centre of the frames, towards the inside, the spring rigging being arranged to be central over the box. This gives a longer bearing area than would otherwise be possible and introduces no particular complications.

The spring rigging is of the customary type, having the front pair of wheels equalized with the front truck and the remaining three on either side being equalized together.

AIR PUMP BRACKET.—A new design of air pump bracket is found on this locomotive, which is considerably lighter and fully equal in strength to the designs commonly in use. It consists of two 1 x 3 in. wrought iron straps, each secured by three 1 in. studs to the boiler shell at the top, and held in position at the bottom by a cast iron bracket extending out from the boiler and secured to each of the straps by two ⅝ in. bolts. The air pump is bolted directly to the vertical hangers, which are lipped over on the bottom. The illustration clearly shows the details of this bracket.

The general dimensions, weights and ratios of this locomotive, which was designed in the Mechanical Engineer's office under the supervision of H. H. Vaughan, Assitant to the Vice President, are as follows:—

GENERAL DATA.

Gauge	4 ft. 8½ in.
Service	Freight and Passenger
Fuel	Bituminous Coal
Tractive effort	44,750 lbs.
Weight in working order	220,000 lbs.
Weight on drivers	195,000 lbs.
Weight on leading truck	25,000 lbs.
Weight of engine and tender in working order	354,000 lbs.
Wheel base, driving	16 ft. 6 in.
Wheel base, total	25 ft. 5 in.
Wheel base, engine and tender	55 ft. 7⅞ in.

RATIOS.

Weight on drivers ÷ tractive effort	4.36
Total weight ÷ tractive effort	4.92
Tractive effort × diam. drivers ÷ heating surface	1003.00
Total heating surface ÷ grate area	57.35
Firebox heating surface ÷ total heating surface	6.40
Weight on drivers ÷ total heating surface	69.4
Total weight ÷ total heating surface	78.3
Volume both cylinders, cu. ft.	16.75
Total heating surface ÷ vol. cylinders	168,000
Grate area ÷ vol. cylinders	2.92

CYLINDERS.

Kind	Simple
Diameter and stroke	24 x 32

VALVES.

Kind	Piston
Diameter	12 in.
Greatest travel	6 in.
Outside lap	1 in.
Inside clearance	Line and line
Lead in full gear	¼ in.

WHEELS.

Driving, diameter over tires	63 in.
Driving, thickness of tires	3½ in.
Driving journals, main, diameter and length	10 x 14 in.
Driving journals, others, diameter and length	9½ x 14 in.
Engine truck wheels, diameter	31 in.
Engine truck, journals	6 x 10 in.

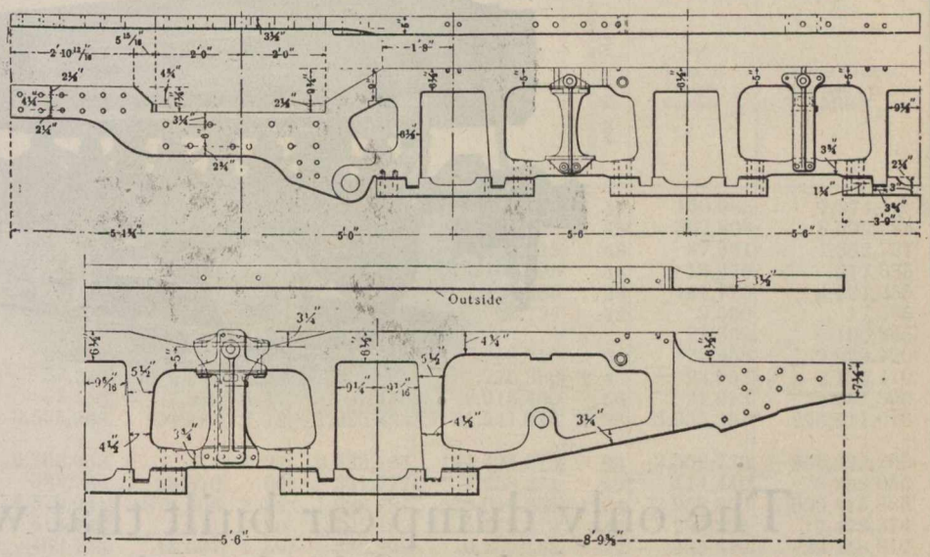
BOILER.

Style	E. W. T.
Working pressure	180 lbs.
Outside diameter of first ring	72 in.
Firebox, length and width	101⅜ x 69¾ in.
Firebox plates, thickness, crown and sides	⅜, Tube ½, and Back ⅜ in.
Firebox, water space	F. 5, S. 4½, B. 3½ in.
Tubes, number and outside diameter	24—5 in.
Tubes, number and outside diameter	272—2 in.
Tubes, length	15 ft. 2¾ in.
Heating surface, tubes	2,631 sq. ft.
Heating surface, firebox	180 sq. ft.
Heating surface, total	2,811 sq. ft.
Superheater heating surface	450 sq. ft.
Grate area	49 sq. ft.
Smokestack, diameter	17 in.
Smokestack, height above rail	15 ft. 2 in.
Centre of boiler above rail	9 ft. 8 1-16 in.

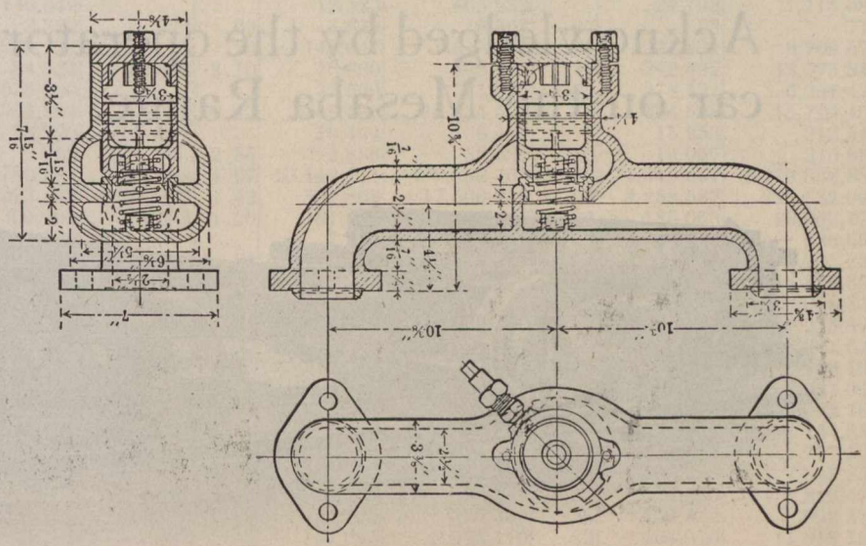
TENDER.

Weight	134,000 lbs.
Wheels, diameter	34 in.
Journals, diameter and length	5½ x 10 in.
Water capacity	5,000 gals.
Coal capacity	10 tons.

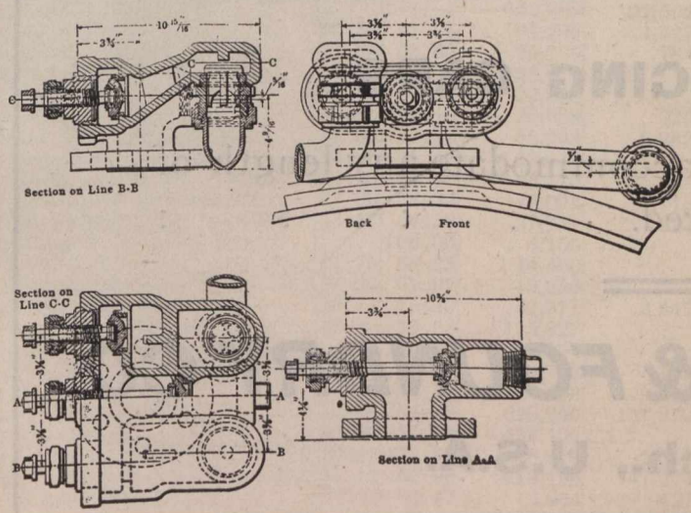
—*American Engineer and Railroad Journal.*



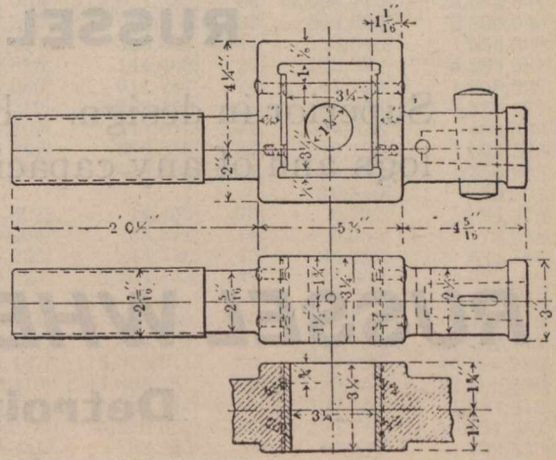
FRAME OF CONSOLIDATION LOCOMOTIVE, CANADIAN PACIFIC RAILWAY.



BY-PASS VALVE ARRANGEMENT.



ARRANGEMENT OF CHECK VALVES AND SYPHEN COCK.



VALVE ROD EXTENSION.