

whether they are free assets or are pledged for the issue of other securities, but the two classes must be entered separately as "unpledged" or "pledged." For the dividend-paying stocks owned the amounts of dividends declared during the year must be shown, except that no income should be shown for the stock of the respondent corporation. If stocks of other concerns have been sold during the year covered by the report dividends accruing on them during the time they are held and the rate of accrual should be given. Par value of stocks still owned must be given. Par value of stocks no longer owned need not be given. Under the head "Valuation," the value at which the stocks specified are carried into the general balance sheet must be given.

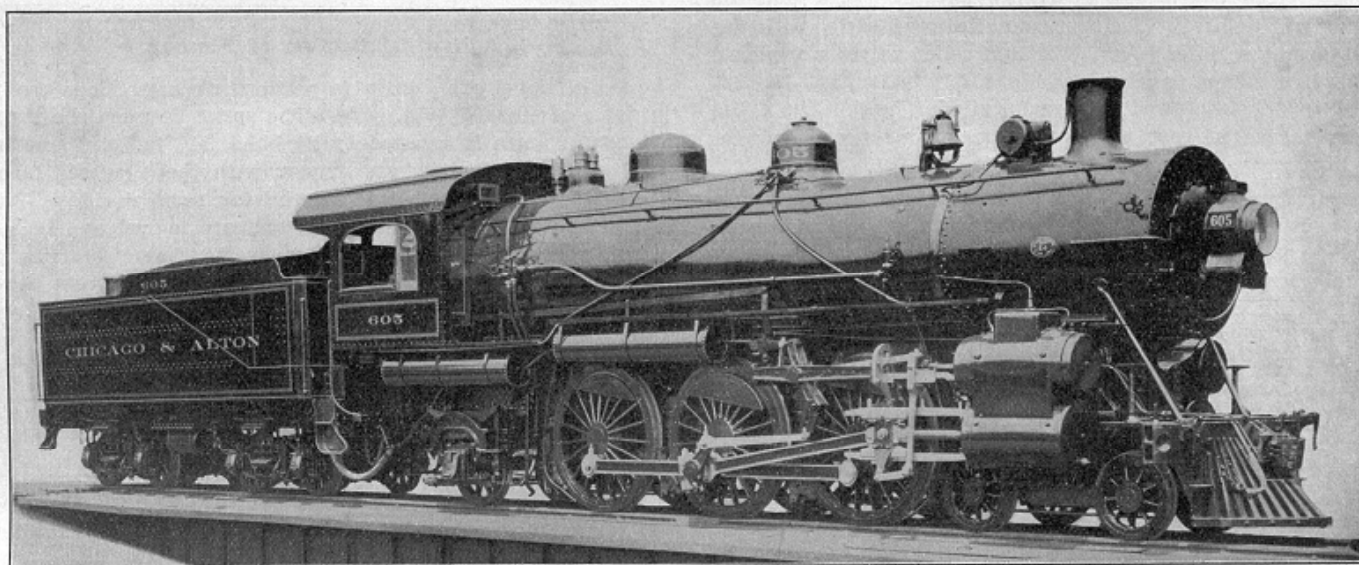
The blanks relating to operating expenses and the hire of equipment have been changed to conform to the new accounting system. Under "Traffic and Mileage Statistics," pages 92-95, more complete information is required than formerly. Locomotive mileage, for example, is now asked for. Under

600 are in use in America, of which about 80 per cent. are owned by the Canadian Pacific, no blank for describing them is given.

The Commission has prepared a new form of "Summary of Monthly Reports of Revenues and Expenses." This new form will be used in the Commission's offices for compilation of reports of revenues and expenses monthly, quarterly and yearly for all railroads, and it is stated that hereafter the Commission will issue quarterly summaries of revenues and expenses of the railroads of the country similar to its quarterly accident bulletins.

PACIFIC LOCOMOTIVES FOR THE CHICAGO & ALTON.

The first standard gage Pacific locomotives built by the Baldwin Locomotive Works were completed early in 1903 for the Chicago & Alton Railroad. These engines were two in number, having driving-wheels respectively 73 in. and 80 in.

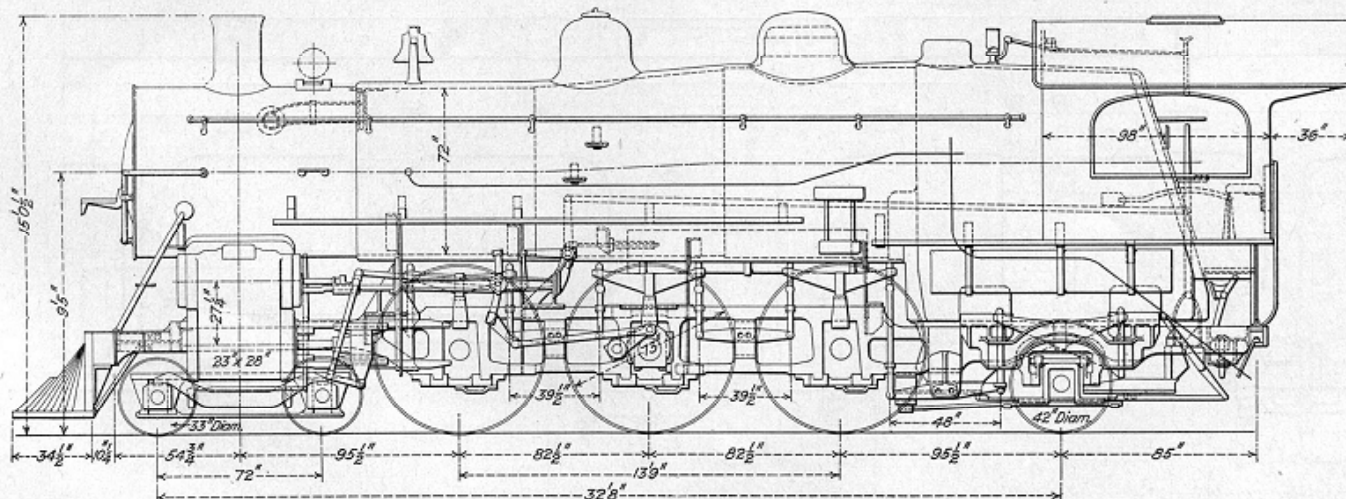


Pacific Locomotive; Chicago & Alton.

the head of "Consumption of Fuel by Locomotives," pages 112 and 113, the Commission for the first time gives instructions for equating the use of oil as fuel as follows: "If oil is used as fuel, its equivalent in tons of coal should be included in their total fuel consumed—tons—the reduction being made upon such a basis as the experience of the company making the report has shown to be proper; but a statement should be made under explanatory marks below showing this basis." One seeming omission from the blank for "Description of Equipment" is the superheater locomotive. Although 500 or

in diameter. Otherwise they were similar throughout, with cylinders 22 in. x 28 in. In the following year three additional Pacific locomotives were supplied to this road by the same builders. These engines, although built (with the exception of the tenders) to Associated Lines standards, were in many respects similar to those delivered in 1903. They had driving-wheels 77 in. in diameter, and the same size of cylinders as the previous locomotives.

The Baldwin Locomotive Works have recently completed five additional Pacific locomotives for the Chicago & Alton,

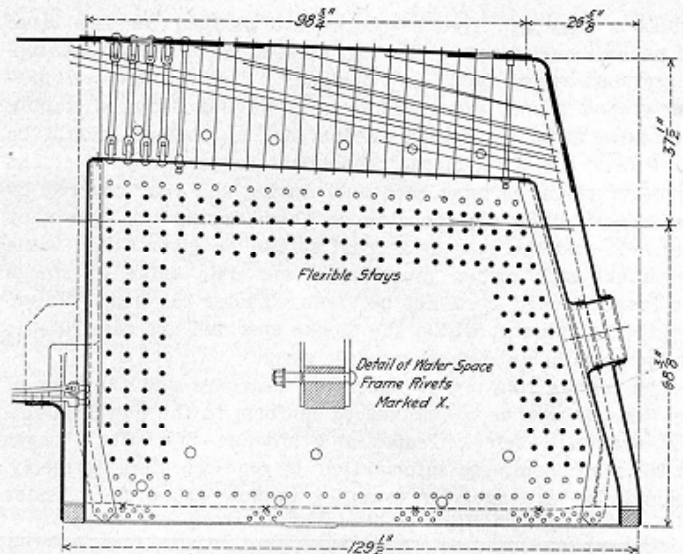


Pacific Locomotive; Chicago & Alton.

the design being illustrated by the accompanying reproduction of a photograph and drawings. The principal differences between these locomotives and those above mentioned, lie in the use, on the new engines of Walschaerts valve gears and wagon top boilers with narrow fireboxes. This form of firebox was applied to a number of Atlantic type locomotives built for the same road by the Baldwin Locomotive Works in 1906.

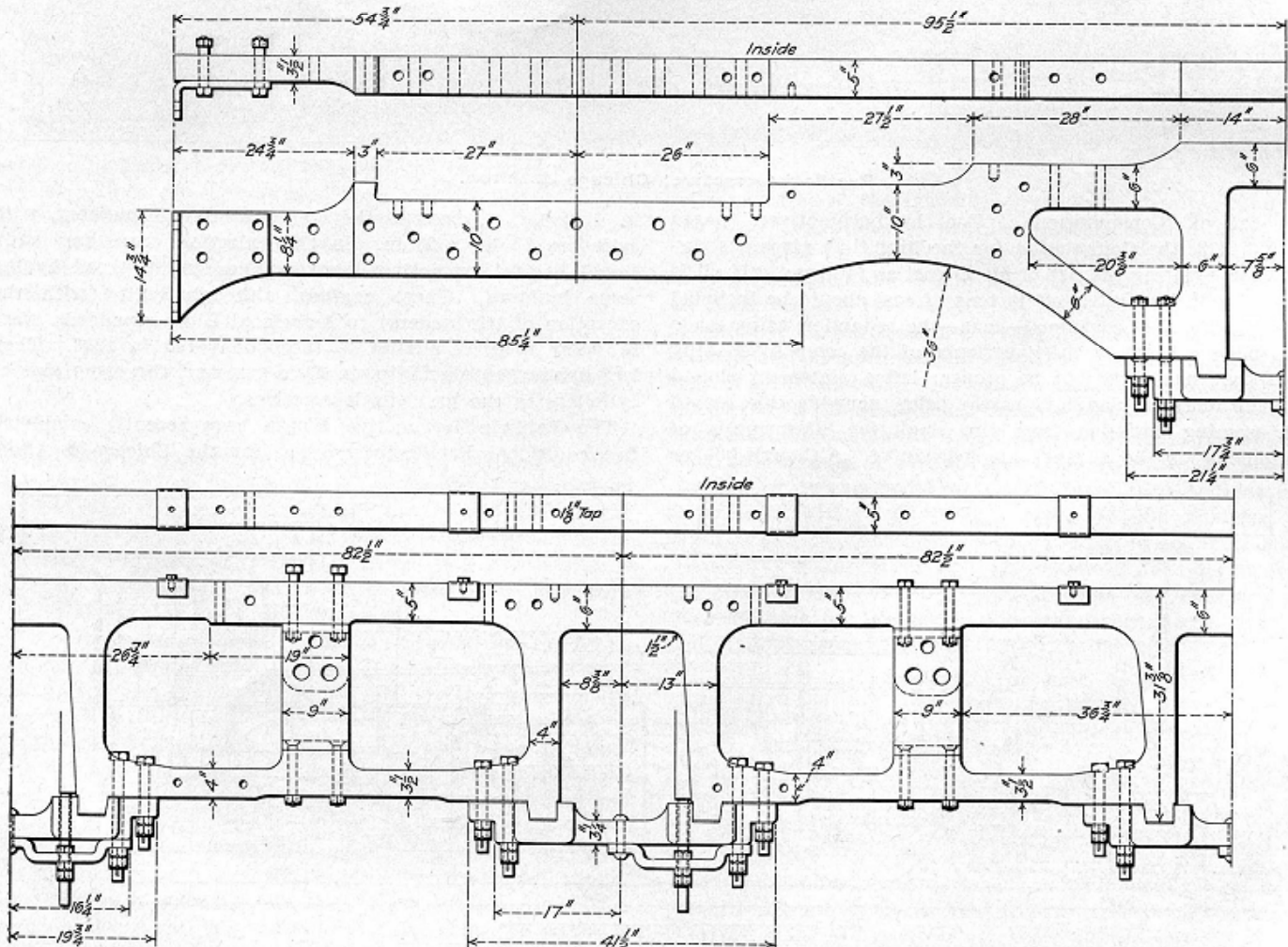
The new locomotives have cylinders 23 in. in diameter by 28 in. stroke. With 73 in. driving wheels and a steam pressure of 200 lbs. the tractive force exerted is thus 34,500 lbs. The cylinders are spaced 90 in. between centers, while the piston valves, 16 in. in diameter, are 98 in. between centers. The maximum width over the assembled cylinder castings is 10 ft. 2 in. The saddle is comparatively low, and the castings are securely fastened together by double rows of bolts in the vertical flanges and two heavy tie bolts $2\frac{1}{4}$ in. diameter, enlarged to $2\frac{1}{2}$ in. at the threaded ends. The piston valves have cast iron bodies and L shaped packing rings, and the drifting valves are of Pennsylvania Railroad style, with flat plates over the relief ports. Vacuum relief valves are placed in the live steam passages, and a safety valve, set for 225 lbs. pressure, is screwed into each cylinder head. The cylinder heads are of cast steel, and the steam chest heads of cast iron.

The frames, where they are secured to the cylinders, are in the form of single rails 5 in. wide by 10 in. deep, and each cylinder casting being secured to its corresponding frame by nine horizontal bolts, $1\frac{1}{2}$ in. in diameter, and four vertical studs, $1\frac{1}{4}$ in. in diameter. The cylinders are keyed at the front only. The frames are of forged iron, and are continuous from the front bumper to a point back of the rear driving pedestals, where they are spliced to the rear sections.



Longitudinal Section of Firebox.

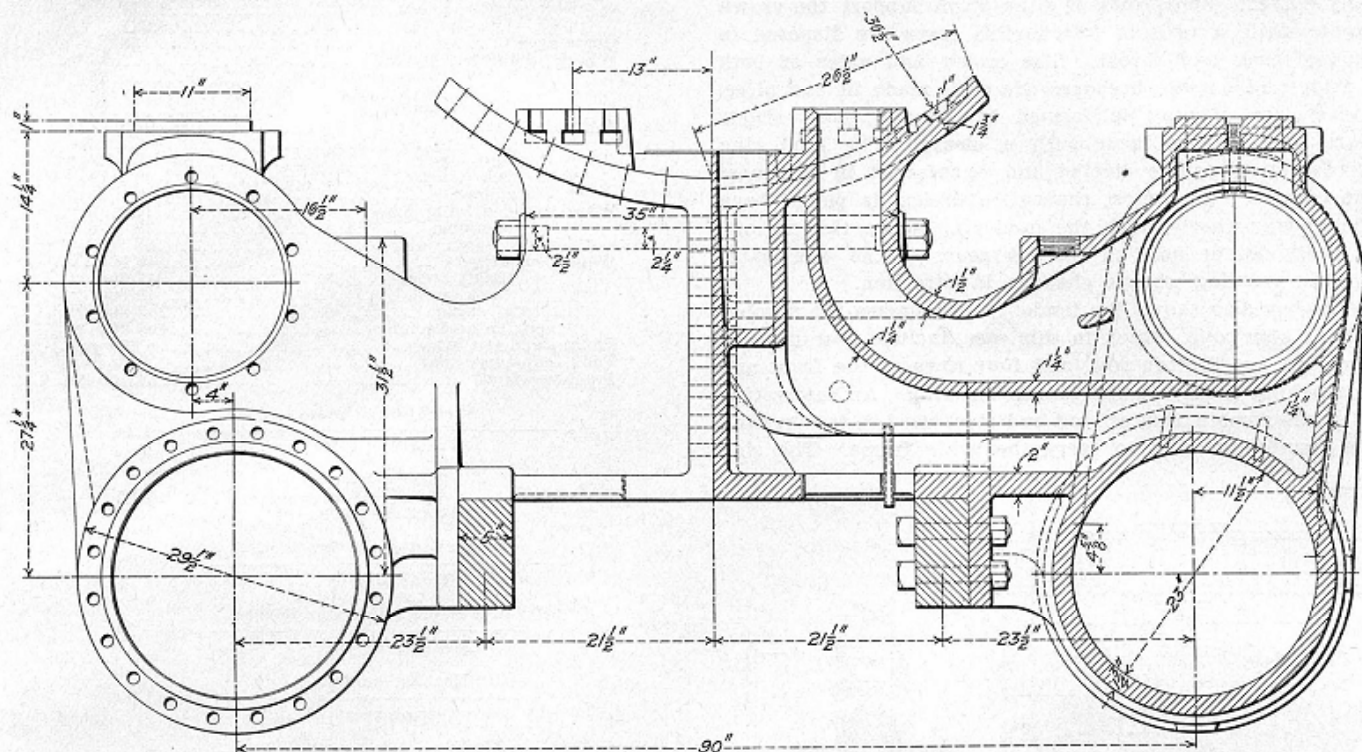
The main frames are 5 in. wide, while the rear sections are in the form of slabs, $2\frac{1}{2}$ in. wide. The splice between the main and rear frames is secured by 20 bolts, $1\frac{1}{8}$ in. in diameter, and by two keys which are driven, with their tapered faces in contact, into a single key way having parallel sides. The pedestal binders are of cast steel, and are lugged and bolted to the pedestals. Substantial transverse frame bracing is provided in these locomotives. In addition to a cast steel foot plate at each end, cross ties, of the same material, are placed back of the cylinders; between the first and second pairs of driving-wheels; above the main driving pedestals and in front of the firebox.



Frame Details of Pacific Locomotive; Chicago & Alton.

The valve gear details include built-up links, having side plates and end filling blocks of cast steel. Each link is supported by two longitudinal cast steel bearers. These are bolted in front to the guide yoke and at the back to a cross-tie, which also serves to support the reverse shaft bearings. The valve stems are driven through crossheads which are

The rear truck is equalized with the driving-wheels in the usual manner. All the driving springs are placed over the boxes, and are mounted on cast steel saddles. The engine and tender truck wheels have cast steel spoke centers, made by the Standard Steel Works Co. The driving-wheel centers and boxes are also of cast steel, and the driving tires are



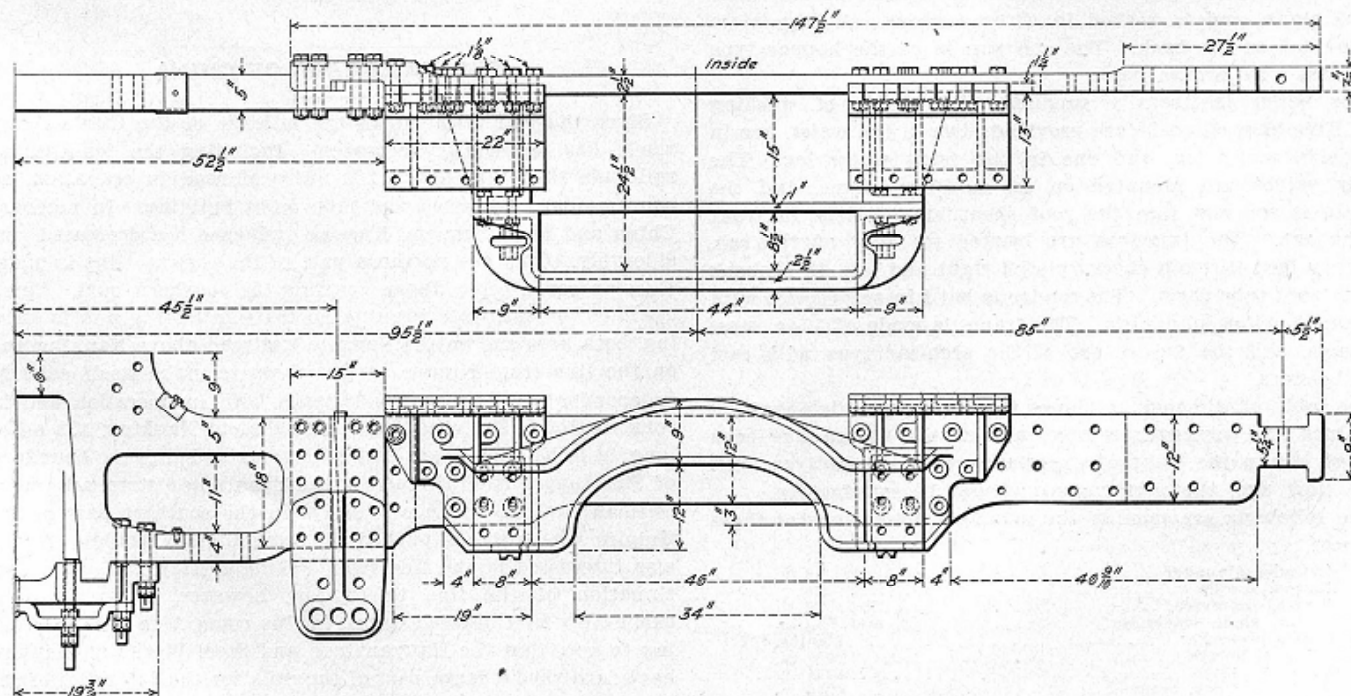
Elevation and Section of Cylinder Casting.

mounted on suitable guides, thus forming a strong and rigid connection for this important part of the gear. The valves are set with a maximum travel of 6 in. and a constant lead of $\frac{1}{4}$ in. The steam lap is 1 in., and the exhaust clearance 1-16 in.

The leading truck is of the usual swing bolster type with heart-shaped links, and the rear truck is of the Rushton radial type with outside journals. The rear truck supplemental frames are bolted to steel castings which also serve as furnace bearer supports. In this way, the firebox is carried, on each side, by two sliding bearings of ample length.

secured by retaining rings. Grease lubrication is provided on all driving axle and crank pin journals. The guides are of the two-bar type, of forged steel, and the crossheads are of cast steel.

As has been mentioned, the boiler is of the wagon-top type with a narrow firebox. Its center line is placed 9 ft. 5 in. above the rail, the diameter is 83 in. at the dome ring and 72 in. at the front end. The longitudinal seams in the barrel have diamond welt strips inside and are located on the top center line. On the dome ring the seam is welded

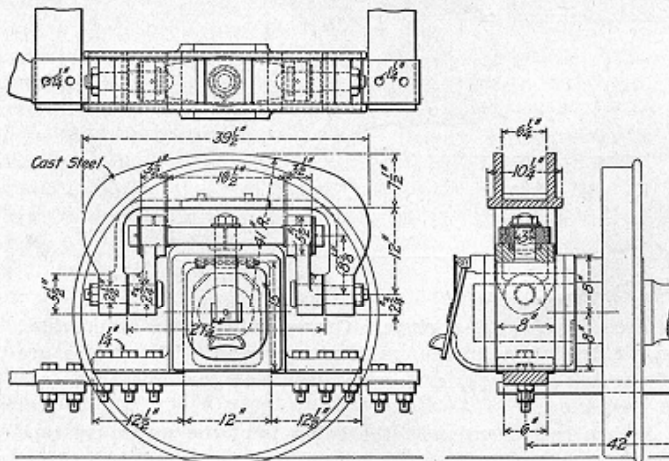


Rear Frame of Pacific Locomotive; Chicago & Alton.

throughout its length on either side of the dome opening. The front end is of the self-cleaning type, without spark hopper. It is equipped with a high single exhaust nozzle and double petticoat pipes. An adjustable plate is located in front of the nozzle, and ample netting area is provided.

The firebox has a sloping back head and roof sheet, and is radially stayed. Four rows of sling stays support the crown in front, while a total of 573 flexible stays are disposed in the sides, back and throat. The crown and sides of both the inside and outside fireboxes are each made in one piece. The fire door opening is formed by flanging both sheets outward and uniting them with a sleeve. The mud ring is of cast steel, double riveted and re-enforced in thickness at the corners. As almost the entire firebox is placed back of the driving-wheels, with the mud ring above the trailers, large radii can be used in the curvature of the side water legs, thus avoiding abrupt changes in direction.

The firebox also shows the tendency to increase the number of flexible stay bolts, which in this case, include four rows at the top, but not the top row, and four rows at the front and back, reaching nearly to the foundation ring. An interesting detail is the combination of stud and rivet used in the riveting of the foundation ring to carry the grate frame. The ring



Rushton Truck.

is double riveted in accordance with what was almost universal practice a few years ago but which has been partially discontinued of late. The entire grate is located in one horizontal plane, and is rocked in three sections. A drop plate is provided at the back. The ash pan is of the hopper type with cast iron bottom pans.

This boiler is liberally supplied with means of washing out. Five blow-off cocks are provided: two in the waist, one in each side water leg, and one in the front water leg. The safety valves are mounted on an auxiliary dome, and the whistle is screwed into the roof sheet immediately in front of the cab. The injectors are located in front of the cab, and they feed through checks placed right and left, 18 in. back of the front tube sheet. The tender is built in accordance with Chicago & Alton standards. The frame is made of 13-in. steel channels, and the trucks are of the arch-bar type with cast steel bolsters.

The table of dimensions shows that these are high-powered machines for passenger service, and as the design has been worked out in the light of experience with locomotives built some time ago, the performance should be satisfactory.

The following are some of the principal dimensions of these engines:

Cylinder diameter	23 in.
Piston, stroke	28 "
Boiler, diameter	72 "
Boiler, shell, thickness	11/16 in. and 13/16 in.
Steam pressure	200 lbs.
Firebox, length	120 1/2 in.
" width	40 1/4 "
" depth, front	82 1/2 "
" depth, back	78 1/2 "

Firebox, thickness, sides, back and crown	3/8 in.
" thickness tubesheet	1/2 in.
" water space, sides and back	4 in.
" water space, front	4 1/2 "
Tubes, material	Iron
" thickness	No. 12
" number	357
" diameter	2 in.
" length	20 ft.
Heating surface, firebox	206 sq. ft.
" tubes	3,721 "
" total	3,927 "
Grate area	33
Wheels, diameter, driving	73 in.
" front truck	33 "
" back truck	42 "
" tender	36 "
Journals, main driving	10 1/2 in. x 12 in.
" other driving	9 " x 12 "
" front truck	6 1/2 " x 12 1/4 "
" back truck	8 " x 14 "
" tender	5 1/2 " x 10 "
Wheel base, driving wheel	13 ft. 9 "
" engine	32 " 8 "
" engine and tender	65 " 8 1/2 "
Weight on drivers	146,500 lbs.
" front truck	47,600 "
" back truck	49,100 "
" total engine	243,200 "
" engine and tender	405,000 "
Tank, capacity, water	8,250 gals.
Tank, capacity, coal	12 1/2 tons
Tractive effort	34,500 lbs.

Weight on drivers	= 4.24
Tractive effort	
Total weight	= 7.05
Tractive effort	
Weight on drivers	= 60.23*
Total weight	
Tractive effort x diameter drivers	= 641.32
Heating surface	
Heating surface	= 11.96
Grate area	
Firebox heating surface	= 5.24*
Total heating surface	
Weight on drivers	= 37.21
Total heating surface	
Total weight	= 61.94
Total heating surface	
Displacement, 2 cylinders, cu. ft.	= 12.32
Total heating surface	= 253.73
Displacement, 2 cylinders	
Grate area	= 2.68
Displacement, 2 cylinders	

*Per cent.

[Correction in Subsequent Issue]

PACIFIC LOCOMOTIVE FOR THE CHICAGO & ALTON.

Attention has been called to an error in the ratios given for the dimensions of the Pacific locomotive of the Chicago & Alton Railroad, published on page 1044 of the issue of October 2. The displacement of the two cylinders should be 13.46, instead of 12.32 cu. ft., which makes:

Heating surface	= 291.75
Displacement, 2 cylinders	
Grate area	= 2.45
Displacement, 2 cylinders	