

when using superheated steam, as against 12 to 24 months with saturated. Valve packing rings last from 12 to 24 months with superheated steam. In both cases, cast iron is the packing ring material.

The information received on lubrication agreed so closely that the following conclusions become certain:

1. The conditions of lubrication are practically unchanged by the degree of superheat commonly obtained from smoke box superheaters.
2. The flash point of oil should be higher than the temperature to which it will be subjected at the point where lubrication is to be effected.
3. The hydrostatic lubrication meets the requirements of proper oil delivery.
4. The life of common gray iron packing rings is too short to commend this material for use with high-degree superheat.

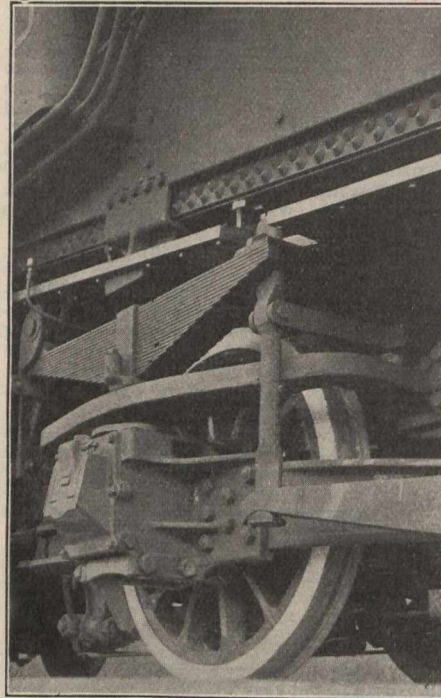
Pacific Type Locomotives for the Grand Trunk Pacific Railway.

The G.T.P.R. has received recently 15 Pacific type locomotives built by the Montreal Locomotive Works, one of which is illustrated herewith. The design embodies a number of features which, while they have been successfully applied to a number of locomotives built within the past two years for railways in the United States, have not heretofore been extensively used on Canadian locomotives. It therefore possesses more than the usual interest.

Among these new features will be noticed the self-centering guide for the valve stem and the outside bearing radial truck. The valve stem guide, which is very clearly shown in the illustration of the general view of the locomotive, is made integral with the back head of the piston valve chamber, and so constructed as to be easily adjusted for wear. It can, therefore, be erected, taken down and replaced without any lining up, at the same time ensuring that the guide is absolutely in line with the piston valve chamber. This saves considerable time which is consumed with the valve stem guide of the ordinary construction employed with the Walschaert valve gear when it becomes necessary to take down the valve motion. In case of wear,

ing radial truck, a detailed illustration of which is given, obviates the use of outside supplementary frames secured to the rear portion of the main frames by heavy cast steel filling pieces, which some of the other designs of this style of truck require. In this way it effects a considerable saving in weight—in the ordinary design from 2,500 to 3,000 lbs.

The floating spring yoke hinged to the



Radial Trailing Truck, G.T.P.R. Pacific Type Locomotive.

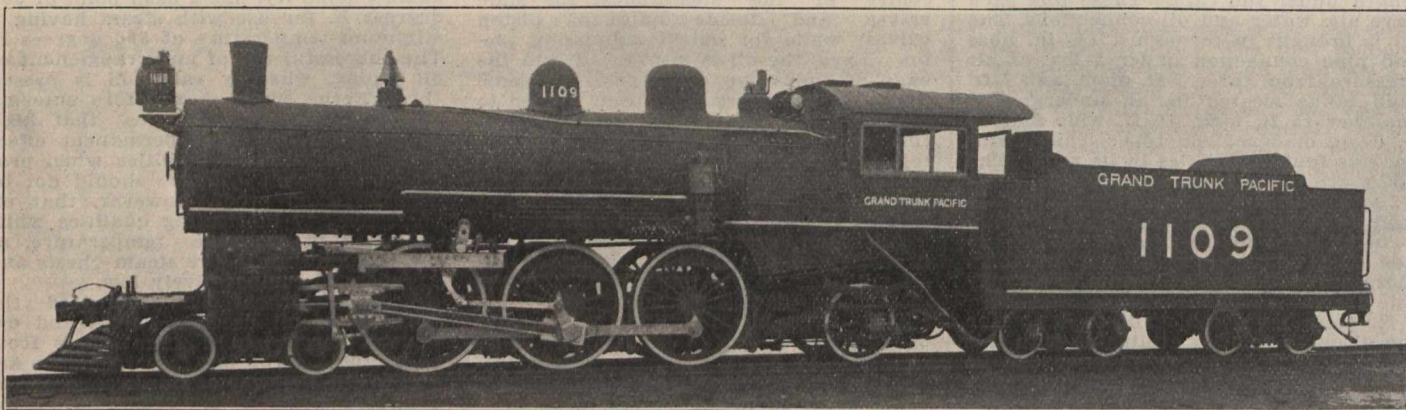
main frame, combined with the drop forged sphere which furnishes support for the spring seat, provides for a universal adjustment of the springs to the rise and fall of the engine. Double inclined friction plates between the spring seat and the top of the journal box provide a resistance to transverse motion and assists the action of the spring centering device to restore the truck to its normal central position on entering a

carried on the driving wheels, and the remainder on the front and trailing trucks. With cylinders 22 ins. in diameter by 28 in. stroke, 73 in. drivers and a boiler pressure of 200 lbs., the maximum theoretical tractive power is 31,600 lbs. Other general dimensions, etc., are given in the following table:—

Gauge	4 ft. 8½ ins.
Weight on drivers	143,500 lbs.
Weight on truck	43,000 lbs.
Weight on trailers	33,400 lbs.
Weight, total of engine	219,900 lbs.
Weight of tender	143,000 lbs.
Wheel base, driving	13 ft. 4 ins.
Wheel base, total of engine	33 ft. 3½ ins.
Wheel base, total of engine and tender	62 ft. 3½ ins.
Cylinders, diameter and stroke	22 by 28 ins.
Type of gear	Walschaert
Diameter of piston valve	14 ins.
Maximum valve travel	6 ins.
Outside lap	1-1-16 ins.
Inside clearance	3-16 ins.
Lead in full gear	1-16 in. forward, 7-16 in. back
Driving wheels, diameter outside	73 ins.
Trailing wheels, diameter outside	49 ins.
Driving journals, diameter and length	9½ x 12 ins.
Trailing journals, diameter and length	8 x 14 ins.
Engine truck wheels, diameter	31 ins.
Engine truck journals	6½ x 10½ ins.
Boiler type	Straight top, radial stay
Boiler, outside diameter at first ring	70½ ins.
Boiler, outside diameter largest course	73 ins.
Working pressure	200 lbs.
Firebox, length	96¾ ins.
Firebox, width	75¼ ins.
Firebox, water space, front	5½ ins.
Firebox, water space, back and sides	4½ ins.
Tubes, material	Kerva seamless steel
Tubes, no. of	303
Tubes, spacing	2¾ ins.
Tubes, diameter	2 ins.
Tubes, length	20 ft. 6 ins.
Heating surface, tubes	3,239 sq. ft.
Heating surface, firebox	169 sq. ft.
Heating surface, total	3,408 sq. ft.
Grate surface	50.59 sq. ft.
Tender, water capacity	8,000 gals.
Tender, coal capacity	10 tons
Tank, kind	Waterbottom
Length over all, engine and tender	72 ft. 9 ins.
Extreme width	10 ft. 6½ ins.
Extreme height	15 ft. 2¾ ins.
Brakes	Westinghouse-American on drivers, engine truck trailers and for train
Frames	Cast steel single, front rails integral with main frame
Fire door	Franklin pneumatic

These locomotives have been placed in passenger service between Winnipeg and Edmonton, and we are advised that they are giving every satisfaction.

The Eastern Terminal Realty Co. has been incorporated under the New Brunswick Companies Act to promote immigration and settlement in the province.



Grand Trunk Pacific Railway Pacific Type Locomotive.

liners are provided on the top and bottom of the guide which can be removed or inserted as may be required. It is self-supporting so that no bracing from the guides or any other source than the cylinder is required, which is another advantage. It also permits the use of a straight design of combination lever, without forks, which is connected to the valve stem cross head by a pin passing through the wings of the latter and thus affords greater lateral stability than is obtained in other designs.

The improved design of outside bear-

tangent after passing through a curve. This gives the track excellent riding qualities, as experience has proven. With the construction used for supporting the spring seats, not only is flexibility provided, but all the spring seats are in compression. Thus, any wear and loss motion which may accumulate is automatically taken up.

In point of weight, the locomotive here illustrated is among the heaviest of its type in service in Canada. In working order it has a total weight of 219,900 lbs., of which 143,500 lbs. are

to deal in lands, to promote the establishment of industries, and in connection therewith to build or promote the building of docks, wharves, railways and tunnels, and to own and operate steam and other vessels. The capital is fixed at \$150,000; the company's offices are in St. John, and the provisional directors are:—A. E. Massie, H. F. Puddington, D. F. Pidgeon, W. H. Harrison, St. John; T. Bell, Rothesay, N.B.

The G.T.R. is opening an uptown ticket office in Stratford, Ont., with Deacon and Trow as agents.