel bolsters.

Springs Elliptic, B. L. W.

Journals, Diam. 4½" Length 8"

Wheels, Diam. 30" 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 Westg. Auto and straight air with 10"x12" tender cylinders.

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

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 3-25-20 Shipment On own wheels.

Brass shop finish, No. 1

Machine shop finish D-185

Patents { B. L. W. Feed Water Strainer, Pat'd. Sept. 1, 1903 (cast on)

Property plates ~~None~~ B. L. W., for Engine and Tender; furnished on Extra Order No. 12884, dated Dec. 19, 1921. 12.20.21.

Painting, style 291, Olive Green and Aluminum.

Mark on Tank Sides: Meredith Lumber Co.

	Road Nos. Pos	Road Nos.	Name None
F. No. Plate		104	
F. Sand Box			
Cab Sides			
Back of Tank			

Actual Dimensions of Loco. Extreme height over all 13' 1¾"

Extreme Width: Cab boards 9' ; Cylinders or valve motion 9' 1½"

Length outside face front bumper of engine to face of tender weight 29' 1½"

Length face of tender weigh to outside face back bumper of tender 21' 8½"

Total length outside face front bumper of engine to outside face back bumper of tender 50' 10"

THE BALDWIN LOCOMOTIVE WORKS as Spec'n C-5912

Memorandum Spec'n 19005

SPECIFICATION FOR LOCOMOTIVES 8 28 D 313

FOR MERIDIAN LUMBER CO., LTD.

RTL

Gen. as PHOTO 5808 — EXCEPT WITH RADLY AND HUNTER SMOKE STACK AND DIFFERENT SMOKE BOX ARRANGEMENT AND TO OMIT HEADLIGHT AT REAR.

Engine Drawing No. 55

1-30-19

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 11' 0" Driving 11' 0" Total 18' 9"
Total wheelbase, eng. and tend. {Actual 46' 7½" / Limited to ——

Curves ——

Limits, Height —— Width ——
Weight (approximate) in working order, Total 101,000 POUNDS
On F. tr'k 15,000 lbs., Drivers 86,000 lbs., B. tr'k —— lbs.

Tractive power 21,500 lbs., Ratio of adhesion 4
Work'g St'm Pres. 160 lbs., Service LOGGING
Fuel WOOD

FRONT TUBE SHEET TO BE ½" THICK.
Boiler STEEL Thick ⅜" Bill 8475
Boiler, Diam. 54" Plan WAGON TOP
Boiler st'm pres. 200 lbs., Tested to {220 lbs. steam pres. / 267 lbs. water pres.
WITH FACTOR OF SAFETY OF 4.73
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS.

Dome, diam. 29" Pos. FORWARD OF FIRE BOX.

Firebox STEEL Combustion chamb. NONE
Firebox, length 70-3/16" Width 42" Depth F. 60½" B. 59½"
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 3/10" HOLES 1½" DEEP FROM O.S.

Radial stays 1" DIAM. Sling stays front {TWO ROWS 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 (B.L.W. OPTION)
Tube ends SHAGED FOR COPPER FERRULES, FIRE BOX ENDS.
Number 211 Diam. 2" Length 10' 9"

Heating Surface	Flues ——	Combus. Chamb. ——	Total 1285 sq
	Tubes 1178 sq	Fire Box 107 sq	Fire Brick Tubes ——
Grate area 20.5 sq	Ratio to Heating Surface 1 : 62.7		
Superheater ——			

Fire Brick ARCH, NONE

Grates ROCKING BARS OMIT DEAD PLATES.
Ash Pan, Dampers FRONT AND BACK.
ASH PAN TO BE SELF-CLEANING TYPE.

Throttle BALANCE Pos. NONE
Dry pipe STEEL

Superheater NONE

(SMOKE BOX SHOWN)
Smokebox extension NONE Cleaning hole and cap NONE
Spark ejector or trapper NONE
Netting and deflect. plates NONE

Exhaust nozzles DOUBLE LOW
CLEANING PIPE, WITH
STACK, RADLY AND HUNTER Dia. 16" [illegible]

Safety Valves TWO CONSOLIDATED 2" (Not Spec)
Safety valves NONE with relief lever, Set to 160 POUNDS
Whistle ONE B.L.W. PLAIN WITH SHARP SHRILL GOOD TONE.

Steam Gauge ONE IRON 7" MAKER ASHCROFT (Spec)
Steam gauge stand NONE **Clock** NONE

{WATER GAUGE OF TYPE WITH GLASSES SIMILAR TO BULL'S EYE LUBR.
Water Gauge ONE **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
Firebox CORNERS DIAGONAL AND SIDES.
Crown, TWO EACH SIDE AND TWO BACK.
Waist, ONE UNDER FRONT.
Front tube sheet, ONE Fusible plug ONE

Pump NONE

SYPHON UNDER CAB ON LEFT SIDE WITH 25 FEET OF SUCTION HOSE FOR FILLING TANK FROM DITCH AND THREE-WAY COCK IN SYPHON DELIVERY AND TO HAVE 4" SIDE OPENING.

Injectors TWO MONITOR (Not Spec) 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 STEEL, UNLINED.
METAL AWNING TO BE APPLIED OVER CAB WINDOWS, THE AWNING NOT TO EXTEND OVER 10".
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
Coupler M.C.B. AUTO. WITH 13" SLOTTED KNUCKLE AT STANDARD HEIGHT (33½") WITH TWO POCKETS BELOW FOR LINK AND PIN COUPLINGS.

Signal fixtures IRON ON BUMPER.

Headlight ONE 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. 28" Body IRON PAINTED Pipes IRON
Sander HAND

Dome casing IRON PAINTED

Boiler Jacket .032 SIZE STEEL Pittsburgh IRON [illegible] Style S
Boiler Lagging PLASTIC MATERIAL FROM B. L. [illegible]

THE BALDWIN LOCOMOTIVE WORKS

J.R. Procter May-1919.

SPECIFICATION FOR LOCOMOTIVES 8 28 D 313 374 374

FOR MERIDIAN LUMBER CO., LTD.

RTL

Frames CAST STEEL Braces SOLID

Cylinders, Diam. 17" 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 strap throw 4½" By-pass valve NONE
S. F. Lubr. DETROIT TRIPLE No. 22 BULL'S EYE (Spec)
Cyl'r heads CAST IRON LUBR. PIPES OF IRON UNDER JACKET.
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 [illegible] U. S. KING TYPE (Not Spec)

Pistons CAST IRON RINGS 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.
DRIVING WHEELS WITHOUT HUB LINERS.
Drivers, O. S. Diam. 44" Con. 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. 7½" Length 8"

Springs, Make B. L. W.

Front Engine Truck TWO Wheeled SWING BOLSTER
To swing 3½" each side of cen. Con. pin liners NONE
Journals, Diam. 5" Length 8" Boxes CAST IRON
Wheels, Diam. 24" Tread 4½" Kind CHILLED CAST IRON PLATE
Tires —— Con. diam. —— Size ——
Tires held by ——
ENTIRE TRUCK CENTER PIN TO BE LARGE, AT LEAST 2½" DIAM.
Back Engine Truck NONE Wheeled ——
To swing —— each side of cen. Con. pin liners ——
Journals, Diam. —— Length —— Boxes ——
Wheels, Diam. —— Tread —— Kind ——
Tires —— Con. diam. —— Size ——
Tires held by ——

Brakes, position ON ALL DRIVING AND TENDER WHEELS.
Cleaning Engine, Sch. U-8 B. L. W. STEAM
Parts Eng. Tr'k, sch. ——
Foundation Drivers, sch. U-8 B. L. W.
Parts Eng. Tr'k, sch. ——
Pins Pos. ——
Triple valves
Train pipe
LUBRICATOR TO BE SET SO ENGINEER CAN SEE FEEDS FROM HIS ACCUSTOMED POSITION.
STEAM CHEST VALVE TO BE LUBRICATED FROM CYLINDER LUBRICATOR.

Tender EIGHT Wheeled, Drawing No. 1371
Weight, with fuel and water about 80,000 POUNDS.
TENDER OF THE LONG LOG TYPE.
Tank 4,000 Gallons, Bill 1760
TANK "U" SHAPE, STRAIGHT TOP. FUEL CAP. 3½ CORDS.
WOOD RACK AROUND TOP OF TANK. {LIBERAL NUMBER OF SPLASH PLATES IN TANK.
Tool Boxes HARD WOOD, TOP
PROVIDE SYPHON CONNECTION TO TANK.
Frame STEEL 10" CHANNELS, WITH BUMPERS OF WOOD REINFORCED WITH ¾" STEEL PLATE.
Front Drawbar height 30"
Pilot NONE Pushing shoes NONE
Back drawhead, center above rail
Coupler M.C.B. AUTO. WITH 13" SLOTTED KNUCKLE AT STANDARD HEIGHT (33½") WITH TWO POCKETS BELOW FOR LINK AND PIN COUPLINGS.
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. 4¼" Length 8"
Wheels, Diam. 28" Tread 4¼" Kind CHILLED CAST IRON PLATE
Tires NONE Con. diam. —— Size ——
Tires held by ——
Safety chains SINGLE

Brake Position ON ALL WHEELS
Brake sch. U-8 B. L. W. STEAM

MATERIAL AND WORKMANSHIP TO BE OF BEST QUALITY.
ONE PAIR JOHNSON WRECKING FROGS, TYPE "2".
List of tools, sch. 30
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 1030.
Junior fawns to 4-1-19 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 ALUMINUM
Painting:—Tender, style 291 OLIVE GREEN AND ALUMINUM
LETTERING, ETC., TO BE SAME AS FOR P 26 D 193.
MARK ON CAB PANELS, M. L. Co.
Mark on TANK SIDES, MERIDIAN LUMBER COMPANY, LTD.
MARK ON REAR OF TANK ABOVE ROAD NUMBER, 4000 GALLONS
ROAD NUMBER ON REAR OF TANK TO BE IN LARGE FIGURES.
Road Nos. Pos. Road Nos. Name NONE
F. No. PLATE 204
F. SAND BOX
BACK OF TANK

METAL AWNINGS 10' 4"
Actual Dimensions of Loco. Extreme height over all 14' 2½"
Extreme Width Cab boards 9'0" Cylinders or valve motion 8'8"
Length outside face front bumper of engine to face of tender wedge 27'1"
Length face of tender wedge to outside face back bumper of tender 24'10"
Total length outside face front bumper of engine to outside face back bumper of tender 52'1"

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-5541

Memorandum Spec'n 19009

SPECIFICATION FOR LOCOMOTIVES 10 28 ½ D 138

FOR Ozan-Graysonia Lumber Company.

RTL

Gen. Bk. Photo 3555 (Except with Walschaerts Valve Motion, Solid End Side Rods and to omit rear headlight.

Engine Drawing No. 30

1-31-19

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 10' 3" Driving 10' 3" Total 26' 10"
Total wheelbase, eng. and tend. (Actual 50' 8½" / Limited to ---

Curves ---
Rails 56 pounds per yard
Limits, Height --- Width ---
Weight (approximate) in working order. Total 125,000 pounds
On F. tr'k 13,000 lbs., Drivers 96,000 lbs., B. tr'k 16,000 lbs.

Tractive power 23,100 lbs., Ratio of adhesion 4.15
Work'g St'm Pres. 180 lbs., Service Freight
Fuel Soft Coal

Front tube sheet to be ½" thick
Boiler Steel Thick ⅝" & 11/16" Bill 8472
Boiler, Diam. 56" 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 5.14
Longitud. seams Butt jointed, double covering strips.

Dome, diam. 29" Pos. Forward of fire box

Firebox Steel Combustion chamb. None
Firebox, length 64 1/16" Width 42" Depth F. 63½" B. 60½"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back ⅜"
Firedoor opening 16" diam. Crown and sides in one sheet
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 B.L.W. / Expansion Stays)
Button heads below crown on Eight contral 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 200 Diam. 2" Length 14' 9"

Heating Surface	Flues ---	Combus. Chamb. ---	Total 1637
	Tubes 1536	Fire Box 101	Fire Brick Tubes ---
	Grate area 18.7	Ratio to Heating Surface 1 : 86.9	
	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 ~~ejector~~ deflector hopper With
Netting and deflect. plates With

Exhaust nozzles Double High

Stack Straight Dia. 16" Hole in S. B., dia. 2½"

Safety Valves Two Crosby 3" (Not Spec)
Safety valves None with relief lever, Set to 180 pounds
Whistle One 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 without separate dry pipe to dome
Blower Valve B. L. W.

Blow-off Cock One B. L. W. Pos. R. S.
Cleaning Plugs One filling plug in top of boiler
Firebox Corners and back
Crown, Two each side and three back
Waist, One under front
Front tube sheet, One Fusible plug Two, Pos. F. & B. of crown

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

Injectors (Spec) Two Sellers 1887 Class "K" 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 Steel One large window in side of cab.
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 36½"

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 Tower M. C. B. Auto. with slotted knuckles.

Signal fixtures Iron on bumper

Headlight One Round Case 18" Reflector,
Headlight, Nos. on sides With H'd'l step With
Lamp shelf None Nosing ---

Bell 92 pounds
Sand Box Two Diam. 28" Body Iron painted Pipes Iron
(No 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 Bands Iron Style 9 and 14
Boiler Lagging B. L. W. Plastic Magnesia from stock.
Back head of boiler to be lagged and jacketed.

THE BALDWIN LOCOMOTIVE WORKS

P. W. Stroud June-1919.

SPECIFICATION FOR LOCOMOTIVES 10 28 ½ D 138

376 376

FOR Ozan-Graysonia Lumber Company.

RTL

Frames Cast Steel Braces Solid

Cylinders, Diam. 17" Stroke 24"
St'm ports, Length 20.84" Width 1½" Bridges ---
Exh. ports, Length --- Width --- Valve lead ¼"
Valve travel 5½" Steam lap ⅞" Exhaust clearance ---
Eccentric crank throw 11½" By-pass valve None
S. F. Lubr. Nathan Triple Bull's Eye (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 --- Covers ---
St'm chest valves 9½" diam. Piston valve
Met. pkg (Piston rods / Valve stems) U. S. King type (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, with bearings of brass
Wrist Pins Steel Rod cups Grease cups 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.
Driving wheels to have hub liners of bronze.
Drivers, O. S. Diam. 46" Cen. diam. 40" Centers 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 = 1/16" total
Driving Boxes Cast steel with Elvin Lubricators
Journals, Diam. 8" Length 9"

Springs. Make B. L. W.

Front Engine Truck Two Wheeled Swing bolster, center bearing
To swing 4" each side of cen., Cen. pin liners None
Journals, Diam. 5" Length 10" Boxes Cast Steel
Wheels, Diam. 28" 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. 5" Length 10" Boxes Cast Steel
Wheels, Diam. 28" 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. No. 6-ET Westg. Auto. Comb. Auto. and Straight Air
Foundation Parts: Eng. Tr'k, sch. ---
Drivers, sch. WI-1 American O.S. Equalized
Eng. Tr'k, sch. ---
Air pump One 11" 2 Pos. L. S.
Train connections Front and back
Train signal, sch. None
Air reservoirs to have hydrostatic test of 210 pounds.

Tender Eight Wheeled, Drawing No. 1367
Weight, with fuel and water, about 80,000 pounds
Tank to be of steel ¼" thick
Tank 4000 Gallons, Bill 4767
Tank "U" shape, straight top. Fuel capacity 6 to 7 tons.

Tool Boxes Hard Wood, Top

Frame Steel 10" channels, with bumpers of wood.

Front Drawbar height 32"
Pilot of wood Pushing shoes None
Back drawhead, center above rail 33½"
Coupler Tower M. C. B. Auto. with slotted knuckle.

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. 4¼" Length 8" Tread 4¼" Kind Chilled cast iron plate
Wheels, Diam. 33" Cen. diam. --- Size ---
Tires None
Tires held by ---
Safety chains Single

Brake Position On all wheels
Brake sch. No. 6-ET Westg. Auto. and Straight Air with 10" x 12" tender cylinder.

List of tools, sch. 29 One pair wrecking frogs.
Photo sch. ~~None~~ 2 5/4/19 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 2-3-19 Shipment On own wheels

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

Coupler changed to 24" Dia wheels. Complain that truck axle #8035-19 one too high and struck main frame when turning curves

B. L. W. Feed Water Strainer, Pat'd Sept. 1, 1903 (Cast on)
Patents

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 similar to 12 34 ½ E 35.
Mark on tank sides, Ozan - Graysonia Lumber Co.

	Road Nos.	Name
Road Nos. Pos.		Painted on Cab Panels:
Front No. Plate	2	George Teat
Front Sand Box		
Back of Tank		

Actual Dimensions of Loco. Extreme height over all 12' 11"
Extreme Width: Cab boards 9' 11" Cylinders or valve motion 9' 2"
Length outside face front bumper of engine to face of tender wedge 31' 6"
Length face of tender wedge to outside face back bumper of tender 24' 5½"
Total length outside face front bumper of engine to outside face back bumper of tender 55' 11½"

SPECIFICATION FOR LOCOMOTIVES 10 28 & 0 Nos. 138

FOR OZAN-GRAYSONIA LUMBER COMPANY.

377

1 FLEXIBLE STAYS, TATE, 1" DIAM. ABOUT 430 IN NUMBER, LOCATED IN THREE FRONT AND THREE BOTTOM ROWS OF SIDE SHEETS, UNDER RUNNING BOARDS, CAB THROAT AND IN OTHER INACCESSIBLE PLACES.

2 ASH PAN SLIDES TO BE OPERATED BY LEVER.

3 STEAM PIPES TO HAVE OUTSIDE CONNECTIONS TO STEAM CHESTS.

4 SMOKE BOX TO BE SELF CLEANING TYPE.

5 INJECTORS TO BE SELF ACTING TYPE FOR USE WITH HOT WATER.

6 VALVE IN LEFT SIDE OF CAB TO OPERATE SYPHON ON TENDER. STEAM LINE TO TENDER TO HAVE McLAUGHLIN METALLIC CONNECTION BETWEEN ENGINE AND TENDER.

7 RADIAL BUFFER BETWEEN ENGINE AND TENDER.

8 HEADLIGHT EQUIPMENT TO BE PYLE NATIONAL ELECTRIC, TYPE "K-2" WITH INCANDESCENT HEADLIGHT.

9 DOME CASING TO HAVE PRESSED STEEL BOTTOM RING AND PRESSED STEEL TOP RING.

10 CYLINDERS TO HAVE BUSHINGS OF HUNT SPILLER IRON.

11 PISTON ROD TO BE LONG ENOUGH TO ENABLE THE RENEWAL OR EXAMINING OF PISTON PACKING RINGS WITHOUT DISCONNECTING CROSSHEAD.

12 GUIDE YOKE TO BE OF MILD WROUGHT STEEL.

13 BACK WRIST PINS TO HAVE NUTS AND WASHERS TO FASTEN RODS.

14 PARALLEL RODS TO HAVE SOLID ENDS EXCEPT FRONT END OF FRONT SIDE ROD TO HAVE STRAP END WITHOUT KEYS AND WITH SPLIT BRASSES.

15 FRONT ENGINE TRUCK FRAME OF WROUGHT STEEL.

16 FRONT ENGINE TRUCK JOURNALS TO BE EQUIPPED FOR OIL INSTEAD OF GREASE LUBRICATION.

17 FRONT ENGINE TRUCK WHEELS TO HAVE HUB LINERS OF BRASS.

18 BACK ENGINE TRUCK FRAME OF WROUGHT STEEL.

19 BACK ENGINE TRUCK JOURNALS TO BE EQUIPPED FOR OIL INSTEAD OF GREASE LUBRICATION.

20 BACK ENGINE TRUCK WHEELS TO HAVE HUB LINERS OF BRASS.

TENDER

51 NANCOCK SYPHON LOCATED UNDER TENDER BETWEEN 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 THE SYPHON.
SYPHON TO HAVE 4" SUCTION.
B. L. W. TO FURNISH HOSE 4" DIAM. 50' 0" LONG.
McLAUGHLIN METALLIC CONNECTION BETWEEN ENGINE AND TENDER FOR SYPHON.

52 RADIAL BUFFER BETWEEN ENGINE AND TENDER.

53 ADDITIONAL BEARINGS AT SIDES OF BOTH TRUCKS.

THE BALDWIN LOCOMOTIVE WORKS As Specn. C-6329.

Memorandum Spec'n 20047

SPECIFICATION FOR LOCOMOTIVES 10 22 ½ D 53

CF.

FOR J. F. Prettyman & Sons

HW.

Gen. as Photo. 5150 {Except to have Rushton Improved wood burning stack, elec. headlights front of engine and back on cab roof, and wood rack on tender.

Engine Drawing No. 18

2.23.20 (Not Specd)

Gauge of Road 4' 8½" Play ¾"

Wheelbase, Rigid 9' 2" Driving 9' 2" Total 23' 6"

Total wheelbase, eng. and tend. {Actual 45' 0¾" {Limited to ---

Curves 10 to 12 degrees Rails 40 pounds.

No. 6 turnouts with curvature of about 20 degrees.

Limits, Height --- Width ---

Weight (approximate) in working order, Total 88,400 pounds.

On F. tr'k 13,400 lbs., Drivers 61,500 lbs., B. tr'k 13,500 lbs.

Tractive power 14,800 lbs. Ratio of adhesion 4.15

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

Fuel Wood and Coal

Boiler Steel Thick ½" Bill 8912

Front Tube Sheet ½" Thick

Boiler, Diam. 52" Plan Straight Top.

{Allowable st'm pres. 200 lbs. **Tested to** {220 lbs. steam pres.

{With Factor of Safety of 4.66 {267 lbs. water pres.

Longitud. seams butt jointed, double covering strips, sextuple riveted.

Dome, diam. 25" Pos. Central

Firebox Steel Combustion chamb. None

Firebox, length 55-15/16" Width 39⅜" Depth F. 64½" B. 61½"

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 12½" deep from O. S.

Radial stays 1" diam. Sling stays front {Two rows 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 (B.L.W. Option)

Tube ends Swaged for copper ferrules, fire box ends.

Number 151 Diam. 2" Length 11' 10½"

Heating Surface {Flues ---, Combus. Chamb. --- Total 1071⁰

{Tubes 994⁰ Fire Box 77⁰ Fire Brick Tubes ---

Grate area 13.3⁰ Ratio to Heating Surface 1: 80.5

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 extenstion With Cleaning hole and cap None

Spark ejector or hopper None

Netting and deflect. plates None

Exhaust nozzles Double-Low

Cleaning Pipe -- With

Stack Rushton Improved Dia. 14"

Safety Valves Two Coale 2½" Open

Safety valves None with relief lever. Set to 170 pounds.

Whistle One B.L.W. Plain

Steam Gauge One Iron 7" Maker: Ashcroft (Not Specd)

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 pipe to dome

Blower Valve B. L. W.

Blow off Cock One Everlasting 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

Injectors Two Monitor (Special) 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 Steel

Cab boards Wood Nosing None

Running boards Wood Nosing None

Hand rail Iron Located on Boiler

Back Bumper Bar Steel Back drawbar height 31¼"

Pilot Steel 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. 5)

Coupler Four-pocket draw casting. (See Sup. 5)

Signal fixtures Iron on bumper.

Headlight Two Round Case 18" Reflector,

Headlight, Nos. on sides With Hand step With

Lamp shelf None Nosing ---

Bell 85 pounds.

Sand Box Two Diam. 23" Body Iron painted Pipes Iron

Sander (Not Specd) 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 Magnesia Sectional.

THE BALDWIN LOCOMOTIVE WORKS

H.F. McNeil July-1920.

SPECIFICATION FOR LOCOMOTIVES 10 22 ½ D 53

FOR J. F. Prettyman & Sons

HW.

Frames Cast Steel

Cylinders, Diam. 14" Stroke 22"

Steam ports, Length 13" Width 1½" Bridge 1"

Exh. ports, Length 13" Width 2½" Clearance 1/16"

Valve travel ½" Steam lap ¾" Exhaust clearance ---

Eccentric throw ½" Exhaust lap None

Piston Valves Detroit Triple No. 22 Bull's Eye

Cylinders Cast Iron Lubricating pipes of iron, under jacket.

Cylinder saddle Iron ptd. Cylinder cover Steel painted

Steam chest Iron ptd. Outside Steel painted

Valves Balanced, with vacuum valves.

Valve motion (Not Specd) United States, King Type.

Piston rods to be keyed to crossheads.

Pistons Heads of cast iron with rings of cast iron sprung in.

Guides Alligator type, Steel Guide bars Needle

Crossheads Cast Steel, with bearings of brass.

Wrist Pins Steel Bushings (See sup. 8)

Parallel rods to have solid ends.

Valve Motion Stephenson

Valves, sliding backs, double ported, links and eccentric rod pins to be hard cast hardened or to have hardened bushings

All journals on bolts except crossheads to be United States Standard.

All finished renewable parts of steel or iron case hardened.

Wearing Bearings B. L. W.

Driving wheel hub liners Bronze

Drivers, O. S. Diam. 42" Centers diam. 36" Centers Cast Iron.

Tires Steel Shrinkage and shoulder.

Tires, Flange, Pos. Front and back Size 3" x 6"

Tires, Tread, Pos. Middle Size 3" x 7"

Lateral play between wheel hubs 3/16" total

Driving Boxes Cast Steel

Journals, Diam. 6" Length 8"

Springs, Make B. L. W.

Front Engine Truck Two Wheeled Swing bolster, center bearing

To swing 12" each side of center Center pin liners None

Journals, Diam. 4½" Length 7½" Boxes Cast Iron

Wheel hub liners None

Wheels, Diam. 24" Tread 4½" Kind Chilled Cast Iron, Spoke

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

Tires held by ---

Back Engine Truck Two Wheeled Swing bolster, side bearing

To swing 2½" each side of center Center pin liners None

Journals, Diam. 4½" Length 7½" Boxes Cast Iron

Wheel hub liners None

Wheels, Diam. 24" Tread 4½" Kind Chilled Cast Iron, Spoke

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

Tires held by ---

Brake, position On all driving and tender wheels.

Operating Engine screw Westg. straight air. (See Sup. 30)

Parts Eng. Truck screw ---

Foundation Drivers, screw A-1 American outside equalized

Parts Eng. Truck screw ---

Air pump One 9½" Pos. L.S.

Train connections None

Cab signal, sch. None

Tender Eight Wheeled Drawing No. 1508

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

Tender to be weighed: Yes

Tank, 8,000 Gallons, Bill 5225

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

Woodrack around top of tank. Coal gates of wood.

Hard wood, top.

Syphon connection to left side of tank. (See Sup. 24 etc.)

Frame steel 5" and 8" channels with bumpers of wood and steel plate.

Front Overhang 2'6"

Pilot None Pushing shoes None

Back overhang, center above rail (See sup. 22)

Coupler Four Pocket Draw Casting. (See Sup. 22)

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. 3½" Length 7"

Wheels, Diam. 28" Tread 4" Kind Chilled Cast Iron Plate.

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

Tires held by ---

Safety chains Single

Brake Position On all wheels

Brake shoes Westg. straight air with 10"x12" cylinder. (Sup. 30)

List of tools, sch. 26 One pair wrecking frogs.

Photo sch. No. 2 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 lawsuits to 2.22.20 Shipment On own wheels.

Brass shop finish, No. 1

Machine shop finish D-165

Feed Water Strainer, Patd. Sept. 1, 1903 (cast on)

Fenders

Property plates None B.L.W. for engine and tender.

Painting, style 291, olive green and aluminum.

Mark Tank Sides: J. F. Prettyman & Sons

Road Nos. Pos. F. No. Plate

F. Sand Box

Cab Sides

Back of Tank

Road Nos. 6 Name None

Actual Dimensions of Loco. Extreme height over all 14' 1¾"

Extreme Width, Cab boards 8' 7" Cylinders or valve motion 8' 5⅛"

Length outside face front bumper of engine to face of tender wedge 29' 5⅝"

Length face of tender wedge to outside face back bumper of tender 21' 7½"

Total length outside face front bumper of engine to outside face back bumper of tender 51' 1¾"

SPECIFICATION FOR LOCOMOTIVES IC 22 1 D 53

FOR J. F. PRETTYMAN & SONS

HW

380

1 LOCOMOTIVE FOR OPERATION IN SOUTH CAROLINA.
DETAILS TO CONFORM TO ALL I. C. C. REQUIREMENTS.

2 ASH PAN TO BE No. 8 W. G. STEEL, AND TO BE BLOWN OUT BY STEAM AND NOT DUMPED.

3 SYPHON H. & D. MODEL 8-C UNDER CAB BOARD ON LEFT SIDE WITH 20' 0" OF 3" HOSE WITH STRAINER AT END, PLACED TO DISCHARGE INTO FRONT OF TENDER: THREE-WAY COCK AT TOP OF LINE, ONE TO RUN BACK TO FILL SKIDDER TANK. (SUP. 16)

4 FEED WATER STRAINERS TO BE SELLERS.

5 COUPLER TO BE FOUR-POCKET DRAW CASTING WITH CENTER OF TOP POCKET 35" ABOVE THE RAIL, CENTER TO CENTER OF POCKETS 5½". VERTICAL MEASUREMENTS OF OPENINGS 3½", HOLE FOR COUPLING PIN 2" DIAM.

6 HEADLIGHT EQUIPMENT TO BE SCHROEDER, ELECTRIC WITH INCANDESCENT HEADLIGHTS.
REAR HEADLIGHT TO BE PLACED ON TOP OF CAB ROOF.
WIRING FOR ELECTRIC HEADLIGHTS TO BE ARRANGED SO EACH HEADLIGHT MAY BE OPERATED INDEPENDENTLY OF THE OTHER, AND SO THAT CAB LIGHTS MAY BE USED IN CONJUNCTION WITH EITHER HEADLIGHT.

7 LUBRICATOR TO BE PLACED FORE AND AFT SO ENGINEER AND FIREMAN CAN BOTH GET VIEW OF OIL GLASSES.

8 COMPRESSION GREASE CUPS FORGED ON RODS.

9 VALVE MOTION TO BE BUSHED FOR PIN BEARINGS.

10 EQUALIZER PIN BEARINGS TO BE BUSHED TO GIVE LONG WEAR.
EQUALIZERS AND SPRING HANGERS TO HAVE PINS OF LARGE SIZE.

11 MAIN RESERVOIR OF ABOUT 30,000 POUNDS CAPACITY.
AIR RESERVOIR TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

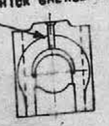
12 ONE S-4 PUMP GOVERNOR
ONE 1" STEAM VALVE.

13 DRIVER BRAKE HEADS AND SHOES OF CAST STEEL.

15 WHISTLE TO BE LARGE, SIMILAR TO POLISH STATE LOCOMOTIVES.

16 SYPHON TO HAVE STRAINER ON END OF SUCTION HOSE; THIS STRAINER TO BE MADE OF PIPE WITH CAP OR PLUG ON END, AND HOLES DRILLED IN PIPE. (SEE SUP. 3)

17 MAIN DRIVING BOX TO HAVE GOOD LIBERAL GROOVE FOR GREASE CUT DOWN FACE OF BOX WITH TOP CHAMFERRED AS SKETCH ATTACHED, SO THICK GREASE MAY BE USED ON TOP BETWEEN HUB AND BOX.



TENDER

21 TANK TO BE MADE OF HEAVIER MATERIAL THAN USUAL, ~~ADVISING COMPANY WHAT THE THICKNESS WILL BE.~~

22 COUPLER TO BE FOUR-POCKET DRAW CASTING WITH CENTER OF TOP POCKET 35" ABOVE THE RAIL, CENTER TO CENTER OF POCKETS 5½". VERTICAL MEASUREMENTS OF OPENINGS 3½". HOLE FOR COUPLING PIN 2" DIAM.

23 TENDER BRAKE HEADS AND SHOES AND HANGERS OF STEEL.

24 SYPHON PIPE FLANGE AS NOW APPLIED TO TANK WATER LEG TO BE OMITTED AND THREE-WAY COCK TO BE APPLIED ON TOP OF TANK WITH A 3" WROUGHT IRON PIPE EXTENDING FROM THE COCK TO 6" BACK OF COAL BOARD, AND TO BE THREADED FOR HOSE COUPLING.

25 SYPHON HOSE TO BE FASTENED TO SYPHON AND CARRIED BACK OVER HOOKS ON TENDER FRAME AFTER ARRIVAL OF LOCOMOTIVE AT DESTINATION.

26 FOUR SYPHON HOSE SUPPORTS MADE OF 3" x ¾" IRON OR STEEL WITH A PIECE OF RUBBER HOSE FORCED ON ENDS TO PREVENT WEAR ON HOSE, TO BE FASTENED TO SIDES OF TENDER FRAME.

39 AIR BRAKE OPERATING FIXTURES AS FOLLOWS:-

		Po. 53111
1	- 9½ S DC	1887
3	- DR. COCKS	1916
1	- CIL COCK	2090
1	- SET PACKING	15551
1	- WRENCH	24974
1	- S 4 SDCG	17944
1	- 1" STEAM VALVE	
1	- 5" GAUGE (FOR MAIN RESERVOIR AND DRIVER BRAKE CYLINDER)	23334 67005
2	- GAUGE UN. FITTINGS	1115
2	- DB CYLRS. No. 55-B	36452
1	- D. COLLECTOR	2626
1	- S 3 BRAKE VALVE	18482
1	- C-6 FEED VALVE	10526
1	- E-1 8 VALVE	46252
2	- H. & C.	2237
1	- ANGLE FITTING	12991
1	- TENDER CYLINDER	

For Hereafter: Provide cut-off valve between injector check and boiler. Provide lock nuts on large grease cups 2½" across flats.

BALDWIN LOCOMOTIVE WORKS As Spec'n C-5815

Memorandum Spec'n 19038

SPECIFICATION FOR LOCOMOTIVES 10 26 E 411

FOR Philip A. Ryan Lumber Company.
RTL

Gen. as Photo 4115 {Except plate engine truck wheels

Engine Drawing No. 54 Photo-7132

6-11-19.

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 12' 3" Driving 12' 3" Total 19' 10"
Total wheelbase, eng. and tend. {Actual 45' 7" {Limited to ---

Curves --- Grades 6%
Rails 35 and 40 pounds. 16 ties per rail, no ballast.
Limits, Height --- Width ---
Weight (approximate) in working order, Total 89,000 pounds
On F. tr'k 13,000 lbs., Drivers 86,000 lbs., B. tr'k --- lbs.

* Tractive power 20,500 lbs., Ratio of adhesion 4.19
Work'g St'm Pres. 180 lbs., Service Logging
Fuel Soft Coal

Front tube sheet ½" thick.
Boiler Steel Thick ½" Bill 8595
Boiler, Diam. 52" Plan Straight Top
Boiler st'm pres. 200 lbs., Tested to {220 lbs. steam pres. {267 lbs. water pres.
With factor of safety of 5.2
Longitud. seams Butt jointed, with double covering strips, sextuple riveted.
Dome, diam. 25" Pos. Central
Auxiliary Dome – None
Firebox Steel Combustion chamb. None
Firebox, length 72" Width 42" Depth F. 57" B. 52⅞"
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 1½" deep from O.S.

Radial stays 1" diam. Sling stays front {Two rows 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 (B.L.W. Option)
Tube ends Swaged for copper ferrules, fire box ends.
Number 166 Diam. 2" Length 13' 1"

Heating Surface	Flues ---	Combus. Chamb. ---	Total 1223 sq. ft.
	Tubes 1130 sq. ft.	Fire Box 93 sq. ft.	Fire Brick Tubes ---
Grate area 21 sq. ft.	Ratio to Heating Surface 1 : 58.2		
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~~ hopper With
Netting and deflect. plates With

Exhaust nozzles Double High.

Stack Straight See Extra Order 11360-13241-Roskton Stack Dia. 15"

* Loco. guaranteed to haul 650 tons of 2000 lbs. each up straight grade of 1%; 340 tons up 2%; 200 tons up 3%; 140 tons up 4%; and 105 tons up 5%, assuming cars to be in good running condition with frictional resistance not exceeding 8 lbs. per ton.

(Not Spec.)
Safety Valves Two Coale 3½" Open
Safety valves None with relief lever, Set to 180 pounds
Whistle One B. L. W. Plain

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

Water Gauge One B.L.W. (Monolad) **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, sides and back
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 Two Monitor (Not Spec) No. 7
Injectors, Pos. R. and L. Steam pipes Copper
Pipes, Check Steel Feed Steel Overflow Steel
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 29"

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. with slotted knuckle, to couple to standard flat cars.

Signal fixtures Iron on bumper
Headlight equipment to be Pyle National Electric, type "K-2" 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 85 pounds
Sand Box One Diam. 28" Body Iron painted Pipes Iron
Sander (Not Spec) Leach Air Double Trap A-10, to sand front and back..

Dome casing Iron painted

Boiler Jacket #22 Plain Steel Bands Iron Style 9
Boiler Lagging Plastic Magnesia from B. L. W. Stock.

THE BALDWIN LOCOMOTIVE WORKS

W.O. Webster July 1919

SPECIFICATION FOR LOCOMOTIVES 10 26 E 411

FOR Philip A. Ryan Lumber Company.
RTL

382

Frames Cast Steel

Cylinders, Diam. 16" Stroke 22"
St'm ports, Length 15" Width 4½" Bridges 1"
Exh. ports, Length 15" Width 2½" Valve lead 3/16"
Valve travel 5½" Steam lap 15/16" Exhaust clearance ---
Eccentric crank throw 11-9/16" By-pass valve None
S. P. Lubr. (Not Spec) Michigan Triple 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
Mel. pkg {Piston rods {Valve stems United States, King type (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 bearings of cast iron, tinned.
Wrist Pins Steel Rod cups Plunger Grease Cups Verbal O.G. 6-24-19 mmc
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 wheel hub liners – None
Drivers, O. S. Diam. 42" Cen. diam. 36" 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 is 1/10" total
Driving Boxes 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. 26" Tread 4¼" Kind Chilled cast iron plate
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. No. 6-ET Westg. Combined Auto. and Straight Air {Eng. Tr'k. sch. ---
Foundation Parts {Drivers, sch. WN-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 pounds.

Tender Eight Wheeled. Drawing No. 1400
Weight, with fuel and water, about 65,000 pounds

Tank 3,000 Gallons, Bill 4237
Tank "U" shape, straight top. Fuel Capacity 6 tons

Tool Boxes Hard Wood, Top

Frame Steel, 6" and 8" channels, with bumpers of wood.

Front Drawbar height 27⅛"
Pilot None Pushing shoes None
Back drawhead, center above rail 33½"
Coupler M.C.B. Auto. with slotted knuckle, to couple to standard flat cars.

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. 3¾" Length 7"
Wheels, Diam. 28" 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 Westg. Auto. and Straight Air, with 10" x 12" tender cylinder.

List of tools, sch. 26 One pair wrecking frogs.
Photo sch. None No. 2 Inspection B. L. W.
To be weighed Yes Material specs B. L. W.
Certificate of boiler test Three copies B. L. W. form 1036.
Junior laws to 6-12-19 Shipment On own wheels

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

B. L. W. Feed Water Strainer, Pat'd Sept. 1, 1903 (Cast on)
Patents

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, Philip A. Ryan Lumber Co.

Road Nos. Pos. Road Nos. Name None
F. No. Plate 2
Sand Box
Cab Sides
Back of Tank

Actual Dimensions of Loco. Extreme height over all 12' 10¼"
Extreme Width: Cab boards 9' 3" Cylinders ~~or steam chests~~ 9' 5½"
Length outside face front bumper of engine to face of tender wedge 30' 0½"
Length face of tender wedge to outside face back bumper of tender 20' 6⅜"
Total length outside face front bumper of engine to outside face back bumper of tender 50' 7¼"

THE BALDWIN LOCOMOTIVE WORKS As Spec'n. C-6096

Memorandum Spec'n 19075

SPECIFICATION FOR LOCOMOTIVES 10 30 ¼ D 14½

FOR SAN AUGUSTINE COUNTY LUMBER COMPANY

P

GEN. AS PHOTO. 1884 { EXCEPT TO HAVE WALSCHAERT'S VALVE GEAR AND GUIDE HEAD-LIGHT FROM CAB ROOF.

Engine Drawing No. 15

11-7-19 (Not Space)

Gauge of Road 4' 8½" Play ¾"

Wheelbase, Rigid 10' 2" Driving 10" 2" Total 26' 10"

Total wheelbase, eng. and tend. { Actual 48' 5½" / Limited to ---

Curves ---

Limits, Height ---¼ Width ---

Weight (approximate) in working order, Total 125,000 POUNDS

On F. tr'k 10,500 lbs., Drivers 103,000 lbs., B. tr'k 11,500 lbs.

Tractive power 25300 lbs., Ratio of adhesion 4.07

Work'g St'm Pres. 180 lbs., Service LOGGING

Fuel OIL (SEE SUP. 1)

2 **Boiler** STEEL Thick ⅞" & 11/16" Bill 8783 8796 FOR HEREAFTER

Front Tube Sheet ½" Thick

Boiler, Diam. 56" Plan EXTENDED WAGON TOP

{ Allowable st'm pres. 200 lbs. / With Factor of Safety of 4.64 } **Tested to** { 220 lbs. steam pres. / 257 lbs. water pres.

Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS

DOME - ONE PIECE TYPE

Dome, diam. 29" Pos. FORWARD OF FIRE BOX

4 **Firebox** STEEL Combustion chamb. NONE

Firebox, length 76-3/16" Width 39½" Depth F. 60¾" B. 65¾"

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

Firedoor opening 16" DIAM. CROWN AND SIDES IN ONE SHEET.

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

Water space frame SINGLE Riveted

3 Water space stays ⅞" DIAM. WITH 3/16" HOLES 1¼" DEEP FROM O.S.

Radial stays 1" DIAM. Sling stays front { TWO ROWS 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 (B.L.W. OPTION)

Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.

Number 18 Diam. 5⅝" Length 12' 10"

120 2"

Heating Surface Flues 323 sq. ft. Combus. Chamb. --- Total 1245 sq. ft.

Tubes 801 sq. ft. Fire Box 121 sq. ft. Fire Brick Tubes ---

Grate area 18.2 sq. ft. Ratio to Heating Surface 1: 68.4

Superheater 238 sq. ft.

Fire Brick ARCH - ON STUDS

FIRE BOX LINED WITH FIRE BRICK FOR OIL BURNING

FIRE BRICK PAVEMENT IN PAN.

1-A **Grates** NONE

Ash Pan, Dampers FRONT ONLY

Throttle BALANCE Pos. DOME

Dry pipe STEEL

Superheater SCHMIDT TYPE (SEE SUP. 6-E)

5 **Smokebox** extension WITH 5½" Cleaning hole and cap L. S. ONLY

5 Spark ~~ejector or~~ hopper WITH

~~Netting and~~ deflect. plates WITH

Exhaust nozzles DOUBLE - LOW

CLEANING PIPE - WITH

Stack STRAIGHT Dia. 16"

Safety Valves TWO COALE 2½" OPEN

Safety valves NONE with relief lever, Set to 180 POUNDS

Whistle ONE B. L. W. PLAIN

2 **Steam Gauge** ONE IRON 7" MAKER: ASHCROFT (Not Space)

Steam gauge stand IRON **Clock** NONE

Water Gauge ONE B.L.W. (IRONCLAD) 12" **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

8 **Cleaning Plugs** ONE FILLING PLUG IN TOP OF BOILER

Firebox, CORNERS, BACK ONES DIAGONAL, SIDES AND BACK

Crown, - TWO EACH SIDE AND TWO BACK

Waist, ONE UNDER FRONT ONE PLUG OVER FIRE DOOR.

Front tube sheet, ONE Fusible plug ONE

Pump NONE

Injectors TWO MONITOR (Not Space) 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

1 **Cab** STEEL, LINED WITH WOOD

Cab boards STEEL Nosing T-IRON

Running boards STEEL Nosing T-IRON

Hand rail IRON Located on BOILER

1 **Back Bumper** BAR STEEL Back drawbar height 35¾"

Pilot WOOD

Front Bumper OAK Pushing shoes AT FRONT

2 **Steps** HAND HOLDS ETC. TO CONFORM TO I.C.C. REQUIREMENTS Bumper plate WITH

Front Drawhead, Center above rail 33½" AND 25"

Coupler (SEE SUP. 11)

Signal fixtures IRON ON BUMPER

1 **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 Space) 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

THE BALDWIN LOCOMOTIVE WORKS

Mr. Conklin

SPECIFICATION FOR LOCOMOTIVES 10 30 ¼ D 14½ Jan. 1920.

FOR SAN AUGUSTINE COUNTY LUMBER COMPANY

P

384 384

Frames CAST STEEL

Cylinders, Diam. 18" Stroke 24"

Sm'k ports, Length 16½" Width 1¼" Bridges ---

Exh. ports, Length --- Width --- Valve lead ⅛"

Valve travel 4½" Steam lap 1" Exhaust clearance ---

Exh. cl'r'k thick 9/16" By-pass valve NONE

S. P. Lubr. (Not Space) NATHAN FIVE FEED BULL'S EYE

Cyl'r heads CAST IRON Lubr. PIPES OF IRON, UNDER JACKET

Cyl'r casings IRON PAINTED Heat covers STEEL PAINTED

Steam chest casings --- Covers ---

St'm chest valves 8" DIAM. PISTON TYPE

Mfd. by (Not Space) UNITED STATES, KING TYPE

PISTON RODS TO BE KEYED TO CROSSHEADS

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD

Guides "ALLIGATOR" TYPE, STEEL Oil cups NEEDLE

Crossheads CAST STEEL, WITH BEARINGS OF CAST IRON, TINNED

Wrist Pins STEEL Hardened PLUNGER, FORGED ON

PARALLEL RODS TO HAVE SOLID ENDS.

Valve Motion WALSCHAERTS

(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 staybolts, to be United States Standard.

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

Wearing Bearings B. L. W.

Driving wheel hub liners OF BRONZE

Drivers, O. S. Diam. 47" Cent. diam. 40" CENTERS CAST STEEL

13 **Tires** STEEL Held by SHRINKAGE AND SHOULDER

Tires, Flange, Pos. ALL Size 3½" x 5½"

Tires, Plain, Pos. NONE Size ---

Lateral play between driving boxes and wheel hubs 3/16" TOTAL

Driving Boxes CAST STEEL, WITH ELVIN GREASE CELLARS

Journals, Diam. 8" Length 9"

14 **Springs.** Make B. L. W.

Front Engine Truck TWO Wheeled SWING BOLSTER, CENTER BEARING

To swing 2½" Cent. of gravity above Cent. of drivers NONE

Journals, Diam. 5" Length 10" Boxes CAST IRON

Wheel hub liners NONE

Wheels, Diam. 28" Tread --- Kind CAST IRON SPOKE CENTER

Tires STEEL Cent. diam. 23" Size 2½" x 5½"

Tires held by SHRINKAGE AND SHOULDER

Back Engine Truck TWO Wheeled SWING BOLSTER, SIDE BEARING

To swing 3" Cent. of gravity above Cent. of drivers NONE

Journals, Diam. 5" Length 10" Boxes CAST IRON

Wheel hub liners NONE

Wheels, Diam. 28" Tread --- Kind CAST IRON SPOKE CENTER

Tires STEEL Cent. diam. 23" Size 2½" x 5½"

Tires held by SHRINKAGE AND SHOULDER

Brake, Position ON ALL DRIVING AND TENDER WHEELS

Operating Equipment No. 6-ET WESTG. COMBINED AUTOMATIC AND

Ratio --- STRAIGHT AIR

Equalization WH-2 AMERICAN OUTSIDE EQUALIZED

Parts ---

Arrangement One 9" Cyls. L. S.

Truck brakes FRONT AND BACK

Tender brakes NONE

AIR RESERVOIR TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

Tender EIGHT Wheeled, Drawing No. 1470 { TENDER TO BE WEIGHED: YES

Weight, with fuel and water, about 99,000 POUNDS

Tank { OIL 2,000 5080 / WATER 4500 Gallons, Bill 5070

TANK "U" SHAPE, STRAIGHT TOP.

OIL TANK TO BE SPEARATE, TO PERMIT REMOVAL

Tool Boxes HARD WOOD, TOP

19 **Frame** STEEL, 8" AND 10" CHANNELS, WITH BUMPERS OF WOOD REINFORCED WITH STEEL PLATE.

Front Drawbar height 30¾"

Pilot NONE Pushing shoes NONE

Back drawhead, center above rail 33½"

Coupler TO BE SAME AS FOR 8 32 D 792, I. E., M. C. B. AUTO. WITH SLOTTED KNUCKLE 33½" CENTER ABOVE RAIL, AND ALSO COUPLING FOR LOGGING CARS 25" CENTER ABOVE RAILS

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

Trucks B.L.W. EQUALIZED TYPE, SIMILAR TO 10 26 ¼ D 157

1A Springs ELLIPTIC, B. L. W.

Journals, Diam. 4½" Length 8"

Wheels, Diam. 33" Tread 4½" Kind CHILLED CAST IRON PLATE

Tires NONE Cent. diam. --- Size ---

Tires held by ---

Safety chains DOUBLE

Brake Position ON ALL WHEELS

Brake sch. No. 6-ET WESTINGHOUSE AUTO. AND STRAIGHT AIR, WITH 10" x 12" TENDER CYLINDER.

List of tools, sch. 31 ONE PAIR OF WRECKING FROGS

Photo sch. No. 2 Inspection B.L.W. (EXCEPT S. E SUP. 2)

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 12-5-19 Shipment ON OWN WHEELS (See page 15)

Brass shop finish No. 1

Machine shop finish D-165

Patents FEED WATER STRAINER, PATENTED SEPT. 1, 1903 (CAST ON)

Property plates NONE

Painting, style 291, OLIVE GREEN AND ALUMINUM

Mark on TANK SIDES: SAN AUGUSTINE COUNTY LUMBER COMPANY

	Road Nos. Pos.	Road Nos.	Name
F. No. Plate		108	
F. Sand Box			
Cab Sides			
Back of Tank			

Actual Dimensions of Loco. Extreme height over stack 13' 4½"

Extreme Width Cab boards 10' 1" Cylinders or valve motion 9' 5"

Length outside face front bumper of engine to face of tender wedge 31' 10"

Length face of tender wedge to outside face back flange of tender 22' 8"

Total length outside face front bumper of engine to outside face back bumper of tender 54' 6"

SPECIFICATION FOR LOCOMOTIVES 10 30 ½ D 44

FOR SAN AUGUSTINE COUNTY LUMBER COMPANY

P

1 FUEL OIL GRAVITY IS SAME AS SPECIFIED FOR SOUTHERN PINE LUMBER COMPANY'S ENGINE 10 26 ½ D 157. OIL BURNING ARRANGEMENT B.L.W. STANDARD WITH BURNER IN FRONT END OF FIREBOX. ROYALTY IF ANY PAYABLE BY THE B.L.W.

2 LOCOMOTIVE TO COMPLY WITH ALL I. C. C. REQUIREMENTS. BOILER TO BE INSPECTED BY THE HARTFORD STEAM BOILER INSPECTION AND INSURANCE COMPANY.

3 HOLLOW STAYBOLTS BEHIND FIRE BRICK ON FRONT WATER LEG.

4 FIREBOX TO BE ARRANGED FOR APPLICATION OF GRATES, TO FACILITATE CHANGE FROM OIL TO COAL FUEL.

5 SMOKE BOX TO BE SUITABLE FOR COAL OR OIL FUEL.

6 SUPERHEATER AS LOCO. SUPERHEATER CO'S. SPECIFICATION O-12415, DATED NOVEMBER 21ST, 1919 (COPY ATTACHED). SUPERHEATER TO CONNECT WITH TOP HEADER IN SMOKE BOX AND TO HAVE OUTSIDE STEAM PIPE CONNECTIONS TO VALVE CHAMBERS. ROYALTY IF ANY, PAYABLE BY THE B. L. W.

7 HAND HOLES AND CAPS IN EACH SIDE OF SMOKE BOX FOR INSPECTION OF SUPERHEATER.

8 WASHOUT PLUGS TO BE LOCATED IN EACH CORNER OF FIRE BOX, AND ONE IN CENTER OF BACK WATERLEG JUST ABOVE THE MUD RING, OTHER PLUGS IN USUAL PLACES.

9 DECK CASTING TO BE OF STEEL.

10 CHAFING CASTING BETWEEN ENGINE AND TENDER TO BE OF STEEL WITH WIDE FACE AND LONG SWEEP.

11 COUPLERS SAME AS APPLIED TO No. 106, CLASS 8 32 D 792, I. C., M. C. B. AUTO, WITH SLOTTED KNUCKLE 33½" CENTER ABOVE RAIL, AND ALSO COUPLING FOR LOGGING CARS 25" CENTER ABOVE RAIL.

12 HEADLIGHT EQUIPMENT TO BE PYLE NATIONAL ELECTRIC, TYPE "K" WITH INCANDESCENT HEADLIGHT.

13 DRIVING TIRES TO BE OF HARDEST GRADE STEEL.

14 ALL SPRINGS AND HANGERS TO BE EXTRA HEAVY FOR ROUGH SERVICE.

15 Extras on Extra Order No. 11738 dated 12.24.19 to be shipped with locomotive

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SPECIFICATION FOR LOCOMOTIVES 10 30 ½ D 44

FOR: SAN AUGUSTINE COUNTY LUMBER COMPANY

Specification for Type A Double Loop Superheater..... SPECN. O-12415 NOVEMBER 21, 1919

BOILER TUBES	120 ...in number... 2 ...o. d... 12 ...ft... 10 ...in. over tube sheets. Tubes located between and adjacent to boiler flues are to be beaded over at front end. Tubes to be in accordance with the American Society for Testing Materials Specification A-28-18.
BOILER FLUES	18 ...in number... 58 ...o. d ...#9 BWG ...of cold drawn seamless steel. Flues to be in accordance with the American Society for Testing Materials Specification A-28-18. ...Card. 1713-L
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 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. 50517
TUBE SHEET LAYOUT	
UNITS	13 units... 12 ...o. d... #9 BWG ...Pipes to be in accordance with the American Society for Testing Materials Specification A-28-18. Pipes united by return bends. Each unit to be tested, before being placed in boiler, with water under pressure of 500 lb. per sq. in. ...Card. 10773
UNIT PIPE SUPPORTS	Of steel fastened securely on superheater pipes so as not to slide. ...Card.
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-A. ...Card. 1064-L
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. 11031-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. ...Card. SEE ARRGT.
DEFLECTING PLATE	To be constructed so as to permit easy inspection and removal of superheater units and joints. Design to be in accordance with.
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 pipe or cylinder. Pipe to be well protected against freezing. ...Card. 1149-H.
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. 10521
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. 1318-E	S. H. UNIT BOLT WASHER	Card. 1071
DAMPER CTL. ARM.	Card. 1074	S. H. UNIT CLAMP	Card. 1073
DAMPER CTL. PIPE FITTING	Card. 1115	S. H. UNIT CLAMP WASHER	Card. 10305
DAMPER CTL. PIPE UNION	Card. 1114	S. H. PIPE END	Card. 1344
DAMPER CTL. PIPING DIAGRAM	Card. 3258	S. H. PIPE BAND	Card. 1988
DAMPER CTL. SUPPORT	Card. 1068-D	SPACING OF BANDS & SUPPORTS	Card. 10759
DAMPER SHAFT	Card. 1065	TYPE OF RETURN BENDS	FORGED
DAMPER SHAFT ARM	Card. 1327-J (RS)	RETURN BENDS	Card. 11022
DAMPER SHAFT BEARING (RS)	Card. 1272-J (LS)	LUBRICATOR CONNECTION	Card. 3823
DAMPER SHAFT BEARING (LS)	Card. 1070-K	DEFLECTING PLATE HANDLE	Card. 11487
DAMPER SHAFT LINK	Card. 3272	DEFLECTING PLATE STUDS	Card. 10809
PATENT PLATE PYROMETER	Card. NONE	DEFLECTING PLATE CLAMP	Card. 10502-A

THE BALDWIN LOCOMOTIVE WORKS At Seattle 0-8-0

Memorandum Sheet 20093

SPECIFICATION FOR LOCOMOTIVES 10 20 1/2 D 32

FOR SANTEE TIMBER COMPANY

No.

Gen. sh. No. 223

Engine Drawing No. 4

2-27-20

Gauge of Road 4'8½" Play ⅜"
Wheelbase, Rigid 8'0" Driving 8'0" Total 22'9"
Total wheelbase, eng. and tend. (Actual 46' 3" / Limited to ——

Curves ETC. (SEE SUP. 2)

Limits, Height —— Width ——
Weight (approximate) in working order, Total 72,800 POUNDS
On F. t'k 10,300 lbs., Drivers 49,100 lbs., B. t'k 13,400 lbs.

Tractive power 12790 lbs., Ratio of adhesion 3.83
Work'g St'm Pres. 190 lbs., Service LOGGING
Fuel Kind SOFT COAL

Boiler STEEL Thick 7/16" & ½" Bill 8965
Front Tube Sheet ½" Thick
Boiler, Diam. 44" Plan EXTENDED WAGON TOP
Allowable st'm pres. 200 lbs. **Tested to** 220 lbs. steam pres
With Factor of Safety of 4.61 267 lbs. water pres.
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS.

Dome, diam. 25" Pos. FORWARD OF FIRE BOX

Firebox STEEL Combustion chamb. NONE
Firebox, length 55-15/16" Width 39⅜" Depth F. 55" B. 54⅜"
Firebox, Tube ½" Crown ½" 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 ¾" DIAM. WITH 3/16" HOLES 1½" DEEP FROM O.S.

Radial stays 1" DIAM. Sling stays front (Two rows B.L.W. / GRANSTON STAYS
Button heads below crown on 54 x 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 116 Diam. 2" Length 11' 6"

Heating (Flues ——) Combus. Chamb. —— Total 767 sq. ft.
Surface (Tubes 693 sq. ft.) Fire Box 74 sq. ft. Fire Brick Tubes ——
Grate area 13.3 sq. ft. Ratio to Heating Surface 1 : 57
Superheater ——

Fire Brick ARCH NONE

Grates ROCKING BARS AND DROP PLATE (CAST IRON BEAR. AND GEAR PLATES)
Ash Pan, Dampers RIGHT AND LEFT

Throttle BALANCE Pos. DOME
Dry pipe STEEL

Superheater NONE

Smokebox extension WITH Cleaning hole and cap L.S. ONLY
Spark ejector or blower WARE
Netting and deflect. plates NONE

Exhaust nozzles DOUBLE LOW
CLEANING PIPE WITH
Stack Diameter IMPROVED DIA. 13"

Safety Valves TWO STAR 2" - ONE MUFFLED
Safety valves NONE with relief lever, Set to 170 POUNDS, MUFFLED / 173 POUNDS, OPEN
Whistle ONE B. L. W. PLAIN

Steam Gauge ONE IRON 7" MAKER: STAR (Spacer)
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 THREE B.L.W. Pos:-(SEE SUP. 5 & 16)
Cleaning Plugs ONE FILLING PLUG IN TOP OF BOILER
Firebox, CORNERS, BACK ONES DIAGONAL, AND BACK
Crown, TWO EACH SIDE AND TWO BACK
Waist, ONE UNDER FRONT
Front tube sheet, TWO Fusible plug ONE

Pump NONE

INJECTORS TO HAVE LARGE CAPACITY
Injectors TWO SELLERS, CLASS "N" (Spacer) No. 6½
Injectors, Pos. RIGHT AND LEFT Steam pipes COPPER
Pipes, Check IRON Feed IRON Overflow IRON
Check B. L. W. Pos. R. AND L.

Steam Heat NONE

Cab STEEL VENTILATOR IN CAB ROOF.
CAB SIDE WINDOWS TO BE LARGE.

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 28½"

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. 8)
Coupler (SEE SUP. 8)

Signal fixtures IRON ON BUMPER

HEADLIGHT TO BE DRESSEL
Headlight TWO ROUND CASE 22" Reflector, To burn KEROSENE
Headlight, Nos. on sides WITH Right stop NONE
Lamp shelf NONE Nosing ——

Bell 85 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

Jan 10 2021 D 32 amy

Boiler Jacket #22 SOFT STEEL PLATE Bands IRON Style 9
Boiler Lagging MAGNESIA SECTIONAL

THE BALDWIN LOCOMOTIVE WORKS

W. S. Morris May 1920

SPECIFICATION FOR LOCOMOTIVES 10 20 1/2 D 32

FOR SANTEE TIMBER COMPANY

No.

3PF 388

Frames CAST STEEL, EXTRA HEAVY

Cylinders, Diam. 13" Stroke 22"
St'm ports, Length 12" Width 1" Bridges ⅞"
Exh. ports, Length 12" Width 2" Valve lead 1/16"
Valve travel 4" Steam lap ⅞" Exhaust clearance ——
Eccentric crank throw 4½" By-pass valve NONE
S. P. Lubr. DETROIT TRIPLE No. 22 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 castings IRON PTD. Covers STEEL PAINTED
St'm chest valves RICHARDSON BALANCED, WITH VACUUM VALVES.
Met. pkg. (MFR. AND MAKE'S NAME NEVER USED) UNITED STATES, KING TYPE

Pistons HEADS OF CAST IRON, WITH RINGS OF CAST IRON, SPRUNG IN
Guides LAIRD TYPE, STEEL Oil cups NEEDLE
Crossheads CAST STEEL, WITH GIBS OF CAST IRON TINNED.
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.
Driving wheel hub liners BRONZE
Drivers, O. S. Diam. 44" Cen. diam. 36" 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 = 3/16" TOTAL
Driving Boxes CAST STEEL
Journals, Diam. 5½" Length 8"

Springs. Make B.L.W.

Front Engine Truck TWO Wheeled SWING BOLSTER, CENTER BEARING
To swing 1½" each side of cen., Cen. pin liners NONE
Journals, Diam. 4½" Length 8" Boxes CAST IRON
Wheel hub liners NONE
Wheels, Diam. 24" Tread 1½" Kind CHILLED CAST IRON PLATE
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 8" Boxes CAST IRON
Wheel hub liners NONE
Wheels, Diam. 24" Tread 1½" Kind CHILLED CAST IRON PLATE
Tires NONE Cen. diam. —— Size ——
Tires held by ——

Brakes, position ON ALL DRIVING AND TENDER WHEELS
Operating Parts: Engine, sch. No. 6 ET WESTG. COMBINED AUTO. AND STRAIGHT AIR; Eng. Trk. sch. ——
Foundation Parts: Drivers, sch. No. 1 AMERICAN O.S. EQUALIZED; Eng. Trk. sch. ——
Air pump: One 9½" Pos. L.S.
Train connections FRONT AND BACK
Train signal, sch. NONE
AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

Tender EIGHT Wheeled, Drawing No. 1531
Weight, with fuel and water, about 60,000 POUNDS
TENDER TO BE WEIGHED YES
Tank 3,000 Gallons, Bill 4991
TANK "U" SHAPE, STRAIGHT TOP. FUEL CAPACITY 5 TONS.
WOOD RACK AROUND TOP OF TANK
Tool Boxes OF STEEL, TOP.
SYPHON CONNECTION TO LEFT SIDE OF TANK
Frame STEEL 6"x8" CHANNELS, WITH BUMPERS OF WOOD AND STEEL PLATE
Front Drawbar height 28½"
Pilot NONE Pushing shoes NONE

Coupler TWO POCKET DRAW CASTING OF CAST STEEL, WITH M.C.B.
AUTO COUPLER 33½" CENTER ABOVE TOP OF RAIL IN UPPER POCKET
LOWER POCKET ARRANGED FOR LINK AND PIN CONNECTION 25½" CENTER ABOVE TOP OF RAIL
STEPS, HAND HOLDS, ETC. TO CONFORM TO I.C.C. REQUIREMENTS.
Trucks ARCH BAR TYPE, WITH CAST STEEL BOLSTERS.
STEPS ACROSS REAR OF TENDER WITH HAND RAIL.
Springs ELLIPTIC, B.L.W.
Journals, Diam. 3½" Length 7"
Wheels, Diam. 28" 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 WESTG. AUTO AND STRAIGHT AIR WITH 8"x12" TENDER CYLINDER

List of tools, sch. 26 ONE PAIR OF WRECKING FROGS
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 4-22-20 Shipment ON OWN WHEELS (SEE SUP. 15)

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

Patents FEED WATER STRAINER, PATD. SEPT. 1, 1903 (CAST ON) B. L. W.

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

Painting, style 291, OLIVE GREEN AND ALUMINUM

Mark on TANK SIDES: SANTEE TIMBER CORPORATION

Road Nos. Pos. Road Nos. Name NONE
F. No. PLATE 1
F. SAND BOX
CAB SIDES
BACK OF TANK

Actual Dimensions of Loco. Extreme height over all 13' 0"
Extreme Width: Cab boards 8' 7" ; Cylinders ~~or valve motion~~ 8' 6"
Length outside face front bumper of engine to face of tender wedge 27' 2"
Length face of tender wedge to outside face back bumper of tender 23' 5½"
Total length outside face front bumper of engine to outside face back bumper of tender 50' 7½"

SPECIFICATION FOR LOCOMOTIVES 10 20 & D 32

FOR SANTEE TIMBER COMPANY

HW

389

1 LOCOMOTIVE TO BE OPERATED IN THE STATE OF VIRGINIA. BOILER TO MEET ALL THE I.C.C. REQUIREMENTS.

2 MAXIMUM MAIN GRADE IS 1% COMPENSATED AND MAXIMUM CURVATURE IS 2 DEGREES. HOWEVER, AS THIS LOCOMOTIVE IS TO BE USED IN SHITCHING SERVICE, WHERE A MAXIMUM OF 12 DEGREES CURVATURE OBTAINS, THIS CURVATURE SHOULD GOVERN IN THE LOCOMOTIVE DESIGN. ALSO ATTENTION SHOULD BE CALLED TO POSSIBILITY OF USE OF RAIL AS LIGHT AS 35 POUNDS PER YARD.

3 ENGINE TO BE BUILT STRONG ENOUGH TO WORK AT 200 POUNDS PRESSURE, IF NECESSARY.

4 CONNECTION FOR ANGLE VALVE ON FRONT OF DOME FOR SYPHON

5 BLOW-OFF COCK , ~~ONE ON EACH SIDE OF FIRE BOX AND ONE IN FRONT~~, BETWEEN MUD RING AND BOTTOM ROW OF STAYBOLTS(SUP.16)

6 KNOCKOUT PLUGS 1½" DIAMETER LOCATED TWO IN FRONT, THREE IN BACK, AND TWO BACK OVER CROWN SHEET.(SEE SUP.16)

7 SYPHON UNDER CAB BOARD ON LEFT SIDE WITH PIPE CONNECTIONS TO TANK AND WITH 25 FEET OF SUCTION HOSE. SYPHON TO BE ARRANGED ALSO AS AN EJECTOR WITH 25 FEET OF DELIVERY HOSE TO DISCHARGE WATER FROM TENDER TANK TO SKIDDER TANK, ALWAYS LEAVING A SUPPLY OF 8" OF WATER IN TENDER TANK.

For Hereafter: Please note Drawing Room Records do not show that tank for 10 20 & D 32 was equipped as specified. (K.R. 5.1.21)

8 COUPLER: TWO POCKET DRAW CASTING OF CAST STEEL WITH M.C.B. AUTO. COUPLER 33½" CENTRE ABOVE TOP OF RAIL IN UPPER POCKET AND LOWER POCKET ARRANGED FOR LINK AND PIN CONNECTION 25½" CENTRE ABOVE TOP OF RAIL.

9 MAIN ROD STRAPS TO BE EXTRA LONG.

10 DRIVING WHEEL HUBS TO BE OF SUFFICIENT STRENGTH TO PREVENT CRACKING.

11 ENGINE SPRINGS TO HAVE ONE EXTRA LEAF ABOVE FIGURED REQUIREMENTS.

12 FRONT ENGINE TRUCK PEDESTALS OF WROT IRON, WITH STEEL CROSS FRAME CASTING.

13 CENTRE CASTINGS FOR FRONT AND BACK ENGINE TRUCKS TO BE OF CAST STEEL.

14 BACK ENGINE TRUCK PEDESTALS OF WROT IRON, WITH STEEL CROSS FRAME CASTING.

15 ONE SET OF ~~[illegible] GRATES WITH ASH PAN~~ PLATE ~~AND ALL NECESSARY APPARATUS FOR OPERATING THE GRATES~~ TO BE ORDERED ON Extra Order No. 17943, DATED 4-19-20 AND TO BE SHIPPED WITH LOCO.

16 OMIT THE BLOW OFF COCKS IN SIDES OF FIRE BOX AND APPLY WASHOUT PLUGS IN THEIR STEAD, FOR 10 20 & D 32 ONLY.

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C 8406

Memorandum Spec'n 20056

SPECIFICATION FOR LOCOMOTIVES 10 18 ½ D 40

FOR Sartin Lumber Company

HW.

Gen. as Photo. 5875

Engine Drawing No. 12

8.1.20

Gauge of Road 4'8½" Play ⅜"

Wheelbase, Rigid 8' 0" Driving 8' 0" Total 21' 4"

Total wheelbase, eng. and tend. (Actual 41'10" (Limited to ---

Rails 30 and 35 pounds.

Curves about 30 to 40 degrees with grades of 4%.

Limits, Height --- Width ---

Weight (approximate) in working order, Total 62,000 pounds

On F. tr'k 8,500 lbs., Drivers 45,000 lbs., B. tr'k 8,500 lbs.

Tractive power 11,020 lbs., Ratio of adhesion 4.1

Work'g St'm Pres. 180 lbs. Service Logging

Fuel Soft Coal

Boiler Steel Thick 7/16" Rill 8947

Front Tube Sheet ½" Thick

Boiler, Diam. 40" Plan Extended Wagon Top

Tested to (Allowable st'm pres. 180 lbs. (With Factor of Safety of 5.02 — 200 lbs. steam pres., 240 lbs. water pres.

Longitud. seams butt jointed, double covering strips.

Dome one piece type.

Dome, diam. 22" Pos. Forward of fire box.

Firebox Steel Combustion chamb. None

Firebox, length 55-15/16" Width 34 1/16" Depth F. 48" B. 40 1/16"

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

Firedoor opening 16" diam. Crown and sides in one sheet.

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" diam. 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 (B. L. W. Option)

Tube ends Swaged for copper ferrules, fire box ends.

Number 90 Diam 2" Length 10' 6"

Heating Surface Flues --- Combus. Chamb. --- Total 551⁰

Tubes 491⁰ Fire Box 60⁰ Fire Brick Tubes ---

Grate area 13.3⁰ Ratio to Heating Surface 1: 41.4

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 L.S. Only

Spark ~~ejector~~ hopper With

Netting and deflect. plates With

Exhaust nozzles Double-High

Stack Straight Dia. 12"

Safety Valves Two Coale 2" Open

Safety valves None with relief lever, Set to 180 pounds

Whistle One B. L. W. Plain

Steam Gauge One Iron 7" Maker:- Ashcroft (Not Agreed)

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 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

Loco. for operation in Mississippi

Details to conform to I. C. C. requirements

Injectors Two Monitor (Not Agreed) No. 5

Injectors, Pos. Right and Left 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 30¼"

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 of cast steel with M.C.B. auto coupler 33½" centre above rail in upper pocket: Lower pocket 6½" wide, 4" high, 6½" deep and 19½" centre above rail. Pin holes arranged for use of one long pin through both pockets.

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 back.

Dome casing Iron Painted

Boiler Jacket #22 Soft Steel Ptd. Bands Iron Style 9

Boiler Lagging Plastic Magnesia (from B. L. W. Stock)

THE BALDWIN LOCOMOTIVE WORKS

J. Daniel April 1920.

SPECIFICATION FOR LOCOMOTIVES 10 18 ½ D 40

FOR Sartin Lumber Company

HW.

Furnish to Company one set of prints of the principal parts of Loco. including the crates and bearing parts (not complete set)

Frames Cast Steel

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 3" Steam lap ⅞" Exhaust clearance ---

Eccentric throw 3" By-pass valve None

S. F. Lubr. Nathan Double 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

Stm. chest valves Richardson balanced, with vacuum valves.

Mot. pkg. Piston rods Valve stems United States, King Type.

Piston rods to be keyed to crossheads

Pistons heads of cast iron with cast iron rings sprung in.

Guides Steel Oil cups Needle

Crossheads Cast Steel with bearings of cast iron, tinned

Wrist Pins Steel Set 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 wheel hub liner, None

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 = 3/16" total

Driving Boxes Cast Iron

Journals, Diam. 5½" Length 7"

Springs. Make B. L. W.

Front Engine Truck Two Wheels Swing bolster, center bearing

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

Journals, Diam. 4½" Length 6½" Boxes Cast Iron

Wheel hub liners None

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

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

Tires held by ---

Back Engine Truck Two Wheels Swing bolster, side bearing

To swing 4" each side of cen., Cen. pin liners None

Journals, Diam. 4½" Length 6½" Boxes Cast Iron

Wheel hub liners None

Wheels, Diam. 24" Tread 4½" Kind Chilled Cast Iron Plate

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

Tires held by ---

Brake, position On all driving and tender wheels

Operating Engine, sch. U-7 B. L. W. Steam

Parts Eng. Trk. sch. ---

Foundation Drivers sch. U-7 B. L. W.

Parts Eng. Trk. sch. ---

Air pump --- Pos. ---

Train connections ---

Train signal, sch. ---

Separate lubricator for steam brake valve

Tender Eight Wheeled, Drawing No. 1522

Weight, with fuel and water, about 48,000 pounds

Tender to be weighed: Yes

Tank 2,000 Gallons, Bill 5251

Tank "U" shape, straight top. Fuel capacity 5 tons coal

Wood rack around top of tank. for 2½ cords wood.

Tool Boxes Hard wood, top.

Frame Steel 6" and 8" channels, with bumpers of wood and steel plate.

Front Drawbar height 25½"

Pilot None Pushing shoes None

Coupler Two pocket draw casting of cast steel with M.C.B. auto coupler, 33½" center above rail in upper pocket: Lower pocket 6½" wide, 4" high, 6½" deep and 19½" center above rail. Pin holes arranged for use of one long pin through both pockets.

Trucks Arch bar type, with cast steel bolsters.

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

Springs Elliptic, B. L. W.

Journals, Diam 3½" 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. U-7 B. L. W. Steam

List of tools, sch. 26 One pair wrecking frogs

Photo sch. ~~No. 2 None~~ 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 3.18.20 Shipment On own wheels

Brass shop finish, No. 1

Machine shop finish, D-165

B. L. W. Patents None

Property plates None

Painting, style 291, Olive Green and Aluminum

Mark on tank sides: Sartin Lumber Co.

Road Nos. Pos. Road Nos. Name None

F. No. Plate 2

F. Sand Box

Cab Sides

Back of Tank

Actual Dimensions of Loco. Extreme height over all 10'7½"

Extreme Width: Cab boards 7'8½" Bumper 9'1" Cylinders ~~at front end~~ 7'11½"

Length outside face front bumper of engine to face of tender wedge 27'1½"

Length face of tender wedge to outside face back bumper of tender 20'1½"

Total length outside face front bumper of engine to outside face back bumper of tender 47'2⅜"

THE BALDWIN LOCOMOTIVE WORKS As Built's C-5001

Memorandum Spec'n 19016

SPECIFICATION FOR LOCOMOTIVES 12 34 ½ E 48

Gen. as PHOTO 3015

FOR THE SHEVLIN-HIXON COMPANY

Engine Drawing No. 6

RTL 3-6-19

Gauge of Road 4' 8½" Play 3" **Wheelbase,** Rigid 13' 1" Driving 13' 1" Total 27' 0"

Total wheelbase, eng. and tend. {Actual 53' 7" / Limited to ——

Curves 25 DEGREES GRADES 5% RAILS 60 LBS. PER YARD

Limits, Height —— Width ——

Weight (approximate) in working order, Total 175,500 POUNDS

On F. tr'k 15,500 lbs., Drivers 136,500 lbs., B. tr'k 23,500 lbs.

Tractive power 25,400 lbs., Ratio of adhesion 3.8

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

Fuel OIL

FRONT TUBE SHEET TO BE ½" THICK.

Boiler STEEL Thick ¾" Bill 8490

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 4.99

Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS

Dome, diam. 33" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE

Firebox, length 90-3/16" Width 66" Depth F. 68¼" B. 64"

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 ⅞" DIAM. WITH 3/16" HOLES 1½" DEEP FROM O. S.

Radial stays 1" DIAM. Sling stays front {THREE ROWS B.L.W. / EXPANSION STAYS.

Button heads below crown on EIGHT central rows

Crown bars NONE Placed —— above crown

Crown bolts ——

Flues —— "H (To be stub't)

Tubes W. G. CHARCOAL IRON OR STEEL (B.L.W. OPTION)

Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS

Number 350 Diam. 2" Length 16' 6"

Heating Surface	Flues ——	Combus. Chamb. ——	Total 3157
	Tubes 3008	Fire Box 149	Fire Brick Tubes ——

Grate area 41.3 Ratio to Heating Surface 1 : 76

Superheater ——

Fire Brick ARCH, NONE

Grates NONE

Ash Pan, Dampers FRONT ONLY.

Throttle BALANCE Pos. DOME

Dry pipe STEEL

Superheater NONE

Snifterbox extension NONE Cleaning hole and cap NONE.

Spark arrestor or hopper NONE

Netting and deflector plates NONE

Exhaust nozzles STANDARD

Cleaning Plug, Number

Stack Cast Iron

Safety Valves TWO CONSOLIDATED 3" (Not Spec)

Safety valves NONE with relief lever, Set to 170 POUNDS

Whistle LARGE CHIME

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 RACK 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 B. L. W. 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 NONE

Top chamb. —— Pos. ——

Feed Cock —— Bottom chamb. ——

Checks —— Feed pipes ——

Check pipes ——

Injectors TWO SELLERS (Spec) 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 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 32"

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. WITH SLOTTED KNUCKLE

Signal fixtures IRON ON BUMPER

Headlight TWO ROUND CASE 10" Reflector,

Headlight, Nos. on sides WITH H'dl't Mtgs WITH

Lamp shell LONE Fairing ——

Bell 92 POUNDS

Sand Box TWO Diam. 31" Body IRON PAINTED

(Not Spec) LEACH AIR TRAP A-1 IN EACH BOX TO

Chute casing IRON PAINTED

Valves PLAN. STEEL Bands

Sand Sifting HOOVER'S SECTIONAL

THE BALDWIN LOCOMOTIVE WORKS

As Executed June-1919.

SPECIFICATION FOR LOCOMOTIVES 12 34 ½ E 48

FOR THE SHEVLIN-HIXON CO.

RTL

Frames CAST STEEL Braces SOLID

Cylinders, Diam. 20½" Stroke 28"

St'm ports, Length 16" Width 1⅞" Bridges 1⅜"

Exh. ports, Length 16" Width 3" Valve lead ⅛"

Valve travel 5½" Steam lap 1" Exhaust clearance ——

Eccentric ~~cranks~~ throw 4⅜" By-pass valve NONE

S. F. Lubr. MICHIGAN TRIPLE BULL'S EYE (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 RICHARDSON BALANCED, WITH VACUUM VALVES

Met. pkg {PISTON ROD / VALVE STEMS} U. S. KING TYPE (No Spec)

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD

Guides LAIRD TYPE, STEEL Oil cups NEEBLE

Crossheads CAST STEEL WITH BEARINGS OF CAST IRON, BABBITTED

Wrist Pins STEEL Rod cups GREASE CUPS, FORGED ON STRAPS

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"

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. INTERMEDIATE Size 3" x 6½"

Lateral play between driving boxes and wheel hubs = 1/16" TOTAL

Driving Boxes STEELED CAST IRON

Journals, Diam. {MAIN 9" / OTHERS 8½" Length 10"

Springs. Make B. L. W.

Front Engine Truck TWO Wheeled SWING BOLSTER, CENTER BEARING

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

Journals, Diam. 6" 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 BOLTED TYPE FASTENING

Back Engine Truck TWO Wheeled ~~SWING BOLSTER, SIDE BEARING~~ Rushton Radial (A Error) 6-20-19

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 CENTER

Tires STEEL Cen. diam. 31" Size 2½" x 5½"

Tires held by BOLTED TYPE FASTENING

Brake, position ON ALL DRIVING AND TENDER WHEELS

Operating Parts: Engine, Sch. NO. 6-ET WESTG. COMBINED AUTO. AND STRAIGHT AIR

Eng. Tr'k. sch. ——

Foundation Parts: Drivers, sch. NN-2 AMERICAN O. S. EQUALIZED

Eng. Tr'k, sch. ——

Air pump TWO 9½" Pos. BOTH L. S.

Train connections FRONT AND BACK

Train signal, sch. NONE

AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS

Tender EIGHT Wheeled, Drawing No. 1376

Weight, with fuel and water, about 80,000 POUNDS

Tank {OIL 2000 / WATER 4000} Gallons, Bill {4794 OIL / 4795 WATER}

TANK "U" SHAPE, STRAIGHT TOP

Tool Boxes HARDWOOD, TOP

Frame STEEL 10" CHANNELS WITH BUMPERS OF WOOD

Front Drawbar height 29⅞"

Pilot NONE Pushing shoes NONE

Back drawhead, center above rail 33½"

Coupler M. C. B. AUTO. WITH SLOTTED KNUCKLE

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

Steps ACROSS REAR WITH HAND RAIL

Trucks (SEE SUP. 4T)

Springs HALF-ELLIPTIC, B. L. W.

Journals, Diam. 4¼" Length 9"

Wheels, Diam. 28" Tread —— Kind CAST IRON PLATE CENTER

Tires 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 WESTG. AUTO. AND STRAIGHT AIR WITH 10" x 12" TENDER CYLINDER

List of tools, sch. 31 ONE PAIR PRESSED STEEL 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 4.1.19 Shipment ON OWN WHEELS (See Sup. 2A)

Brass shop finish, No. 1

Machine shop finish D-165

B. L. W. Patents | FEED WATER 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., TO BE SIMILAR TO 12 30 ½ E 41

Mark on SIDES OF TANK, THE SHEVLIN - HIXON COMPANY

MARK ON BACK OF TANK, 4000 GALS.

Road Nos. Pos. Road Nos. Name NONE

F. No. PLATE 4

F. SAND BOX

BACK OF TANK

Actual Dimensions of Loco.—Extreme height over all 14' 10"

Extreme Width:—Cab boards 10' 5" Cylinders ~~or valve casings~~ 8' 6"

Length outside face front bumper of engine to face of tender wedge 36' 1"

Length face of tender wedge to outside face back bumper of tender 22' 10"

Total length outside face front bumper of engine to outside face back bumper of tender 58' 11"

SPECIFICATION FOR LOCOMOTIVES 12 3¼ ½ E 48

FOR THE SHEVLIN-HIXON CO.

RTL

1 AUXILIARY DOME. NONE.

2 CROWN AND SIDE SHEETS OF FIRE BOX IN ONE PIECE.

3 FIRE DOOR TO BE HOOD TYPE.

4 FLEXIBLE STAYBOLTS TO BE TATE, ABOUT 1400, IN BREAKING ZONE.

5 TUBES TO BE SPACED ¾" AND APPLIED WITH PROSSER EXPANDER.

6 FIRE BOX TO BE LINED WITH FIRE BRICK FOR OIL BURNING.
FIRE BRICK PAVEMENT IN PAN.

7 OIL BURNING ARRANGEMENT TO BE SOUTHERN PACIFIC STYLE WITH VON BODEN INGLES BURNER IN FRONT OF PAN.
CAST IRON AIR INTAKE IN FRONT OF PAN.
ROYALTY ON OIL BURNING ARRANGEMENT PAYABLE BY THE B. L. W.

8 McLAUGHLIN FLEXIBLE CONDUITS BETWEEN ENGINE AND TENDER FOR OIL AND STEAM CONNECTIONS.

9 WHISTLE TO SCREW INTO SIDE OF DOME.

10 SUITABLE VALVES TO BE PROVIDED ON BLOWER PIPE FOR ROUND HOUSE CONNECTION.

11 PLUG STOP VALVE TO BE PROVIDED BETWEEN INJECTOR CHECK AND BOILER.

12 WATER DEFLECTOR, C. B. & Q. STYLE, TO BE APPLIED INSIDE OF BOILER AT INJECTOR CHECKS.

13 ONE FIRE EXTINGUISHER Y, WITH STOP VALVES, TO BE APPLIED TO INJECTOR CHECK PIPE.

14 CAB TO BE LINED WITH WOOD.
VENTILATOR IN CAB ROOF.

15 DROP SEAT FOR ENGINEER ON RIGHT SIDE OF CAB, AND TOOL BOX FOR FIREMAN ON LEFT SIDE.

16 CAB BOARDS TO BE COVERED WITH WOOD IN CAB.

17 HEADLIGHT EQUIPMENT TO BE PYLE NATIONAL ELECTRIC, TYPE "E" COMPLETE WITH GENERATOR, AND ARC HEADLIGHTS.
HEADLIGHT CASES TO HAVE LONG FRONT EXTENSION, TO PREVENT BREAKING OF GLASS.
SWITCH TO BE PROVIDED IN CAB FOR CUTTING OUT HEADLIGHTS.

18 PARALLEL RODS TO HAVE STRAPS, KEYS AND BRASSES.

19 ALL VALVE MOTION WORK TO BE BUSHED.

20 ALEMITE LUBRICATORS, C. R. & N. STYLE TO BE APPLIED TO FRONT OF FRONT DRIVERS AND BACK OF REAR DRIVERS.

21 MAIN DRIVING WHEELS TO HAVE HUB LINERS OF BRASS, OTHER DRIVING WHEELS WITHOUT HUB LINERS.

22 FRONT ENGINE TRUCK WHEELS WITHOUT HUB LINERS.

23 BACK ENGINE TRUCK WHEELS WITHOUT HUB LINERS.

24 EXTRAS ORDERED THROUGH EXTRA WORK DEPT. ORDER No. 3535, DATED 4-5-19, TO BE SUPPLIED WITH LOCO.

25 Snow plow for front of engine as B.L.W. Card 91 to be shipped on Tender 4/8/19

TENDER.

W1 TANK COLLAR TO BE ABOUT 3" HIGH IN BACK TO PROVIDE GOOD VIEW BY ENGINEMAN IN BACKING UP.

W2 DRAIN PIPES 2" DIAMETER ON EACH SIDE OF TANK FUNNEL TO CARRY WASTE WATER TO TRACK.

W3 LIFTING LUGS TO BE PROVIDED ON EACH CORNER OF OIL TANK.

W4 MEASURING CHART TO BE FASTENED IN FRONT OF OIL TANK, GIVING CAPACITY IN INCHES. MEASURING RODS ALSO TO BE FURNISHED.

W5 STEP TO BE APPLIED ON FRONT OF OIL TANK.

W6 SPACE ABOUT 18" TO BE ALLOWED BETWEEN BACK OF TANK AND REAR BUMPER FOR CARRYING MATERIAL.

W7 TRUCKS TO HAVE SQUARE WROT IRON EQUALIZED FRAME, NORTHERN PACIFIC STYLE.

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-6335

Memorandum Spec'n 20017

SPECIFICATION FOR LOCOMOTIVES 12 26 ½ E 22

FOR Simpson Logging Company.

HW.

Gen. as B. L. W. Tracing 26331 {Except engine truck wheels 28" diameter.

Engine Drawing No. 4

Gauge of Road 4' 8½" Play ⅜" except ⅞" for F. & C. Drivers.
Wheelbase, Rigid 11' 6" Driving 11' 6" Total 25' 9"
Total wheelbase, eng. and tend. {Actual ---
{Limited to ---
Rails 40 and 45 pounds.
Curves not over 25 degrees. Grades 4% and 5%.

Limits, Height --- Width ---
Weight (approximate) in working order, Total 124,500 pounds.
On F. tr'k 13,500 lbs. Drivers 95,500 lbs. B. tr'k 15,500 lbs.

Tractive power 21,100 lbs., Ratio of adhesion 4.53
Work'g St'm Pres. 180 lbs., Service Logging.
2 **Fuel** Oil

1 **Boiler** Steel Thick ½" Bill 8887
Front Tube Sheet ½" Thick
Boiler, Diam. 50" Plate Straight Top.
{Allowable st'm pres. 180 lbs. **Tested to** 200 lbs. steam pres.
{With Factor of Safety of 5.02 240 lbs. water pres.
Longitud. seams Butt jointed, double covering strips.
Dome - one piece type. Auxiliary dome - none.
Dome, diam. 25" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 60-7/16" Width 42" Depth F. 53¾" B. 48¼"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back 5/16"
Firedoor opening 16" diam. Crown and sides in one sheet.
Water space, Front 4" Sides 3" Back 3"
Water space frame Single Riveted
4 Water space stays ⅞" diam. with 3/16" holes 12½" deep from O. S.
Radial stays 1" diam. Sling stays front {Two rows B. L. W.
{Expansion Stays.
Button heads below crown on Six central rows
Crown bars None Placed ---- above crown
Crown bolts ----

Flues ----
5 **Tubes** #11 W. G. Charcoal Iron or Steel (B. L. W. Option)
Tube ends Staged for copper ferrules fire box ends.
Number 139 Diam. 2" Length 13' 0"
Tubes to be welded in fire-box tube sheet.

Heating {Flues --- Combus. Chamb. --- Total 1018
Surface {Tubes 940 Fire Box 78 Fire Brick Tubes ---
Grate area 17.7 Ratio to Heating Surface 1: 57.5
Superheater ---

6 **Fire Brick** Arch None
Fire box lined with fire-brick, for oil burning.
Fire brick pavement in pan.
Grates None
Ash Pan, Dampers Front Only.

Throttle Rushton Balance Pos. Dome
Dry pipe Steel

Superheater None

Smoke Box to have short extension.
Smokebox extension Short Cleaning hole and cap None
Spark ejector or hopper None
Netting and deflect. plates None

Exhaust nozzles Double-Lor
Cleaning Pipe - With
Stack Straight Dia. 14"

Safety Valves Two Consolidated 2" Open
Safety valves None with relief lever, Set to 180 pounds.
Whistle One Chime

Steam Gauge One Iron 7" **Maker:-** Ashcroft (Not Spec'd)
Steam gauge stand Iron **Clock** None

Water Gauge One Sargent (Sup. **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:- L. S.
Cleaning Plugs One filling plug in top of boiler.
Firebox, Corners diagonal R. S. and front and back.
Crown, Two each side and three back.
Waist, One under front
Front tube sheet One Fusible plug One

Pump None

Injectors (Spec'd) Two Hancock Type "A" No. 7
Injectors, Pos. R. and L. Steam pipes Copper
Pipes, Check Iron Feed Iron Overflow Iron
7 Check B. L. W. Pos. R. and L.

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 Tank

Back Bumper Oak (See sup. 8)

Pilot (See sup. 9) Pushing shoes Front and Back.
Front Bumper Oak Bumper plate With
Steps Hand holds, etc., to conform to I. C. C. requirements.

E & B Drawhead, Center above rail 25½" and 33½"
Coupler Two pocket cast iron drawhead fitted with M. C. B. automatic coupler.

Signal fixtures None

10 **Headlight** Two Round Case 18" Reflector,
Headlight, Nos. on sides With H'dl't step With
Lamp shelf None Nosing ---

Bell 85 pounds.
Sand Box Two Diam. 23" Body Iron painted Pipes Iron
Sanders 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 Magnesia Sectional.

THE BALDWIN LOCOMOTIVE WORKS

W. Bonbright March 1920.

396 396

SPECIFICATION FOR LOCOMOTIVES 12 26 ½ E 22

FOR Simpson Logging Company.

HW.

Frames Cast Steel (See sup.

Cylinders, Diam. 16" Stroke 22"
St'm ports, Length 15" Width 1½" Bridges 1"
Exh. ports, Length 15" Width 2½" Valve seat 1/4"
Valve travel 5½" Steam lap ¾" Exhaust clearance ---
Eccentric throw 4¾" By-pass valve None
11 S. R. Lubr. (Spec'd) Detroit Three Feed No. 22 Bull's Eye.
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. Upkg. (Spec'd) Piston rods, valve stems United States, Multi-angular.

12 **Pistons** heads of cast iron with follower and "T" rings.
Guides Laird type, Steel. Oil cups Needle
Crossheads Cast steel with bearings of bronze.
Wrist Pins Steel Rod cups (See sup. 14)

Valve Motion Stephenson (See sup. 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.
Driving wheel hub liners Cast Iron, for all wheels.
Drivers, O. S. Diam. 41" Cen. diam. 36"
Wheel centers main, cast steel, others cast iron.
17 **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 = 3/16" total
Driving Boxes Cast Steel (See sup. 18)
Journals, Diam {Main 7" Length 8"
{Others 6½"

19 **Springs.** Make Standard Steel Works.

20 **Front Engine Truck** Two Wheeled Swing bolster, center bearing
21 To swing 4" each side of cen., Cen. pin liners None
Journals, Diam. 4½" Length 7½" Boxes Cast Iron
Wheel hub liners None
26 Wheels, Diam. 28" Tread --- Kind Cast Iron spoke centers
17 Tires Steel Cen. diam. 23" Size 2½" x 5½"
Tires held by Bolted type fastening.

Back Engine Truck Two Wheeled Swing bolster, side bearing.
21 To swing 4½" each side of cen., Cen. pin liners None
Journals, Diam. 4½" Length 7½" Boxes Cast Iron.
Wheel hub liners None
26 Wheels, Diam. 28" Tread --- Kind Cast Iron Spoke Centers.
17 Tires Steel Cen. diam. 23" Size 2½" x 5½"
Tires held by Bolted type fastening.

Brake, position On all driving wheels (no tender)
Operating {Engine, sch. No. 6 ET Westg. combined auto. and
Parts {Eng. Tr'k, sch. --- straight air.
Foundation {Drivers, sch. No. 1 American O. S. equalized.
Parts {Eng. Tr'k, sch. ---
27 Air pump Two 9½" Pos. Both sides. R. and L.
Train connections Front and Back.
Train signal, sch. None
Air reservoirs, Westg. enamelled, with hydrostatic test of 210 pounds.

Tender None

Tank {Oil 650 5220
{Water 1700 Gallons, Bill 5241
Water tank saddle over top of boiler, with the plates reinforced where they rest upon brackets.
Oil tank on rear extension of engine frameback of cab.
Oil tank seams to be electric welded in addition to the riveting.

List of tools, sch. 28 One pair wrecking frogs.
Photo sch. No. 2 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 2. 1. 20 Shipment On own wheels.

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

B. L. W. {None
Patents {—

Painting, style 291, Olive Green and Aluminum.
Property plates None

Road Nos. Pos. 2 Name None
F. No. Plate —
F. Sand Box
Cab Sides
Back of Oil Tank.

Actual Dimensions of Loco. Extreme height
Extreme Width {Over cab boards = 8'11"
{Over cylinders or valve motion =
Length outside face of front bumper to outside face of back bumper of engine = 32' 5"

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-6335

Memorandum Spec'n 20017

SPECIFICATION FOR LOCOMOTIVES 12 26 ½ E 22

FOR Simpson Logging Company.

HW.

Gen. as B. L. W. Tracing 26331 {Except engine truck wheels 26" diameter.

Engine Drawing No. 4

Gauge of Road 4' 8½" Play ⅜" except ⅞" for F. & C. Drivers.

Wheelbase, Rigid 11' 6" Driving 11' 6" Total 25' 9"

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

Rails 40 and 45 pounds.

Curves not over 25 degrees. Grades 4% and 5%.

Limits, Height --- Width ---

Weight (approximate) in working order, Total 124,500 pounds.

On F. tr'k 13,500 lbs., Drivers 95,500 lbs., B. tr'k 15,500 lbs.

Tractive power 21,100 lbs., Ratio of adhesion 4.53

Work'g St'm Pres. 180 lbs., Service Logging.

2 **Fuel** Oil

1 **Boiler** Steel Thick ½" Bill 8887

Front Tube Sheet ½" Thick

Boiler, Diam. 50" Plan Straight Top.

{Allowable st'm pres. 180 lbs. **Tested to** {200 lbs. steam pres.
{With Factor of Safety of 5.02 {240 lbs. water pres.

Longitud. seams Butt jointed, double covering strips.

Dome - one piece type. Auxiliary dome - none.

Dome, diam. 25" Pos. Central

Firebox Steel Combustion chamb. None

Firebox, length 60-7/16" Width 42" Depth F. 53¾" B. 48¼"

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

Firedoor opening 16" diam. Crown and sides in one sheet.

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

Water space frame Single Riveted

4 Water space stays ⅜" diam. with 3/16" holes 1¼" deep from O. S.

Radial stays 1" diam. Sling stays front {Two rows B. L. W. Expansion Stays.

Button heads below crown on Six central rows

Crown bars None Placed --- above crown

Crown bolts ---

Flues ---

5 **Tubes** #11 W.G. Charcoal Iron or Steel (B. L. W. Option)

Tube ends Swaged for copper ferrules fire box ends.

Number 139 Diam. 2" Length 13' 0"

Tubes to be elded in fire-box tube sheet.

Heating {Flues --- Combus. Chamb. --- Total 1018
Surface {Tubes 940 Fire Box 78 Fire Brick Tubes ---

Grate area 17.7 Ratio to Heating Surface 1: 57.5

Superheater ---

6 **Fire Brick** Arch None

Fire box lined with fire-brick, for oil burning.

Fire brick pavement in pan.

Grates None

Ash Pan, Dampers Front Only.

Throttle Rushton Balance Pos. Dome

Dry pipe Steel

Superheater None

Smoke Box to have short extension.

Smokebox extension Short Cleaning hole and cap None

Spark ejector or hopper None

Netting and deflect. plates None

Exhaust nozzles Double-Low

Cleaning Pipe - with

Stack Straight Dia. 14"

Safety Valves Two Consolidated 2" Open

Safety valves None with relief lever, Set to 180 pounds.

Whistle One Chime

Steam Gauge One Iron 7" Maker:- Ashcroft (Not Spec'd)

Steam gauge stand Iron **Clock** None

Water Gauge One Sargent (Sup. **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:- L. S.

Cleaning Plugs One filling plug in top of boiler.

Firebox, Corners diagonal R. S. and front and back.

Crown, Two each side and three back.

Waist, One under front

Front tube sheet One Fusible plug One

Pump None

1 29.20 (Spec'd)

Injectors Two Hancock Type "A" No. 7

Injectors, Pos. R. and L. Steam pipes Copper

Pipes, Chack Iron Feed Iron Overflow Iron

7 Check B. L. W. Pos. R. and L.

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 Tank

Back Bumper Oak (See sup. 8)

Pilot (See sup. 9)

Front Bumper Oak Pushing shoes Front and Back.

Steps Hand holds, etc., to conform to I. C. C. requirements. Bumper plate With

E & B Drawhead, Center above rail 25½" and 33½"

Coupler Two pocket cast iron drawhead fitted with M. C. B. automatic coupler.

Signal fixtures None

10 **Headlight** Two Round Case 18" Reflector,

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

Lamp shelf None Nosing ---

Bell 85 pounds.

Sand Box Two Diam. 23" Body Iron painted Pipes Iron

Sanding (Spec'd) Each 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 Magnesia Sectional.

THE BALDWIN LOCOMOTIVE WORKS

H. Conklin March 1920.

SPECIFICATION FOR LOCOMOTIVES 12 26 ½ E 22

FOR Simpson Logging Company.

HW.

Frames Cast Steel (See sup.

Cylinders, Diam. 16" Stroke 22"

St'm ports, Length 15" Width 1½" Bridges 1"

Exh. ports, Length 15" Width 2½" Valve lead 1/16"

Valve travel 5½" Steam lap 1" Exhaust clearance ---

Eccentric throw 4⅝" By-pass valve None

11 S. Pt Lubr (Spec'd) Detroit Three Feed No. 22 Bull's Eye.

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.

Mot. Upkg. (Spec'd) Piston rods Valve stems United States, Multi-angular.

12 **Pistons** heads of cast iron with follower and "T" rings.

Guides Laird type, Steel. Oil cups Needle

Crossheads Cast steel with bearings of bronze.

Wrist Pins Steel Rod cups (See sup. 14)

Valve Motion Stephenson (See sup. 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.

Tender None

Tank {Oil 650 5220
{Water 1700 Gallons, Bill 5241

Water tank saddle over top of boiler, with the plates reinforced where they rest upon brackets.

Oil tank on rear extension of engine frameback of cab.

Oil tank seams to be elegiric welded in addition to the riveting.

Wearing Bearings B. L. W.

Driving wheel hub liners Cast Iron, for all wheels.

Drivers, O. S. Diam. 41" Cen. diam. 36"

Wheel centers main, cast steel, others cast iron.

17 **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 = 3/16" total

Driving Boxes Cast Steel (See sup. 18)

Journals, Diam {Main 7" Length 8"
{Others 6½"

List of tools, sch. 28 One pair wrecking frogs.

Photo sch. No. 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 2.1.20 Shipment On own wheels.

Brass shop finish, No. 1

Machine shop finish D-165

B. L. W. {None
Patents {—

19 **Springs.** Make Standard Steel Works.

20 **Front Engine Truck** Two Wheeled Swing bolster, center bearing

21 To swing 4" each side of cen., Cen. pin liners None

Journals, Diam. 4¼" Length 7½" Boxes Cast Iron

Wheel hub liners None

26 Wheels, Diam. 28" Tread --- Kind Cast Iron spoke centers

17 Tires Steel Cen. diam. 23" Size 2½" x 5½"

Tires held by Bolted type fastening.

Property plates None

Painting, style 291, Olive Green and Aluminum.

Back Engine Truck Two Wheeled Swing bolster, side bearing. Mark on Tank Sides, Simpson Logging Company

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

Journals, Diam. 4½" Length 7½" Boxes Cast Iron.

Wheel hub liners None

26 Wheels, Diam. 28" Tread --- Kind Cast Iron Spoke Centers.

17 Tires Steel Cen. diam. 23" Size 2½" x 5½"

Tires held by Bolted type fastening.

Road Nos. Pos. Road Nos. Name None

F. No. Plate 2

F. Sand Box

Cab Sides

Back of Oil Tank.

Brake, position On all driving wheels (no tender)

Operating Parts {Engine, sch. No. 6 ET Westg. combined auto. and straight air.
{Eng. Tr'k, sch. ---

Foundation Parts {Drivers, sch. AW-1 American O. S. equalized.
{Eng. Tr'k, sch. ---

27 Air pump Two 9½" Pos. Both L. R. and L.

Train connections Front and Back.

Train signal, sch. None

Air reservoirs, Westg. enamelled, with hydrostatic test of 210 pounds.

Actual Dimensions of Loco. Extreme height over all = 12'11½"

Extreme Width {Over cab boards = 8'11"
{Over cylinders or valve motion = 8'

Length outside face of front bumper to outside face of back bumper of engine = 32' 5"

SPECIFICATION FOR LOCOMOTIVES 12 26 ½ E 22

FOR SIMPSON LOGGING COMPANY.

HB

1 LOCOMOTIVE TO BE OPERATED IN OREGON.
BOILER TO CONFORM TO I. C. C. REQUIREMENTS.

2 FUEL OIL TO HAVE GRAVITY OF 18 DEGREES BAUME'
FLASH .180 FAHRENHEIT
FIRE .240 FAHRENHEIT
COLD TEST ABOUT 34 DEGREES FAHRENHEIT.

3 OIL BURNING ARRANGEMENT SOUTHERN PACIFIC STYLE, WITH VAN BODEN INGLES BURNER.
ROYALTY PAYABLE BY THE B. L. W.

4 FLEXIBLE STAYBOLTS (Spaced) TATE, ABOUT 200 IN BREAKING ZONE.

5 TUBES TO BE SET WITH PROSSER EXPANDER.
BACK FLUE SHEET TO HAVE SUFFICIENT ROOM BETWEEN TOP ROW OF FLUES AND RIVET HEADS TO ALLOW USE OF FLUE ROLLER.

6 FIRE BRICK TO INCLUDE ONE ADDITIONAL ROW OF BRICK IN THE BACK WALL, LAID LENGTHWISE OF FIRE BOX, MAKING THE BACK WALL APPROXIMATELY 14" THICK.

7 WATER DEFLECTOR C. B. & Q. STYLE, INSIDE OF BOILER AT INJECTOR CHECK.

8 BACK BUMPER OF WOOD, REINFORCED FOR DRAW CASTING.

9 PILOT OF WOOD, STUB PATTERN, AT FRONT OF ENGINE.

10 HEADLIGHT EQUIPMENT TO BE SCHROEDER ELECTRIC WITH INCANDESCENT HEADLIGHT.

11 SIGHT FEED LUBRICATOR TO BE LOCATED SO THAT IT CAN BE SEEN BY BOTH THE ENGINEER AND FIREMAN.

12 MAIN ROD STRAPS TO HAVE KEY PUT IN FROM TOP.

13 PARALLEL RODS TO HAVE STRAP ENDS FOR MAIN PIN AND SOLID ENDS WITH HEAVY BRONZE BUSHINGS ON ALL OTHER PINS.

14 COMPRESSION GREASE CUPS FORGED ON ALL RODS.

15 VALVE MOTION - ALL VALVE MOTION PARTS TO BE BUSHED.
ECCENTRICS IN HALVES TO BE PLACED ON MAIN PAIR OF DRIVERS.
ECCENTRIC STRAPS TO BE BABBITTED ALL THE WAYAROUND.

16 COLLING FLANGE LUBRICATOR FOR FRONT AND BACK DRIVING WHEELS.

17 ALL TIRES AND AXLES FROM STANDARD STEEL WORKS.

18 DRIVING BOXES BABBITTED ¼" THICK AND FASTENED IN APPROVED DOVETAIL FASHION.

19 ALL SIDE RING RIGGING PARTS TO BE BUSHED.
AMPLE CLEARANCE TO BE PROVIDED BETWEEN SPRING LINKS AND ENGINE FRAME.

20 FRONT TRUCK TO HAVE KEY INSTEAD OF JAM NUT ON THE KING PIN.

21 TRUCKS TO BE BUILT FOR 30 DEGREE CURVES.

22½ FRONT AND BACK ENGINE TRUCK WHEELS AND TIRES TO BE INTERCHANGEABLE WITH CO'S LOCO. 5, B.L.W. CLASS 12 32½ E 14.

23 AIR PUMP EXHAUST TO BE PIPED INTO THE EXHAUST CAVITY OF CYLINDERS.

24 AIR LINE FITTINGS TO BE EXTRA HEAVY.

THE BALDWIN LOCOMOTIVE WORKS As Spec'n. - C-5668 (See Sup. 1)

Memorandum Spec'n 19030

SPECIFICATION FOR LOCOMOTIVES 12 32½ E 16 Gen. as Photo 5647

FOR Snoqualmie Falls Lumber Company Engine Drawing No. 8

P 5-22-19

Gauge of Road 4' 8½" Play ⅜"
Wheelbase, Rigid 12' 1" Driving 12' 1" Total 28' 3"
Total wheelbase, eng. and tend. { Actual 51' 1½" / Limited to ---

Curves 30 degrees Grades (See Sup. 4)
Rails 60 pounds
Limits, Height --- Width ---
Weight (approximate) in working order, Total 149,000 pounds
On F. tr'k 15,500 lbs., Drivers 118,000 lbs., B. tr'k 15,500 lbs.

Tractive power 30,000 lbs., Ratio of adhesion 3.9
Work'g St'm Pres. 180 lbs., Service Logging
Fuel Oil (See Sup. 7-E)

Front tube sheet to be ½" thick
Boiler Steel Thick ⅜" Bill 8560
Boiler, Diam. 72" Plan Straight Top
2. Boiler st'm pres. 200 lbs., Tested to 220 lbs. steam pres. / with factor of safety of 4.8 — 267 lbs. water pres.
Longitud. seams (See Sup. 3)
Auxiliary Dome None
Dome, diam. 33" Pos. Central

Firebox Steel Combustion chamb. None
Firebox, length 101-15/16" Width 41" Depth F. 69¼" B. 58¼"
4. Firebox, Tube ½" Crown ⅜" Sides ⅜" Back 5/16"
Firedoor opening 16" diam. (See Sup. 5)
Water space, Front 4" Sides 3" Back 3"
Water space, Frame Single Riveted
6. Water space stays ⅞" diam. with 3/16" holes 1¼" deep from O. S. { Three rows B. L. W. Expansion Stays.
Radial stays 1" diam. Sling stays front
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 (B.L.W. Option)
Tube ends Swaged for copper ferrules, fire box ends.
Number 332 Diam. 2" Length 13' 0"

Heating Surface	Flues ---	Combus. Chamb. ---	Total	2401 sq. ft.
	Tubes 2245 sq. ft.	Fire Box 156 sq. ft.	Fire Brick Tubes	---
Grate area 29 sq. ft.	Ratio to Heating Surface 1 : 82.8			
Superheater --				

7-E **Fire Brick** Arch, To suit oil burning equipment.
Fire box lined with fire brick for oil burning
Fire brick pavement in pan.
7-E **Grates** None
Ash Pan, Dampers Front only.

Throttle Balanced 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 Cast Iron, Straight Dia. 18"

Safety Valves Two Consolidated 3" (Not Spec)
Safety valves None with relief lever, Set to 180 pounds
10 **Whistle** Large Chime

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

Water Gauge One (Sup. 11) 18 **Cab Lamps** Electric
Gauge Cocks Three Back Surface valve None
4. Lowest gauge cock 3¼" above highest part of crown
Lubricator steam valve To have separate dry pipe to dome
12 **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, One Fusible plug One

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

Injectors Two Sellers (Spec) No. 10½
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Steel Feed Steel Overflow Steel
Check B. L. W. (Sup. 13-E) Pos. Right and Left

Steam Heat None

16-E **Cab** Steel, lined with wood Ventilator in cab roof.

17 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 37"

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. with slotted knuckle

Signal fixtures Iron on bumper

18 **Headlight** Two 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. 31" Body Iron painted Pipes Iron
(No. Spec) 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

L. Hance
SPECIFICATION FOR LOCOMOTIVES 12 32½ E 16 July-1922 399

FOR Snoqualmie Falls Lumber Company Furnish one complete set of prints

P

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 5½" Steam lap 1" Exhaust clearance ---
Eccentric-crank throw 4½" By-pass valve None
S. F. Lubr. Detroit Triple No. 22 Bulls Eye (Specd)
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. King type (Spec)
Piston rods to be keyed to crossheads.
Pistons Cast iron rings sprung into solid head.
Guides Laird type, Steel Oil cups Needle
Crossheads Cast Steel, with bearings of cast iron babbitted.
Wrist Pins Steel Rod cups Grease cups, forged on straps
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 valve motion to be bushed same as for 12 30½ E 42.

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.
All driving wheels to have hub liners of brass or bronze
Drivers, O. S. Diam. 44" Cen. diam. 38"
Wheel Centers: Main Cast Steel, others Cast Iron
Tires Steel Held by Shrinkage and Shoulder
19 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
Journals, Diam. 8" Length 9"

Springs. Make B. L. W.

26-E **Front Engine Truck** Two Wheeled Swing bolster, Center Bearing
To swing 45° each side of cen., Cen. pin liners None
27 Journals, Diam. 5" Length 8" Boxes Cast Iron
Wheels, Diam. 28" Tread --- Kind Cast Iron Spoke Center
Tires Steel Cen. diam. 23" Size 2½" x 5½"
Tires held by Bolted type fastening

26-E **Back Engine Truck** Two Wheeled Swing bolster, Side bearing
To swing 5° each side of cen., Cen. pin liners None
27 Journals, Diam. 5" Length 8" Boxes Cast Iron
Wheels, Diam. 28" Tread -- Kind Cast Iron Spoke Center
Tires Steel Cen. diam. 23" Size 2½" x 5½"
Tires held by Bolted type fastening

Brake, position On all driving and tender wheels
Operating Parts: Engine, Sch. No. 6-ET Wsg'g. Combined Auto. and Straight Air
Eng. Tr'k, sch. ---
Foundation Parts: Drivers, sch. WN-1 American O. S. Equalized
Eng. Tr'k, sch. ---
Air pump Two 9½" Pos. Both left side (Sp. 28)
Train connections Front and Back
Train signal, sch. None
24 Air reservoirs to have hydrostatic test of 210 pounds

A1-E **Tender** Eight Wheeled, Drawing No. 435
Weight, with fuel and water, about 70,000 pounds
A2-E **Tank** { Oil 1,600 / Water 3,500 Gallons, Bill { 4844 / 4845
Tank "U" shape, straight top.

Tool Boxes Hard wood, Top.

A3-E **Frame** Steel, 10" channels, with bumpers of wood and steel plate.
Front Drawbar height 32½"
Pilot Wood at rear Pushing shoes None
Back drawhead, center above rail 33½"
Coupler M. C. B. Auto. with slotted knuckle

A4 Steps Hand holds etc., to conform to I. C. C. requirements.

A5 **Trucks** Square wrought iron equalized frames.
Springs Elliptic, B. L. W.
Journals, Diam. 5" Length 9"
Wheels, Diam. 28" 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 Wsg'g. Auto. and Straight Air with 10" x 12" tender cylinder.

List of tools, sch. 31 One pair pressed steel 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 7-30-19 Shipment On own wheels (Sp. 30)

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

Lettering etc. to be same as for 12 30½ E 42, etc.
Mark on tank sides, Snoqualmie Falls Lumber Company
Mark on back of tank, 3500 gals.

Road Nos. Pos. Road Nos. Name None
F. No. Plate 5
F. Sand Box
Cab sides
Back of tank

Actual Dimensions of Loco.—Extreme height over all 14' 8⅛"
Extreme Width:—Cab boards 10' 0" Cylinders ~~or valve motion~~ 9' 2"
Length outside face front bumper of engine to face of tender wedge 33' 5⅜"
Length face of tender wedge to outside face back bumper of tender 23' 8⅛"
Total length outside face front bumper of engine to outside face back bumper of tender 56' 9⅛"

SPECIFICATION FOR LOCOMOTIVES 12 32 ½ E 16

FOR Snoqualmie Falls Lumber Co.

P

400

1 ALL FITTINGS EXCEPT WHERE OTHERWISE SPECIFIED, WHICH DO NOT AFFECT THE PRICE OR EFFICIENCY OF THE LOCOMOTIVE TO BE INTERCHANGEABLE WITH FITTINGS FOR 12 30 ½ E 42 ETC.

2 BOILER TEST PRESSURE PLATE TO SHOW THAT BOILER IS DESIGNED FOR WORKING PRESSURE OF 200 POUNDS.

3 LONGITUDINAL SEAMS OF BOILER TO BE BUTT JOINTED WITH DOUBLE COVERING STRIPS.

4 CROWN SHEET OF FIRE BOX TO BE ARRANTED FOR GRADES OF 7%. CROWN AND SIDES OF FIRE BOX IN ONE PIECE.

5 FIRE DOOR TO BE HOOD TYPE.

6 FLEXIBLE STAYBOLTS TO BE TATE ABOUT 450 IN NUMBER, LOCATED IN BREAKING ZONE.

7 OIL BURNING ARRANGEMENT SOUTHERN PACIFIC STYLE WITH VON BODEN INGLER OIL BURNER PLACED IN FRONT OF FIRE PAN.
CAST IRON AIR INTAKE IN FRONT OF PAN.
ROYALTY ON OIL BURNING ARRANGEMENT PAYABLE BY THE B. L. W.

8 OIL BURNING ARRANGEMENT TO BE SAME AS ON Co's. PRESENT LOCOS. Co. DOES NOT DESIRE TO GIVE ANY OTHER INFORMATION REGARDING OIL, AS OIL CHANGES WITH THE RENEWAL OF THEIR CONTRACT.

9 OIL AND STEAM CONNECTIONS BETWEEN ENGINE AND TENDER TO BE McLAUGHLIN FLEXIBLE CONDUITS.

10 WHISTLE TO BE SCREWED INTO SIDE OF DOME.

11 WATER GAUGE TO BE KLINGER REFLEX WITH REFLECTOR.

12 BLOWER PIPE TO HAVE SUITABLE VALVE FOR ROUND HOUSE CONNECTION.

13 PLUG STOP VALVE TO BE PROVIDED BETWEEN INJECTOR CHECK AND BOILER.

14 WATER DEFLECTOR, C. B. AND Q. STYLE TO BE APPLIED INSIDE OF BOILER AT INJECTOR CHECKS.

15 ONE FIRE EXTINGUISHER "V" WITH STOP VALVES TO BE APPLIED ON INJECTOR CHECK PIPE.

16 DROP SEAT FOR ENGINEER ON RIGHT SIDE OF CAB, AND TOOL BOX FOR FIREMAN ON LEFT SIDE.

17 CAB BOARDS TO BE COVERED WITH WOOD, IN CAB.

18 HEADLIGHT EQUIPMENT TO BE PYLE NATIONAL ELECTRIC, TYPE "E" WITH ARC HEADLIGHT.
HEADLIGHT CASES TO HAVE LONG FRONT EXTENSION TO PREVENT BREAKING OF GLASS.
SWITCH TO BE PROVIDED IN CAB FOR CUTTING OUT HEADLIGHTS.
ALL WIRING TO BE APPLIED IN CONDUITS.

19 FLANGE LUBRICATORS, O. R. & N. STYLE, TO BE APPLIED TO FRONT OF FRONT DRIVERS AND TO BACK OF REAR DRIVERS.

26 FRONT AND BACK ENGINE TRUCK BOLSTERS OF CAST STEEL.

27 WHEELS AND AXLES OF FRONT AND BACK TRUCKS TO BE INTERCHANGEABLE. TRUCK WHEELS WITHOUT HUB LINERS.

28 AIR PUMPS TO BE LOCATED SAME AS FOR 12 30 ½ E 42 ETC.

29 AIR RESERVOIRS TO BE LOCATED SAME AS FOR 12 30 ½ E 41.

30 EXTRAS TO BE ORDERED THROUGH EXTRA WORK DEPARTMENT, ORDER No. 4185, DATED 7-1-19 TO BE CHARGED EXTRA AND SHIPPED WITH LOCO. AS FOLLOWS:
ONE PAIR DRIVING SPRINGS.
ONE SET EACH FRONT AND BACK ENGINE TRUCK SPRINGS, IF OF A DIFFERENT SIZE FROM THOSE NOW ON Co's. PRESENT LOCOS.

FOR HEREAFTER - Rock shafts to be altered as B. L. W. tracing No. 43963. (V.S. APP. K.R. 12/24/20)

A1 DRAIN PIPES 2" DIAMETER ON EACH SIDE OF TANK FUNNEL TO CARRY WASTE WATER TO TRACK.

A2 TANK COLLAR TO BE ABOUT 3" HIGH AT BACK TO PROVIDE GOOD VIEW BY ENGINEMAN IN BACKING UP.

A3 OIL TANK TO BE SET 18" ABOVE FLOOR OF TENDER TO SECURE GOOD OIL GRAVITY ON GRADES.
LIFTING LUGS TO BE PROVIDED ON EACH CORNER OF OIL TANK.

A4 MEASURING CHART TO BE FASTENED IN FRONT OF OIL TANK, GIVING CAPACITY IN INCHES. MEASURING ROD ALSO TO BE PROVIDED.

A5 TENDER SAND BOXES TO BE SECURED TO FLOOR OF TENDER.

A6 ABOUT 18" TO BE PROVIDED BETWEEN BACK OF TANK AND REAR OF BUMPER FOR CARRYING MATERIAL.

A7 STEPS ACROSS REAR OF TENDER WITH HAND RAILS.
STEPS TO BE APPLIED IN FRONT OF OIL TANK.

A8 TRUCKS TO BE NORTHERN PACIFIC STYLE.

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-5846

Memorandum Spec'n 19053

SPECIFICATION FOR LOCOMOTIVES 10 26 ½ D 157

FOR Southern Pine Lumber Company. RTL

Gen. as Photo 6455

Engine Drawing No. 40

7-18-19.

Gauge of Road 4' 8½" Play ¾" except 1" for F. & B. Drivers

Wheelbase, Rigid 10' 0" Driving 10' 0" Total 26' 0"

Total wheelbase, eng. and tend. { Actual 47' 3" / Limited to —

Curves — Grades 6%, Prevailing Grades 1% to 3%

Limits, Height — Width —

Weight (approximate) in working order, Total 107,000 pounds

On F. tr'k 13,000 lbs. Drivers 81,000 lbs., B. tr'k 13,000 lbs.

Tractive power 19,600 lbs., Ratio of adhesion 4.13

Work'g St'm Pres. 180 lbs., Service Logging

3 **Fuel** Oil

Front tube sheet ½" thick.

12 **Boiler** Steel Thick 9/16" Bill 8665

Boiler, Diam. 52" 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 4.54

Longitud. seams Butt jointed, double covering strips.

1 **Dome,** diam. 29" Pos. Forward of fire box

Firebox Steel Combustion chamb. None

Firebox, length 69 7/16" Width 34¼" Depth F. 70" B. 66"

Firebox, Tube ½" Crown 8" Sides 8" 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 ⅜" diam. with 3/16" holes 1¼" deep from O.S.

Radial stays 1" diam. Sling stays front { Two rows 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. (See Sup. 5)

Tube ends Swaged for copper ferrules, fire box ends

Number 15 / 102 Diam. 5⅜" / 2" Length 13' 3"

Heating Surface	Flues 278	Combus. Chamb. —	Total 1091
	Tubes 703	Fire Box 110	Fire Brick Tubes —
Grate area 16.5	Ratio to Heating Surface 1 : 66		
Superheater 222			

Fire Brick Arch None

Fire box lined with fire brick for oil burning.

Fire brick pavement in pan.

Grates None

Ash Pan, Dampers Front only

Throttle Balance Pos. Dome

Dry pipe Steel

Superheater Schmidt type (See Sup. 6-C)

Smokebox extension With 7 Cleaning hole and cap L. S. only

Spark ~~ejector or~~ hopper With

~~Netting and~~ deflect. plates With.

Exhaust nozzles Single Low

Cleaning Pipe - With

8 **Stack** Straight Dia. 16"

Safety Valves Two Consolidated 3" Open (Not Spec)

Safety valves None with relief lever, Set to 180 pounds

Whistle One Chime

12½ **Steam Gauge** One Iron 7" Maker: Ashcroft (Spec)

Steam gauge stand Iron **Clock** None

Water Gauge One B.L.W. (Ironclad) **Cab Lamps** Electric (Sup. 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 One Crosby Pos.: Right Side

9 **Cleaning Plugs** One filling plug in top of boiler

Firebox Corners, left side, front and back

Crown, Two each side and two back

Waist, One under front

Front tube sheet, One Fusible plug One

Pump None

Top chamb. —	Pos. —	Bottom chamb. —	
Feed Cock —		Feed pipes —	
Checks —		Check pipes —	

Injectors Two Monitor Lever type (Spec) No. 7

Injectors, Pos. Right and Left Steam pipes Copper

Pipes, Check Steel Feed Steel Overflow Steel

Check B. L. W. (See Sup. 10) Pos. R. and L.

Steam Heat None

29 **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

11 **Back Bumper** Bar steel Back drawbar height 35½"

Pilot Wood Pushing shoes None

Front Bumper Oak Bumper plate With

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

Front Drawhead, Center above rail 33½"

12 **Coupler** Sharon M. C. B. Auto. with 13" knuckle face.

Signal fixtures Iron on bumper

13 **Headlight** Two Round Case 18" Reflector,

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

Lamp shelf None Nosing —

Bell 85 pounds

Sand Box Two Diam. 28" Body Iron painted Pipes Iron

Sander Hand, only, in each sand box.

Dome casing Iron painted

Boiler Jacket #22 Plan. Steel Bands Iron Style 9

1A **Boiler Lagging** Magnesia Sectional

THE BALDWIN LOCOMOTIVE WORKS

J. F. Woessner August -1919.

SPECIFICATION FOR LOCOMOTIVES 10 26 ½ D 157

FOR Southern Pine Lumber Company. RTL

402

Frames Cast steel

Cylinders, Diam. 16" Stroke 24"

St'm ports, Length 19.63" Width 1⅝" Bridges —

16 Exh. ports, Length — Width — Valve lead ⅛"

Valve travel 5" Steam lap ⅞" Exhaust clearance —

Eccentric crank throw 11⅝" By-pass valve None

S. F. Lubr. Nathan Five-feed Bull's Eye (Spec)

Cyl'r heads (Sup. 15) Lubr. pipes of iron under jacket.

Cyl'r casings Iron painted Head covers Steel painted

St'm chest casings — Covers —

St'm chest valves 8" diam. piston type

Met. pkg {Piston rods / Valve stems} U. S. King type (Not Spec)

Pistons Cast iron rings sprung into solid head

Guides Alligator type, steel Oil cups Needle

Crossheads Cast steel with bearings of cast iron, tinned

Wrist Pins Steel Rod cups (Sup. 18)

17 Parallel rods to have solid ends.

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 stayboltsto be United States Standard.

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

Wearing Bearings B. L. W.

Driving wheel hub liners of brass

Drivers, O. S. Diam. 48" Cen. diam. 42" Centers cast steel

28 19 14 **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. 8" Length 9"

20 **Springs.** Make Standard Steel Works

26 16 **Front Engine Truck** Two Wheeled Swing bolster, center bearing

To swing 4" each side of cen., Cen. pin liners None

Journals, Diam. 5" Length 10" Boxes Cast Steel

Wheels, Diam. 28" Tread — Kind Cast iron spoke center

16 19 28 Tires Steel Cen. diam. 23" Size 2½" x 5½"

Tires held by Bolted type fastening

Front and back engine truck wheel hub liners - Brass.

27 16 **Back Engine Truck** Two Wheeled Swing bolster, side bearing

To swing 4" each side of cen., Cen. pin liners None

Journals, Diam. 5" Length 10" Boxes Cast steel

29 19 28 Wheels, Diam. 28" Tread — Kind Cast iron spoke center

Tires Steel Cen. diam. 23" Size 2½" x 5½"

Tires held by Bolted type fastening

Brake, position On all driving and tender wheels

30 Operating Parts: Engine, Sch. No. 6-ET Westg. Combined Auto. and Straight Air

Foundation Parts: Eng. Tr'k, sch. —; Drivers, sch. WM-1 American O. S. Equalized; Eng. Tr'k, sch. —

30 Air pump One 11" Pos. L. S.

Train connections Front and Back

Train signal, sch. None

5 **Tender** Eight Wheeled, Drawing No. 1435

Weight, with fuel and water, about 110,000 pounds

5 3 **Tank** { Oil 1200 / Water 3500 } Gallons, Bill 4955

Tank "U" shape, straight top.

Wood rack around top of tank.

Tool Boxes Hard Wood, Top.

Frame Steel 8" and 10" channels, with bumpers of wood, reinforced with steel plates.

11 Front Drawbar height 31⅜"

Pilot None Pushing shoes None

Back drawhead, center above rail 33½"

Coupler Sharon M. C. B. Auto. with 13" knuckle face.

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

Trucks Square wrought iron, equalized type.

Springs Half-elliptic - Standard Steel Works

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 Double (See Sup. 54)

Brake Position On all wheels

Brake sch. No. 6-ET Westg. Auto. and Straight air with 10" x 12" tender cylinder.

List of tools, sch. 28

Photo sch. No. 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 8-2-19 Shipment On own wheels (See Sup. 31)

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 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., Block style, same as for 10 28 ½ D 47.

Mark on tank sides, Southern Pine Lumber Company

Road Nos. Pos.	Road Nos.	Name None	
F. No. Plate	14		
F. Sand Box			
Cab Sides			
Back of Tank			

Actual Dimensions of Loco. Extreme height over all 12' 11½"

Extreme Width: - Cab boards 9' 1" Cylinders or valve motion 9' 0"

Length outside face front bumper of engine to face of tender wedge 31' 3½"

Length face of tender wedge to outside face back bumper of tender 24' 7½"

Total length outside face front bumper of engine to outside face back bumper of tender 55' 11"

SPECIFICATION FOR LOCOMOTIVES 10 26 ½ D 157

FOR SOUTHERN PINE LUMBER COMPANY.

RTL

1 DOME - ONE PIECE TYPE.

2 AUXILIARY DOME - NONE.

3 OIL BURNING ARRANGEMENT, B. L. W. STANDARD WITH BURNER IN FRONT END OF FIRE BOX.
ROYALTY, IF ANY, PAYABLE BY THE B. L. W.
FULL OIL BURNING EQUIPMENT AND CONNECTIONS FOR ENGINE AND TENDER (EXCEPT TANK) TO BE FURNISHED BY THE B. L. W.

4 FUEL TO BE OIL, BUT STUDS ARE TO BE APPLIED IN FIRE BOX FOR APPLICATION OF WOOD BURNING GRATES.
FUEL OIL HAS GRAVITY 22, FLASH TEST UNKNOWN.

5 TUBES (2") TO BE TYLER DIAMOND "T" SPECIAL QUALITY CHARCOAL IRON.

6 SUPERHEATER AS LOCO. SUPERHEATER CO.'S SPECIFICATION NO. S-50-262-A, DATED JULY 31, 1919 (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 STACK TO BE SAME AS FOR LOCOS. 11 AND 12, B. L. W. CLASS 10 28 ½ D 42 AND 47, EXCEPT TO BE 8" SHORTER.

9 TWO WASHOUT PLUGS, ONE IN EACH SIDE JUST IN FRONT OF BACK FLUE SHEET.

10 INJECTOR CHECK VALVES TO BE OF REGRINDING TYPE, WITH CUTOUT VALVE.

11 DECK PLATE OF CAST STEEL WITH EXTRA HEAVY DRAWBAR CONNECTION BETWEEN ENGINE AND TENDER, AND STEEL CHAFING IRONS WITH 10" VERTICAL FACE AND LONG SWEEP TO PROVIDE FOR EXTRA ROUGH SERVICE.

12 LOCO. TO CONFORM TO ALL I. C. C. REQUIREMENTS.

13 HEADLIGHT EQUIPMENT TO BE PYLE NATIONAL ELECTRIC, TYPE "K-2" WITH ROSS SPECIAL CASE FOR INCANDESCENT HEADLIGHT.
BACK HEADLIGHT TO BE PLACED ON SWIVEL BASE ON TOP OF CAB.
HEADLIGHT TURBINE TO BE LOCATED IMMEDIATELY FORWARD OF CAB.

14 LAGGING TO BE EQUIPPED TO SIDES OF FIRE BOX AS SHOWN ON PHOTO. 6455, B. L. W. CLASS, 10 26 ½ D 146.

15 CYLINDER HEADS, FRONT, TO BE CAST IRON, BACK TO BE CAST STEEL.

16 SPECIAL ATTENTION TO BE GIVEN TO SETTING OF VALVES SO THAT TROUBLE EXPERIENCED WITH LOCOS. NOS. 11 AND 12, B. L. W. CLASS 10 28 ½ D 42 AND 47 WILL NOT RECUR.
THIS APPLIES ALSO TO LINING UP OF WHEELS AND TRUCKS.

17 MAIN ROD I SECTION.
MAIN AND SIDE ROD WRIST PIN FASTENINGS TO BE MADE WITH HEXAGON NUTS ON OUTSIDE, SUITABLY LOCATED.

18 RODS TO HAVE GREASE CUPS FORGED SOLID ON RODS.

19 ALL TIRES, DRIVING AND TRUCK, TO BE HARDEST GRADE.
TIRES TO BE SHRUNK ON EXTRA TIGHT.

20 SPRINGS AND SPRING RIGGING TO BE EXTRA HEAVY.
EQUALIZING BEAMS TO REAR TRUCK TO BE EXTRA HEAVY.

24 FRONT TRUCK FRAME TO BE OF WROUGHT STEEL, WITH 2" CRADLE PIN.

27 BACK TRUCK FRAME TO BE OF WROUGHT STEEL, WITH 2" CRADLE PIN.

28 TRUCK WHEEL TIRES TO BE INTERCHANGEABLE WITH LOCOS. 11 AND 12 B. L. W. CLASS 10 28 ½ D 42 AND 47.

29 RAIL WASHER TO BE APPLIED ON BACK OF BACK TRUCK WHEELS.

30 AIR RESERVOIR TO HAVE LARGE CAPACITY AND TO HAVE HYDROSTATIC TEST OF 210 POUNDS.
AIR PUMP TO HAVE U. S. METALLIC PACKING.

31 EXTRAS ORDERED ON EXTRA ORDER NO. 6372 DATED 8-26-19 TO BE SHIPPED WITH LOCO.

TENDER.

51 TANK TO BE OF LONG, LOW DESIGN.

52 TANK TO HAVE DRAIN PIPE THROUGH CAPING ON BOTH SIDES OF TENDER TO DRAIN TOP OF TANK.

53 OIL TANK TO BE FURNISHED BY SOUTHERN PINE LUMBER CO.
SPACE TO BE PROVIDED IN TENDER TO ACCOMMODATE OIL TANK FURNISHED TO S. P. L. CO., FOR LOCOS. NOS. 11 AND 12, B. L. W. CLASS 10 28 ½ D 42 AND 47, INVOICE DECEMBER 18, 1914, NOS. 514 AND 7491.

54 EIGHT 1" SAFETY CHAINS TO BE PROVIDED FOR TENDER TRUCKS.

404

404

SPECIFICATION FOR LOCOMOTIVES 10 26 ½ D 157

FOR SOUTHERN PINE LUMBER COMPANY.

Specification for Type A Double Loop Superheater Spec'n S-50-262-A, dated July 31, 1919.

BOILER TUBES 102 in number 2" o.d. 13 ft. 3 in. over tube sheets. Tubes located between and adjacent to boiler flues are to be headed over at front end. Tubes to be in accordance with the American Society for Testing Materials Specification A-28-18.

BOILER FLUES 15 in number 5½" o.d. #9 B.W.G. of cold drawn seamless steel. Flues to be in accordance with the American Society for Testing Materials Specification A-28-18. Card 10812-B

BOILER TUBE SETTING 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 1136 Card 50462

TUBE SHEET LAYOUT UNITS 15 units 1½" o.d. #9 B.W.G. Pipes to be in accordance with the American Society for Testing Materials Specification A-28-18. Pipes united by return bends.
Each unit to be tested, before being placed in boiler, with water under pressure of 500 lb. per sq. in. Card 10773

UNIT PIPE SUPPORTS Of steel fastened securely on superheater pipes so as not to slide. Card 1043

UNIT PIPE JOINT To be made in best possible manner to insure absolutely tight joints in accordance with the notation on. Card 10695

UNIT CLAMP BOLT To be in accordance with requirements of Locomotive Superheater Company Material Specification No. 12-A.

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 1632-G

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 pipe or cylinder. Pipe to be well protected against freezing. Card 1149-J

DAMPER SHAFT COUNTERWEIGHT To be painted a light color to render it easily visible by the engineer. Card 1067 Card 40461

S. H. ARRANGEMENT To be in accordance with. Card

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 11282-B	S. H. UNIT BOLT WASHER	Card 1071
DAMPER CYL. ARM	Card 1074	S. H. UNIT CLAMP	Card 1073
DAMPER CYL. PIPE FITTING	Card 11115	S. H. UNIT CLAMP WASHER	Card 10305
DAMPER CYL. PIPE UNION	Card 11114	S. H. PIPE END	Card 1344
DAMPER CYL. PIPING DIAGRAM	Card 3258	S. H. PIPE BAND	Card 1982
DAMPER CYL. SUPPORT	Card 10759	SPACING OF BANDS & SUPPORTS	Card
DAMPER SHAFT	Card 1065	TYPE OF RETURN BENDS	FORGED
DAMPER SHAFT ARM	Card 11277-A RS	RETURN BENDS	Card 11022
DAMPER SHAFT BEARING (O.S.)	Card 11107 LS	LUBRICATOR CONNECTION	Card 3023
DAMPER SHAFT BEARING (I.S.)	Card 1070-K	DEFLECTING PLATE HANDLE	Card 1487
DAMPER SHAFT LINK	Card 3272	DEFLECTING PLATE STUDS	Card 10809
PATENT PLATE	NONE	DEFLECTING PLATE CLAMP	Card 10809-A
PYROMETER			

THE BALDWIN LOCOMOTIVE WORKS As Specn C-5952

Memorandum Spec'n 19064

SPECIFICATION FOR LOCOMOTIVES 10 18 ¼ D 37, 38

FOR Surry Lumber Company

P

8-29-19

Gen. as Photo 4478 — Except to have extended wagon top boiler and Southern valve gear.

Engine Drawing No. 17

Gauge of Road 3' 0" Play ⅜"

Wheelbase, Rigid 7' 9" Driving 7' 9" Total 20' 9"

Total wheelbase, eng. and tend. { Actual 40' 1¼" / Limited to ---

Curves ----

Grades - 4%

Limits, Height --- Width ---

Weight (approximate) in working order, Total 57,000 pounds

On F. tr'k 8,000 lbs., Drivers 40,000 lbs., B. tr'k 9,000 lbs.

Tractive power ~~9650~~ 10100 lbs., Ratio of adhesion ~~4.14~~ 3.96

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

Fuel Soft Coal

Front Tube Sheet ½" Thick

Boiler Steel Thick 7/16" Bill 8749

Boiler, Diam. 38" Plan Extended Wagon Top

Boiler st'm pres. 170 lbs., Tested to { 190 lbs. steam pres. / 227 lbs. water pres.

With Factor of Safety of 5.78

Longitud. seams Butt jointed, double covering strips.

Dome, diam. 22" Pos. Central

Firebox Steel Combustion champ. None

Firebox, length 51" Width 37⅞" Depth F. 45½" B. 37½"

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

Firedoor opening 14" diam. Crown and sides in one sheet.

Water space, Front 3½" 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 None central rows

Crown bars --- Placed --- above crown

Crown bolts ---

Flues ---

Tubes #12 W.G. Charcoal Iron or Steel (B. L. W. Option)

Tube ends Swaged for copper ferrules, fire box ends.

Number 81 Diam. 2" Length 11' 6"

Heating Surface				
Flues ---	Combus. Chamb. ---	Total 534
Tubes 181	Fire Box 50	Fire Brick Tubes ---
Grate area 13.2	Ratio to Heating Surface 1 : 40.5	
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~~ hopper With

Netting and deflect. plates With

Exhaust nozzles Double - High

Stack Straight Dia. 12"

Safety Valves Two Crosby 1½" Plain (Spec)

Safety valves None with relief lever, Set to 170

Whistle One B. L. W. Chime, in side of dome

Steam Gauge One Iron 6" Maker: Ashcroft (Not Spec)

Steam gauge stand Iron Clock None

2 **Water Gauge** None **Cab Lamps** to burn oil

2 **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 One filling plug in top of boiler

Firebox Corners diagonal

Crown. One R. S., Two 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 ---

3 **Injectors** (Spec) Two Sellers, Class "N" 1887 No. 6½

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

3 **Cab** Steel

Cab boards Steel Nosing T-Iron

Running boards Steel Nosing T-Iron

Hand rail Iron Located on Boiler

5 **Back Bumper** Bar Steel Back drawbar height 27⅛"

6

1 **Pilot** Wood Pushing shoes None

1 **Front Bumper** Heavy Oak Bumper plate With

Steps None

Front Drawhead, Center above rail 24"

Coupler Cast Iron Drawhead as Ry. Co's. Print, for Link and Pin Connection, same as for 10 22 D 86.

Signal fixtures Iron on bumper

Headlight None Reflector, To burn ---

Headlight, Nos. on sides --- 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 Pl'd. Bands Iron Style 9

Boiler Lagging Magnesia Sectional.

THE BALDWIN LOCOMOTIVE WORKS

F. I. Bird Oct. 1919.

SPECIFICATION FOR LOCOMOTIVES 10 18 ¼ D 37, 38

406 406

FOR Surry Lumber Company

P

7 **Frames** Cast Steel

10 **Cylinders,** Diam. 12" Stroke 18"

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

Exh. ports, Length 10" Width 2" Valve lead ⅛"

Valve travel 4" Steam lap ⅞" Exhaust clearance ---

Eccentric crank throw 16" By-pass valve None

S. F. Lubr. Detroit Triple No. 22 Bulls Eye (Spec)

12 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 Richardson balanced, with vacuum valves

Met. pkg. [illegible] valve stems United States. King Type (Not Spec)

Pistons Cast iron rings sprung into solid head

12 **Guides** "Laird" type, steel Oil cups Needle

Crossheads Cast Steel, with gibs of brass

Wrist Pins Steel 1⅜" Rod cups Plunger, forged on.

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 wheel hub liners None

4 **Drivers,** O. S. Diam. 37" Cen. diam. 32" Centers Cast Iron

Tires to be interchangeable with 8 18 D 70 and 74.

Tires Steel Held by Shrinkage and Shoulder

Tires, Flanged, Pos. Front and Back Size 2½" X 5

Tires, Plain, Pos. Middle Size 2½" X 6"

Lateral play between driving boxes and wheel hubs { ⅛" total for hereafter / 1/16" total for 37, 38 only (R.L.B. 11/5/19)

Driving Boxes Cast Iron

Journals, Diam. 5" Length 6"

Spring plates to be 1/16" thicker than usual

15 **Springs.** Make B. L. W.

Front Engine Truck Two Wheeled Swing Bolster, Center Bearing

To swing 3⅜" each side of cen., Cen. pin liners None

Journals, Diam 3½" Length 6" Boxes Cast Iron

Wheel hub liners None

Wheels, Diam 24" Tread 3⅜" Kind Chilled Cast Iron Plate

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

Tires held by ---

Back Engine Truck Two Wheeled Swing Bolster, Side Bearing

To swing 3⅜" each side of cen., Cen. pin liners None

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

Wheel hub liners None

Wheels, Diam. 24" Tread 3⅜" Kind Chilled Cast Iron Plate

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

Tires held by

Brake, position On all driving wheels (no tender)

Operating { Engine, sch. B. L. W. Steam

Parts { Eng. Tr'k. sch. ---

Foundation { Drivers, sch. W-1 American O.S. Equalized

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

Air pump --- Pos. ---

Train connections ---

Train signal, sch. ---

Main cylinder lubricator to be piped to lubricate the steam brake valve.

Tender Eight Wheeled, Drawing No. 1449

Weight, with fuel and water, about 36,000

Tender tank to be 90" wide, 6" to be taken out of coal space.

Tank 1700 Gallons, Bill 5012

Tank "U" shape, straight top. Fuel capacity 4 tons.

Tool Boxes Hard Wood, Top

5 **Frame** Steel 6" channels, with bumpers of steel plate.

Front Drawbar height 25¾"

Pilot None Pushing shoes None

Back drawhead, center above rail 24"

Coupler Cast Iron Drawhead as Ry. Co's. Print, for Link and Pin Connection, same as for 10 22 D 86

Steps Front and Back

Trucks Arch Bar Type, with cast steel Bolsters

Spring plates to be 1/16" thicker than usual.

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. ---

Wheel Guards Front and Back

Lubrication Engine Oil throughout

Sanding Gear Engine

Cab Steel

Cab Fittings Iron

Seats Wood

Deck Sheets Steel

Deck Roofing Canvas

Cab Windows Wood Sash

Cab Doors Wood

Cab Curtains Duck

Headlight Electric, Generator Type Turbine Driven

Mounted on Cab

Bell Ringer Electric

Bell Gong Cast Iron

Bell Hanger Iron

Bell Stand Iron

Bell Cord Rope

Whistle Cord Rope

Fire Hose Rubber

Fire Hose Couplings Iron

Fire Hose Nozzle Iron

Fire Hose Rack Iron

Fire Hose Box Iron

Fire Hose Strainer Iron

Fire Hose Wrench Iron

Fire Hose Spanner Iron

Fire Hose Valve Iron

Fire Hose Bracket Iron

Fire Hose Clamp Iron

Fire Hose Hanger Iron

Fire Hose Reel Iron

Fire Hose Guide Iron

Fire Hose Pulley Iron

Fire Hose Chain Iron

Fire Hose Rope Rope

SPECIFICATION FOR LOCOMOTIVES 10 18 ¼ D 37, 38. 407 407

FOR SURRY LUMBER COMPANY.

P

1 ~~MR. A. S. HIGGINS, U. U., TO BE NOTIFIED WHEN FIRST LOCOMOTIVES IS READY TO S-IP, IN ORDER THAT HE MAY COME TO EDDYSTONE TO INSPECT SAME.~~

2 OMIT WATER GAUGE AND PROVIDE ONLY ONE SET OF GAUGE COCKS.

3 SYPHON:- XL EJECTOR TO BE PLACED UNDER LEFT SIDE OF CAB AND TO HAVE 1½" STEAM AND 2½" SUCTION AND DISCHARGE CONNECTIONS, WITH 20 FEET OF SUCTION HOSE AND DISCHARGE PIPED TO TENDER WITH HOSE BETWEEN ENGINE AND TENDER.

4 CAB TO BE 90" WIDE.

5 THE ENDS OF THE BACK BUMPER ON ENGINE TO BE FLANGED FORWARD AND THE FRONT BUMPER OF TENDER TO BE FLANGED BACKWARD, TO ALLOW CLEARANCE ON CURVES.

6 PILOT TO BE NOT OVER 26" LONG FROM FACE OF BUMPER, AND TO HAVE 6" CLEARANCE ABOVE RAILS.

7 INSIDE FRONT BUMPER KNEES TO BE 1" THICK.

8 FRAME SECTIONS TO BE EXTRA STRONG.
FRAME CENTERS TO BE 27".
ALL POINTS OF FRAME, CROSSED BY SPRING HANGERS, TO BE MADE 1½" DEEPER,
TOP AND BOTTOM FRONT RAILS OF FRAME TO BE BOLTED TOGETHER FORWARD OF CYLINDER.

9 ALLOW ALL POSSIBLE CLEARANCE BETWEEN DRIVERS AND FRAMES.

10 CYLINDER SADDLE TO HAVE TWO HORIZONTAL ROWS OF BOLTS.

11 CYLINDER COCKS TO BE WATERTOWN AUTOMATIC.

12 GUIDE LUGS TO BE CAST ON CYLINDER HEADS.
GUIDE LUGS TO HAVE RIBS APPLIED HORIZONTALLY.

13 MAIN ROD TO BE CONNECTED TO REAR DRIVING WHEEL.
PARALLEL RODS TO HAVE STRAP ENDS.

14 ALL ROD BRASSES TO BE ADJUSTED SAME AS FOR 10 22 D 86.

15 DRIVING SPRING STAPLES TO BE CAST STEEL, 6½" WIDE AT BASE.
ROLLERS TO BE APPLIED BETWEEN DRIVING SPRING STAPLES AND SPRING BANDS.

19 Blank plates (herewith) covering Southern Valve Gear to be applied to the rear end of link supports on each side of loco.

THE BALDWIN LOCOMOTIVE WORKS DUP. TO 10 18 & D 37 AND 38, WITH SAME EXTRAS, EXCEPT WHERE OTHERWISE SPECIFIED.

Memorandum Spec'n 20093

SPECIFICATION FOR LOCOMOTIVES 10 18 & D 42 AND 43

CP/

FOR SURRY LUMBER COMPANY

Gen. as PHOTO. 7321

Engine Drawing No. 17

4-13-20

HE

Gauge of Road 3' 0" Play 8"
Wheelbase, Rigid 7'9" Driving 7' 9" Total 20'9"
Total wheelbase, eng. and tend. { Actual 40'1¼" / Limited to ---

Curves ---
GRADES - 4%
Limits, Height --- Width ---
Weight (approximate) in working order, Total 57,000 POUNDS
On F. Trk. 8,000 lbs. Drivers 40,000 lbs., B. Trk. 9,000 lbs.

Tractive power ~~9,450~~ 10108 lbs., Ratio of adhesion ~~4.14~~ 3.96 6/22
Work'g St'm Pres. 170 lbs., Service LOGGING
Fuel SOFT COAL
LOCOMOTIVE FOR OPERATION IN VIRGINIA.
Boiler STEEL Thick 7/16" Bill 8749
Front Tube Sheet ½" Thick
Boiler, Diam. 38" Plan EXTENDED WAGON TOP
{ Allowable st'm pres. 170 lbs. **Tested to** { 190 lbs. steam pres.
{ With Factor of Safety of 5.78 { 227 lbs. water pres.
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS.

Dome, Diam. 22" Pos. CENTRAL

Firebox STEEL Combustion chamb. NONE
Firebox, length 51" Width 37⅜" Depth F. 45½" B. 37½"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back 5/16"
Firedoor opening 14" DIAM. CROWN AND SIDES IN ONE SHEET.
Water space, Front 3½" Sides 2½" Back 2"
Water space frame SINGLE Riveted
Water space stays ⅝" DIAM. WITH 3/16" HOLES 1½" DEEP FROM O.S.

Radial stays 1" DIAM. Sling stays front NONE
Roof bolts below crown or NONE central rows
Crown bars --- Placed --- above crown
Crown bolts ---

Flues ---
Tubes #12 W.G. CHARCOAL IRON OR STEEL, (B.L.W. OPTION)
Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.
Number 81 Diam. 2" Length 11'6"

Heating Surface { Flues --- Combus. Chamb. --- Total 534.6
{ Tubes 484.6 Fire Box 50.0 Fire Brick Tubes ---
Grate area 13.2 Ratio to Heating Surface 1 : 40.5
Superheater ---

Fire Brick ARCH -NONE

2 **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 STRAIGHT Dia. 12"

Safety Valves TWO CROSBY 1½" PLAIN (Spec)
Safety valves NONE with relief lever Set to 170 POUNDS
Whistle ONE B.L.W. CHIME, IN SIDE OF DOME.

Steam Gauge ONE IRON 6" MAKER: ASHCROFT (Not Spec)
Steam gauge stand IRON **Clock** NONE

3 **Water Gauge** NONE **Cab Lamps** TO BURN OIL
3 **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. WITH ¾" PIPE.

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

Pump NONE

5 **Injectors** (Spec) TWO SELLERS, CLASS "N" 1887 No. 6½
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

4 **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 27⅛"

8 **Pilot** WOOD
9 **Front Bumper** HEAVY OAK Pushing shoes NONE
Steps NONE Bumper plate WITH

Front Drawhead, Center above rail 24"
Coupler CAST IRON DRAWHEAD AS RY. CO'S PRINT, FOR LINK AND PIN CONNECTION, SAME AS FOR 10 22 D 86.

Signal fixtures IRON ON BUMPER

Headlight NONE Reflector,
Headlight, Nos. on sides --- Headlight step NONE
Lamp shield NONE Nosing ---

Bell 45 POUNDS
Sand Box TWO Diam. 12" Body IRON PAINTED Pipes IRON
Sanders HAND IN EACH BOX, TO SAND FRONT AND BACK.

Domes casing IRON PAINTED

Boiler Jacket #22 SOFT STEEL PTD. Bands IRON Sides 9
Boiler Lagging MAGNESIA SECTIONAL

THE BALDWIN LOCOMOTIVE WORKS

H. B. Lichetti JULY-1920

SPECIFICATION FOR LOCOMOTIVES 10 18 & D 42 AND 43

FOR SURRY LUMBER COMPANY

HE

Frames CAST STEEL

12 **Cylinders,** Diam. 12" Stroke 18"
Steam ports, Length 10" Width 1" Bridge ⅝"
13 Exh. ports, Length 10" Width 2" Valve Rod ⅝"
Valve travel 4" Steam clearance 5/8" Exhaust clearance ---
Exhaust cavity from 15" Bridge valve NONE
S. P. Lubr. DETROIT TRIPLE No. 22 BULLS EYE. (Spec)
1A Cylinders CAST IRON Lubr. PIPES OF COPPER UNDER JACKET.
Cyl. casings IRON PAINTED Jackets STEEL PAINTED.
Steam chest covers IRON PTD. Covers STEEL PAINTED
Slide valves RICHARDSON BALANCED, WITH VACUUM VALVES
Valve gear UNITED STATES, KING TYPE. (Not Spec)

Pistons CAST IRON RINGS SPRING INTO SOLID HEAD
1A **Guides** "LATHO" TYPE, STEEL Oil cups NEEDLE
Crossheads CAST STEEL, WITH SIDS OF BRASS
21 **Wrist Pins** STEEL 2½" Plugs PLUNGER, FORGED ON.

22 **Valve Motion** SOUTHERN ROYALTY PAYABLE BY THOS. L. W.
Valves sliding back of bars, fitted links and eccentric rod bushings
Dwell cam hardened or of Novo hardened bushings

All threads on bolts, except stayrods, to be United States Standard.
All pins and movable parts of steel or of iron case hardened.

Wearing Bearings B.L.W.
Driving axle bushings NONE
11 **Drivers,** Diam. 37" Centers diam. 32" CENTERS CAST IRON
Tires STEEL TIRES TO BE INTERCHANGEABLE WITH 8 13 D 70 AND 74
Tires, Flanged, Pos. FRONT AND BACK Held by SHRINKAGE AND SHOULDER
23 Tires, Plain, Pos. MIDDLE Size 2½" x 5"
Lateral play between driving boxes and wheel fronts 8" TOTAL Size 2½" x 5"

Driving Boxes CAST IRON
Journals, Diam. 5" Length 6"

SPRING PLATES TO BE 1/16" THICKER THAN USUAL.
25 **Springs,** Make B. L. W.

Front Engine Truck TWO Wheeled SWING BOLSTER, CENTER BEARING
To swing 34" each side of cent. Cent. pin liners NONE
Journals, Diam. 3½" Length 6" Boxes CAST IRON
29 Wheel hub liners NONE
Wheels, Diam. 24" Tread 3½" Kind CHILLED CAST IRON SPOKE
Tires NONE Cent. diam. --- Size ---
Tires held by ---

Back Engine Truck TWO Wheeled SWING BOLSTER, SIDE BEARING
To swing 3½" each side of cent. Cent. pin liners NONE
29 Journals, Diam. 3½" Length 6" Boxes CAST IRON
Wheel hub liners NONE
Wheels, Diam. 24" Tread 3½" Kind CHILLED CAST IRON SPOKE
Tires NONE Cent. diam. --- Size ---
Tires held by ---

Brake, position ALL DRIVING WHEELS (NO TENDER)
Operating { Engine, sch. —B.L.W. STEAM
Parts { Eng. Trk. sch. ---
30 Foundation { Drivers, sch. W—1 AMERICAN O.S. EQUALIZED
Parts { Eng. Trk. sch. ---
Air pump --- Pos. ---
Train connections ---
Train signal, sch. ---
MAIN CYLINDER LUBRICATOR TO BE PIPED TO LUBRICATE THE STEAM BRAKE VALVE.

Tender EIGHT-WHEEL (Spec 1119) { TENDER TO BE WEIGHED: No
Weight, on drivers 38,000 POUNDS
TENDER TANK TO BE 9'0" WIDE, 6" TO BE TAKEN OUT OF COAL SPACE.
Tank 1,700 GALLONS (Spec 7012)
TANK "U" SHAPE, STRAIGHT TOP. FUEL CAPACITY 7 TONS.
SYPHON CONNECTION TO TANK WITH HOSE BETWEEN ENGINE AND TENDER.
Tool Boxes OF STEEL, TOP.

7 **Frame** STEEL, 5" CHANNELS, WITH BUMPERS OF STEEL PLATE.

Front Drawhead, Center above rail 24½"
Pilot NONE Pushing shoes NONE
Bumper plate 24"
Coupler CAST IRON DRAWHEAD, AS RY. CO'S PT. FOR LINK AND PIN CONNECTIONS, AS FOR 10 22 D 86.

Steps FRONT AND BACK. STEPS TO HAVE WOOD TREAD, 8" WIDE.

Trucks ARCH BAR TYPE, WITH CAST STEEL BOLSTERS.
SPRING PLATES TO BE 1/16" THICKER THAN USUAL.
Springs ELLIPTIC, B. L. W.
Journals, Diam. 5¼" Length 8"
Wheels, Diam. 29" Tread ¾" Kind CHILLED CAST IRON PLATE
Tires NONE Cent. diam. --- Size ---
Tires held by ---
Side chains SINGLE

Brake Position NONE
Brake shoes ---

Lubrication 26
Photo sch. No. 2, for 143, Inspection B. L. W. (SEE SUP. 1)
To be weighed NO Material used B.L.W.
Certificate of inspection THREE COPIES OF B. L. W. FORM 1036
Junior flues to be 1-30-20 Shipment ON CARS

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

B. L. W. FEED WATER STRAINER PAT'D SEPT. 1, 1903 (CAST ON)
Patents
Property marks NONE

Painting, style —BLACK, NO STRIPING
LETTERING ETC., IN YELLOW, SAME AS FOR 10 18 & D 37 &c.
Marks on TANK SIDES: S. S. & S. RY.

Road Nos. Pos.	Road No.	Name NONE
F. No. PLATE	24	
F. SAND BOX	26	
CAB SIDES		
BACK OF TANK		

Actual Dimensions of Loco. Extreme height over stack 11'1⅝"
Extreme Width Cab boards 7'10" Cylinders ——— 6'2½"
Length outside face front bumper to angle to fireman's coupler width 25'2"
Length face of tender wedge to outside face back bumper to tender 19'0½"
Total length outside face front bumper to outside face back bumper of tender 44'8½"

SPECIFICATION FOR LOCOMOTIVES 10 18 & D 42 AND 43

FOR SURRY LUMBER COMPANY

HW

410 410

1 MR. A. S. HIGGINS, M.M. TO BE NOTIFIED WHEN FIRST LOCOMOTIVES IS READY TO SHIP, IN ORDER THAT HE MAY COME TO EDDYSTONE TO INSPECT SAME.

2 GRATE SHAFT LOCATED AT BACK END OF FIRE BOX FOR OPERATING ROCKING BARS IS TO BE MOVED FORWARD 4". SHAFT IS TO BE LOCATED SAME RELATION TO BOTTOM OF FRAME AS NOW SHOWN ON CARDS AND TO HAVE A SEPARATE BEARING. LEVER AT OUTSIDE OF FRAME TO SLOPE BACKWARD AND TO BE OFFSET AT UPPER END TO OBTAIN SAME LOCATION ABOVE DECK AS ON PREVIOUS LOCOMOTIVES, IF POSSIBLE.

3 OMIT WATER GAUGE AND PROVIDE ONLY ONE SET OF GAUGE COCKS.

4 GAUGE COCKS TO BE SAME SIZE AS ON LOCOMOTIVE NO. 14, B.L.W. CLASS 10 22 E 31.

5 SYPHON:- XL EJECTOR TO BE PLACED UNDER LEFT SIDE OF CAB, AND TO HAVE 1½" STEAM AND 2½" SUCTION AND DISCHARGE CONNECTIONS, WITH 20 FEET OF SUCTION HOSE AND DISCHARGE PIPED TO TENDER WITH HOSE BETWEEN ENGINE AND TENDER.

6 CAB TO BE 90" WIDE.

7 THE ENDS OF THE BACK BUMPER ON ENGINE TO BE FLANGED FORWARD AND THE FRONT BUMPER OF TENDER TO BE FLANGED BACKWARD, TO ALLOW CLEARANCE ON CURVES.

8 PILOT TO BE NOT OVER 25" LONG FROM FACE OF BUMPER, AND TO HAVE 6" CLEARANCE ABOVE RAILS.

9 INSIDE FRONT BUMPER SHEES TO BE 1" THICK.

10 FRAME SECTIONS TO BE EXTRA STRONG.
FRAME CENTERS TO BE 27".
ALL POINTS OF FRAME, CROSSEDBY SPRING HANGERS, TO BE MADE 1" DEEPER.
TOP AND BOTTOM FRONT RAILS OF FRAME TO BE BOLTED TOGETHER FORWARD OF CYLINDER.

11 ALLOW ALL POSSIBLE CLEARANCE BETWEEN DRIVERS AND FRAMES.

12 CYLINDER SADDLE TO HAVE TWO HORIZONTAL ROWS OF BOLTS.

13 CYLINDER COCKS TO BE WATERTOWN AUTOMATIC, TAPPED INTO BOTTOM CENTER OF CYLINDERS.

14 GUIDE LUGS TO BE CAST ON CYLINDER HEADS.
GUIDE LUGS TO HAVE RIBS APPLIED HORIZONTALLY.

21 MAIN ROD TO BE CONNECTED TO REAR DRIVING WHEEL. PARALLEL RODS TO HAVE STRAP ENDS.

22 SOUTHERN LOCOMOTIVE VALVE GEAR PATENT PLATES COVERING VALVE GEAR TO BE APPLIED TO THE REAR END OF THE LINK SUPPORT ON EACH SIDE OF LOCOMOTIVE.

23 MIDDLE DRIVING TIRES TO BE 5¾" WIDE I.E., ¼" TO BE TAKEN OFF OUTSIDE OF MIDDLE TIRES, TO PROVIDE MORE CLEARANCE BETWEEN THE CONNECTING ROD JAW AND TIRE.

24 ALL ROD BRASSES TO BE ADJUSTED SAME AS FOR 10 22 D 36.

25 DRIVING SPRING STAPLES TO BE CAST STEEL, 6½" WIDE AT BASE. ROLLERS TO BE APPLIED BETWEEN DRIVING SPRING STAPLES AND SPRING BANDS.

26 EQUALIZING BEAM BACK OF REAR DRIVERS SETS ONLY ½" BELOW FRAME. SPRING RIGGING MUST BE ARRANGED SO THAT THERE WILL BE MORE CLEARANCE AT THIS POINT, AND SO THAT EQUALIZER WILL NOT STRIKE THE FRAME WHEN ENGINE IS RUNNING.

27 DOWEL PINS TO BE APPLIED IN FRAMES TO SECURE SPRING LINK BLOCKS IN PLACE.

28 REAR ENGINE TRUCK SPRINGS TO BE STRENGTHENED, IF POSSIBLE, AS SPRINGS ON PREVIOUS ENGINES ARE BREAKING.

29 ENGINE TRUCK BOX CELLARS TO HAVE TOP CORNERS ROUNDED AT OUTSIDE END AND SLIDE ON BOX TO BE CHAMFERED AT INSIDE END, TO PROVIDE MEANS FOR REMOVING CELLARS WITHOUT NECESSITY OF JACKING UP ENGINE.

30 BRAKE SHOES ON MIDDLE DRIVERS WEAR OUT BEFORE THOSE IN FRONT AND BACK ARE WORN MORE THAN 1/16". REQUEST AMERICAN BRAKE COMPANY TO INVESTIGATE BRAKE DESIGN No. 9289, AND CORRECT TROUBLE.

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-6207

Memorandum Spec'n 19082

SPECIFICATION FOR LOCOMOTIVES 10 28 ¼ D 145

FOR WEED LUMBER COMPANY

P

Gen. as PHOTO. 3234

Engine Drawing No. 31

11-25-19

Gauge of Road 4' 8½" Play ¾"

Wheelbase, Rigid 9' 6" Driving 9' 6" Total 24' 6"

Total wheelbase, eng. and tend. (Actual 46' 6" / Limited to ---)

RAILS - 50 POUNDS

Curves 20 DEGREES GRADES 6%

Limits, Height 14' 0" Width 10' 0"

Weight (approximate) in working order, Total 123,000 POUNDS

On F. trk 13,000 lbs., Drivers 96,000 lbs., B. trk. 14,000 lbs.

Tractive power 23,400 lbs., Ratio of adhesion 4.1

Work'g St'm Pres. 175 lbs., Service Locomotive

Fuel OIL (SEE SUP. 8 ETC.)

BOILER ROOF AND SIDES 9/16", BACK SHEET ½"

14C Boiler STEEL Thick 21/32" Dia. 3800

51 55 Front Tube Sheet ½" Thick THROAT SHEET 11/16"

Boiler, Diam. 62" Plan WAGON TOP

58 Allowable st'm pres. 200 lbs. / 56 With Factor of Safety of 5. **Tested to** 225 lbs. steam pres. / 300 lbs. water pres.

56-18 Longitud. seams (SEE SUP. 3)

DOME - ONE PIECE TYPE

55 **Dome,** diam. 29" Pos. FORWARD OF FIRE BOX

55 **Firebox** STEEL Combustion chamb. NONE

Firebox, length 72" Width ½" Depth F. 62½" B. 55½"

60 Firebox, Tube ½" Crown ⅜" Sides ⅜" Back ⅜"

4 Firedoor opening (SEE SUB 4) CROWN AND SIDES IN ONE SHEET

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

Water space frame DOUBLE Riveted

5 57 Water space stays 1" DIAM. WITH 3/16" HOLES 1½" DEEP FROM O. S.

57 Radial stays (SUP. 5) Sling stays front { TWO ROWS TATE / EXPANSION STAYS

Button heads below crown on EIGHT central rows

Crown bars NONE Placed --- above crown

Crown bolts ---

54 Flues ---

7 **Tubes** #12 B. W. G. SEAMLESS STEEL (SEE SUP. 7)

68 Tube ends SWAGED FOR COPPER FERRULES FIRE BOX ENDS

Number 240 Diam. 2" Length 12' 6"

Heating Surface Flues --- Combus. Chamb. --- Total 1664 sq. ft.

Tubes 1560 sq. ft. Fire Box 104 sq. ft. Fire Brick Tubes ---

Grate area 21 sq. ft. Ratio to Heating Surface 1: 79.3

Superheater ---

Fire Brick ARCH - NONE

FIRE BOX LINED WITH FIRE BRICK FOR OIL BURNING

FIRE BRICK PAVEMENT IN PAN

8 **Grates** NONE

Ash Pan, Dampers BACK ONLY

FIRE PAN OF STEEL

Throttle BALANCE Pos. DOME

Dry pipe STEEL

Superheater NONE

55 SMOKE BOX TO HAVE SHORT EXTENSION

10 **Smokebox** extenstion SHORT Cleaning hole and cap NONE

Spark ejector or hopper NONE

Netting and deflect. plates NONE

Exhaust nozzles DOUBLE - LOW

CLEANING PIPE - WITH

Stack CAST IRON, STRAIGHT Dia. 16"

58 **Safety Valves** TWO COALE 2½" OPEN (Spec)

66 Safety valves BOTH with relief lever. Set to 175 POUNDS

58 **Whistle** ONE B. L. W. PLAIN

58-59 **Steam Gauge** ONE IRON 6½" MAKER: ASHCROFT (Spec)

Steam gauge stand IRON **Clock** NONE

58 **Water Gauge** ONE REFLEX 18-18 **Cab Lamps** ELECTRIC

58 **Gauge Cocks** THREE BACK Surface valve NONE

Lowest gauge cock 4½" above highest part of crown

Lubricator steam valve WITHOUT Separate dry pipe to dome

58 **Blower Valve** B. L. W.

58 **Blow off Cock** ONE CRANE 2" POS: IN THROAT

67 **Cleaning Plugs** ONE FILLING PLUG IN TOP OF BOILER

Firebox, CORNERS, BACK ONES DIAGONAL

Crown, TWO EACH SIDE AND TWO BACK.

Waist, ONE UNDER FRONT. ONE ABOVE FIRE-DOOR

Front tube sheet, ONE Fusible plug ONE

Pump NONE

(Spec) **Injectors** TWO HANCOCK, APPROVED TYPE No. 8

Injectors, Pos. R. AND L. Steam pipes COPPER

Pipes, Check IRON Feed IRON Overflow IRON

58-60 Check B. L. W. Pos. R. AND L.

Steam Heat NONE

11C **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 34½"

13 **Pilot** NONE Pushing shoes NONE

Front Bumper CAST STEEL Bumper plate WITH

13 **Steps** HAND HOLDS ETC. TO CONFORM TO I.C.C. REQUIREMENTS

Front Drawhead, Center above rail 34½"

Coupler M. C. B. AUTO., WITH SLOTTED KNUCKLE

Signal fixtures IRON ON BUMPER

1A-18 **Headlight** TWO 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 TWO Diam. 28" Body IRON PAINTED Pipes IRON

Sanders (Spec) NEVER-CLOG AIR, ALSO HAND, IN EACH BOX, TO SAND FRONT AND BACK.

Dome casing IRON PAINTED

Boiler Jacket #18 SOFT STEEL PTD. Bands IRON Style 9

Boiler Lagging ASBESTOS CEMENT

15 **Frames** CAST STEEL, 4" WIDE

FRAME PEDESTAL CAPS OF FORGED STEEL

Cylinders, Diam. 17" Stroke 24"

St'm ports, Length 16" Width 1¼" Bridges 1"

Exh. ports, Length 16" Width 2½" Valve head ¼"

Valve travel 5½" Steam lap ¾" Exhaust clearance ---

Eccentric crank throw 11-11/16" By-pass valve NONE

S. F. Lubr. (Spec) NATHAN TRIPLE BULL'S EYE, THREE PINTS CAPACITY

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 RICHARDSON BALANCED, WITH VACUUM VALVES

Met. pkg. (Spec) UNITED STATES, KING TYPE

PISTON RODS TO BE KEYED TO CROSSHEADS.

Pistons HEADS CAST IRON WITH RINGS OF CAST IRON SPRUNG IN

Guides LAIRD TYPE, FORGED STEEL Oil cups NEEBLE

Crossheads CAST STEEL WITH BEARINGS OF BRONZE

Wrist Pins STEEL Rod cups (SEE SUP. 16)

PARALLEL RODS TO HAVE SOLID ENDS.

17 **Valve Motion** WALSCHAERTS

21 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 wheel hub liners OF BRONZE, CAST ON HUB FACES OF BOXES

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

TIRE SECTION TO HAVE M. M. STANDARD TREAD AND FLANGE.

22 **Tires** STEEL Held by SHRINKAGE ONLY

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 3/16" TOTAL

23 **Driving Boxes** CAST STEEL WITH CAST IRON OIL CELLARS

Journals, Diam. 8" Length 10"

Springs. Make B. L. W.

FRONT ENGINE TRUCK FRAME OF CAST STEEL

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

Wheel hub liners BRASS, ON HUB FACES OF BOXES

Wheels, Diam. 28" Tread 1½" Kind ~~SOLID CAST STEEL OR~~ Cen. diam. --- Size --- ROLLED STEEL

Tires NONE Tires held by --- WHEEL RIMS 2½" THICK

Back Engine Truck TWO Wheeled B. L. W. INSIDE BEARING

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

Journals, Diam. 5" Length 9" Boxes CAST IRON

Wheel hub liners BRASS, ON HUB FACES OF BOXES

Wheels, Diam. 28" Tread 1½" Kind ~~SOLID CAST STEEL OR~~ Cen. diam. --- Size --- ROLLED STEEL

Tires NONE Tires held by --- WHEEL RIMS 2½" THICK

24 **Brake,** position ON ALL DRIVING AND TENDER WHEELS

25 Operating Engine, sch. A-1 AND SHA WESTINGHOUSE AUTO. AND STRAIGHT AIR

Parts Eng. Trk. sch. ---

Foundation Drivers, sch. W-1 AMERICAN O. S. EQUALIZED

Parts Eng. Trk. sch. ---

24 Air pump TWO 9½" Pos. BOTH L. S.

Train connections FRONT AND BACK

Train signal, sch. NONE

AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS.

A1C **Tender** EIGHT Wheeled, Drawing No. 1477 TENDER TO BE WEIGHED? YES

Weight, with fuel and water, about 72,000 POUNDS 50?7

A1C **Tank** { OIL 1000 / WATER 3300 Gallons, Bill 5107

TANK "U" SHAPE, SLOPING BACK

Tool Boxes HARD WOOD, TOP

Frame STEEL, 6" AND 8" CHANNELS, WITH BUMPERS (SEE SUP. 13)

FRAME BOLSTER TO BE TRUSSED TYPE

Front Drawbar height 31½"

Pilot NONE Pushing shoes NONE

Back drawhead, center above rail 34"

Coupler M. C. B. AUTO., WITH SLOTTED KNUCKLE

A1C Steps HAND HOLDS ETC., TO CONFORM TO I. C. C. REQUIREMENTS

Trucks ARCH BAR TYPE WITH CHANNEL SPRING PLANKS AND BOLSTERS OF CAST STEEL

Springs ELLIPTIC, B. L. W.

Journals, Diam. 4½" Length 8"

Wheels, Diam. 30" Tread 1½" Kind ~~SOLID CAST STEEL OR~~ ROLLED STEEL

Tires NONE Cen. diam. --- Size --- WHEEL RIMS 2½" THICK

Tires held by ---

Safety chains SINGLE

Brake Position ON ALL WHEELS

Brake sch. FL-1012 AND SHB WESTINGHOUSE AUTO. AND STRAIGHT AIR

List of tools, sch. 28 (SEE SUP. 26)

Photo sch. NO. 2 Inspection B. L. W. (EXCEPT SEE SUP. 2) TWO SIDES

To be weighed YES Material specifns B. L. W.

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

Junior laws to 12-22-19 Shipment ON OWN WHEELS (SEE SUP. 27)

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, style 291, OLIVE GREEN AND ALUMINUM

Mark on TANK SIDES: WEED LUMBER COMPANY

Road Nos. Pos.	Road Nos.	Name: NONE
F. No. PLATE	7	
F. SAND BOX		
CAB PANEL		
BACK OF TANK		

Actual Dimensions of Loco. Extreme height over all 13' 8½"

Extreme Width: Cab boards 9' 11" Cylinders or valve motion 10' 0"

Length outside face front bumper of engine to face of tender wedge 30' 5"

Length face of tender wedge to outside face back bumper of tender 24' 6"

Total length outside face front bumper of engine to outside face back bumper of tender 54' 11"

SPECIFICATION FOR LOCOMOTIVES 10 20 & 0 115 — 413

FOR Kern County Company

1. LOCO. TO BE OPERATED IN CALIFORNIA.
BOILER TO CONFORM TO REQUIREMENTS OF BOILER LAWS OF THE STATE OF CALIFORNIA, I. C., A. S. M. E. CODE.

2 BOILER TO BE INSPECTED BY THE HARTFORD STEAM BOILER INSPECTION AND INSURANCE COMPANY.

3 LONGITUDINAL SEAMS, BUTT JOINTED WITH DOUBLE COVERING STRIPS, SEXTUPLE RIVETED, 90% SEAMS.
CIRCUMFERENTIAL SEAMS, DOUBLE RIVETED LAP JOINTS.

4 FIRE DOOR ELLIPTICAL SHEETS TO BE PROTECTED FROM WEAR BY GUARD CAST ON FIRE DOOR FRAME. FIREDOOR OPENING, OVAL 13"x 18".

5 STAY BOLTS - TWO FRONT ROWS RADIAL STAYS TO BE (Not Spec.) TATE EXPANSION ABOUT 28 IN NUMBER.
CROWN STAYS TO BE 15/16" DIAM. ON BODY, 1" DIAM. AT ENDS.

6 STAYBOLTS IN SIDES, THROAT AND BACK HEAD TO BE 1" DIAMETER HOLLOW STAY BOLTS BEHIND BRICK WORK IN FIRE BOX.

7 BOILER TUBES TO BE SPACED IN VERTICAL ROWS AND SET WITH COPPER FERRULES, AND BEVELED ROLLED AND BEADED ON FIRE BOX END, AND ROLLED IN FRONT TUBE SHEET.

8 OIL BURNING ARRANGEMENT TO BE HEINTZELMAN SYSTEM WITH BURNER IN FRONT OF FIRE BOX.
OIL CONTROL ON LEFT SIDE OF BACK HEAD IN CAB.
ROYALTY, IF ANY, PAYABLE BY THE B. L. W.

9 FUEL OIL: FULL ANALYSIS OF FUEL OIL IS AS FOLLOWS:-
GRAVITY: 19 — B. T. U. 18990 PER POUND
FLASH: 172 — SULPHUR .9%
FIRE TEST 218 DEG. F. — VISCOSITY 21 SEC. ENGLAR AT 70°F.
COLD TEST BELOW 0 DEG. F.

10 SMOKE BOX TO BE 1/2" THICK AND TO BE MADE SEPARATE FOR EASY RENEWAL.

11 CAB ROOF TO BE LINED WITH WOOD AND TO HAVE VENTILATOR.
CAB SASH OF HARD WOOD WITH DOUBLE STRENGTH GLASS.

12 CAB TO HAVE CONVENIENT SEATS WITH CUSHION, AND TOOL BOX FOR ENGINEER AND FIREMAN.

13 QUIT PILOT AND PROVIDE FOOT BOARDS FRONT AND BACK.
FOOT BOARDS OF WOOD ACROSS FRONT, WITH WROT IRON SUPPORTS.

14 ~~GENERAL ELECTRIC EQUIPMENT, HEADLIGHT DESIGN 718, AND TURBO HEADLIGHT SET 500 WATTS, 32 VOLTS, SERIAL NUMBER 21838, SAME AS FURNISHED REED LUMBER COMPANY SEPTEMBER 2, 1919, G. E. INVOICE F-33532, SHIPPED FROM ROCHESTER, N. Y. COMPANY ADVISES IT IS USING THE G. Y. 32-C TYPE HEADLIGHT EQUIPMENT, AND IT GIVES US ALL THIS INFORMATION ABOUT HEADLIGHT IN ORDER TO GET EXACTLY WHAT IT WISHES.~~ (SEE SUP. 18)

15 FRAMES TO HAVE DOUBLE FRONT ENDS SECURELY BOLTED AND KEYED TO MAIN FRAME.

16 MAIN AND SIDE ROD CUPS TO BE ARRANGED FOR HARD GREASE, AND TO BE FORGED SOLID ON RODS.

17 ECCENTRIC CRANKS TO BE FORGED STEEL.

18 HEADLIGHT EQUIPMENT TO BE SCHROEDER ELECTRIC, WITH INCANDESCENT HEADLIGHTS (ACCOUNT OF TIME). (SEE SUP. 14)

21 LINKS, BLIDING BLOCK AND ALL WEARING SURFACES TO BE CASE HARDENED.
ALL PIN BEARINGS TO HAVE CASE HARDENED PINS AND BUSHINGS.

22 DETROIT AUTO. FLANGE OILER WITH FOUR FEEDS TO BE APPLIED FOR FRONT AND BACK DRIVERS.

23 DRIVING BOXES TO HAVE BRONZE WEARING PLATES CAST ON THE SHOE AND WEDGE FACES.

24 AIR PUMPS TO BE REGULATED BY 1 1/2" GOVERNOR, SO ARRANGED THAT ONE OR BOTH PUMPS CAN BE OPERATED BY SAME GOVERNOR.

25 BRAKE EQUIPMENT TO INCLUDE G-6 AUTOMATIC BRAKE VALVE AND S-3-A STRAIGHT AIR VALVE, WITH DRIVER BRAKE RELEASE. DRIVER BRAKE CUTOUT TO BE PLACED IN CAB WITHIN REACH OF ENGINEER.

26 TOOLS TO INCLUDE ALL NECESSARY WRENCHES AND SPANNERS, ONE HARD AND ONE SOFT HAMMER, MONKEY WRENCH, A COLD CHISEL, THREE OIL CANS, TWO JACK SCREWS AND TWO CAMEL BACK FROGS.

27 EXTRAS ON EXTRA WORK ORDER NO. 10051, DATED 1-12-20, TO BE SHIPPED WITH LOCO.

For Hereafter- Buffer plates between engine and tender to conform to Ry. Co's print (not numbered) received Dec 1st 1920 and filed in Drawing Room Vault. RSW. 3.3.21.

TENDER

A1 TANK - STEEL; TOP, BOTTOM AND INSIDE TO BE 1/4" THICK, OUTSIDE TO BE 3/16" THICK.

A2 TANK TO BE PROVIDED WITH TANK VALVES AND STRAINER AND CLEANING HOLES.

A3 BUMPERS FRONT AND BACK OF TENDER TO BE OF CAST STEEL.

A4 FOOT BOARD OF WOOD ACROSS BACK, WITH WROT IRON SUPPORTS.

SPECIFICATION FOR LOCOMOTIVES 10 28 ½ D 145

FOR WEED LUMBER COMPANY

P

414 414

51 BOILER TO BE OPERATED IN THE STATE OF CALIFORNIA
BOILER TO BE BUILT TO CONFORM TO THE BOILER CODE OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS (1918), AND MUST BE INSPECTED DURING CONSTRUCTION AND UPON COMPLETION BY AN AUTHORIZED INSPECTOR WHO SHALL NOT BE INTERESTED EITHER DIRECTLY OR INDIRECTLY WITH THE MANUFACTURERS.

52 A DATA REPORT, ON FORMS FURNISHED BY THE ABOVE MENTIONED STATE SHALL BE FORWARDED TO THE PROPER OFFICIAL BEFORE THE BOILER LEAVES THE BUILDER'S WORKS.

53 A HYDROSTATIC TEST SHALL BE APPLIED EQUAL TO ONE-AND -ONE-HALF (1½) TIMES THE WORKING PRESSURE.

54 THE MATERIALS ENTERING INTO THE CONSTRUCTION SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS:-

BOILER AND FIRE BOX STEEL MATERIAL FOR ONE-PIECE DOME	A.S.M.E. SPEC. PAGE 11
BOILER RIVET STEEL	A.S.M.E. SPEC. PAGE 15
BOILER RIVET IRON	A.S.M.E. SPEC. PAGE 31
BOILER BRACE IRON	A.S.M.E. SPEC. PAGE 37
BOILER STAYBOLT IRON	A.S.M.E. SPEC. PAGE 34
BOILER TUBES	A.S.M.E. SPEC. PAGE 40

55 FRONT TUBE SHEET SHALL BE OF FIRE BOX STEEL.
ALL BOILER AND FIRE BOX STEEL AND MATERIAL FOR ONE PIECE DOME SHALL BE MARKED BY THE MANUFACTURER WITH THE HEAT NUMBER, NAME OF MANUFACTURER, GRADE AND LOWEST TENSILE STRENGTH IN THE MANNER AND LOCATION DESCRIBED ON B.L.W. MARKING CARD 6859. SMOKE BOX STEEL MAY CONFORM TO B.L.W. SPECIFICATION.

56 THE MINIMUM FACTOR OF SAFETY SHALL BE FIVE. (1918)
LONGITUDINAL SEAMS SHALL BE OF BUTT AND DOUBLE STRAP CONSTRUCTION.

57 THE OUTSIDE ENDS OF SOLID STAYBOLTS, 8 IN. AND LESS IN LENGTH, SHALL BE DRILLED WITH A HOLE AT LEAST 3/16" DIA., TO A DEPTH EXTENDING AT LEAST ½" BEYOND THE INSIDE OF THE PLATES

58 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 TABLES:

SIZE OF PIPE CONNECTION OR CORRESPONDING TAPER TAP.	1" & 1¼"	1½" & 2"	2½" TO 4"
NO. OF THREADS PER INCH.	11½	11½	8
MINIMUM NO. OF THREADS REQUIRED IN OPENING.	4	5	7
MINIMUM THICKNESS OF MATERIAL REQUIRED TO GIVE ABOVE NO. OF THREADS.	⅜"	7/16"	½"

IF THICKNESS OF BOILER MATERIAL IS NOT SUFFICIENT TO GIVE THE ABOVE NUMBER OF THREADS, A LINER OR FLANGE MUST BE APPLIED.

59 EACH BOILER MUST BE PROVIDED WITH A CONNECTION ¼ PIPE SIZE FOR ATTACHING INSPECTOR'S TEST GAUGE.

60 A FUSIBLE PLUG MUST BE APPLIED. THE PLUG MUST BE FILLED WITH PURE TIN AND THE LEAST DIAMETER OF THE FUSIBLE METAL MUST BE NOT LESS THAN ½" EXCEPT FOR WORKING PRESSURE ABOVE 175 LBS., IN WHICH CASE THE LEAST DIAMETER SHALL NOT BE LESS THAN ⅜", (i. E., USE FUSIBLE PLUG CARD 1410 FOR PRESSURE ABOVE 175 LBS. AND FUSIBLE PLUG CARD 1219 FOR 175 LBS. AND LESS).

65 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.

66 SAFETY VALVES MUST MEET THE REQUIREMENTS OF THE A. S. M. E. BOILER CODE AND MUST BE PLAINLY STAMPED BY THE MANUFACTURER AS PER B. L. W. MARKING CARD 6858.
SAFETY VALVES OVER 3" IN DIAMETER SHALL HAVE FLANGED INLETS. THESE FLANGES SHALL CONFORM TO THE AMERICAN STANDARD.
ALL SAFETY VALVES MUST BE PROVIDED WITH RELIEF LEVERS.

67 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: ALSO WHERE POSSIBLE ONE NEAR THE THROAT SHEET.

68 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 5/8" IN THICKNESS, AND ⅛" LESS THAN FULL SIZE FOR PLATES 5/8" 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 ¼" LESS THAN FULL SIZE AND THEN DRILLED, REAMED OR FINISHED FULL SIZE WITH ROTATING CUTTER.

69 UPON COMPLETION, EACH BOILER SHALL BE STAMPED IN THE PRESENCE OF THE AUTHORIZED INSPECTOR, WITH THE WORDS AS ARRANGED BELOW. THE HEIGHT OF THE LETTERS AND FIGURES SHALL NOT BE LESS THAN ¼". THE LOCATION OF THE STAMP SHALL BE ON THE BACK HEAD ABOVE A PLUG HOLE.

(Manufacturer's Serial Number)	CALIFORNIA (State in which built, or U.S. if for export) No. 1 (Manufacturer's State Standard Number) THE BALDWIN LOCOMOTIVE WORKS (Name of Manufacturer) (LEAVE BLANK) (State Number) (LEAVE BLANK) (Year put in service) 200 LBS. (Maximum working pressure when built)

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-5647.
Memorandum Spec'n 19091
SPECIFICATION FOR LOCOMOTIVES 10 36 E 3550.
FOR THE WHITNEY COMPANY.
HW.

Gen. as PHOTO. 3843.
Engine Drawing No. 101
12.30.19

Gauge of Road 4' 8½" Play ¾" EXCEPT ⅞" FOR F.&B. DRIVERS
Wheelbase, Rigid 14' 3" Driving 14' 3" Total 21' 11"
Total wheelbase, eng. and tend. {Actual 50'11½" {Limited to ---
GRADES 1 TO 2% RAILS 60 POUNDS.
Curves 20 DEGREES.

Limits, Height ----- Width -----
Weight (approximate) in working order, Total 159,000 POUNDS.
On F. Trk 16,000 lbs. Drivers 143,000 lbs. B. Trk. ----- lbs.

Tractive power 35,000 lbs. Ratio of adhesion 4.1
Work'g St'm Pres. 180 lbs. Service LOGGING
Fuel OIL - (SEE SUP. 4 ETC.)

1 **Boiler** STEEL Thick ¾" Bl. 8834
Front Tube Sheet ½" Thick
Boiler, Diam. 64" Plan EXTENDED WAGON TOP.
{Allowable st'm pres. 180 lbs. {Tested to {200 lbs. steam press.
{With Factor of Safety of 4.86 {240 lbs. water pres.
Longitud. seams BUTT JOINTED, DOUBLE COVERING STRIPS.

2 **Dome,** diam. 33" Pos. FORWARD OF FIRE BOX.

Firebox STEEL Combustion chamb. NONE
Firebox, length 107 11/16" Width 42" Depth F. 70¼" B. 66"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back 5/16"
Firedoor opening 16" DIAM. CROWN AND SIDES IN ONE SHEET.
Water space, Front 4" Sides 3" Back 3"
Water space frame DOUBLE Riveted
3 Water space stays ⅞" DIAM. WITH 3.10" HOLES 1¼" DEEP FROM O.S.

Radial stays 1" DIAM. Sling stays front {THREE ROWS 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 #12 W. G. CHARCOAL IRON OR STEEL (B.L.W. OPTION)
Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.
Number 24 157 Diam. 5½" 2" Length 12' 10½"

Heating Surface {Flues 432.0 {Tubes 1052.0 Combus. Chamb. --- Total 1649.0 Fire Box 165.0 Fire Brick Tubes ---
Grate area 31.4.0 Ratio to Heating Surface 1: 52.4
Superheater 344.0

Fire Brick ARCH, NONE
FIRE BOX LINED WITH FIRE BRICK, FOR OIL BURNING.
FIRE BRICK PAVEMENT IN PAN.
4 **Grates** NONE.
Ash Pan, Dampers FRONT AND BACK.

Throttle BALANCE Pos. DOME
Dry pipe STEEL

Superheater SCHMIDT TYPE (SEE SUP. 6 ETC.)

Smokebox extension SHORT 7 Cleaning hole and cap NONE
Spark ejector or hopper NONE
~~Netting and~~ deflect. plates WITH
Exhaust nozzles SINGLE, LOW.
CLEANING PIPE, WITH.
Stack STRAIGHT Dia. 18"

Safety Valves TWO COALE 3" OPEN. (Not Spec)
Safety valves NONE with relief lever. Set to 180 POUNDS.
Whistle ONE 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** TO BURN ACETYLENE
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 ONE FILLING PLUG IN TOP OF BOILER.
Firebox, CORNERS, BACK ONES DIAGONAL, SIDES AND BACK.
Crown, THREE EACH SIDE AND THREE BACK.
Waist, ONE UNDER FRONT ONE PLUG ABOVE FIRE DOOR.
Front tube sheet ONE Fusible plug ONE

Pump NONE

Injectors TWO MONITOR (Not Spec) 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 STEEL Nosing T-IRON
Running boards STEEL Nosing T-IRON
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
1 **Steps** HAND HOLDS, ETC., TO CONFORM TO I.C.C. REQUIREMENTS.

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

Signal fixtures NONE

Headlight ONE ROUND CASE 16" Reflector, To burn ACETYLENE.
Headlight, Nos. on sides WITH H'dl't step WITH
Lamp shelf NONE Nosing ---

Bell 92 POUNDS.
(Not Spec) **Sand Box** ONE Diam. 28" Body IRON PAINTED. Pipes IRON
Sanding LEACH AIR DOUBLE TRAP A-10, TO SAND FRONT AND BACK OF MAIN DRIVING WHEELS.
Dome casing IRON PAINTED.

Boiler Jacket #18 SOFT STEEL PTD. Bands IRON Style 9
Boiler Lagging MAGNESIA SECTIONAL.

THE BALDWIN LOCOMOTIVE WORKS

Jas. Bretherick MARCH-1920.
SPECIFICATION FOR LOCOMOTIVES 10 36 E 3558.

416 416

FOR THE WHITNEY COMPANY {FURNISH TO CO. ONE SET BLUE PRINTS.
HW

Frames CAST STEEL.
CYLINDERS BUSHED A/C DETECTIVE CASTING FOR 3558 ONLY.
Cylinders, Diam. 21" Stroke 26"
St'm ports, Length 26.56" Width 1⅞" Bridges ---
Exh. ports, Length --- Width --- Valve lead 3/16"
Valve travel 5¼" Steam lap ⅞" Exhaust clearance ---
Eccentric crank throw 14 13/16" By-pass valve NONE
S. F. Lubr. NATHAN FIVE FEED BULL'S EYE. (Not Spec)
Cyl'r heads CAST IRON. LUBR. PIPES OF CAST IRON UNDER JACKET.
Cyl'r casings IRON PAINTED 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. (Not Spec)
PISTON RODS TO BE KEYED TO CROSSHEADS.
Pistons HEAD OF CAST IRON, WITH RINGS OF CAST IRON SPRUNG IN.
Guides STEEL Oil cups NEEDLE
Crossheads CAST STEEL, WITH BEARINGS OF CAST IRON TINNED.
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 wheel hub liners (SEE SUP. 8)
Drivers, O. S. Diam. 50" Cen. diam. 44"
WHEEL CENTRES: - MAIN CAST STEEL, OTHERS CAST IRON.
Tires STEEL Held by SHRINKAGE AND SHOULDER.
Tires, Flanged, Pos. ALL Size 3"x5½"
Tires, Plain, Pos. NONE Size -----
Lateral play between driving boxes and wheel hubs = 3/16" TOTAL
Driving Boxes STEELED CAST IRON.
Journals, Diam. 8½" Length 9"

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 8" Boxes CAST IRON.
Wheel hub liners NONE
Wheels, Diam. 30" Tread 4½" Kind CHILLED CAST IRON PLATE.
Cen. diam. --- Size ---
Tires NONE
Tires held by ---

Back Engine Truck NONE Wheeled ---
To swing --- each side of cen., Cen. pin liners ---
Journals, Diam. --- Length --- Boxes ---
Wheel hub liners ---
Wheels, Diam. --- Tread --- Kind ---
Cen. diam. --- Size ---
Tires ---
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. Trk. sch. ---
Foundation Parts {Drivers, sch. WH-2 AMERICAN O. S. EQUALIZED. {Eng. Trk. sch.
Air pump Two 9½" Pos. BOTH L. S.
Train connections FRONT AND BACK.
Train signal, sch. NONE
AIR RESERVOIRS TO HAVE HYDROSTATIC TEST OF 210 POUNDS.
AMERICAN STEAM BRAKE ON DRIVING WHEELS, IN ADDITION TO AIR.

Tender EIGHT Wheeled, Drawing No. 1489 {TENDER TO BE
Weight, with fuel and water, about 70,000 POUNDS {WEIGHED: YES.
Tank {OIL 1200 WATER 3500 Gallons, Bill 5052 5190
TANK "U" SHAPE, SLOPING BACK.
OUTLET TO DRAIN OIL AND WATER TANKS, TO BE PROVIDED.
Tool Boxes HARD WOOD, TOP.
FIRE HOSE, REEL, AND PUMP WITH 2" DELIVERY, ON TENDER.
Frame STEEL 8" & 10" CHANNELS, WITH BUMPERS OF WOOD AND STEEL PLATE.
Front Drawbar height 31¼"
Pilot NONE Pushing shoes NONE
Back drawhead, center above rail 33½"
Coupler M. C. B. AUTO. WITH SLOTTED KNUCKLES.

STEPS ACROSS REAR, WITH HAND RAIL.
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.
Cen. diam. --- Size ---
Tires NONE
Tires held by ---
Safety chains SINGLE

Brake Position ON ALL WHEELS.
Brake sch. No. 6 ET. WESTINGHOUSE AUTOMATIC AND STRAIGHT AIR WITH 10" x 12" CYLINDER.

List of tools, sch. 31 ONE PAIR OF WRECKING FROGS.
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 2.16.20 Shipment ON OWN WHEELS.

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

Patents {B. L. W. FEED WATER STRAINER. PAT. SEPT. 1, 1903, (CAST ON)

Property plates NONE

Painting, style 291, OLIVE GREEN AND ALUMINUM.
MARK ON CAB SIDES BELOW NAME C - 50 21 159 26
Mark on CAB SIDES: ✠ BIG JACK ✠ WITH A GREEN SHAMROCK BEFORE AND AFTER.
Mark on TANK SIDES: THE WHITNEY CO.

Road Nos. Pos. F. No. PLATE DOME BACK OF TANK — Road Nos. 2501 — Name NONE

Actual Dimensions of Loco. Extreme height over all 14'1"
Extreme Width: Cab boards 9'11" ; Cylinders or valve motion 9'10½"
Length outside face front bumper of engine to face of tender wedge = 33'0½"
Length face of tender wedge to outside face back bumper of tender = 22'4"
Total length outside face front bumper of engine to outside face back bumper of tender 56'6½"

SPECIFICATION FOR LOCOMOTIVES 10 36 E 3553

FOR THE WHITNEY COMPANY

1 LOCOMOTIVE FOR OPERATION IN OREGON.
DETAILS TO CONFORM TO I. C.C. REQUIREMENTS.

2 AUXILIARY DOME FOR SAFETY VALVES AND WHISTLE.

3 FLEXIBLE STAY BOLTS, TATE ABOUT 350 IN BREAKING ZONE.

4 OIL BURNING ARRANGEMENT SOUTHERN PACIFIC STANDARD, WITH BURNER IN FRONT END OF FIRE BOX.
ROYALTY, IF ANY, PAYABLE BY B. L. W.

5 FUEL OIL SAME AS FOR SOUTHERN PACIFIC SYSTEM LOCOMOTIVES.
FUEL OIL FROM STANDARD OIL COMPANY, WITH FOLLOWING TESTS:
FIRE, 315 F., FLASH, 270F.,
GRAVITY AT 60° F. O. 958 CENTIGRADE, OR 14° TO 15° BAUM,
AND AT 32° F. 968 CENTIGRADE, OR 14° TO 15° BAUM.
COLD TEST NONE MOISTURE 9%

6 SUPERHEATER AS LOCOMOTIVE SUPERHEATER COMPANY'S SPECIFICATION NO. 0-1275, DATED JANUARY 30TH, 1920. (COPY ATTACHED)
SUPERHEATER TO CONNECT WITH TOP HEADER IN SMOKE BOX AND TO HAVE OUTSIDE STEAM PIPE CONNECTIONS.
ROYALTY ON SUPERHEATER PAYABLE BY THE B. L. W.

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

8 DRIVING WHEEL HUB LINERS - NONE EXCEPT MAIN WHEELS TO HAVE HUB LINERS OF BRONZE PRESSED INTO FACE OF WHEELS.

418

SPECIFICATION FOR LOCOMOTIVES 10 36 E 3558

FOR:- THE WHITNEY COMPANY

Specification for Type A Double Loop Superheater. O-1275 JANUARY 30TH, 1920.

BOILER TUBES 157 in number 2 o.d. 12 ft. 10½ in. over tube sheets. Tubes located between and adjacent to boiler flues are to be headed over at front end. Tubes to be in accordance with the American Society for Testing Materials Specification A-28-18.

BOILER FLUES 24 in number 5½ o.d. #9 BWG of cold drawn seamless steel. Flues to be in accordance with the American Society for Testing Materials Specification A-28-18. Card 1523-G

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, headed 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 50538

TUBE SHEET LAYOUT UNITS 24 units 12 No. d. #9 BWG Pipes to be in accordance with the American Society for Testing Materials Specification A-28-18. Pipes united by return bends.
Each unit to be tested, before being placed in boiler, with water under pressure of 500 lb. per sq. in. Card 10773

UNIT PIPE SUPPORTS Of steel fastened securely on superheater pipes so as not to slide. Card 1043

UNIT PIPE JOINT To be made in best possible manner to insure absolutely tight joints in accordance with the notation on Card 10695

UNIT CLAMP BOLT To be in accordance with requirements of Locomotive Superheater Company Material Specification No. 12-A

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 1432-E

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. SEE ABOVE

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

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 pipe or cylinder. Pipe to be well protected against freezing. Card 1314

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 40564

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 11282-F	S. H. UNIT BOLT WASHER	Card 1071
DAMPER CYL. ARM	Card 1074	S. H. UNIT CLAMP	Card 1073
DAMPER CYL. PIPE FITTING	Card 11115	S. H. UNIT CLAMP WASHER	Card 0305
DAMPER CYL. PIPE UNION	Card 11114	S. H. PIPE END	Card 1388
DAMPER CYL. PIPING DIAGRAM	Card 11274	S. H. PIPE BAND	Card 10759
DAMPER CYL. SUPPORT	Card	SPACING OF BANDS & SUPPORTS	FORGED FORGED
DAMPER SHAFT	Card 1068-H	TYPE OF RETURN BENDS	Card 11022
DAMPER SHAFT ARM	Card 1065	RETURN BENDS	Card 1022
DAMPER SHAFT BEARING (O.S.)	Card 1145-B	LUBRICATOR CONNECTION	Card 1457
DAMPER SHAFT BEARING (I.S.)	Card 12366	DEFLECTING PLATE HANDLE	Card 10839
DAMPER SHAFT LINK	Card 1070	DEFLECTING PLATE STUDS	Card 10839-A
PATENT PLATE	Card 3272	DEFLECTING PLATE CLAMP	
PYROMETER	NONE		

THE BALDWIN LOCOMOTIVE WORKS As Specn. C-5803

Memorandum Spec'n 19044

SPECIFICATION FOR LOCOMOTIVES 10 28 ½ D 140

FOR White-Grandin Lumber Company, Ind.

P

G-27-19

Gen. as Photo. 3555 { Except apply headlight on ba... of tender instead of on cab.

Engine Drawing No. 26

Gauge of Road 4' 8½" Play ¾"
Wheelbase, Rigid 10' 3" Driving 10' 3" Total 28' 10"
Total wheelbase, eng. and tend. { Actual 46' 10" / Limited to ---

Curves ---

Limits, Height --- Width ---
Weight approximate in working order, Total 122,000 pounds
On F. tr'k 12,500 lbs., Drivers 94,000 lbs., B. tr'k 15,500 lbs.

Tractive power 22,100 lbs., Ratio of adhesion 4.25
Work'g St'm Pres. 185 lbs., Service Freight
Fuel Wood

Front Tube Sheet ½" Thick
Boiler Steel Thick ⅜" & 1 1/16" Bill 8619
Boiler, Diam. 56" 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 5.14
Longitud. seams Butt jointed, double covering strips

Dome, diam. 29" Pos. Forward of firebox
Auxiliary Dome - None
Firebox Steel Combustion chamb. None
Firebox, length 64-3/16" Width 42" Depth F. 63½" B. 60½"
Firebox, Tube ½" Crown ⅜" Sides ⅜" Back 5/16"
Firedoor opening 18" 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 1½" deep from O.S.
Radial stays 1" diam. Sling stays front { Two rows 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 (B.L.W. Option)
Tube ends Swaged for Copper Ferrules, firebox ends.
Number 200 Diam. 2" Length 14' 9"

Heating Surface Flues --- Combus. Chamb. --- Total 1637 sq.ft.
Tubes 1536 sq.ft. Fire Box 101 sq.ft. Fire Brick Tubes ---
Grate area 18.7 sq.ft. Ratio to Heating Surface 1 : 88
Superheater ---

Fire Brick Arch, None

Grates Plain bars and dead plate
Ash Pan, Dampers R. and L. and Back

Throttle Balance Pos. Dome
Dry pipe Steel

Superheater None

Smokebox to have short extension
Smokebox extension Short Cleaning hole and cap None
Spark ejector or hopper None
Netting and deflect. plates None

Exhaust nozzles Double, Low
Cleaning Pipe - With
Stack Rushton Improved Dia. 18"

Safety Valves Two Coale 2½" Open (Not Spec)
Safety valves None with relief lever, Set to 185 pounds
Whistle One 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** 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: R. S.
Cleaning Plugs One filling plug in top of boiler
Firebox Corners, 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 Two Monitor (Not Spec) No. 8
Injectors, Pos. Right and Left Steam pipes Copper
Pipes, Check Steel Feed Steel Overflow Steel
Check B. L. W. Pos. R. and L.

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 35½"

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.

Signal fixtures Iron on bumper
Headlight equipment to be Pyle National Electric, Type "K-2" with incandescent headlights.
Headlight Two Round Case 18" Reflector,
Headlight, Nos. on sides With H'dl't step With
Lamp shelf None Nosing ---

Bell 32 pounds
Sand Box Two Diam. 28" Body Iron painted Pipes Iron
(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 Pts Bands: Iron Style 9
Boiler Lagging Magnesia Sectional

THE BALDWIN LOCOMOTIVE WORKS

J. F. Woesner August-1920.

SPECIFICATION FOR LOCOMOTIVES 10 28 ½ D 140

FOR White-Grandin Lumber Company, Inc.

P

D-4 420

Frames Cast Steel

Cylinders, Diam. 17" Stroke 24"
St'm ports, Length 18" Width 1½" Bridges 1"
Exh. ports, Length 18" Width 2½" Valve lead ⅜"
Valve travel 5" Steam lap ¾" Exhaust clearance ---
Eccentric crank throw 10½" By-pass valve None
S. F. Lubr. Detroit Michigan No. 32 (4-Time) Tripple 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 Balanced, with vacuum valves
Met. pkg Piston rods / Valve stems United States, King Type (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, with bearings of cast iron, tinned
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 wheel hub liners - Brass
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 5" x 5½"
Tires, Plain, Pos. Middle Size 5" x 6½"
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, center bearing
To swing 4" each side of cen. Cen. pin liners None
Journals, Diam. 5" Length 10" Boxes Cast Iron
Wheels, Diam. 26" Tread 4½" Kind Chilled Cast Iron Plate
Tires --- Cen. diam. --- Size ---
Tires held by ---
Front Engine Truck Wheel Hub Liners - None

Back Engine Truck Two Wheeled Swing Bolster, Side Bearing
To swing 4" each side of cen. Cen. pin liners None
Journals, Diam. 5" Length 10" Boxes Cast Iron
Wheels, Diam. 26" Tread 4½" Kind Chilled Cast Iron Plate
Tires --- Cen. diam. --- Size ---
Tires held by ---
Back Engine Truck Wheel Hub Liners - None

Brake, position On all driving and tender wheels
Operating Parts { Engine, Sch. No. 6-ET Westg. Combined Auto. and Straight Air / Eng. Tr'k, sch. ---
Foundation Parts { Drivers, sch. UC-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 pounds.

Tender Eight Wheeled, Drawing No. 1413
Weight, with fuel and water, about 74,000 pounds

Tank 3500 Gallons, Bill 4885
Tank "U" shape, straight top. Fuel capacity 3½ cords
Wood rack around top of tank.
Tool Boxes Hard Wood. Top

Frame Steel, 6" and 8" channels, with bumpers of wood.

Front Drawbar height 31⅞"
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 bolsters.

Springs Elliptic - B. L. W.
Journals, Diam. 4½" Length 8"
Wheels, Diam. 28" 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 Westg. Auto. and Straight Air with 10" x 12" tender cylinder.

List of tools, sch. 30
Photo sct. No. 2 Inspection B. L. W.
To be weighed No Material specins B. L. W.
Certificate of boiler test Three copies of B. L. W. form 1036
Junior laws to 7-30-19 Shipment On own wheels

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

B. L. W. Patents } Feed Water St...ner, Patented Sept. 1, 1903 (cast on)

Property plates None

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

Mark on tank sides, White-Grandin Lumber Company.

Road Nos. Pne 2 Road Nos. Name None
F. No. Plate
F. Sand Box
Cab Sides
Back of Tank

Actual Dimensions of Loc. Extreme height over all 14' 2½"
Extreme Width:- Cab boards 9' 11" Cylinders or valve motion 9' 10"
Length outside face front bumper of engine to face of tender wedge 32' 0½"
Length face of tender wedge to outside face back bumper of tender 20' 2"
Total length outside face fron. bumper of engine to outside face back bu... tender 52' 2½"

THE BALDWIN LOCOMOTIVE WORKS As Spec'n C-6255

Memorandum Spec'n 20018

SPECIFICATION FOR LOCOMOTIVES 12 32 ± E 17

WKS **FOR** Wisconsin Logging and Timber Company

HW

Gen'l as Photo. 3824 Except to have steel cab.

Engine Drawing No. 10

1.31.20 (Not Spaced)

Gauge of Road 4'8½" Play 2¾"

Wheelbase, Rigid 11' 6" Driving 11' 6" Total 26' 3" 7/4/23.

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

Rails 60 pounds.

Curves 36 degrees on level

Curves 30 degrees in combination with 7⅛ grades.

Limits, Height --- Width ---

Weight (approximate) in working order, Total 180,000 pounds

On F. tr'k 18,000 lbs., Drivers 140,000 lbs., B. tr'k 22,000 lbs.

Tractive power 32,500 lbs., Ratio of adhesion 4.3

Work'g St'm Pres. 185 lbs., Service Logging

Fuel Oil (See sup. 2)

Boiler Steel Thick 11/16" Bill 8934

Front Tube Sheet ½" Thick

Boiler, Diam. 66" Plan Straight Top

Tested to {Allowable st'm pres. 185 lbs. / With Factor of Safety of 5.14 — 205 lbs. steam pres. / 247 lbs. water pres.

Longitud. seams butt jointed, double covering strips.

Auxiliary Dome – none.

Dome, diam. 29" Pos. Forward of Fire Box.

Firebox Steel. Combustion chamb. None.

Firebox, length 80" Width 54" Depth F. 63" B. 46⅜"

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

Firedoor opening 16" diam. Crown and sides in one sheet.

Water space, Front 4" Sides 3½" Back 3½"

Water space frame Double Riveted

Water space stays ⅝" diam. with 3/16" holes 12" deep from O.S.

Flexible Stays, Tate, 350 in breaking zone.

Radial stays 1" diam. Sling stays front {Two rows 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 (B.L.W. Option)

Tube ends Swaged for copper ferrules, fire box ends.

Number 289 Diam. 2" Length 11'6"

Heating Surface {Flues --- Combus. Chamb. --- Total 1901 sq. ft. / Tubes 1787 sq. ft. Fire Box 114 sq. ft. Fire Brick Tubes ---

Grate area 30 sq. ft. Ratio to Heating Surface 1: 63.4

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 only

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 None

Exhaust nozzles Double Low

Cleaning Pipe with

Stack Cast Iron Straight Dia. 18"

Safety Valves Two Coale 3" Open

Safety valves None with relief lever, Set to 185 pounds

Whistle One B. L. W. Plain

Steam Gauge One Iron 7" Maker: Ashcroft (Not Spaced)

Steam gauge stand Iron **Clock** None

* Two addl gauge cocks furn. Eng. Ord. 25243-1920, see letter 7/14/20 from A.J. Baxter.

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 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 and one back

Crown, Three each side and three back

Waist, One under front

Front tube sheet One Fusible plug One

One filling plug in top of boiler.

Pump None

Locomotive for service in Oregon.

Injectors to have shut off valve for use in case it is necessary to remove injectors.

Injectors Tw. Hancock, type "A" (Spec) 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. in fitting

Steam Heat None

Cab Steel

Cab details to be arranged so that engineer can fire the locomotive from his side of the cab.

Cab boards Steel Nosing T-Iron

Running boards None Nosing ---

Hand rail Iron Located on Cab

* **Back Bumper** Yellow Pine

* For Hereafter: Bumpers to be made of Oak. (R.S.M.C.)

Pilot None Pushing shoes None

* **Front Bumper** Yellow Pine Bumper plate With

Steps across front and back with hand rails.

Coupler Toner M.C.B. auto. 33½" centre above rail in three pocket draw casting 27" to 30" high to centre pocket front and back similar to 10 26 ± D 80.

Signal fixtures Iron on Front 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 hand, in each box, to sand front and back.

Dome casing Iron Painted

Boiler Jacket 18 Soft Steel Pto. Bands Iron Style 9

Boiler Lagging Magnesia Sectional.

THE BALDWIN LOCOMOTIVE WORKS

E Steele April-1920.

SPECIFICATION FOR LOCOMOTIVES 12 32 ± E 17

FOR Wisconsin Logging and Timber Company

HW

Frames Cast Steel

Cylinders, Diam. 19" Stroke 24"

St'm ports, Length 16" Width 1½" Bridges 1"

Exh. ports, Length 16" Width 2½" Valve lead ⅛"

Valve travel 4¾" Steam lap ¾" Exhaust clearance ---

Eccentric crank throw 10" By-pass valve None

S. P. Valve (Not Spaced) Nathan Double Bull's Eye.

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

Cyl'r casings Iron Pto. Head covers Steel Painted

St'm chest castings Iron Pto. Covers Steel Painted

Slide valves Richardson balanced with vacuum valves

Met. pkg. Water rods Valve stems United States, King type.

Piston rods to be keyed to crossheads.

Pistons heads of cast iron with rings of cast iron, sprung in

Guides Steel Oil cups Needle

Crossheads Cast Steel, with bearings of cast iron, tinned

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 stay bolts) to be United States Standard.

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

Wearing Bearings B. L. W.

Driving wheel hub liners None

Drivers, O. S. Diam. 42" Cen. diam. 30" Cens. 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 3/16" total

Driving Boxes Steeled Cast Iron

Journals, Diam. 8" Length 10"

See X1168-24 change of Journals to 9" x 10"

Springs. Make B. L. W.

Front Engine Truck Two Wheeled Swing Bolster, Centre Bearing

To swing 5" each side of cen., Cen. pin liners None

Journals, Diam. 5" Length 10" Boxes Cast Iron

Wheel hub liners None

Wheels, Diam. 26" Tread --- Kind Cast Iron Spoke Centre

Tires Steel Cen. diam. 23" Size 2½" x 5½"

Tires held by Shrinkage and Shoulder

Back Engine Truck Two Wheeled Swingbolster, Side Bearing

To swing 5½" each side of cen. Cen. pin liner None

Journals, Diam. 5" Length 10" Boxes Cast Iron

Wheel hub liners None

Wheels, Diam. 26" Tread --- Kind Cast Iron Spoke Centre

Tires Steel Cen. diam. 23" Size 2½" x 5½"

Tires held by Shrinkage and Shoulder

Brake, Operating {Engine, sch. S-American Steam / Parts / Eng. Tr'k, sch. ---

Foundation {Drivers, sch. WN-2 American O.S. Equalized / Parts / Eng. Tr'k, sch. --- / Pos. ---

Air pump --- Train connections ---

Train signal, sch. ---

~~Separate Driver Brake Valve~~

Tender None

Oil tank placed on rear extension of engine frame, back of cab.

Tank {Oil 900 5290 Gallons. Bill 5312 / Water 2400

Water tank, rectangular shaped, at sides of boiler.

Tanks to have slope similar to Photo. 3824.

Side tanks connected by equalizing pipes at front and rear.

Oil Burning Arrangement B.L.W. Standard with Von Boden Ingals burner ~~or equivalent~~ in front of fire pan.

Royalty, if any, payable by The B. L. W.

Fuel oil from the Associated Oil Company, with gravity 16 degrees, flash 150 to 165: Fire 165 to 185.

~~Locomotive guaranteed to haul eight sets of logging trucks eight tons per set on 60 pounds rail up 1 4% grade continuous with 30 degree curves~~ (CANCELLED) HS- 2/25/20.

Grades, curves, and water tank and oil tank locations as diagram hereith of Rwy. Co's track.

Locomotive will take empty loads up two miles of maximum curves and back down with load. It is imperative that brake shoes be hung in front of drivers instead of back, as shown by Photo.

Wedges between driving boxes and frame pedestals at front of boxes.

Hereafter: Raise question as to applying equal beams instead of short springs between second, third and fourth drivers. R.S.M.C. 11/20/20

Hereafter: Raise question about moving Boiler back, so that a spring can be placed above the 3rd driver, instead of a dolphin beam, and use an equal beam between the 3rd and 4th drivers instead of a short spring. R.S.M.C. 12/1/20

List of tools, sch. 31 One pair wrecking frogs.

Photo sch. No. 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 4.23.20 Shipment On own wheels

Brass shop finish, No. 1

Machine shop finish D-165

Patents B. L. W. Rear end Susp. Truck 1095929 Pat. May 5, 1914 (brass plate)

Property plates None

Painting, style 220, Olive Green and Aluminum.

Mark on tank sides: Wisconsin Logging & Timber Company

Road Nos. Pos.	Road No.	Name None
F. No. Plate	7	
F. Sand Box		
Cab Sides		
Back of Oil Tank		

Actual Dimensions of Loc. Extreme height over all 14' 5"

Extreme Width {Over cab boards 10' 6" Over Cab Handles 11' 1" / Over cylinders ~~or valve motion~~ 10' 1"

Length outside face of front bumper to outside face of back bumper of engine 33' 1"

THE BALDWIN LOCOMOTIVE WORKS As Specn. C-6030

Memorandum Spec'n 19069

SPECIFICATION FOR LOCOMOTIVES 8 28 D 320

Gen. as PHOTO 6098 {EXCEPT TO HAVE STEEL CAB AND ELECTRIC HEADLIGHT EQUIPMENT.

FOR WISCONSIN AND ARKANSAS LUMBER COMPANY

Engine Drawing No. 58

P 10-17-19

Gauge of Road 4' 8½" Play ¾" EXCEPT ⅞" FOR MIDDLE DRIVERS

Wheelbase, Rigid 11' 6" Driving 11' 6" Total 19' 4"

Total wheelbase, eng. and tend {Actual 47' 1½" / Limited to ---

RAILS 45 POUNDS AND 60 POUNDS PER YARD.

Curves 20 DEGREES

GRADES 5%

Limits, Height --- Width ---

Weight (approximate) in working order, Total 111,000 POUNDS

On F. tr'k 15,000 lbs., Drivers 96,000 lbs., B. tr'k --- lbs.

Tractive power 24,100 lbs., Ratio of adhesion 3.98

Work'g St'm Pres. 180 lbs., Service LOGGING

Fuel SOFT COAL

FRONT TUBE SHEET ⅜" THICK

Boiler STEEL Thick ⅜" Bill 8753

Boiler, Diam. 54" 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

Dome, diam. 29" Pos. FORWARD OF FIRE BOX

Firebox STEEL Combustion chamb. NONE

Firebox, length 74-3/16" Width 41⅜" Depth F. 59½" B. 55½"

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 1¼" DEEP FROM O. S.

Radial stays 1" DIAM. Sling stays front {TWO RODS 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 (B.L.W. OPTION)

Tube ends SWAGED FOR COPPER FERRULES, FIRE BOX ENDS.

Number 219 Diam. 2" Length 11' 0"

Heating Surface				
	Flues ---	Combus. Chamb. ---	Total 1355⁰	
	Tubes 1252⁰	Fire Box 103⁰	Fire Brick Tubes ---	
Grate area 21.3⁰	Ratio to Heating Surface 1 : 63.6			
Superheater ---				

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 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"

Safety Valves TWO COALE 2½" OPEN (Not Spec)

Safety valves NONE with relief lever, Set to 180 POUNDS

Whistle ONE 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** 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 ONE FILLING PLUG IN TOP OF BOILER

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 ---

Siphon 1" diam. under cab board on left side with pipe connection to tank and with 15 feet of 1" rubber suction hose.

Injectors TWO OHIO (Spec) No. 7

Injectors, Pos. R. AND L. Steam pipes COPPER

Pipes, Check STEEL Feed STEEL Overflow STEEL

Check B. L. W. Pos. R. AND L.

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 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 33½"

Coupler M. C. B. AUTO.

Signal fixtures IRON ON BUMPER

HEADLIGHT EQUIPMENT TO BE ELECTRIC, COMPLETE WITH SCHROEDER GENERATOR, AND 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

Sand Box TWO Diam. 28" Body IRON PAINTED Pipes IRON

(No Spec) 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 MAGNESIA SECTIONAL

THE BALDWIN LOCOMOTIVE WORKS

H.K. Harwick Dec. 1919.

SPECIFICATION FOR LOCOMOTIVES 8 28 D 32⁰

FOR WISCONSIN AND ARKANSAS LUMBER COMPANY

P

4214

Frames CAST STEEL FRAMES TO BE EXTRA STRONG

Cylinders, Diam. 17" Stroke 24"

St'm ports, Length 16" Width 1¼" Bridges 1"

Exh. ports, Length 16" Width 2½" Valve lead ¼"

Valve travel 5¼" Steam lap ¾" Exhaust clearance ---

Eccentric crank throw 9⅜" By-pass valve NONE

S. F. Lubr. DETROIT TRIPLE No. 22 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} UNITED STATES, KING TYPE (Not Spec)

PISTON RODS TO BE KEYED TO CROSSHEADS

Pistons CAST IRON RINGS SPRUNG INTO SOLID HEAD

Guides ALLIGATOR TYPE, STEEL Oil cups NEEDLE

Crossheads CAST STEEL, WITH BEARINGS OF CAST IRON, TINNED

Wrist Pins STEEL Rod cups GREASE CUPS, FORGED ON MAIN 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.

Driving wheel hub liners BRONZE, PRESSED INTO FACE OF WHEELS

Drivers, O. S. Diam. 44" Cen. diam. 38" CENTERS 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 = 3/16" TOTAL

Driving Boxes CAST STEEL

Journals, Diam. 7½" Length 9"

Springs. Make B. L. W.

Front Engine Truck TWO Wheeled SWING BOLSTER, CENTER BEARING

To swing 4" each side of cen., Cen. pin liners NONE

Journals, Diam. 5" Length 10" Boxes CAST IRON

Wheel hub liners NONE

Wheels, Diam. 26" Tread --- Kind CAST IRON PLATE 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 ---

Wheel hub liners ---

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 WESTG. 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 11" Pos. 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. 1461

Weight, with fuel and water, about 93,500 POUNDS

TENDER TO BE DESIGNED WITH LONG LOW TANK

Tank 4,500 Gallons, Bill 5053

TANK "U" SHAPE, STRAIGHT TOP. FUEL CAPACITY 7 TONS.

Tool Boxes HARD WOOD, TOP

Frame STEEL, 8" AND 10" CHANNELS, WITH BUMPERS OF WOOD AND STEEL PLATE.

Front Drawbar height 29¼"

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 HAND RAIL

Trucks ARCH BAR TYPE WITH CAST STEEL BOLSTERS.

Springs ELLIPTIC - B. L. W.

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. No. 6-ET WESTG. AUTO. AND STRAIGHT AIR WITH 10" X 12" TENDER CYLINDER.

List of tools, sch. 26, ONE PAIR OF WRECKING FROGS

Photo sch. ~~No. 2~~ 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 11-1-19 Shipment ON OWN WHEELS

Brass shop finish, No. 1

Machine shop finish D-165

B. L. W. Patents {FEED WATER STRAINER, PAT'D SEPT. 1, 1903 (CAST ON)

Property plates NONE

Painting, style 291, OLIVE GREEN AND ALUMINUM

Mark on CAB PANEL: M. & F. V.

ROAD NUMBER ON SIDES AND BACK OF TANK TO BE IN LARGE FIGURES.

Road Nos. Pos. Road Nos. Name NONE

F. No. PLATE 10

DOME

SIDES OF TANK

BACK OF TANK

Actual Dimensions of Loco. Extreme height over all 13' 3"

Extreme Width: Cab boards 9' 6¾" ; Cylinders or valve motion 8' 10½"

Length outside face front bumper of engine to face of tender wedge 28' 10"

Length face of tender wedge to outside face back bumper of tender 29' 9¼"

Total length outside face front bumper of engine to outside face back bumper of tender 58' 7¼"