

The Railway and Marine World

July, 1912.

The June Railway Mechanical Conventions at Atlantic City.

The two great railway conventions of the year, the Master Car Builders' Association and the American Railway Master Mechanics' Association, were held at Atlantic City, N.J., the former on June 12 to 14, and the latter on June 17 to 19. The most important features of these annual conventions are the reports of the standing and special committees, the principal ones of which are given on this and following pages, either in full or in abstract:—

The Maintenance of Superheater Locomotives.

The Master Mechanics' Committee, R. D. Smith, Superintendent of Motive Power and Rolling Stock, Boston and Albany Rd., chairman, and of which H. H. Vaughan, Assistant to the Vice President, C.P.R., is a member, reported as follows:—

Your committee was instructed to consider and report on: The best metal for cylinder and steam chest bushings; the best metal for valve and piston rings; the best means of lubricating superheater locomotives.

In order to obtain as much data as possible upon which to base its report, the committee issued a circular of inquiry to the members; the different questions and an outline of replies received being as follows:

The total number of superheater locomotives in service on the railways answering our circular is 2,222, of which 1,748 are of the fire-tube type and 474 of the smoke-box type. So far as the committee is able to ascertain, there are about 2,500 superheater locomotives of the fire-tube type now operating in the United States and Canada, so that the replies represent 70% of the total number of locomotives now in service, using highly superheated steam. This is an exceptionally large percentage and indicates the great interest taken in the use of superheated steam on American railways. In addition to the 36 railways mentioned, replies were received from a number of roads stating their experience had been so limited they did not feel justified in answering the circular.

The following types of superheaters are in use on the railways replying to the circular: Schmidt, Cole, Emerson, Vaughan-Horsey, Baldwin, Jacobs and Vauclain. Of these types, the first four are fire-tube superheaters and the other three smoke-box superheaters.

The results are not based on any particular type of locomotive, as many different classes or types were reported as having superheaters, among which are Pacifics, Consolidations, Mallets, Prairie, Mikado, Mountain and 10-wheelers.

Superheater locomotives have been operating on American railways for 11 years, but most of the 36 roads referred to have been operating them for at least one year.

As might be expected, the steam pressures and degrees of superheat vary considerably on the various types of locomotives on different roads, the maximum steam pressure being 220 lbs. per sq. in., and the minimum 150 lbs. per sq. in. The degrees of superheat, that is, the excess in temperature of

superheated steam over the temperature of saturated steam at same pressure, varies from 100° to 250° F. for fire-tube superheaters and from 10° to 65° F. for smoke-box superheaters. The temperature of superheated steam as used in locomotives rarely exceeds 600° F.

Twelve roads reported that cylinder and steam-chest bushings on superheater locomotives wear out more rapidly than on locomotives of the same classes using saturated steam, and 20 roads replied that there is no perceptible difference in the wear of cylinder and steam-chest bushings between locomotives using superheated steam, as now operated, and those using saturated steam. All roads reporting more rapid wear on superheated steam than on saturated steam locomotives have superheaters of the fire-tube type, giving a high degree of superheat, but all roads having superheaters of this type do not report more rapid wear of bushings.

Fourteen railways report that valve-packing rings of superheater locomotives wear out more rapidly than those of saturated steam locomotives of the same classes, and 17 roads state there is no appreciable difference between the wear of the rings on superheater locomotives as now operated and those of saturated steam locomotives.

Sixteen roads report they have found Hunt-Spiller gun iron the best metal for cylinder and steam-chest bushings, and one other road intends to use this iron for cylinder and steam-chest bushings of new locomotives. Nine roads state they are using grey iron for bushings, three roads use the same metal for the bushings of superheater locomotives as is used for saturated-steam locomotives, and one road is undecided as to the best metal.

All the roads favoring the use of Hunt-Spiller gun iron for bushings also favor its use for piston and valve packing rings, and two other roads report using this material for rings but do not use it for bushings.

The ordinary "L" type of spring packing ring is used for valve packing on practically all the railways, and most of them use the ordinary rectangular section rings for piston packing.

Have you used and do you favor the use of packing rings having equalizing holes drilled radially through packing rings to eliminate pressure caused by steam leaking under them? The object of this question was to learn whether any American railroads had adopted packing rings having equalizing holes drilled radially through the ring. Of 36 roads replying, there are but four which have used this type of packing ring and the replies indicate there is no particular benefit to be derived from such a design.

The use of piston rod or valve stem extensions is so closely allied to the consideration of the wear of cylinder and steam-chest bushings, we thought it advisable to include this question in our circular. Replies also placed us in position to better understand conditions under which superheater locomotives are operating. Eighteen roads use piston-rod extensions and 12 use valve-stem extensions, but three of the 18 roads

using piston-rod extensions are eliminating them.

Eight roads favor the use of piston-rod extensions, nine favor the use of valve-stem extensions, and six advocate the use of piston-rod extensions on superheater locomotives having large and heavy pistons. Eleven roads are opposed to the use of either piston-rod or valve-stem extensions and two are undecided as to their desirability.

Twenty-three roads report there is no unusual difficulty in properly lubricating the cylinders and steam chests of superheater locomotives as they are now operating. Five roads report it is difficult to properly lubricate superheater locomotives, and three state that trouble was experienced at first, but the use of a different grade of oil has overcome the trouble. One road using balance slide valve states it is difficult to properly lubricate the valve, but no difficulty is encountered in lubricating the cylinders. Reports indicate it is no more difficult to lubricate locomotives with smoke-box superheaters than to lubricate the ordinary saturated steam locomotive.

Twenty-nine roads report using hydrostatic feed lubricators with entirely satisfactory results. There is but one road using mechanical feed lubricator exclusively. Of the roads now using hydrostatic lubricators, four had formerly tried mechanical feed lubricators. The advantages of the hydrostatic lubricator are its reliability, simplicity of construction and ease of regulation as compared with the considerable number of moving parts of mechanical feed lubricators and the tendency of the latter to wear and get out of order.

Atomizers are used on three roads to deliver oil to steam chest of superheater locomotives and results are reported as satisfactory, but we are of the opinion that without atomizers, when the oil is discharged into the steam passageway above the entrance to the steam chest it is partially atomized, which would seem to be desirable. Replies indicate no advantage is derived from the use of an atomizer.

There are a number of different arrangements of oil pipes on superheater locomotives which may be divided as follows: The most common arrangement is that in which the oil is delivered at the centre of steam chest and at the centre of cylinder. Another arrangement is that in which the oil is discharged into the steam passageway above the entrance to the steam chest, with an independent connection to the centre of the cylinder. Some roads use oil connections to both ends of the steam chest, with an independent connection to the centre of the cylinder. A common arrangement, and one that is growing in favor, has a connection which discharges oil into the steam passageway only. It is claimed that the oil is thoroughly mingled with and distributed by the steam. A few roads report having oil connections to the centre of the steam chests only.

Twenty roads consider it necessary to lubricate the cylinders of superheater locomotives independent of the steam chest, eight roads that it is unnecessary and two are undecided.

From replies received and from the experience of members of your committee, there seems to be no doubt that an oil connection into steam passageway only, near entrance to steam chest, is the best arrangement for obtaining satisfactory lubrication. It reduces the number of feeds to a minimum and furnishes sufficient oil to valves and cylinders.

The allowance of valve oil per 100 miles for superheater locomotives varies according to type and service. The maximum allowance reported for Pacific type locomotives with fire-tube superheaters is 3.25 pints per 100 miles and the minimum 1.25 pints, the average allowance being 2.25 pints. For consolidation locomotives with fire-tube superheaters, the allowance of oil varies from 2.50 pints to 1.25 pints, the average being 1.75 pints per 100 miles. The average allowance of oil for Mikado locomotives with fire-tube superheaters is 4 pints and the allowance for Mallets is about 6 pints per 100 miles.

Answers indicate that the allowance of valve oil for superheated steam locomotives varies in about the same proportion as for saturated steam locomotives, according to type and service. It is customary to allow about 45% more oil for the fire-tube superheaters than for saturated steam locomotives, while locomotives with smoke-box superheaters usually have the same allowance of oil as saturated steam locomotives.

Twelve roads report using special superheater oil exclusively on superheater locomotives and 13 roads report using the ordinary grade of valve oil, but all the roads using superheater oil report it is more satisfactory, and tests which have been made of the two kinds of oil, on superheater locomotives, bear out this statement.

None of the roads report the admission of steam automatically to the cylinders when drifting, but 12 roads report good results from keeping the throttle slightly open when engine is drifting, and this practice seems to meet with most general approval.

Answers show that the use of vacuum valves on superheater locomotives is quite general on American railways, as 23 roads report their use gives satisfactory results and five report using by-pass valves.

There are a number of different makes of metallic piston-rod packing in use on superheater locomotives, all reported as giving satisfactory service. In general, the same types are used as on saturated steam locomotives, the principal difference, if any, being in the composition of the rings. The chemical composition of the rings is in most cases unknown to the railways, the rings being purchased in finished state from the manufacturers. Where reports are given, a mixture of 80% lead on 20% antimony has been used with several makes of packing. Some roads have tried a mixture containing a small percentage of tin, but this has been found unsatisfactory. A widely different mixture containing approximately one-half copper and one-half lead has given exceedingly good results, but is expensive. In general, the preferable composition for packing rings is still largely a matter of experiment.

The committee received a great many suggestions and much information that is embodied in the report. The replies were so general as to indicate that this is a very live subject, and the committee feels that a report based on replies from such a large number of railways may be considered as representing conditions prevailing on practically all the railways in the country.

SUMMARY.—An analysis of the replies indicates that the results obtained from superheater locomotives have been very satisfactory. It is interesting to note that five years ago there were less than

a dozen superheater locomotives operating in the United States, whereas at the present time there are about 2,500 in the U.S. and Canada having fire-tube superheaters.

Minor difficulties have been experienced on a number of railways, but the great advantages to be derived from the use of superheated steam, such as increased economy of coal and water, increased power, due to the absence of cylinder condensation, the permissible reduction of steam pressure combined with the use of larger cylinders—all obtained without material increase in the size or weight of boiler—leads us to believe that the use of superheated steam in locomotives will increase rapidly. This being so, it is of great importance to determine the metal best suited for use for bushings and packing rings on modern superheater locomotives, because the use of highly superheated steam increases the difficulty of obtaining proper lubrication, and thus the metal is subjected to more severe working conditions than are usually found with saturated steam locomotives. It is also important that we know the best means of securing proper lubrication because the efficiency of lubrication has a direct bearing on the life of bushings and packing rings. A metal suitable for use as cylinder and steam-chest bushings of superheater locomotives should be homogeneous, close grained, tough and of good wearing quality, combined with sufficient strength. It should be tough in order to resist wear, but at the same time it must be of such composition that it can be readily machined.

Replies to the circular indicate that Hunt-Spiller gun iron has been used on many railways with excellent results. This is stated to be an air-furnace charcoal iron, and the process of manufacture, combined with proper chemical composition, seems to result in a metal which is well adapted for use with highly superheated steam. The analysis of this iron, obtained by your committee, is as follows:

Silicon	1.40 per cent.
Phosphorus	0.35 "
Sulphur	0.07 "
Manganese	0.49 "
Combined carbon	0.80 "
Graphite carbon	2.20 "

Replies indicate that this same iron has been used extensively for piston and valve packing rings on superheater locomotives with very satisfactory results and that an iron of this character is the best metal so far produced for piston and valve packing rings of superheater locomotives.

The importance of properly lubricating cylinders and steam chests of superheater locomotives, especially those using a high degree of superheat, can hardly be overestimated, because if proper lubrication is not obtained, many of the advantages derived from the use of superheated steam are offset by continual troubles from excessive cutting of bushings and packing rings, which keep the engine in the engine house when its proper place is on the road.

There seems to be a tendency to use too much oil in superheater locomotives, with the result that there is trouble from the oil carbonizing on the cylinder heads, pistons and steam passages. The deposit of carbon also tends to diminish the life of the metallic piston-rod packing, as it builds up in the stuffing boxes and under the vibrating cups to such an extent that the packing in a short time is forced to carry a part of the weight of the piston rod and piston head.

On certain classes of locomotives, possibly those having pistons exceeding 24-in. diameter, it is considered by some advisable to lubricate the cylinder independent of the steam chest, but in most cases we believe better results will be obtained by eliminating the connec-

tion to the cylinders and delivering the oil to the steam passageway.

We do not approve of the arrangement of oil pipes in which the oil is delivered near the end of the steam chest, as in this case it is probable that part of the oil is lost in the exhaust, due to the difference in pressure between the live and exhaust steam. A number of roads report that when superheater locomotives were received from the builders oil was delivered to both ends of the steam chest and to the centre of the top of the cylinder; but this arrangement has since been changed so that the oil is now delivered into the steam passageway above the entrance to the steam chest, and the feed to the cylinder has been discontinued. The allowance of oil has also been reduced and it has been found that the locomotives are much better lubricated than formerly and there is a marked diminution in the quantity of oil adhering to the cylinder heads, piston heads and steam passages.

There can be no doubt of the advisability of using a good grade of mineral oil having a high flash point, for locomotives using highly superheated steam, because the temperature of the superheated steam is sometimes as high as 600° F. A number of the roads state they have used valve oil having a flash point of about 520° and also special superheater oil having a flash point of at least 585°, and in every case better results have been obtained from the oil having the higher flash point.

Tests have shown that a moderately high temperature has very little effect on the lubricating properties of a good grade of valve oil when the oil is protected by steam, but when the engine is drifting there is, in most cases, no steam in the cylinders, and the bushings are apt to become hot. There does, however, appear to be a difference in the results obtained on superheater and saturated-steam locomotives. When drifting the conditions are the same on both, but on saturated-steam locomotives the oil deposit on the cylinders is fluid and the condition of the oil does not appear to have changed; while on superheater locomotives the deposit is gummy and sticky to the touch. This difference may possibly account to a large degree for the rapid wear of piston rings and bushings occasionally experienced on superheater locomotives.

When an engine is drifting a good deal with a closed throttle, there is a considerable vacuum in the cylinders and steam chests, and cinders may be drawn through the exhaust and dirt through the relief valves. This dirt may adhere to the gummy oil on the cylinder walls and convert them into a lap which will wear away the packing rings and piston heads very rapidly. This theory explains the good results obtained on locomotives where the drifting throttle has been carefully used and is supported by analyses of the deposit found on the cylinders, which show the presence of cinders and dirt in considerable quantities. The remedy is obviously to obtain a quality of oil that does not make a deposit of this nature at the temperature to which it is exposed, and to provide means either by ample vacuum or by-pass valves, or by the admission of steam to prevent overheating when drifting.

Many roads use a tandem type of metallic packing on account of the importance of preventing the blowing out of the lubricating oil, which might result in the cutting of the cylinder bushings. During the past year or two, several alloys have been tried that have given satisfactory results, and while the preferable mixture will vary with the type of packing employed, this question is not now a serious one. It is important to use a type of piston-rod packing which will stand up under the high temperature met with in the use of super-

neated steam, and considerable trouble has been experienced with packing that had proven satisfactory with saturated steam when this point had not been attended to. The melting point of the packing rings should be higher than the melting point of rings usually found on saturated-steam locomotives.

In conclusion, your committee feels that, in order to insure satisfactory results in the operation of superheater locomotives, it is of the utmost importance not only to use the best metals for parts subjected to the action of superheated steam, but it is also important to take all reasonable precautions to obtain proper lubrication.

When superheater locomotives were first placed in operation it was to be expected that certain difficulties would be experienced, but these difficulties have been overcome one by one and we believe that at the present time, with reasonable care in operation and with proper attention on the part of engine-house forces, superheater locomotives will be no more difficult to maintain than saturated-steam locomotives of the same classes.

Report of Committee on Rules for Loading Materials.

The Master Car Builders' Committee, A. Kearney, Assistant Superintendent of Motive Power, Norfolk and Western Ry., Roanoke, Va., chairman, reported as follows:—

Your committee wishes to report the following recommendations for changes in the present code of rules for loading materials. The modifications, in the main, have reference to reductions in amount of material required to build up loads, having due regard for the safety of cars as well as lading in transit. We have during the past year collected a good deal of information from railways and shippers in connection with the several suggestions we are recommending, some of this information coming to us quite recently.

First, we would direct attention to rule 6, and with particular reference to its apparent conflict with American Railway Association rule 15, some allusion to which was made in our report of 1910. Your committee has had a great deal of correspondence during the past year concerning this particular subject, no doubt mainly brought about by the insertion of the second paragraph of rule 6, which was effected in 1911 on the strength of an interpretation given us by the American Railway Association.

In our 1910 report we stated that the question concerning the apparent conflict between M.C.B. rule for loading materials and American Railway Association rule 15 was first brought up by Mr. Delano, then president of the American Railway Association, who suggested some modification in the rule to make it harmonize with rule 15 of the American Railway Association. Mr. Delano suggested that rule 6 of the rules for loading materials be modified to conform to the principle of run, repair or transfer, in order to increase the movement of cars in interchange. The specific point in rule 6 was its apparent conflict with American Railway Association rule 15, paragraph D, showing the conditions for which the receiving road should pay cost of transfer, the paragraph reading as follows—"The receiving road shall pay cost of transfer or rearrangement: (d) When cars exceed load limit or cannot pass clearances or be moved through on account of any other disability of receiving line."

After the presentation of the 1911 report your committee recommended to the arbitration committee the acceptance of the last suggestion offered by the American Railway Association, which was to add the following paragraph to rule 6:—"Should it become necessary to

transfer or rearrange the lading in transit on account of excess width or height of lading, see American Railway Association Car Service rule 15, paragraph D."

This was done under the impression that the supplement would remove the apparent conflict, still leaving rule 6 in such shape as to allow the shippers to build up loads within reasonable limits, without infringing upon the principle involved in American Railway Association rule 15.

The application of the second paragraph or added portion of rule 6 soon demonstrated the wisdom of the rule as it originally stood prior to the change last year, which required that the load be built up with reference to the clearances of the roads over which the lading is routed. In the light of this development the General Managers' Association of New York, at their meeting held there, 1911, concluded to suggest to the American Railway Association certain modifications to American Railway Association rule 15, having further in mind that in the event of the American Railway Association adopting such changes the Master Car Builders should be requested to modify rule 6 for loading materials, erasing therefrom that portion of the rule which was added in 1911, which would leave the rule practically in its original shape. Your committee has no further reference to make relative to rule 6 until the matter is disposed of by the American Railway Association.

RULE 10.—Wooden cars of light capacity when used as idlers between cars of heavier capacity are liable to break down when placed in a train composed of heavier capacity cars, in case of sudden stops or emergency application of the brakes; a paragraph, therefore, should be added to rule 10 reading as follows:—"If the idler is a flat car of wooden construction, its capacity must be not less than that of the carrying cars."

RULE 11.—Change "for" to "from" following "inches" in the middle line of the last paragraph of this rule, which would make the last paragraph read as follows:—"For loads of greater height than 12 ft., subtract 2 ins. from given width (w) of load for every inch of width in excess of 12 ft."

RULE 23.—The first sentence of this rule should be changed to read as follows, so as to also cover the placing of sliding as well as bearing pieces:—"Bearing and sliding pieces must never be placed between bolster and end of car, unless special provision is made therefor in detail instructions."

RULE 43.—This should be changed to read as follows:—"The lading overhanging the idler, figs. 6 and 7, must be governed by restrictions contained in general rule 11, so that overhang will not exceed clearances in curving."

RULE 45.—The last portion of this rule should be changed to read as follows:—"Where the pile of lumber on the idler exceeds 20 ft. in length, four stakes on each side must be used, three on each side being sufficient for shorter piles to conform to rule 34." This would make the new rule read as follows:—"The five stakes on each side of the carrying car should be placed as near the bolsters as possible, and no stakes whatever should be used on the idler to confine the overhanging part. The only stakes permitted on the idler will be such as may be required for the short lumber loaded on the idler. Where the pile of lumber on the idler exceeds 20 ft. in length, four stakes on each side must be used, three on each side being sufficient for shorter piles to conform to rule 34. All stakes should be fastened as shown in figs. 6 and 7, and as provided for in rules 12, 13, 34, 35 and 36."

RULE 55.—We find that some of the Canadian roads have flat cars equipped with permanent chains and short stakes,

which are used for the handling of logs, and having ascertained that logs loaded on these cars with this method of binding the lading are safe, we would recommend the addition of the following note immediately after rule 55 so as to allow the use of this equipment for handling the material in question. It would be proper to mention that this subject came up last year, too late to be presented in our report. The subject was put before the executive committee, but was laid on the table. "Logs loaded in accordance with fig. 14, secured by means of permanent short stakes and chains in lieu of the specified staking and wiring will be acceptable."

RULES 56 AND 57.—These two rules should refer to flat as well as low-sided gondola cars, and, therefore, should be changed to read as follows:—

"RULE 56.—When material of this kind is loaded on flat or gondola cars with sides less than 30 ins. high, and lading does not exceed 4 ft. in height measured from floor, and the lading is not loaded in pyramidal form, the stakes must be as high as the lading and must be tied together at the top with not less than eight strands equal to four wrappings of good ½ in. diameter wire, and must be tight. Stakes must be sound hardwood, free from knots and of the dimensions specified in general rule 12."

"RULE 57.—If the material is loaded on flat cars or gondola cars with sides less than 30 ins. high, to a height more than 4 ft. measured from floor, opposite stakes must be bound together with wire at about one-third of the height above car floor after one-third of the load has been placed on the car, and in such a manner that when the remaining load is placed on the car the wire will have a tendency to draw the tops of the stakes toward each other. The middle as well as the top wrappings of wire must consist of not less than 10 strands equal to five wrappings of good ½-in. diameter wire and must be tight. Bearing pieces may be placed between the lower and upper sections of load to facilitate application of wire after all the lading has been placed on the car. See

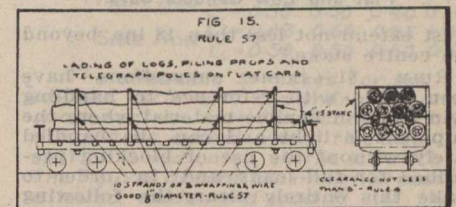


Fig. 15.—Loading of Logs, Piling, Props and Telegraph Poles on Flat Cars.

fig. 15. Stakes must be sound hardwood free from knots and of the dimensions specified in general rule 12. Stakes must incline toward centre of car a total of about 12 ins. before load is placed on car, and in no case will they be allowed to incline away from centre of car after the car is loaded. The inspector must assure himself that all wiring is tight before load is moved."

RULE 58.—Insert the figures "4½" just preceding the word "live" toward end of fourth line, which will then show size of saplings, making the first sentence read as follows:—"When lading is placed inside of a single gondola car with sides 30 ins. high or over and load projects above car sides, not less than three pairs 4 by 4 hardwood stakes or three pairs of 4½-in. live saplings should be well secured to either side of lading on inside of car for piling or props 20 ft. or less in length."

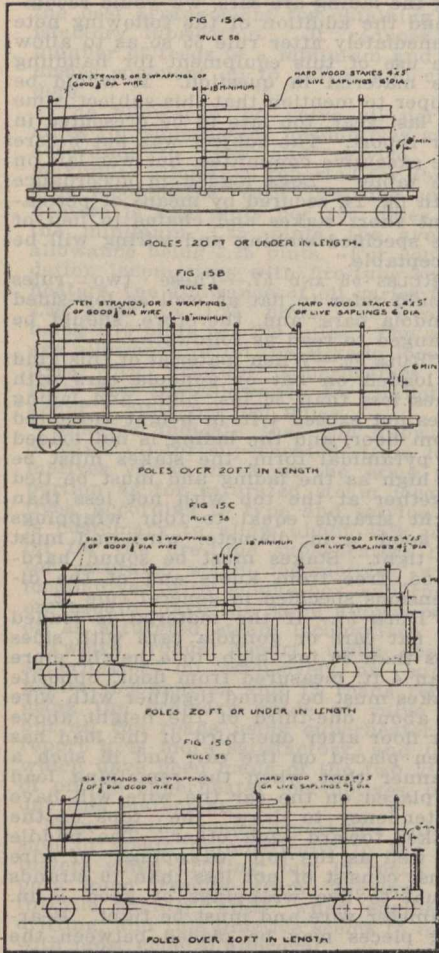
Also add the following paragraph to this rule:—"When lading is in two piles not over 20 ft. in length and ends of piles are interlaced at centre of car as per figs. 15-A and 15-C, there must be not less than five pairs of stakes for total length of load. If the length exceeds 20 ft. as per figs. 15-B and 15-D, there must

be not less than six pairs of stakes for total length of load. The ends of poles

000 to 30,000 lbs. each in weight, shall be so arranged that two or more can be loaded side by side on pivoted bolsters:—"Two or more girders may be loaded vertically, side by side, provided they are bolted together near pivoted bolsters, with proper spacing pieces between them, in such a manner that they act as one girder."

FIG. 56.—It is claimed that the method of loading pipe 24 ins. or more in diameter on a flat car in accordance with

"Steel tanks, lined or unlined, in sections weighing not over 2,500 lbs. per section, 8 ft. or less in diameter, when loaded on single flat or gondola cars, must be substantially chocked on each side with blocks not less than 6 inches in height and of sufficient length and width so that they may be securely spiked to the floor of the car. End blocking to be not less than 4 ins. in height and of sufficient length to provide for proper bearing area against head of tank or shell, and to be securely spiked to the floor of the car. If more than 8 ft. in diameter the same side and end chocking is to be used, and, in addition, each tank or part of tank must be secured with two bands not less than 1/2 by 2 ins. in section passing over the top and properly secured to the floor or stake pockets of the car. In lieu of the bands over the top of the shell the same may be secured to the floor of the car or stake pockets by straps of 3/4 in. round iron or equal section, bolted to the flange of the tank or shell with not less than two bolts, the lower end of the strap passing through the floor or stake pocket. See fig. 64-C."



Figs. 15A-D—Loading of Logs, Piling, Props and Telegraph Poles in Two Piles on Flat and Low Gondola Cars.

must extend not less than 18 ins. beyond the centre stake."

RULE 81.—Some suggestions have been made with reference to handling twin loads of flexible material where the shipment is light and can be handled safely without the use of blocking prescribed for full loads, and in order to make this entirely clear, the following paragraphs should be added to this rule:—

"81-A. If the total weight per bolster, figs. 32 and 33, does not exceed 10,000 lbs., the centre post and bolster cross braces may be omitted, provided the bearing piece is not less than 8 x 10 ins.

"81-B. For twin loads of plates with two bearing pieces and two or four sliding pieces, if the total weight does not exceed 20,000 lbs., or 10,000 lbs. per bearing piece, the centre post and bolster cross braces may be omitted, providing the bearing pieces are not less than 8 by 10 ins.

"81-C. For loads less in weight than those specified in paragraphs A and B, the dimensions of bearing pieces may be proportionately reduced as per rule 29."

RULE 98 A.—Add the word "cars" after the word "hoppers" in the first line last paragraph, which would make this paragraph read as follows:—"When hopper cars or self-cleaning hopper cars are selected the doors must be securely boarded over as per fig. 45-D."

RULE 103.—In order to bring the weight of the lading nearer to the allowable limit for double and triple loads, the following paragraph should be added to provide that girders, either of the solid or latticed type, ranging from 10-

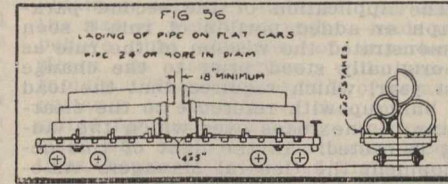


Fig. 56—Loading of Pipe on Flat Cars.

the present figure is wrong on account of there being no provision for holding the second and top tiers of pipe from sliding off endwise. Pipe of this description should be loaded with the bell ends toward the centre of car the bell ends of the second tier overlapping the first toward centre of car. There should be at least 18 ins. clearance between the bell ends of the top tier and when loaded in this manner the end blocking is not required, therefore fig. 56 should be changed accordingly.

RULE 121.—Due to objection on the part of shippers to the size of blocking now specified, and due also to the fact that blocking of smaller dimensions can be used without interfering with the safe movement of boiler shells and tanks this rule should be changed to read as follows:—"Lading of this description, 8 ft. or less in diameter, when loaded on single flat or gondola cars, should be substantially chocked with side blocking in height equal to one-seventh the diameter of the shell, providing that blocking of more than 10 inches in height will not be required. End blocking to be not less than 4 ins. in height. See fig. 64-A."

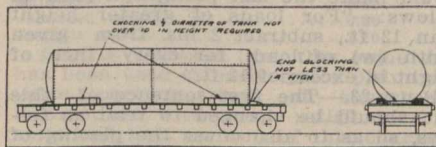


Fig. 64A—Loading Boiler Shells and Tanks 8 ft. or less in Diameter.

"Lading over 8 ft. in diameter, when loaded on single flat or gondola cars with sides less than 30 ins. in height, must be substantially chocked with side blocking not less than 10 ins. in height

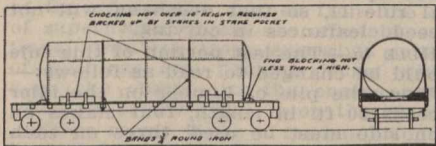


Fig. 64B—Loading Boiler Shells and Tanks over 8 ft. in Diameter.

and backed up by the use of stakes in the stake pockets, and in addition to this must be secured with two bands of not less than 3/4 in. round iron or flat bands of equal section. End blocking to be not less than 4 ins. in height. See fig. 64-B."

"When loaded in gondola cars with sides 30 ins. or over in height, the bands will be unnecessary, but precaution with reference to blocking must be taken as specified for lading 8 ft. in diameter."

"When such lading is placed upon two or more cars as a tandem shipment, it should be secured with two bands of not less than 3/8 in. round iron or flat bands of equal section, in addition to the prescribed blocking."

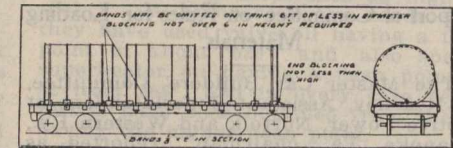


Fig. 64C—Loading Sections of Boilers, Tanks or Shells over 8 ft. in Diameter, Weighing less than 2,500 lbs. per Section.

The heading "Rules Governing the Loading of Mounted Wheels on Open Cars," should be inserted immediately following rule 122, and new rule 122-A should be added to the code to cover the shipment of mounted wheels on flat cars, as follows:—"122-A—Mounted wheels may be loaded on flat cars as shown by figs. 66-B and 66-C. If fig. 66-B is followed, the end blocking must be

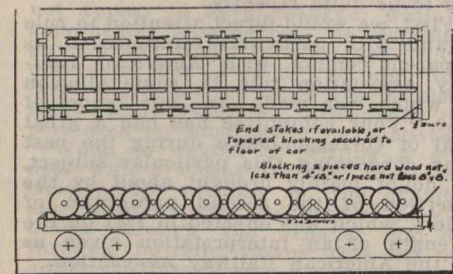


Fig. 66B—Loading Mounted Wheels on Open Cars.

not less than 8 by 8 ins. in section in one piece, or made up of two pieces of hardwood of equivalent section and secured by end stakes in addition to bolts through floor, or by separate blocking pieces secured to floor and end sill with

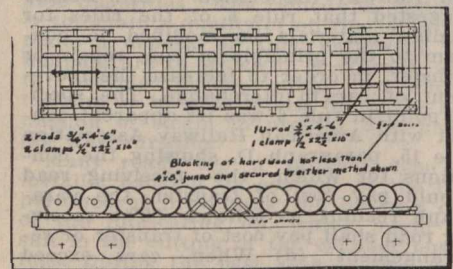


Fig. 66C—Loading Mounted Wheels on Open Cars.

3/4 in. bolts. In addition to this, for a full load, five pair of wheels must be secured by 2 by 4 in. hardwood braces as shown, spiked to floor of car."

"If fig. 66-C is followed, three pairs of wheels at either end of load are to be

... tied together, using 3/4 in. rods with clamp plates or 3/4 in. U rod and plate as shown, and blocking at ends and along sides of hardwood not less than 4 by 8 ins., joined and bolted to car floor by either of the methods shown in fig. 66-C."

The two new figures referred to in new rule 122-A should be inserted in the code, immediately following fig. 66 and ahead of fig. 66-A.

RULE 124.—We have had some correspondence in reference to some modifications in the latter part of this rule, referring to the necessity for protection strips being placed in the door openings on cars not equipped with doors, where such cars are loaded with a commodity requiring that the door openings be protected. As the rule now reads, the lading must be protected by placing strips or slab wood, whether the lading does or does not require it; hence, we felt that some latitude might be given the shipper, and therefore wish to add after the words in the second sentence, "cars without doors." the words, "and containing freight of a character requiring it." This would make the second sentence of rule 124 read as follows:—"Cars without doors, and containing freight of a character requiring it, must

Report of Committee on Main and Side Rods

The Master Mechanics Committee, W. F. Kiesel, Jr., Assistant Mechanical Engineer, Pennsylvania Rd., Altoona, Pa., Chairman, reported as follows:—

A year ago a progress report was submitted, and criticisms and suggestions requested. Your committee has received none, and therefore assumes that the members are satisfied with the formulae as they stand.

Checking Formulae

All measurements in inches and pounds.

- A=Area of section considered
- a=Width of section considered
- b=Depth of section considered.
- C₁=Maximum compression unit stress for transverse bending.
- C₂=Maximum compression unit stress for vertical bending.
- C, C₁, C₂=Coefficients.
- d=Cylinder diameter.
- L=Length of rod from centre to centre of pins.
- M=Bending moment.
- P=Maximum compression strain acting at the end of rod
- p=Maximum boiler pressure
- Q=Cylinder pressure=0.7854 d²p.
- R=Radius of driving wheels
- r=Radius of crank.

$$C_2 = \frac{\frac{P}{A}}{1 - \frac{PL^2}{300000000AR^2}}$$

Values for C, and C₂ can also be taken from tables in "Kent's Pocket Book" under heading "Merriman's Rational Formula for Columns".

First—
For rods without offset, the larger value of C, and C₂ should be taken equal to S.

For rods with offset, the larger value of C, + $\frac{PL^2}{SM}$ and C₂ should be taken equal to S.

Second—

$$S = C \frac{AL^2r}{SM} + C_1 P \left(\frac{1}{A} + \frac{5}{SM} \right)$$

The calculations should be based on a section located at a distance 0.6L from crosshead pin for main rods, and half way between pins for side rods.

Values of C, and C₂

Revs per min =	265	325	375	420
Main Rod C =	0.036	0.055	0.073	0.091
C ₂ =	0.500	0.500	0.400	0.300
Side Rod C =	0.071	0.106	0.142	0.177
C ₂ =	0.500	0.500	0.500	0.500

The coefficients selected should correspond with the highest number of revolutions per minute which the locomotive can make.

If this cannot be determined, use 420 R.P.M. for high speed passenger, 375 R.P.M. for pass. and high speed freight, 325 R.P.M. for all other locomotives.

Very simplerules for rods without offset and having bodies with rectangular section, based on the above theory follow:

First—

Stress is less than one-sixth of ultimate strength of the steel if L is less than 46a or 23b, and if A is more than P divided by one-eighth of ultimate strength.

Second—

$$S = C_2 \frac{L^2r}{b} + C \frac{P}{A}$$

Values of C, and C₂

Revs per min	265	325	375	420
Main Rod C ₂ =	0.22	0.33	0.44	0.55
C ₁ =	0.50	0.50	0.40	0.30
Side Rod C ₂ =	0.43	0.64	0.85	1.06
C ₁ =	0.50	0.50	0.50	0.50

The allowable stresses for the various sections of rod ends are given in connection with the accompanying diagrams, except where thickness of section is indicated by the letter "b"

The figures denote maximum stress allowed under end load P. If the minimum areas of the two members differ, take double the lesser area for A.

The minimum area at points indicated by the letter "b" should be:—

For main rods—
 $A = \frac{PX}{30000b}$

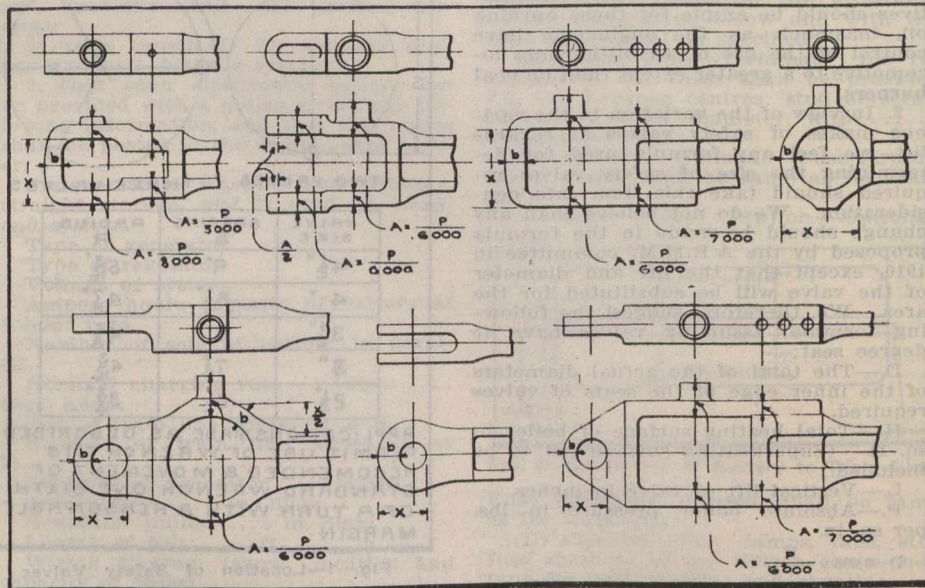
For side rods—
 $A = \frac{PX}{60000b}$

In which X is the average diameter of eye, or average spread of jaw members.

Report of Committee on Mechanical Stokers.

The Master Mechanics' Committee, T. Rumney, Assistant to Vice President, Chicago, Rock Island and Pacific Ry., Chicago, chairman, reported as follows:—

Last year your committee expressed the expectation that this year, judging from the progress which was being made in the development of the mechanical stoker, it would be able to report finally on a few stokers which had then been developed sufficiently to render practically uninterrupted service. Your committee also pointed out that the principal benefit to be derived from the utilization of a perfected stoker fulfil-



Standard Main and Side Rod Ends.

have the lading protected from falling or rolling out of the car by strips or slab wood, not less than 1 1/2 in. thick at centre, nailed to inside of door posts, and sufficiently close to floor of car and to each other to prevent lading from passing between them."

We have also had a great deal of correspondence recently in reference to the subject of proper method of loading triple loads of long flexible material (angle irons and plates) as specifically referred to in paragraph 15-E on pg. 10. It is a fact, if such lading is built up in accordance with the present prescribed practice, and the load bears on the sliding pieces on the centre car, there is some danger of upsetting the car on account of the lading shifting or sliding toward the outer edge in going round a curve, and by its bearing rather heavily at this particular point would contribute to the greatest liability of derailment. Still, we do not feel that we have as yet obtained sufficient data or information along this line to warrant changing the present practice or adding any additional rules to the code, it being our idea that such shipments for the present should be handled under special instructions until we have an opportunity to further study the subject with a view of ascertaining the best and safest practice for shipment of such material.

RG=Radius of gyration of section—axis horizontal.
rg=Radius of gyration of section—axis vertical.

S=Stress. Where used in formulae must not exceed one-sixth of ultimate strength of the steel.

s=Horizontal offset in rod.

SM=Section modulus of section considered—axis horizontal.

sm=Section modulus of section considered—axis vertical.

W=Weight on pairs of drivers actuated through rod considered.

Main rod area must not be less than P÷10000 lbs.

For main rods, P=Q.
For side rods, P=0.3WR

To determine C, and C₂, calculation should be based on a section half way between rod pins.

For transverse bending in rods having knuckle pins flexible transversely,

$$C_1 = \frac{\frac{P}{A}}{1 - \frac{PL^2}{675000000AR^2}}$$

For all other rods,

$$C_1 = \frac{\frac{P}{A}}{1 - \frac{PL^2}{1200000000AR^2}}$$

For vertical bending in all rods,

ling the requirements specified was the realization of the maximum boiler capacity of locomotives with the ultimate result of increasing their hauling capacity and reducing their cost of operation per ton mile of service rendered.

The actual service performance of two stokers complying with the specifications laid down in last year's report, as developed by extensive enquiry among railways who have heeded your committee's request by lending their aid and installing a limited number upon large locomotives, justifies your committee in now reporting that these two stokers have, in a measure, fulfilled its expectations, inasmuch as the indications are that their service has been sufficiently reliable in practical operation on a large number of heavy locomotives. The stokers are the Crawford underfeed stoker and the Street overfeed stoker.

Both types of stokers in successful service to-day maintain the same general principles in design originally employed. The improvements made on them, which resulted in making their operation practicable, are improvements of detail only, such as would result from the knowledge gained of the weaknesses of individual details brought out by actual service.

The principal benefit to be secured by the application of the mechanical stoker to large locomotives is the realization of the maximum boiler capacity. When three or four years ago the necessity for passenger locomotives and freight locomotives of still greater capacity than those already in service became apparent, they were not generally considered possible without some device to assist in handling the increased quantity of fuel which it was thought these engines would require. The solution of the apparent difficulty, however, was accomplished to a large extent by providing means which reduced the actual fuel requirements of large locomotives. These means are the superheater, the brick arch, improved boiler, better engine proportions, more scientific methods of firing, and better locomotive maintenance. The fact is being more strikingly realized every day that a five per cent. saving in fuel amply warrants the installation of apparatus and the adoption of means which may result in a five per cent. increase in the cost of maintaining motive power.

The net effect of these means as far as the stoker is concerned, in spite of the fact that they tend to increase maintenance expenses, has been to defer, to some extent, the absolute necessity of the stoker as a means on present-day engines to get out of them their maximum capacity. It should not be inferred, however, from this statement that the mechanical stoker does not find application to certain engines in operation to-day especially of the larger Mallet types which are in continuous service on long mountain grades. On the other hand, too, as the greater sustained tractive efforts of the large engine, equipped with superheaters and brick arches, is gradually taken advantage of, its fuel consumption per hour will increase, though decreasing on the ton-mile basis, with the eventual result of possibly making necessary to some extent means, in addition to those already provided, to supply fuel to the engine up to its maximum requirements.

When this condition develops, as it is bound to, by traffic increases, careful investigation of tonnage ratings, and the raising to a higher standard the efficiency of operation, the demand for a perfected type of mechanical stoker will become more acute than ever. It is, perhaps, somewhat of a good fortune that the superheater has stepped in and tided over the difficulty that would have resulted while the stoker was in process of development and the demand for large engines becoming more insistent.

The report then gives a review of the

present status of stokers already called attention to, and a brief description of new stokers under process of development.

Generally speaking, your committee feels justified in concluding that decided progress has been made during the last year in the development of the mechanical stoker. While the perfection of the superheater and the brick arch have assisted in making possible a larger engine, it is considered, judging from these indications, that the advent of the perfected mechanical stoker will make possible a still larger engine.

Report of Committee on Safety Valves.

The Master Mechanics' Committee, W. J. Tollerton, Assistant General Superintendent of Motive Power, Chicago, Rock Island and Pacific Ry., Chicago, chairman, and of which W. D. Robb, Superintendent of Motive Power, Grand Trunk Ry., is a member, reported as follows:—

1. The suggestions given below apply to oil and coal burning locomotives, whether using superheated or saturated steam. Safety valves suitable for the requirements of coal burning locomotives should be ample for those burning oil, inasmuch as the enginemen have control of the fire of an oil-burning locomotive to a greater extent than on coal burners.

2. In view of the variation in the various makes of safety valves as regards lift, we feel any formula used for determining the size of safety valves required should take this item into consideration. We do not believe that any change should be made in the formula proposed by the A.R.M.M. committee in 1910, except that the lift and diameter of the valve will be substituted for the area. We, therefore, suggest the following formula, assuming valves have 45 degree seat:—

D.—The total of the actual diameters of the inner edge of the seats of valves required.

H.—Total heating surface of boiler in sq. ft. (Superheating surface not to be included.)

L.—Vertical lift of valve in inches.

P.—Absolute boiler pressure in lbs. per sq. in.

$$D = 0.036 \times \frac{H}{L \times P}$$

EXAMPLE.

$$\frac{0.036 \times 2878}{0.1 \times 200} = 5.2'' \text{ diameter}$$

which would require two 3 inch valves.

3. The only accurate method of determining the capacity of safety valves is by actual test in a testing plant, with safety valves fully equipped with springs, as in actual road service. In order that it should be positively known that safety valves will prevent undue raise in pressure under extreme conditions, they should be subjected to a road test.

4. Every locomotive should be equipped with not less than two, and not more than three, safety valves, the size to be determined as per formula in paragraph 2. Safety valves to be set as follows:—

First—Boiler pressure.

Second—Two lbs. in excess.

Third—Three lbs. above second, or five lbs. in excess of first.

5. No metal for valves and valve seats has yet been developed as entirely proof against erosion. Nickel seats and valves are desirable, and an improvement over other metal, but are expensive as to first cost and renewals; therefore, your committee's recommendation is to continue the use of bronze alloys.

6. Manufacturers should be required to stamp on the valve the lift in inches, as determined by actual test, with valve in working condition, and set for a blow-

back of not to exceed 3 lbs. Your committee recognizes the fundamental importance of valve lift. It, therefore, recommends that in design and manufacture valve lift receive proper consideration.

7. Steam discharge from safety valves of given size can be estimated closely by the use of Napier's rule for flow of steam, as follows:—

Flow of steam per second.

Absolute pressure in lbs. per sq. in., multiplied by area in sq. in. of discharge opening, divided by 70.

Multiplied by 3,600 gives flow in lbs. per hour.

8. The location of safety valves has much to do with the normal crest of the water in the boiler; therefore, safety valves should be located at the highest point on the boiler, where clearance limits will permit, in vertical position, avoiding the use of piping, long nipples, and ells between safety valves and boiler.

9. Where safety valves are located on an independent dome, they should be spaced as per fig. 1. The opening from boiler into dome and the area between

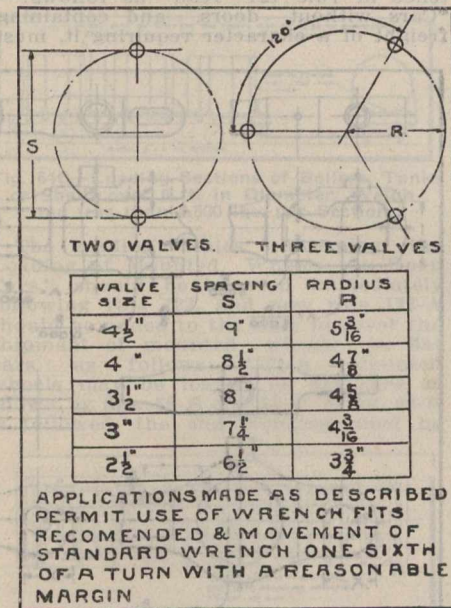


Fig. 1—Location of Safety Valves.

supporting ribs in dome should not be less than inlet area of valves. If this is not done, the opening will momentarily reduce pressure, causing valve to flutter and hammer.

10. The practice of screwing down the safety valve spring during a hydrostatic test of boiler should be discontinued. Valves with springs designed for certain pressures should not be subjected to extreme pressures. One safety valve should be removed and replaced with a special high-pressure valve, and the other valves should be removed and replaced with caps or plugs during test.

11. In order to make valves of different manufacture interchangeable, recommend standard thread and diameter of valves at connections as follows:—

2½ in. safety valve, 2½ in. U.S.S. pipe thread, 8 threads to in.

3 in. safety valve, 3 in. U.S.S. pipe thread, 8 threads to in.

3½ in. safety valve, 3½ in. U.S.S. pipe thread, 8 threads to in.

4 in. safety valve, 4 in. U.S.S. pipe thread, 8 threads to in.

4½ in. safety valve, 4½ in. U.S.S. pipe thread, 8 threads to in.

Value of above dies to be made for U.S.S. wrench, fit 12. As it has been found that the condition of the safety valve springs greatly affects the discharge capacity of the valve, oil springs should be tested as to their deflection under load before being used in repaired valves.

13. Safety valves should be thoroughly overhauled and put in good condition whenever the locomotive is in shop for general repairs. Standard gauges should be used, in order that important dimensions may be maintained as originally designed. If this is not done, it generally impairs the efficiency of the valves.

Report of Committee on Train Lighting and Equipment.

The Master Car Builders' Committee, T. R. Cook, Master Mechanic, Pennsylvania Lines, Wellsville, Ohio, chairman, reported as follows:—

Your committee has gone over carefully the suggestions as to recommended practices given in our report to the 1911 convention, and have also given careful consideration to the various points as brought out by the Association of Railway Electrical Engineers' committee on standards at their 1911 convention, and desire to change our suggestions as to recommended practices given in our report of 1911 to read as follows:—

1. That in electrically lighted cars the following voltages should be used:—

60 volts (nominal) for straight storage, head-end and axle-dynamo systems.

30 volts (nominal) for straight storage and axle-dynamo systems.

2. That each electrically lighted car be provided with a notice giving the following information, and that this notice shall be posted in the switchboard locker.

System—State whether axle dynamo, straight storage, and if used on head-end system.

Type of generator.

Type of regulator.

Voltage of system.

Ampere hours capacity of battery at 8 hour rate.

Number of sets of battery in parallel.

Nominal charging rate...amps. max. amps.

Size of train line wires—B. & S.

Number of train line wires—(2 or 3).

Capacity of generator amps.

Axle pulley in. diam.

Generator pulley in. diam.

Length of belt ft. in.

Wiring diagram (show location and capacity of fuses).

3. That the rules of fire underwriters shall cover all car wiring.

4. That all wiring under car to the switchboard shall be run in conduits.

5. Standard lamps for car lighting service should be in accordance with dimensions as shown on exhibit L.

6. That where train line connectors are used a connector having dimensions as shown on exhibit A shall be used and located as shown on fig. 1, with connec-

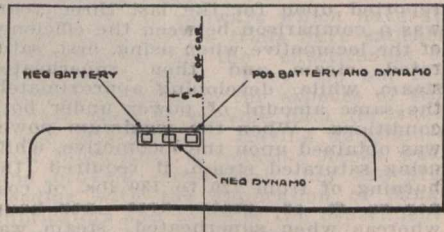


Fig. 1—Location of Connector and Arrangement of Terminals when Facing Car.

(Note: In head-end system, jumper to be placed across negative battery and negative dynamo).

tions to dynamo, battery and jumper as shown on fig. 2.

If only two wires are used they shall be connected to the outside terminals and the female connector on each end

of the car shall be stencilled: "Not for use on head end system."

7. That each electrically lighted car equipped with batteries shall be provided with two charging receptacles with swivel supports, as shown in detail on exhibits B, C and D, installed one on each side of the car as shown on exhibit E, the outside annular ring to be the positive.

8. That each electrically lighted car shall be provided with a switchboard upon which shall be mounted switches, fused switches or terminals. The switches, fuses or terminals to protect and completely disconnect the following parts:—(a) Train line. (b) Battery. (c) Axle dynamo. (d) Circuits for lamps, fans, etc.

The axle dynamo terminals to control the positive and negative armatures and the positive field of the dynamo. Each of the above switches, fuses or terminals to be plainly marked, designating the part controlled, the positive terminal to be on the right side facing the board.

9. Where a main lamp switch is used, or where fuses controlling all lamps are used, they shall be so stencilled in plain letters.

10. The switchboard or regulator panels of electrically lighted cars shall be provided with fuses for the protection of the parts given below and with the type of terminal as specified:—

(A) Train Line.—Terminals for reception of flat fuses shall be provided 2 1/2 ins. between centres; stud or screw to be in. diameter, with threads per inch.

(B) Battery.—Optional. Fuse terminals, if fused, shall be same as for train line.

(C) Main Line Switch.—Optional.

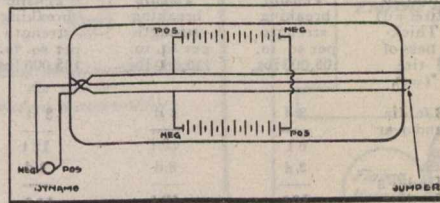


Fig. 2—Connection of Battery to Train Line.

Fuse terminals, if used, shall be same as for train line.

(D) Circuits.—For lamps, fans, etc., fuse shall be of the Edison screw-shell type for both positive and negative.

(E) Axle Generator.—Positive armature fuse terminal; terminals to have N.E.C. code standard 150 amperes knife blade contact clips mounted with 4 in. clearance between clips.

(a) Axle Generator.—Negative armature fuse terminal optional. If used, terminal shall be same as positive.

(b) Axle Generator.—Positive field optional. If used, to have ferrule type clip mounted with 1 in. clear space between clips and to take N.E.C. code standard, 0 to 30 amperes.

Note.—Capacity of fuses, as designated above, to be such as to properly protect the parts in question.

11. That each electrically lighted car equipped with battery box or boxes shall have provided a fuse block, mounted in a suitable metal box at the positive and negative terminals of each set of batteries, and that the fuse block shall be in accordance with the detail as shown on exhibit F, and installed on the car substantially as shown on exhibit E. knife-blade fuses shall be provided with a capacity of between 101 and 200 amperes.

12. That where axle dynamos are used, negative, positive and dynamo field shall be fused as close as possible to the dynamo and prior to the said leads either entering the conduits or being secured to the bottom of the car. The above fuses to be used for emergency service only, and to be at least one hun-

dred per cent. above the capacity of the fuses on the switchboards protecting the same leads.

13. All wires or terminals must be marked for identification.

14. That batteries as a set shall be connected up with a positive pole to the right, facing the car as shown in fig. 2.

15. Where lead storage batteries are used they shall be preferably installed in double compartment tanks substantially as shown on exhibits G, H and I.

16. That where double compartment tanks are used, the connections and arrangements of battery terminals are to be as shown on fig. 3.

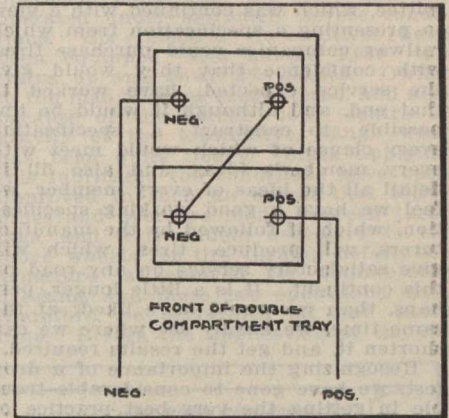


Fig. 3—Connection and Arrangement of Terminals in Double-compartment Tray.

(Note: When Westinghouse hand connectors are used, male head to be used for positive, female head for negative terminal).

17. Battery boxes shall have provided in each door a vent, substantially as shown on exhibit K.

18. That a straight pulley seat be provided for the axle pulley. That if a bushing or sleeve be used, it should preferably be secured to the axle, independent of the pulley. Bushing to have an external diameter of 7 1/2 ins., and to be 8 1/2 ins. long, turned straight. That the pulley hub have a uniform internal diameter of 7 1/2 ins., the length of the hub to be 6 1/2 ins., the face of the pulley to be 9 ins., or wider if flangeless, and 8 ins. if flanged. That the generator pulley be flanged, crowned and perforated, and have a 7 in. face.

19. That when facing the end of the truck on which axle generator is mounted, the pulley or sprocket shall be on the right hand side.

In addition to the above report on recommended practices your committee desire to make the following suggestions to the Association for consideration:—

The adoption of standard size straight axles for different journal sizes for use with axle dynamos. This in view of the adoption of the axle device throughout the country, and the fact that with the present standard tapered axle it is very difficult to properly secure the axle pulley or bushing. The straight axle would result in less maintenance cost in axle pulleys and belts and improvement in service. A number of roads have adopted the straight axle, and if this practice spreads, the diameter of the axle should be standardized in order to minimize the different sizes of bushings or pulleys for car lighting equipment.

The design and adoption of standard arrangement of axle dynamo suspension; the axle dynamo people arranging to provide necessary lugs so that their dynamos will be applicable to the M.C.B. standard suspension. This suggestion is made in order that a safe suspension may be provided for all equipment and that the generators as manufactured by the various manufacturers will be interchangeable.

If the train lighting committee is con-

tinued, the committee would like to be advised as to whether or not it is desired that they include in their investigation recommended practices as to maintenance and repairs of batteries and other electric car lighting apparatus, and maintenance and repairs of axle generators.

Report of Committee on Steel Tires.

The Master Mechanics' Committee, of which L. R. Johnson, Assistant Superintendent of Motive Power, C.P.R., Montreal, is chairman, reported as follows:—

Since the last convention, your committee, which was continued with a view to presenting a specification from which railway companies could purchase tires, with confidence that they would give the service expected, have worked to that end, and although it would be impossible to construct a specification every clause of which would meet with every member's ideas, and also fill in detail all the ideas of every member, we feel we have a good working specification, which, if followed by the manufacturers, will produce tires which will give satisfactory service on any road on this continent. It is a little longer, perhaps, than we would have liked; at the same time, we hardly see where we can shorten it, and get the results required.

Recognizing the importance of a drop test, we have gone to considerable trouble in getting the very best practice of the old and new worlds, but clause 8 leaves it optional with the railway companies to demand or not as they wish. The rules for the drop test have been drawn up with the idea of utilizing as far as possible the drop test machines already in use for other purposes, and so sparing the manufacturers the expense of making special one for tires.

SPECIFICATION FOR STEEL TIRES.

1. MATERIAL.—Stock for tires shall be made by the open hearth or crucible process.

2. CLASSES.—There will be three classes of tires for the different classes of service, as follows:—

Class 1. Driving tires for passenger engines.

Class 2. Driving tires for freight engines.

Class 3. Driving tires for switching engines, and tires for engine truck, tender truck, trailers and car wheels.

3. CHEMICAL COMPOSITION.—

Class 1. Carbon not less than 50% or over 70%.

Phosphorus, not over .05%.

Manganese, between 50% and 80%.

Sulphur, not over .05%.

Class 2. Carbon, not less than 60% or over 80%.

Phosphorus, not over .05%.

Manganese, between 50% and 80%.

Sulphur, not over .05%.

Class 3. Carbon, not less than 70% or over 85%.

Phosphorus, not over .05%.

Manganese, between 50% and 80%.

Sulphur, not over .05%.

4. FINISH.—The tires must be free from defects of any kind, and finished tires must be accurately machined to the prescribed dimensions of the Master Mechanics' standard, and rough tires must not be outside the limits of the attached prints.

5. BRANDING.—The tires shall be distinctly stamped when hot with such brands as the purchaser may require, and in such a manner that the marks shall be legible when the tires are worn out.

6.—SAMPLES FOR CHEMICAL ANALYSIS.—

Drillings from a small test ingot cast with the heat, or turnings, from a tensile specimen, or turnings from a tire (where tires are machined at the works of the manufacturer), shall be used to determine whether the chemical compo-

sition of the heat is within the limits specified in paragraph 3. When required, the purchaser or his representative shall be furnished an analysis of each heat from which tires are made.

7. PHYSICAL PROPERTIES.—The steel for the different classes of service shall meet the following minimum physical requirements:—

Class (a)—Tensile strength, lbs. per sq. in., 105,000; elongation per cent. in 4 ins., quotient of 1,556,000 divided by the tensile strength.

Class (b) Tensile strength, lbs. per sq. in., 115,000; elongation per cent. in 4 ins., quotient of 1,300,000 divided by the tensile strength.

Class (c)—Tensile strength, lbs. per sq. in. 125,000; elongation per cent. in 4 ins., quotient of 1,150,000 divided by the tensile strength.

8. FALLING WEIGHT TEST.—Should the contract call for a falling weight test, a test tire from each heat represented shall be selected by the purchaser or his representative and furnished at his expense, provided it meets the requirements.

8a. The test tire shall be placed vertically under the drop in a running position on a spring foundation with an anvil of at least ten tons weight, and shall be subjected to successive blows from a tup weighing 2,000 lbs., falling from heights of 5 ft., 10 ft., 15 ft., and 30 ft., and upwards, until the required deflection is obtained as specified in paragraph 8b.

8b. The test tire shall stand the drop test described in paragraph 8a without breaking or cracking, and shall show a minimum deflection equal to X in the following table:—

Internal diam. of tire (=d) Thickness of tire (=t).	Class 1. Tensile breaking strength per sq. in. 105,000 lbs.	Class 2. Tensile breaking strength per sq. in., 115,000 lbs.	Class 3. Tensile breaking strength per sq. in., 125,000 lbs.
3 ft. dia. and over	3 d	3 d	3 d
	6 t	10 t	12 t
	3 d	3 d	3 d
Under 3 ft. diam.	10 t	12 t	14 t

8c. A specimen for the tensile test is to be taken from a tire that has been subjected to a falling weight test, and it shall be cut cold from the tested tire at the point least affected by the falling weight test. The tensile test specimen when cut from a tire that has been subjected to a falling weight test shall be cut normal to the radius and parallel to the face.

8d. Should the test tire fail to meet these requirements in any particular, two more test tires shall be selected from the same heat if the manufacturer so desires, and at his expense. Should these two tires fulfil the requirements, the heat shall be accepted.

9. INSPECTION.—The inspector representing the purchaser shall have free entry to the works of the manufacturer at all times while his contract is being executed. All reasonable facilities shall be afforded to the inspector by the manufacturer to satisfy him that the tires are being furnished in accordance with the specifications. All tests and inspections shall be made at the place of manufacture prior to shipment, and shall be conducted so as not to interfere unnecessarily with the operations of the mill.

Tires must be rolled in accordance with the best practice, sufficient metal being discarded to insure sound tires. The tire taken from the bottom of the ingot must be stamped with the letter A before the tire number, the next above B, and so on up the ingot.

Tensile test specimens, one from each heat, must be forwarded to the engineer of tests of the railway company, together with a copy of the chemical analysis of

each heat, showing the tire numbers rolled from each heat; also destination of each tire, together with the railway company's purchasing agent's order number. If, however, the manufacturer is rolling tires right along for the railway company, and its inspector is at the plant, the test specimens from heats ready at that time may be pulled at the manufacturer's plant by the inspector and the broken test pieces sent in for analysis, in which case the above information must be furnished the inspector.

An analysis of the test pieces made by the railway company's test bureau must agree with that furnished by the manufacturer, and with an analysis made from turnings from the tires after received; a failure to agree within reasonable limits will be cause for rejection.

In addition to the above tests, the railway company reserves the right to make a repetition of any tests to make sure that only material meeting all the requirements set forth in this specification be accepted, and all material found not up to any one or all of these requirements will be rejected.

Samples representing rejected material will be retained in the test bureau not longer than thirty days from date of test. If at the end of that period the sellers have not signified their desire for a rehearing, it will be understood that they agree with the results as reported. If by this time the sellers have not given shipping directions for material rejected at destination, the material represented by the samples will be returned to them at their risk, they paying freight both ways.

Increased Power Obtained with Superheat.

C. H. Benjamin, Dean of the Schools of Engineering, and L. E. Endsley, Professor of Railway Mechanical Engineering, Purdue University, Lafayette, Ind., presented the following report of progress:—

It is with regret that we have to say that we are unable at this time to make a full report upon the results obtained on the Purdue locomotive in regard to the increased power obtained with superheated as compared with the maximum power obtained with saturated steam. This is due to the fact that laboratory conditions were such that all the tests of the series could not be completed until so late a date that sufficient time was not available to make a full report.

It was thought worth while, however, to make some statement in regard to the progress of the work, and, in a general way, to indicate to what extent the power of the locomotive was increased by the installation of a Schmidt superheater, which gives a rather high degree of superheat.

It will be remembered that the work reported upon for the last three years was a comparison between the efficiency of the locomotive when using, first, saturated steam, and then superheated steam, while developing approximately the same amount of power under both conditions. When the maximum power was obtained upon the locomotive, while using saturated steam, it required the burning of from 120 to 130 lbs. of coal per sq. ft. of grate area per hour, whereas when superheated steam was used, and when approximately the same power was developed, only from 85 to 90 lbs. of coal per sq. ft. of grate area were burned. This difference in the amount of coal burned while operating with saturated and superheated steam, respectively, is due to the fact that about 25% saving was made in the amount of coal burned.

The work this year has consisted in increasing the power by increasing the cut-off by small increments in an en-

deavor to burn the same amount of coal per sq. ft. of grate area per hour, as was done while using saturated steam. While we have not increased the cut-off to such an extent as to make this possible, it is apparent that there will be no great difficulty in burning the same amount of coal. When these tests are completed, it can then be determined to what extent the power has been increased and by what amount the efficiency has been affected. It is evident that if this increase in the amount of coal burned can be effected without decreasing the efficiency of the locomotive, the per cent. of gain in power will be even greater than the per cent. of gain in the efficiency of the locomotive when using superheated steam than when using saturated steam. The tests made so far, however, indicate that there is a slight decrease in efficiency with increased burning of coal, so that a gain of not more than 20 or 25% in power may be anticipated.

Flange Lubrication.

The Master Mechanics' committee, of which M. H. Haig, Mechanical Engineer, Atchison, Topeka and Santa Fe Ry., is chairman, reported as follows:—

In preparing last year's report an effort was made to determine to what extent the railways were troubled with flange wear; to describe the methods and

has been received of flange lubricators having been applied by over 30 railways on which lubricators had not been used previously. In most cases reported, the number of locomotives equipped on each road has been small. In one instance, however, a road operating over 1,100 locomotives has applied flange lubricators to the entire number. On a number of other railways on which flange lubricators were used at the time of preparing the last report, the application has since been extended. The reports of 35 of these roads show an average increase of 30 lubricators each, the number per road varying from one to over 200.

An affirmative answer to the question "Does your experience confirm the report on flange lubrication presented at the last convention?" was received from 23 of the 29 roads replying in detail to the committee's circular. Five of these roads explained that failure to answer was due to lack of sufficient experience.

Among these railways on which lubricators have been used, no cases have been reported where flange lubrication has been abandoned. A number of roads has removed certain types of lubricators applied experimentally and replaced them by others. The types of lubricators applied during the past year indicate the most general adoption of crude oil as a lubricant. Some reports state that hard grease has been rejected

pipe is connected to the oil delivery pipe leading to the flanges. The oil is thus forced through the pipes and sprayed upon the flanges. Used with electrical equipment, the air is controlled by an electric push button. Valves admitting air above the surface of the oil, as well as to the delivery pipes, are operated by electro magnets. The push button is located in easy access of the engineer and oil is sprayed upon the wheel flanges almost immediately upon the admission of air pressure. With this arrangement flange lubricant is applied only when needed, and when running on straight track the lubricator is not continued in operation.

This apparatus has been in successful operation since July 10, 1910, and has operated under extremely severe conditions. Six electric locomotives have been equipped and handle 1,000 ton trains up and down 2% grades. Owing to the many curves encountered, and also because of the rather low centre of gravity of the locomotive, flange wear has been quite heavy. Since applying this lubricator the conditions have been improved to such an extent that 50,000 miles and over are made between turnings, and it is seldom necessary to remove wheels for tire turning before the armature is removed for commutator dressing, and these two operations may, therefore, be performed at the same time. Before the application of the lu-

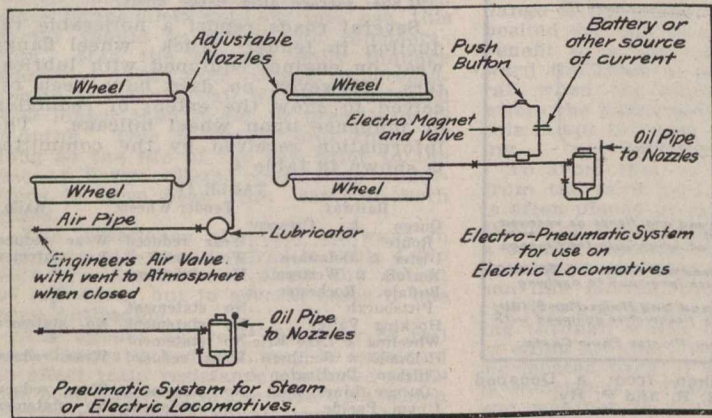


Fig. 1—Pneumatic Flange Lubricator for Grand Trunk Ry. Electric Locomotives.

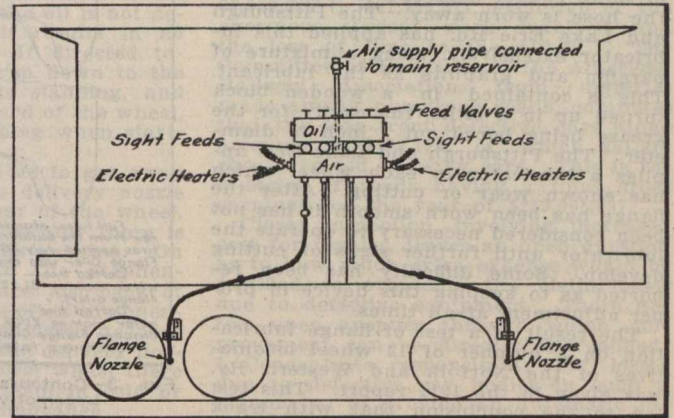


Fig. 2—Four inch Pneumatic Flange Lubricator for Electric Locomotives.

devices for applying lubricant to flanges; and to record the effectiveness of lubrication in overcoming flange wear. Having presented its conclusions as based on information available at the time the former report was closed, the committee feels that its further duty lies in recording the development in flange lubrication during the past year; the increase or decrease in the application of flange lubrication; as well as in reporting the further actual experience of the various railways, thereby confirming or refuting its previous report.

Some of the railways which have already made service trials have satisfied themselves as to the effectiveness of flange lubrication. They do not feel justified in going to the expense of still further tests to provide data for additional information. Having determined that lubrication is reducing flange wear and proving economical, they are proceeding with the application of flange lubricators and consider the experimental stage to have been passed.

As but little further information seemed available from formal tests, a consensus of opinion was sought through replies to a set of questions distributed to all members, through the Association's Secretary. The report is, therefore, a compilation based on the experience of various railways and does not represent merely the opinion of a single committee or single individual.

Since closing the 1911 report advice

as unsatisfactory due to the fact that the grease catches and holds sand. The abrasive action resulting has increased instead of decreased the flange wear. Graphite as a flange lubricant has been reported as successful by some roads, but others have abandoned it for crude oil. Crude oil with a heavy asphaltum base is spoken of with the greatest favor by roads using flange lubricators. It has been successfully applied by both hydrostatic and gravity feed devices.

Exhaust steam from air pumps as well as water jets are still being used to a limited extent by some railways, and beneficial results are reported. An undesirable feature of the water jet is the fact that it must be abandoned during the winter weather.

A type of lubricator especially adapted to electric locomotive service has been developed on the Grand Trunk Ry. by W. D. Hall, Superintendent of Power Plant and Electrical Equipment, St. Clair Tunnel, to meet the requirements of service through the tunnel. Fig. 1 shows the principle by which this lubricator is connected and operated. Oil is contained in an airtight receptacle of one quart capacity. The oil is led to the wheel flanges by pipes and is sprayed upon the flanges by jets of air. The air is supplied from the main reservoir by a 1/4 in. pipe connected to the oil receptacle above the surface of the oil. This provides a pressure to force the oil from the receptacle. A branch of this

bricator, mileage made between tire turnings was from 12,000 to 25,000. The lubricant used is engine oil, most of which is taken from bearing cellars of the railway armatures when the oil in them is being changed. The oil is filtered before being applied to the flange lubricators. No difficulty has been experienced with the delivery of this oil in cold weather. It is sometimes thinned to suit the weather conditions by the addition of a little coal oil. Care has been exercised in keeping the oil free from anything that might obstruct the nozzle, and very satisfactory results have been obtained under varying and severe weather conditions.

Fig. 2 shows the application and principle of operation of an air operated flange lubricator for electrical equipment, manufactured by the makers of a hydrostatic flange lubricator for steam locomotives. The lubricator is located in the cab, as with the hydrostatic device, and sight feeds indicate the rate of formation of the drops of oil. An electrical heater is included in the equipment, and the temperature of air and oil is raised by passing through this heater. The air supply is from the main reservoir. Oil is led to wheel flanges by pipes as with the hydrostatic lubricator and is sprayed upon the flanges by air instead of steam. This lubricator has been placed on electric locomotives of the Baltimore and Ohio and the Pennsylvania Railroads.

The Collins flange lubricator illustrated and described in the former report has since been improved. The improved device is similar in construction to that already described. The feeding device of the original type was placed under the body of the lubricator. The lubricating block of graphite composition was pressed against the flange by a pawl engaging in notches in the under side of the block. With the improved type a coil spring and plunger acting directly behind the block of lubricant presses it against the flange, the feed being continuous without adjustment until refilling is necessary. The 1911 report has given the impression that this lubricator was designed to use hard grease. The lubricant is graphite.

Among the simple devices operated by some of the railway companies is one which can be built up of pipe fittings and has been used to apply either hard grease or graphite. The device consists of a short section of 1 1/4 inch pipe capped at one end and containing a piston actuated by a spiral spring. A small rod threaded into the piston extends through the cap, not only assisting to guide the piston, but also indicating the amount of grease in the lubricator. This device is clamped to the frame of the locomotive in front of the drivers and feeds the lubricant directly against the flange. When using ordinary rod grease the lubricant is contained in a section of scrap rubber hose and is deposited as the hose is worn away. The Pittsburgh and Lake Erie Rd. has applied this lubricator extensively, using a mixture of paraffin and graphite as the lubricant. This is contained in a wooden block turned up in a lathe, the cavity for the grease being bored out 1 inch in diameter. The Pittsburgh and Lake Erie applies a lubricator to each wheel which has shown wear or cutting. After the flange has been worn smooth it has not been considered necessary to operate the lubricator until further signs of cutting develop. Some difficulty has been reported as to keeping this device in proper adjustment at all times.

The result of a test of flange lubrication on a number of 12 wheel locomotives of the Norfolk and Western Ry. was given in the 1911 report. This test led to the conclusion that with track conditions as existing on this line, flange wear was too slight on freight engines to warrant the practice of lubrication. Five Pacific type passenger engines have since been equipped with lubricators for test purposes. The equipment includes three types of lubricators—hydrostatic, gravity and graphite. The comparative mileage between front tire removals before and after the application of the lubricators is shown in table I. It will be seen that the average service per front tire removed from these engines before the lubricators were applied was 16,518 miles, while the average for the same engines since the lubricators were installed has been 39,909. The former figures are taken from the record of 25 tires removed, the latter from the record of 10 tires removed. The local authorities providing the data suggest that this result may have been affected in some measure by a lateral spring arrangement applied to the trailer trucks to prevent nosing. They state, however, that they consider the improved condition to be due to lubrication and not to the spring.

TABLE 1.

Eng.	Mileage after equipped with oilers.	
	Right Side.	Left Side.
564	63,141	63,141
	Average miles per tire, 63,141.	
	Tires removed, 2.	
569	27,889	27,889
569	39,582	39,582
	Average miles per tire, 33,735.	
	Tires removed, 4.	
571	26,728	26,728
571	26,702	26,702
	Average miles per tire, 43,512*	
	Tires removed, 2.	

572	No tire renewals since oilers applied.	
573	33,816	33,816
	Average miles per tire, 33,816.	
	Tires removed, 2.	
	Average miles per tire, all engines, 39,909.	
	Mileage before equipped with oilers.	
	Eng.	Right Side. Left Side.
564	26,702	26,702
	Average miles per tire, 26,702.	
	Tires removed, 2.	
569	13,175	13,175
	Average miles per tire, 13,175.	
	Tires removed, 2.	
571	17,204	17,204
571	6,845	6,845
571	12,096	12,096
571	16,784	16,784
	Average miles per tire, 12,725.	
	Tires removed, 7.	
572	15,846	15,846
572	24,553	24,553
572	24,297	24,297
572	14,640	14,640
	Average miles per tire, 19,834.	
	Tires removed, 8.	
573	17,972	17,972
573	15,618	15,618
573	9,139	9,139
	Average miles per tire, 14,243.	
	Tires removed, 6.	
	Average miles per tire, all engines, 16,518.	
	*Includes four months mileage before oiler was applied.	

Fig. 3 shows the contour and mileage records of a decapod locomotive on the Buffalo, Rochester and Pittsburgh Ry. Previous to the application of the lubri-

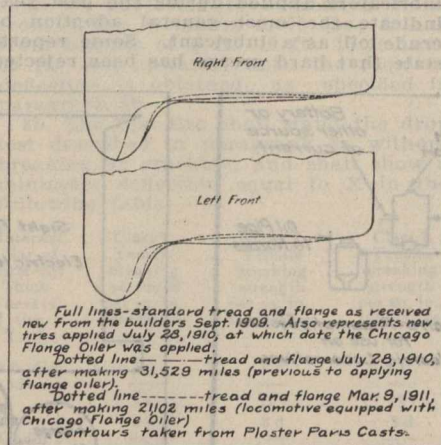


Fig. 3—Contours taken from a Decapod Locomotive, B. R. and P. Ry.

cator this engine had made 31,529 miles with the flanges worn as shown by the dot and dash contour lines. After making 21,102 miles with a hydrostatic oiler in service, the condition of tires was as shown by the dotted contour lines.

The Hocking Valley Ry. reports that the service of switch engines operating upon industrial tracks with much sharp curvature has been increased from 4 to 12 months. On consolidation engines subject to excessive wear of front and back flanges, the service of tires has been increased from 1 to 2 years. At the end of this period the flanges are still in good condition.

Table 2 shows the estimated saving in cost of tires effected by the use of flange lubrication on the St. Louis and San Francisco Rd. This is based upon experience with consolidation engines equipped with hydrostatic oilers using asphaltum oil.

TABLE 2.

Value of new 56-in. tire, 3 1/2 ins. thick	\$30.80
Less scrap metal in tire	2.45
Net value of wearing metal	28.35
Net value per sixteenth, figuring on 28 sixteenths, wearing metal	1.01
Average loss of metal account flange wear after one year's service if tires have been changed three times	9-16 in.
Average tread wear	5-16 in.
Average loss of metal account flange wear 4-16 in. at \$1.01 per sixteenth	\$ 4.04
Loss on consolidation engines, eight tires at \$4.04 each	32.32
Cost of changing tires three times	70.80
Total loss account flange wear	\$103.12
Deduct—	
45% gallons oil at 50 cents	\$22.81
Storehouse expense and cost of handling flange oil	2.28

Interest on flange oiler and material used in equipping engine 5.40

Total deductions 30.49

Net saving per consolidation engine equipped with oiler per year \$72.63

Comparative mileage of two classes of locomotives of the Queen and Crescent Route is shown in Table 3.

TABLE 3.

Consolidation Type.			
Before.		After.	
701	22,855	705	44,387
703	18,293	707	43,230
706	16,211	712	51,255
704	26,026	716	45,344
709	25,755	720	42,205
716	25,246	721	43,352
717	24,278	726	40,340
732	18,897	729	44,226
736	24,823	733	42,394
737	27,961	737	43,738
Total	230,335	Total	440,471
Average	23,033 miles	Average	44,047 miles

Pacific Type.

Before.		After.	
800, 11-1908 to 6-1909	36,154		
801, 12-1908 to 6-1909	19,743		
802, 12-1908 to 7-1909	46,466		
803, 11-1908 to 8-1909	56,722		
	159,085		
39,771, average before flange oilers.			
	After.		
800, 6-1909 to 10-1910	76,890		
801, 6-1909 to 10-1910	96,918		
802, 7-1909 to 11-1910	96,470		
803, 5-1910 to 9-1911	97,137		
	367,415		

91,854, average after flange oilers.

Several roads report a noticeable reduction in tender truck wheel flange wear on engines equipped with lubricators. However, no data have been received to show the extent of reduction or influence upon wheel mileage. The information received by the committee is shown in table 4.

TABLE IV.

Railway.	Tender Wheels.	Rails.
Queen & Crescent		
Route	Wear reduced	Wear reduced
Ulster & Delaware	Wear reduced	No statement
Norfolk & Western	No statement	*
Buffalo, Rochester & Pittsburgh	No statement	*
Hocking Valley	No statement	No statement
Wheeling & Lake Erie	No statement	*
Colorado & Southern	Wear reduced	Wear reduced
Chicago, Burlington & Quincy Lines West	No statement	Wear reduced
Union Pacific	No statement	No statement
Duluth & Iron Range	No statement	No statement
St. Louis & San Francisco	Wear reduced	Wear reduced
El Paso & South-western	No statement	No statement
Santa Fe System	Wear reduced	Wear reduced
Canadian Pacific	No statement	No statement
Grand Trunk	No statement	No statement
Washington Terminal	No statement	Wear reduced
Baltimore & Ohio	No statement	Wear reduced
Terminal Railroad Association of St. Louis	No statement	No statement
Mrs. Ry. Co. of St. Louis	No statement	Wear reduced
Southern Pacific	Wear reduced	Wear reduced
Lake Shore & Michigan Southern (with associated roads)	No statement	Wear reduced

The number of lubricated engines in service is relatively too small to have any noticeable effect upon track.

The question of saving in rail renewals and decreased train resistance to be realized from lubrication of rails on curves has been carefully investigated by the Pennsylvania lines west of Pittsburgh. Tests to determine the reduction in rail wear to be obtained by lubrication were made on curves 3° 20' and 10° respectively. The rails on the first half of the curve to be traversed were not lubricated, and those on the last half were lubricated by hand. The following is quoted from the conclusions of the Pennsylvania committee: "The data collected shows that with lubrication there would be considerable saving in rail and flange wear on roads with sharp curvature. . . . Our tests confirm a saving, but show that for light curvature the saving is very little. The tests show very little more wear on curves up to 4° than on straight line."

Records of rail renewal on the South-

ern Pacific in the Sierra Nevada Mountains, where all of the locomotives are equipped with flange oilers, show that since the oilers have been in service the average life of the outside rail on all curves above 5° has been increased from 12 to 32 months, or 2 2-3 times the life prior to the use of flange oilers. The average life of the inside rail on curves above 5° has been increased from 13 to 33 months, or 2½ times the life prior to the use of the oilers.

In this connection it should be stated that rails are now removed having a much smaller percentage of wear than those removed a number of years ago. In other words, rails which are now considered unsafe for traffic, a number of years ago would have been allowed to remain in the track several months longer. Keeping this in mind, the above figures, which have been abstracted from curve-worn rail reports, will be seen to be conservative.

Attention should also be called to the increase in average daily tonnage. The flange oilers have been in general use on the territory under consideration since May, 1908. For three years prior to that date the average daily tonnage passing over these curves was approximately 15,000 tons. For the three years since that date the average daily tonnage has been 22,000, an increase of 47%. The increase in tonnage should increase the rail wear, and in order to get at the actual increase in the life of the rail since flange oilers were put into use, this factor should be taken into consideration. Had the average daily tonnage remained 15,000 tons instead of increasing to 22,000, the rail would have lasted 47% longer than it did, or practically 48 months. This is nearly four times as long as the life of the rail prior to the use of flange oilers, considering conditions to have been the same in both cases.

The experience of other railways in reducing rail wear is given in table 4. No data are available to show the extent of reduction, but in several cases it has been noticeable.

Any agency whereby the wear of rail and flanges is reduced may be expected to affect train resistance on curves. This has been observed in the ease with which lubricated engines round curves, but it has not been of sufficient effect to lead to any increase of tonnage rating. It must be considered that the effect of lubricant applied to the flanges of the locomotive drivers decreases very rapidly with increased distance from the locomotive.

The committee of the Pennsylvania lines, already referred to, continued its tests to determine the effect of flange lubrication on train resistance. A series of runs was made on a division with a grade northbound of 90 ft. per mile and 60 ft. per mile southbound. About two-thirds of the track over the summit is made up of curves from 2° to 6° 45'. The trains were hauled by a consolidation locomotive. The drawbar pull of runs made with oil lubrication applied to two pair of drivers and the truck wheels, and the runs with graphite applied to the gauge side of the rail by brushes, was compared with the drawbar pull without lubrication. Northbound the trains consisted of the dynamometer car and 29 empty cars weighing about 605 tons. Southbound the trains consisted of the dynamometer car and 13 loaded cars weighing from 915 to 951 tons. The tests showed a reduction in drawbar pull with a loaded train of 951 tons, of 285 lbs., or about one-sixth of the drawbar pull for one loaded car. The reduction for empty cars was equal to about one and one-half cars. The tests were not considered conclusive, however, on account of variable weather.

A similar set of test runs was made over another piece of track as nearly

level as could be found, with curves from 2° 49' to 9° 59'. This was selected in order to eliminate, as far as possible, any resistance due to grade. The tests showed fairly uniform results and that there was slight decrease in curve resistance due to lubrication, but not sufficient to allow of another car being added to the train.

It is the practice of many roads, where curves occur on grades, to compensate for the curvature by reducing the grade. Where this practice is followed no decrease in curve resistance can affect tonnage rating.

The flange lubricator, like other devices, requires attention. Any defects or any imperfections in the device or its connections should be included by the engineer in his work report at the end of his trip. This work should be done by the roundhouse force and the roundhouse should be held responsible for repairs.

Engine crews should be held responsible for the performance of the lubricators, and where repairs are maintained by the roundhouse, the lubricators require comparatively little attention. In view of the economy in life of tires when flanges are properly lubricated, road foremen of engines should see that lubricators are kept in operation on the engines under their jurisdiction.

With oil as a lubricant the delivery nozzle should be properly adjusted and maintained to direct the oil against the flange of the wheel. If the oil is not deposited on the flange it results in no benefit as a lubricant. If directed toward the tread it will run down to the rail when the engine is standing, and where the nozzle is forward of the wheel, this is apt to cause slipping when starting.

To avoid this, as well as to get away from the sand pipe, the delivery nozzle is often placed at the rear of the wheel. With the hydrostatic lubricator there is a certain objection to this location. On an engine equipped with the Stephenson link motion, the space just back of the first pair of wheels is often the opening through which the engineer reaches in oiling around. With the delivery nozzle located back of the first wheel there is sometimes sufficient steam in cold or wet weather to cause annoyance.

When placed forward of the wheel a good location is just opposite to the top frame rail. This should be far enough from the delivery end of the sand pipe to prevent water of condensation from collecting at the end of the pipe and freezing.

In severely cold weather care should be exercised to prevent water of condensation from freezing in the delivery pipes of the hydrostatic lubricator. By keeping a sufficient flow of steam through the pipes this should be avoided. This steam can be throttled sufficiently to keep the pipes clear without emitting so much steam as to be annoying.

Considering the previous report and the information upon which the present report has been based, your committee feels justified in the following conclusions:—

The value of flange lubrication depends upon local conditions.

Flange lubrication has proven effective as a means of reducing flange wear, particularly on driving wheels.

The effect of lubricant applied to driving wheel flanges decreases rapidly as distance from locomotive increases.

Flange lubrication results in considerable saving in rail wear when sharp curves are frequent.

The effect of flange lubrication upon train resistance is not sufficient to make it a factor in tonnage rating.

The Canadian Northern Ry. hotel at Brandon, Man., which has been named the Prince Albert, was opened June 1.

Report of Committee on Overhead Inspection of Box Cars.

The Master Car Builders' Committee, A. Kearney, Assistant Superintendent Motive Power, Norfolk and Western Ry., Roanoke, Va., presented a report, of which the following is an abstract:

In an endeavor to formulate methods and practices for the prevention of losses it is not always certain what proportion of the resulting damage belongs to the condition of the car, the manner in which the packages are made up for shipment, method of packing and stowing away in the cars, rough handling and the shrinkage incidental to the method of transportation. All these conditions carry responsibilities.

A very important consideration is the ability to readily secure the necessary supply of equipment in the event of more stringent and specific rules being established for the selection of cars, separating them for certain commodities. Any further restrictions might result in diminishing the opportunity of readily supplying sufficient equipment, and might prove disastrous to the degree of almost causing a cessation of traffic locally. The need of some form of easement of the difficulty is shown by the extent of the freight losses and damage per annum, which from 1900 to 1910 increased in the United States from \$7,055,622 to \$21,756,671, exclusive of the enormous clerical work involved and the loss of time to the public. The Committee of Relations of the American Railway Association, from inquiries made among numerous roads, computes that the loss from defective cars alone amounts to \$139,194, of which \$51,919 can be traced to leaky cars. This is for a series of roads having a total gross earnings for the year of \$259,061,997.

Closer inspection, involving increased cost for repairs, leaves an open question as to how much extra expense would be justified to overcome the claim losses due to defective equipment. There are two open avenues through which improvement can be directly approached: 1. Concentrate responsibility for losses due to defective car bodies in such a manner as to provide an automatic incentive for the use of better cars. 2. Establish standard requirements for inspection of car bodies.

The General Managers' Association of the southeast has been giving considerable attention to the subject of freight losses and damage, and the feature of defective car bodies has been under consideration, the results of the investigations of the committees formed by this association being embodied briefly in what follows.

DEFECTIVE CARS.—Scarcity of cars has almost compelled the use of defective cars, but which are kept running so long as the running gear is in good condition. These cars ought to be inspected more closely, and if the roof and sides be found defective, have them placarded "Not to be loaded with freight that could be damaged by rain," and have them loaded with non-destructive freight and directed homeward for such repairs as are necessary to again permit them to go into service. This suggestion was unanimously adopted.

This was followed up by correspondence in various directions, which led to the conclusion that the rules of the Freight Claim Association in loading the losses on the several lines that participated in the haul were not conducive to the best results in the maintenance of the rolling stock in good condition, as the loading line is relieved of a large part of the burden, although initially responsible for the loading of the defective car. The General Managers' Association resolved that all the responsibility for loss and damage from defective car roofs and bodies be centred

manufactured as insuring more prompt filling of orders and a smaller stock on hand at their own shops. Car, tender and engine truck wheels are, as a rule, turned up on the same machine, and most shops are provided with special tools for dressing the flanges and treads. To require different tool equipment for different wheels would be objectionable and confusing. In fact, when wheels are being machined, it is not generally known whether application will be made to cars or tenders. Your committee, therefore, recommends for engine and tender truck wheels in all classes of service the contour of tread and flange as shown in fig. 1. This contour is the same as will be recommended to the M.C.B. Association in June, 1912, and differs from the present M.C.B. recommended contour in that additional metal has been added to the back of the flange, making the contour of the flange identical with the flange for cast iron wheels. This thickening of the flange was recommended with the view of increasing the life of the wheel, as many steel wheels are now withdrawn from service due to thin flange.

Replies received from manufacturers of steel wheels indicate that about 80% of the engine truck and 95% of the tender truck wheels manufactured during the past year are of the 1909 M.C.B. recommended contour.

In driving wheel service the conditions are somewhat different, as the brake shoes generally used are recessed for the flange, and also opposite that part of the tread coming in contact with the rail. This tends to keep down the height of the flanges and retards channelling of tread. On account of the general opposition to any reduction in flange height of driving wheels in road service and the fact that the present A. R.M.M.A. standard contour of tread is so nearly like the M.C.B. 1909 contour, your committee does not feel justified in recommending, at present, any change from the present contour for driving and trailing wheels of locomotive in road service. As a matter of information, we wish to add that while practically all railways are using a contour of driving wheel tire approximating the A.R.M.M.A. standard, almost all are deviating in some particular.

In the case of switching locomotives it is felt that a flange 1 in. high is perfectly safe and will be more satisfactory than the present standard, as a greater mileage can be made with the shorter flange before reaching an objectionable height. As has been previously mentioned, the A.R.M.M.A. and M.C.B. contours of tread being so nearly alike, it was felt unwise to establish a new contour having the M.C.B. flange and A.R.M.M.A. tread, and we, therefore, recommend the contour shown in fig. 1 for driving wheel tires in shifting service.

The six widths of flanged tires shown on sheet 1 of the standards are, in your committee's opinion, entirely unnecessary, and we would recommend that one width be shown, namely, 5½ ins. In the case of plain tires, three sizes as recommended last year are sufficient; the two sizes 6¼ and 6¾ ins. to be eliminated.

As concerns condemning thickness of flange below 15-16 in., after carefully considering the replies received and all information available, we cannot see our way clear to recommend flanges of wheels under locomotives and tenders being allowed to remain in service when worn below this limit.

Our recommendations, therefore, are as follows:—

Engine truck and tender truck wheels, contour as shown in fig. 1.

Flanged driving wheels and trailing wheels of locomotives in road service, present A.R.M.M.A. standard of 5½ ins. wide.

Flanged driving wheels in shifting service to be as shown in fig. 1.

Plain tires, present A.R.M.M.A. standard, three widths, 6, 6½ and 7 ins.

Condemning limit of thickness of flange, 15-16 in.

Master Car Builders Association's Meetings.

This association met at Atlantic City, June 12 to 14, the President, A. Stewart, G. S. M. P. & E., Southern Ry., Washington, D.C., presiding. In opening the convention he said:—"We are meeting again this year, with the approval of our respective companies, to further perfect our rules, and, if possible, to revise them in a manner that will still further reduce our cost of maintenance and clarify matters that have not been understood alike by all of our members; also to devise the best possible manner of complying with new legislation affecting the construction, maintenance and handling of equipment in interchange."

He paid tribute to the earnest work done by the committees on various subjects assigned to them, the principal reports on which are given in earlier pages of this issue. He also referred to the interchange of equipment in the U.S., as regulated by the recent safety appliance acts, and said:—"We are required to change the safety appliances to standard on both system and foreign cars going through the shops for general repairs, and we should have a rule for charging the car owner with a portion of this expense. It is my understanding that we are now subject to a penalty for handling cars marked "U. S. Safety Appliances," if the cars so marked are not in accordance with the law. To inspect all cars received with safety appliance defects, including location, is obviously out of the question, and we should have a rule that will relieve the receiving line for penalty defects and material, location or manner of application, when cars have been stencilled as complying with the law."

"Cars that have been fitted with the special 12 in. coupler to give the required end clearance should be so stencilled for protection to the owners and for the information of the inspectors.

"We should consider a rule for a fair basis of interchange where it affects the removal or turning of steel wheels under freight equipment, and a proper charge for wooden cars which have been reinforced by continuous metal draft sills.

"The question of changing the present M.C.B. specifications for air brake hose has been brought to my attention, and a committee should be appointed to take up this matter and report what changes are necessary."

REVISION OF CONSTITUTION.

The committee on revision of constitution pointed out that prior to the adoption of the new constitution in 1909, a nominating committee presented a verbal report to the convention at the first day's session, and the election called at the third day's session was by viva voce vote. It was felt by some of the members that this method did not offer the best opportunity for the membership to express their preference as to officers, and, therefore, when the constitution was changed provision was made for the so-called secret ballot. It has developed in the election since the adoption of the constitution that this method is not entirely satisfactory, requiring considerable time. The committee proposed certain changes in the constitution, and submitted sample forms of ballots to be used. In the method proposed by the committee each member has an opportunity to vote for the membership of the nominating committee, and at the same time has opportunity to vote for any other member than those named by the nominating committee if he may desire to do so.

H. H. VAUGHAN, Assistant to the Vice President, C.P.R., in discussing the re-

ports, said that the matter was not of great importance so long as the association was willing to trust the election of officers to its nominating committee, but he thought that if printed ballots were to be used, some plan should be evolved by which the names of any members proposed as officers might be put on the ballots in addition to those proposed by the nominating committee. He suggested that the American Society of Mechanical Engineers' plan be adopted, by which the nominees of the committee on nominations are printed as such, but if any section of the membership desires to put up any other candidates for office, they have the privilege of doing so, and the names of such candidates are entered on the regular ballot which contains the names of the candidates proposed by the committee on nominations. This nomination of a candidate other than those nominated by the committee on nominations has to be signed by a certain number of members. He moved in amendment that where 20 members desire to propose a name of any member for any office in place of one or more of the names suggested by the nominating committee, that the secretary shall place that member's name on the printed ballot, making a statement in connection with such name that it has been proposed by a certain number of members. This amendment was adopted.

REVISION OF STANDARDS AND RECOMMENDED PRACTICE.

The committee on this subject said in its report, among other things:—"In accordance with action of this association, 1911 convention, with respect to the establishment of a maximum standard or limiting height for the running board of a standard dimension box car, your committee, after careful consideration, believes that this is governed by the height of the brake staff as referred to in the 1911 proceedings, pg. 564, which fixes this at 14 ft., and with this in mind, and the clearances for the brake wheel as established by the U.S. safety appliance standards, determines the maximum height of running board for the various construction of roof, and, therefore, does not concur in the suggestion."

H. H. VAUGHAN, Assistant to the Vice President, C.P.R., said that was an important question for the C.P.R., and also for other lines, and continued:—"We have in Canada legislation in connection with the height of clearances which is demanded, and I understand some of the bills have been introduced in the U.S., and we feel that it is impracticable to discuss the construction of cars of more than standard height. That is a matter that rests as a rule outside of the car department. But one thing we can do, and that is to fix the maximum height or standard dimension box cars. I think there is no objection to taking a limited height of 13½ ft. on the running board or standard box cars. As nearly as we can ascertain, there are only about 30,000 cars in the U.S. and Canada which exceed this limit. It seems to me just as reasonable for this association to fix a limited height for the running board of a car, as it has been in the past to fix the height of eaves, etc. But if we can establish a limited height that constructors would work to in their cars, there would be some hope of keeping this running board height down to a certain limit. The difference may not appear very great, but if it amounts in practice to nearly 6 ins. in construction of bridges and in structures of that sort, it is important, and the amount of that kind of work that has been going on in Canada and the U.S. in recent years has been considerable. We are very much interested in seeing some action taken by this association that will put this matter in such shape that we can show the standard of the running board shall not exceed a figure to be determined by the committee on standards, which we hope

they can make 13½ ft. for a standard dimension box car."

T. H. GOODNOW, M.C.B., Armour Car Lines, Chicago, who was chairman of the committee making the recommendation, said that one of the things that occurred to the committee's mind was the question of the longitudinal running board, coming up in connection with the outside metal roof, which naturally increased the height of the car at the eaves, and affected the height of the box car at that point. The committee felt that as railways are limited now by the height of the brake wheel and the clearance of the brake wheel under the U.S. appliances standards, to go any further would be tying it down pretty tight. He thought they could not take the benefit of half an inch, or an inch, especially with outside metal roofs and the additional running board that is required with that roof.

H. H. VAUGHAN could see no reason why the outside metal roof designer should not be kept down to designing to the limit. It was the height of the running board that was involved in the question. He moved that the report on the running board be referred back to the committee.

TESTS OF BRAKE SHOES.

This committee reported on brake beam standard as well as testing brake shoes.

L. C. ORD, Car Inspector, C.P.R., said he understood the Air Brake Association had a committee which has recommended 5 ft. for the length of the beam, and the Angus Shops thought it would be well for the committees of the two associations to co-operate in investigating the matter and to determine the standard length.

ELECTION OF OFFICERS.

The following officers were elected:— President, C. F. Fuller, Union Pacific; Vice Presidents, M. K. Barnum, Illinois Central; D. F. Crawford, Pennsylvania, and D. R. MacBain, Lake Shore and Michigan Southern; Treasurer, J. S. Lentz, Lehigh Valley. Executive Committee: R. E. Smith, Atlantic Coast Line; C. E. Chambers, Central of New Jersey, and H. LaRue, Chicago, Rock Island and Pacific.

At a subsequent meeting of the executive committee, J. W. Taylor was re-elected Secretary and F. W. Brasier was elected a member of the arbitration committee to succeed E. D. Bronner, who resigned on his appointment as General Manager, Michigan Central Rd.

American Railway Master Mechanics Association Meetings.

This association met at Atlantic City, June 17 to 19, the 1st Vice President, D. F. Crawford, G.S.M.P., Pennsylvania Lines, Pittsburgh, Pa., taking the chair in the absence through illness of H. T. Bentley, A.S.M.P. and M., Chicago Dock Island and Pacific Ry., Chicago, whose address was read by the secretary. Following are extracts:—

The question of consolidating the Association with the Master Car Builders Association has been discussed since the last convention, but the feeling of the members generally appears to be against anything of the sort being done; the thoughts expressed are to the effect that after 44 years of good service, it hardly seems wise that the A.R.M.M.A. should lose its identity. The two conventions could, however, be held in one week, Monday and Tuesday being set aside for the Master Mechanics' meeting; Wednesday for a joint meeting of the two associations to discuss matters of common interest, and Thursday and Friday for the Master Car Builders' Association. The principal reason for consolidating is to reduce the time away

from business, the present arrangement breaking into two weeks for those attending both conventions, but by handling it as suggested the duplication of work would be avoided by the joint session, and only five days would be taken up with both meetings.

A suggestion was made by the General Foremen's Association last year that the members be allowed to investigate and report to the Master Mechanics' Association upon matters pertaining to shop methods and practices, the statement being made that there might be numerous details in shop organization which we were desirous of obtaining information about, but for lack of time had to pass up, and which they were willing and anxious to investigate and report on if asked to do so. This offer was laid before the executive committee who will probably take advantage of it.

Apart from the experience gained at our meetings through the discussion of the various subjects presented, the opportunity for exchanging ideas among members, when outside of the Convention Hall, is great. I am a warm advocate of meetings of this kind, and know personally that valuable information can be obtained from people who have, perhaps, gone through some experiences that we are lacking. I believe we should insist on our men attending conventions; it broadens their ideas, gives them new thoughts and puts fresh life into them, so that on their return to business they are better able to grapple with the problems that confront them.

The question of promoting safety in the operating of railways has received a tremendous impetus lately. About eighteen months ago an organization was started on the Chicago and North Western Ry., in a very humble way, for the purpose of trying to reduce the number of accidents that were occurring daily on our tracks, in the movement of trains and in our shops and roundhouses. The plan worked out so well under the forceful leadership of the general claim agent, and with the assistance of the members of the central safety committee and the local committees on the various divisions, and the results were so gratifying that the scheme was quickly taken up by all of the large roads in the country, and now, fortunately, nearly everybody has acquired the "safety" habit, or as one road tersely sets forth, "It is better to be careful than crippled."

At one time it was thought that most accidents were inevitable, but when live safety committees got into action it is remarkable how quickly this idea changed, and a reduction in 16 months (the latest data for which figures are available) of 107 persons killed and 3,996 persons injured on the C. and N.W. shows what can be done when men make up their minds that it is better to cause a delay than to cause an accident. The fact that it is possible to make such a remarkable showing has induced the Railway Commission of Indiana to ask all the roads in that State to go and do likewise. Before long the Federal Government will probably step in and call for some action that will help this good cause along; if it would only pass a trespass law and enforce it, a large number of the 5,000 men, women and children who are now being killed each year, because of the dangerous track walking habit would be saved.

The past winter has been the most severe in years, as most of us know to our sorrow, and now that summer is here, we must remember our weaknesses and fix our fences before another winter comes along. In the summer we are liable to forget the cold weather, but that is the time to remember it, and taking advantage of the experience gained, to profit by it. It is only by having the engines and roundhouses in first-class condition that the best results can

be obtained, and I am sorry to say when the weather is warm we are likely to forget some of the things we promised to do when we were in trouble.

The progress in locomotive construction appears to have kept pace with the requirements, but nothing of a freakish design has been seen. The most radical departures noticed are the turbine locomotive, built and put in service at Milan, Italy, and the turbine electric locomotive constructed by the North British Locomotive Co. Dr. Diesel is also reported as having designed an electric locomotive, the generator being operated by a Diesel engine. So far, however, nothing definite has been heard of their performance.

The question of fuel economy is of greater importance than ever. The railways and locomotive builders, however, have had this before them, and a large number of Mikado engines have been built, which while pulling very little more tonnage than a consolidation engine, have done it with a decrease in coal consumed for the work performed.

In some places Mallet engines have displaced consolidations with remarkable success in the way of increasing the train load, reducing the number of trains, and doing the work with a reported saving of more than 40% in the amount of fuel burned over other engines engaged in similar service.

The superheater engine has given a good account of itself during the past few months, and the results obtained last winter were, generally speaking, very satisfactory. While we have had troubles on account of lubrication, headers leaking, etc., we are overcoming them successfully for the reason that our education has been improved by our difficulties and where regular men are employed, they soon become familiar with the different conditions brought about by the higher temperatures, so that no more trouble is experienced with superheater than with saturated engines, the improved results justifying the regular crewing of power, where possible.

Several switch engines have recently been equipped with superheaters and excellent results in the way of fuel and water economy are reported. It would seem that the best results in superheating could be obtained by an engine that is working practically up to its capacity most of the time, and not one in switching service, working intermittently, as most of them do, but the satisfactory service reported as being obtained by superheater switch engines would indicate a field for the device in that kind of work.

While nothing very new has been developed in the stoker line, steady progress has been made with the few that we consider have passed the experimental stage, and a number of Mallet engines have, during the past year, been equipped with them, in one case over 9,000 lbs. of coal per hour having been fed into a locomotive firebox by a mechanical stoker.

The question of efficiency in our shops has not been lost sight of. Careful investigations are constantly being made tending to increase our output and decrease cost, and in this we are being ably assisted by the tool and machine manufacturers, who are very much alive to our requirements.

The headlight question is still a very serious one for us; lack of uniformity in state and railway requirements making it difficult to know what to do for the best. The difference of opinion among railways as to what should be used is perhaps justifiable, for the reason that what would be entirely satisfactory on a busy double or four track road with block signals, might not be suitable for a single track road with very little traffic and no automatic signals, and it would be far better for the various states to call for a minimum re-

quirement, that would be low, so as to be suitable for a double track road, and then those roads that felt a brighter light was necessary in certain sections, could provide it.

There appears to be considerable progress in the welding up of locomotive broken parts, firebox sheets, etc., by the use of electric and oxy-acetylene, and a large number of engines that would ordinarily have required new firebox sheets have been kept in service by repairing defects in the old ones. The welding of flues in place is probably going to be a solution of the failures due to flues leaking.

Considerable interest is being taken in the tests of boiler fireboxes of different designs at Coatesville under the direction of Dr. Gross; but so far, results of these tests are not forthcoming and we cannot yet say whether the standard design of box will have to give way to one of entirely new shape and form.

Elaborate locomotive tests have been made on the Altoona testing plant in connection with the Chicago committee on smoke abatement to see what effect the different locations of air tubes with steam and air jets in the side of the firebox will have on the amount of smoke emitted; also what benefit is derived from brick arches, air openings in firebox door, etc. When the results of these tests are tabulated, a very useful work will have been accomplished.

CONTOUR OF TIRES.

R. PATTERSON, Master Mechanic, G.T.R., Stratford, Ont., in the course of the discussion of the committee's report on the contour of tires, said: "I am not any more convinced this year than I was last year that we should turn our driving tires taper. I think the explanation which the committee has given in regard to tender and engine tires and tires for cars is all right. Where wheels are turned up in the same shop both for the car department and engine repairs, I think that is desirable. We, of course, run our departments entirely separately, and it is not necessary to follow the same plan in turning tires for locomotive work as for car work. Consequently we don't see any reason why we should turn our tires taper for locomotive work. I have heard no explanation yet of why we should turn our driving tires taper except at the extreme edge. How long does that taper last on the tires after the engines are put out? You can turn them more rapidly. You can make a better job of it. Why turn them taper. As I mentioned before, on the road I am representing, we invented that practice 35 years ago. What advantage is there in it? I have yet to hear of an advantage in driving tires being turned taper. It is quicker done. You can make a better job of it. You don't require an expert machinist on the lathe to turn them, and it is only a month or so when the tire becomes worn."

ELECTION OF OFFICERS.

The following were elected:—President, D. F. Crawford, Pennsylvania Rd.; 1st Vice President, T. Rumney, Chicago Rock Island and Pacific Ry.; 2nd Vice President, D. R. McBain, Lake Shore and Michigan Southern Ry.; 3rd Vice President, F. F. Gaines, Central of Georgia Ry.; executive members till 1914, G. W. Widden, New York, New Haven and Hartford Rd.; C. F. Giles, Louisville and Nashville Rd.; W. Schlafye, Erie Rd.

The branch office of the Department of Natural Resources, C. N. R., was opened June 1, in the new section of the Windsor St. station building, Montreal.

The G.T.R. has opened an office in the Montreal Harbor Commissioner's buildings at the foot of St. Sulpree St., Montreal, for the convenience of freight importers and exporters.

Atlantic City Convention Notes.

The entertainment features were somewhat cut down from previous years, informal dances being substituted for the usual balls. There were orchestra concerts in the entrance hall of the pier each afternoon and evening, and local gatherings and informal dances at the Marlborough-Blenheim, and on the pier, also evening musicales on the pier. On the Saturday there was the usual baseball game, between the east and the west, each team being composed of eight railway supply men and four railway men, and on the Sunday there were morning and afternoon instrumental concerts at the Marlborough-Blenheim.

Among the Canadian officials in attendance were the following:—

CANADIAN PACIFIC RY.—H. H. Vaughan, Assistant to the Vice President; R. W. Burnett, General Master Car Builder; P. A. Crysler, Assistant Master Car Builder; C. Kyle, General Master Mechanic; J. H. Mills, J. Burns, A. Dixon, Master Mechanics; H. Osborne, Superintendent Angus Locomotive Shops; A. Plow, Mechanical Inspector; G. E. Smart, District Car Foreman; L. C. Ord, Car Inspector.

GRAND TRUNK RY.—W. D. Robb, Superintendent Motive Power; J. Coleman, Superintendent Car Department; J. Hendry, J. L. Hodgson, Master Car Builders; A. A. Maver, J. Markey and R. Patterson, Master Mechanics; J. Powell, Chief Draughtsman Locomotive Department.

A. L. Graburn, Mechanical Engineer, Canadian Northern Ry.; G. W. Robb, Master Mechanic, Grand Trunk Pacific Ry.; G. R. Joughins, Superintendent Motive Power and Rolling Stock, Intercolonial Ry.; W. Kuhn, Master Mechanic, Toronto, Hamilton and Buffalo Ry.; T. Fraser, Master Mechanic, Algoma Central and Hudson Bay Ry.; T. C. Hudson, Master Mechanic, Canadian Northern Quebec Ry.; J. Ogilvie, Inspector Board of Railway Commissioners; W. Cross, ex-Assistant to Vice President, C.P.R.; A. Allen, ex-Superintendent of Motive Power, T. and N.O. Ry.

The Railway Supply Exhibits at Atlantic City Convention.

The larger portion of the space on Young's million dollar pier was devoted viva voce vote. It was felt by some of the members that this method did not to exhibits of railway supplies, machinery, etc., there being over 260 exhibitors, using over 83,000 sq. ft. of space. Among the principal exhibitors were the following:—

AMERICAN BRAKE SHOE AND FOUNDRY Co., Mahwah, New Jersey—Brake shoes for locomotives; passenger and freight equipment and electric railway equipment. Brake heads and keys.

AMERICAN LOCOMOTIVE COMPANY, New York, N.Y.—Reception booth.

AMERICAN VANADIUM Co., Pittsburgh, Pa.—Vanadium steel, iron, brass and bronze locomotive parts; vanadium steel forgings and castings, vanadium tool steels, vanadium ore and vanadium alloys.

ANCHOR PACKING Co., Philadelphia, Pa.—Packing and mechanical rubber goods.

BALDWIN LOCOMOTIVE WORKS, Philadelphia, Pa.—Pneumatic power reverse gear for locomotives.

BOWSER & Co., Inc., S. F., Ft. Wayne, Ind., and Toronto, Ont.—Standard self measuring oil pumps; one tank and oil pump combined; one paint oil outfit; one power pump; one automatic registering measure; one automobile filling station; one oil filtration and circulating.

BUFFALO BRAKE BEAM Co., New York, N.Y.—High speed passenger brake beams. Automatically adjustable brake heads, truss and solid brake beams for all classes of cars, locomotives and electric equipment.

COMMERCIAL ACETYLENE Co., The, New York, N.Y.—Railroad car lighting by acetylene. Locomotive headlighting by acetylene, signal lighting by acetylene, marker, gauge and cab lights by acetylene; buoy lantern with sun valve and flasher, commercial acetylene tanks for oxy-acetylene welding, commercial acetylene tank cut open showing asbestos packing.

CONSOLIDATED CAR HEATING Co., New York, N.Y.—Pressure traps, vapor traps, steam couplers, end valves, admission valves, thermostat, electric heaters, switches, resistances.

DEARBORN DRUG AND CHEMICAL WORKS, Chicago, Ill.—Reception booth.

DETROIT LUBRICATOR Co., Detroit, Mich.—No. 0 one feed Bullseye Locomotive Lubricators, No. 5 one feed, No. 11 two feed, No. 22 three feed, No. 22 sectional, No. 32 four feed, No. 42 five feed, No. 52 six feed, No. 62 seven feed, No. 72 eight feed. Half pint air brake lubricator; flange lubricator; one, two, three and four feed air cylinder lubricator, complete with emergency and throttle valve and check valve connection. "T" steam chest plugs, angle and straight; locomotive road cup; locomotive guide cup; Pendry throttle valve; boiler valve; mechanical force feed oiler for motors on section cars. Complete line of all models, sizes and finishes of stationary accessories.

EDISON STORAGE BATTERY Co., Orange, N. J.—Five exhibition boards showing the assembly and parts of the various sized cells made by this company; car lighting battery equipment; short circuit test on a fully charged Edison battery.

FAIRBANKS Co., The, New York, N.Y.—Railroad track scales; platform scales; valves; dart unions and flangers.

FAIRBANKS-MORSE & Co., Chicago, Ill.—Sectionalized No. 32 gasoline section motor car.

FLANNERY BOLT Co., Pittsburgh, Pa.—Tate flexible staybolts; Tate adjustable crown stays; tools for applying Tate staybolts; "F. B. C." arch bar nut locks.

FRANKLIN RAILWAY SUPPLY COMPANY, New York, N.Y.—Franklin automatic fire door; grate shaker; flexible joint between cars; water joint; flexible metallic roof.

GALENA-SIGNAL OIL COMPANY, Franklin, Pa.—Reception booth.

GOLD CAR HEATING & LIGHTING Co., New York, N.Y., and Montreal, Que.—Gold's combination pressure and vapor system; straight vapor system; thermostatic temperature regulator; new ideal pressure regulator; cyclone ventilators; heat storage system for refrigerator cars; wedge lock steam hose couplers; electric heaters.

GOLDSCHMIDT THERMIT Co., New York, N.Y., and Toronto, Ont.—Thermit of various kinds and appliances; metals and alloys produced by the aluminothermic process; specimen pipe welds and apparatus for making same; motion pictures and transparencies to show the operations done by the Thermit process.

GREENE, TWEED & Co., New York, N.Y. Palmetto packing, round and square, for high steam pressures; Palmetto packing, twist, for small globe valves, etc.; Palmetto packing in sets for railroad service; Manhattan packing for low steam and hydraulic pressures. Favorite reversible ratchet wrench.

JOHNS-MANVILLE COMPANY, H. W., New York, N.Y.—Refrigerator and steel passenger car insulation; waterproofing and mastic samples; electrical materials; air pump packings; Vitribestus pipe coverings; high and low pressure pipe coverings; train pipe coverings; wool felt roofing; car roofing; asbestos roofing; throttle and steam hammer packings; Transite asbestos shingles; smoke jack; ebony asbestos wood; ventilators; fire resisting cements; asbestos car sill covering; friction tapes and splicing compounds; packings; gaskets; diaphragm canopy covers; locomotive laggings; in-

durated fibre conduit for electric wiring; Sanitor toilet seats.

LOCOMOTIVE SUPERHEATER Co., New York, N.Y.—Model of Schmidt top header type superheater. Model showing method of setting superheater flues in boiler. Model of superheater unit.

MCCORD & Co., Chicago, Ill.—McCord malleable iron and vanadium cast iron journal boxes for freight, passenger and engine tender equipment; draft gear; spring dampener; force feed locomotive lubricator in operation.

NORTON, Inc., A. O., Boston, Mass., and Coaticook, Que.—Various types of jacks.

PYLE-NATIONAL ELECTRIC HEADLIGHT Co., Chicago, Ill.—Pyle-National latest type "E" electric turbo generator set for locomotive electric headlights.

SAFETY CAR HEATING AND LIGHTING Co., New York, N.Y.—Pintsch car lighting system; safety electric axle dynamo lighting system; thermo jet car heating system; Pintsch and electric car lighting fixtures; steam traps, valves, etc.; indirect lighting fixtures; hot water car heating system.

STANDARD COUPLER COMPANY, New York, N.Y.—Standard steel platforms; couplers; Sessions-Standard friction draft gears.

UNITED STATES LIGHT AND HEATING Co., New York, N.Y.—Axle light equipment, stationary and vehicle batteries, electric starters for gasoline trucks and vehicles; complete assortment of parts and partly assembled apparatus.

WESTINGHOUSE AIR BRAKE Co., Pittsburgh, Pa.—Reception booth.

WESTINGHOUSE, CHURCH, KERR & Co., New York, N.Y.—Plans and photographs showing design and construction of machine shops, erecting shops, boiler shops, locomotive and freight car blacksmith shops, stripping shops, planing mills, foundries, power plants, storehouses, roundhouses, etc., with which the company has been connected as engineers or constructors.

WESTINGHOUSE ELECTRIC & MANUFACTURING Co., East Pittsburgh, Pa.—Reception booth.

WESTINGHOUSE MACHINE Co., East Pittsburgh, Pa.—Reception booth.

WOOD, GUILFORD S., Chicago, Ill.—Wood's flexible nipple end air hose protector; the Monogram train pipe bracket; standard improved all steel warehouse truck.

1,000 Ton Coaling Station on the Grand Trunk Pacific Railway.

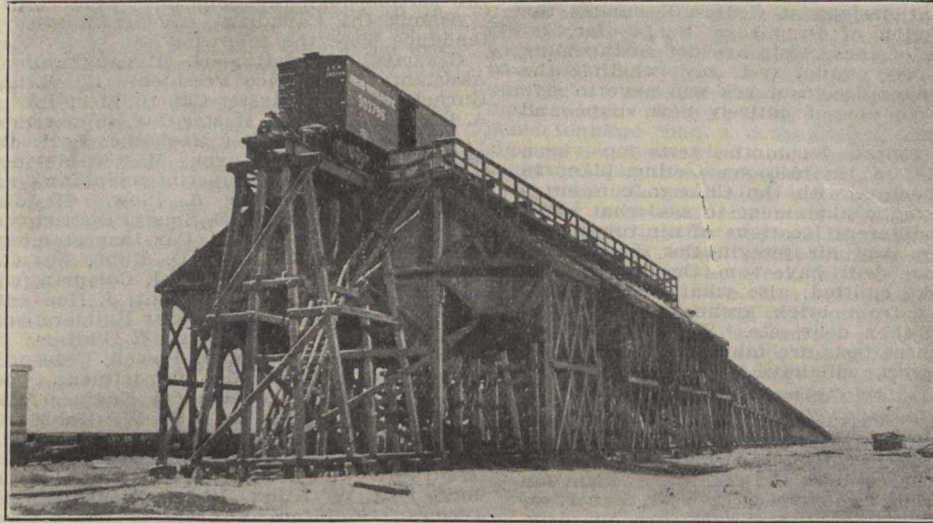
By J. G. Le Grand, Bridge Engineer, G.T.P.R.

It may be of interest to have a description of one of our 1,000 ton coaling stations, which has been adopted as standard for all our principal division points, the one particularly referred to having been built at Edson, Alta., the first division point west of Edmonton.

When I was first called upon to design a coal chute I was furnished with drawings of the one in use on the Grand Trunk Ry., which is called the

into tender. They are sorry to say when before mentioned, with we are likely to volving gates, which Gags we promised into tender. trouble.

The side bins over the motive construction are completely covered by an inclination slight of a freakish the natural slope of the ceiling most radical ing the complete filling of a turbine to the roof line. The central portion is covered with hinged gates which are opened when coal is to be unloaded from box cars. The centre portion between rails is covered by movable traps, which are removed when hopper cars are used. When there are no cars standing on top of bins, the traps and hinged doors are

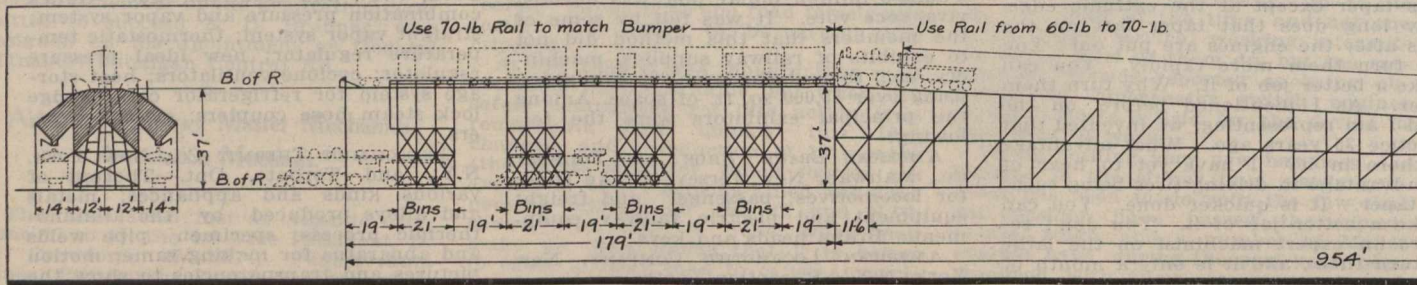


1,000 Ton Coaling Station for the G.T.P.R. at Edson, Alta.

ramp type. This type, in common with those in use on railways in the United States, is composed of pockets separated by bents 12 ft. centres, with sliding gates and aprons on each side, the whole covered by a frame roof resting on two sides composed of scantling covered with plank. Upon going over these plans the first thing that struck me was the enormous quantity of timber used to accommodate a comparatively small quantity of coal. By adding to a similar cross-

closed, thus forming a kind of arched roof, upon which the snow will hardly remain.

The trestle approach, as constructed, gives a rise of 8 ins. in 12 ft., which corresponds to about 5.55% grade. The total length from the point where the vertical curve commences to the last bent is 954 ft., of which the vertical curve takes up a distance of 200 ft., the trestle 575 ft., and the horizontal part, including the four groups of bins, 179



End and Side Elevations of 1,000 Ton

Railway Supply Manufacturers' Association.

The annual meeting was held at Atlantic City, June 13, the President, B. C. D. Stafford, General Manager, Flannery Bolt Co., Pittsburgh, Pa., in the chair.

S. G. Allen, Vice President, Franklin Supply Co., New York, was elected President for the current year, and B. H. Hagerman, Jr., President, N.S. Metal and Manufacturing Co., New York, was elected Vice President.

The following were elected members of the executive committee to serve three years:—First district, F. M. Nellis, Westinghouse Air Brake Co., Boston, Mass.; Second district, O. F. Ostby, Commercial Acetylene Co., New York; Fourth district, J. C. Whitridge, Buckeye Steel Castings Co., Columbus, Ohio; Seventh district, S. M. Dolan, American Car and Foundry Co., St. Louis.

section a bent on the outside of the coaling track, this bent supporting upper bins with a revolving gate discharging on the centre of the coaling track. I practically doubled the capacity of the section.

Now, what governed me in the design of the length was the number of cars required to be unloaded at one time, this number being stated to be four cars. These four cars and their length gave me the length required for the horizontal part of the trestle placed over the bins. I then designed the bins in four groups, each one composed of three sections made by four bents 7 ft. centres, well braced together, the space between each group being 19 ft. centre to centre of bents, spanned by means of steel beams carrying the rail on their top flange, each bin being provided on each side with a revolving gate and an apron which can be lowered for discharging

ft. The distance between base of rail of the coaling tracks and the base of rail of the coal track is 37 ft., and the distance between the two coaling tracks is 38 ft., these two coaling tracks being called inbound tracks in the mechanical department yard.

Comparing this with the G.T.R. design, the portion required for the bins is 179 ft., with a capacity of 1,000 tons, against 228 ft. for a capacity of 500 tons. The estimated cost of the G.T.R. design is about \$18,000 for 500 tons, or about \$36 a ton; the G.T. Pacific design costs \$25,000 for a capacity of 1,000 tons, which means \$25 a ton.

Outside of this, a great feature is the arrangement of groups well separated in case of fire. With the revolving gates in case of fire in any one group of bins, it can be emptied practically instantaneously and the fire extinguished very readily, thus saving practically the

whole structure. In the other design several fires have occurred in which not only the bins but the entire trestle has been destroyed.

The question of capacity is also a very important one, especially in this western country, where coal movement is very often seriously delayed owing to our rigorous winter season, strikes, etc.

The foregoing was read before the Western Canada Railway Club recently. As this design is to represent standard practice, it has been most carefully worked out in every detail, and it contains a number of interesting points that the foregoing description does not mention. The timber sizes are as follows:

- Ties 8 x 8 ins. by 10 ft. long
- Guard rails 6 x 8 ins. by 12 ft. 8 ins. long
- Stringers 8 x 16 ins. by 24 ft. long
- Splices 4 x 16 ins. by 4 ft. long
- Caps 10 x 14 ins. by 12 ft. long
- Sills 10 x 10 ins. and variable length
- Spacing blocks 4 x 10 ins. by 3 ft. 1 in. and 2 ft. 5 ins. long
- Posts 10 x 10 ins. and variable length
- Sway bracing 3 x 10 ins. and variable length
- Longitudinal bracing 4 x 8 ins. and variable length

Two different designs of foundations are called for under different conditions of the ground on which the coaling station is to be constructed. Where piles can be driven, they are in all cases to be used, driven 2 1/2 ft. apart under each post in the line of the station length, two per post under the bin section, and one per post under the ramp, with the heads of the piles in all cases projecting above the ground 1 ft. on which the framed bents rest. Where it is impossible or impracticable to drive piles, the framed bent is to rest on concrete foundations under the bins, and on mud sills under the ramp portion. The concrete for the bin piles is to be a 1-3-5 mixture, the centre one containing 15 cu. yds., and the outer ones 1.4 cu. yds. each.

The vertical curve portion of the approach is filled with a stone fill for drainage purposes to a level of 5 ft. 7 ins., where it strikes the framed structure ramp.

All contact surfaces in the framed structure are to be given a coating of creosote residuum to preserve the timber from decay.

The central openings for hopper bottom cars mentioned in the article are each covered by three doors, 7 ft. by

Agreements Between Canadian Northern, Great Northern and Northern Pacific Railways.

The agreements between the Canadian Northern Ry. and the Midland Ry. of Manitoba, through which the Great Northern Ry. and the Northern Pacific Ry. obtain entrance into Winnipeg, are three in number, the first covers the section of the C.N.R. between Emerson and Portage Jct., the second covers the section between Portage Jct. and Woodward Ave., Winnipeg, and the third covers the entrance into the union terminals at Fort Garry.

The first agreement describes the joint section as being the C.N.R. lines connecting with the G.N. Ry. and the N.P. Ry. at the International boundary near Emerson, Man., and near West Lynn tp. to Portage Jct., and the portion of the line westerly from Portage Jct. to any point of connection with the Midland, or other line, the use of which may be acquired, but not west of the G.N. Ry. crossing of the C.P.R. near Wilkes Ave., Winnipeg. The C.N.R. grants the full, joint and equal use of the line to the M. Ry. (and such other companies as it may admit to this joint section) by its own crews and equipment, except that it shall not do any local business, and shall not use any of the industrial spurs on the section westerly from Portage Ave., Winnipeg. If, however, local business is done under the Board of Railway Commissioners' order, or the consent of the C.N.R., the M. Ry. shall pay 80% of the gross receipts to the C.N. Ry.

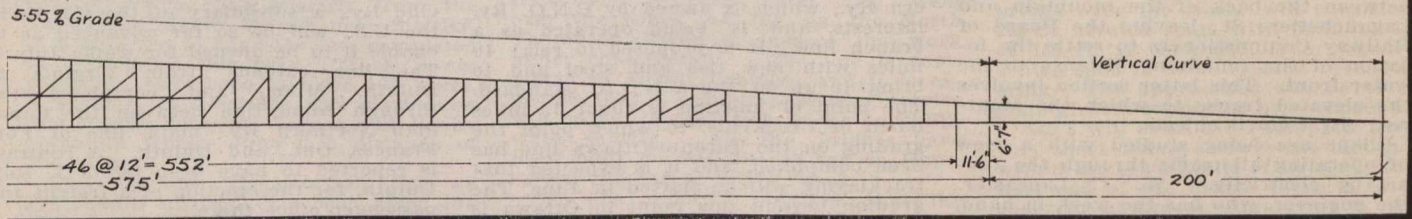
The C.N. Ry. is to keep the joint section in repair, and if it is not kept in suitable condition for the traffic offering, and the C.N. Ry. is unwilling to put it in such repair, the question shall be submitted to arbitration. The M. Ry. intends to operate freight engines of 362,000 lbs., and passenger engines of 384,000 lbs. weight, and the C.N. Ry. agrees within nine months to reconstruct the bridges as may be rendered necessary, charging the same to capital. The M. Ry. is given the right to string telegraph and telephone wires for its own purposes, and to have its own operating crews, which are to co-operate with the C.N. Ry. crews. In order to make the

Morris, and providing for referring to arbitration any questions as to which there is a difference. The agreement is to run for 20 years, and the M. Ry. has the right on giving one year's notice to abandon the use of the line westerly from Portage Jct. The C.N. Ry. agrees to ask for parliamentary authority to sanction the agreement being extended for 999 years.

The second agreement provides for the operation of the trains of the two companies over the C.N. Ry. from Portage Jct., and Woodward Ave., in order to enable the trains to enter the Fort Garry union terminal, Winnipeg. It gives the right to six revenue trains per day, with such light engines and empty trains as may be necessary. The trains to be moved shall be through trains, and only the main and passing tracks are to be used. In the event of any local business being done the C.N. Ry. is to be paid 80% of the gross receipts. The trains are to be treated as C.N. Ry. trains, and the engines and cars are to be stored at the C.N. Ry. yards at Fort Rouge. The rental to be paid will be at the rate of \$2.50 for each revenue train movement, with 50 cents extra for every car over eight; actual cost plus 10% of cost of cleaning, etc.; actual cost plus 10% of repairs; \$2.50 a day for housing each engine; \$2.50 for each boiler washing; actual cost plus 10% for supplies; actual cost plus freight, plus 15 cents a ton bunkerage for coal, and 50 cents a tank for water. The agreement also contains similar provisions to the first, as to arbitration, etc. It is to continue in force for five years, subject to the right of the M. Ry. to withdraw on giving a year's notice, and after the five year period is subject to termination by either party on giving two years notice.

These two agreements are assigned by the Midland Ry. to the Great Northern Ry. and the Northern Pacific Ry., which own its capital stock. The Board of Railway Commissioners has recommended the Governor-General-in-council to sanction the agreements, and has permitted the lines to be operated under them for 30 days, pending the obtaining of such sanction.

The Manual of Statistics.—The numerous changes which take place annually



Coaling Station for the G.T.P.R.

4 1/2 ft. The outer doors in the top are six in number on each side and measure 5 ft. 9 ins. by 3 1/2 ft. The tender filling doors in the sides and bottom of the bins have swinging doors that cut the coal in the direction of flow down the chutes.

J. B. Fuller, operator, Canadian Northern Ry., Woodworth, Man., was, on June 9, sentenced to two years' imprisonment for being intoxicated while on duty.

The Fort William Coal Dock Co. has decided to make extensions to its plant in order to handle the increased business. A contract has been placed with the Brown Hoisting Machinery Co., Cleveland, Ohio, for a six ton bridge and equipment, and another with the Canadian Westinghouse Co., Hamilton, for three generators.

joint section suitable for the increased traffic, the C.N. Ry. will relay the line with 80 lb. steel, upon the completion of which work the M. Ry. shall pay \$30,000 in half yearly payments of \$5,000 each.

For the use of the joint section the M. Ry. shall pay \$35,000 a year for the Emerson-Portage Jct. section, and \$1,225 a year for the line westerly from Portage Jct., and such proportion of 5% on the capital expenditure, other than relaying rails, as the car miles of the M. Ry. bear to the total car miles of all companies using the section, and a pro rata proportion of expenses chargeable to maintenance.

The agreement contains all the necessary provisions defining the powers of each company, safeguarding the interest of each in cases of accident, etc.; reserving to the M. Ry. the right to build its own connection with the C.P.R. at

in connection with large joint stock corporations — amalgamations, rearrangements, and new incorporations—necessitate a great deal of work in the compilation of such a book of reference as this. The edition for 1912 is brought well up to date, and adequately represents the organization, finances and position of the leading railway and transportation companies of Canada and the U.S., as well as of allied companies, and the industrial concerns of the two countries from which the transportation companies draw such a large portion of their revenues. The present volume has been increased to 1,100 pages; the matter is well arranged, and the index is copious and clear. It is published by the Manual of Statistics Co., 20 Vesey St., New York. Price \$5.

The Canadian Northern Ex. Co. has opened a waybill office at Gypsumville, Man.

Canadian Northern Railway Construction, Betterments, etc.

Quebec and Lake St. John Ry.—A deputation waited on the Quebec Government, recently, to urge the building of a five mile extension of the company's Gosford branch. W. A. Kingsland, representing the company, stated that in view of the subsidies voted by the Legislature, he did not think there would be any hesitation on the part of the company in building the line. There were certain preliminary steps needful, and as soon as the necessary data were obtained, arrangements would be made for starting construction.

Canadian Northern Quebec Ry.—Work has been resumed on the erection of the shop buildings at Limoilou, Que., and it is expected that they will be ready for occupancy in November. As soon as the change has been made, the present shops, adjacent to the Q. and L. St. J. Ry. station, will be demolished, and the land so cleared will be utilized for other purposes.

The company has under consideration the extensions of terminal yards, etc., in view of the completion of its trans-continental line in 1914, and negotiations are in progress with the city on various matters in connection therewith. D. B. Hanna, Third Vice President, C.N. Ry., is expected in the city, to take up matters in connection with the project with the city council.

Montreal Tunnel and Terminal Construction.—We are advised that plans and details for the construction of the proposed tunnel under Mount Royal, and the terminals in Montreal, have not yet been approved by the Board of Railway Commissioners. The general plans for the terminals are the subject of negotiations with the Montreal city council, and there are several questions in connection with them which will be argued before the Commission. The company proposes to start operations on the west end of the tunnel before anything is done in the city. The only contract let to the date we were advised, is one for core boring to the Eddy-Burland Development Co., Ottawa. While it is expected that the company will do a good deal of the tunnel work itself, it is very probable that a contract may be let for work at the west end to a company which has a novel device for tunnel excavation.

The Minister of Railways has approved of the tunnel and terminal plans between the back of the mountain and Lagachetiere St., leaving the Board of Railway Commissioners to settle the location of the remaining distance to the water front. This latter section involves the elevated tracks to which the Montreal city council objects.

Plans are being studied with a view of operating all traffic through the tunnel by electricity. W. C. Lancaster, the engineer, who has the work in hand, is quoted as stating that 120 ton electric locomotives will probably be used, capable of making 70 miles an hour. Electricity will also be used on the suburban lines to be operated in connection with the main line. A press report states that it is likely that the line between Montreal and Ottawa will be electrically operated, but we are advised that this is not correct, as it will be a steam road.

Construction work was started May 24, and preparation is being made for the starting up of the boring plant. Six air compressors with a 400 h.p. motor plant are being installed. Electricity will be supplied by the Montreal Light, Heat and Power Co., according to a statement made at that company's annual meeting, June 5, by the President, H. T. Holt, who said that the company had not only secured the contract for power for tunnel driving, but also for the power to operate trains through the tunnel.

Montreal-Ottawa-Port Arthur Line.—The Board of Railway Commission-

ers has approved revised location plans for the line in Ross tp., mileage 62.09 to 66.19; mileage 69.15 to 71.08; mileage 254.53 to 256.2, and mileage 267.2 to 271.4 from Ottawa. An effort is being made to have the line carried through Pembroke, and as a compromise it was decided to have a route surveyed through Churchville. The Board of Railway Commissioners has also approved revised location plans for the line through Davis tp., at Callandar, through Pedley tp.; location plans through unsurveyed territory in Thunder Bay district, between mileage 363 and 398, and mileage 399.21 to 404.46, Sudbury Junction, and revised location plans between mileage 149.85 and 161.03, from Port Arthur. It has also authorized a temporary connection with the C.P.R. at Dalzell station, Thunder Bay district, Ont., for construction purposes only.

The question of the location of the line through North Bay, Ont., has been practically settled, a new agreement having been reached, under which certain subways will be built, and watchmen provided at certain level crossings by the company.

The Board of Railway Commissioners has authorized the company of connect its line under construction with the C.P.R. at Meadowside, 15 miles west of North Bay, Ont., for construction purposes only, for six months from May 28.

Track laying was started at the Port Arthur end of the line in May, and District Engineer Hazen, is reported as stating that the laying of steel would be going on in earnest by the end of June.

W. M. Everill, of the Railways Department, Ottawa, is acting as Inspecting Engineer for the department between Ruel and Port Arthur, Ont.

Canadian Northern Ontario Ry.—Construction is reported to be proceeding at a satisfactory rate on the line under construction into Ottawa from Toronto. An official inspection of the line was made recently by the company's officers and G. A. Mountain, Chief Engineer of the Board of Railway Commissioners, the special train carrying the party running as far east as Enterprize. A train service was put in operation as far as Napanee, June 14.

Press reports state that plans are being prepared for improving the Brockville, Westport and North Western Ry., which is owned by C.N.O. Ry. interests, and is being operated as a branch line. It is proposed to relay 40 miles with new ties and steel and to bring it up to the C.N.O.R. standard. The point of junction is about 35 miles north of Brockville, to which point the grading on the Toronto-Ottawa line has been completed, and it is expected that tracklaying will be started in June. The grading beyond this point to Ottawa is well advanced.

The company has made very extensive purchases of land in the vicinity of Leaside Jct., near Toronto, for yard and terminal purposes, and a site for a model city.

We are advised that it is extremely probable a start will be made this season, from the Toronto end, on the company's projected line from Toronto to Niagara Falls, and that the route to be followed will be mainly along the Electrical Development Co.'s right of way, on which is the power transmission line between Niagara Falls and Toronto. In connection with this projected construction the Board of Railway Commissioners has authorized the crossing of the C.P.R. spur line from Islington to Mimico, an interlocking plant to be installed at the cost of the C.N.O. Ry.

The plans for the entrance into Hamilton were filed at the end of May, and the city council has had them, as well as the alternative route suggested by F.

L. Somerville, consulting engineer, under consideration. The route of the line from Hamilton to Windsor, is under consideration, and considerable speculation is being raised in various towns owing to the visits of people representing MacKenzie, Mann and Co. The firm is interested both in the steam line and electric feeders for the same, but where the one begins and the other ends cannot be definitely gauged from the negotiations with the various public authorities. That there will be a steam line from Toronto to Hamilton and Niagara Falls, and a line from Toronto to Windsor, whether as an independent line, or as a branch of the Toronto-Niagara Falls line, is pretty certain. All the other lines to be built will probably be electric. This seems to be indicated by a recent statement of Sir Wm. MacKenzie, who is quoted as stating that the steam line will be carried into London from the east, connecting with the London and Port Stanley Ry., for a lease of which the company would make an offer. The line would run through Delaware and on to Detroit.

Canadian Northern Ry.—Sir. Wm. Mackenzie, President, returned to Toronto, June 22, after a trip to the Pacific coast. He reached Victoria, B.C., June 4, and after an interview with the Premier, left for the east a couple of days later. In the course of his trip he is reported to have stated that it was expected to have the line completed through from coast to coast by 1914. The question of a ferry service to connect the lines on the mainland with those on Vancouver Island had not been considered. The building of a second track between Port Arthur and Winnipeg was a necessary work, and would be undertaken, but he could not state just exactly it would be started.

Efforts are being made along the route of the branch line now terminating near Gunflint, near the International boundary line between Ontario and Minnesota, to induce the company to extend it, if not to complete it into Duluth, as originally proposed.

It is expected that the work of completing the Duluth, Winnipeg and Pacific Ry., a subsidiary of the C.N.R. in the U.S., will be so far advanced as to enable it to be opened for traffic July 1. The line extends from Virginia to Duluth, Minn., and completes the through connection between the Canadian Northern Ry. main line at Fort Frances, Ont., and Duluth. A contract is reported to have been let to J. Roy, Duluth, for the erection of a freight and passenger office there.

A contract for the construction of a section of the Winnipeg and Northern branch of the C.N.R. has been let, we are advised, to the Western Construction Co., Winnipeg.

M. H. MacLeod, General Manager and Chief Engineer, is quoted as stating that the company proposes to build the new yard at St. Boniface, Man., with its own forces.

The train shed at the Fort Garry, Winnipeg, union station, is practically completed and is being used.

The Board of Railway Commissioners has approved of an agreement between the C.P.R. and the C.N.R. for the provision of joint facilities in Regina, Sask.

We are advised that no information is available with respect to the branch line which press reports state is to be built from Regina to a junction with the Goose Lake line at Rosetown, Sask. A second report states that the junction point with the Goose Lake line will be Kindersley.

Plans for an addition to the station building at Saskatoon, Sask., have been prepared, and Superintendent Entwistle is quoted as stating that the work will be started at an early date.

A contract has been let to W. J. Cowan, Winnipeg, for building 25 miles from Vonda, on the Winnipeg-Edmonton line, to Fenton, on the line to Prince Albert, Sask.

The Board of Railway Commissioners has approved of the location of the line from near Radville into Moose Jaw, Sask., through tps. 16 and 17, range 26, west 2nd meridian, and part of Moose Jaw, mileage 84.25 to 87.13. The terminals in Moose Jaw have been arranged for, the location of the station being between Athabasca and Fairford streets. Surveys are reported to have been made for a line from Moose Jaw to Swift Current, passing through Gravelburg, at which point it is stated that the line from Maryfield, now terminating west of Bengough, will effect a junction.

We are officially advised that a contract has been let to W. J. Cowan, Winnipeg, for an extension of the Thunder Hill branch for 21 miles northerly from Canora, Sask.

Surveys were recently started on the projected branch line from Prince Albert, Sask., to a junction with the Dominion Government line to Hudson Bay at either Split Lake or The Pas, Man., P. H. Canby being in charge of the work. The survey starts just north of the C.N.R. bridge over the Saskatchewan river, and the line will be about 150 miles long. Press reports state that 50 miles of this line is to be built this year, and that grading has been started at Prince Albert.

We are officially advised that the company has no information in relation to surveys being made for a line southeasterly from Camrose, Alta., which press reports credit to the C.N. Ry.

M. H. MacLeod is quoted as stating recently that he was not prepared to say definitely when the company would be running its trains into Calgary. The work on the line from Vegreville was being proceeded with as rapidly as circumstances permit, and the line would certainly be completed by the fall. It is reported that arrangements are being made with the G.T. Pacific Ry. for facilities in that company's proposed station.

Press reports state that 1,500 men and 300 teams are at work on the Brazeau branch, which runs westerly from the Vegreville-Calgary branch near Stettler. It is expected to have the line completed for 170 miles this year. Track is reported to have been laid for 100 miles. A regular train service was started on this branch between Warner and Rocky Mountain House, June 1, a distance of 120 miles.

The Northern Construction Co., we are officially advised, has been given the contract for the line from Munson, Alta., easterly for 110 miles. Munson is a station north of Drumbheller on the Vegreville-Calgary line, and the point to which the 110 miles will carry the line will be to Benton, near the Saskatchewan boundary, to which point a line from Saskatoon, passing north of Goose Lake, has been completed.

A branch line described as the Pakar branch is under construction, work being started May 1. Pakar is four miles north of Oliver, northeasterly from Edmonton, and it is proposed to build the line as far as Birch Lake, about 20 miles. M. McCrimmon is reported to be in charge of construction for the Northern Construction Co. We are advised that the contract has been let to the Northern Construction Co. for the building of 10 miles, and that about 20 miles of the branch has been definitely located. On the company's map this line is shown as effecting a junction with the line now under construction from

North Battleford, Sask., to Athabasca Landing, for which the Saskatchewan and Alberta Legislatures have voted guarantees of bonds.

Work is reported to have been started on the line from Calgary southerly, the McDonald grading outfit having been delivered at Macleod from Athabasca Landing, in May. The camp has been located nine miles north of Macleod. The James O'Connor Construction Co., which has the contract for grading from Macleod to Pincher Creek, is reported to have four miles completed, and expects to have it finished by Aug. 1. We are officially advised that a contract for a section on this line south of Macleod has been let to W. J. Cowan, Winnipeg. E. O. Archibald is engineer in charge of construction at Macleod.

The Board of Railway Commissioners has approved of revised location plans for the projected Strathcona-Calgary branch, mileage 72.58 to 81.75. This line passes through Lacombe, Alta., at which point a station to cost about \$25,000 is to be built on Stanley St. The work of clearing the right of way for the line is being proceeded with. The plans provide for a line running west of Pigeon Lake, and about 20 miles westerly of the Calgary and Edmonton Ry., for a considerable mileage. It is expected that construction will be started in the near future.

The line to Athabasca Landing has been completed, and the work of finishing ballasting, putting up buildings, etc., is in progress.

C. W. Cummings, of the Northern Construction Co., is quoted as saying that a large force of men is at work on the Peace River line between the Pembina and the Athabasca rivers, and it is expected to have track laid to the latter point, 98 miles northwest of Onoway, Alta., this year. The sub-contractors at work on this mileage are—Rumble, Mann and Co., J. Bradley, Allen Bros., T. Hoggood, W. F. McKenzie, W. Hoggood, P. Peterson.

Work on the line to the Yellowhead Pass is being pushed. The steel for the bridge across the Pembina River has been delivered, and it is expected that this will be erected within three months. It is expected to have track laid through the Pass by the fall.

Canadian Northern Pacific Ry.—E. V. Johnson, Inspecting Engineer of the Department of Railways, made an inspection of the line as far as the present track end recently, and also went over the route, as far as the North Thompson River, to inspect the work under construction. The line is completed to Mount Lehman, and it is expected that a regular passenger service will be put in operation as far as Chilliwack shortly. All the bridges have been built on the line as far as Hope, except the one at Silver Creek.

We are officially advised that the company has abandoned its original plan to construct a line on the north bank of the South Thompson River, having obtained permission from the C.P.R. to build a parallel line on that company's right of way on the south bank of the river, between Black Canyon and the Oregon Jack Creek, about four miles. This change will effect a saving of about \$100,000 in construction, as the route on the north bank was through moving clay banks.

Press reports state that negotiations are in progress by which the company will obtain access to the Great Northern Ry. terminals now being developed on False Creek, Vancouver.

Vancouver Island.—E. G. Holt, Executive Agent, Vancouver, recently completed an inspection of the work on the island, and is quoted as stating that satisfactory progress is being made. The route of the line across the island to the east coast, he stated, had not been definitely located.

Grading is in progress as far as Cowichan Lake, and the line is under contract to about two miles west of the Alberni slope.

We are advised that nothing has been definitely decided as to the letting of further contracts for grading on the line so as to carry it to Comox, on Vancouver Island.

Press reports state that interests associated with the C.N.R. have what is referred to as the Bute Inlet Ry. charter, and have in contemplation the building of a line to connect the lines on Vancouver Island with those on the mainland by means of a bridge across the Seymour Narrows. It is reported that about 20 miles of line will be built from Campbell River, a point on the present authorized lines of the C.N.P. Ry., to Seymour Narrows, and from the mainland to a junction with the line now being built from through the Yellowhead Pass to Port Moody and Vancouver. The bridge part of the undertaking, it is said, will cost about \$20,000,000, and reports state that a preliminary arrangement has been made with the Provincial and Dominion Governments as to its erection. (May, pg. 231.)

Bridge Construction on the Canadian Northern Pacific Railway.

Tenders will be received to July 8 for the steel superstructure for 10 bridges over the Fraser and Thompson Rivers on the Canadian Northern Pacific Ry. The plans were prepared by Waddell, and Harrington, Kansas City, Mo., who planned and supervised the erection of the New Westminster bridge for the British Columbia Government. The Victoria Colonist gives the following details of the bridges:—

No. 1 will cross the Fraser River a short distance above the C.P.R. bridge, or about five and a half miles below Lytton, starting from an abutment on the hillside at the west end, the structure will have three 40 ft. deck plate spans, supported by a steel bent and a steel tower, a 60 ft. plate girder span over the C.P.R. right of way, a 40 ft. tower span and tower, a 90 ft. plate girder span, a 424 ft. three hinged riveted spandrel arch span and a 30 ft. plate girder span.

No. 2 will cross the Fraser River just below Lytton, about half a mile from the C.P.R. station. The portion of this bridge over the water will consist of a 292 ft. riveted span, with flanking spans of 150 ft. at each end, from which the centre span is to be erected by cantilevering. The approaches will be of deck plate girders supported by concrete piers.

No. 3 will cross the Thompson River a very short distance above the mouth and within the town limits of Lytton. At the west end of the bridge there is to be a concrete abutment supporting a 90 ft. plate girder span, following which there will be three 150 ft. deck, open webbed, riveted girder spans, the westerly one resting on either a small concrete abutment or a bearing cut into the solid rock. The concrete piers are all to be parallel to the current.

No. 4 will cross the Thompson River midway between Spatum Station and Black Canyon siding, on the C.P.R. The superstructure will consist of six 125 ft. deck, open webbed, riveted spans, supported by five concrete piers and two concrete abutments. Four of the piers have to rest on pneumatic caissons, and the other pier and abutments are to have ordinary earth foundations.

No. 5, which will cross the Thompson River about six miles below Ashcroft, will consist of a single through truss span of about 16 ft., resting on little concrete abutments that are resting on solid rock. As the final survey of this crossing has not yet been made, the span length may have to be changed later. As

the bridge is located over a narrow deep gorge, it will be necessary to erect by cantilevering and anchoring back into the solid rock.

No. 6 will cross the Thompson River about two miles above Ashcroft. It will consist of six 93 ft. deck plate girder skew spans on concrete piers having shafts parallel to the current. These shafts will rest on cribs containing concrete and piles, if the latter can be driven, as in all probability they can by using water jets, for the material to be penetrated is mainly sand and gravel, covered in many places with boulders.

No. 7, which will cross the Thompson River another mile above Ashcroft, will be on a skew. It will consist of twelve 85-ft. deck plate girder spans, resting on 11 concrete piers and two concrete abutments.

No. 8 will bisect the Thompson River about a mile below Wallachin. It will consist of 11 93 ft. deck plate girder, skew spans. These will rest on 10 concrete piers and two concrete abutments to be founded on piles, if they can be driven.

Bridge No. 9 will cross the Thompson River almost midway between Wallachin and Savonas, which stations are some seven miles apart. At the west end of the bridge location there is a rocky hill from the foot of which the bridge will start with a through skew span of about 200 ft., then will come six half through, plate girder skew spans of 91 ft. each. These spans will rest on concrete piers and abutments.

No. 10 will cross the North Thompson River some four miles by water from Kamloops. It will consist of thirteen 93-ft. deck plate girder spans resting on fourteen concrete piers.

The contractors are given until June 1, 1913, to complete the work.

Toronto, Hamilton and Buffalo Railway Co.'s Annual Report.

The report for the year 1911, presented at the annual meeting at Hamilton, Ont., June 4, shows there was no change in the capital stock during the year, it remaining at \$2,500,000. The funded indebtedness authorized and outstanding remains at \$4,280,000. There was expended for additions and betterments, and charged to cost of road and equipment, \$163,410.92, of which \$51,084.25 was expended on yards and sidings; \$40,062.24 on stations and other structures; \$53,571.20 on roadway, and \$18,693.23 on new equipment.

The operating revenue was \$1,256,012.43, an increase over the previous year of \$110,243.33. The increase in freight and switching revenue was \$90,470.31, and in passenger revenue \$14,216.19. Operating expenses increased \$95,490.36, being \$726,775.54; maintenance of way and structures showed an increase of \$47,033.68, due to extensive repairs to track, bridges and buildings; maintenance of equipment increased \$14,890.45; traffic expenses \$2,206.02; transportation expenses \$28,911.92, due to greatly increased volume of traffic and general expenses \$2,448.39. Other income was \$46,333.53, an increase of \$3,464.30, and total deductions from income were \$269,449.72, a decrease of \$22,847.70, the principal decrease being for hire of equipment. The surplus for the year was \$300,108.18, an increase of \$39,752.45.

The company's equipment includes, 18 passenger, and nine switching locomotives, 11 passenger cars, four combination cars, two mail, express and baggage cars, 181 box cars, 73 flat cars, 10 stock cars and nine cabooses, and 26 other road cars.

In addition to 80.57 miles of main line and 11.06 miles of branches, the company has 3.89 miles of second track, 37.04 miles of side tracks, and three miles of track owned and leased to the C.P.R.

TRAFFIC STATISTICS.—Operating revenue per mile of road, \$14,909.92; operating expenses per mile of road, \$8,627.43; net operating revenue per mile of road, \$6,282.49; operating revenues per train mile, \$2.70; operating expenses per train mile, \$1.56; net operating revenue per train mile, \$1.14.

EQUIPMENT STATISTICS.—Average mileage per engine, 29,703; cost of repairs per engine mile, 7.63 cents; total capacity of freight train cars, tons, 7,950; average capacity of freight train cars, tons, 30; seating capacity of passenger cars, 842; average seating capacity of passenger cars, 56; average mileage per passenger train car, 24,548; average cost of repairs per passenger train car mile, 1.170 cents.

CONSUMPTION OF FUEL BY LOCOMOTIVES.—Total tons of coal, bituminous, 42,018; average pounds consumed per mile run by locomotives in freight service, 178; average pounds consumed per mile run by locomotives in passenger service, 62; average cost of fuel per ton, \$3.11; average cost of fuel per locomotive mile, 16.28 cents.

The directors for the current year are:—J. N. Beckley, Rochester, N.Y., President; Sir Thos. G. Shaughnessy, Montreal, Vice President; D. McNicoll, Montreal; W. L. Scott, Ottawa; Sir Edmund Osler, N. Kingsmill, and W. P. Torrance, Toronto; W. C. Brown, W. H. Newman, and C. F. Cox, New York; H. B. Ledyard, Detroit, Mich.

Rotary Snow Plough for Reid Newfoundland Co.'s Railway.

The Reid Newfoundland Co. is building a rotary snow plough at its shops at St. John's, Nfld., of which the following are particulars:

The engine consists of two horizontal cylinders 17 ins. bore by 22 ins. stroke each, cast with half saddle, rigidly bolted together, and to the frame. Steam is distributed to the cylinders by slide valves worked by Walschaert valve gear, and arranged so that the one engine works in the opposite direction to the other. Each engine is connected by a balanced crank disc to a cross shaft, on the end of which is a bevelled gear cast steel pinion, which meshes with the bevelled gear on the end of the rotary wheel shaft.

The boiler is of the straight locomotive type, length of barrel 9 ft. 6½ ins., smoke box extension 2½ ft., diameter of barrel inside 4 ft. 10¾ ins., thickness of barrel plates ¾ in., thickness of smokebox tube plate ¾ ins., length of firebox casing outside 8½ ft., number of tubes, steel, 202, diameter of tubes outside 2 ins., firebox (steel) length inside 7 ft. 7 ins., width inside 4 ft. 3 ins., thickness of tube plate ¾ in., top, back and sides 7-16 in., heating surface firebox 131 sq. ft., tubes 1,000 sq. ft., total heating surface 1,131 sq. ft., grate area 28 sq. ft., working pressure 180 lbs. per sq. in. Steam is supplied from the dome of the boiler to the steam chests of the engines by two 4¾ ins. inside diam. copper pipes, one on each side of the boiler. The throttle valve is inside the dome, and is operated by the engineer from the cab by a spring lever and quadrant in the usual way.

The tender is supported on two bogies, the axle boxes of which are connected with the equalizing beams. It is designed to carry 5½ tons coal, and the tank about 3,000 gals. of water. Both engine and tender are fitted with Janney couplers, and spring buffers are provided between the engine and tender.

The wheel of the rotary consists of a cast iron conical hub, keyed to the rotary wheel shaft. Bolted to the forward side of this drum is the arm piece which takes the knives, and to which the six scoops are fastened by angles.

These scoops are also fastened to the steel plate disc which forms the back of the wheel, and in turn is bolted to the aft side of the conical hub. Each scoop is open on the front side, and through these openings the snow is taken in. The knives are hinged and so arranged that they automatically adjust themselves into cutting position. The scoops are tied together at their outer ends by 4 x 1 in. flats on the circumference, and have also a ¾ in. diam. diagonal tie rod between each. This makes the front of the wheel where the cutting takes place extra strong, and stiffens up the scoops at the front, as the disc plate does at the back. The diameter of the scoop wheel is 12 ft. The wheel is encased in a drum, with a rectangular front or hood. The knives, being slightly in front, are the first to encounter the snow. The wheel, of course, can be made to rotate in either direction, to throw the snow on one side of the track or the other, and the top of the hood is provided with a spout fitted with a movable cover, which can be turned to suit the direction in which the wheel is rotating, by means of a mechanical arrangement inside the cab.

The plough is carried on two four wheel plate frame trucks. Ice cutters and flangers are applied as a safeguard against derailment. The ice cutters are composed of two parts, the wing and the cutter. They are secured to a wrought iron frame supported by bearings on the front of the forward truck. There is a pneumatic operating gear under control of the pilot, by which the ice cutters and flangers may be raised or lowered. The frame of the plough is constructed of two 55 lb. I beams and two 45 lb. channel beams. The cab is made extra strong, and is partitioned off in front of the boiler, the forward part being the pilot house and the rear the engineer's cab.

The plough is equipped with the following mountings:—One 9½ pump, standard Westinghouse automatic brake, one engineers automatic brake valve, one governor, one blower valve, two check valves, two locomotive pop safety valves, one chime whistle, two self-acting injectors, one triple sight feed bull's eye lubricator, two steam gauges and two duplex air gauges, one set automatic water gauges.

Abuse of Rolling Stock.—On all sides one hears reference to the increasing cost of maintaining rolling stock in condition. An instance of what is happening daily to freight cars in general came before the attention of the writer recently when passing through one of the larger freight yards of this country on a train, the car that caught his attention standing at the edge of the through running tracks. A box car door was being closed by two men, and difficulty having been experienced by them in sliding it along its tracks, force was applied. At the rear edge of the door a flat edged axe was being driven into the car body sheathing, and the door pried along about an inch each time. When observed, the door was nearly closed, and the car body where the axe pry had been used looked as though the car had been badly side swiped, leaving the car in a condition that would doubtless require its shopping at an early date for new sheathing. Such treatment—presumably by railway employes, too—should not be tolerated. This and many other examples of the way in which rolling stock is subjected to rough usage, affords a partial explanation of the reasons for the increasing costs of maintaining stock in repair.

F. W. Atherton, former purser of the C.P.R. s.s. Empress of Britain, was sentenced to two years in the Dorchester penitentiary, at St. John, N.B., June 25, for theft of travellers' cheques, etc., from the Dominion Ex. Co.

RAILWAY DEVELOPMENT.

Projected Lines, Surveys, Construction, Betterments, Etc.

Alberta Interurban Ry.—The Vice President has been investigating the question of the motive power to be adopted on this projected railway. It has been decided, we are advised, to adopt the heavy oil engine, conveying its power by friction. This motive power, it is claimed, is several times more powerful than the gas-electric, and is produced at a cost of from one-third to one-fourth, and probably about one-half of that of electric installation, and has the additional advantage that the vibratory and other objectionable features are nil. The class of rolling stock has practically been decided, and will consist to a large extent in following the plans of the big railways. The power unit will have a seating capacity of from 26 to 40 passengers, and baggage and other facilities, and will be able to haul up to eight freight cars. These will be platform cars with fairly high sides. The motors will be able to haul over any pulls of the line, four of the largest freight cars of the regular steam lines. The lines will be built on the highways, the use of 26 ft. on one side having been freely granted. The plans for the first section of the line have been approved by the Department of Railways, and are now before the Board of Railway Commissioners. (June, pg. 299.)

In the item in our last issue the name of A. F. MacLaren, Toronto, was inadvertently omitted from the list of directors.

Alberta, Peace River and Eastern Ry.—The work plans for this projected railway came before the Minister of Railways for approval June 26. The plans show a line starting at the international boundary west of the Milk River, via Cardston, Pincher, the Happy Valley to Cochrane, keeping about 25 miles west of the Calgary and Edmonton Ry., and passing through the Big Prairie country, on to the Peace River country. A branch line to Edmonton, and another to Fort Churchill, are shown. The line will connect with the Great Northern Ry. and the Northern Pacific Ry., to the south of the international boundary. (May, pg. 238.)

Atlantic, Quebec and Western Ry.—Quebec Oriental Ry.—The Board of Railway Commissioners has approved an agreement between these companies for the erection of joint shops at New Carlisle, Que. C. R. Scholes, New Carlisle, is General Manager. (April, pg. 101.)

Burrard Inlet Tunnel and Bridge Co.—The question of the site of the bridge is under discussion, and the local municipalities have made certain representations to the Minister of Railways. The site agreed to is that which was acquired by the Victoria, Westminster and Yukon Ry., but since the amalgamation of interest in the bridge project, the V., W. and Y. Ry. has not given its assent to the sale of the site by the bridge company. (June, pg. 299.)

Cariboo, Barkerville and Willow River Ry.—Surveys were made for this projected railway by — McGregor, of Gore and McGregor, Vancouver, B.C. The company was dissatisfied with the work done and claimed \$1,645.70 damages, and \$4,999 paid for work done, etc. Mr. McGregor disputed the claim and put in a counterclaim for additional remuneration. At the hearing, June 7, the company's claim was dismissed, and Mr. McGregor allowed \$225 on his counterclaim, but without costs. (May, pg. 239.)

Central Ry. of Canada.—The Board of Railway Commissioners has approved location plans for this line from near the McAlpine station of the C.P.R., to near

the G.T.R. station at South Indian, Ont., mileage 7.2 to 38.165. This portion of the route passes through Routinier, Fournier and Lemieux. The company's plans also show an extension of the line from McAlpine to Hawkesbury, on the Ottawa River. (June, pg. 299.)

Chicago, Milwaukee and St. Paul Ry.—Surveys are reported completed for a line from Fargo to Grand Forks, N.D., thence crossing the Red River into Minnesota, in a nearly direct northerly line to Winnipeg. R. Hamilton, Milwaukee, Wis., was the engineer in charge. Right of way is reported to have been secured from Fargo to Grand Forks. (April, pg. 187.)

Delaware and Hudson Co.—Press reports state plans have been discussed for extending the Napierville Jct. line from its present junction with the C.P.R. at Delson Jct., across the St. Lawrence River and through Verdun into Montreal. (May, pg. 238.)

Edmonton, Dunvegan and British Columbia Ry.—Surveys were started June 8, for a spur line from the G.T. Pacific Ry. in Edmonton, to the southwest quarter of sec. 24, tp. 43, range 25, which has been acquired as a terminal site. — Jackson, who is in charge of the surveys, is quoted as stating that the plans are to provide for extensive trackage, roundhouse, machine shop and other necessary buildings. (June, pg. 299.)

Edmonton, Dunvegan and British Columbia Ry.—Considerable work is being done on the grading of the first 30 miles out of Edmonton, Alta. The steel is being delivered and it is expected that tracklaying will be started early in July. (June, pg. 299.)

Esquimalt and Nanaimo Ry.—We are officially advised that a contract has been let to Culleton Bros., Spokane, Wash., for grading and bridging on the Comox extension, from McBride Jct., to mileage 10 in the direction of Courtenay, B.C. The contract calls for the completion of the work by Mar. 31, 1913. (June, pg. 300.)

Fredericton and Grand Lake Coal and Ry. Co.—We are officially advised that A. E. Trites and Son, the general contractors for the building of this line from Fredericton to Minto, N.B., have let subcontracts as follows:—For clearing—Station 355 to 450, L. Taylor; station 454 to 560, H. Burns; station 633 to 792, J. W. Steevens; station 1,156 to 1,636, Barns and Nichols. Except for the distances included in the above, the subcontracts mentioned below cover the grading and any clearing:—Station 1 to 100, A. E. Trites and Son; station 100 to 160, J. Mavor; station 160 to 200, Patterson Bros.; station 200 to 355, Mavor Bros.; station 355 to 528, J. E. Armstrong; station 528 to 633, McPhail and Baird; station 792 to 1,056, Cook, Kitchen & Co.; station 1,056 to 1,151, McLeod and McNeill; station 1,156 to 1,214, Wm. Rocheford; station 1,322.50 to 1,636, Sutton and Martin. Subcontracts have not been let for the sections:—station 633 to 792, station 1,214 to 1,322.50. The section, station 1,151 to 1,156 covers the bridge across the Little River, the contract for the masonry work has been let to D. C. Burpee and Son, who will also do the masonry work on the Nashwaak bridge, and build the concrete culverts at stations 97.50, 110.50 and 143.50. McLaggan and Bain have the contract for the masonry and concrete work at Burpee Mill stream, and stations 881.50 and 986, while the Bailey Brook arch, station 1,279, and a number of arch culverts will be built by — Maxwell. H. W. D. Armstrong, Fredericton, N.B., is Chief Engineer. (June, pg. 300.)

Grand Lake and Bell River Ry.—Press reports state that arrangements are being made to start construction on this line, so as to have it finished by the opening of the National Transcontinental Railway. J. B. Fraser, 74 Nepean St., Ottawa, is Chief Engineer. (June, pg. 300.)

Kettle Valley Lines.—The Board of Railway Commissioners has approved location plans for the extension of the Kettle Valley Ry. from mileage 4.80 to 38.99 west of Pemberton, B.C.

A contract is reported to have been let to G. A. Carlson and Co., Spokane, Wash., for about 35 miles in the vicinity of Pemberton, the work to be completed in 1913. A. McCulloch, Penticton, B.C., is Chief Engineer. (June, pg. 300.)

The Klondike Mines Ry. was re-opened for traffic May 1, and reports from Dawson, Yukon, state that 5,000 ties have been distributed along the line, and that other material has been taken in for the repair and improvement of the roadbed, etc. (July, 1911, pg. 647.)

Medicine Hat, Alta.—We are officially advised that the line which will be built partly by the Ansley Coal Co. and partly by the city of Medicine Hat, will be constructed under and operated by the coal company, which will have its own rolling stock. It is said that ties and steel rails have been ordered. W. Ansley, Medicine Hat, Alta., is President. (June, pg. 301.)

Montreal to James Bay.—Several survey parties have left Montreal for James Bay, with a view of locating a line from some point on Rupert's Bay, at the mouth of the Nottaway River, to Montreal or other points in Quebec. There are several companies authorized to build such a line, and subsidies have been voted by the Dominion Parliament and the Quebec Legislature to aid in its building. The Quebec Government, however, has under consideration a proposition for building the line as a Government work. (June, pg. 301.)

North Ry.—A contract has been entered into between the Department of Railways and the North Ry. Co., under the provisions of the act passed last session of the Dominion Parliament granting aid, among other lines, for one from Montreal to mileage 337 west of Moncton on the National Transcontinental Ry., and from that point to Hudson Bay at the mouth of Nottaway River, Que., a total distance of about 500 miles.

We are advised by F. H. Clergue, President, that the North Ry. was incorporated at the last session of the Quebec Legislature for the purpose of building this railway. The surveys preliminary to construction are now being made, and are expected to be completed in time to permit of contracts being let by the end of the year. (See Montreal to James Bay on this page. Also North Eastern Ry., June, pg. 301.)

Owen Sound and Meaford Ry.—The Owen Sound, Ont., town council has under reconsideration a bylaw for submission to the taxpayers providing for guaranteeing the bonds of this projected railway. (Mar., 1911, pg. 207.)

Pacific Great Eastern Ry.—Three parties are reported to be in the field locating the route. One party, under J. Nelson, has been operating between Port Atkinson lighthouse and Newport, B.C.; a second, under W. Oakley, has been working between Newport and Green Lake Summit, and a party in charge of J. Callaghan, Chief Engineer, is going over the route to Lillooet, 120 miles from Vancouver. Press reports state that preparations are being made for an early start at construction. (June, pg. 301.)

Prince Edward Island Ry.—We are officially advised that the Minister of Railways has selected the route from Cape Tormentine, N.B., to Carleton Point, P.E.I., for the Prince Edward Island car ferry service. The adoption of this route

will mean the sending of considerable traffic over the New Brunswick and Prince Edward Island Ry., extending from Sackville, on the Intercolonial Ry., to Cape Tormentine, 36 miles. It is said that an agreement has been reached between the Government and the company, which is controlled by the Lieut.-Governor of New Brunswick, for acquiring its line under the provisions of the act relating to the taking over of branch lines for the Intercolonial Ry. The only work which will be necessary in addition to standardizing the gauge of the P.E.I. Ry., will be the construction of ferry terminals at Cape Tormentine and Carleton Point. (April, pg. 182.)

Quebec and Saguenay Ry.—In a recent interview, A. H. N. Bruce, Chief Engineer, is quoted as saying:—"The building of the line to Pointe-a-Pic, commonly called Murray Bay, was commenced at Cape Tormente in May, 1911, by the contractors, O'Brien and Doheny, and work is so far advanced that we calculate to have trains running over the road by the first snow fall next autumn. We have finished 90% of the construction and will begin to lay the rails from Cap Tormente to Nairn's Falls in the middle of July, and have the whole line tracked by November. Last summer we landed on the beach at Pointe-a-Pic a 65-ton engine and 12 freight cars, and have lost no time in the construction work. This locomotive and freight cars were used to transport the machinery for the new Eastern Canada Pulp Co.'s mill at Nairn's Falls, and the branch of railway leading from Pointe-a-Pic to the pulp mill was first attended to, in order to haul this machinery, etc. The construction was one of the heaviest propositions on this continent. As a rule, in railway building, the easiest work is at the beginning. It was the very reverse with us. We started right in on heavy work, and for the first 16 miles had to cut through solid rock. The line will run through two tunnels, one four miles east, to Cap Tormente, 500 ft. in length, and the other at Cap Martin, four miles below Les Eboulements, 300 ft. in length."

The length of the line is 56 miles to Murray Bay, and the extension to Nairn's Falls is 7.5 miles. The grading etc., for the latter section was carried out by the Bishop Construction Co. (May, pg. 238.)

St. John and Quebec Ry.—We are officially advised that a contract has been let to J. H. Corbett and Sons, Kittanning, Pa., for grading, tracklaying, ballasting and bridge building (except the steel work) on the line from Fredericton to Rothesay, 65 miles. The bridges over the St. John River and the Kennebecasis River, on this point, are to be built by a bridge company, the Dominion Government having granted special subsidies for them.

Press reports state that the Quebec Contracting Co. has sublet work on the 62 miles from Fredericton to Woodstock to the following:—J. C. Scott and Co., Fredericton, from Woodstock to Medunatic; Smith and Merrithew, mileage 7 to 16.5; Collins, Labelle and Prey, mileage 16.5 to 20; G. H. Tuitere, Brownville, Me., one mile at Springhill; W. and C. R. MacDonald, mileage 27 to 32; J. A. Wheaton and Son, St. John, mileage 32 to 35. F. A. Hibbard is Chief Engineer for the general contractor on this section. It is further reported that the Corbett firm has sublet a portion of its contract to Morrison and Clark, ummerside, P.E.I.

The contract for fencing the right of way, and the stringing of the telegraph line, has been let to T. R. Campbell, Salisbury, N.B. (June, pg. 302.)

Seymour's Narrows, B.C.—A deputation from Vancouver Island waited on the Dominion Government, June 11, to urge the construction by the Dominion of a bridge across the Seymour's Narrows, so as to give direct railway con-

nection between Vancouver Island and the British Columbia mainland. The cost of the bridge is estimated at \$20,000,000. The Premier promised that an engineering party would be sent out to investigate and report upon the feasibility of the project.

Temiskaming and Northern Ontario Ry.—The Minister of Railways has approved of plans for the proposed crossing of the Montreal River on lots 10 and 11, con. 1, Tudhope tp., Nipissing district. This crossing is on the Enk Lake branch. Work is reported to be progressing favorably on the building of the branch. The right of way has been cleared to Montreal River, 25 miles, and about five miles of grading completed. (June, pg. 302.)

Birthdays of Transportation Men in July.

Many happy returns of the day to:—

W. H. Allison, District Freight Agent, C.P.R., Saskatoon, Sask., born at London, Ont., July 22, 1885.

J. H. Black, ex-Superintendent, Temiskaming and Northern Ontario Ry., now at Cobalt, Ont., born near Smiths Falls, Ont., July 8, 1874.

M. S. Blaiklock, Engineer Maintenance of Way, G.T.R., Montreal, born at Quebec, July 19, 1859.

D. E. Blair, Superintendent of Rolling Stock, Montreal Tramways Co., born at St. Thomas de Montmagny, Que., July 25, 1877.

D. C. Coleman, General Superintendent, Manitoba Division, C.P.R., Winnipeg, born at Carleton Place, Ont., July 9, 1879.

Geo. Collins, General Manager, Central Ontario Ry., Trenton, Ont., born at Kingston, Ont., July 20, 1860.

G. C. Conn, Vice President, Pere Marquette Rd., Detroit, Mich., born at Woburn, Mass., July 1, 1867.

D. D'E. Cooper, Canadian Freight Agent, Lehigh Valley Rd., Toronto, born at Buffalo, N.Y., July 8, 1862.

John Corbett, ex-General Foreign Freight Agent, C.P.R., Montreal, born in Lanarkshire, Scotland, July 19, 1863.

E. J. Coyle, ex-Assistant General Passenger Agent, C.P.R., Vancouver, B.C., born at Stayner, Ont., July 23, 1870.

S. E. Dewey, Commercial Agent, G.T.R., Pittsburgh, Pa., born at Beckenham, Kent, Eng., July 4, 1879.

J. F. Dolan, City Passenger and Ticket Agent, Richelieu and Ontario Navigation Co., Montreal, born at Kingston, Ont., July 1, 1868.

F. C. Foy, Canadian Passenger Agent, New York Central Lines, Toronto, born there, July 5, 1881.

W. R. Haldane, ex-Division Freight Agent, Kootenay and Boundary District, C.P.R., Nelson, B.C., now at Detroit, Mich., born at Galashiels, Scotland, July 6, 1867.

J. H. Hanna, ex-Division Freight Agent, G.T.R., at Hamilton, Ont., now at Calgary, Alta., born at London, Ont., July 27, 1867.

A. D. Huff, Division Freight Agent, G.T.R., Ottawa, born at Chatham, Ont., July 17, 1866.

C. A. Jaques, General Manager, Montreal and Lake Erie Steamship Co., Montreal and Great Lakes Steamship Co., and Jaques Transportation Co., Montreal, born there July 15, 1849.

J. P. Kavanagh, Local Manager, Ogdensburg Coal and Towing Co., Montreal, born at Plattsburg, N.Y., July 17, 1862.

R. G. McNeillie, District Passenger Agent, C.P.R., Calgary, Alta., born at Lindsay, Ont., July 1, 1883.

J. M. Macrae, District Freight Agent, Canadian Northern Ry., Saskatoon, Sask., born at Stornoway, Scotland, July 31, 1884.

T. J. Maguire, Accountant, Quebec Central Ry., Sherbrooke, Que., born at Quebec, July 31, 1860.

R. E. Perry, Assistant General Freight Agent and Chief of Tariff Bureau, Intercolonial Ry., Montreal, born at Drayton, Ont., July 5, 1876.

R. Preston, Master Mechanic, Manitoba Division, C.P.R., Winnipeg, born at Toronto, July 28, 1863.

J. E. Quick, General Baggage Agent, G.T.R. and G.T.P.R., Toronto, born at Richmond, Ontario Co., N.Y., July 10, 1851.

G. G. Ruel, Chief Solicitor, Canadian Northern Ry., Toronto, born at St. John, N.B., July 5, 1866.

P. E. Ryan, Secretary, National Transcontinental Railway Commission, Ottawa, born there July 26, 1876.

Geo. Stephen, General Freight Agent, Canadian Northern Ry., Winnipeg, born at Montreal, July 5, 1870.

R. F. Struthers, Chief Inspector of Time Service, C.P.R., Winnipeg, born at Stratford, Ont., July 31, 1879.

Sir Thos. Tait, President, Fredericton and Grand Lake Ry and Coal Co., born at Melbourne, Que., July 24, 1864.

H. T. Wilgress, Agent, C.P.R. Pacific Steamship Service, Yokohama, Japan, born at Lachine, Quebec, July 29, 1857.

The Death of James Stephenson.

On June 5, W. Wainwright, Vice President, G.T.R., Montreal, received a cablegram stating that his brother in law, James Stephenson, had died at Clevedon, Somerset, Eng., as the result of an accident. Only a few days before Mr. Wainwright had received a letter from him, written in the best of spirits and saying that he was in excellent health. Subsequently Mr. Wainwright received a letter from Mrs. Stephenson giving particulars of the accident. Mr. and Mrs. Stephenson had been in London, where they had celebrated Mr. Stephenson's 75th birthday. They reached home about 5 p.m. and after reading some letters that had arrived during his absence Mr. Stephenson went upstairs. The supposition is that in coming down he missed his footing at a turn in the stairs and fell the whole flight to the bottom, striking his head, which brought on concussion of the brain. He did not regain consciousness and died at 3 a.m. the following day. He was buried at Weston Super Mare, where his mother-in-law, Mrs. Arnold, formerly of Toronto, is buried.

Mr. Stephenson was born at Lancaster, Eng., in June, 1837. On coming to Canada in 1855 he entered the British American Telegraph Co.'s service, and in 1856, on its amalgamation with the Montreal Telegraph Co., entered the Grand Trunk Ry. service as telegraph operator, afterwards occupying the following positions in the same company's service:—1861 to 1862, train dispatcher, Kingston, Ont.; 1862 to 1863, agent at Don, Toronto; 1863 to 1867, Assistant Superintendent, Toronto; 1870 to 1874, Assistant Superintendent, Kingston; June 29, 1874, to June 13, 1881, Assistant Superintendent, Montreal; June 13, 1881, to July 1, 1884, General Passenger Agent; July, 1884, to Feb. 16, 1896, Superintendent, Montreal. In the latter year he was superannuated and went to England to live, first going to Weston Super Mare, and in 1910 removing to Homeleigh, Walton Park, Clevedon, a short distance from Weston Super Mare.

During the Fenian raid in 1866 he enlisted in the volunteer militia and went to the front, subsequently becoming captain and then major, and retiring in 1871, retaining the latter rank. He married a daughter of the late Richard Arnold, of Toronto, and sister of the late Mrs. Wm. Wainwright. He visited Canada in 1911, receiving a warm welcome from old colleagues and other friends. He was one of the earliest subscribers to The Railway and Marine World.

National Transcontinental Railway Construction.

Owing to the revision of certain drawings, the commissioners extended the time for receiving plans for station and other buildings referred to in our last issue, from May 31 to June 14.

It is reported that on the 578 miles in District B, extending from the New Brunswick boundary to Megiskin bridge, grading is completed on all but 80 miles; and that of the mileage on which track has been laid, only 30 miles have yet to be ballasted.

The Quebec city council has decided to call the Government's attention to the fact that when the Champlain market was sold for \$100,000, it was on the understanding that it was to be used as the terminal site for the National Transcontinental Ry. and to ask the Government to carry out the agreement made.

The Quebec board of trade has passed a resolution urging the commissioners to push forward the work on the line between Quebec and Cochrane, Ont., so that it may be completed at the same time as the line easterly to Cochrane. This section of the line, R. W. Leonard, commissioner, stated would be ready for operation by the end of the year. The contractors are operating a bi-weekly train service from Cochrane easterly to Peter Brown Creek, 150 miles, and bi-weekly from Cochrane westerly to Crow Creek, 103 miles. (June, pg. 291.)

Grand Trunk Pacific Railway Construction.

The Port Arthur, Ont., city council, discussed the company's plans for entering that city, June 15. The company informed the council that it will start construction almost immediately on the line along Empire avenue. At Fort William, the company is preparing to build its line into the union station, now that the Board of Railway Commissioners has approved of location plans for the line in accordance with the agreement between the city and the C.P.R., an order which rescinds that made Oct. 6, 1909. The company is also laying additional tracks in the Mission River yards.

The Board of Railway Commissioners has approved of revised location plans for the Regina-Moose Jaw branch from mileage 0 to 2.1, and a diversion of 0.4 of a mile at mileage 36.4.

Surveys are reported completed by the party under — Silcox, for a line from Watrous, through Swift Current, Sask., to the international boundary. The first 50 miles of the line is said to have been definitely located, and it is reported that construction will be started early next year.

D. McPherson, representing McPherson and Quigley, is quoted as stating that his firm has completed the last of the masonry and concrete work for the bridges, etc., on the Tofield-Calgary line, and that according to the present rate of progress, track will be laid and the line ready for operation into Calgary in the fall.

Reports from construction gangs, quoted in Edmonton, June 14, state that grading is practically completed to 140 miles west of the British Columbia boundary, and that considerable grading has been done west of that point on the 100 miles intervening to Fort George.

Grading gangs are at work west of Fort George. It was expected to have steel laid to Tete Jaune Cache, 53 miles from the B.C. boundary line, June 30, but this depended upon a 2,000 ft. tunnel being completed at mileage 47. Two steamboats and 12 gasoline launches are employed in transporting men and materials from Tete Jaune Cache, on the Upper Fraser River, to the camps in the direction of Fort George.

The line from Prince Rupert, B.C., has now been opened for traffic as far as the Skeena River, 164 miles, the Board of Railway Commissioners having given its approval for the opening of the last 64 miles, June 4. The construction of the bridge across the Skeena River is well advanced, and it is expected to have it completed early in July. Work is well advanced between this point and Hazelton, and track will be laid into it as soon as the bridges are completed. There is still a lot of heavy work to be done east of Hazelton to Mud Creek. (June, pg. 291.)

Little Current Channel Bridge, Algoma Eastern Railway.

The Algoma Eastern Ry., the construction of which was described in *The Railway and Marine World* for June by the Chief Engineer, will cross the channel between the mainland and Manitoulin Island. The small intervening islands are being utilized to make the spans required shorter. All but one of the bridges are solid spans, as the channel between Goat and Manitoulin Islands at Little Current is the only one required to be open for navigation. In consequence a swing or lift bridge was necessitated at this point.

The present plans call for a 372 ft span swing girder, with approaches from each side, giving two clear channels 150 ft. wide. The Little Current approach is across a single 60 ft. deck plate girder, and the approach at the other end is across two 70 ft. deck plate girders. The swing bridge pier is circular, 31 ft. in diameter below the water line, and 28 ft. above. The swing bridge abutments and the approach girder piers, as well as the land abutment piers are all of concrete, and with the central swing girder pier of the same construction, run down to bed rock, which is at the bed of the channel. The central pier extension, on to which the swing revolves, is 425 ft. 9 ins. long by 49 ft. wide. The embankment approaches from the Little Current end are short, while that on the other end is of some length. The bridge and approaches are on a tangent and level, at an elevation of 636.00, or 23 ft. above the mean water level. The whole structure has been approved by the Minister of Public Works, and was designed to conform to the Dominion Government specifications of 1908, class I. This is the plan that has been filed, but there is under discussion the substitution of the swing span by a bascule lift span, with consequent change in the present arrangement.

Railway Finance, Meetings, Etc.

Canadian Pacific Ry.—On his return to Montreal, June 10, Sir Thomas Shaughnessy was reported to have stated, in regard to the rumors that the C.P.R. shares would be split and arranged to cover separately, the land, steamships and railway departments, that the directors had given no thought whatever to such a proposal, and, in any case, it would not be legal.

Dominion Atlantic Ry.—Approximate passenger earnings for May, \$51,740.95; freight earnings, \$51,657.87; total earnings, \$103,398.82, against \$97,100, total earnings for May, 1911.

Grand Trunk Ry.—The G.T.R. is reported to have arranged with Blair and Co., and the Bankers Trust Co., New York, for the financing of \$4,483,675 of 5% equipment trust notes repayable in 10 years.

Kootenay Valley Ry.—Press reports recently stated that the C.P.R. had purchased the K.V. Ry., running from Bonners Ferry, Idaho, to Creston, B.C., and that the transfer would be made June 1.

We are officially advised that there is nothing in the report.

Montreal and Vermont Junction Ry.—Following are the officers and directors for the current year:—President, E. H. Fitzhugh; Vice President and Managing Director, G. C. Jones; Auditor, W. G. Crabbe; Secretary Treasurer, A. H. Gilmour; Assistant Secretary Treasurer, W. H. Chaffee.

New York Central and Hudson River Rd.—There has been deposited in the office of the Secretary of State at Ottawa a lease and agreement, dated Apr. 23, between the Guaranty Trust Co., New York, and the N.Y.C. and H.R. Rd., the Lake Shore and Michigan Southern Rd., the Michigan Central Rd., and the Cleveland, Cincinnati, Chicago and St. Louis Ry. The Canadian interests affected by the lease and agreements cover the Canada Southern Ry., an interest in the Toronto, Hamilton and Buffalo Ry., the Ottawa and New York Ry., the St. Lawrence and Adirondack Ry., and the Rutland and Noyan Ry.

Pere Marquette Rd.—The U.S. court at Detroit, Mich., has authorized the receivers to raise \$3,500,000 to take \$1,800,000 of equipment obligations now due, to provide for the purchase of further equipment, and to make improvements on the line. The order also permits the receivers to pay out of the earnings of the line interest on the underlying mortgages as it becomes due.

Quebec Central Ry.—Under the provisions of acts passed last session of the Quebec Legislature amending the company's charter and confirming an agreement between the Q.C. Ry. and the C.P.R., meetings of bondholders were held in London, Eng., June 12, when resolutions consenting to the terms and stipulations of the first act, and the schedules attached thereto were passed. The holders of the 4% debenture stock met first; then the holders of the 3% debenture stock, and then the holders of income bonds. A special meeting of shareholders was subsequently held and resolutions as to the lease of the line of the C.P.R. were adopted.

A London, Eng., cable, June 12, states that the lease to the C.P.R. was approved, and that it will become operative Dec. 31, after having been approved by the C.P.R. shareholders. Under the terms of the lease the interest on all the Q.C.R. securities is guaranteed by the C.P.R. for 999 years. The directors will be appointed jointly by the C.P.R. and the holders of securities. The company's head office has been transferred from England to Canada, where all future meetings will be held.

Quebec Central Ry.—Gross earnings for April, \$107,371.25; expenses, \$67,633.37; net earnings, \$39,737.88, against \$104,176.10 gross earnings; \$65,901.30 expenses; \$38,274.80 for April, 1911. Aggregate gross earnings for 10 months ended Apr. 30, \$1,067,441.22; expenses, \$737,097.96; net earnings, \$330,343.26, against \$964,536.49 aggregate gross earnings; \$661,461.44 expenses; \$303,075.05 net earnings for same period 1910-11.

Toronto, Hamilton and Buffalo Ry.—At the annual meeting at Hamilton, Ont., June 4, the following were elected directors for the current year:—J. N. Beckley, W. C. Brown, Nicol Kingsmill, H. B. Ledyard, D. McNicoll, W. H. Newman, Sir Edmund Osler, W. L. Scott, Sir Thomas Shaughnessy, W. P. Torrance and W. K. Vanderbilt, Jr.

White Pass and Yukon Route.—Gross earnings for four months ended Apr. 30, \$81,439, against \$131,570 for same period, 1911.

The Board of Railway Commissioners has notified railway companies to show cause why a general order should not issue requiring railway companies to furnish a heated car service.

Automatic Signals of the Toronto, Hamilton and Buffalo Railway.

The T.H. and B. Ry.'s annual report for 1911 shows that \$18,136.58 was expended on automatic signals between Hamilton and Vinemount, Ont., 11 miles. From Kinnear to Vinemount, 7 miles, the line is single track and the signals are so arranged and controlled that as against opposing trains this is one block section, while for following movements several trains may follow one another through short block sections. The arrangement of these signals is shown in the accompanying illustration. Vinemount is a regular passing point. Kinnear is a day and night telegraph office. Six regular passenger trains run in each direction over this section daily, and a similar number of regular freight trains. In addition there from one to five extra freight trains daily. There is a heavy descending grade westbound, signal 27.1 being 301 ft. higher than signal 33.2. This amounts to nearly a 1% grade. The signalling between Hamilton and Kinnear, about three miles, has no special features. Power semi-automatic home signals have been provided in connection with the mechanical interlocking plant at the G.T.R. crossing. The entrance to the receiving yard is at Kinnear.

On account of the heavy up grade from Kinnear to Vinemount, three eastbound intermediate signals have been provided to permit close headway between eastbound trains, whereas only one westbound intermediate signal is required on account of the higher speed of

the same facility is afforded for following trains as in the case of double track signalling.

All intermediate signals are permissive. They are not required for protection against opposing trains, but only to facilitate following movements. It should be mentioned, however, that when 27.1 clears for a westbound train, signals 29.2, 31.2 and 33.2 are set in the stop position; and signals 34.2 and 35.2 are, of course, prevented from clearing. Likewise, when 34.2 clears for an eastbound train signal 31.1 is set in the stop position as well as 27.1 being prevented from clearing.

This arrangement is that of the A.P.B. block system, devised by the General Railway Signal Co., which installed the signals.

Regulations for Prevention of Forest Fires by Railways.

Order 16570, dated May 22, of the Board of Railway Commissioners, covers the method of equipping locomotives so as to prevent them from being a cause of forest fires, and at the same time lays down the liabilities and requirements of railway companies in the event of such a conflagration occurring. The order cancels earlier orders 3245, 3465, 8903 and 15995, bearing on the same subject.

Every locomotive must be so equipped with smokebox netting as to prevent the discharge of live cinders. When equipped with an extension smokebox, the whole space through which the smoke ascends must be covered with a mesh

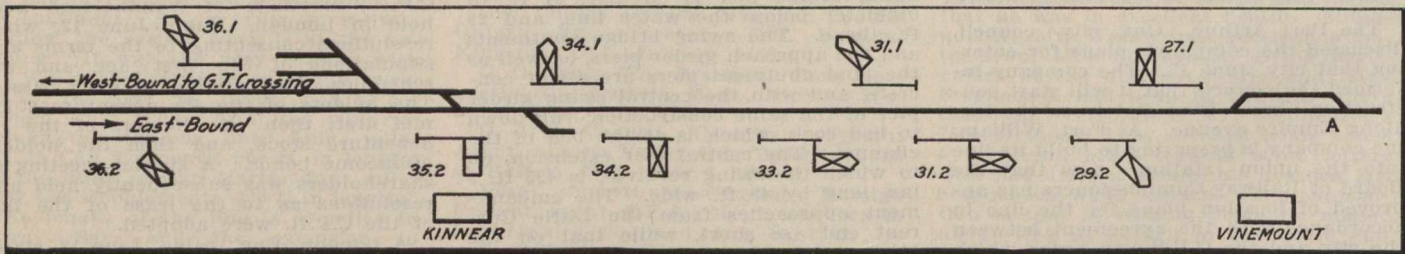
or the front dampers open when running tender first. The depositing of fire or live ashes upon the tracks or right of way outside the yard limits unless immediately extinguished, is forbidden.

Lignite is not to be permitted as a fuel on locomotives unless otherwise ordered by the board.

The railways are ordered to establish and maintain such fire guards along the line as the chief fire inspector may prescribe, the latter submitting to each railway annually a statement of the measures deemed necessary to maintain the line safe from fire. These measures may provide for the cutting and disposal by fire of all the debris and undergrowth, and the ploughing up of strips on one or both sides of the line as local conditions require, the intention being to adjust the protective measures to the local conditions to the degree of making the expense proportionate to the fire risk and the possible damage.

Cultivated lands are not to be entered upon for the erection of such protective appliances except by the consent of the occupant, the matter being immediately referred to the board in the event of a refusal.

In carrying out the provisions of the Railway Act concerning the removal of dead grass, etc., from the right of way, the railways are forbidden to burn any ties, cuttings, debris or litter on or near the right of way between Apr. 1 and Nov. 1, except under such supervision as will prevent the spreading of the fire beyond the strip. The chief fire inspector or authorized member of the board may require all such burning to be carried out under a written order.



Arrangement of Block Signals, Toronto, Hamilton and Buffalo Ry.

westbound trains. Signal 31.1 governs movements to the westbound main of the double track section and clears as soon as the switches are set for this movement, provided the block is unoccupied. Signals 27.1 westbound and 34.2 eastbound govern movements into the single track block between Kinnear and Vinemount. Signal 34.2, is provided in order to hold mount. Signal 35.2, which repeats signal eastbound trains back of the crossover at the end of the double track, when a westbound train is approaching. Signal 35.2 is always regarded as a nabsolute signal, except under orders from the operator at Kinnear, and such orders are given only for switching movements into the yard. In case it is desired to make a switching movement from the eastbound track into the yard ahead of a westbound train which has not yet reached Vinemount, the operator opens a switch which prevents signal 34.2 from clearing; and this in turn leaves signal 27.1 free to clear for a westbound train.

Signal 27.1 clears when a westbound train enters the preliminary section at point marked "A," provided no opposing train has cleared or passed signal 34.2 and there is no preceding westbound train nearer than signal 31.1. As soon as a westbound train has cleared the block between 27.1 and 31.1, a following train will get a 45 degree indication. Signal 27.1 will give a 90 degree indication if the preceding train has passed signal 34.1.

The signal operation for eastbound trains is similar to that westbound, following trains getting the 45 degree indication when running one block apart and the 90 degree indication when running two blocks apart. In other words

not larger than 2½ by 2½, No. 10 b.w.g., the openings in this screen not to exceed 17-64 in. square. Diamond stacks are to have 3 by 3, No. 10 b.w.g., screen at the flare of the stack, the mesh openings not to exceed 13-64 in. square.

The ash pans are to have sheet iron dampers where practicable, and where it is not, 2½ by 2½, No. 10 b.w.g., netting, such dampers to be secured by heavy springs or a split collar. Overflow pipes from the injector or boiler are to connect into the front and rear of the ash-pans in order that they may be properly wetted, and are to be used yearly from Apr. 1 to Nov. 1, unless otherwise directed.

Inspectors must be provided by the companies at divisional and terminal points to examine, at least once a week, the netting, dead plates, ash pans, slides and all other fire protecting appliances, and to keep a record of every inspection, recording the locomotive number, time, condition of apparatus, and record of the repairs necessitated, this book to be open for inspection by the board. No locomotive must be permitted to operate on the discovery of any defects, until repaired. The railway must also appoint special inspectors to make an independent examination monthly, and to report the results of the inspection to the chief official responsible for the operation of the motive power. An authorized official of the board is to be free at any time to make an examination of the locomotive equipment.

Employees are to exercise extreme care in not injuring the fire-protecting appliances, and to see that the back dampers are not open when running ahead,

The railways shall provide and maintain a sufficient force of rangers from Apr. 1 to Nov. 1 each year for an efficient patrol, the methods of the rangers being subject to the approval of the chief fire ranger. The annual statement of the chief fire ranger to the railway shall provide for the number of men with their stations and duties, the acquisition and location of the necessary equipment for the transportation of the tools and force from point to point, and any other measures that are considered to be essential by him.

Railways that use oil as a fuel exclusively on all or any portion of the system, shall be relieved of such part of these requirements as may seem to the Board safe and expedient.

All employes shall be ever alert to report the existence and location of a fire, train employes reporting to the agent at the nearest telegraph station and to the first section employes passed, it then being the duty of the person advised to notify the nearest fire rangers. Any fire presumably started by a railway shall be attended to either independently or under direction by the section hands or other employes that are available, provided those employes are not at the time engaged in labors immediately necessary to the safety of trains. When the men available are not sufficient, the railway shall employ such other men as are considered necessary, and when the extra men thus obtained are sufficiently numerous, the regular employes may be returned to their usual occupations. In this connection, any fire starting within 300 ft. of the track shall be presumed to have started from the

railway, unless proof to the contrary is furnished.

For the violation of any of these regulations, the railway shall be liable to a penalty of \$100 for each offence in addition to any other liability incurred. Any employe or party included in the regulations, and who fails to obey them, is subject to a penalty of \$25 for each offence, in addition to his other liabilities.

Grand Trunk Railway Betterments, Construction, Etc.

Southern New England Ry.—The Governor of Massachusetts has signed the act of Legislature authorizing the building of an extension into Boston and other lines to connect with the projected extension to Providence, R.I.

The extensions proposed to be built in Vermont, New Hampshire, Massachusetts and Rhode Island total 208 miles, and will serve a rich agricultural and manufacturing district. The S.N.E. Ry. is a subsidiary of the Central Vermont R'y., and will have outlets to ocean ports at Boston, Mass., and Providence, R.I. The Central Vermont Ry. has an ocean port at New London, Conn., and the G.T.R., which owns the C.V. Ry., has an ocean port at Portland, Me.

The Boston line will branch off from the C.V. Ry. at Bellows Falls, on the Vermont-New Hampshire State line, and will be over 100 miles long. Preliminary surveys have been made, but the route is not yet finally determined. The contract for the line to the Rhode Island boundary at Woonsocket, R.I., has been let to J. Marsh, Chicago, Ill.; and that for the line to Providence has been let to the O'Brien Construction Co., New York.

We are officially advised that G. M. Thompson has been appointed engineer in charge of surveys for the section of the projected lines of this company in the state of New Hampshire.

Montreal Track Elevation.—The Chief Engineer estimates that the proposed track elevation will cost over \$1,000,000 in excess of the amount originally proposed, when the city of Montreal undertook to contribute \$200,000 towards it. The company is asking for an increased contribution, which the city council is opposing. A proposition has been submitted to the board of control with a view of having the tracks depressed instead of elevated, with subways at the street crossings, and it is contended that this plan will cost less than the original estimate for the elevation.

Ottawa Station and Hotel.—The new central station and hotel were opened to the public June 1.

Brockville Roundhouse.—A new roundhouse with 47 stalls is projected at Brockville, Ont. On its completion a new station will be built at the head of Buell St., according to press reports.

Toronto Union Station.—Workmen started work June 4, clearing the debris of the fire of 1904, on the site secured for the new union station. The real work of building the station will not be undertaken, however, according to a statement of Vice President Kelley, until the work of grade separation from Bathurst St. is well forward. The plans for this have been finally approved by the Board of Railway Commissioners, and arrangements are in progress for putting it in hand.

Woodstock-Sarnia Track Relaying.—We are officially advised that the track between Woodstock and Sarnia, Ont., is to be relaid with 100 lb. steel rails. (June, pag. 292.)

S. G. Ferguson, engineer, Intercolonial Ry., Chaudiere Jct., Que., in remitting his annual subscription, writes: "I consider The Railway and Marine World of great value and interest to us railway men."

C.P.R. Passenger Terminal and Office Facilities at Vancouver.

Plans have been prepared and work is now under way on extensive improvements in connection with the passenger terminal at Vancouver, B.C. The present passenger station, which is located at the foot of Granville St., near the shore line of Burrard Inlet, was built about 14 years ago, and except for minor alterations, is unchanged from its original plan. The general waiting room and ticket offices are at the street level, and the baggage room is on the track level, which is about 30 feet below the street.

Along the water front across the local freight yard tracks are located the steamship wharves. There are two large sheds on a jetty pier of recent construction used by the C.P.R. trans Pacific steamship lines; also five sheds adjoining the longitudinal wharves used by the C.P.R. Victoria, Seattle, Alaska and other steamship lines. Between the wharf sheds and the passenger tracks adjoining the passenger station certain of the freight tracks serve the several sheds, and other tracks are used for drilling and storage. The yard tracks extend along the harbor front about a mile and a half.

By reason of its favorable location and the transportation facilities afforded by C.P.R. enterprise, Vancouver has grown from a trading camp to a well established city with over 125,000 inhabitants in about 25 years time. All business lines are represented in the commercial field centring at the city. Situated at the terminal of the first, and still the only, Canadian transcontinental railway on a fine natural harbor and with other favorable surroundings, its growth has been based on advantages which ensure continued growth and permanency, and there is every indication that its population will be not less than 300,000 at the end of the next decade. The past growth has rendered inadequate the present facilities for handling the C.P.R.'s terminal business and the general plan adopted has been designed to relieve the present congestion, as well as to provide for reasonable growth in the near future.

The general scheme embraces a passenger station and office building located on available land immediately east of the present passenger station. There will be four passenger tracks, with provision for more when required, separated by wide platforms, between the station and the present freight yard. The passenger tracks are to be raised about 5 ft. above the present track level to reduce the difference in level between the street and the tracks to about 25 ft.

In order to avoid an inconvenient grade crossing and delays to traffic between the city and steamship wharf a bridge on the line of Granville St. extended, is to pass over the passenger and freight tracks to the steamship pier and connect directly with passenger accommodations on the pier. An incline is also to be built leading from the west side of this bridge to the wharf, giving access to the lower deck of the pier and freight sheds and the water front. Another viaduct over the tracks is to be built on the line of Burrard St. extended northerly, with an incline giving access to the present trans Pacific pier and other portions of the water front.

The main entrance of the passenger station will be on Cordova St. with the main waiting room located centrally in the station on the street level. Ticket offices serving the several classes of railway and steamship passengers will be located at one end of the waiting room, and the baggage checking room, luncheon and dining room, parcel room, women's waiting room, men's smoking room, news booth, information booth and other facilities will be all placed

immediately adjoining the main waiting room.

On the lower floors of the station will be the baggage rooms, express company's space, immigrants' rooms, supply rooms, and other station facilities not directly used by passengers. Stairways and lifts will connect the two levels of the station and also afford communication with the office floors above. A separate foot bridge will be carried over the passenger tracks directly connected with the waiting room at one end and with stairways leading to the track level, giving access to platforms without crossing tracks at grade. The track platforms will be 1,000 ft. long and will be covered with shelter sheds of the umbrella type. The platform adjoining the station will be used only for baggage express and supplies.

Above the public rooms of the station building the space will be devoted to the company's offices. The interior arrangement of the office space will be adapted for a unit system of sub-division; that is, each panel will have heating and lighting facilities so that partitions may be placed or removed at will in order to provide for changes in arrangement of office accommodations which may be desired from time to time.

The proposed steamship station on the pier will be a two level building, the upper floor being devoted to the passenger business and offices and the lower floor to freight, baggage and express. There will be double level gangways on the west side of the pier, which will be used for the Victoria and Seattle service, the lower gangway being used for freight and the upper for passengers; these gangways to be supported on floating pontoons to maintain the landing at a constant level with respect to the boats. On the passenger or upper level of the pier will be waiting rooms, ticket offices, baggage checking room, customs office and other conveniences. Separate rooms will be provided for outgoing and incoming passengers. Two tracks will be placed on the surface of the pier within the shed, and one track on the outside of the building for the direct handling of freight between cars and steamers.

The essence of the general design has been to secure easy lines of communication between the railway trains, steamers and the city. The traffic conditions at Vancouver are unusual as compared with other large terminals on account of the absence of suburban business. The aggregate number of trains is not large, but they are long and frequently are run in several sections and contain a number of classes of traffic.

The designs for the terminal have been prepared by Westinghouse, Church, Kerr and Co., New York and Montreal, in co-operation with C.P.R. officials, and the construction of the station and facilities is being carried out by the same organization.

Dominion Railway Subsidy Agreements.

The Dominion Government has entered into agreements with the following companies, under the act granting aid for the construction of railways:—

SOUTHAMPTON RY., May 14.—From Millville, N.B., to the St. John river, near Pokiok bridge, 13 miles.

DOMINION ATLANTIC RY., June 1.—From the main line to the Government pier or wharf at Canning, N.S., one mile.

JOLIETTE AND LAKE MANUAN COLONIZATION RY., June 11.—From Joliette, Que., to near Lake Manuan, 60 miles.

NORTH RY., June 12.—From near Montreal, to mileage 837 west of Moncton, N.B., on the National Transcontinental Ry., and from that point, northerly and northwesterly 300 miles.

FREDERICTON AND GRAND LAKE COAL AND RY. CO., June 13.—From Gibson, N.B., to near Minto, with a branch to Marysville, 35 miles.

Canadian Pacific Railway Construction, Betterments, Etc.

Quebec Terminals Proposals.—A modified proposal was submitted by the President to the Quebec city council, June 13, by which the company will accept 107,000 ft. on the south end of Victoria Park, instead of 225,000 ft., and in return give over to the city a portion of its property at Hare Point. The proposition is under consideration.

St. Martin's Jct. to Ste. Therese.—The Board of Railway Commissioners has authorized the opening for traffic of the second track on the main line between St. Martin's Jct. and Ste. Therese, Que., 7.22 miles.

Hull Station.—The President invited the Hull, Que., city council, June 4, to submit suggestions with regard to the new station which it is proposed to build there. The site selected is on Brewery St., at the junction of Frost St. and Chelsea Rd. It is proposed to utilize the old station for freight purposes only. Plans for submission to the C.P.R. are being prepared by the city engineer.

Ottawa Tunnel, etc.—The Minister of Railways recently stated that the Department would not decide upon the question of the proposed C.P.R. tunnel through the city for some time. In connection with this proposal it is reported that the C.P.R. has secured an option on the Russell House property.

Campbellford, Lake Ontario and Western Ry.—The Board of Railway Commissioners has authorized the making of a connection of this line under construction, with the C.P.R. Montreal-Toronto line at Glen Tay, Ont., and has approved of revised location plans from the point of the junction to mileage 2.08. The board has also approved of location plans for the line from mileage 58.5 to 68; from mileage 72 to 75.45; from 79.5 to the western boundary of Trenton; from mileage 106.7 to 123, and from mileage 140.63 to 147.89, all mileages being calculated from Glen Tay. It has also authorized the taking possession of certain portions of the right of way of the Canadian Northern Ontario Ry. at mileage 79.5.

Toronto Terminal Improvements.—In connection with the laying out of the old Government House site, etc., at Toronto, the Board of Railway Commissioners has authorized the company to make connections with the G.T.R., to take additional lands, and to divert lanes, near Clarence Square.

Islington-Weston Branch.—The Board of Railway Commissioners has dismissed the company's application to build a branch from Islington, on the Toronto-Windsor line, to Weston, on the Toronto-Owen Sound line. It is said that the project to build this line has been abandoned in favor of a line, which is now being surveyed, to connect the Hamilton-Guelph Jct.-Guelph line with the Owen Sound line near Bolton.

Collingwood Southern Ry.—C.P.R. surveyors were reported to be working in the vicinity of Litsa, Ont., June 13, on a line from Collingwood to a junction with the Toronto-Sudbury line.

Toronto-Owen Sound Line.—Press reports state that a resurvey of the line from Bolton to Owen Sound, Ont., is being made with a view of reducing gradients, and eliminating curves, notably the horseshoe curve at Caledon. We are officially advised that this is incorrect. The gradients on the section of the line from Toronto to Bolton Jct. were reduced, and a number of curves eliminated, at the time of the building of the line from Bolton Jct. to Sudbury.

Georgian Bay and Seaboard Ry.—A contract has been let to the John S. Metcalf Co., Montreal, for the erection of an addition to the grain elevator at Port McNicoll, Ont., the terminus of the line

on Georgian Bay. The addition will have a storage capacity of 2,000,000 bush., and will be similar in construction to the main building.

Car Ferry at Fort William.—The C.P.R. has a car ferry barge in operation at Fort William, connecting with Island No. 1. A temporary track has been laid from the city yards to the banks of the Kaministikwia River, and the ferry is used for the transfer of cars of construction plant and material.

Freight Yards at North Transcona, Man.—We are officially advised that the contract for the erection of a 1,000,000 bush. grain elevator, with cleaning facilities, has been let to the Barnett, McQueen Co., Minneapolis, Minn. The elevator is to be built of reinforced concrete throughout. It will have a capacity for receiving, cleaning and loading out to cars at the rate of 12 cars an hour, and a drying capacity of 1,000 bush. an hour. It will contain 140 bins, so that the individuality of cars of grain could, to a large extent, be maintained in passing through it. The general arrangement of the plant will admit of an increase of storage up to 15,000,000 bush., if required. The elevator will be operated by electricity.

Winnipeg-North Transcona.—It is reported that in connection with the laying out of the new yards at North Transcona, Man., a new line will be built about a mile north of the Winnipeg limits. To carry the line, two subways across streets, and a new bridge across the Red River, would be required.

Gimli Branch Extension.—Tenders are being asked for the clearing of the right of way for the extension of the Gimli branch, from its present terminus at Gimli to the Icelandic River, Man.

Portage la Prairie-Brandon Second Track.—Vice President George Bury made an inspection of the second track work, now practically completed between those points, June 7. The Board of Railway Commissioners has authorized the opening for traffic of the second track from mileage 92.4 to 105.7 from Winnipeg.

Saskatoon Office Building.—Plans have been completed, and tenders are being asked for the erection of an office building on 2nd Avenue, Saskatoon, Sask., at an estimated cost of \$200,000. The building will be four stories high, of steel, with stone and brick facings. The basement will be of full size, 50 by 148 ft. On the ground floor there will be ticket, telegraph, express and freight offices, and the three upper floors will be laid out in suites of offices.

Kerrobert Northeasterly.—The Board of Railway Commissioners has approved of location plans for the branch line northeasterly from Kerrobert, Sask., from mileage 20 to 36.09. This branch will connect with the branch line southerly from Wilkie, which is projected on the east side of Tramping Lake to Anglia. The contract for grading has been let to Dutton and Trenton, Winnipeg.

Weyburn-Lethbridge Line.—The western end of this line is being built as a branch of the Alberta Ry. and Irrigation Co.'s line, owned by the C.P.R., and starts at Stirling, from which point a branch runs westerly to Cardston. The route map as approved shows that the line will run almost due east for 36 miles. J. Timothy has the contract for 25 miles, and Foley, Welch and Stewart are building the line from the east. It is expected that track will be laid on a considerable mileage at the east as well as the west end this year.

Suffield Southwesterly.—In connection with the reported building of a line from Suffield, on the main line, to Kipp, between Lethbridge and Macleod, a con-

tract was let early in the season (see R. and M.W., April, pg. 177) to the J. G. Hargrave Co., Winnipeg, for 25 miles, and construction was started at Suffield in a southwesterly direction.

Bassano Branch.—The Board of Railway Commissioners has approved of revised location plans for the proposed branch from Bassano, Alta., for 35.39 miles in tp. 3, range 22 to 25, west of the 44th meridian.

Track Revision, Gleichen to Shepherd.—The Board of Railway Commissioners has approved plans for the revision of the line from Gleichen to Shepherd, Alta., mileage 0 to 16.

Alberta Central Ry.—The Board of Railway Commissioners has authorized the building of a bridge over the trail at Rocky Mountain House, Alta., and the diversion of the trail.

Strathcona-Edmonton Line.—The Board of Railway Commissioners has authorized the crossing of the Saskatchewan Ave., Edmonton, Alta., by an overhead bridge, and the crossing of Hardisty Ave., on the level. This is the extension of the line from Strathcona into Edmonton, for which the high level bridge is being built across the Saskatchewan River.

Edmonton Office Building.—A contract is reported let to C. W. Sharpe and Son, Winnipeg, for the erection of an office building in Edmonton, Alta., the estimated cost of which is \$300,000.

Double Track Work in the Rocky Mountains.—Sir Thos. G. Shaughnessy, President, is quoted as stating, June 11, that surveys were to be started at once for a second track through the Rocky and Selkirk Mountains. It was estimated roughly that the work would cost \$60,000,000.

Kaslo and Slocan Ry.—We are officially advised that the C.P.R. has agreed with the B.C. Government to reconstruct prior to Dec. 31, 1913, the K. and S. Ry. from Kaslo to Bear Creek, B.C. The line is a narrow gauge one, and it is to be made standard. The contract with the B.C. Government calls for the effectual maintenance and continued operation of the line as part of the C.P.R. system.

The line was taken over by the C.P.R. at the end of May, the officers and directors being as follows:—President, Geo. Bury; Vice President, J. S. Dennis; Secretary Treasurer, G. A. Walker, C.P.R. Solicitor, Calgary; other directors, T. Heeney, Calgary, and C. L. Stephenson, Kaslo.

The spur line from Three Forks to Bear Lake, which the C.P.R. has under construction, will connect with the K. and S. Ry. The contractors, Anderson and Co., have the grading nearly completed, and are having a connection made with the Sandon spur in order to get in material for the Seaton Creek bridge.

Vancouver Station, etc.—The Board of Railway Commissioners has approved of change in location of the station at Vancouver. The new building, according to a statement attributed to F. W. Peters, General Superintendent, will cost about \$1,000,000; the overhead viaducts to the docks, and the additions to the docks, will cost an additional \$1,500,000. The site of the new station will be just east of, and including a portion of the present building. The contract has been let to the Westinghouse, Church, Kerr Co., New York, and preliminary operations were expected to be started by June 30. The building will be six stories in height, four of which will be above the Cordova St. level. In connection with the station building there will be an overhead bridge carrying Granville St. right across the tracks to the new and enlarged docks. The agreement in connection with these matters was approved by the city council, May 30. It also provides for the building of bridges across the tracks to the waterfront at George

Harris St., at Dunsmuir St., and a subway at Carral Ave., in conjunction with the city.

Branch in North Vancouver.—The Board of Railway Commissioners has approved location plan for a line from mileage 115, Cascades subdivision, along the north shore of Burrard Inlet, to North Vancouver, 21 miles. (June, pg. 290.)

Traffic Orders by the Board of Railway Commissioners.

The dates given for orders are those on which the hearings took place, and not those on which the orders were issued:—

Rates on Coke from Hamilton and Toronto.

16453. May 6. Re complaint of Consumers Gas Co. of Toronto complaining that rates on gas house coke from Buffalo to Hamilton, Brantford and Toronto create an unjust discrimination in favor of Buffalo and against Toronto. It is ordered that the railway companies charge the following rates on coke per net ton in carloads of the minimum Hamilton to Toronto, Brantford and Bridgeburg, 50c; from Toronto to Hamilton, 50c; from Toronto to Brantford, 60c; from Toronto to Bridgeburg, \$1; and that the tariffs containing the said rates be published and filed to become effective not later than June 1, 1912.

Order 16707, June 4, amended order 16453, by substituting 40,000 lbs. for 30,000 lbs.

Classification of Gramophones.

16479. May 10. Re application of Berliner Gramophone Co., Ltd., of Montreal, for an order directing railway companies to add gramophones, boxed, to the musical instruments list in Canadian freight classification. It is ordered that in the Canadian freight classification the following articles be transferred from their present positions to the "musical instruments list," and that they be also included in the second class rating applicable to "Musical instruments, all kinds, not otherwise specified, carloads, minimum 12,000 lbs., viz.—Gramophones, gramophones, phonographs, records.

Order 16705, June 5, prescribes that order 16479 take effect, July 15.

Victoria and Sidney Railway Freight Tariff.

16507. May 13. Re application of Great Northern Ry. Co., under sec. 327 of the Railway Act, for the approval of its standard freight tariff of maximum tolls to apply on the Victoria and Sidney Ry. It is ordered that, pending the Board's decision in the enquiry into the tolls of railway companies in British Columbia generally, the applicant company's said tariff be approved.

Grand Trunk Pacific Railway Freight Tariff.

16528. May 15. Re application of Grand Trunk Pacific Ry. under sec. 327 of the Railway Act, for the approval of its standard freight mileage tariff C.R.C. 9, to apply from Prince Rupert east 170 miles to Carnaby, cancelling tariff C.R.C. 8. It is ordered that the said tariff, specifying the maximum mileage tolls to be charged for each class of the Canadian freight classification for all distances covered by the company's railway up to 170 miles, between and including Prince Rupert and Carnaby, be temporarily approved pending the result of the Board's enquiry into the rates charged generally by the railway companies west of and including Crow's Nest, Canmore, and Thornton; the said tariff to include and supersede the company's standard freight mileage tariff C.R.C. 8, approved by order 14524, Aug. 8, 1911.

Quebec Oriental Ry.—A meeting of the holders of 5% first and second mortgage gold bonds on the Matapedia section of the line is to be held, July 18, to authorize the creation of £50,000 of prior lien mortgage gold bonds or other security to rank in priority to the existing bonds.

Block and Truck Car for Wrecking on the Grand Trunk Pacific Ry.

The block and truck car for wrecking purposes shown in the accompanying illustration was designed by John B. Shelton, Car Foreman, G.T.P.R. shops, Transcona, Man, and since being put in service has proved its merits.

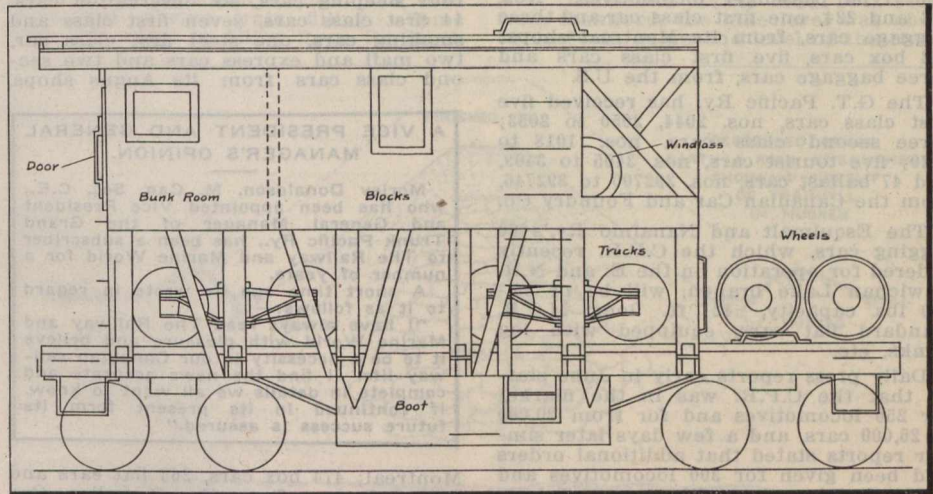
In the first place, a common flat car was used, erecting thereon heavy posts, braces and rods. The upper deck of the superstructure is used for wrecking blocks, with one end of this floor partitioned off to form a 6 x 9 ft. bunk room, containing two bunks, providing ample room for four men. In this room, which is 5 ft. high, there is also a provision closet and stove.

Under this upper deck, on the surface of the flat car, there is a store of trucks and wheels, which can be unloaded from either end of the car by the use of the windlass and rope. Between the wheels, there is room for a supply of steel rails and wrecking chains. In addition to this storage space and the store on the upper deck, a boot has been added, suspended from the sills under the car, in which are kept oil boxes, journal bearings, dope buckets, packing hooks and various other articles required by a repair car.

Automatic Block Signals on the Grand Trunk Railway.

The G.T.R. is installing an automatic block signal system on its western division in Indiana, as follows:—Maynard to Sedley, double track, 20 miles; Valparaiso to Grangers, double track, 55 miles; Valparaiso to Sedley, single track, 5 miles; Olivers to St. Joe River, single track, 2 miles.

On double track the signals will be automatic, bottom post, pull clear, three position type, operating in the upper quadrant and arranged to be worked "normal clear." On single track the system will be controlled manual with continuous track circuits. All the signals will be power operated. The materials and specifications will conform to the Railway Signal Association standards throughout. The type of signal to be used is the three position, normal clear, the semaphore indications being in the upper right quadrant. All the signals are to be power operated. Where the G.T.R. is crossed by other railways, interlocking plants are in service, but improvements are to be made to these which will become an integral part of the signal system. They will be equip-



Block and truck car for wrecking purposes on the G.T.P. Ry.

Securely fastened along each side of the car is a supply of heavy wire cables. In addition, the car is supplied with climbing ladders, sill steps, grab irons, uncoupling levers, etc., conforming with the Board of Railway Commissioners' requirements for safety appliances.

The windlass is geared, and has two 18 in. cranks, giving a sweep of 36 ins. Two men can thus unload a pair of trucks with ease, and, by the same arrangement, the car men can load defective trucks or wheels without the delay attendant on the use of a locomotive, which would block the track to passing trains and others that are required in the work of clearing the wreck.

Mr. Shelton resigned from the G.T.P.R. service since the above information was furnished us and has been appointed Car Foreman, C.P.R., at Moose Jaw, Sask.

B. J. Coghlin Co., Ltd., manufacturers of railway rolling stock springs, track tools, tie plates, etc., Montreal, whose factory has been on its present site since 1863, have bought a large block of land on Ontario St. East, between Davidson and Darling Streets, and have let contracts for the erection of a large factory and office building, which will double their present capacity. They will also put up a large warehouse for steel and have ordered considerable new machinery.

ped with power operated signals route locking, calling on arms, and tower indicators, which will give an advance indication of the approach of trains. Switch boxes will be installed on all switches and derails leading off the main line; while switch indicators of normal danger type are to be installed on all main line switches. The two short stretches of single track between Olivers and Studebaker and between Valparaiso and Sedley respectively will be operated and controlled by manual system with track circuit. Metallic signal blades will be used entirely. It is proposed to combine into one signal the automatic and beam morder functions where possible to do so. Double track junctions will be locked into the controlled manual circuit to facilitate the movement of trains entering the single track, and minimize the hazard. The spacing of the signals will approximate two miles. This spacing, of course, is modified for gradient, curvature, location of crossings and other physical features.

It is expected that the sections between Maynard and Sedley and Valparaiso and Sedley will be completed by Sept. 1, and the balance by Dec. 1. The Hall Signal Co. has the contract.

The installation of similar signalling between Toronto and Niagara Falls is contemplated, but up to June 17 it had not been authorized.

Railway Rolling Stock Notes.

The Canadian Northern Ry. has ordered two cafe-parlor cars, and six sleeping cars in the U.S.

The Intercolonial Ry. has ordered 50 box cars, 60,000 lbs. capacity, to be built at its Moncton shops.

F. H. Hopkins and Co., Montreal, have ordered two 30 ton Lidgerwood flat cars from the Canadian Car and Foundry Co.

The Dominion Iron and Steel Co. has ordered 10 limestone cars from the Canadian Car and Foundry Co., Montreal.

The Quebec Central Ry. has received two consolidation locomotives from the Canadian Locomotive Co., Kingston, Ont.

Press reports state that a private car for use by members of the Dominion Government has arrived in Ottawa from Dayton, Ohio.

The Temiskaming and Northern Ontario Ry. has received four consolidation locomotives from the Canadian Locomotive Co., Kingston, Ont.

The Reid Newfoundland Co. recently placed in service the fourth locomotive built in its shops at St. John's, Nfld. Four more of the same type are being built there.

The G.T.R. recently received two Pacific type passenger locomotives, Nos. 223 and 224, one first class car and three baggage cars, from its Montreal shops; 543 box cars, five first class cars and three baggage cars, from the U.S.

The G.T. Pacific Ry. has received five first class cars, nos. 2044, 2050 to 2053; three second class cars, nos. 1018 to 1020; five tourist cars, nos. 3405 to 3409, and 47 ballast cars, nos. 392700 to 392746, from the Canadian Car and Foundry Co.

The Esquimalt and Nanaimo Ry.'s 60 logging cars, which the C.P.R. recently ordered for operation on the E. and N.R. Cowichan Lake branch, will be of 80,000 lbs. capacity, 42 ft. long, M.C.B. standard flat cars, equipped with log bunks, etc.

Daily press reports early in June stated that the C.P.R. was in the market for 250 locomotives and for from 20,000 to 25,000 cars, and a few days later similar reports stated that additional orders had been given for 300 locomotives and 12,500 freight cars. We were officially advised June 13 that there was absolutely nothing in the reports.

The C.P.R., between May 13 and June 17, placed orders for additional rolling stock, as follows—nine stock cars, five refrigerator cars, two flat cars, one flanger and five vans, at its Angus shops, Montreal; four Jordan spreaders and 16 ballast ploughs, with F. H. Hopkins and Co., Montreal; one Lidgerwood un-loader, with Allis-Chalmers-Bullock, Ltd., and two wrecking cranes in the U.S.

The G.T.R. has ordered 41 Pacific type passenger locomotives, 4-6-2-S., with superheaters, cylinders 23 by 28 ins., total weight in working order 223,000 lbs., driving wheels, for 31 locomotives, 69 ins., diar., and for remainder, 73 ins. diar., from the Montreal Locomotive Works. We are also advised that an order has been placed with the Baldwin Locomotive Co., Philadelphia, Pa., for 19 Pacific type passenger locomotives. These are in addition to 15 switching locomotives, ordered from the Canadian Locomotive Co., Kingston, Ont., details of which are given elsewhere under this heading.

Following is a list of the rolling stock which the Canadian Northern Ry. has ordered for delivery during this year, of which mention has already been made in our columns, the greater portion having been already delivered:—4,100 box cars, 2,500 delivered; 1,050 flat cars, 950 delivered; 400 Hart cars, all deliv-

ered; 70 cabooses, 20 delivered; six snow ploughs, all delivered; one rotary snow plough, delivered; 136 locomotives, 75 delivered; 82 passenger cars, 45 delivered; 35 mail and baggage cars, five delivered; four dining cars, all delivered; two cafe parlor cars, all delivered; 10 sleeping cars, nine delivered.

The Intercolonial Ry., between May 22 and June 18, received the following additions to rolling stock—five consolidation locomotives from the Canadian Locomotive Co., Kingston, Ont.; four first class cars from the Preston Car and Coach Co., Preston, Ont.; one postal car from the Nova Scotia Car Works, Halifax, N.S., and one dining and two sleeping cars from the Pullman Co.

The Canadian Northern Ry., between May 15 and June 15, received the following additions to rolling stock—one sleeping car, five first class cars, 200 box cars from the Canadian Car and Foundry Co.; one flat car, one baggage and mail car and nine baggage cars from the Crossen Car Co., Cobourg, Ont.; 275 box cars from the Nova Scotia Car Works, Halifax; two consolidation locomotives from the Canada Foundry Co., Toronto, and six flat cars.

The C.P.R., between May 13 and June 17, received the following additions to rolling stock—92 box cars, 97 refrigerator cars, 121 stock cars, 23 vans, four sleeping cars, six observation cars, 14 first class cars, seven first class and smoking cars, one steel first class car, two mail and express cars and two second class cars from its Angus shops,

Boiler, type Radial stayed
Boiler, working pressure 190 lbs.
Tubes, No. and diar. 264—2 in.
Tubes, length 12 ft. 9 1/2 ins.
Brakes Westinghouse E. T. 6
Weight of tender, loaded 108,500 lbs.
Tank, capacity 5,500 U.S. gals.
Tank, type Sloping back
Coal capacity 8 tons
Truck, type Arch bar
Wheels, diar. 33 ins. M.C.B.
Journals 5 by 9 ins.
Brake beam G.T.R. standard

Canadian Northern Railway Earnings, Etc.

Gross earnings, working expenses, net profits, increases or decreases, compared with those for 1910-11, from July 1, 1911:—

Earnings.	Expenses.	Earnings.	Net Increase
July \$1,475,900	\$1,114,800	\$361,600	\$13,400
Aug. 1,420,600	1,105,900	314,700	51,700
Sept. 1,576,400	1,157,000	419,400	38,200
Oct. 2,028,900	1,348,500	680,400	99,900
Nov. 2,001,500	1,336,300	665,200	106,300
Dec. 1,831,400	1,327,600	503,800	144,600
Jan. 1,223,100	1,004,400	218,700	122,000
Feb. 1,203,400	965,800	237,600	101,800
Mar. 1,672,700	1,145,900	426,800	72,000
Apr. 1,608,100	1,205,000	403,100	42,000
\$15,947,000	\$11,710,700	\$4,236,300	\$791,900
Inc \$ 3,658,700	\$2,866,800	\$ 791,900	.....

Approximate gross earnings for May, \$1,822,100, against \$1,445,600, for May, 1911.

Average mileage operated, 3,888 miles, against 3,851 miles for the 1911 period.

Canadian Pacific Railway Earnings, Etc.

Gross earnings, working expenses, net profits, increases or decreases, compared with those for 1910-11, from July 1, 1911:

Earnings.	Expenses.	Net Profits.	Increases.
July \$ 9,661,818.14	\$5,958,789.81	\$3,703,028.33	\$218,408.74
Aug. 10,421,904.42	6,346,333.41	4,075,571.01	383,898.68
Sept. 10,049,084.97	6,131,638.17	3,917,446.80	5,847.16
Oct. 11,207,991.99	6,526,887.24	4,681,104.75	175,944.23
Nov. 10,570,694.80	6,583,328.31	3,987,366.46	250,244.23
Dec. 10,654,871.67	6,549,141.41	4,105,730.26	819,196.37
Jan. 7,323,781.81	6,245,924.11	1,082,857.70	426,739.83
Feb. 8,931,907.20	6,548,040.53	2,383,866.67	239,159.16
Mar. 10,519,328.76	6,800,317.65	2,718,401.11	561,834.57
Apr. 11,301,349.46	7,185,597.67	4,115,751.79	958,777.18
\$100,647,723.22	\$64,876,598.31	\$35,771,124.91	\$5,040,050.15
Inc. 15,271,622.54	\$10,251,572.39	\$ 5,040,050.15	.....

Approximate gross earnings for May, \$1,133,000, against \$9,111,000 for May, 1911.

Grand Trunk Railway Earnings, Etc.

Following are the earnings of the G.T.R., C.A.R., G.T. Western Ry., and D.G.H. and M. Ry., for April, as compared with those for April, 1911:—

GRAND TRUNK RAILWAY.		
	1912.	1911.
Earnings	\$3,199,400	\$2,879,144
Expenses	2,283,600	1,975,272
Net earnings	\$ 915,800	\$ 903,872
CANADA ATLANTIC RAILWAY.		
	1912.	1911.
Earnings	\$179,400	\$169,963
Expenses	149,200	143,405
Net earnings	\$30,200	\$16,588
GRAND TRUNK WESTERN RAILWAY.		
	1912.	1911.
Earnings	\$582,600	\$503,071
Expenses	484,600	461,189
Net earnings	\$98,000	\$41,882
DETROIT, GRAND HAVEN AND MILWAUKEE RY.		
	1912.	1911.
Earnings	\$175,500	\$146,587
Expenses	168,100	149,509
Net earnings	\$ 7,400	*\$ 2,922

* Deficit.
Approximate gross earnings for May, \$4,303,374, against \$3,942,055 for May, 1911.

TRAFFIC RECEIPTS OF THE SYSTEM.

Aggregate from Jan. 1 to May 31.			
	1912.	1911.	Inc.
G. T. R.	\$14,868,816	\$13,790,038	\$1,078,778
C. A. R.	841,288	797,414	43,874
G. T. W. R.	2,676,727	2,690,305	*13,578
D.G.H. & M.R.	828,256	818,199	10,057
Totals.	\$19,215,087	\$18,095,956	\$1,119,131

A VICE PRESIDENT AND GENERAL MANAGER'S OPINION.

Morley Donaldson, M. Can. Soc. C.E., who has been appointed Vice President and General Manager of the Grand Trunk Pacific Ry., has been a subscriber to The Railway and Marine World for a number of years.

A short time ago he wrote in regard to it as follows:—

"I have always read The Railway and Marine World with pleasure and believe it to be a necessity in our Canadian railway life. I find the news accurate and complete in details we all want to know. If continued in its present form its future success is assured."

Montreal; 474 box cars, 263 flat cars and five coal cars from the Canadian Car and Foundry Co.; 10 Rodger ballast spreaders from F. H. Hopkins and Co., Montreal; 35 stone cars from the Nova Scotia Car Works, Halifax, N.S.; 351 box cars from the American Car and Foundry Co.; 10 sleeping cars, and one wrecking car from the U.S.

O'Brien and Martin, railway contractors, Cochrane, Ont., have ordered 23 Hart convertible ballast and construction cars from the Hart-Otis Car Co., Montreal. Following are the chief dimensions:—

Length over end sills 36 ft. 8 ins.
Width over side sills 8 ft. 10 ins.
Length inside as hoppers 20 ft. 10 ins.
Length inside as gondolas 34 ft. 8 ins.
Width inside 8 ft. 8 ins.
Width over all 10 ft. 2 1/2 ins.
Width at top 9 ft. 10 ins.
Height from rail to floor 4 ft. 4 1/2 ins.
Height from rail to top of car 8 ft. 1 3/8 ins.
Height inside 3 ft. 9 1/4 ins.
Truck centres 26 ft. 8 ins.
Wheel base of truck 5 ft. 4 ins.
Length of hopper door opening 16 ft. 3 1/2 ins.
Width of hopper door opening 2 ft.

Following are chief details of the 15 six wheel switching locomotives which the G.T.R. is having built by the Canadian Locomotive Co., Kingston, Ont.

Weight in working order 139,500 lbs.
Wheel base 12 ft. 8 ins.
Heating surface, fire box 148 sq. ft.
Heating surface, tubes 1,772 sq. ft.
Heating surface, total 1,920 sq. ft.
Driving wheels, diar. 56 ins.
Driving wheel centres Cast steel
Driving journals, diar. and length. 9 1/2 by 12 ins.
Cylinders, diar. and stroke 20 by 26 ins.

Embankments and Foundations on the Toronto-Sudbury Branch C.P.R.

By A. C. Oxley, A.M. Can. Soc. C.E.

The C.P.R.'s Toronto-Sudbury branch was built in the years 1905-1909, and as the standards were of a very high type they may contain some points of interest. No curves over 4° were allowed, and the grades were limited to 3-10% compensated. These grades were successfully maintained, with the exception of a pusher grade of 8-10%, for some miles near Tottenham, mile 37. This difficulty will eventually be obviated when traffic demands it, by the substitution for freight purposes of 8 miles of 3-10% track for the present 3 miles of 8-10%. Velocity grades were allowed within the limits of 10 and 30 miles per hour for freight trains.

The intention was to insure a thoroughly solid road bed, rather than to keep initial expenses at a minimum, and as the greater part of the 225 miles runs through a rock and muskeg country, there was frequently some difficulty in attaining this result. This article, however, will deal only with the district between miles 22 and 182, north from West Toronto, from Bolton to Byng Inlet, as this was the part with which the writer became personally familiar during his four years' experience on the work.

The line may be divided into two sections, viz., the earth district and the rock district; the first running from mile 22 to 92, and the second north from mile 92 to 248.

On the south, or earth section, little difficulty was encountered either with foundations or embankments. Eventually all streams and gulleys will be bridged either by steel viaducts, or by concrete arches and embankments, but at the time a number of permanent timber trestles were built, several of them containing an average of 500,000 f.b.m. The bent of these trestles rested on piles driven to an average depth of 20 ft. or more, and the only settlement that has occurred has been on the ends of the trestles, where the bents rested on mud sills on the made embankment.

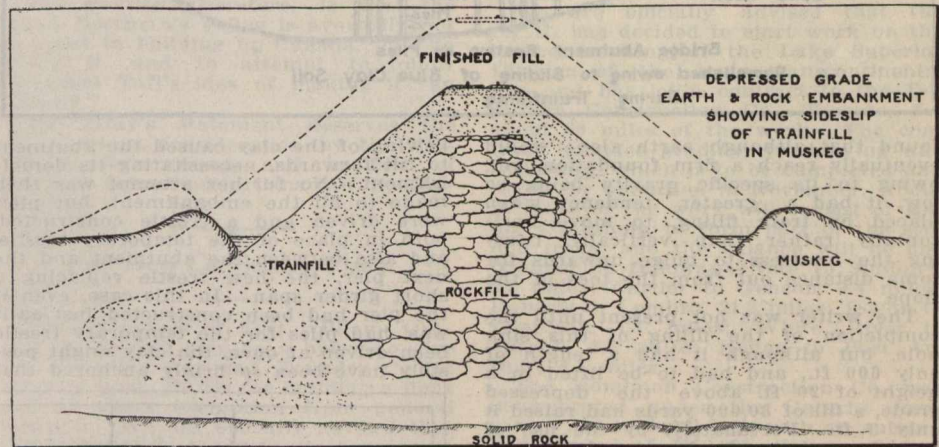
A curious instance of an over refinement of engineering occurred at the Nottawasaga River trestle. The trestle is about 700 feet long with a maximum height of 110 ft., and is located on the short tangent between two reverse curves. The trestle itself has an average elevation of 10 or 15 ft. below the general track elevation in the immediate vicinity. This is overcome by the use of 2,000 ft. of velocity grade of 6 or 7-10%, resulting in a high rate of speed for the consolidated locomotive that passes over it. This will easily be remedied, however, when the trestle is replaced by a steel viaduct, either by building the viaduct higher or by slightly reducing the little summits adjacent to it. The curves also may be somewhat lessened by turning the new viaduct in a direction more nearly parallel with the tangents.

In the earth section water openings were either concrete or glazed tile pipes for small drainage areas, with concrete arches for the larger ones. The pipes, on the whole, were very satisfactory, except that in a number of instances insufficient allowance had been made for their becoming reduced in area by being partially filled with water-washed sand; it was therefore necessary, under these circumstances, to replace 18 or 24-in. pipes with 4 ft. arches. The rule was to camber as high as the drop would allow, and the adjustment of the soil under the embankment was usually sufficient to take out quite a large curve, as shrinkage seemed to be due not only to settling of the deposited embankment, but chiefly to the sagging of even firm clay in such a way as to cause a low spot in a pipe laid flat, and the consequent tendency of the pipe to clog. The

culverts were the standard 1905 and 1906 types of concrete arches made in 20 ft. sections, to allow settlement. Piles were used in exceptional cases, a row under each side, but the general practice was to divert the stream far enough to secure firm soil.

In the rock soil, practically all openings of 8 ft. or less were built up of the excavated rock and laid without mortar, those over 4 ft. in width being made double, with the top constructed of flat lintel stones. These proved entirely satisfactory in the great majority of cases, as they were laid on solid rock a little to one side of the original stream.

We will now proceed to deal with the rock section, discussing particular points in the order of their mileage from the south end. At mile 102, near Buckskin, a rock embankment about 10 ft. high crossed a fairly dry muskeg, in which the rock was about 50 or 60 ft. down. No cross waying was ever permitted, as the intention was to have the rock embankment cut its way through the thin mattress of the dry surface of the muskeg; in this case the rock remained on the surface for about a year, and then gave way during train filling. Some time was spent in filling it, as its depth



allowed the train gravel to move sideways, but eventually bottom was reached after 3,000 Hart car loads of gravel had been placed in it. The only real objection to its sinking, when it did, was that the gravel used was high grade surface gravel which had to be hauled about 40 miles, as track laying had not then proceeded far enough to reach the more northerly, and thus more convenient, sand pits.

The only midway divisional point was at Muskoka, mile 126 from West Toronto. As this point was in the rock district the grading for it was rather heavy, the finished yard occupying an area, apart from the main pass siding, of about 3,000 x 300 ft., much of which was solid rock that had to be lowered about 10 ft. Water was obtained from the near by Stewart Lake, but, as it is not allowable to pollute the Muskoka waters, the sewers had to drain into the swamp on the other side of the track.

The general mode of procedure through the rock country was to make the rock cut only about a third of the embankment, as this quantity of rock would have sufficient weight to cut its way vertically through the mattress, and as soon as bottom was reached the remainder could be made by train filling. The efficiency of this method of forcing the sink holes through is shown by the fact that, train filling once completed, the percentage of derailments has been at least as low on this new road bed as on that of sections 20 years old or more.

This brings up an important question. If the intention is to have the weight of the rock cut its way through the mattress, and as it is only when it has done so and reached solid bottom that the earth filling becomes really effective, would it not be advisable, in some instances, before placing the rock fill, to cut right through the mattress parallel to the centre line, for instance, in the case of a thirty foot embankment, to cut two longitudinal ditches 40 ft. apart, and thus allow that whole section to sink vertically without deforming the surface at the side. Almost every case of deformation is caused by the sand or gravel floating sideways, and it does not become solid for some time.

Depressed temporary grades of 3% were allowed. In many cases small hillocks of rock were cut away to allow the temporary grades to descend to the centre of the larger gulleys.

At mile 124, during train filling, a low rock embankment, while carrying a locomotive, gave way suddenly, and the locomotive sank with such force as to shear the nuts in the track for 1,000 ft. or more. Between miles 112 and 142 a number of embankments were train filled from temporary trestles, and little trouble was experienced, although in many cases it was found necessary to lower the level of adjacent small lakes in order to give more solid bearing to the toes of the slopes.

At Richmond Lake, mile 101, south from Romford, the lake level was about 50 or 60 ft. below the level of the track.

A rock embankment rested firmly on the solid rock below, but was not carried up to grade, a trestle being used above water level. The water would probably seep through the rock fill, but, in the event of its not doing so, it would easily flow through the trestle at high water. At mile 76, south from Romford, occurred one of the heaviest train fills of the line, the depressed grade being 25 ft. at a maximum below the final grade, and as it was necessary in filling to cover the toes of a rock embankment up to 30 ft. in height, at least 250,000 yards of earth must have been used in this half mile of fill.

At mile 75.5, south from Romford, a temporary trestle beside a lake had been train filled, but the water had apparently dissolved the embankment and caused lateral slipping. The lake was small, and the lowering of its level about 4 ft. left the toe dry and firm.

In many instances where a comparatively dry muskeg was to be crossed, provision was made for thickening the dry supporting mattress by ditching and lowering the level of the water table. This was generally effective, provided there was solid soil in the mattress, but not invariably. At mile 70.5 from Romford, the track crossed a muskeg about 2,000 ft. long and from 20 to 40 ft. deep, with an embankment when completed about 4 ft. high. A drainage ditch was dug, leaving the water table only about 4 ft. below the level of the surface soil. The track crept very badly and made

sun kinks, elevations taken during the passage of a train showing track undulations of one or two tenths. The track was made safe for traffic and prevented from creeping by the substitution of 14-ft. bridge ties; later it was diverted to a side hill of solid rock and made thoroughly solid.

At mile 66.7, south, in order to make secure a muskeg, which for its length gave considerable trouble, a depressed grade was built, with a rock embankment about 10 ft. high, the lowest point of which was a maximum of about 20 ft. below the intended finished grade. In this case, although soundings showed a depth of 50 ft. or more to bed rock, the weight of the rock embankment was not in itself sufficient to slice through the surface mattress. This was somewhat unfortunate, as it was always

viaduct, at the same time leaving the bridge contractors a mile or more of blind main line for bridge yard purposes. The only difficulty occurred at one of the abutments at the South Nascoutyong River. In this case the abutment was carried to a depth of 10 or 15 ft. below the surface of the ground, and piles were then driven to bed rock, about 20 ft. further. Back of the abutment was a temporary trestle about 30 ft. high, resting on mud sills, the soil being an alluvial clay, which was kept moist by the presence of a stream less than 100 ft. away. No trouble was experienced with the abutment until train filling had proceeded for some time on the temporary trestle, when the earth filling caused a flow of the clay sub-soil, and, although the bases of the piles remained in their places on bed rock, the

Division Organization on C. P. R. Western Lines.

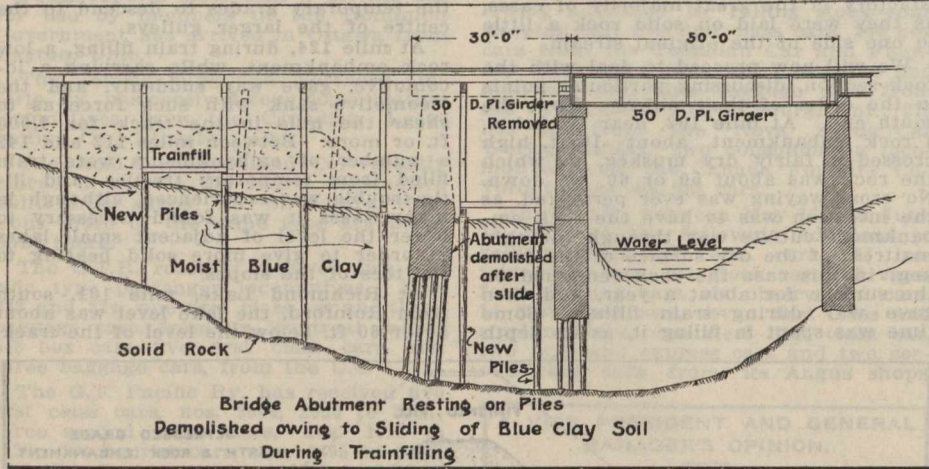
The organization of the operating and maintenance of way departments on the C.P.R. Western Lines is divisional, a system which is in force on the best operated railways in the United States. The difference between divisional and departmental organization is so well understood that it need not be dwelt on here.

To improve the ordinary divisional organization, the consolidation of the office work of the divisions and districts was arranged on the Western Lines.

The accompanying plan shows the layout of the General Superintendent's offices at Winnipeg, which may be regarded as typical. All the other grand divisions are arranged on the same principle, with the exception of the British Columbia division, which will be similarly arranged when the new station is built and the necessary room becomes available at Vancouver.

Under the old system the general superintendent had a separate staff, with a chief clerk in charge, the master mechanic, the divisional engineer and the car service agent, each had the same. Under the divisional organization, there is one clerical office for the general superintendent, divisional engineer, master mechanic and car service agent. All communications addressed to these several officers are opened in this general office, and are distributed to the various officers. This office organization is not only more economical in labor and stationery, but it gives the general superintendent greater control of his territory, eliminates red tape, minimizes office work, and enables the officers to spend more of their time on the line, and everyone knows that good operation is the result of the officers being out on the road as much as possible.

Under the old organization, if the general manager wrote to the general superintendent about a mechanical matter, the latter would, in turn, be required to write to the master mechanic, the master mechanic would write back to him, and he would in turn write to the



found that although earth alone would eventually reach a firm foundation, yet, owing to its specific gravity being so low, it had a greater tendency when placed by train filling, to move horizontally rather than vertically, causing the mattress to bulge upwards for some distance out from the toes of the slope.

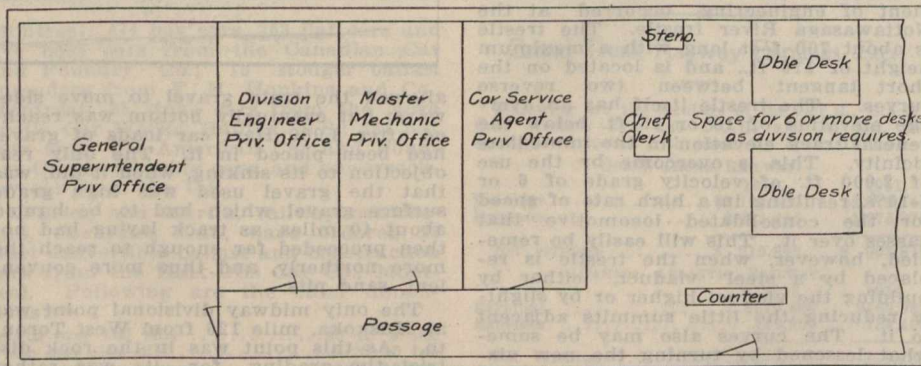
The writer was not present until the completion of the filling of this sink hole, but although it had a length of only 600 ft., and had to be lifted to a height of 20 ft. above the depressed grade, a fill of 30,000 yards had raised it only 3 ft. Fortunately, by the use of spreaders, the embankment while sinking retained a good surface and alignment, and no difficulty was experienced in running passenger trains over this temporary velocity grade.

The next large fill occurred at the crossing of the Magnetawan River, the valley of which is about 3,000 ft. wide. With the exception of three girder spans this valley was crossed by a timber trestle about 40 ft. high. In this case the length of the trestle helped to reduce the unit cost of filling, as it was possible to fill from temporary grades placed on each side of the trestle, and thus leave the main line open for traffic.

On this 160 mile section, with two exceptions, there were no steel bridges larger than plate girders the exceptions were at the Severn River, where there was a 200-ft. through Pratt truss, and at Parry Sound, where there was a viaduct 1,700 ft. in length. The largest span consisted of two Howe deck trusses of 165 ft. span. In the earth district all concrete was carried below frost line and rested on piles; while in the rock country the piers in almost every case rested directly on the rock itself.

During the construction of the Parry Sound viaduct a simple method was adopted to eliminate delay. The track was paralleled at the points by the Canadian Northern Ontario Ry., and running rights, or rather haulage rights, were given by that railway over a four mile section through Parry Sound. In this way it was possible to lay some twenty miles of steel north of Parry Sound during the construction of the

flowing of the clay caused the abutment to tilt forwards, necessitating its demolition. No further attempt was then made to fill the embankment, but piles were driven and a trestle constructed, both in place of the temporary trestle, and also between the abutment and the next pier, the new trestle replacing a short girder span. In this case, even if the pier had been constructed just as it was, had piles for the temporary trestle been driven at once, the clay might possibly have been so firmly anchored that



Arrangement of Offices, Manitoba Division, C.P.R., Winnipeg.

there would have been little, if any, horizontal movement.

The foregoing paper was read before the Canadian Society of Civil Engineers.

The Canadian Ticket Agents Association's annual meeting will be held in Ottawa, Oct. 9 and 10, instead of Oct. 8 and 9 as first arranged, thus obviating the necessity of staying over in Montreal for 30 hours, which would have been caused by the first arrangement. Ottawa will be left on the morning of Oct. 11, luncheon will be had at a hotel in Montreal; there will be afternoon tea on the Donaldson line s.s. Saturnia; the White Star Dominion line s.s. Laurentic will be boarded in the evening, and at daylight the party will leave Montreal for Quebec, where the members will disband.

general manager. This took time and stationery. Under the present system, letters coming to the general superintendent about mechanical, engineering and transportation matters are placed on his desk. He asks the respective officers to step in and discuss the matters, and he then hands the letters over to these officers, who call in a stenographer and dictate a reply to be signed by the general superintendent. This means that usually a letter is answered the same day as received.

The superintendent's offices on the Western Lines were also reorganized a little over a year ago. The superintendent, district master mechanic bridge and building master and road master's offices are located side by side, and they have one general office under one chief clerk and with one clerical staff.

**THE
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TORONTO, CANADA JULY, 1912.

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**The Great Northern Railway's Policy in
Canada.**

C. R. Gray, the newly appointed Pres-
ident of the Great Northern Ry., is
credited by a United States paper, En-
gineering News, with making the fol-
lowing statement:

"Millions of dollars are to be expend-
ed this year and next year in extending
lines into the virgin territory of Wash-
ington and Oregon, and into the pro-
vince of British Columbia. The plan is
to drain the rich grain fields of western
Canada by means of north and south
feeders. Contracted work in eastern
Washington to the Pacific coast will be
rushed to completion, and additional
contracts will be awarded soon for ex-
tensive development in northern Wash-
ington. Development of subsidiary lines
in Oregon will be carried out by J. H.
Young, the new President of the Spo-
kane, Portland and Seattle Rd. and oth-
er Hill lines. The Northwest is our
territory, and we are planning to
strengthen our position in all parts of
the western country."

Mr. Gray's statement that the Great
Northern's intention "is to drain the
rich grain fields of Western Canada by
north and south feeders" is significant.
Of course it has been a well known fact
for some years, but this is the first
public announcement of it by one of the
company's officers.

The position, therefore, is that the
Great Northern's policy is avowedly not
to assist in building up Canada, but "to
drain" it, and to attempt to follow
President Taft's idea of making it "an
adjunct."

Mr. Gray's statement deserves the
most serious consideration by the Do-
minion Government, and in fact of
everyone interested in Canadian develop-
ment.

Four New Car Building Plants.

The ratepayers of Fort William, Ont.
will on July 10 vote on a bylaw to give
the Canadian Car and Foundry Co. 80
acres of land, \$20,000 for building a dock
and 10 years exemption from general
taxation. We are officially advised that
the company is ready to start work on
its car building plant as soon as the
ratepayers ratify the agreement entered
into with the council.

W. W. Butler, Vice President, Cana-
dian Car and Foundry Co., returned to
Montreal from the Pacific coast about
the middle of June, and confirmed the
previous announcement that the com-
pany would establish a car building
plant in British Columbia, and that it
would turn out all wood, steel and steel
and wood construction cars, and that
there will probably be a small cast steel
plant in conjunction with it.

The Eastern Car Co., Ltd., was organ-
ized recently at New Glasgow, N.S., the
\$2,500,000 of capital being quickly under-
written by the principal promoters, who
are connected with the Nova Scotia Steel
and Coal Co. The company will manufac-
ture freight cars, including both steel
underframe cars and complete steel
cars. The plant will be built either at
Trenton, adjoining the Nova Scotia Steel
and Coal Co.'s plant, or in the adjoining
town of New Glasgow. It will require
a ground space of about eight acres, and
some 10 miles of railway tracks will be
built. It will have a capacity of from 25
to 50 cars a day, and will employ from
800 to 1,000 men. H. H. Lane, late of the
American Car and Foundry Co., Detroit,
Mich., has been appointed consulting en-
gineer, to design and construct the plant,
and we were advised on June 10 that the
plans were well under way and that the

early stages of construction would prob-
ably be commenced before the end of
June.

The directors are the following officers
of the Nova Scotia Steel and Coal Co.:
R. E. Harris, President; Hon. J. D. Mc-
Gregor, 1st Vice President; T. Cantley,
2nd Vice President and General Man-
ager; J. C. McGregor and G. F. McKay,
directors; R. E. Chambers, Mining Su-
perintendent.

In the middle of June the public were
offered \$1,000,000 of the Eastern Car
So.'s 1st mortgage 6% bonds at par and
interest, payment of both principal and
interest being guaranteed by the Nova
Scotia Steel and Coal Co., and it was
announced that the issue had been over-
subscribed.

The Ontario and Western Car Co.,
which is promoted by F. B. McCurdy,
F. M. Brown and J. M. McLeod, of Hal-
ifax, N.S., is going to erect a car build-
ing plant at Port Arthur, Ont. Plans
are being prepared and the promoters
state that construction will be com-
menced at an early date. Both passen-
ger and freight cars will be built. Under
the agreement with the city the plant is
to have a capacity of 40 cars a day, the
buildings, machinery, etc., are to cost
not less than \$1,250,000.

**Second Track on C.P.R. Lake Superior
Division.**

We are officially advised that the
C.P.R. has decided to start work on the
second tracking of the Lake Superior
Division of the main transcontinental
line and has let a contract to the Do-
minion Construction Co., Toronto, for
about 60 miles of the work. The con-
tract includes grading, tracklaying and
ballasting, which is to be completed and
ready for operation in November. About
20 miles of the work will consist of sid-
ing extensions, to form part of the sec-
ond track, and the balance will be dis-
tributed as follows:—Crete to Sudbury,
3.2 miles; Cartier to Gencon, 3.4 miles;
Roberts to Lembro, 21.2 miles; Devon to
Chapleau, 4.8 miles; White River to
Tarpon, 3.5 miles; Hedge to Port Ar-
thur, 4.1 miles.

The Dominion Construction Co. was
incorporated under the Ontario Com-
panies Act in April last, with an author-
ized capital of \$150,000, the provisional
directors being:—G. S. Deeks, T. R.
Hinds, H. E. Williams, and T. F. Hinds,
the two first named being President and
Secretary-Treasurer respectively of the
Toronto Construction Co., Ltd., railway
contractors, which has carried out sev-
eral other C.P.R. contracts. The same
parties have the contract for the
C.P.R.'s subsidiary line, the Campbell-
ford, Lake Ontario and Western Ry., be-
tween Glentay and Agincourt, Ont.

**The Construction of the Algoma Eastern
Railway.**

In the article on this subject, by R.
S. McCormick, Chief Engineer, in The
Railway and Marine World's June is-
sue, the first paragraph was printed as
follows:—

"The original charter for this railway,
of 855 miles, now being completed from
Sudbury to Little Current, on Manitou-
lin Island, Ont., was obtained by F. H.
Clergue, at about the same time as the
Algoma Central and Hudson Bay Ry.
project was launched. A land grant and
subsidy accompanied the granting of the
charter."

The article as written stated that the
distance covered in the original char-
ter was 85 miles, but by mistake 855 was
put in type, and, unfortunately, was
overlooked in the proof reading.

Mainly About Transportation People.

HON. J. D. HAZEN, Minister of Marine, sailed for England, June 26.

SIR THOS. G. SHAUGHNESSY returned to Montreal from England early in June.

JAS. ROSS, Montreal, has been elected a member of the Royal Yacht Squadron, Cowes, Isle of Wight, Eng.

R. H. DUFF, Resident Engineer, Mackenzie, Mann and Co., was married in Toronto, June 14, to Miss S. Neilson.

SIR MONTAGU and LADY ALLAN arrived in Montreal from England June 8, and will spend the summer at Cacouna, Que.

JAS. KENT, Manager, C.P.R. Telegraphs, left Montreal, June 12, for the west, on his annual inspection over the company's lines.

A. W. SMITHERS, Chairman, G.T.R. board, left Montreal, June 10, for Boston, Mass., whence he sailed for England.

JAS. DUNSMUIR, of Victoria, B.C., director, C.P.R., and Mrs. Dunsmuir, who are staying in England, have taken Bisham Abbey for a time.

G. BLACKBIRD, Locomotive Foreman, G.T.R., Richmond, Que., left early in June to spend two months' holiday in Europe, accompanied by Mrs. Blackbird.

H. TANDY, of Kingston, Ont., who has been a member of the American Railway Master Mechanics' Association since 1883, has been elected an honorary member.

T. KILPATRICK, Superintendent, C.P.R., Revelstoke, B.C., was the principal guest at a dinner given by the Vernon, B.C., Board of Trade, recently.

MRS. W. H. GRANT, wife of the manager of Construction, Mackenzie, Mann & Co., Ltd., Toronto, sailed for England on the s.s. Royal George, June 26.

LADY THOMAS TAIT and Miss Tait, who have been spending some time at Niagara-on-the-Lake, have gone to St. Andrew's, N.B., for the rest of the summer.

W. F. TYE, President, Canadian Society of Civil Engineers, and Mrs. Tye, who have been visiting Europe, are expected to return to Toronto early in July.

SIR WILLIAM MACKENZIE and Lady Mackenzie left Canada for England June 26. On their return they will probably be accompanied by Mrs. Scott Griffin and family.

J. DUNCAN and J. K. DUNCAN, C.P.R. ticket agents, Thamesville, Ont., and J. F. ROBERTS, C.P.R., ticket agent, Parkhill, Ont., have joined the Canadian Ticket Agents' Association.

The Countess Jacques de Lesseps, daughter of SIR WILLIAM MACKENZIE, with the Count and their son, arrived in Toronto, June 10, from France, and will spend the summer in Canada.

SIR DONALD MANN has given \$1,000 towards the relief of the sufferers by the recent fire at Chicoutimi, Que. Relief supplies are being carried free by the Canadian Northern Ry. lines.

D. W. HAYES was presented with a quantity of silver by merchants of Guelph, Ont., June 13, on his transfer from G.T.R. freight agent there to a similar position at London, Ont.

E. WALTER RATHBUN, President of the Thousand Islands Ry. and other transportation lines, with headquarters at Deseronto, Ont., left there early in June, with Mrs. Rathbun, for England.

The body of LAWRENCE CHIPMAN, the Edmonton, Dunvegan and British Columbia Ry. engineer, who was drowned April 7, was found near Mirror Landing, on the Athabasca River, May 20.

T. R. CAMPBELL, Salsbury, N.B., a sub-contractor on the National Transcontinental Ry., was badly injured in the

wreck of a construction train on the railway near McGivney's, N.B., June 4.

MAJOR GEO. C. ROYCE, Manager, Toronto Suburban Ry., was officer commanding the 2nd Queen's Own Rifles of Canada, at the 6th district camp at Niagara, Ont., recently.

SIR WILLIAM VAN HORNE, with Lady and Miss Van Horne, and Mrs. R. B. Van Horne and family, left Montreal, about the middle of June, for their summer home, Covenhoven, St. Andrews, N.B.

LORD STRATHCONA has given \$10,000 to complete a fund of \$100,000 for the establishment of a school for the English-speaking blind, proposed to be erected by the Montreal Association for the Blind.

J. J. HILL, Great Northern Ry., U.S.A., and a party of friends, are on a fishing trip on the St. Lawrence River and tributary waters. His yacht, Wascouta, arrived in Montreal, June 13, to take on the party.



William Phillips,
European Traffic Manager, Canadian Northern Ry. and Canadian Northern Steamships, Ltd.

F. E. TRAUTMAN was presented with a purse of over \$900, May 30, on his leaving Fort William, Ont., to take a position on the staff of Geo. Bury, Vice President and General Manager, C.P.R. Western Lines.

R. MARPOLE, General Executive Assistant, C.P.R., returned to Vancouver early in June, much benefitted by a holiday which he spent in California. There is no truth in the press report that he is about to retire.

F. L. WANKLYN, M. Can. Soc. C.E., General Executive Assistant, C.P.R., was married in England, June 18, to Miss L. H. McConnel, youngest daughter of the late Wm. McConnel, of Knockdolan, Ayrshire.

C. C. WORSFIELD, heretofore Assistant District Engineer of the Dominion Department of Public Works for Southern British Columbia, has been appointed District Engineer in succession to the late G. A. Keefer.

T. DUFF SMITH, Fuel Agent, Grand Trunk Pacific Ry., Winnipeg, was elected a member of the International Railway Fuel Association's executive committee

for three years, at the convention held in Chicago recently.

Miss M. M. Somerville, eldest daughter of F. L. SOMERVILLE, of Toronto, formerly Resident Engineer, Grand Trunk Ry., was married at Winnipeg, June 15, to the Rev. Somerville Caldwell, rector of Rapid City, Man.

E. W. BEATTY, K.C., General Solicitor, C.P.R., on account of whose illness the hearing of the western freight rate case before the Board of Railway Commissioners, June 18, was deferred to Oct. 1, returned to business June 25.

CAPT. KILLALY GAMBLE, who died at Bournemouth, Eng., June 19, was a well known land surveyor of Toronto, being for some time connected with Speight and Van Nostrand. He was President of the Engineers Club of Toronto in 1911.

M. J. BUTLER, C.M.G., formerly Deputy Minister of Railways, and now General Manager, Dominion Steel Corporation, addressed the Canadian Club of Moncton, N.B., recently, on "The Industrial Development of the Maritime Provinces."

D. M. WILLIAMS was presented with some silverware and cut glass by North Bay, Ont., friends, May 31, on leaving the C.P.R. service, in which he was chief clerk in the General Superintendent's office, to engage in business in Montreal.

K. GALLAGHER, Roadmaster, G.T. Pacific Ry., Prince Rupert, B.C., was thrown off a railway motor cycle into the Skeena River, by a collision with a train near Terrace, B.C., recently. The body had not been recovered when this was written.

J. J. HILL, of the Great Northern Ry., U.S.A., who was born at Rockwood, near Guelph, Ont., has contributed \$1,000 to the Guelph Y.M.C.A., and \$500 towards the cost of beautifying the Everton cemetery, where a number of his relatives are buried.

M. Dow, President, British North American Construction Co., who dropped dead in Prince Rupert, B.C., May 20, had only been there a few weeks in connection with the construction of the G.T. Pacific Ry. docks, for which his company has the contract.

W. D. BARCLAY, General Manager, Canadian Northern Quebec Ry., Quebec and Lake St. John Ry., and Halifax and Southwestern Ry., who has been given leave of absence on account of ill health, left Montreal early in June to spend some weeks at Banff, Alta.

E. H. WILSON, heretofore Assistant Land Commissioner, Alberta Ry. and Irrigation Co., Lethbridge, Alta., has entered private business in partnership, and his firm, Wilson and Skeith, Lethbridge, has been appointed agent for sale of C.P.R. lands and town lots.

SIR THOMAS SHAUGHNESSY, who returned to Montreal, June 9, from Great Britain, denied that he was to be president of a reported large banking merger. He stated that it would probably be many years before he would be able to lay down his work as President of the C.P.R.

JAS. DUGUID, who recently resigned the position of Master Mechanic, G.T.R., Eastern Division, was, on June 1, presented with an address and a purse of gold by his former associates. He has since then been appointed machine shop foreman, Canadian Locomotive Co., Kingston, Ont.

JOS. FARRAR, who was recently appointed Assistant Superintendent, Canadian Locomotive Co., Kingston, Ont., was, for a number of years, in G.T.R. service, subsequently being in the employ of the American Locomotive Co., at Pittsburgh, Pa., and later, with the Chicago and Alton Rd., at Bloomington, Ill.

R. W. BAXTER, heretofore General Superintendent, Illinois Central Rd., at

Chicago, Ill., has been elected President of the Copper River and Northwestern Ry. of Alaska, and of the Alaska Steamship Co., succeeding J. R. Young, who has been made President, Spokane, Portland and Seattle Ry.

J. H. FLOCK, K.C., London, Ont., Honorary Counsel, Canadian Ticket Agents' Association, was the only member of the London city council which welcomed the Duke of Connaught, when, as Prince Arthur, he visited that city in 1860, surviving to welcome him there as Governor-General, May 31.

LORD STRATHCONA has been awarded the Albert Medal of the Royal Society of Arts, with the approval of the President, the Governor General of Canada, for services in improving railway communication, developing resources and promoting commerce and industry in Canada and other parts of the British Empire.

G. J. DESBARATS, Deputy Minister of Naval Service, who is in England in connection with the international wireless conference, will, it is stated, remain there to assist in the conference between the Premier, the Minister of Marine and the Imperial Government, regarding suggestions as to the naval policy to be adopted by Canada.

G. BETHUNE GREY, of the C.P.R. Land Department, London, Eng., died at Woking, Surrey, recently, after a long illness, aged 53, from Bright's disease. He was born in Edinburgh, Scotland, and was, for some time, resident in Alberta, before becoming connected with the C.P.R. Land Department. He joined the London staff about four years ago.

GEORGE B. HULL, A.M. Can. Soc. C.E., Assistant Engineer, Dominion Department of Public Works, who had charge of the surveys for and construction of the Quinze dam of the Upper Ottawa River reservoir system, has been appointed District Engineer for the Department in British Columbia, with headquarters at Prince Rupert.

W. C. LANCASTER, M.Am.I.E.E., who has been appointed Electrical and Mechanical Engineer, Canadian Northern Montreal Tunnel and Terminal Co., is a graduate of Virginia University, and has had experience on tunnel construction on the Pennsylvania crosstown tunnels and various other works in the U.S., and abroad, besides being consulting engineer for several of the large tunnel contractors in New York.

W. M. PUNTER, Manager, Canadian Branch, Saxby and Farmer, Ltd., railway and signal engineers and contractors, with headquarters at Montreal, left there about the middle of May for a trip to the Pacific coast. En route he was attacked with pneumonia, and on arrival at Winnipeg had to be taken to the General Hospital. He had sufficiently recovered to return to Montreal about the middle of June, where he is convalescing.

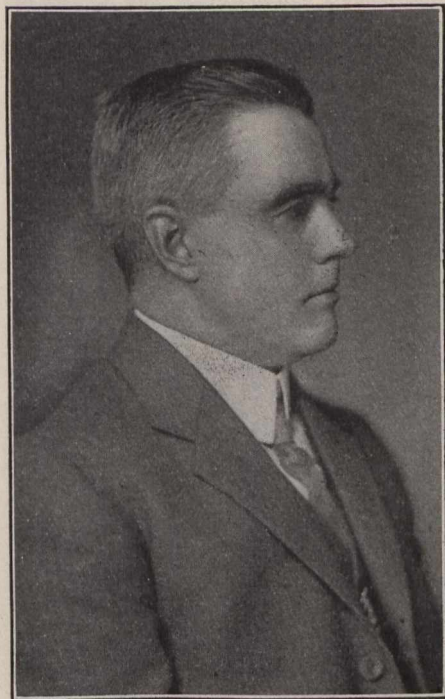
J. S. PYEATT who has resigned as Vice President and General Superintendent, Fort Worth and Rio Grande Ry., Fort Worth, Texas, on his appointment as Vice President and General Manager, New Orleans, Texas and Mexico Rd., and Beaumont, Sour Lake and Western Ry., and Vice President, St. Louis, Brownville and Mexico Ry., Houston, was for some time Superintendent, Canadian Division, Pere Marquette Rd., St. Thomas, Ont.

HON. F. COCHRANE, Minister of Railways and Canals, left Ottawa June 26, intending to be absent till September. Press reports say he will go over as much of the National Transcontinental Ry. and the G.T. Pacific Ry. as possible between Quebec and Prince Rupert and will also go by steamship from Quebec to Hudson Bay, visiting Nottaway River, Port Nelson and Fort Churchill. Hon. J. D. Reid, Minister of Customs, will act as

Minister of Railways and Canals during Mr. Cochrane's absence.

L. G. COLEMAN, who has been appointed Superintendent, Ottawa Division, G.T.R., Ottawa, was born at Macon, Ga., in 1877, and entered railway service in 1900, in the G.T.R. transportation department. He was later transferred to Barrie, Ont., and subsequently returned to Montreal, and in 1906 was appointed Assistant Superintendent, Ottawa Division, and later Assistant Superintendent, Eastern Division, Belleville, Ont., which position he retained to June 24, the date of his present appointment.

F. G. WOOD, who has been appointed Travelling Agent, Canadian Northern Ry., and Duluth, Rainy Lake and Winnipeg Ry., Pittsburgh, Pa., was born at Toronto, Sept. 15, 1890, and entered railway service in 1905, in Division Freight Agent's office, G.T.R., Toronto, since when he has been connected with the National Despatch-Great Eastern Line, Canadian Northern Ry., and G.T. Pacific Ry., at Edmonton, Alta. He returned to C.N.R. service, Feb. 16, 1911, in the Traffic Manager's office, Toronto, and on Apr. 29, 1911, was appointed Contract-



W. A. Fitch, Assistant Superintendent, Sydney and Oxford District, Intercolonial Ry.

ing Agent, C.N.R., and D.R.L. and W.R., at Pittsburgh, Pa., which position he held to June 1, 1912.

E. L. DESJARDINS, whose appointment as Assistant Superintendent, Montreal and Ste. Flavie District, Intercolonial Ry., was announced in our last issue, was born at St. Jean Port Joli, Que., Aug. 1, 1859, and was educated at Ste. Anne de la Pocaterie College. He entered I.R.C. service, Nov. 1, 1876, since when he has been, to Apr. 11, 1878, agent at Sayabec, Que.; Apr. 11, 1878, to June 1, 1879, night operator at Ste. Flavie, Que.; June 1, 1879, to July 29, 1880, train baggage master between Levis, Que., and Halifax, N.S.; July 29, 1880, to Feb. 15, 1898, dispatcher at Riviere du Loup, Que.; Feb. 15, 1898, to May 1, 1912, Chief Dispatcher at Levis, Que.

W. A. FITCH, whose appointment as Assistant Superintendent, Sydney and Oxford District, Intercolonial Ry., Sydney, N.S., was announced in our last issue, and whose portrait appears in this issue, was born at Kentville, N.S., Nov. 25, 1867, and entered I.R.C. service, Oct. 1880, since when he has been, to Jan.,

1882, Telegraph operator at Folley, N. S.; Jan., 1882, to Apr., 1883, telegraph operator at Maccan, N.S., Sackville, N.B., and St. John, N.B.; Apr., 1883, to July, 1885, agent at Folley, N.S.; July, 1885, to Aug. 25, 1886, dispatcher's operator at Truro, N.S.; Aug. 25, 1886, to Mar. 30, 1903, dispatcher at Truro, N.S., Campbellton, N.B., Moncton, N.B., and Truro, N.S.; Mar. 30, 1903, to June 1, 1912, Chief Dispatcher at Sydney, N.S.

W. S. POOLE, Mechanical Superintendent, Prince Edward Island Ry., Charlottetown, P.E.I., who has retired on the Provident Fund, was born at Burslem, Eng., July 20, 1844. He entered railway service in 1857, as an apprentice in Earl Granville's works at Hanley, Eng., and served in other capacities until 1866, when he came to Canada. After spending a short time at other work he entered the service of Schreiber and Burpee, contractors for the construction of the P.E.I. Ry., and on the completion of the line from Charlottetown to Tignish, in 1875, he entered its service as a mechanic, becoming, successively, roundhouse foreman, foreman of erecting shop, locomotive foreman, and, since Aug. 31, 1901, Mechanical Superintendent.

T. COLLINS, who has been appointed Superintendent, District 2, Lake Superior Division, C.P.R., Chapeau, Ont., entered C.P.R. service, Sept. 2, 1885, since when he has been, to Mar. 7, 1887, brakeman, West Toronto, Ont.; Mar. 7, 1887, to Aug. 1, 1896, conductor, West Toronto, Ont.; Aug. 1, 1896, to Sept. 1, 1897, construction trainmaster, Guelph and Goderich branch; Sept. 1, to Oct. 15, 1897, trainmaster, London, Ont.; Oct. 15, 1897, to Jan. 1, 1908, construction trainmaster, double tracking, Montreal to Smiths Falls; Jan. 1, to Apr. 15, 1908, Trainmaster, Smiths Falls, Ont.; Apr. 15, 1908, to June 1, 1909, construction trainmaster, double tracking, Montreal to Smiths Falls; June 1, 1909, to June 1, 1912, Assistant Superintendent, Smith's Falls, Ont.

H. P. DWIGHT, President, Great North-western Telegraph Co., was taken ill early in June, first suffering from lumbago and then from weakness of the heart. As this is written on June 26, he is in a critical condition, though hope of his recovery is entertained. He was born at Belleville, N.Y., Dec. 23, 1828, and commenced telegraph operating at an early age. He came to Canada in 1847, from when to 1881 he was in the Montreal Telegraph Co. service, since when he has been in the G.N.W. Telegraph Co.'s service. From 1881 to 1892 he was General Manager; 1892 to 1903, President and General Manager; and from 1903, President. During the North West rebellion of 1885 he rendered signal service to the Government, which was acknowledged in Parliament by the then Minister of Militia. He is also connected with several industrial and financial companies.

MORLEY DONALDSON, M.Can.Soc.C.E., who has been appointed Vice President and General Manager, Grand Trunk Pacific Ry., Winnipeg, and whose portrait appears in this issue, is a son of the late Major R. D. Donaldson, of the 41st regiment, and subsequently staff officer of pensioners, Ottawa. He was born near Edinburgh, Scotland, May 1, 1851, and was educated in France and Canada. After spending some time in E. Gilbert and Co.'s engine works, Montreal, he entered the service of W. and F. Shanly, and was with them during the construction of the Hoosac tunnel in Massachusetts. He entered railway service in 1881, as chief draughtsman, Canada Atlantic Ry., since when he has been consecutively Superintendent of Traffic, Superintendent Mechanical Department, and to Apr. 11, 1898, Superintendent, same road, Ottawa; Apr. 11, 1898, to Sept. 30, 1905, General Superintendent, same road, Ottawa; and on the absorp-

Transportation Appointments Throughout Canada.

tion of the C.A.R. by the G.T.R., and its operation as the Ottawa division, G.T.R., he was appointed Superintendent, which position he retained to June 17, the date of his present appointment.

E. H. KEATING, who died at Toronto, June, 17, was born at Halifax, N.S., Aug. 7, 1844, and was educated at the Free Church Academy and Dalhousie University. He studied engineering under G. Whiteman, Nova Scotia Government Engineer, and Sir Sandford Fleming, and commenced his career on the Pictou Extension Ry. In 1867 he was chief draughtsman, Windsor and Annapolis Ry.; 1867 to 1870, Contractors' Engineer, European and North American Ry., and Division Engineer, Intercolonial Ry. at various points in Nova Scotia and New Brunswick; 1870 to 1871, Division Engineer in charge of exploratory surveys, C.P.R.; 1872 to 1890, City Engineer, Halifax, N.S., during which time he was also engaged in private practice, designing and constructing water works, sewerage works, etc., and also acted as Resident Engineer, Halifax graving dock; 1891 to 1892, City Engineer, Duluth, Minn.; 1892 to 1898, City Engineer, Toronto; 1898 to 1904, General Manager, Toronto Ry.; 1904 to 1905, Manager and Engineer for Mackenzie, Mann and Co. in Mexico, and since then in private practice in Toronto, latterly as senior partner of Keating and Breithaupt. He was appointed a member of the commission to deal with the proposed dry dock at Montreal, in 1903, and was responsible for several large municipal engineering works. He was a member of the Canadian Society of Civil Engineers, since May 23, 1895, and served as President in 1901, as Vice President in 1899 and 1900, and as a member of the council from 1896 to 1898. He was also a member of the Institute of Civil Engineers (Eng.), of which he was elected a member of the council in April, and was a member of the American Society of Civil Engineers.

Algoma Steel Corporation.—Under the Ontario Companies Act, supplementary letters patent have been issued changing the name of the Lake Superior Iron and Steel Co. to that of the Algoma Steel Corporation; increasing the capital from \$1,000,000 to \$30,000,000, of which \$15,000,000 shall be preference stock, and authorizing it to take over the following companies:—Algoma Steel Co., Algoma Commercial Co., Algoma Iron Works, Lake Superior Power Co., Fiborn Limestone Co., Cannelton Coal and Coke Co. The two latter companies are located in the U.S., the first in Michigan, and the second in West Virginia. This is a consolidation of a number of the subsidiary companies owned by the Lake Superior Corporation, and is being carried out in furtherance of the policy of consolidating the subsidiary companies in natural groups and arranging for the independent management and financing of each consolidated unit.

The Canadian Locomotive Co., Kingston, Ont., has increased its output from five locomotives a month to eight, and by the end of this year will be able to turn out 15 to 18 a month.

The General Improvement and Contracting Co., Ltd., has been incorporated under the Dominion Companies Act, with \$100,000 capital and office at Montreal, to engage in river, lake, canal, and other dredging, and in connection therewith to own and operate vessels, wharves, piers, elevators, etc. The incorporators are E. Rainville, J. O. Gagnon, and others of Montreal.

The steamboat Frontier, operated by the People's Steamboat Co., Toronto, formerly known as the Argyle, and before that as the Empress of India, which is running between Toronto and the Niagara River, started Sunday trips on June 23, carrying about 400 people on the two round trips between Toronto and Lewiston.

The information under this head, which is almost entirely gathered from official sources, is compiled with the greatest care, so as to ensure absolute accuracy. Anyone who may notice any error in our announcements will confer a favor by advising us.

Canadian Northern Ry.—JAS. MORRISON, heretofore chief rate clerk, C.P.R., Montreal, has been appointed Assistant General Passenger Agent, Eastern Division, C.N.R. lines east of Port Arthur in Ontario and Quebec. Office, Montreal. Agents east of Ottawa send correspondence and reports of passenger traffic to Mr. Morrison, instead of as formerly to Guy Tombs.

GUY TOMBS, heretofore General Freight and Passenger Agent, lines east of Ottawa in Ontario and Quebec, has been appointed General Freight Agent, lines east of and including Ottawa. Office, Montreal.

J. H. MCKINNON, heretofore Commercial Agent, St. Paul, Minn., has been appointed General Agent.

F. G. WOOD, heretofore Contracting Freight Agent, Pittsburgh, Pa., has been appointed Travelling Freight Agent,



Morley Donaldson,
Vice President and General Manager, Grand Trunk Pacific Ry.

there, vice A. E. Hodgins, appointed General Agent, as announced in our last issue.

A. J. ISBESTER, heretofore Assistant District Engineer, C.N.O.R., Port Arthur, Ont., has been appointed District Engineer, there, vice H. T. Hazen, resigned, to enter the Railways Department service.

Canadian Northern Steamships, Ltd.—JAS. MORRISON, who has been appointed Assistant General Passenger Agent, Eastern Division, C.N.R., as mentioned above, has also been appointed Assistant General Passenger Agent, Canadian Northern Steamships, Ltd.

J. B. HOSEASON, heretofore in General Freight and Passenger Agent's office, lines east of Ottawa in Ontario and Quebec, has been appointed General Agent, C.N. Steamships. Office, Montreal.

Canadian Pacific Ry.—D. L. JONES, heretofore District Master Mechanic and Trainmaster, District 2, Atlantic Division, Woodstock, N.B., has been appointed District Master Mechanic, Districts 1 and 2. The position of Train-

master, District 2, has been abolished, and F. Grant, heretofore District Master Mechanic, District 1, Brownville Jct., Me., has resumed the position of locomotive driver. Office, McAdam Jct., N.B.

C. W. STACKHOUSE, heretofore Locomotive Foreman, Three Rivers, Que., has been appointed Locomotive Foreman, Sherbrooke, Que., vice G. Couture, transferred to Three Rivers, Que.

G. COUTURE, heretofore Locomotive Foreman, Sherbrooke, Que., has been appointed Locomotive Foreman, Three Rivers, Que., vice C. W. Stackhouse, transferred to Sherbrooke, Que.

L. G. ROGERS, heretofore Chief Dispatcher, District 1, Eastern Division, Farnham, Que., has been appointed acting Trainmaster, District 1, Eastern Division. Office, Farnham, Que.

J. J. MORGAN, heretofore trick dispatcher, Farnham, Que., has been appointed acting Chief Dispatcher, District 1, Eastern Division, vice L. G. Rogers, promoted. Office, Farnham, Que.

W. WOOD, heretofore Locomotive Foreman, Megantic, Que., has been appointed Locomotive Foreman, Sortin Yard, Montreal. This is a new position.

G. AITKEN, heretofore Assistant Foreman, Glen Yard, Montreal, has been appointed Locomotive Foreman, Megantic, Que., vice W. Wood, promoted.

C. A. DELANEY, heretofore fitter at North Bay, Ont., has been appointed assistant foreman, Glen Yard, Montreal, vice G. Aitken, promoted.

H. B. SPENCER, Superintendent, Ottawa, having returned to duty after absence through ill health, J. H. BOYLE, who has been acting Superintendent, has resumed the position of Assistant Superintendent there.

C. W. LOTT, heretofore Chief Dispatcher, Smiths Falls, Ont., has been appointed acting Assistant Superintendent, District 2, Eastern Division, Smiths Falls, vice T. Collins, promoted.

J. W. WANSBOROUGH, heretofore night chief dispatcher, Toronto, has been appointed Chief Dispatcher, Districts 3 and 4, Toronto.

J. B. CROSSETT, heretofore trick dispatcher, Toronto, has been appointed night chief dispatcher, there, vice J. W. Wansborough, promoted.

G. E. MURPHY has been appointed assistant foreman, West Toronto shops, vice J. H. Mitchell, resigned.

The Lake Superior Division was reorganized on June 1 into three districts, the territory of each, and the superintendents, being as follows:—

District 1—Timiskaming, Kipawa, Webbwood, Algoma, Sudbury, North Bay and Cartier subdivisions, including all terminals connected therewith, except Cartier and Muskoka. G. SPENCER, Sudbury, Ont.

District 2—Chapleau and White River subdivisions, including Cartier terminal. T. COLLINS, Chapleau, Ont.

District 3—Schreiber and Nipigon subdivisions, including White River terminal. J. H. HUGHES, Schreiber, Ont.

In consequence of the reorganization of the Lake Superior Division the headquarters of the following officials, which were formerly at White River, have been moved to Schreiber:—R. V. NICHOLSON, Bridge and Building Master; W. MASCOE, Car Foreman; R. T. MORAN, Chief Dispatcher; F. NOWELL, District Master Mechanic; J. F. GILDEA, Locomotive Foreman; M. KELLY, Resident Engineer; M. J. SHERIDAN and J. CAUGHLIN, Roadmasters.

H. B. STEVENS, heretofore Chief Dispatcher, White River, Ont., has been transferred to Sudbury, Ont.

D. BURBIDGE has been appointed Car Foreman, White River, Ont., vice J. Baldwin.

A. J. WOLFE, heretofore Roadmaster, White River subdivision, Lake Superior Division, White River, Ont., has been appointed Roadmaster at Chapleau, Ont.

A. STURROCK has been appointed acting Locomotive Foreman, Fort William, Ont., on account of the serious illness of J. McArthur.

N. KEELAND has been appointed Travelling Freight Agent for Eastern Manitoba, vice J. H. Gordon, deceased. Headquarters, Winnipeg.

R. R. NEILD, General Foreman, Winnipeg shops, has resigned.

F. WALKER, heretofore Chief Dispatcher, Vancouver, B.C., has been appointed Car Service Agent, Winnipeg, vice G. B. Williams, resigned.

J. B. SHELTON, heretofore Car Foreman, G.T. Pacific Ry., Transcona, Man., has been appointed Car Foreman, C.P.R., Moose Jaw, Sask., vice C. H. Zerbach, transferred.

C. H. ZERBACH, heretofore Car Foreman, Moose Jaw, Sask., has been appointed car foreman, Estevan, Sask., This is a new position.

J. E. LETHBRIDGE, heretofore Auditor, Alberta Ry. and Irrigation Co., Lethbridge, Alta., has been appointed General Auditor, Department of Natural Resources, C.P.R., acting in a travelling capacity. Headquarters, Lethbridge, Alta.

W. W. NEELAND, heretofore Storekeeper, Alberta Ry. and Irrigation Co., Lethbridge, Alta., has been appointed Storekeeper, Department of Natural Resources, C.P.R. Office, Lethbridge, Alta.

R. SINCLAIR has been appointed Trainmaster between Laggan and Field, including Field terminals, vice A. W. G. Clark, transferred to Manitoba Division, Office, Field, B.C.

W. S. HALL, heretofore Yardmaster, Cranbrook, B.C., has been appointed Trainmaster, Macleod, Alta., vice P. F. Weisbrod, promoted.

D. G. McDONALD has been appointed Locomotive Foreman, Red, Deer, Alta., vice J. A. Doig assigned to other duties.

J. H. JACKSON, heretofore acting Locomotive Foreman, Rogers Pass, B.C., has been appointed Locomotive Foreman there.

The Shuswap and Okanagan subdivisions, British Columbia Division, heretofore in charge of A. W. GRASS, Roadmaster, have been divided, and he has been appointed Roadmaster from Revelstoke to Sicamous on the Shuswap subdivision, and from Sicamous to Okanagan Landing on the Okanagan subdivision. Office, Revelstoke. W. LORTUS, heretofore extra gang foreman, has been appointed Roadmaster from Sicamous to Kamloops, including Sicamous yard. Office, Sicamous.

H. A. KESWICK, shop foreman at Kamloops, B.C., has resigned.

J. E. BEATON, heretofore yard foreman, Cranbrook, B.C., has been appointed Yardmaster there, vice W. S. Hall, promoted.

T. MORE, heretofore trick dispatcher, Vancouver, B.C., has been appointed Chief Dispatcher, District 2, British Columbia Division, Vancouver, vice C. A. Cotterell, promoted.

Canadian Pacific Ry., Minneapolis, St. Paul and Sault Ste. Marie Ry., Duluth, South Shore and Atlantic Ry.—R. C. CLAYTON, heretofore Travelling Passenger Agent, Philadelphia, Pa., has been appointed City Passenger Agent, there, vice F. W. Huntington, deceased.

Dominion Atlantic Ry.—G. G. HARE, Engineer, Kingston and Pembroke Ry., Kingston, Ont., is reported to have been transferred to D.A.R. service.

Fort Garry Union Station, Winnipeg.—M. H. MACLEOD, General Manager and Chief Engineer, Canadian Northern Ry.; A. G. MACFARLANE, acting District Engineer, National Transcontinental Ry.; H. H. BREWER, General Superintendent, G.T. Pacific Ry., and J. R. CAMERON, Assistant General Manager, Canadian Northern Ry., Winnipeg, have been appointed members of the Terminals Board, controlling the Winnipeg Joint Terminals of the Canadian Northern,

G.T. Pacific and National Transcontinental Rys. Mr. Brewer's appointment is as an acting member.

J. A. GLASFORD, formerly General Yardmaster, C.P.R., Winnipeg, has been appointed Terminals Manager.

G. A. TEMPLEMAN, heretofore Assistant Yardmaster, Canadian Northern Ry., Fort Rouge, Man., has been appointed General Yardmaster, Winnipeg Joint Terminals.

Grand Trunk Pacific Ry.—The practice of designating the several Vice Presidents by numbers has been discontinued.

W. WAINWRIGHT, heretofore First Vice President, has been appointed Vice President. Office, Montreal.

M. M. REYNOLDS, heretofore Second Vice President, has been appointed Vice President, in charge of Financial and Accounting Departments. Office, Montreal.

MORLEY DONALDSON, M. Can. Soc. C.E., heretofore Superintendent, Ottawa Division, G.T.R., Ottawa, has been appointed Vice President and General Manager, lines west of Fort William, Ont., in charge of Construction, Transportation and Maintenance Departments, vice E. J. Chamberlin, recently appointed President. Office, Winnipeg.

J. E. DALRYMPLE, heretofore Fourth Vice President, has been appointed Vice President, in charge of traffic. Office, Montreal.

H. H. HANSARD, Assistant Solicitor, is reported to have been appointed Solicitor, G.T.P.R., Winnipeg, vice D'Arcy Tate, who resigned in April.

The following agents have been appointed:—Cabot, Man., A. Jackson; Gregg, Man., D. W. Peters; Gerald, Sask., R. W. Gibson; Tate, Sask., G. V. Nowlan; Bradwell, Sask., T. W. Fleming; Biggar, Sask., J. O'Leary; Coblenz, Sask., H. E. Henshaw; Camrose, Alta., A. McRae.

Grand Trunk Ry.—J. W. FARRELL, Trainmaster, District 1, Island Pond, Vt., has had his jurisdiction extended to include District 2, and reports from that district hitherto sent to J. J. Connelly, are now sent to him. Office, Island Pond, Vt.

J. J. CONNELLY, heretofore Trainmaster, District 2, Eastern Division, Island Pond, Vt., has been appointed Assistant Superintendent, District 4, and in charge of Montreal terminals, vice H. F. Coyle, transferred. Office, Montreal.

J. W. CANATSY has been appointed General Yardmaster, Montreal Terminals, vice X. J. Schlätze.

L. G. COLEMAN, heretofore Assistant Superintendent, Districts 6 and 7, Eastern Division, Belleville, Ont., has been appointed Superintendent, Ottawa Division, vice M. Donaldson, promoted to G.T. Pacific Ry. service as Vice President and General Manager. Office, Ottawa.

H. F. COYLE, heretofore Assistant Superintendent, District 4 and Montreal Terminals, Montreal, has been appointed Assistant Superintendent, Districts 6 and 7, Eastern Division, vice L. G. Coleman, promoted. Office, Belleville, Ont.

W. KIRKWOOD, heretofore locomotive driver, Sarnia Tunnel, has been appointed Road Foreman of Engines, Stratford, Ont., vice G. Black, deceased.

The following agents have been appointed:—Lacadie, Que., J. A. Langlois; Huntington, Que., E. E. Bourdon; Beauharnois, Que., E. Rheume; Keene, Ont., P. Stinson; Uhtoff, Ont., R. G. Winters; Kirkfield, Ont., G. Raymes; Alliston, Ont., E. M. Ellis; Everett, Ont., E. N. Marshall; Grimsby Beach, Ont., J. A. Mitchell; Winona, Ont., S. A. Fairweather; Hespeler, Ont., N. A. Walford; Owen Sound, Ont., J. G. Heyd; Whitechurch, Ont., R. M. Patten; Ripley, Ont., W. M. Salkeld; Vankleek Hill, Ont., G. A. Cass; Kinburn, Ont., O. B. Elliott, temporarily; Wilno, Ont., G. H. Bates; Brule Lake, Ont., P. F. Madden; Sprucedale, Ont., H. W. Otto; Rose Point,

Ont., R. J. Hardy; Galt, Ont., outside, G. T. Misener.

Great Northern Ry.—L. W. HILL, heretofore President, has been appointed Chairman of the Board, vice J. J. Hill, retired.

K. J. BURNS, heretofore General Agent, Vancouver, B.C., has been appointed Assistant General Freight Agent, in direct charge of the company's freight traffic interests in British Columbia west of the 121st meridian, including Vancouver Island. Office, Vancouver.

Hudson Bay Ry.—Referring to the mention made in our last issue of a press report stating that C. J. BRUCE stated to be Chief Engineer of Surveys, had resigned, we are advised that he was an instrument man. As stated in the same paragraph, J. ARMSTRONG is Chief Engineer.

H. T. HAZEN, heretofore District Engineer, Canadian Northern Ontario Ry., Port Arthur, Ont., has received an appointment on the Dominion Government railway to Hudson Bay. It is said that he will be in charge of the railway terminals work in Hudson Bay.

Kingston and Pembroke Ry.—JAS. IRWIN, of Montreal, is reported to have been appointed Engineer, K. and P. Ry., vice G. G. Hare, transferred to Dominion Atlantic Ry. service.

Michigan Central Rd.—R. H. L'HOMMEDIEU, heretofore General Manager, has been appointed Assistant to the Operating Vice President, performing such duties as may be from time to time assigned to him. Office, Detroit, Mich.

W. H. FLYNN, heretofore Division Master Mechanic, St. Thomas, Ont., has been appointed Superintendent of Motive Power, vice E. D. Bronner, appointed General Manager, as announced in our last issue. Office, Detroit, Mich.

T. J. BURNS, heretofore Assistant to Superintendent of Motive Power, Detroit, Mich., has been appointed Assistant Superintendent of Motive Power. Office, Detroit, Mich.

E. R. WEBB, heretofore Division Master Mechanic, Michigan City, Ind., has been appointed Division Master Mechanic, St. Thomas, Ont., vice W. H. Flynn, promoted.

T. HALL, heretofore Division Foreman of Buildings, St. Thomas, Ont., has been appointed Assistant Superintendent of Buildings. Office, Jackson, Mich.

A. LESLIE, heretofore shop foreman, St. Thomas, Ont., has been appointed Division Foreman of Buildings, vice T. Hall, promoted. Office, St. Thomas, Ont.

Niagara Navigation Co.—See under "Richelieu and Ontario Navigation Co.'s absorption of three more steamboat lines" in Marine Department, further on in this issue.

Pere Marquette Rd.—E. E. CAIN, heretofore Superintendent, Cincinnati, Hamilton and Dayton Ry., Dayton, Ohio, has been appointed Superintendent, Toledo-Ludington District, P.M.R., vice A. R. Merrick, transferred. Office, Saginaw, Mich.

GLEN WARNER has been appointed Fuel Inspector, reporting to Assistant General Manager, Detroit, Mich.

Prince Edward Island Ry.—P. McQUAID, heretofore roundhouse foreman, has been appointed Master Mechanic. Office, Charlottetown, P.E.I.

Reid Newfoundland Co.—A. C. GRAY has been appointed Superintendent of Motive Power, vice W. H. Turnbull, resigned. Office, St. John's, Nfld.

Richelieu and Ontario Navigation Co.—See under R. and O.N. Co.'s absorption of three more steamboat lines in Marine Department, further on in this issue.

St. Lawrence River Steamboat Co., Thousand Island Steamboat Co.—See under "Richelieu and Ontario Navigation Co.'s absorption of three more steamboat lines" in Marine Department, further on in this issue.

Union Station, Regina, for C.P.R. & C.N.R.

The Railway and Marine World for Oct., 1911, contained a preliminary description of the station being built at Regina, Sask., by the C.P.R. for joint use with the Canadian Northern Ry. Following are fuller details:—

The main building is fireproof throughout and the wings are of slow burning construction. The main building is reinforced concrete frame construction, the foundations being also reinforced. The ground floor of the main building is designed to carry a live load of 175 lbs. per square ft., and the first and second floors 75 lbs. per square ft. The wings are designed to carry 200 lbs. live load per square ft. The building has been designed so that an additional story can be added over the main building, if required for offices.

The main portion of the structure is 105 by 64 ft. The east wing is 105 ft. long and the west wing 107 ft. long. The cost of the whole structure, including track work, platforms, fittings, etc., will be about \$200,000. The structure is being built of Bedford stone in the renaissance style. A special feature has

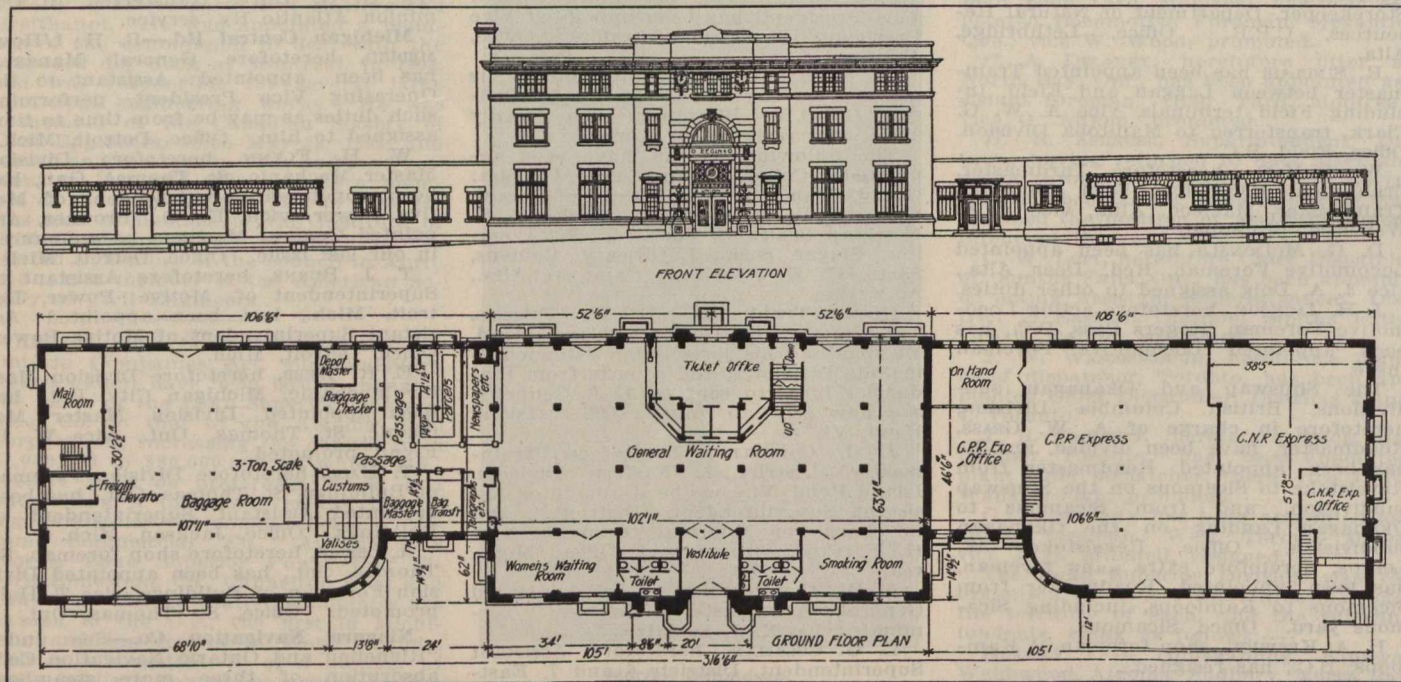
Entry is made from the main entrance through the vestibule to general waiting room by folding doors. This room, which is one of the features of the building, is 44 by 102 ft., and 19 ft. high. A marble terrace floor with dark marble border is provided around the room and between piers. The walls of the general waiting room are decorated with a panelled oak moulding 10 ft. high, supported on a verdantique marble base. The central piers and wall pilasters are finished in plaster supported on verdantique marble bases. The plaster caps of these piers are enriched with ornamental plaster shields. The piers and pilasters carry the plaster freize, architraves and modillion cornice under the ceiling. The light well, which is between the ticket office and vestibule, is finished in oak to match the interior trim of the general waiting room. The light shaft is carried through the first and second floors and is finished on the corridor side with a brass handrail. This light shaft also serves to ventilate and light the offices on the inside of the building.

The booking office is 9 ft high and the front is octagonal in plan; it is provided with two ticket cages, each 7 x 8 ft., with interlaced wire partitions and appropriate fittings. There are a number of

with oak finish and marble work, as is also the ceiling, the latter being a light buff.

The smoking and retiring rooms, toilets, news and telegraph offices are easy of access from the general waiting room. A 15 ft. space is provided at the west end in the baggage department to provide access to the counters of the parcels, baggage transfer and checking rooms, and there is a valise room at the rear of these. The baggage master's office is situated at the side of the checking room. An entrance from the platform is provided for the use of passengers. The telegraph department is placed at the west end of the general waiting room, where there are also two private telephone boxes. Opposite the telegraph department is the news agent's office with glass silent salesmen on both sides. Besides the accommodations mentioned above, the west wing has mail transfer and customs offices; the rest of the wing, including the basement, is for the storage of baggage. An electric elevator is provided for handling baggage.

The east wing is occupied by the Dominion Express Co. and the Canadian Northern Express Co. The public entrances to these offices are from Railway St. The offices will be fitted up with



Elevation and Floor Plan of Union Station, Regina, Sask.

been made of the deep stone reveals of the door and window openings.

The principal entrance is in the centre of the main building and faces Railway St., a subway is provided under the tracks at the east end of the building on Broad St. The track side has two entrances, one on each side of the ticket office, which is placed centrally in the general waiting room opposite the main entrance.

A steel and glass marquee, suspended on heavy iron chains from lions heads bolted through the wall, runs the entire length of the main building outside the general waiting room on the track side. This marquee has ornamental copper cresting and shields, and projects 12 ft. from face of stonework over the train platform. Similar protection is provided outside the baggage and express department both on the front and track sides, but the supports consist of steel trusses bolted into the walls. A clock chamber is provided over the main entrance with self-illuminating clock dials showing from the front of the building and also in the general waiting room. The vestibule and waiting room staircase and corridors are designed in the French renaissance style.

counters, including information and ticket counters, with metal grills over them. Special fittings are provided at the back of counters to suit the requirements of the ticket agent, and a ticket room is provided in the basement for the storage of tickets.

A steel and marble staircase is provided from the general waiting room at the side of the ticket office to give access to the offices on the first and second floors. This staircase leads to the mezzanine floor over the booking office (which is finished as a gallery, with terrace floor and iron railings) with plaster newells supporting ornamental electric light fittings. The staircase, from the gallery to the first and second floors, is provided with wrought iron ornamental shields and oak handrails.

Ornamental plaster shields and enrichments are designed over the entrances of the general waiting room and above the pilasters of the doors and windows. The panelling of the waiting room door and windows, counters, pilasters, etc., is white oak, finished with a dull surface. The space outside the baggage department is finished to match. All the plaster work, with the ornamentation mentioned, is tinted to harmonize

quarter sawed oak counter fittings, and cages to suit the companies' requirements. The basement of this wing is used for storage purposes. The boiler room for heating the building is in the basement in the centre of the main building.

The electrical work is done by the C.P.R. electrician, and all the wiring, fittings, etc., will be of the most up-to-date description. Lights are suspended from hanging chain pendants in the general waiting room, and are supported by brackets attached to wall pilasters and fittings in the gallery. Specially designed electric light standards will be provided over stone pedestals at the sides of the principal entrance. These will be finished to harmonize with the metal grillage at entrance. The first and second floors of the main building will be used for offices by the two railway companies, and will be subdivided to suit the requirements.

The building was designed in the C.P.R. Chief Engineer's office in Winnipeg. The work is being carried out under the supervision of the C.P.R. Division Engineer at Moose Jaw, T. Martin, the contractors being the J. McDiarmid Co., Winnipeg.

The Distribution of Heat Value in Coal.

By Sydney H. Pudney, Fuel Inspector, Eastern Lines, Canadian Pacific Railway.

The subject of how the heating value in coal is distributed, and why the proportionate distribution of such heating values affect the consumption and economy of fuel is very little understood by large numbers who use coal for the production of steam power. It is also a subject that is often lost sight of by those who construct steam boilers and their settings.

The many bylaws covering the smoke nuisance in various localities cause a need for a closer study into coal and its combustion which will also add to the economical use. The idea of putting in steam sprays at various parts of the combustion chamber or smoke stacks, to overcome the smoke nuisance, is no doubt a costly one, and detrimental in many ways, especially if by careless handling an excess of steam is used. What is needed to assist in the economical use of fuel and at the same time to abate the smoke nuisance is a closer study of fuel matters, following all subjects pertaining to them, such as the percentage of volatile combustible of fixed carbon and of ash. A knowledge of the action of fuels in the process of combustion in a furnace or firebox is essential to everyone who would understand the science of fuel economy. A careful study of the nature of the ash, and its action in forming clinker, or in other ways preventing a free circulation of air through the fuel bed, is also very beneficial in the use of fuel. An elementary analysis is of the utmost value in determining the heating power of a fuel, much more so than the "proximate analysis" that is so freely used, just because it gives one the exact percentage of combustible elements and non-combustible elements which a coal contains. The usual calorimetric test of fuel is a good reliable means of ascertaining the highest power of a coal which is burned in oxygen and is usually expressed in b.t.u.

When one gets all the above information, with the b.t.u. value in each case from standard calculations, his knowledge of fuel is yet very little assistance to him in pursuing a system of economy of fuel, or lessening the smoke trouble, in anything like a scientific or business like manner. And if he goes into it only armed with such knowledge the results of his efforts are likely to fall far below his expectations. The important knowledge which he must have is that of the combustion of fuel, a subject which is nearly worn threadbare.

It is to be presumed that most men in an official capacity already know that hydrogen combines with oxygen in combustion and forms water as a product of combustion, giving up 62,000 b.t.u. in so doing, and also that carbon will unite with one part of oxygen, forming monoxide of 4,500 b.t.u. value, or will combine with two parts of oxygen, forming carbon dioxide of 14,544 b.t.u. value, therefore it would appear that as far as they are concerned the combustion of fuel is old.

There are points in connection with the burning of fuel that the practical man never learns because of his lack of scientific knowledge; and the scientific man never knows because of his lack of practice. The whole of this subject takes years of study and observation to master, and even then there are new ideas coming up continually leading one into different channels of thought. What I want to do in this paper is to give a few examples of different coals and their actions, and the distribution of their heating value.

We will take up the case of volatile combustible matter first. It is usually considered by firemen and engineers,

both of stationary engines and locomotives, that a coal that has plenty of flame and smoke is a good one to produce steam, and a great many people are influenced in the purchasing of such coals as have a high percentage of v.c.m. Nothing is farther from the truth than such ideas of enginemen. As a matter of fact the higher the percentage of v.c.m. the lower the heating value of the coal. The reason will be explained later on. I may mention here that as described in the U.S. Geological Survey Bulletin, 373, Messrs. Randall and Weeks made investigation of between 400 and 500 steam boiler plants, and in their summary state that they found that high volatile matter in coal gives low efficiency and vice versa. It is only reasonable to suppose they mean high volatile combustible matter, because all steam users know that a coal which might have 10% of moisture would mean that 10% of its volatile matter was of no use in raising steam in a boiler, and that this moisture would take up heat to vaporize it and drive it off at chimney or smoke box temperature, therefore it is most likely they mean v.c.m. and not v.m.

In an analysis we usually get the percentage of moisture of v.c.m. of fixed carbon, and of ash, with b.t.u. value. In arriving at these percentages a given weight of coal is dried at about 220° F. for an hour and weighed, the loss being the percentage of moisture. The sample is then heated at high temperature by a Bunsen burner for a few minutes and then at a higher temperature by a blast lamp for about the same length of time, and after cooling in a desiccator is weighed, the loss being v.c.m. or volatile combustible matter. This is where I take exception to the rule, because this does not give the v.c.m., but the total v.c.m. and non-combustible elements such as oxygen and nitrogen as well, therefore we find that the proximate analysis is incorrect and the exact percentage of v.c.m. is not given but the total v.m. minus water or moisture. We can easily see how this would mislead us in the purchase of coal. We might buy a coal with 40% v.c.m. shown and it might have 15% of oxygen, consequently only 25% out of this 40% v.c.m. as shown would be of any use to produce steam. Again we might purchase another fuel with 35% of v.c.m. shown, with only 5% of oxygen, and in this case, though the total percentage of v.c.m. dropped 5%, the fuel value increased 5%.

Prof. Phillips, in his work on the analysis and valuation of fuel says the more organic oxygen that is present in a fuel the less heat will be given out, owing to its already being in chemical combination with the carbon and hydrogen.

In the U.S. geological survey bulletin 382, "The effect of oxygen in coal," by David White, it is stated that the result of oxygen in coal, in relation to the heating value, is just about as detrimental as the same percentage of ash would be, that is to say that a coal having 7% of ash and 13% oxygen would give about the same heating value as if the figures were reversed, i.e., 13% ash and 7% oxygen. Two special cases are cited to prove their contention, and in table 1 of the ultimate analysis of 319 American coals there are two cases shown where the ash and oxygen about equal each other in qualities that are detrimental to the heating value. No. 1, having 4.02% o. and 18.80% ash, has 12,472 b.t.u. no. 2, having 18.32% o. and 3.63% ash, has 12,5519 b.t.u. These cases show conclusively that a proximate

analysis as previously mentioned does not give one much reliable information of his fuel.

The calorimetric determination of the heat value of fuel is obtained by its combustion in an enclosed bomb, under a measured quantity of water, and careful readings are taken of the raise in temperature. This, multiplied by the weight of water, gives the b.t.u. value, but this is all it does give, just the heat value only; and to be able to go forward with the subject of fuel economy and smoke prevention in steam boilers it is necessary to know not only the heating value of a coal, but also how such heat value is distributed in the coal and then to devise some means whereby the ultimate value produced by its combustion may be as near as possible to the initial value in the fuel. We shall then be as near to the economy of fuel as it will be possible to be in the combustion of it.

To get at the distribution of heat values it is not necessary to have an elementary analysis, the proximate will enable us to get this information, provided we also have a b.t.u. value from calorimetric test. Take for instance a coal of 35% v.c.m., 55% of f.c., 10% ash moisture, the b.t.u. value from calorimetric test shows it to be 13,700 b.t.u. which is distributed between the 55% f.c. and 35% v.c.m. As the value of carbon is always the same, namely, 14,500 b.t.u. per lb., we find that by multiplying 14,544 by 55% and dividing by 100 we get 7,999 b.t.u. in the fixed carbon, and this subtracted from 13,700 gives us 5,701 b.t.u. in the 35% of v.c.m., this volatile combustible matter is only of 16,300 b.t.u. value per lb.

We will take two samples of coal mentioned in the U.S. Geological Survey Bulletin 402 on the utilization of fuel in locomotive practice, by W. F. M. Goss. Coal A has 31.94% v.c.m., 57.71% f.c., 14,047 b.t.u.; coal B has 15.23% v.c.m., 72.75% f.c., 14,347 b.t.u. Coal A from the above calculation has 14,544 x 57.71% f.c. ÷ 100 = 8,393 b.t.u. in fixed carbon and 5,654 in 31.94% of v.c.m. 5,654 x 100 ÷ 31.94% of v.c.m. gives 17,776 b.t.u. value per pound of v.c.m. Coal B, worked out on the same system, is as follows:—14,544 x 72.75% f.c. ÷ 100 = 10,580 b.t.u. for fixed carbon and 3,767 b.t.u. for 15.25% v.c.m. Again we find the heating value of the v.c.m. 3,767 b.t.u. x 100 ÷ 155.25% = 24,000 b.t.u. per pound.

These few examples are enough to show that the higher percentage of volatile combustible matter the lower the heating value of the coal, as the percentage of v.c.m. increases, the actual value of the heating equivalent decreases, and as the percentage of v.c.m. decreases the heating value increases. Not only this but the total heat value increases. Coal A has a total of 89.65% combustible 14,047 b.t.u. Coal B has a total of 87.98% combustible 14,347 b.t.u. We can easily see why the statement is made in U.S. Geological Survey Bulletin 373 that high v.c.m. gives low efficiency because the power is not there.

So far these points have brought out something definite in the distribution of heating values in fuels, but not enough to economize in fuel. As to the production of smoke we already know that the less percentage of v.c.m. the less smoke, until we may use anthracite with no smoke. But in the case of low efficiency and smoking plants and locomotives, due to high v.c.m. coals or long flame coals there are some very important facts to be considered. In all cases of smoke there is only one thing that can be said to be the reason, and that is incomplete combustion. Complete combustion produces carbonic oxide and water, and both are without color, so when volumes of smoke are

going out into the atmosphere it means loss of such fuel that makes the smoke.

There are several reasons for the incomplete combustion of the gaseous portion of coal, and it is due sometimes to the class of coal being used in a certain form of furnace. There is also a great difference, not only in the heat value of the v.c.m., but also how it is contained in the coal and how it will be evaporated or distilled from the fixed carbon in the furnace or firebox. We may take two coals having exactly the same percentage of composition, i.e., 35% v.c.m. and 55% f.c., and yet these two may be totally distinct from each other in the way they will act while going through the process of combustion, and it would be practically impossible to get the same ultimate results from both coals with the same furnace or locomotive. One will give up its volatile matter quickly while the other gives it up very slowly, usually making a dense coke, while the first kind makes no coke practically, and burns away quickly, having no body. The knowledge of the analysis or of their heat distributions does not give any intimation of their actions in the fire, and these are some of the most important things in connection with fuel combustion.

It is doubtful if any one furnace or firebox could be constructed that would give equally good results with both such fuel mentioned, without it were equipped with automatic appliances to regulate the flow of air through the fuel bed and to the combustion chamber. The free burning coal that gives off its gaseous content quickly must have a very large supply of air just at the time of the distillation, or setting free of these gases, and must have this air delivered in such a position that it will become well heated and mixed with the gases before they come near the heating surfaces of the boiler. If such a coal is used without the necessary amount of air delivered in this way, there will be large quantities of smoke and a great loss of heat value due to incomplete combustion of the v.c.m. And as far as the consumer is concerned he might have purchased his coal without an analysis on b.t.u. value except that he will have some idea as to the heat value he is losing through poor equipment.

In the case of stationary boilers that are built in brickwork it is very easy so to construct the bridge wall that there may be a supply of air distribution from it, which will be well heated and mix with the gases as they go over to the combustion chamber. If this is done it will ensure a full supply of air and perfect combustion of the gases of such free burning coal, which will mean less smoke and greater efficiency. To ensure a much greater efficiency it will be necessary to increase the travel of the hot gases over the heating surfaces. The arrangement sometimes used to assist in the combustion of quick burning coal by having holes direct from the atmosphere to a position above the fire is open to dispute, because the cold air rushing in amongst the gases being liberated does not have a chance to become heated and therefore has a cooling effect, lowering the temperature of the firebox. Such inlets are often detrimental to fuel economy. If the holes or inlets are in such a position that the air may be heated, by directing the air downwards to the fire, more benefit will be derived from them.

Poor firing is also a great drawback to good efficiency, with long flame, quick burning coal. If the fireman charges his fire by putting in large quantities at long intervals he will certainly lose a large percentage of the heating value, because it will be impossible to get sufficient air through the fuel bed to mix with the gases at the moment of their being set free from the coal.

In any plant where it is impossible to get the air arrangement in this way it is far more economical to use a slower burning coal, firing on to the dead plate and allowing the gasses to pass over the hot fuel bed while mixing with air and so ensure perfect combustion and less smoke. The only way to fire a free burning coal as described is to carry as light a body as possible, always taking care that there are no bare spots on the grates, and firing often with light charges at each time. As a rule the stationary boiler fireman is not so careful to keep his fire in condition. I remember once going to a boiler house where slack coal was being used, and asking the superintendent how they were progressing. He took me around a battery of four locomotive type boilers, and after opening the door I pointed out to him that there was a bare part of grate at each corner just inside the door fully two square feet at each corner. He promptly drew the fireman's attention to it, and told him to keep the grates covered. We found all four boilers in the same condition. I have repeatedly seen the same with all classes of hand fired stationary boilers, i.e., bare spots on the grates. If a locomotive fireman were to do this it would result in lost time for steam and leaky boiler.

The percentage of heat value in the fixed carbon can be controlled in a better manner than the gaseous content. Every effort should be made to have the coke burn to as near white heat as possible. This is a sure sign that enough air is coming in contact with it. In quick burning coal it is just as necessary to carry a very light body of coke to get the full heat value out of it as it is to carry a light fire for the perfect combustion of the gases. The coke is not solid and will combine very freely with the oxygen of the air. This is evidenced by its quick burning properties. The gases in leaving it make it very porous, so that the air can circulate through it as though it were a sponge, and if there is not sufficient air to form the CO₂ gas, CO will be formed and with only one-third of the heat production it should give.

Often quick burning coals give poor efficiency due to a lack of knowledge of their actions and properties because it is a very easy matter in both locomotive and stationary practice to lose a great deal of the initial heating value. If such coals are fired heavily, that is to say a large application at each time of firing, and the body of the fire is carried too heavy, there will be poor results and low efficiency. In the first place a large percentage of the gaseous content will escape with the chimney gases and smoke stack gases, without ever passing through the process of combustion, therefore a great loss occurs. The same thing occurs with the fixed carbon, owing to its burning so free, which, in other words, means combining with oxygen so freely. If a thick fuel bed is carried it will result in low efficiency due to the oxygen of the atmosphere combining with the lower portion of the fuel bed and forming CO₂, and in passing through the thick bed of fuel is again reduced to CO, consequently producing only 4,500 b.t.u. instead of 14,544 as it would have done if the fuel bed had been thinner.

Besides this there is another feature to be considered with this class of coal and that is its tendency to form clinkers if fired too heavily, sometimes so much so that a stop has to be made to clean the fire, whereas if fired lightly this never occurs, except slightly, causing no damage.

The subject of buying coal on a b.t.u. basis is of no use if no attempt is made to get the ultimate value as near as possible to the initial value as purchased, thereby getting the highest efficiency.

The Passenger Department of a Railway.

By W. P. Hinton, General Passenger Agent, Grand Trunk Pacific Railway.

In the beginning of rail transportation the lines were few, serving a limited territory where there was no competition and each passenger received a receipt, made out on a form duly provided and signed by the agent as his passage ticket. No general passenger agent was necessary then, but with the extension of these lines, connecting with others, forming through links in vast distances, and eventually transcontinental, a special organization was found necessary to provide means for through ticketing and making other arrangements necessary to the convenience and care of the traveller and his property and the protection of the railway and its passenger revenue. The paralleling of the lines and the growing competition eventually required enterprising specialists to arrange to secure and hold as much of the competitive business as possible to their respective lines, and to branch out into new fields and create new business wherever practicable. Thus we have tourist, colonization, transcontinental and round the world traffic promoted in volume, where, if left to itself, the business would not develop except on natural lines and very slowly. The passenger department, in short, while looking closely after the development of business along the line, must instill the desire for travel in the minds of the public and incite them to journey, even to the extent of their resources.

To maintain and supervise the different branches of good service (and there is a constant demand for improved service on the part of the public, and growing competition) there are many subdivisions of the general passenger department, such as the district passenger agents or general agents passenger department, who direct the work of ticket or passenger agents; travelling passenger agents, and on some lines certain of the train employees. They are held accountable for the business in their respective districts, and to promote local excursions, to conduct advertising of a local nature and to examine and report on the condition of cars, their ventilation and heating, the condition of stations and offices as far as they serve the travelling public, and suggest improvements and other changes which will be beneficial to passenger traffic. There are superintendents of dining, sleeping and parlor car service, general passenger agents, tourist and colonization agents and general advertising agents, all expected to be exceedingly thorough and alive to possibilities and who serve to focus results, reports and practical improvements which may be feasible, on the general head of the department for disposition or action.

The organization of a general passenger department may be comparatively simple, as it is on a small line, or very complex, but nevertheless firmly welded together and carefully shepherded, on a large line. The department proper may be divided into the following branches:—1. Tariffs, tickets, excursions. 2. Statistics and accounts. 3. Train schedules and equipment. 4. Advertising. 5. Tourist, immigration and colonization. 6. Baggage. 7. Dining, sleeping and parlor cars.

A brief summary of these varied branches of our work will naturally follow as pertaining to the systematic arrangement and the efficiency of our duties towards the traveller, who must be constantly studied in relation to his needs and desires, which are more or less fitting; so that the unit as well as the volume may be made to move without friction or complaint, while returning the maximum revenue to the transportation company with its enormous investment, for which a capacity business is always desirable.

It may appear to be a simple matter to compile and publish a tariff, and so it would be if a line served purely local

territory, but with many intersections by competing lines, making it advisable to adopt common fares at many points, which have their effect on the majority of fares over the entire system, also owing to the extension of through ticketing arrangements between all railway points on this continent, the problem is far from simple, the work heavy and wearisome, though interesting. One tariff alone may contain 10,000 fares, and any large system has literally scores of such tariffs prepared with utmost care, scrutiny and comparison. Tickets are of many classes, and reading over as many routes, rail, inland waters and ocean, as tariffs may provide for.

Excursions must be duly arranged for, as well as the several classes of traffic for which special tariffs and tickets are provided. As special train movements must be provided for in case of excursions, the closest attention is necessary to the correctness of advices to the different departments involved, with close supervision as to the carrying out of the arrangements, as any neglect of the smallest detail is almost sure to cause inconvenience and serious consequences.

Statistics must be kept of results of train operation, including the different departments, recording revenue or expenditure, which must be scrutinized perpetually to arrest any waste or to watch developments with a view to increased revenue. In like manner the handling of department accounts affords an opportunity for careful study of the expenditure.

Advertising, in which should be included the right kind of publicity, has become one of the most important branches of passenger department work. Not only must copy be supplied for advertising space contracted for in the daily and weekly newspapers and periodicals throughout the land, but news items and stories, keeping the name of the transportation company prominent and impressively before the public, must be prepared and insertion obtained. Through this latter medium it is possible to reach a score of millions of readers or more in the course of a few months. This also creates a better understanding of the railway aims by the public, who, as a rule, never come personally in contact with the higher officials of a railway, and their impressions are more readily formed from the more or less impersonal treatment they receive while travelling with hundreds of others and imbibing adverse criticism or theories by the way.

Display posters and bills are prepared and issued, together with tons of carefully prepared and arranged public time tables. Literature attractively prepared, tastefully printed, and profusely illustrated, must be supplied the soliciting staff for distribution and to drive home the statement that this particular route is the only popular one, or that the prospect needs a change of scene. All are familiar, however, with the nature and variety of these publications.

Tourist traffic is the business that the transportation companies must create, and it really requires more careful and patient tending than any other branch of passenger traffic. There would be little tourist traffic if it were left to develop by itself. The seeds of a desire for travel or change must be sown by the passenger department, and this is the impulse of tourist travel. There is a satisfaction, however, in knowing that once interested this business increases rapidly in volume to each particular section, it becomes a very valuable addition to the local traffic, and in many cases warrants an improvement in train service, from which a large community of regular travellers benefit, and which could not be provided without the through tourist.

Off to the west the mountains rear their snow and ice capped pinnacles, a very ocean of them, and for a long time were considered a never ending detriment to the development of the coun-

try. If a cash value were placed on scenery they would be very rich, but then capitalization from a national standpoint is established alone by the efficient work of the passenger department.

Nor are the millions spent in the mountain and other resorts of Canada the only national benefit received. The tourist from other lands becomes interested in Canadian institutions and investments and where he comes to play and rest he is easily induced to own and develop property and aid through his investments the development of Canadian manufactures and prosperity.

An illustration of the benefit to a community the railway activity produces in promoting tourist travel might be instanced to advantage in the business in one of the eastern states during the summer season. Maine is a prohibition state, but tourists leave there annually in the hotels and farmers' hands over \$15,000,000. The railways glean besides a reasonable return for their efforts, while producing a satisfactory result to the tourist or health seeker and the local community. Corresponding results might be quoted in the development of travel to Florida and California



W. P. Hinton,
General Passenger Agent, Grand Trunk Pacific Railway.

in the winter, the Pacific Coast and mountain resorts at other seasons, and surely the railways have been largely misunderstood by the people whose best interests are at stake, while through legislative action and otherwise, every influence has been employed to curb and restrict their operations. Happily this attitude is passing, or is being directed more and more in other directions in favor of the square deal. Possibly the public will realize, as every student of transportation economics does, that unless this, the greatest business in the world, is made the business partner of the people, neither can prosper or develop.

Immigration and colonization are closely allied, and this branch also calls for specialized work in order to be effective. It is a very important work in its relation to the freight and other industrial traffic revenue of the line. In this work a place must be found where each settler will fit, so that a very wide knowledge of the country and its needs must be acquired, as it is necessary to talk intimately of conditions in sections of the country one, two or three thou-

sand miles apart. Happily, in Canada, we have many talking points, as it is mostly good, and often I have said to a prospective agriculturist, which class is our chief concern, copying an old Chinese proverb: "If the farmer be diligent the soil will not be lazy."

Baggage and its care has received its share of study and attention in the last few years, and it is truly amazing to what perfection its transport has attained. Losses are very seldom experienced in the millions of pieces handled in the year, a result aimed at in the feeling that no matter how pleasant a journey, or what courtesies are received on the train, if baggage is not promptly produced at destination, the testimonial which the traveller has determined to insert in the newspapers on arrival is converted into a withering and sarcastic commentary of the rottenness prevailing on that particular line, and to the passenger official the missing article looks more precious and as difficult to redeem as the one mourned by the shepherd of the other ninety and nine.

Train schedules and equipment is a matter of almost daily study in the general passenger department. In the first place, the needs of the travelling public must be fairly provided for, while the trains operated must be confined to the number which will just suffice and leave terminals and important points at the most suitable hour, at the same time assuring ourselves that the revenue will be remunerative to the company. The public presents many problems in this connection, as varied almost as the number of would be travellers, and while numerous suggestions are furnished to meet peculiar personal needs, a decision must be reached which will please the majority, and the results are disastrous and expensive to the company if any mistake is made in the arrangement of these schedules. Further, when a new train is decided upon to take care of a particular traffic, while supplementing other trains, it should not impair their revenue to any extent. If poor judgment is shown, the expense is great, and it may be many months before a conclusion can be reached as to whether the train should or should not be continued.

In the meantime, expensive equipment is employed; for instance, the cost of equipment used on all railways last year exceeded \$1 for each passenger carried; and as a train piles up mileage very fast, whether fully or only lightly patronized, the large expense involved is a fixture which must be grimly viewed. A particular knowledge of the physical features and conditions of the line, also the fitness of motive power for the service required, must be reckoned in dealing with the season's train service arrangements, and suitable equipment for all requirements must be figured on with much care, and requisitioned a year or more ahead, or at the critical time it will not be available. Naturally, it is far from desirable to have more equipment than required of an unsuitable class, an expense and deterioration which must be rigidly guarded against.

When, with other duties in the provision for and care of the travelling public, a passenger department must provide hotels and restaurants on wheels, and give service, too, in these cramped quarters equal to high class hotels, another specialty is introduced into the work which requires little comment on my part as to its difficulties, cares and triumphs, so that this is the only mention I will make of the sleeping, parlor and dining car service, where courtesy of employes, when cheerfully and helpfully given, shines like a precious gem and makes a traveller happy that his choice led him in such pleasant ways.

Passenger work must be different in different sections of the country. For instance, different methods must be employed in Canada, and especially in Western Canada, from, say, New England. In Massachusetts the population is 419 to the square mile, in Manitoba, the most densely populated province of

Western Canada, 6; in Alberta, 1½, and British Columbia, 1. It is apparent that the railway passenger revenue must be drawn to a considerable extent in Western Canada from the through passenger and new settler, whereas in Massachusetts the local traffic alone is very large. In the latter case the business originates at home and needs to be properly taken care of only, while in Canada we must go far afield, even across the seas, to secure sufficient business to cover the expense of operation of our trains, and the handsomely equipped services, the equal of any in America, which are provided for the public here, are only possible through procuring the greater part of our business from remote districts and countries.

In this connection, and as further illustrating the need of effective colonization and attracting through business, Lieutenant Butler (later General Sir Wm. Butler), in his record of a journey in 1869-70, between Winnipeg and the Rockies, over the trail which the G.T.P. so closely skirts, in recording his thoughts in camp near Portage la Prairie, says:—"Between this little camp fire and the giant mountains to which my steps were turned, there stood in that long 1,200 miles but six houses. On the same day as I read this I saw a train of eight coaches leave the station at Winnipeg with its human freight for points along the self same trail, and this is a matter of daily occurrence on three railways now."

Needless to say, the passenger department must obtain the fullest co-operation of the transportation and mechanical departments, or it can only succeed to a certain degree in developing traffic. In train schedules and ensuring the on time habit for trains, the cleanliness and upkeep of cars and stations, the proper attitude of employes to the travelling public, all mean service and good returns as contrasted with slovenliness and failure without this active co-operation. In my observations, during many years in railway service, I am convinced that next to inefficiency of the traffic department itself, this lack of co-operation on the part of the transportation department is the most frequent cause of failure for that particular line to stand out prominently above other lines designated as railways, but with no particular features to commend them. This is, of course, deplorable and bears very seriously on the possible revenue of such a company.

Do you realize that failures on the part of any department of the railway to please the exacting traveller invariably lead to the injury of the passenger department in the results which it strives to obtain? A complaint for any cause drifts into the general passenger department, which must endeavor to perpetually smooth over the faults of others as well as its own, and its contact with the public is not always pleasant, however necessary. As a matter of fact, we frequently deplore that we do not receive enough complaints.

We do not render thanks for praise, but we invariably do to anyone who will offer us intelligent comment, criticism or complaint respecting our service, fully realizing the value of it and enabling us to remedy some defect, possibly so slight that it was not apparent to us. My experience has convinced me, that good service is always cheaper in every way than only fair or poor service. Good service makes friends who are willing to tell their friends about it, the most valuable advertising results we can procure, and at the least cost; new friends are made in an endless chain. Poor service has the effect of making the once patron look around for another route, and he will not be slow in telling others of his preference.

The results achieved by the passenger department do not all directly contribute to the passenger revenue of a railway. No one has been able to accurately estimate the great benefit to the freight revenue from the large expenditure in advertising and publicity disbursed and charged to the passenger depart-

ment revenue, nor has any claim been made by the railways on the government for the peopling of the lands with tax payers, the greatest of all national undertakings, for which the passenger department of a railway is responsible.

Under the Railway Act of Canada, transportation companies are permitted to give special fares and concessions to land settlers, agricultural exhibition managers, exhibitors and commercial travellers. The ultimate results are reaped by the freight department, owing to the settlement of the land, the improvement of crops and the additional sale and distribution of merchandise and supplies.

Effective advertising and good passenger service to the public has influenced the shipper and merchant to forward his merchandise by the same route as he travels. He finds that the route affording comfortable travelling conditions through smooth track and careful train handling does not damage his freight and leaves it in good saleable condition on delivery, as contrasted with the other line, which makes an expense in repairing damage to his goods, besides detracting from their appearance, freshness and other marketable qualities.

Frequent comparison of the two great branches of the traffic is made, and I am often asked if there is not a great similarity in the work of the freight and passenger departments of a railway. Speaking from an experience of twenty-five years, slightly more than half of which was spent in the freight department, possibly some remarks in this connection will be interesting. The freight department may be fairly compared to the wholesale mercantile warehouse, while the passenger department is the department store. The freight department is a seller of the wholesale merchandise branch of transportation, the passenger of the retail, and with this difference the similarity fairly ends. The freight department has the problem of developing and securing traffic which does not move of itself, and where certain fixed principles apply, the results being certain and quick, and in money revenue to the railway usually much greater in bulk than the passenger receipts.

The passenger department, on the other hand, has a new problem to consider in every community, in fact, frequently finds one in every passenger carried, whose prejudices and convenience, no matter how varied and generally fickle, must be carefully taken into consideration at every turn. A passenger has a mind and legs, freight has neither. A new train may be put on to develop and increase travel, but it takes at least six months or longer to demonstrate whether it is a success or otherwise. It may not suit the communities served just right, but a passenger department must take the responsibility for its enterprise and will be judged accordingly, both by the public and the executive heads of the line. Freight business can be handled by the service necessary from day to day. Passenger service must be maintained regularly under all circumstances, whether there be business or not. In fact, there are so many differences in the principles of conducting these respective departments, and so very few of a similar nature, that I am convinced that there is not a more striking likeness between these brothers than there is say, between the passenger and any other department of railway operation. In other words, they are both concerned in selling transportation, but the nature of their goods is so different that the similarity must cease with that general basis.

You have all heard, however, that the freight business is the backbone of a railway's revenue. Let us look into this. The revenue per train mile of all Canadian railways last year yielded for passenger \$1.35, and \$2.38 per mile for freight. The earnings of all trains were \$2.10 per train mile, and the cost of operation \$1.46. It is unfortunate that it is impracticable to separate the abso-

lute cost of operation of freight and passenger trains. The passenger train mileage was 37,000,000, freight 52,500,000. The value of passenger rolling stock used was \$36,000,000, of freight, \$95,000,000, or, roughly speaking, about one-fourth passenger, three-quarters freight. The cost of maintenance and renewals of cars amounted to 9½c per passenger, and 16½c for freight per train mile. It cost \$250,000 more to pay loss and damage claims for freight than the entire expenditure in advertising conducted by all Canadian lines.

Considering the roomy and expensive terminals necessary for receiving and delivering freight; the long crossing and other sidings necessary at each station, chiefly for freight purposes, also their upkeep; the large staff necessary in all principal terminal and transfer offices to handle freight business, as contrasted with the two or three ticket sellers at the same points; the large number of yard engines and crews for freight service, as contrasted with one or two for passenger service in even the largest yards; the larger use of the railway and greater liability to interruption of traffic with slowly moving as contrasted with express trains; additional crews and fuel necessary to move trains an equal distance to passenger trains and other minor considerations, and it will be readily seen that the earnings per mile of passenger and freight trains respectively are not at all out of proportion to the net results.

I hope, as the result of these few remarks, thorough co-operation with the work of the passenger department will be given, and its fitness allowed for a worthy place in each and every railway family in this great country. Lack of co-operation between departments, or the failure of any unit in the railway organization, is a disaster to the company we serve and a crime towards the country in which we live.

The foregoing paper was read before the Western Canada Railway Club recently.

Railway Conquests of the World.—F. A. Talbot, who wrote a recently published volume, "The Working of a Great Canadian Railway," has written another one, "Railway Conquests of the World." The latter deals with the romance of railway building, and when it is considered that there are now 700,000 miles of railways in the world, the author had ample material to work upon. Some of the difficulties of the early periods of railway building in the British Isles, the continent of Europe, and in the United States, are graphically told, and there are given such feats as the boring of the Gothard tunnel in Switzerland, the holy railway to Mecca, the highest line in the world, the Cape Cairo Ry., the building of railways through the Rocky Mountains, the toy railways of Wales and Central Africa. In fact, Mr. Talbot has gathered together in one volume the most important features in the construction of railways in every part of the world, and tells of them in a most interesting manner. The volume is one of the Conquests of Science Series, issued by W. Heinemann, 21 Bedford st., London, Eng., and sold in Canada through the Methodist Book and Publishing House, at \$1.50.

The Canadian Fish and Cold Storage Co., Prince Rupert, has awarded contracts for the construction of three steam trawlers in Selby, Eng., at an approximate cost of \$40,000 each. The dimensions will be, length, between perpendiculars, 118 ft., beam 22 ft., depth of hold 12½ ft. Each vessel will be equipped with triple expansion engines, supplied with steam by Scotch boilers, and they will have a speed of about 10 knots. They are being built to special specification and in excess of classification requirements, 100 A1 at Lloyds. Two of them are to sail from England in Sept., and the third, with the possible addition of a fourth one, in October.

Orders by Board of Railway Commissioners.

Beginning with June, 1904, we have published in each issue summaries of orders passed by the Board of Railway Commissioners, so that subscribers who have filed our paper have a continuous record of the Board's proceedings. No other paper has done this.

The dates given of orders, immediately following the numbers are those on which the hearings took place, and not those on which the orders were issued. In many cases orders are not issued for a considerable time after the dates assigned to them.

16548. May 20.—Authorizing C.P.R. to rebuild bridge 94.8, Moose Jaw subdivision, Sask., and rescinding order 15687, Dec. 27, 1911, giving similar authority.

16549, 16550. May 20.—Recommending to the Governor-in-council agreements between Canadian Northern Ry. and Midland Ry. of Manitoba (G.N.R.) for operation as joint section from International boundary to Woodward Ave., Winnipeg, and authorizing such operation for 30 days, when, if not approved by Governor-in-council, operation shall cease.

16551. May 20.—Approving location of Central Ry. of Canada from C.P.R. near McAlpine station, mileage 7.2, to G.T.R. near South Indian station, mileage 38.165, Russell county, Ont.

16552. May 21.—Authorizing J. Battle, Thorold, Ont., to build chute under G.T.R. Stuart St. station yard, Hamilton.

16553. May 20.—Ordering G.T.R. by Aug. 1 to install electric bell at crossing of con. 3, Stamford tp., Ont., 20% to be paid from the railway grade crossing fund.

16554. May 20.—Approving Kettle Valley Ry. location from mileage 4.80 to 38.99, west of Penticton, B.C.

16555. May 20.—Authorizing Vancouver and Lulu Island Ry. (C.P.R.) to build second track across 11 roads and streets in Point Grey municipality, B.C.

16556. May 17.—Dismissing application of Canadian Press, Ltd., requiring Great North West and Western Union Telegraph Cos. to provide special press service tolls similar to C.P.R. and ordering C.P.R., G.N.W. and Western Union Telegraph Cos. to restore rate of 25c per 100 words for press specials in Maritime Provinces, effective by June 17.

16557. May 21.—Authorizing G.T.R., Georgian Bay and Seaboard Ry. (C.P.R.) and C.N. Ontario Ry. to operate over interlocking plant at Atherley Jct. without previously stopping, interlocker being completed.

16558. May 20.—Approving express collection and delivery limits for Grand Falls, N.B.

16559. May 20.—Ordering G.T. Pacific Branch Lines Co. to place crossing on E. D. Sworder's property, Balcarres, Sask., in proper condition for tram traffic by June 30, under penalty of \$25 a day.

16560. May 21.—Authorizing C.P.R. to divert Government road, mileage 9.92, on Waldo branch, B.C.

16561. May 20.—Authorizing C.P.R. to rebuild bridges 66.77, 19.7 and 6, Cartier and Havelock subdivisions, and Orford Mountain branch, Eastern Division.

16562. May 21.—Authorizing James Bay and Eastern Ry. (C.N.R.) to build bridge across River a l'Ours, Ashuapmouchouan tp., Que.

16563. May 20.—Approving location of C.N. Quebec Ry. station and baggage room at Sixteen Island Lake, Que.

16564, 16565. May 21.—Approving revised location of C.N. Ontario Ry. Toronto-Ottawa line, west of Newburgh, and authorizing it to cross public road between lots 20 and 21, con. 2, Thorah tp.

16566. May 21.—Authorizing G.T. Pacific Branch Lines Co. and C.P.R. to operate over interlocker at crossing of former's Melville-Regina branch and latter's Bulyea branch.

16567. May 21.—Authorizing C.N. Ontario Ry. to build bridge over Otter Creek, mileage 204 from Toronto.

16568. May 22.—Ordering C.P.R. to install within 90 days electric bell at main trail near Hesperus, Alta., 20% to be paid from railway grade crossing fund.

16569. May 15.—Approving diversion and crossings of C.P.R. in Purdue rural municipality, 346, Sask.

16570. May 22.—General order re fire prevention on railways.

16571. May 21.—Authorizing Port Arthur and Fort William Electric Ry. to operate over C.P.R. crossing at Pacific avenue, Fort William, Ont.

16572. May 21.—Approving plan A for subway under C.P.R. at 9th avenue east, Calgary, Alta.

16573. May 21.—Authorizing C.P.R. to cross 25 highways with its Swift Current northwesterly branch, and approving location, mileage 78.00 to 111.14.

16574. May 21.—Authorizing C.P.R. to build extension to spur for Dominion Gypsum Co., Winnipeg.

16575. May 22.—General order re forged steel wheels on tender trucks.

16576. May 22.—Authorizing C.P.R. to build cement foot subway at George street, Smiths Falls, Ont.

16577. Mar. 8.—Ordering C.N. Ontario Ry. to erect and maintain a flag station at eastern extremity of Deaf and Dumb Institute grounds near Belleville, Ont.

16578. May 23.—Approving agreement between Bell Telephone Co. and Algoma Steel Co., Sault Ste. Marie, Ont.

16579. May 22.—Authorizing G.T.R. to use jointly with C.P.R., spur to Toronto Furniture Co., Toronto.

16580. May 23.—Authorizing C.P.R. to build second main track across five highways on its Kenora subdivision.

16581. May 23.—Authorizing C.P.R. to build spur for Western Foundry and Machine Co., Saskatoon, Sask.

16582. May 22.—Authorizing Dominion Atlantic Ry. to build its North Mountain branch across highways between Centreville and Weston, N.B.

16583, 16584. May 23.—Authorizing C.N. Ontario Ry. to build bridge over Riviere des Milles Isles, mileage 37.9 from Hawkesbury, Ont., and to cross three highways in Bristol tp., Que.

16585. May 9.—Authorizing C.N. Ontario Ry. to connect temporarily with siding of Canada Coopera Co. Smiths Falls.

16586. May 23.—Approving C.N. Ontario Ry. revised location in Ross and Westmeath tps., mileage 69.15 to 71.08 from Ottawa.

16587. May 22.—Authorizing C.N. Ontario Ry. to build spur for Shevlin Clarke Lumber Co., Fort Frances.

16588. May 23.—Authorizing St. Cuthbert parish, Que., to build highway across C.P.R. two miles east of St. Cuthbert.

16589. May 20.—Approving G.T. Pacific Ry. location through Fort William, Ont., in accordance with agreement between the city and C.P.R., and rescinding order 8493, Oct. 6th, 1909, in the same connection.

16590. May 27.—Authorizing G.T.R. and C.P.R. to operate over interlocker at Nipissing Jct. without previously coming to a stop.

16591. May 27.—Approving Toronto Eastern Ry. revised location through Whitby and Whitby East tps., Ont.

16592. May 23.—Authorizing G.T. Pacific Ry. to build farm type of crossing over C.P.R. near dock in Vancouver, B.C.

16593. May 27.—Approving C.N. Ontario Ry. revised location through Gibbons and Crerar tps., mileage 267.2 to 271.4 from Ottawa.

16594. May 27.—Approving C.N. Quebec Ry. location through Two Mountains and Terrebonne counties, mileage 16.71 to 33.04.

16595 to 16597. May 27, 23.—Approving Canadian Northern Ry. location through tps. 39-42, r. 1, w. 3 m., to tp. 27 w. 2 m., mileage 0 to 26.56 and location of its Alsask southeasterly line through tps. 25-26, r. 15-20, w. 3 m., mileage 49.59 to 85.24; and authorizing it to cross C.P.R. Calgary-Edmonton branch with its Strathcona-Camrose branch in n.w. ¼ sec. 16, tp. 52, r. 24, w. 4 m., Alta., interlocker to be installed.

16598, 16599. May 23, 27.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to connect with Ontario and Quebec Ry. (C.P.R.) at Glen Tay, and approving revised location at Glen Tay to mileage 2.08.

16600. May 23.—Authorizing C.P.R. to build three additional tracks across Wolever Ave. and public lane in Winnipeg.

16601. May 27.—Approving C.P.R. revised location from mileage 0 at Bassano for 35.38 miles, sec. 3, tp. 25 and 22, w. 4 m., Alta.

16602. May 23.—Authorizing C.P.R. to take certain Toronto belt line lands in connection with diversions of St. Clair Ave. and Scarlet Rd., Toronto.

16603. May 27.—Dismissing Bell Telephone Co.'s application re crossing C.P.R. and G.T.R., Brock Ave., Toronto.

16604. May 27.—Authorizing C.N. Ontario Ry. to cross public road on lot 21, r. 2, Clarendon tp., Que.

16605. May 28.—Authorizing Alberta Central Ry. (C.P.R.) to divert trail at Rocky Mountain House by overhead bridge.

16606. May 28.—Authorizing Esquimalt and Nanaimo Ry. to build bridge 4.5 near Victoria, B.C.

16607. May 27.—Dismissing application of Campbellford, Lake Ontario and Western Ry. (C.P.R.) for crossing of G.T.R. at mileage 70.74 from Glen Tay, Ont.

16608, 16609. May 27.—Authorizing C.P.R. to build spurs for W. Bannerman Co.'s ballast pit at mileage 2, Ignace subdivision, Ont., and for E. Hogg, near Agassiz, B.C.

Ry. to cross temporarily concession road in Georgina tp., by agreement with township.

16611. May 28.—Authorizing C.P.R. to connect with G.T.R., take certain lands and divert lanes, etc., near Clarence Sq., Toronto, in connection with freight terminal enlargement.

16612. May 27.—Extending to July 1 time for completion of C.P.R. spur in West Oxford tp., Ont., as authorized by order 15542, Nov. 22, 1911.

16613. May 28.—Further extending to Dec. 1 C.P.R. Telegraph Tolls, C.R.C. 5.

16614 to 16617. May 28.—Authorizing C.P.R. to build two spurs for H. S. Gree, Killoonan parish, near Winnipeg, Man.; Canada Sand-Lime Pressed Brick Co., Symes Rd., Toronto.; British Columbia Brass, Ltd., New Westminster, B.C., and Argenteuil Granite Co., Chatham tp., Que.

16618. May 27.—Authorizing G.T. Pacific Ry. and Midland Ry. of Manitoba to operate trains without stopping over interlocker parish lot 55, St. Boniface, Man.

16619 to 16624. May 28.—Extending to Dec. 1 G.N.W., G.T.P., C.N.R. White Pass and Yukon and North American Telegraph and Bell Telephone Companies' tariff of tolls authorized by former orders or acts 7-8, Edward VII., chap. 61.

16625. May 29.—Extending to July 1, time for completion of fencing Great Northern Ry. from m.p. 63 to 77, as directed by order 16131, Mar. 13.

16626. May 23.—Ordering Canadian Northern Ry. to install improved type of electric bell at Bay Bridge Rd., Belleville, Ont.

16627. May 28.—Authorizing Vancouver, Victoria and Eastern Ry. (G.N.R.) to build dock and warehouse at Burrard Inlet, B.C., and rescinding order 15093, Oct. 16, 1911, to the same effect.

16628. May 29.—Approving C.N. Ontario Ry. revised location through Clarendon tp., Que., mileage 55 to 58 from Ottawa.

16629. May 29.—Authorizing Canadian Northern Ry. to divert public road on its Swift Current extension, Sask.

16630 to 16632. May 30.—Approving C.P.R. plans of bridge 61.51, Woodstock subdivision, N.B., and authorizing it to rebuild bridges 58.59, Cartier subdivision, Ont., and 57.1, Cascade subdivision, B.C.

16633. May 29.—Authorizing G.T.R. to rebuild bridge carrying highway in Caradoc tp., Ont.

16634 to 16636. May 30.—Dismissing application of city of Hamilton, Ont., to continue Lottridge St. across Toronto, Hamilton and Buffalo Ry., Hamilton Radial Ry. and G.T.R.

16637. May 29.—Relieving Great Northern Ry. from erecting and maintaining fences from International boundary to Brandon, Man.

16638. May 29.—Authorizing Essex Terminal Ry. and Michigan Central Rd. to operate trains over crossing at Windsor, Ont., without stopping.

16639. May 29.—Extending to July 1, time for installing derrails by G.T.R. at Toronto Suburban Ry. crossing, Keele St. and St. Clair Ave., as ordered by order 16411, Apr. 19.

16640. May 28.—Authorizing city of Lethbridge, Alta., to build crossing over C.P.R. at 13th St., for one year, watchmen to be employed by city.

16641. May 29.—Extending to Aug. 31 time for completion of highway diversion and crossing of C.P.R. at Foam Lake by Saskatchewan Government as authorized by order 15770, Jan. 11.

16642. May 29.—Authorizing G.T.R. to build additional track across Bedford St., Brantford, Ont.

16643. May 30.—Authorizing Quebec Ry., Light, Heat and Power Co. to build spur for Beupre Sand Co., Ste. Anne de Beupre, Que.

16644. May 29.—Authorizing Michigan Central Rd. to build spur for Dominion Cannery, Ltd., Niagara-on-the-Lake, Ont.

16645. May 29.—Approving location of Vancouver, Victoria and Eastern Ry. (G.N.R.) station at White Rock, B.C.

16646. May 28.—Authorizing C.N. Ontario Ry. to connect with C.P.R. at Meadowside, Nipissing District, for six months for construction purposes only.

16647. May 30.—Approving location of C.P.R. Kerrobert northeasterly branch from mileage 20 to 36.08, Sask.

16648. Apr. 23.—Approving location of C.P.R. freight shed at Saskatoon, Sask.

16649, 16650. May 29.—Authorizing Kettle Valley Ry. to cross highway at mileage 10.5, northwest of Penticton, and to cross six highways in Summerland municipality, B.C.

16651. June 1.—Authorizing C.P.R. to build three spurs for Union Stock Yards Co., Toronto.

16652. May 30.—Relieving Vancouver, Victoria and Eastern Ry. (G.N.R.) from erecting fences along certain portion of its line.

16653. May 31.—Authorizing city of Ham-

lton, Ont., to build subway under G.T.R. near Sherman Inlet (Birch Ave.).

16654. May 29.—Authorizing G.T. Pacific Ry. to build branch into secs. 18 and 7, tp. 53, r. 23, w. 4 m.

16655. May 31.—Authorizing C.N. Ontario Ry. to build spur from its joint section of C.P.R. spur in Parry Sound for Canada Chemical Co.'s smelter.

16656. May 31.—Extending to Oct. 1 time for installation of interlocker by C.N. Ontario Ry. at crossing of C.P.R. and G.T.R. near Ottawa, authorized by order 11386, Aug. 6, 1910.

16657, 16658. May 30, 31.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to cross C.N. Ontario Ry. in lot 27, con. 2, Pickering tp., and Pointe Anne Ry. Co. (Canada Cement Co.), in lot 15, con. 1, Thurlow tp., interlocking plants to be installed.

16659. May 30.—Approving location of Campbellford, Lake Ontario and Western Ry. (C.P.R.) from mileage 72 to 75.45, Ont.

16660. May 27.—Ordering C.P.R. to file within 90 days, plan showing location of junctions with Canadian Northern Ry., and interlocking signalling system to govern train movements.

16661 to 16663. May 31.—Dismissing C.P.R. applications to build its Lambton to Weston branch across certain highways in York and Etobicoke tps., and to connect with Toronto to Owen Sound line near Toronto, and to build branch from its Toronto to London line to connect with Toronto to Owen Sound line near Toronto.

16664, May 30.—Authorizing C.P.R. to take certain lands in St. Andrew's ward, Montreal.

16665. May 31.—Ordering that C.P.R. crossing at Dovercourt Rd., Toronto, be protected by day and night watchman, one-half wages to be paid by city of Toronto and one-half by C.P.R.

16666. June 4.—Authorizing G.T. Pacific Ry. to open for traffic its line from mileage 100 to 164 west of Prince Rupert, B.C., speed of trains limited to 25 miles an hour

16667. May 31.—Ordering C.P.R. to install standard gates at crossing in Hartland, N. B., within 60 days, to be operated between 7 a.m. and 6 p.m. daily, 20% of cost to be paid from railway grade crossing fund.

16668. June 1.—Authorizing Vancouver, Westminster and Yukon Ry. and C.P.R. to operate trains over crossing at Burrard Inlet, Vancouver, B.C., without stopping.

16669, 16670. May 30.—Approving location of Campbellford, Lake Ontario and Western Ry. (C.P.R.) from mileage 106.7 to 123 from Glen Tay, and authorizing it to cross Thurlow Ry. by overhead bridge to Canada Cement Co.

16671. June 1.—Ordering G.T.R. to compensate existing landowners on either side of Ferguson Ave., Hamilton, Ont., who were owners prior to establishment of Cannon St. yard, or who have option of purchasing same outright.

16672. June 5.—Authorizing C.P.R. to open for traffic its double track from St. Martin's Jct. to St. Therese, Que., 7.22 miles.

16673. June 4.—Authorizing G.T. Pacific Ry. to build two spurs for Alsip Brick and Supply Co., Edmonton, Alta.

16674. June 7.—Authorizing G.T. Pacific Ry. to cross and divert highway at mileage 58.3, Alberta.

16675, 16676. June 7, 4.—Authorizing G.T. Pacific Branch Lines Co. to cross two highways on its Biggar-Calgary branch, and to divert road from mileage 36.4 to 36.8 on its Regina-Moose Jaw branch.

16677. June 5.—Authorizing G.T. Pacific Ry. to cross highway at mileage 193.5, r. 6, Cassiar District, B.C.

16678. June 4.—Approving location and plans of G.T. Pacific Branch Lines Co.'s station at Bardo, on its Tofield-Calgary branch.

16679. June 5.—Authorizing G.T.R. to build siding for Canada Brick Co., near Montreal.

16680. June 6.—Authorizing G.T.R. to rebuild bridge 4.90, District 16, near Waterdown, Ont.

16681. May 30.—Authorizing G.T.R. to build two additional tracks across Bay St., Kingston Ont.

16682, 16683. June 4.—Authorizing G.T.R. to build sidings for Bronson Co., Ottawa, and Dominion Flour Mills Co., Montreal.

16684. June 8.—Extending to July 15, time for completion of transfer track, between Brandon, Saskatchewan and Hudson Bay Ry. (G.N.R.) and Canadian Northern Ry., at Minto, Man., as authorized by order 16501, May 10.

16685. June 4.—Extending to Nov. 30, time for construction by C.P.R. of spur to ballast pit near Marquette, Man., as authorized by order 16289, Apr. 10.

16686, 16687. June 7, 6.—Authorizing

C.P.R. to build spurs for F. H. Wiley, Winnipeg, Man., and Hub Roofing and Cornice Works Co., Saskatoon, Sask.

16688. June 8.—Approving location of C.P.R. station at Yahk, B.C.

16689. June 5.—Authorizing C.P.R. to build spur for National Portland Cement Co. near Hanover, Ont.

16690. June 8.—Authorizing C.P.R. to rebuild bridges 86.1 and 57.9, Havelock and London subdivisions, Ont.

16691. May 4.—Authorizing C.P.R. to build spur for Winnipeg Supply Co., Winnipeg.

16692. June 6.—Authorizing C.P.R. to rebuild bridge 113.5, Cascade subdivision, B. C.

16693. June 4.—Authorizing C.N. Ontario Ry. to cross two highways in Ross tp.

16694, 16695. June 4, 7.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to take portion of C.N. Ontario Ry. right of way at mileage 79.5, Sidney tp., and approving revised location from mileage 140.63 to 147.89 from Glen Tay.

16696. June 7.—Approving C.N. Ontario revised location through unsurveyed territory, Thunder Bay District, mileage 142.8 to 148.4 from Port Arthur.

16697, 16698. June 4, 6.—Authorizing Canadian Northern Ry. to cross with its Swift Current branch 23 highways in Saskatchewan, and with its Macleod-Calgary branch, 24 highways in Alberta.

16699. May 31.—Authorizing city of Hamilton, Ont., to carry Dunsmore road across Toronto, Hamilton and Buffalo Ry. spur.

16700, 16701. June 1, 4.—Authorizing Edmonton Radial Ry. to cross G.T. Pacific Ry. at Spruce Ave., Edmonton, Alta., and at intersection of 21st St. with Short and Nelson Aves; half interlockers to be installed.

16702. June 7.—Ordering Great Northern Ry. to fence its right of way from Elko, B. C., to international boundary, with exception of where it skirts the Kootenay River, etc.

16703. June 7.—Authorizing Alberta Government to build highway across C.P.R. on north boundary of n.e. $\frac{1}{4}$ sec. 3, tp. 39, r. 27, w. 4 m.

16704. May 31.—Authorizing Montreal Tramways Co. to rebuild bridge over C.P.R. near Blue Bonnets, Que.

16705. June 5.—Ordering that provision of order 16479, May 10, re classification of gramophones, etc., be put into effect not later than July 15. This order is given in full on another page.

16706. June 5.—Authorizing Peterboro' Radial Ry. to cross C.P.R. and G.T.R. at Park St., Peterboro', Ont.

16707. June 4.—Amending order 16453, of May 6, by substituting 40,000 lbs. for 30,000 lbs. Order 16453 is given in full on another page.

16708. May 31.—Ordering Toronto, Hamilton and Buffalo Ry. to protect Walnut St. crossing, Hamilton, Ont., by day and night watchman; gate question reserved.

16709. June 5.—Recommending to Governor-in-Council agreement between Atlantic Quebec and Western Ry. and Quebec Oriental Ry. for joint shops at New Carlisle, Que.

16710. June 4.—Approving revised rule relating to baggage of excess size as follows:—Commencing July 1, for any piece of baggage of any class, except immigrant baggage checked at port of lading, and whips in canvas or leather cases, the greatest dimension of which exceeds 45 ins., there will be an additional charge for each additional inch equal to the charge for 5 lbs. of excess baggage.

16711. June 7.—Authorizing G.T.R. to build additional team tracks along and across Esplanade St., Toronto.

16712. June 8.—Authorizing C.N. Ontario Ry. to cross public road on lot 11, r. 2, Clarendon tp., Que.

16713. June 8.—Authorizing C.P.R. to open for traffic its double track from mileage 92.4 to 105.7, at Carberry, Man.

16714 to 16717. June 6, 7.—Authorizing C.P.R. to build spur for T. D. Robinson and Sons, Winnipeg; M. Rumely Co., Saskatoon, Sask.; International Harvester Co., Lethbridge, Alta., and Harbor Commissioners, at Bureau Wharf, Three Rivers, Que.

16718. June 8.—Authorizing C.P.R. to cross Saskatchewan Ave., Edmonton, Alta., overhead, and Hardisty Ave., at grade.

16719. June 1.—Approving location of Lake Erie and Northern Ry., from Grand River to Colborne St., Brantford, Ont.

16720. June 10.—Approving change in location of C.P.R. at Vancouver, B.C.

16721. June 10.—Authorizing C.N. Ontario Ry. to open for traffic its line from Trenton to Deseronto and rescinding orders 15211, Oct. 28, 1911, and 15940, Feb. 13, covering same territory in two sections.

16722. June 14.—Ordering G.T.R. to re-

locate loading siding and to erect fruit shed east of Vineland station, Ont.

16723. June 11.—Approving Algoma Eastern Ry. location across Little Current channel, Ont., between mileage 79.80 and 80.69.

16724. June 4.—Approving G.T. Pacific Ry. plans for freight shed at mission terminals, Fort William, Ont.

16725. June 11.—Approving Georgian Bay and Seaboard Ry. (C.P.R.) plan for interlocker in swing bridge over Trent canal, mileage 44, Ont.

16726. June 13.—Approving Kettle Valley Ry. plan for 250 ft. deck span over Trout Creek, near Penticton, B.C.

16727. June 8.—Authorizing G.T. Pacific Branch Lines Co. to open for traffic its Tofield-Calgary branch from Red Deer, mileage 83.5, to Trough, mileage 121.4, Alta.

16728. June 10.—Authorizing G.T.R. to build bridges 189, Northern Division, and 77, Ottawa Division, Ont., and approving stress sheets.

16729, 16730. June 10.—Relieving Vancouver, Victoria and Eastern Ry. from erecting fences from Blaine to Brownsville, B.C.

16731. June 11.—Extending to July 15, time for C.N.R. to put tracks at Saskatoon, Sask., in good shape.

16732 to 16735. June 11, 10.—Ordering Dominion Atlantic Ry. within 60 days to install improved electric bells at four street crossings in Windsor, N.S., 20% of cost to be paid from railway grade crossing fund.

16736, 16737. June 11, 13.—Approving C.N. Ontario Ry. revised location through Torbolton and Fitzroy tps., Ont., mileage 27 to 37.01 from Ottawa; and through Fitzroy, Onslow and Bristol tps., Que., mileage 36 to 40 from Ottawa.

16738, 16739. June 14, 12.—Authorizing C.N. Ontario Ry. to build across Leamy Creek, Nepean tp., and approving revised location through Barron and White tps., Nipissing district.

16740. June 14.—Authorizing Canadian Northern Ry. to cross with its Vonda northerly line, 11 highways in Saskatchewan.

16741. June 14.—Authorizing G.T. Pacific Ry. to build across highway at mileage 194.8, Cassiar district, B.C.

16742. June 13.—Approving location of G.T.R. new station at Stratford, Ont.

16743. June 14.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to cross two highways in East Whitby tp., Ont.

16744. June 13.—Authorizing C.P.R. to build additional track across highway at mileage 107.38, on Cascade subdivision, B.C.

16745, 16746. June 12, 14.—Authorizing C.P.R. to rebuild bridges 17 and 17.9, Swift Current subdivision, Sask., and relieving it from further protecting crossing of Main St., Walton, Ont.

16747. June 15.—Ordering Central Vermont Ry. to extend its siding at Stone, Que.

16748. June 17.—Authorizing G.T.R. to build two sidings across William St., Kingston, Ont.

16749. June 8.—Authorizing C.P.R. to take lands at Leaside Jct., for new station site, and approving location of site.

16750 to 16754. June 13, 11, 14.—Authorizing C.P.R. to build spurs for Alaska Bedding Co., Regina, Sask.; J. McDiarmid Co., Calgary, Alta.; American Lumber Co., Sumas Jct., B.C.; Canadian Sardine Co., Chamcook station, N.B., and Saskatoon Lumber Co., Saskatoon, Sask.

16755. June 14.—Authorizing C.P.R. to build two additional tracks across road allowance at mileage 176.57, Calgary subdivision, Alta.

16756. June 14.—Rescinding order 16713, June 8, and authorizing C.P.R. to open for traffic its double track from mileage 98 at Melbourne to Carberry, Man., mileage 106.

16757. June 10.—Extending to July 15, time for C.P.R. to complete fencing on its Moose Jaw southwesterly branch, ordered by 15864, Feb. 1.

16758. June 15.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to cross 12 highways in Bedford and Hinchinbrooke tps., Ont.

16759, 16760. June 8, 15.—Authorizing C.P.R. to build bridge 0.3 over Saskatchewan River, Calgary subdivision, Alta., and to rebuild bridge 124.4, Muskoka subdivision, Ont.

16761, 16762. June 13, 17.—Authorizing C.P.R. to build additional track across highway at Westminster Jct., New Westminster, and at Kyle St., Port Moody, B.C.

16763, 16764. June 14.—Approving changes in location of C.P.R. stations at Plaisance, Que., and Hammond, Ont.

16765 to 16768. June 15, 13, 10.—Authorizing G.T.R. to build spurs for British Canadian Cannery, Cobourg, Ont.; Dain Manufacturing Co., Humberstone tp., Ont.; London Concrete Machinery Co., London, Ont., and Alaska Feather and Down Co., Montreal.

16769. June 11.—Authorizing G.T.R. to re-build bridge at milepost 20.56, district 22, Waterloo tp., Ont.

16770, 16771. June 13, 15.—Authorizing G.T. Pacific Ry. to cross two highways in Cassiar and Coast districts, B.C.

16772, 16773. June 8, 15.—Authorizing G.T. Pacific Branch Lines Co. to build station at Prongua on its Cutknife branch, Sask., and approving location of station at Rowatt, Sask.

16774. June 13.—Authorizing G.T. Pacific Ry. to cross highway at mileage 90.5, North Alberta district.

16775. June 17.—Authorizing G.T. Pacific Branch Lines Co. to take possession of C.P.R. land for right of way of its Tofield-Calgary branch.

16776, 16777. June 10, 17.—Authorizing Algoma Eastern Ry. to build swing bridge at Little Current, between Goat and Manitoulin islands, and to connect with C.P.R. Sault branch and Canadian Copper Co.'s spur, Drury tp., Ont.

16778. June 11.—Authorizing Algoma Central and Hudson Bay Ry. to cross highway between Cathcart St. and Wilde Ave., Tagona, Ont.

16779. June 11.—Approving C.P.R. plans of subway at Jasper Ave., and bridges at McKay and Victoria Aves., Edmonton, Alta.

16780, 16781. June 10, 15.—Authorizing C.N. Ontario Ry. to cross eight highways in Ross and Westmeath tps., and to cross Nicholas Creek, Marlborough tp.

16782, 16783. June 17, 13.—Authorizing Canadian Northern Ry. to cross with its Alsask southerly extension, 13 highways, and with its Swift Current extension, six highways in Saskatchewan.

16784. June 8.—Approving British Yukon Ry. bylaw 12, authorizing O. L. Dickenson, President, to prepare and issue tariffs.

16785. June 15.—Approving clearances for Vancouver, Victoria and Eastern Ry. dock and warehouse at Burrard Inlet, B.C.

16786. June 14.—Authorizing Toronto, Hamilton and Buffalo Ry. to build spur for G. Frid Co., Hamilton, Ont.

16787. June 10.—Authorizing Vancouver-Nanaimo Coal Co. to use bridge across Esquimalt and Nanaimo Ry., Mountain district, Vancouver Island, B.C.

16788, 16789, June 15.—Authorizing C.P.R. to build spurs for Gorman, Clancy and Grindley, Edmonton, Alta., and O. Lemaire, Cabane Ronde, Que.

16790. June 10.—Authorizing C.P.R. to change location of tracks and make alterations in bridges across Mountain, Aqueduct and Guy Sts., Montreal.

16791. June 13.—Authorizing G.T.R. to build siding for Dominion Cannery, Simcoe, Ont.

16792. June 15.—Authorizing C.N. Ontario Ry. to cross McCawley's Creek, Nepean tp.

16793. June 17.—Authorizing Canadian Northern Ry. to build bridge on land of T. Tall, Rosebud Creek, Alta., within 30 days.

16794. June 17.—Amending order 16061, Mar. 2, re newspaper rates from Winnipeg to Calgary, by striking out "minimum charge 10c." at end of par. 2 of clause (b), to points not over 300 miles distant.

16795. June 19.—Appointing F. Blois, mayor, New Carlisle, Que., and D. W. Mill, Q. L.S., as arbitrators between Quebec Oriental Ry. and L. J. Ripel, re payment for lands.

16796. June 18.—Authorizing Essex Terminal Ry. to open for freight traffic its line through Windsor, Sandwich West tp., and Sandwich, Ont.

16797. June 18.—Amending order 16706, June 5, which authorized Peterboro Radial Ry. to cross C.P.R. and G.T.R. at Park St., Peterboro', Ont.

16798. June 19.—Extending to Oct. 31, time for completion by Toronto Eastern Ry. of spur to Durham Rubber Co., Bowmanville, Ont.

a survey for a line from the International boundary, north of Plentywood, Mont., passing through Swift Current, to Edmonton, Alta.

Vancouver, Victoria and Eastern Ry. and Navigation Co.—L. W. Hill, Chairman, G.N.R., on the occasion of his recent visit to Vancouver, B.C., is reported to have stated that the construction of the line across the Hope Mountains would be started just as soon as the question of the route had been disposed of by the Board of Railway Commissioners. The company was ready to build its own line, or to work jointly with the Kettle Valley Lines.

It is reported that the company proposes to establish car shops in the vicinity of Coquitlam, B.C. A new station is to be built at once at New Westminster.

Vancouver Terminals.—J. D. Mason, Chicago, Ill., and A. Stewart, of the G.N.R. engineering staff, Seattle, Wash., were in Vancouver, early in June, looking over the work in progress at the site of the new terminals, False Creek.

The work is being pushed along rapidly, and L. W. Hill is reported to have stated on his recent visit that as soon as sufficient filling had been done on the site of the proposed union station near the foot of Park Lane, the building of the station would be started, and that the cost of the building would be over \$500,000.

Victoria and Sidney Ry.—L. W. Hill had an interview with the Premier at Victoria, B.C., June 7, at which it is reported that the question of the sale of the V. and S. Ry. to the Canadian Northern Pacific Ry. was discussed. (June, pg. 296.)

The Central Railway of Canada's Bond Issue.

At a recent meeting of bondholders of the Central Ry. of Canada, in London, Eng., called to deal with the proposed release of the land grant subsidy comprised in the trust deed from the security on the bonds being converted into bonds guaranteed by the Dominion, Ontario or Quebec governments; and the modification of the conditions under which the proceeds of the bonds are to be applied by the trustees, C. N. Armstrong, who presided, stated that owing to there not being a quorum present, no business could be done. He said that the whole object of the company was to get the bondholders' opinion as to whether they would prefer to get the bonds guaranteed by the Dominion Government or get what was expected in place of the bonds they now held. Ninety-five per cent. of those he had been able to see, or those he had heard from, were entirely in favor of exchanging the bond, worth, say 95%, for a bond which would be worth at least par. There were only four bondholders who would prefer to stick to their land. Members of the Stock Exchange only represented about 5% of the bondholders. The total amount of debentures issued was £600,000, and the balance of £400,000 was all ready to be taken up on certain conditions. The cash in hand was about £125,000, and there were ample funds to carry on the whole of the work to be done this year, which was going on satisfactorily. He gave a history of the original land grant, and read an opinion by Sir Charles Cripps, K.C., as to its validity.

The C.P.R. put in operation June 2, a solid sleeping car train between Winnipeg and Calgary. It runs an hour ahead of the regular trains between these cities.

J. G. SCOTT, ex-General Manager, Quebec and Lake St. John Ry., in remitting his renewal subscription, says: "The Railway and Marine World is the best value for \$1 that I know of."

Dominion Government Railway to Hudson Bay.

Hon. R. Rogers, Minister of the Interior, speaking at Regina, Sask., June 11, is reported to have said that much progress was being made with surveys, and he hoped that the Government would be in a position to call for tenders within 30 or 40 days for the remaining distance to the Bay. If the eastern railway companies, he added, did not make connection with the Government line, the Government itself would build the connections.

An advertisement has since been issued stating that tenders will be received to Aug. 1 for the construction of a section of the line, from Thicket Portage, where the J. D. McArthur contract ends, to Split Lake Jct., 68 miles.

A contract is reported let to E. M. Joyle and Co. for the supply of 170,000 ties for the mileage now under construction.

A party of engineers under H. T. Hazen, it is reported, left Montreal, June 8, for Port Nelson to make surveys in connection with the proposed terminals. (June, pg. 267.)

Protection of Railway Employes in Yards.

The Board of Railway Commissioners has notified railway companies to show cause by July 2 why an order should not be issued as follows:—

Re memorial of Trainmen's Association of Canada for the adoption of certain regulations by the Board, having in view the protection of employes of the railway companies, it is ordered:

Railway companies under the Board's jurisdiction shall file with the Board, on or before Oct. 1, 1912, a statement of its yards, limits of which are indicated by yard limit boards, showing the distance that these boards are located from the outer switches of such yards.

Before any company shall proceed to erect any yard limit board upon its right of way after the date of this order, it must first obtain the Board's approval to the location of such yard limit board.

After Oct. 1, 1912, rule 93 of the approved uniform rules for the operation of Canadian railways shall apply only to yards where locations of yard limit boards have been approved by the Board.

Probable Sale of Temiscouata Railway.

An Ottawa press report states that negotiations are in progress for the acquiring by the C.P.R. of the Temiscouata Ry., which is owned by the same interests in England, from whom the C.P.R. recently acquired the Quebec Central Ry.

The Temiscouata Ry. runs from Riviere du Loup, Que., on the Intercolonial Ry., to Connors, N.B., 113 miles. It connects at Edmundston, N.B., with the C.P.R. branch line from St. John, along the St. John River Valley, via Fredericton.

The Longest Metal Shaving.—A United States technical paper recently claimed that the longest metal shaving had been produced in the U.S., measuring 155 ft. A previous one produced by the same machinist measured 121 ft., while the best previous record ever reported was from the Santa Fe Ry. shops at Topeka, where a shaving of 110 ft. was turned out. These "records" were beaten before they were made, as there has been on exhibit for several years, in the museum attached to the Belle Vue Zoological Gardens, Manchester, Eng., a steel turning, 166 ft. long, taken from a 68 ton gun, at the works of Sir Joseph Whitworth and Co., Manchester.

Great Northern Railway Lines in Canada.

Port Arthur and Fort William, Ont.—Press reports are again current that the company has survey parties in the field locating lines to Port Arthur and Fort William, Ont., from the International boundary.

Brandon, Saskatchewan and Hudson Bay Ry.—The Board of Railway Commissioners has directed the company to build transfer tracks to connect with the Canadian Northern Ry. at Minto, Man.

Montana-Swift Current-Edmonton.—A press report from Swift Current, Sask., states that G.N.R. engineers are making

Traffic Department Established by the Toronto Board of Trade.

The Toronto Board of Trade has established a traffic department under the supervision of its railway and transportation committee, and has appointed as Manager, T. Marshall, heretofore Chairman, Canadian Freight Association Eastern Lines.

A report from a special committee of the board's executive, submitting an outline of the work to be done by the traffic department, says it will embrace the adjustment of freight and express, the provision of facilities for freight handling, convenient train service, commutation and excursion rates. The department will keep on file a complete set of freight, passenger and express tariffs for the information of members.

Mr. Marshall entered railway service, Aug., 1882, since when he has been, to March, 1883, operator, Northern and North Western Ry., Elmdale, Ont.; Apr., 1883, to Dec. 1885, operator and ticket agent, same road, Allandale, Ont.; Jan., 1886, to Sept., 1887, relieving agent, same road; Mar., 1887, to June, 1899, chief clerk, Traffic Manager's office, Lake Erie and Detroit River Ry., Walkerville, Ont.; July, 1899, to Nov., 1901, Assistant General Freight and Passenger Agent, same road; Dec., 1901, to Jan., 1904, General Freight Agent, same road; Feb., 1904, to Jan., 1905, General Agent, Pere Marquette Rd., London, Ont.; Jan. to July, 1905, Division Freight Agent, same road, London, Ont., at which latter date he was appointed Secretary-Treasurer, Canadian Freight Association. On May 1, he was appointed Chairman of the Association.

Association of Railway Telegraph Superintendents.

The annual convention of this association was held at New York, June 4-6. Committee reports on various matters were read, and the committees continued. Papers were also read on construction materials and methods, handling of supplies, polarized sounder in telegraphy, telegraph and telephone facilities at St. Louis terminal, telegraph traffic, maintenance of telegraph lines, the portable telephone in railway service, etc.

In the discussion on construction materials and methods, W. J. Camp, Assistant Manager, C.P.R. Telegraphs, Montreal, described in detail the company's practice and experience regarding the size of poles, spacing of wires on cross arms, insulators, underground service, etc. He favored porcelain insulators, and showed samples as used on the C.P.R. He also stated that the company used nothing but tile conduit for underground service, and that the Board of Railway Commissioners required the use of double cross arms at crossings.

A letter was read from J. Kent, Manager, C.P.R. Telegraphs, giving an account of an experience in the use of dry batteries at Sudbury, Ont., during a flood which submerged the storage battery.

Among Canadians present in addition to Mr. Camp, were: T. Rodger, Inspector of Telephones, G.T.R., and A. Dwight Smith, Northern Electric and Manufacturing Co., Montreal; W. Marshall, Superintendent, and G. T. Rooke, Inspector of Transportation, C.P.R. Telegraphs, Toronto.

Telegraph and Cable Matters.

E. A. Stainton, night chief operator, Great North West Telegraph Co., Montreal, was presented with an electric reading lamp, by the operating staff, recently, on leaving the service.

W. F. Ryan, who has been connected with C.P.R. Telegraph service for 25 years, latterly as Assistant Manager of the Montreal office, resigned recently on his appointment as Secretary of the National Bond Co., Montreal.

The Boundary Creek Telegraph and Telephone Co. has been notified that it will be struck off the B.C. Companies register, unless cause be shown to the contrary, for failure to comply with the regulations as required by the Companies Act.

The Minister of Trade and Commerce, who is visiting England, will probably discuss the question of linking up the various islands comprising the British West Indies, by cable, following out the suggestions of the Dominion and West Indies delegates at the recent trade conference at Ottawa.

The Board of Railway Commissioners has further extended, to Dec. 1, the tariffs of telegraph tolls of the C.P.R., White Pass and Yukon Ry., and the G.T. Pacific, Canadian Northern, Great North West and North American Telegraph Cos., which have been authorized by previous orders, and 7 and 8, Ed. VII., chap. 61.

The Western Union Telegraph Co. has announced that it has entered into an agreement with the Marconi Wireless Telegraph Co., for general interchange of business to and from Europe. The agreement also provides for the extension of the service from the Pacific coast to Hawaii, China, Japan and the Philippine Islands.

The Toronto board of control has recommended that the city solicitor apply to the Board of Railway Commissioners for an order to compel all Dominion companies having overhead wires in Toronto, to place them underground in accordance with the Dominion acts. It was also suggested that a conference should be arranged between the authorities and the companies concerned, with a view to abolishing overhead wires.

The installation of the Dominion Government telegraph line between Vancouver and Povel River, B.C., is in progress. The line will run from North Vancouver to Point Atkinson and from there to Howe Sound. Several of the sections will necessitate the use of a cable, and it is expected that the work will be completed by August. The branch line from 150-mile House to Bella Coola, across the Chilcoten country, is being pushed forward.

The Board of Railway Commissioners recently dismissed the application of Canadian Press, Ltd., requiring the Great North West Telegraph Co., and the Western Union Telegraph Co., to provide special tolls for press service, similar to those provided by the C.P.R., and ordered the C.P.R., the Great North West and Western Union Telegraph Cos. to restore the rate of 25c per 100 words for press specials in the Maritime provinces. This order came into effect June 17.

Work has been recommenced on the extension of the St. Barbe telegraph line, Newfoundland. At the conclusion of last season's operations, the line had reached Griquet, where an office was opened, thus putting in operation 300 miles of line. During the winter, poles were cut and placed along the route from Griquet to Locks Cove in Hare Bay, to which latter point, 45 miles, the line will be completed as soon as possible. From Locks Cove the line is to be continued to Croc and Conche, and possibly to Englee, before the end of the season.

The C.P.R. has opened telegraph offices at Banff Hotel, Beiseker, Cluny, Czar, New Dayton, Parkland, Standard and Tilley, Alta.; Ainsworth, Chilliwack, Clayburn, Craigellachie, Galloway, Nicomen Quarry, Taft, Whonnock and Wy-

cliffe, B.C.; Bergen Station, Tilston Station, Man.; Eau Claire, Grand Valley Station, Jeannettes, Port Burwell and Port McNicoll, Ont.; Chelsea Station, Hebert, Ivry, St. Guillaume and Val Morin, Que.; Aikins, Deviot, Denzil, Dilke, Druid, Forres, Holdfast, Penzance, Regina Beach, Silton and Simpson, Sask.

At the annual meeting of the Marconi Wireless Telegraph Co., in London, Eng., June 10, the net profits for 1911 were shown to be \$708,585, against \$307,565 for the previous year. A final dividend of 1% on both classes of shares was declared, making 17% for the year on the preference and 20% on the ordinary stock, and for the current year, first interim dividends of 7% on the preference and 10% on the ordinary stock were declared. G. Marconi stated that the amount due to the company from the Canadian company was reduced in 1911 from \$819,330 to \$392,940, but this would probably be increased during the current year, as financial assistance was being given the Canadian company for further development.

Railway and Allied Associations, Clubs, Etc.

The names of persons given below are those of the secretaries.

CANADIAN CAR SERVICE BUREAU, J. E. Duval, 401 St. Nicholas Building, Montreal.

CANADIAN FREIGHT ASSOCIATION (Eastern Lines), T. Marshall, Canadian Express Bldg., Montreal.

CANADIAN FREIGHT ASSOCIATION (Western Lines), W. E. Campbell, 502 Canada Building, Winnipeg.

CANADIAN RAILWAY CLUB, J. Powell, St. Lambert, Que. Meetings at Montreal 2nd Tuesday each month, 8.30 p.m., except June, July and August.

CANADIAN SOCIETY OF CIVIL ENGINEERS, C. H. McLeod, 413 Dorchester St. West, Montreal.

CANADIAN STREET RAILWAY ASSOCIATION, Acton Burrows, 70 Bond Street, Toronto.

CANADIAN TICKET AGENTS' ASSOCIATION, E. de la Hooke, London, Ont.

CENTRAL RAILWAY AND ENGINEERING Club of Canada, C. L. Worth, 409 Union Station, Toronto. Meetings at Toronto 3rd Tuesday each month, except June, July and August.

EASTERN CANADIAN PASSENGER ASSOCIATION, G. H. Webster, 54 Beaver Hall Hill, Montreal.

ENGINEERS' CLUB OF MONTREAL, R. W. H. Smith, 9 Beaver Hall Square, Montreal.

ENGINEERS' CLUB OF TORONTO, R. B. Wolsey, 94 King St. West, Toronto.

NOVA SCOTIA SOCIETY OF ENGINEERS, A. R. McCleave, Halifax, N.S.

QUEBEC TRANSPORTATION CLUB, J. S. Blanchet, Quebec.

WESTERN CANADA RAILWAY CLUB, W. H. Rosevear, 25½ Princess St., Winnipeg. Meetings at Winnipeg 2nd Monday each month except June, July and August.

Dominion Express Company.

J. A. Boswell, Superintendent Eastern Division, retired from active service June 30.

Effective July 1, lines east of Port Arthur will be subdivided as follows:—

Atlantic Division—All offices in New Brunswick, Nova Scotia and Quebec (except C.P.R. Mattawa and Temiskaming branch). V. G. R. Vickers, Superintendent. Office, Montreal.

Eastern Division—All offices in Ontario east of Port Arthur, including C.P.R. Mattawa and Temiskaming branch. J. J. Murray, Superintendent. Office, Toronto, Ont. The Southern Division, of which J. J. Murray has been Superintendent, is abolished and offices are now included in Eastern Division.

Electric Railway Department

The Ottawa Electric Railway and its Employees.

The conciliation board, consisting of Judge McDougall, chairman; Travers Lewis, K.C., representing the company, and P. M. Draper, on behalf of the employees, recently appointed under the Industrial Disputes Investigation Act, to hear the complaints of the Ottawa Electric Ry. employees, submitted a unanimous report to the Department of Labor, June 12.

The demands of the men were embodied in the form of an agreement, which they asked to be entered into by the company and the Amalgamated Association of Street and Electric Railway Employees of America, Division 279, and covered the following points—the discussion of questions with a duly accredited committee of the association; the division of runs into regular and relief runs, conforming, as nearly as possible to a 9 hour day; priority of runs according to seniority; preference in leave of absence for employees who are officers of the association for transacting association's business; clothing for conductors and motormen to consist of, full suit, coat, vest and trousers for summer, and for winter, trousers every year

between 6 p.m. and 6 a.m., if required to work all night; time and a half for statutory holidays; 5c an hour increase for all men employed in shop, shed and line work; no discrimination against members of the association; agreement to remain in force to May 1, 1913, and from year to year thereafter, unless changed, each party desiring a change to notify the other 30 days prior to the expiry of each year.

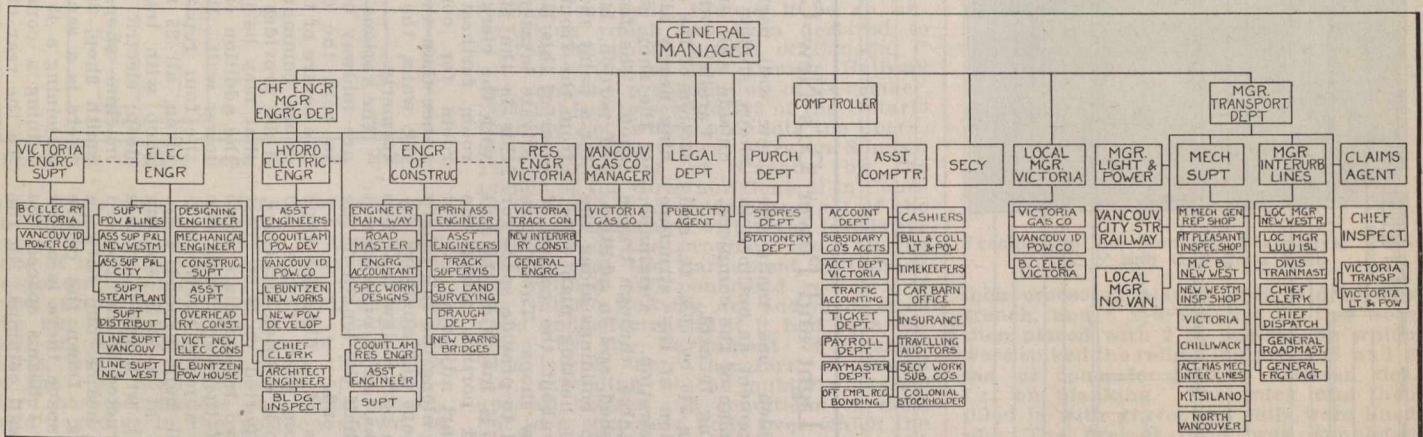
In response to these demands, the company replied to the effect that it declined to enter into an agreement with a union on matters relating to the conduct or management of its business, this reply affecting 14 of the 22 requests involving that principle. Six of the remaining requests were already in force, and the remainder, covering the rates of wages and the hours of work the company stated that it was prepared to discuss with a committee of its motormen and conductors. The conciliation board held 12 sittings, at which the company's side was given by J. E. Hutcheson, Superintendent, and J. D. Fraser, Secretary-Treasurer, and the men's by M. Sinclair, C. Ryan and J. O'Brien. The board's report classified the demands as follows:—(a) increases of pay; (b) hours of work; (c) recognition of the association; (d) other rules and conditions of employment not included in the fore-

much interest in its employees and provides for their comfort and convenience in a very generous manner, and that consequently it has an exceptionally capable and well set up body of men, who provide an excellent public service. Although not convinced of the justice of any advance in wages, T. Ahearn, President, on behalf of the company, ultimately agreed to the proposition in a very generous spirit, thus enabling the board to make a unanimous report.

It was subsequently stated that the employees had accepted the report, with the exception of one of the conditions of employment which prohibits the wearing of any badge or emblem on the uniforms supplied by the company, when on duty. In order to participate in the increased wages they will also have to accept the decision re badges, etc.

The British Columbia Electric Ry. Co.'s Official Organization

The B.C.E.R. Co., with 182.6 miles of line, has much the largest mileage of any electric railway in Canada, the Toronto Ry., including the Toronto and York Radial Ry., coming second with 126.49 miles, and the Montreal Tramways Co. third with 124.26 miles.



British Columbia Electric Ry. Official Organization Chart.

and overcoat every second year, the company to pay full cost for all men over one year service, and half cost for those in the first year; caps and badges to be supplied without charge; the right of appeal, in case of suspension or discharge, to the President in person, or through the officers of the association; running of cars for conveying employes to their work; provision of suitable seats for motormen and conductors on all cars; cleaning of cars to be done by shed men; free transportation at all times on all company's lines; double time for extra work in excess of regular day's schedule; six days to constitute a week's work; canopy switches in all cars over or near controller; time and a half to be paid for working on statutory holidays; permission to post notices of association's meetings on office bulletin board; one year leave of absence in the case of an employe being elected business agent for the employes, to be renewed in case of re-election; wages to be paid as follows:—30c an hour for week days, work to be performed between 6 a.m. and 12 midnight; 32c an hour for Sundays; 34c an hour between 12 midnight and 6 a.m.; for shop, shed and line men, nine hours to constitute a day's work, with one hour off for dinner; time and a half for overtime; double time for Sundays; double time

going, and it was agreed that the items coming within (d) should continue in force, that those under (b) and (c) be waived, and that the following scale of wages take effect July 1, 1914:—

For conductors and motormen—first year, 21½c an hour for week days, 23½c for Sundays; second year, 22½c for week days, 24½c for Sundays; third year, 25c for week days and 27c for Sundays. For shop and line men, an increase of 1½c an hour throughout.

The old rates of pay were as follows— for first year men, 20c an hour week days, 22c Sundays; second year, 23c an hour weekdays, 25c Sundays; third year, 23c an hour weekdays, 25c Sundays; the rates for shop and shed men now range from 22½c to 36c an hour, according to the class of work, and for line men, from 20c to 23c an hour.

The company also agreed, as heretofore, except in cases of personal dishonesty, to meet and treat individual employes, or a committee of such employes, on grievances or disputes which may arise between them and the company.

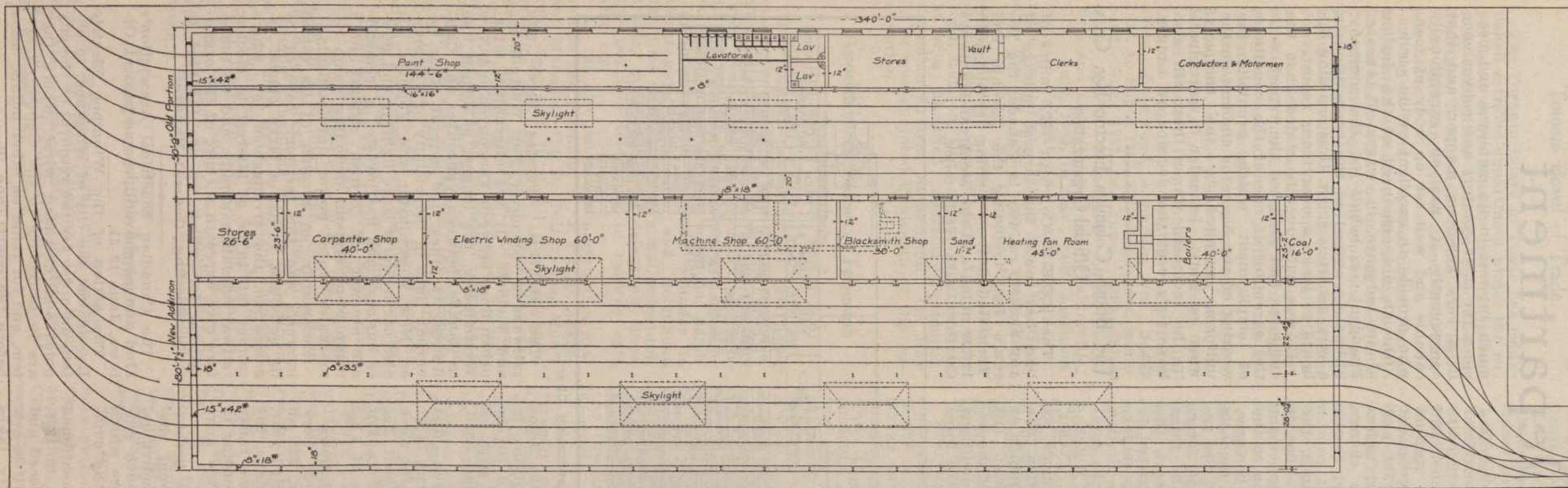
The report states, that, as mentioned in the report of a like board in 1908, from the observations of this board and statements made at its sittings, it is evident that the Ottawa Electric Ry. takes

The B.C.E.R. operates three city railways in Vancouver, New Westminster and Victoria. It has alternative inter-urban lines between Vancouver and New Westminster, the longest suburban line in Canada, between Vancouver and Chilliwack, 64 miles, and several other suburban lines in the vicinity of Vancouver, New Westminster and Victoria. It also carries on a large lighting and power business, and has invested a tremendous amount of British capital in a magnificent system, including some remarkable water power developments.

Necessarily, on account of its varied interests and the territory covered by its activities, it has a large official organization, the arrangement of which cannot fail to be of interest to electric railway officials generally, and we therefore give herewith a chart of the organization, for which we are indebted to R. H. Sperling, General Manager.

The Canadian Electrical Association's 22nd annual convention was held at Ottawa, June 19-21.

The action of the Winnipeg Electric Ry. against the city of Winnipeg, to obtain an order for the removal of the city poles and overhead wires, where they are in proximity to the company's system, and for relief on other points, came before the court June 10.



The Quebec Railway, Light and Power Co's New Car Shed and Repair Shops.

To meet the requirements of the increasing rolling stock which needed greatly increased accommodation, the Quebec Railway, Light and Power Co. has built an addition to its car storage shed at St. Sauveur, a suburb of Quebec city, in the lower part of the town near the St. Charles River. For some years the company has had a storage shed on the site of the present structure, where the summer cars were stored in winter, and vice versa; the shed was used for no other purpose, being closed for the season on the storage of the particular series of cars that were not required. The car sheds in the upper part of the town, where the cars in daily service were stored and where the car repair shops were also located, were rapidly overcrowding, and in addition, the repair shop facilities were not of the best under the cramped conditions that prevailed, the heavier repairs being confined to one corner of the car shed, with the lighter repairs removed to the more spacious basement, where a number of the machine tools were located.

On the decision to remove the repair shop and to increase the daily storage space, attention was turned to the old storage shed in the lower part of the town, especially as it was not advantageous to have to bring all the rolling stock up on to the hill each night, as the heavy traffic in the morning and evening hours is in the lower part of the town, where the working classes reside. In consequence, the old storage shops were taken as a base and a new

addition added, which has made the commodious arrangement as outlined in the accompanying plan of the complete shop, accommodating 70 cars.

The old shed was 340 by 50 $\frac{3}{4}$ ft., and is the upper portion of the structure shown in the illustration. Originally, this portion had three through tracks the length of the shed, and in addition, a couple of lean-to buildings along the lower side for the heating plant, etc., which are shown about the centre of the plan of the new shops. These were first of all removed to provide space for an addition 80 ft. 7 $\frac{1}{2}$ ins. wide the full length of the old portion along the lower side. The part adjoining the old structure is divided along the full length into the various shops and auxiliary departments, and the part below that has four through tracks, each one with a repair pit running half the length of the shed at the front end.

The new shed is of a different type of construction from that of the old building. The latter is a brick structure, with the roof supported on 8 in. cast iron columns in two intermediate rows down the centre of the shop, while the newer portion has a more lightly constructed brick wall built around 8 in. by 18 lb. I beams at a 13 ft. spacing along the side wall, with the entrances at both ends constructed of unsupported 15 in. by 42 lb. I beams, one between each of the tracks. Down the centre of the four track space there is a row of 8 in. by 35 lb. I beams spaced the same as the side wall columns. In the

new wall partitioning off the central shops, similar columns to those in the outside wall are employed.

Parallel with the top wall of the old section of the shops there is a wall running nearly all the way down that side of the shop, dividing off a third of the shop. The front section of the divided off portion, 144 $\frac{1}{2}$ ft. in length, is used for a paint shop, the car entrance being from the front of the building. To the rear of this large room the general and private lavatories are located. Back of this is the store room communicating with the clerks' room to the rear. The room furthest to the rear is the rest room for conductors and motormen. Other than the addition of these dividing walls, the old shop is the same as formerly.

The various shops in the new addition are midway between the storage tracks in both the old and new parts, along the centre of the complete building, with doors communicating with both parts. This provides a flexible arrangement that may be increased in the future by the addition of further tracks along the lower wall. Beginning at the front end, the four repair shops are in the order given, all 25 ft. 2 in. wide; carpenter shop with track down centre, 66 $\frac{1}{2}$ ft. deep; electric winding shop, 60 ft. deep; machine shop, 60 ft. deep; and blacksmith shop, 30 ft. deep. Behind this there is a sand room 11 ft. 2 ins. deep, adjoining a 45 ft. heating fan room containing a complete heating installation. To the rear of this are the boilers in a

40 ft. room with a 16 ft. coal bin at the extreme rear.

This heating apparatus is of the hot air blast type, the air passing through heating coils and by means of fans the air is distributed to shop by pipes, ventilators being placed along these at convenient places to ensure a regular heating of the shops and sheds.

In the various shops the machinery and equipment from the upper town shops is installed, along with considerable new machinery, that make the shops in every sense an up-to-date repair plant to handle all the repairs of the city section of the company's lines. The new machinery installed is as follows:—Carpenter shop, circular and band saws, wood lathe and a wood planer; electric winding shop, armature banding machine; machine shop, new shafting and belting, air compressor with long hose for cleaning cars; and blacksmith shop, new forge and blower, anvil and water tank.

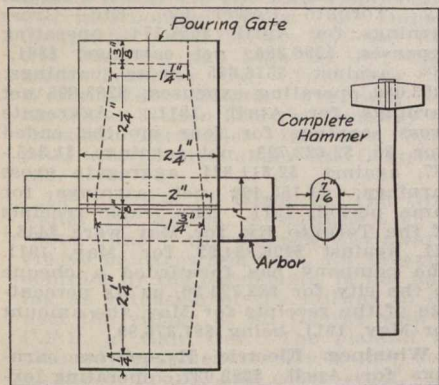
The sheds are not located on a regular car line, but are about two blocks distant, connecting with a through line by means of a single track loop, which leads into the sheds from the left end, the cars passing out through the other end, a track on another street leading to the through line. The entrance to the shed are through rolling metal doors, which roll up into a cage over each.

The completed shops are now in service and will help in the handling of the heavy summer traffic that comes to such a historic old town as Quebec.

Lead Hammer Mould at Halifax Electric Tramway Co.'s Shops.

The use of a lead hammer on an assembling job where parts that are more or less completely finished are to be handled, is almost an absolutely indispensable tool. It will be found in the majority of repair shops, whether they be on steam or electric lines.

At the Halifax Electric Tramway Co.'s shops, D. B. Logan, Foreman Machinist, has made up a simple mould for casting these hammer heads. As all who have had occasion to use them know their life is very short, requiring frequent replacing. The construction of the mould is shown in the accompanying illustration. The body of the hammer head is made in the form of a double frustum of a cone, tapering from the centre towards the ends as the sketch of the completed hammer indicates. In consequence, the mould is made in two sections, each



Mould for Casting Lead Hammer Heads.

part containing the form for an end, the taper allowing for the draw. A recessed ring at the centre in the upper face of the lower section, receives a corresponding protecting ring on the lower face of the upper mould form, aligning the two sections. An arbor, contained half in each contact face of the two parts, leaves a hole through the centre of the cast head the shape of a standard hammer handle end. The mould, held together in the position shown, is poured from a gate in the upper end, a small settling space being left in the upper end for shrinkage.

The hammer thus made is simple in construction and at the same time it is quite shapely. It is ready for removal shortly after pouring, so that several may be made up with one heat of lead, with little intervening loss of time from delay in cooling. The steel body of the mould forms a very good heat absorbing medium for quickly cooling the hammer head in the mould.

Sunday Operation on the London and Lake Erie Railway.

At the Toronto Assizes, June 4, the Chancellor heard the case of W. Kerley, of St. Thomas, Ont., against the London and Lake Erie Ry, claiming three penalties of \$400 each for operating the line on three Sundays in Dec., 1911, or, as an alternative, an order to restrain the railway from operating on Sunday, the case having been entered by the Ontario Railway and Municipal Board's consent.

The plaintiff relied on the section of the Ontario Railway Act which provides that "no company operating an electric railway shall operate the same or employ any person thereon on the first day of the week, commonly called Sunday, except for the purpose of keeping the

track clear of snow or ice or for the purpose of doing other work of necessity."

Counsel for defendants repudiate the jurisdiction of the Province, claiming that the company was incorporated by the Dominion Parliament, that the line is run in conjunction with the G.T.R. and other transportation companies, and is amenable only to the Dominion. It is also claimed that, as the late J. P. Mabee, sitting as chairman of the Board of Railway Commissioners, refused to adjudicate or authorize action, the court has no jurisdiction.

Defendant also relies on that part of the Railway Act which gives exemption to a system running in a continuous line between points in different provinces or to a foreign country or which lies between ports on the great lakes.

Chancellor Boyd gave judgment, June 25, as follows:—The simple question here is whether the defendants are liable to pay penalties for running their cars on Sunday. The answer is far from simple and involves difficulties in the application of constitutional law not covered by previous authority. I find as facts that the road has always been strictly a local concern with no such connection as would constitute it part of a continuous route or system and that the traffic of the company was in no sense through traffic within the meaning of the Dominion Railway Act, 1906, c. 37, s. 9, so that the road as operated at the time of the alleged offences was not within any of the exceptions expressed in such section of the Dominion Railway Act; wherefore the net result is that the defendant company, though it be an undertaking which has been declared to be for the public benefit of Canada, yet by virtue of the Canada Railway Act, and the proclamation of December, 1906, subject to section 193 of the Ontario Railway Act, which prohibits the operation of electric railway cars on Sunday. The Parliament of Canada by the agency of the Governor General in Council undertakes to confirm any act of the Ontario Legislature within the legislative authority of the province, etc. In the present case the Parliament of Canada has ratified and confirmed sec. 193 of the Ontario Railway Act and made it as valid and effectual as if it had been enacted by the Parliament of Canada. This law is not, therefore, a general law, extending to the public at large, and all classes and conditions of men, but to a corporate body over which the local legislature has inherently or by delegation from the Dominion legislation plenary power as to its control, governance and operation. The late decision of the Supreme Court on Sunday law is not in point for the present case. It is distinguishable both because it purports to be a general law framed for all persons, and the case did not involve the question of local corporations over which the province has constitutional power and competence. The legislation is not to be regarded as a section of the criminal law of Canada, but as a particular penal law intended for the regulation of local electric railways within the province. So viewed I would uphold the impeached legislation as intravires and would award to the plaintiff the penalties claimed. There should be no exemption as to the day on which the mail was carried. The cars were not run for the purpose of carrying the mail, but the mail was carried as a favor because the cars ran that Sunday. Costs to plaintiff.

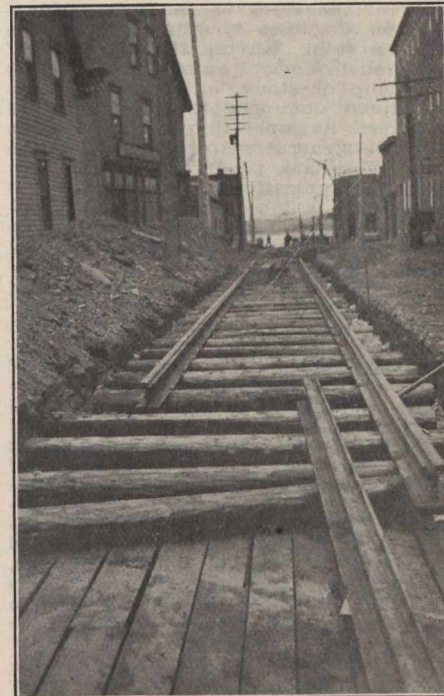
It is said that the case will be appealed.

The Berlin and Waterloo Electric Ry has decided to furnish its motormen and conductors with new uniforms, and has increased their pay to the following scale:—For first six months, 16c. an hour; second six months, 17c.; second year, 17½c.; third year, 19½c.; fourth year, 20½c.

An Unsuccessful Roadbed Experiment at Moncton N.B.

In The Railway and Marine World for Nov., 1911, reference was made to a departure in roadbed construction adopted by the Moncton Tramways, Electricity and Gas Co., which the engineer believed would eliminate difficulty from frost.

The accompanying illustration shows the method adopted: The street was trenched to a depth of 15 ins. Two



Tracklaying on Moncton Tramways, Electricity and Gas Co.'s Line.

inch creosoted planks were laid in this trench, and 6 x 8 ins. x 8 ft. ties were then placed with 2 ft. centres, on which were spiked the rails, 6 ins. grooved and 2 ins. of concrete poured between ties, i.e., on planking. The track was then filled in with gravel and rails were lined up. The present track was completed in November last. We are advised that this spring it was found that the frost had heaved the track work to a considerable extent, and the presence of the planking made the work of lining up the track more difficult than had the ties been laid directly on the ground.

London and Lake Erie Railway Co.'s Car Barns.

In connection with the information as to these new barns at St. Thomas, Ont., contained in our last issue, we are advised that the boiler and coal storage room will be under the inspector's office and conductor's room. The floor of the west half of the building will be flush with the rails, and this section will be used only for car storage. The operating pits are located in the east half adjacent to the machine shop, etc. The barn will have accommodation for 16 of the company's 50 ft. cars. The building, as well as the freight house and substation, which are located about 20 ft. to the west, will be heated by steam from one boiler. The whole of the equipment will be thoroughly modern.

S. D. Egan, of Toronto, is reported to have been appointed Superintendent of the municipal street railway of Regina, Sask.

Change of Control of International Traction Co.

With the completion of the purchase of \$5,000,000 of the common stock of the International Traction Co. of Buffalo, N.Y., that property becomes one of a group of operating public utility corporations controlled by a central holding organization. The United Gas and Electric Corporation, which has been organized under the laws of Connecticut by Bertron, Griscom and Jenks, of New York, although not securing a majority of the stock of the International Traction Co., has bought half of the common stock, leaving the \$5,000,000 of preferred stock outstanding. This ownership of stock, of course, is large enough to dominate the property and to direct its operation in accordance with the general plan followed by the other subsidiary properties of the new holding organization. Among the properties that will be included in the control of the group are, in addition to the International system, a number of lighting and power companies, the Susquehanna Ry. and Light Co., the Elmira Water, Light and Rd. Co., and the Lancaster County Ry. and Light Co., which controls the Conestoga Traction Co. and other properties. The principal lines of urban and interurban railways are owned and operated by the International Ry. Co., which also owns the capital stock of several other small operating companies. The entire capital stock of the International Ry. is owned by the International Traction Co. About one-half of the common stock of the International Traction Co. has been owned heretofore by the Tracional Company, a New Jersey holding company. It is this stock which is understood now to have been acquired by the United Gas and Electric Corporation.

The International Traction Co. controls the Niagara Falls Park and River Ry. between Queenston, Niagara Falls and Chippewa, Ont.

Rumored Sale of Dominion Power and Transmission Company.

It was stated in Hamilton, Ont., June 25, that the Mackenzie, Mann and Co. interests had secured control of the Dominion Power and Transmission Co., which, in addition to controlling the Cataract Power Co., which generates electric power at De Cew Falls, near St. Catharines, and transmits it to Hamilton, etc., also controls the Cataract Power Co.'s various subsidiary companies and other companies generating and transmitting electric energy and operating electric railways, including the Hamilton St. Ry., the Hamilton Radial Ry., the Hamilton and Dundas Ry., the Hamilton, Grimsby and Beamsville Ry. and the Hamilton and Brantford Ry.

The President of the Dominion P. and T. Co., J. R. Moodie, according to press reports, admitted that negotiations were in progress and said that a directors' meeting would be held June 26.

The Dominion P. and T. Co. has the following capitalization:—Bonds, \$6,488,000 preference stock, \$3,673,100; limited preference stock, \$5,100,000; common stock, \$2,608,000.

Installation of Manually Operated Signal System.

The Indianapolis and Cincinnati Traction Co. has just put into service a manually operated, remotely controlled interlocking signal system designed by P. J. Simmen and installed by Northey-

Plummer, Ltd., Toronto, Ont., and Indianapolis, Ind. This system affords means by which the dispatcher as a train approaches, passes or leaves a siding can display stop or proceed signals to the motorman. These signals are displayed by red and green lamps inside the cab, placed directly in the motorman's view. The signal-transmitting apparatus is interlocked so that it is mechanically and electrically impossible for the dispatcher to give signals corresponding to a lap order. Another strong feature of this system is that a permanent graphic record is continually being made in front of the dispatcher, showing at all times the position and direction of movement of all trains. This system of signalling has been in satisfactory operation for some time past on the Toronto and York Radial Ry.'s Mimico Division between Toronto and Port Credit, and has given excellent results.

The Indianapolis and Cincinnati Traction Co. installation includes protection for nine blocks and ten sidings, each block extending from siding to siding and averaging about two miles in length.

Electric Railway Finance, Meetings, Etc.

British Columbia Electric Ry.—Gross earnings for April, \$476,058; operating expenses, \$302,135; net operating earnings, \$173,923; renewal funds, \$37,935; net earnings, \$135,988; approximate income from investments, \$25,000; net income, \$160,988, against \$368,233 gross earnings; \$243,097 operating expenses; \$125,136 net operating earnings; \$29,770 renewal funds; \$95,366 net earnings; \$20,000 approximate income from investments; \$115,366 net income for April, 1911. Aggregate gross earnings for ten months ended Apr. 30, \$4,759,517; net earnings, \$1,671,408, against \$3,440,733 aggregate gross earnings; \$1,336,479 net earnings for same period 1910-11.

Calgary Municipal Ry.—Passenger earnings for May, \$48,467.86; miscellaneous earnings, \$636.60; total earnings, \$49,104.46; operating expenses, maintenance, etc., \$26,250.91; net earnings, \$22,853.55; contingent account, 5% gross receipts, \$2,455.22; interest and sinking fund, \$5,263.33; net profits, \$15,135, against \$28,293.40 passenger earnings; \$438.25 miscellaneous earnings; \$28,731.65 total earnings; \$13,568.35 operating expenses, maintenance, etc.; \$1,436.58 contingent account; \$2,715.88 interest and sinking fund; \$11,010.84 net profit for May, 1911. The revenue per car mile for May was 31.403c; operating expenses per car mile, 16.787c; gross surplus per car mile, 14.616c; cost of power per car mile, 4.651c.

Cape Breton Electric Co.—Gross earnings for April, \$26,558.86; operating expenses and taxes, \$16,064; net earnings, \$10,494.86; interest charges, \$4,495.83; balance, \$5,999.03; sinking and improvement funds, \$1,206.67; balance for reserves, etc., \$4,792.36, against \$23,331.50 gross earnings; \$12,810.47 operating expenses and taxes; \$10,521.03 net earnings; \$4,512.50 interest charges; \$6,008.53 balance; \$1,141.67 sinking and improvement funds; \$4,866.86 balance for reserves, etc., for April, 1911. The construction charges during April were \$4,528.06.

Grand Valley Ry.—The Trust and Guarantee Co., Toronto, are in charge of the affairs of this company, and its allied company, the Brantford St. Ry., and certain legal proceedings have been taken to secure the interests of bondholders. The National Trust Co., Toronto, is seeking to secure a sale of the Brantford St. Ry. in order to settle with the Canadian General Electric Co., which holds \$140,000, the original bonded indebtedness of the company. Nothing has been said of the position of the Woodstock, Thames Valley and Inger-

soll Electric Ry., which is owned by the same interests.

Halifax Electric Tramway.—The regular quarterly dividend of 2% will be paid on and after July 1, to shareholders of record at the close of business June 19.

Receipts for March, \$17,995.42; April, \$17,585.96; May, \$18,678.30, against \$16,129.49 for March, \$17,285.67 for April, and \$17,158.82 for May, 1911.

London St. Ry.—Gross earnings for May, \$24,620.46; expenses, \$18,371.45; net earnings, \$6,249.01; deductions, \$2,450; net income, \$3,799.01. Aggregate gross earnings for five months ended May 31, \$116,053.02; expenses, \$83,749.70; net earnings, \$32,303.23; deductions, \$11,997.25; net income, \$20,305.98.

Nelson St. Ry.—The city council of Nelson, B.C., decided, June 3, to acquire the street railway from the present company, buying out the shareholders in 20 years. It was reported by the City Auditor that the company was \$16,000 in debt, and that there was a present loss of \$4,000 a year.

Toronto Ry., Toronto and York Radial Ry., Toronto Power Co., Etc.—Gross earnings for April, \$658,174; operating expenses, \$296,286; net earnings, \$361,888, against \$576,685 gross earnings; \$293,080 operating expenses; \$283,695 net earnings for April, 1911. Aggregate gross earnings for four months ended Apr. 30, \$2,622,723; net earnings, \$1,345,987, against \$2,311,821 aggregate gross earnings; \$1,153,462 net earnings for same period, 1911. The traffic receipts of the Toronto Ry. for May were \$446,371, against \$406,884.92 for May, 1911. The company has forwarded a cheque to the city for \$89,724.20, as its percentage of the receipts for May, the amount for May, 1911, being \$81,376.99.

Winnipeg Electric Ry.—Gross earnings for April, \$292,037; operating expenses, \$152,938; net earnings, \$139,099, against \$308,113 gross earnings; \$148,096 operating expenses; \$160,017 net earnings for April, 1911. Aggregate gross earnings for four months ended Apr. 30, \$1,209,577; net earnings, \$554,437, against \$1,280,472 aggregate gross earnings; \$615,367 net earnings for same period 1911.

With reference to the negotiations for the sale of the property to a New York syndicate, as noted in our last issue, it was rumored in Winnipeg, during June, that the sale to the syndicate, of which E. B. Reese is the head, has been concluded, but no confirmation has been made. It is stated that the decision of the city in agreeing to come under the jurisdiction of the Public Utility Commission, so far as its light and power plant is concerned, has cleared the air considerably. The rumor also declares that the syndicate had a \$500,000 option on the property before the company commenced negotiations with the city some time ago, and that the price paid is in the neighborhood of \$25,000,000.

Electric Railway Notes.

W. T. Woodroffe, who was formerly in the British Columbia Electric Ry. service, has been appointed Superintendent of the municipal street railway at Edmonton, Alta.

The Grand Valley Ry. has not been running its cars into Galt, Ont., for some months, and the Galt city council is considering the advisability of cancelling the franchise.

The Calgary, Alta., city council has under consideration a proposition for the abolition of transfers and the reduction of fares to 2½ cents, on its municipal electric railway.

The Port Arthur, Ont., city council, at a meeting, June 5, authorized the street railway commissioner to call for

tenders for two pay-as-you-enter cars, for delivery as soon as possible.

The Niagara, St. Catharines and Toronto Ry. is building an electric locomotive, with a weight of 33 tons, 36 ft. long over platform, with steel under framing and steel cab. The cab is to be 29 ft. long over all, length of operating room in cab 9 ft., height of cab, 10 ft., equipped with four Westinghouse 119 motors, Westinghouse straight, and automatic air brakes for train control. The locomotive is of the electrical control type, 161 contactors and C-74-A master controller. The new locomotive is to be practically a duplicate of the last one, which was built at St. Catharines last year, this making six locomotives in use on the line.

The following companies have been notified that they will be struck off the British Columbia Companies register, unless they show cause to the contrary, for failure to comply with the regulations required by the act:—Vancouver Street Ry.; Vancouver Electric Ry. and Light Co.; Vancouver and Lulu Island Electrical Ry. and Improvement Co., incorporated under the Imperial Companies Acts, 1862-69; National Electric Tramway and Lighting Co.; Chilliwack Tramway Co.; Vancouver and Westminster Electric Tramway and Light Co.; Nelson Electric Tramway Co.; Canadian Territories Railways Syndicate, incorporated under the Companies Act, 1890.

In the case of Wood vs. The Grand Valley Ry. and A. J. Pattison, at Toronto, June 7, the plaintiff was awarded \$10,000 damages and costs for breach of contract by the defendants, in not building an extension of the railway to connect the village of St. George with the C.P.R. at Galt, Ont. The plaintiff also claimed repayment of \$10,000 for bonds of the company, and other relief. Justice Middleton, in delivering judgment, said:—"I find on both document and oral evidence that both defendants are liable. The promise for the construction of the road has not been performed, and the only remedy is damages for its breach. If the award is paid, the bonds are to be assigned to the party paying, and any money received by plaintiff on account of the bonds in the meantime, is to be credited on the judgment."

Electric Railway Projects, Construction, Betterments, Etc.

Brandon, Man.—The city council decided, May 22, to take over the project for the building of an electric railway in the city, J. D. McGregor consenting to relinquish the franchise which the council had agreed to give him. The feeling of the ratepayers against the proposed franchise, and the question of the company's position under the Public Utilities Act, were the principal factors in bringing this arrangement about. The council proposes to ask the ratepayers to approve of the raising of \$300,000 for the construction and equipment of the line as a public utility. The City Engineer was instructed to order 100 tons of 70 lb. steel rails and 500 tons of 60 lb. steel rails. The council started work in 1912, grading and preparing the road bed on certain streets in connection with the franchise proposed to be given Mr. McGregor. This work is being continued, and it is hoped to have several miles of line in operation this year.

The bylaw authorizing the expenditure of \$300,000 upon the building of an electric railway in the city as a municipal undertaking was passed June 14. (June, pg. 308.)

British Columbia Electric Ry.—The question of the company's franchises in the various municipalities which are included in what is called Greater Van-

couver, continues to be the subject of considerable discussion between the municipalities, the company and the Provincial Government.

Tracklaying has been completed on the Millside extension, and it was expected to have the line in operation by June 30. It has been arranged to build a second track on the Eberne line, and application has been made to the Board of Railway Commissioners for the approval of plans for the work. Rapid progress is being made on the Highland Park cutoff.

The company is building a line from Port Moody to the Coquitlam dam, upon which it is proposed to use light steam engines. The line will only be used for freight.

A contract has recently been let to C. C. Moore and Co., Seattle, Wash., for the building of a steam auxiliary power plant on Saanich Inlet, Vancouver Island.

The equipment, in addition to a complete steam generating plant, will consist of two Allis-Chalmers turbo-generators, each having a capacity of 2,000 kilowatts, the entire production giving the plant an output equivalent to 6,000 h.p. The B.C.E.R. Co had already purchased five steam turbo-alternators aggregating over 18,000 from Allis-Chalmers-Bullock, Ltd.

One of the features of the new plant will be the construction of the huge stack, which will be of reinforced concrete and will be 248 ft. high. Its inside diameter at the top will be 11 ft., while the inside diameter at the base will be 18½ ft.

The addition of this plant to the working plants, and the others under construction, will bring the total supply of electrical energy controlled by the company up to 128,000 h.p.

At the Jordan River power plant, the original plans have been extended to make the proposition more ambitious, and the ultimate possibilities of the plant have been placed at 36,000 h.p., instead of 24,000, which was first taken to be the maximum of production. The industrial plans also include the development of power on the Lillooet River and the development of hydro-electric projects at Jones and Chilliwack Lakes, which will advance the total output of electrical energy to over 200,000 h.p.

Galt, Preston and Hespeler St. Ry.—We are officially advised that an extension of the line is under construction to the factory district on the west side of the river in Galt, Ont. (May, pg. 257.)

Halifax Electric Tramway Co.—We are officially advised besides building a second track on the loop line mentioned in our April issue, pg. 196, the company is going to extend its Gittingen St. line about a mile to Yong St., provided the city widens Cunard St. The company is now about two weeks ahead of its schedule on the second track work, and is waiting on the city to complete the work in other places. In connection with the power equipment, orders have been given for a General Electric Co., 1,500 k.w. turbo generator with 33% over load capacity, this equalling a 2,000 k.w. turbo generator; a Worthington surface condensing outfit, and a 25 k.w. turbine exciter set. This contract calls for a complete installation, also one spare arc board panel for 2,100 lamp circuit and one spare a.c. fender panel.

The construction programme for 1913 is also under consideration. It is proposed to extend the track from Quinpool Road and Oxford St. to the head of the northwest arm, 15 miles. (June, pg. 308.)

Lake Erie and Northern Ry.—J. Muir, President, made the announcement in Brantford, Ont., recently, that \$1,000,000 of the company's bonds had been placed, subject to the subscription locally of \$500,000 of debenture stock. Of this

\$275,000 had been subscribed by H. Cockshutt, J. Marr, L. Harris, J. Sanderson and R. Thompson, and it was proposed to ask the municipalities to subscribe for the balance in the following proportions:—Brantford, \$125,000; Paris, Galt, Simcoe, and Port Dover, \$25,000 each. The men named above, with W. P. Kellert, are directors of the company. The taxpayers of Brantford voted, June 25, on a bylaw to borrow the sum necessary to purchase the debenture stock at 90, the price at which it has been offered. The councils of the other towns have the matter of subscribing for the stock under consideration.

A meeting of shareholders to complete organization and to authorize the issue of first mortgage and other securities has been called to be held in Brantford July 9.

The Board of Railway Commissioners has approved location plans for the line from the Grand River to Colborne St., Brantford. (May, pg. 251.)

London and Lake Erie Ry and Transportation Co.—In connection with the proposal to build a line from St. Thomas to Port Burwell, via Aylmer, the city of St. Thomas and the municipalities of Yarmouth and Malahide have agreed, provided Aylmer joins them, in guaranteeing the company's bonds for \$15,000 a mile, an amount which the London and Lake Erie Ry. and Transportation Co. will accept. At present Aylmer has offered to guarantee its share of the bonds up to \$10,000 a mile. (June, pg. 309.)

Levis County Ry.—Press reports state that the company is preparing to award contracts to build an extension of 1.5 miles from the present terminus of its St. Romauld line to the site of the bridge under construction over the St. Lawrence. A. K. McCarthy, Levis, Que., is manager.

We were officially advised, June 14, that the extension from the present terminus of the St. Romauld line will be for 1.5 miles, to Garneau's bridge, and that the work was expected to be started at once.

London, Aylmer and North Shore Ry.—The city of London, which owns the London and Port Stanley Ry., has made a suggestion that it would be willing to guarantee the bonds of a company to build a line from London to Port Burwell, via Aylmer, to the amount of \$100,000; to grant running rights over the L. and P.S. Ry., and to provide terminal facilities at the Michigan Central Rd. station in London. The lease of the station by the M.C.R. expires in 1914. It is stated that application will be made for a new charter, and to abandon any efforts to revive the L. A. and N.S. Ry. charter. (June, pg. 309.)

London St. Ry.—Considerable improvements are being made on the lines in London, Ont. Arrangements are being made for the building of second tracks, and the question of the north end extension and that of bricking certain crossings, are being considered. (June, pg. 309.)

Moncton Tramways, Electricity and Gas Co.—We are officially advised that the company is laying a 300 ft. extension to the new I.R.C. shops at Moncton, N.B. No decision has been reached as to other extensions in the city or suburbs.

Moncton Tramways, Electricity and Gas Co.—E. B. Reeson, Vice President, is quoted as stating, June 6, that an early start will be made on projected extensions of the street railway. (June, pg. 309.)

Montreal and Southern Counties Ry.—Considerable progress has been made with the electrification on the line to Chambly, and on the other works which the company is carrying out in St. Lambert, Que. Granby taxpayers on June 15 carried a bylaw granting a 25 year fran-

chise for a line in that city. It is said that the surveys for the Granby St. Cesaire line will be started at once. (June, pg. 309.)

Moose Jaw Electric Ry.—We are officially advised that the land acquired by the company for park purposes is situated about 2.5 miles from the post office in Moose Jaw, Sask. A line is to be built from the corner of Coteau St and Sixth Ave., South Hill, west along Coteau St. to Third Ave., then south, crossing the river and to the park on the southern boundary of sec. 39. It is expected that the development and construction work will be started in the near future. A. H. Dion is manager. (June, pg. 309.)

Nanaimo, B.C.—A resolution was adopted by the Nanaimo, B.C., city council, May 22, granting the right to M. Yates to build an electric railway on the city streets, upon terms to be agreed upon. A vote of the taxpayers will be taken at an early date, and application will be made next session of the Legislature for the incorporation of a company to build the line. (Mar., pg. 148.)

Niagara, St. Catharines and Toronto Ry.—Work was started June 11 on the company's new station and freight sheds at Port Dalhousie, Ont. J. T. Rebstock, President, Welland board of trade, is quoted as stating June 10, that he had been informed by D. B. Hanna, President, N., St. C. and T. Ry., that all financial arrangements had been completed for extending the railway from Port Colborne to Fort Erie, and that the only obstacle in the way of work being started at once was the opposition of certain residents along the route.

Enquiry of the management shows that Mr. Rebstock was either misreported or that he misunderstood what he was told in the interview referred to. It is not considered likely that the extension will be gone on with this year. (June, pg. 309.)

Niagara, Welland and Lake Erie Ry.—We are officially advised that further construction on this line cannot be proceeded with until the plans have been approved by the Board of Railway Commissioners. (June, pg. 309.)

Ottawa and St. Lawrence Ry.—J. A. Morden and Co., Toronto, advise that they have acquired the charter and all assets of the O. and St. L. Ry. and of the North Lanark Ry. They say that the company is being reorganized, but that officers have not yet been appointed; also that surveys have been completed from Ottawa to Arnprior and from Arnprior to Perth, Ont. Negotiations are said to be in progress for financing construction. No contracts have been let. (May, pg. 252.)

Port Arthur and Fort William Electric Ry.—Bylaws have been passed by the taxpayers of Port Arthur, Ont., to provide funds for the purchase of steel rails for Cumberland St. and Fort William road, and to provide iron poles for use on the line. Plans are under consideration for the building of a belt line which will serve the outlying points of the city. (June, pg. 310.)

St. Thomas St. Ry.—The city council of St. Thomas, Ont., has accepted the tender of the Michigan Central Rd for 60 lb. rails at \$26.50 per ton, for the street railway. (June, pg. 310.)

Saskatoon Electric Ry. and Power Co.—The taxpayers voted June 18 on a bylaw authorizing the Saskatoon, Sask., city council to raise \$500,000 on debentures for the construction and equipment of a municipal street railway. (June, pg. 310.)

Stratford St. Ry.—At a special meeting of the Stratford, Ont., city council, May 29, the bylaw granting a franchise to the company was finally settled. The bylaw provides that the company shall

obtain its power from the Hydro-Electric Commission of Ontario, provided that the rates charged by the commission are not greater than can be obtained from other corporations guaranteeing power, or by other means. The city authorities undertake to secure legislative sanction to the amendments made in the bylaw of 1910. It is said that construction will be started at an early date, and that surveys will be made at once for an extension of the line to Grand Bend on Lake Huron. The charter is controlled by Mackenzie, Mann and Co., and J. E. Rothery, Toronto, is in charge of the project. (June, pg. 310.)

Toronto.—The city council passed a resolution, May 28, authorizing the corporation counsel to appoint a permanent railway expert as an official to be attached to his department for street railway traffic purposes, and appropriating \$35,000 for the securing of expert assistance required in connection with transportation matters. This was the recommendation of the board of control, but in passing the council an amendment was added as follows:—"Such expert or experts to be residents of Canada if such can be found satisfactory to the corporation counsel." B. J. Arnold, Chicago, Ill., and J. W. Moyes, Toronto, have been engaged for the purpose. (April, pg. 198.)

Toronto Eastern Ry.—The Board of Railway Commissioners has approved location plans for this projected line through the townships of Whitby and Whitby East. A contract has been let to Ewen Mackenzie, Toronto, for the building of the line from Bowmanville to Toronto, or to some point near Toronto. The route of the line into Toronto has not yet been announced, but it is probable that at first, at least, it will connect with the Canadian Northern Ontario Ry. line outside Toronto. (June, pg. 310.)

Toronto and York Radial Ry.—Surveys are reported to have been made for a line to connect the Scarboro and Metropolitan divisions with the Canadian Northern Ontario Ry. in the Don Valley near where the Toronto Eastern Ry. will connect. This will enable a connection to be made round north Toronto with the Toronto Suburban Ry. in the north west end of the city, which line is owned by the same interests.

The Ontario Railway and Municipal Board, June 17, made an order authorizing the Metropolitan Ry., one of the component companies, to deviate its line from Yonge St. to a private right of way from Farnham Ave. to a new terminal 800 ft. west, and north of the C.P.R. The line will cross several streets on the level, but the speed is not to exceed six miles an hour, the Board holding that it was not reasonable to compel the line, with its small earnings, to spend \$500,000 in grade separation, more especially as the municipalities refused to contribute anything. Very strong objection has developed in Toronto to the Board's order and steps are being taken to upset it. (Mar., pg. 149.)

Toronto Suburban Ry.—Application is being made for permission to build a second track on certain of the lines in West Toronto, and to alter the gauge in others to standard. Construction of the line from Weston to Woodbridge, Ont., is being proceeded with, but nothing had been done to June 18 on the line from Lambton west. Purchasing agents are negotiating for right of way between Wellington and Meadowvale. (June, pg. 310.)

Windsor, Essex and Lake Shore Rapid Ry.—Location plans have been approved by the Board of Railway Commissioners for a new siding, freight shed and station at Essex, Ont. (Dec., 1911, pg. 1173.)

Among the Express Companies.

The Canadian Ex. Co. has extended its service on the G.T. Pacific Ry. to Mirton, 56 miles west of Edson, Alta. New offices will be established at Bickerdike and Makanum.

The Pacific Parcels Delivery and Express Co., and the White Pass and Yukon Express Co., have been notified that they will be struck off the B.C. Companies register unless cause be shown to the contrary, for failing to comply with the regulations as required by the act.

The Dominion Express Co.'s annual meeting was held at Montreal, June 14, when the report for the past year was presented and the usual dividends declared. The directors for the current year are—President, W. S. Stout; Vice President, R. Paton McLea; Sir Thos. G. Shaughnessy, R. B. Angus, C. R. Hosmer.

The Canadian Northern Ex. Co. commences operating over the Bay of Quinte Ry., July 1, superseding the Dominion Ex. Co. Following is a list of the offices on the line:—Actinolite, Allens, Bannockburn, Camden East, Deseronto, Entorprise, Erinsville, Larkins, Marlbank, Moscow, Napanee, Newburgh, Queensboro, Strathcona, Sydenham, Stoco, Tamworth and Yarker, Ont.

The American Ex. Co., which has been operating over the Quebec Central Ry. for the past 15 years, withdrew from the service, June 30, and closed its offices on the line between Quebec and Sherbrooke. The company retains an office at Montreal. The control of the Quebec Central Ry. having passed into the hands of the C.P.R., the Dominion Ex. Co. will in future operate over the line.

The Dominion Ex. Co. advised that it withdrew its service from the Bay of Quinte Ry., June 30, being superseded by the Canadian Northern Ex. Co., the Bay of Quinte Ry. having passed under the control of the C.N.R. Hereafter shipments by Dominion Ex. Co. will be way-billed to destination through Tweed, Ont., and business from its offices on the Kingston and Pembroke Ry. south of Sharbot Lake will be routed through Harrowsmith, Ont.

The Dominion Ex. Co. advises that on account of the Canadian Northern Ex. Co.'s service not having yet been put into operation over the C.N.R., west of Hawkesbury to and including Ottawa, also west of Port Arthur to North Lake, Ont., shipments for Addie Lake, Cumberland, Cyrville, Evanturel, Gravel Lake, Hiawatha Park, Hymers, Jessop Falls, La Ramboise, L'Original, Nilalu, Clarence, Orleans, Rideau Jct., Rock Lake, Rockland, Sandstone, Silver Creek, Silver Mountain, Slate River, Stanley Jct., Treadwell, Wall Bridge, Wendover, Whitefish and North Lake, must not be accepted until further advised.

The Dominion Ex. Co. calls the attention of its agents to conditions of carriage 10 of Express Classification 2, covering carriage by two or more companies, providing that unless otherwise specifically stated, where a shipment cannot be carried through to destination by one company and is necessarily carried by two or more companies, each company's charge will be assessed separately and not on the through rate made by combining the locals, except that when the shipment comes within the table of graduated charges, one through charge shall be assessed thereon, as in Condition of Carriage 9. For example, when the local merchandise rates are \$1 and \$2, the scale N rate through is \$2.30, that is, the sum of the local scale N rates, not \$2.10 based on the combined merchandise rate of \$3. This does not apply when a specific minimum charge or a joint through rate is in effect.

Marine Department

The Richelieu and Ontario Navigation Co. Absorbs Three More Steamboat Lines.

Following on its acquisition last year of the Northern Navigation Co., the Richelieu and Ontario Navigation Co. has recently made considerable further progress with its scheme for the absorption of lake vessel lines, by adding the Niagara Navigation Co., the St. Lawrence River Steamboat Co. and the Thousand Island Steamboat Co.

The whole of the Niagara Navigation Co.'s issued stock, \$998,600, out of an authorized issue of \$1,000,000, there being 14 shares in the treasury, was secured before the end of May, all the shareholders having transferred their holdings. A very large majority of them took payment in cash at \$200 a share, the balance taking R. and O.N. stock in exchange at 120, that is five R. and O.N. shares for three Niagara shares. In addition to this the Niagara shareholders received a bonus of \$13.72 for each share held, this being the advance in value of 1981 shares of stock which were taken over some months ago from J. C. Eaton of Toronto, and which he received in part payment for the Hamilton Steamboat Co. and the Turbine Steamship Co.'s properties. In other words, the sale to the R. and O.N. Co. netted the Niagara shareholders \$213.72 per \$100 share. The Niagara Navigation Co. had 4½% debentures outstanding for \$227,000, thus bringing the total purchase price up to \$2,224,200.

The transfer of stock having been effected, the directors of the Niagara Navigation Co., headed by Sir Edmund Osler, retired early in June, the following being elected to succeed them:—Sir Rodolphe Forget, President; W. Wainwright, Vice President; C. J. Smith, Vice President and General Manager; Sir Henry M. Pellatt, W. Manson, G. Caverhill and A. H. Sims. F. Percy Smith, Secretary, R. and O.N. Co., was also appointed Secretary of the Niagara Navigation Co., vice J. M. Sullivan, who has been appointed Assistant Secretary.

B. W. Folger, who has been General Manager of the Niagara Navigation Co. for a number of years, since the retirement of the late John Foy from that position to take the presidency, resigned at the same time as the old board. He has not decided on his future activities, but will probably remain in Toronto for this summer at least.

The St. Lawrence River Steamboat Co. and the Thousand Island Steamboat Co. with headquarters at Kingston, Ont., and Clayton, N.Y., respectively, were owned by a syndicate headed by Sir Edmund Osler, W. D. Matthews and B. W. Folger of Toronto, Robt. Crawford of Kingston being President. The St. Lawrence River Steamboat Co. has a capitalization of \$60,000 and the Thousand Islands Steamboat Co. of \$100,000, in addition to which there is certain bonded indebtedness. The prices paid by the R. and O.N. Co. for these properties have not been made public, but it is generally believed that the syndicate above mentioned, which obtained control a little over a year ago, made a good profit on the sale. The stock of both companies having been purchased by the R. and O.N. Co., Mr. Crawford and his co-directors retired June 11 and the following were elected:

St. Lawrence River Steamboat Co.—President, Sir Rodolphe Forget; Vice President, W. Wainwright; Vice President and General Manager, C. J. Smith; other directors, F. P. Smith, J. V. O'Donahoe.

Thousand Island Steamboat Co.—President, Sir Rodolphe Forget, Vice President, C. J. Smith; other directors, W. Wainwright, A. H. Sims, Montreal; B. L. Jones, H. Parry, Buffalo, N.Y.; F. K. Force, Watertown, N.Y.

F. Percy Smith, Secretary, R. and O.N. Co., was appointed Secretary of both these acquired companies.

At Dec. 31, 1911, the R. and O.N. Co. had capital stock issued for \$5,311,875 and 5% bonds for \$1,233,633.33 outstanding. On May 28 notice was given of the issue of new stock for \$1,908,500, which was offered to shareholders at par, one share of new for each four shares of old held.

The following appointments, etc., have been announced:—

C. J. Smith, as Vice President and General Manager, will have full charge of the properties of the Niagara Navigation Co.



C. J. Smith,
General Manager, Richelieu and Ontario Navigation Co.

gation Co., the St. Lawrence River Steamboat Co. and the Thousand Island Steamboat Co.

H. Foster Chaffee, heretofore Assistant General Passenger Agent, R. and O.N. Co., Toronto, has been appointed General Passenger Agent, R. and O.N. Co. lines west of Prescott, Ont., including Niagara Navigation Co., Thousand Island Steamboat Co., and St. Lawrence River Steamboat Co. Office, Toronto.

The jurisdiction of the following R. and O.N. Co.'s officials has been extended over the Niagara Navigation Co.:—T. Henry, Traffic Manager; H. Foster Chaffee, General Passenger Agent Western Lines; J. Ritchie, General Agent; J. A. Villeneuve, Comptroller and Treasurer; M. Cussen, Auditor Freight and Passenger Receipts; J. V. O'Donahoe, Manager's Assistant; G. Johnston, Mechanical Superintendent; A. Angstrom, Naval Architect; J. Phelan, Assistant to Me-

chanical Superintendent; A. A. Barry, Chief Culinary Steward; J. H. Bouchard, Chief Equipment Steward. The jurisdiction of all these officers except J. Ritchie, has also been extended over the St. Lawrence River Steamboat Co. and Thousand Island Steamboat Co.

Jas. Ritchie, heretofore General Agent, R. and O.N. Co., Toronto, as General Agent representing the General Manager's office, has been given general supervision of the Toronto, Hamilton, Lewiston, Youngstown and Niagara terminals, and the operation of the steamboats and handling of traffic in connection therewith. Officers, agents, captains, engineers, pursers, stewards and employees of the mechanical department report to his office in connection with operation, maintenance, repairs and supplies.

J. V. Foy, heretofore General Passenger Agent, Niagara Navigation Co., has been appointed District Passenger Agent, R. and O.N. Co. Office, Toronto.

R. H. McBride, heretofore Treasurer, Niagara Navigation Co., has been appointed Assistant Treasurer, N.N. Co.

S. J. Murphy, heretofore Travelling Passenger Agent, Niagara Navigation Co., has been appointed Excursion Agent, Niagara Navigation Co. Office, Toronto.

J. A. Goodearle, General Freight Agent, and J. P. McConnell, Assistant Freight Agent, Niagara Navigation Co., Toronto, and W. E. Bishop, General Agent, Niagara Navigation Co., Hamilton, Ont., remain in the same positions.

H. D. Patterson, heretofore Travelling Passenger Agent, R. and O.N. Co., Toronto, has been appointed Travelling Passenger Agent lines west of Prescott, including affiliated lines.

G. Price, ticket agent, R. and O.N. Co., 46 Yonge St., Toronto, has also been appointed ticket agent for the Niagara Navigation Co., and other affiliated lines.

H. E. Weller, heretofore ticket agent, Niagara Navigation Co., 63 Yonge St., Toronto, has been appointed terminal ticket agent, R. and O.N. Co., at the Yonge St. wharf, Toronto. The business heretofore transacted at 63 Yonge St. has been removed to 46 Yonge St.

W. F. Cloney, District Passenger Agent, R. and O.N. Co., Buffalo, N.Y., has also been given jurisdiction over the Niagara Navigation Co.'s line.

The jurisdiction of T. Henry, Traffic Manager, R. and O.N. Co., has been extended over Thousand Island Steamboat Co. and St. Lawrence River Steamboat Co.

H. B. Mills, heretofore General Passenger Agent, St. Lawrence River Steamboat Co. and Thousand Island Steamboat Co. at Kingston, Ont., has been appointed General Agent at Clayton, N.Y.

G. Bowden, heretofore Secretary Treasurer, St. Lawrence River Steamboat Co. and Thousand Island Steamboat Co., has been appointed Assistant Secretary Treasurer of those companies.

J. W. Canvin, District Passenger Agent, R. and O.N. Co., Alexandria Bay, N.Y., has had his jurisdiction extended over the St. Lawrence River Steamboat Co., and the Thousand Island Steamboat Co.

The Niagara Navigation Co.'s general offices in the Traders Bank Building, Toronto, will be retained by the R. and O.N. Co.

With the exception of its ferryboat

Ongiara on the Niagara River, the Niagara Navigation Co. has not operated on Sunday, but the R. and O.N. Co. intends to run its Niagara River Line on that day, commencing July 7. The official notice say "that as a matter of public necessity and in order to provide through service for the travelling public it will establish a Sunday service to and from Toronto connecting with other transportation companies, leaving Toronto at 7.30 and 11 a.m., 2 and 5.15 p.m., connecting with New York Central Lines and Niagara Gorge Rd. for Buffalo, and at Buffalo with all rail and water lines. From Lewiston, N.Y., steamboats will leave at 8 and 10.30 a.m., and 2 and 6 p.m., making through rail and water connections at Toronto."

The R. and O.N. boats on the Prescott-Toronto run have heretofore arrived at and departed from Toronto on Sundays, so that the change above mentioned will merely be an extension of the service through to Lewiston, N.Y. The boats will not call at Niagara-on-the-Lake or Queenston, Ont. The line between Toronto and Olcott, N.Y., will also run on Sundays. There will be no Sunday service between Toronto and Hamilton. On the Toronto-Lewiston and Toronto-Olcott routes passengers will be carried at regular rates only, book tickets will not be honored and there will be no excursion rates.

The combined fleet of the R. and O.N. Co. and the companies which it has acquired is now as follows:—

R. and O.N. Co., 13 steamboats and 18 market line steamboats and ferries.

Northern Navigation Co., 9 steamboats.

Niagara Navigation Co. (including acquired from Hamilton Steamboat Co. and Turbine Steamship Co.), 8 steamboats.

St. Lawrence Steamboat Co., 3 steamboats.

Thousand Islands Steamboat Co., 3 steamboats.

This makes a total fleet of 54.

A large passenger steamboat is being built for the Northern Navigation Co. at Port Arthur. The Thousand Islander, the Thousand Island Steamboat Co.'s new boat, was delivered on June 16 and the R. and O.N. Co. announces that it will build a large ferry for service at Montreal. Some months ago it was announced that the Niagara Navigation Co. had decided to build another boat and that plans were being prepared by F. E. Kirby, of Detroit, Mich. Only some preliminary work was done in this connection, the Niagara Co.'s management dropping the matter in consequence of the negotiations for the sale of the company's interest. The R. and O.N. Co. will probably take this up.

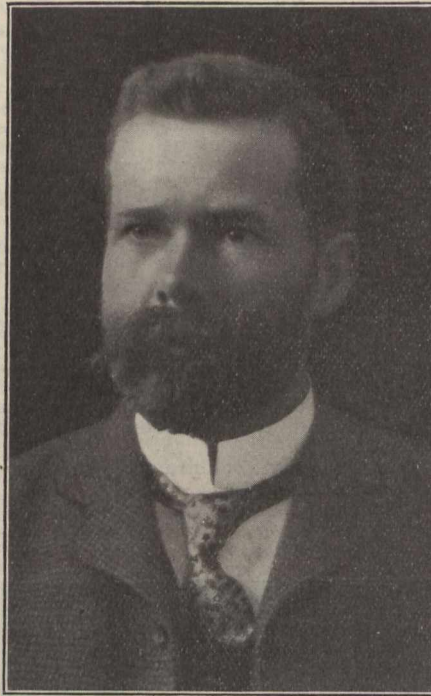
Up to June 20, when this was written, the Island Navigation Co. had not been taken over by the R. and O.N. Co., but we were officially advised that the basis on which it was to be taken over had been approved of.

Dominion Government Hydrographic Steamship for Atlantic Coast.

The specification for the building of a single screw steamship for the hydrographic branch naval service department for use in the Atlantic coast service, tenders for which were received up to June 30, call for a vessel of the following principal dimensions:—Length, over all, 177 3/4 ft.; length, between perpendiculars, 165 ft. beam moulded, 33 1/2 ft.; depth, 13 1/2 ft.; displacement to mean draught of 11 ft., above bottom of keel angles amidships, about 950 tons, with 250 tons of coal on board and 60 tons of stores and water. The vessel and fittings are to conform to all the requirements of the

rules and regulations prescribed by the Dominion Board of Steamboat Inspection, and to equal the requirements of British Lloyds to class 100 A 1.

She is to be built of steel throughout except where otherwise specified, with



Thomas Henry,
Traffic Manager, Richelieu and Ontario Navigation Co.

straight stem, elliptical stern and two pole masts of wood with necessary sails and rigging; one spar deck of steel covered with wood deck to Lloyds' requirements, the forward end being stiffened



H. Foster Charfee,
General Passenger Agent, Western Lines,
Richelieu and Ontario Navigation Co.

from the stem back to the breakwater. The main deck to be plated amidships over the machinery space and bunker, and covered with wood deck; double bottom extending from aft engine room bulkhead to forward bunker bulkhead,

and a water tight flat forward and aft of same, there being six water tight bulkheads extending to main deck; nine hatchways in spar deck, on which deck will be located the deck house and pilot house. The equipment is to include a steam winch with all necessary fair leads for handling boats and warping ship, one steam anchor windlass forward for handling anchors and fitted with gypsy heads for warping ship, one sounding winch, and a sounding machine, which will be provided by the department. The steam steering gear is to consist of a two-cylinder, 4 by 5 in. engine of approved make, operated by means of a telemotor located in the pilot house. Two 27 ft. gasoline launches, each fitted with 15 h.p., or 4-cycle engines, two 27-ft. cutters and one 18-ft dinghy are to be supplied. The electric lighting plant is to consist of a generating set of one steam-turbo generator of steam economy equal to that of a compound engine, or a compound engine, to be directly connected to a generator of not less than 13.2 kw., capable of supplying all lights on the vessel, including a search light at the same time at 110 volts pressure.

The propelling machinery to consist of vertical inverted three cylinder triple expansion engines with cylinders 17 1/2, 27 1/2, and 47 1/2 ins. diam., by 28 ins. stroke, driving a three blade propeller 10 ft. diam. 9 ft. pitch, at about 150 revs. per minute, giving a speed of 12 knots an hour, with steam pressure of 185 lbs. The steam will be supplied by two Scotch boilers, each 11 1/2 ft. long by 11 1/4 ft. mean diam., fitted with corrugated furnaces, with a combined grate surface of 90 sq. ft., and total heating surface of 2,800 sq. ft., and with forced draught equipment. The auxiliary machinery will include, steam dynamo, one independent bilge pump, one fire pump, one auxiliary feed pump, one main feed pump, one sanitary pump and one 10-ton evaporator and a distiller with capacity for 1,600 gallons in each 24 hours.

Reid Newfoundland Co.'s New Steamship for Canadian Service.

As noted in our last issue, the Reid Newfoundland Co. has ordered in Newcastle, Eng., two steamships, one of which will be operated in the daily service between Port aux Basques and North Sydney, N.S., with the company's new steamship Bruce, replacing the s.s. Invermore, and the other being run in the Labrador service. Both vessels are being built to class 100 A1 at Lloyds, with special strengthening for ice.

The first vessel, that for the Port aux Basques-North Sydney service, will have accommodation for 78 first and 160 second class passengers, and will have the following dimensions—Length between perpendiculars, 255 ft.; breadth, 37 ft.; depth, moulded to shade deck, 24 3/4 ft. She has been designed to carry about 800 tons on a 17 1/4 ft. mean draught, with a speed of 15 knots an hour. She will be equipped with four boilers, 15 ft. diam. by 11 1/2 ft. long, fitted with forced draught, supplying steam at 180 lbs. pressure. The contract calls for delivery by Jan. 31, 1913.

The vessel for the Labrador service will have accommodation for 68 first, and 140 second class passengers, with extra accommodation for 18 persons in hospital. Her dimensions will be, length between perpendiculars, 220 ft.; breadth, 32 ft.; depth moulded, 20 1/2 ft. She will have a speed of 13 knots an hour, and will be equipped with two boilers 13 3/4 ft. outside diam., by 11 ft. long, fitted with forced draught. The contract calls for delivery by Apr. 15, 1913.

The Board of Railway Commissioners has defined the express collection and delivery limits for Grand Falls, N.B.

The Dominion Canals Statistics for 1911.

The canal statistics of the year 1911 have been issued by the Railways and Canals Department.

The aggregate volume of freight moved through all the canals was 38,030,353 tons, a decrease of 4,960,255 tons from 1910. This is more than accounted for by the decline in traffic at Sault Ste. Marie, applicable almost wholly to United States ore. An increase of 211,339 tons through the Welland canal, and of 344,956 tons through the St. Lawrence canals, would point to satisfactory growth as far as strictly Canadian business was concerned.

The freight traffic was distributed among the various canals as follows:—

	Tons.	Inc.	Dec.
Sault Ste. Marie...	30,951,709	.....	5,443,978
Welland.....	2,537,629	211,339	.....
St. Lawrence.....	3,105,708	344,956	.....
Chambly.....	599,829	.....	69,470
St. Peter's.....	75,298	.....	10,653
Murray.....	163,457	.....	14,484
Ottawa.....	320,071	.....	65,190
Rideau.....	172,227	37,346	.....
Trent.....	57,290	11,027	.....
St. Andrew's.....	47,135	38,852	.....
Total.....	38,030,353	643,520	5,603,775

The expansion for the ten year period between 1902 and 1911 was equal to 406%, the tonnage in 1902 having been 7,513,197 tons.

The following comparative statement shows on what canals the growth has taken place during the past four years:—

	1908.	1911.
Sault Ste. Marie.....	12,759,216	30,951,709
Welland.....	1,703,453	2,537,629
St. Lawrence.....	2,009,102	3,105,708
Chambly.....	503,276	599,829
St. Peter's.....	72,015	75,298
Murray.....	25,901	163,457
Ottawa.....	258,527	320,071
Rideau.....	89,640	172,227
Trent.....	81,690	57,290
St. Andrew's.....	.....	47,135

The percentage of traffic in 1911 was as follows:—Vegetable products, 14.2%; animal products, 0.1%; manufactures, 6.2%; produce of forests, 4%; produce of mines, 75.5%.

CANADIAN AND UNITED STATES TRAFFIC.

Prior to 1908 the statistical methods in use did not provide for a separation of Canadian and United States business passing through the canals. Since that date a record has been kept of the country of origin, and the facts with respect to the traffic of all the canals are given in the following statement:—

Year.	Canadian Vessels.		U. S. Vessels.		Freight Tonnage.		
	No.	Tonnage.	No.	Tonnage.	Canadian.	United States.	Total.
1903.....	29,040	6,780,789	7,439	4,835,320	5,012,147	12,490,673	17,502,820
1909.....	22,507	7,811,578	9,996	16,459,322	7,378,057	26,342,691	33,720,748
1910.....	25,337	8,931,790	11,462	21,777,297	7,883,614	35,106,994	42,990,608
1911.....	25,585	9,172,192	10,370	18,231,622	7,792,907	30,287,446	38,080,353
				Through U.S. canal.....	9,117,328	5,321,446	1,981,481
				Grand total ...	57,165,161	57,096,279	65,622,481

Of all the commodities transported through Canadian canals in 1911, the proportion originating in the U.S. was 79.5%. In 1910 the proportion was 81.6%. This large difference in favor of the U.S. is almost wholly accounted for in the volume of ore passed through the Sault Ste. Marie canal.

With regard to vessel tonnage, the proportions in 1911 stood as follows:—Canadian, 33.5%; United States, 66.5%.

TRANSPORTATION OF CANADIAN WHEAT.

With the development of the western provinces there has been a steady growth in the volume of waterborne wheat. Since 1895 the quantities annually brought down through the Sault Ste. Marie canal are as follows:—

	Bush.
1895.....	4,518,334
1896.....	19,314,234
1897.....	17,925,834
1898.....	9,746,600
1899.....	12,759,634

1900.....	9,292,034
1901.....	9,639,534
1902.....	27,912,500
1903.....	32,233,934
1904.....	29,794,100
1905.....	25,983,100
1906.....	34,339,300
1907.....	49,399,967
1908.....	58,574,034
1909.....	48,047,833
1910.....	51,774,833
1911.....	63,641,000

The figures for the years anterior to 1909 include U.S. wheat. The increase in 1911 over 1909, applicable only to Canadian wheat, was 15,593,167 bush., or 32.4%.

In addition to the 63,641,000 bush. of Canadian wheat which passed through the Canadian canal at Sault Ste. Marie, 1,981,481 bush. of Canadian wheat passed through the U.S. canal there. These figures combined show that the volume of waterborne Canadian wheat in 1911 was 65,622,481 bush. Account is not taken of the relatively small quantity of wheat which was moved through any of the other canals. However, 183,449 barrels of Canadian flour were carried through the Canadian canal at Sault Ste. Marie in 1911, and 841,733 barrels of Canadian flour through the U.S. canal. Calculating this Canadian flour into wheat makes an addition of 4,100,728 bush. to the volume already indicated, bringing the total up to 69,723,209 bush.

Last year, for the first time, a careful study was made of the distribution of Canadian wheat after it had passed through the canal at Sault Ste. Marie, and this year the same analytical methods have been applied to the traffic of 1911. The record is as follows:—

	1909.	1910.	1911.
	Bush.	Bush.	Bush.
Fort William to Montreal.....	10,517,266	13,185,370	12,761,666
Fort William to Georgian bay.....	13,384,400	12,753,200	9,881,234
Fort William to other Canadian ports.....	10,149,633	9,603,400	11,880,666
Fort William to Buffalo.....	12,841,334	15,693,363	27,945,600
Duluth to Montreal.....	520,000	315,000	.....
Duluth to Buffalo.....	528,200	224,500	710,334
Duluth to Georgian bay.....	28,000	.....	461,500
Duluth to other Can. ports.....	79,000	.....	.....
Total.....	48,047,833	51,774,833	63,641,000

Year.	Canadian Vessels.		U. S. Vessels.		Freight Tonnage.		
	No.	Tonnage.	No.	Tonnage.	Canadian.	United States.	Total.
1903.....	29,040	6,780,789	7,439	4,835,320	5,012,147	12,490,673	17,502,820
1909.....	22,507	7,811,578	9,996	16,459,322	7,378,057	26,342,691	33,720,748
1910.....	25,337	8,931,790	11,462	21,777,297	7,883,614	35,106,994	42,990,608
1911.....	25,585	9,172,192	10,370	18,231,622	7,792,907	30,287,446	38,080,353
				Through U.S. canal.....	9,117,328	5,321,446	1,981,481
				Grand total ...	57,165,161	57,096,279	65,622,481

The "other Canadian ports" indicated above are ports west of Lake Erie, but not on the Georgian bay.

It is quite impracticable to follow the course of the small volume of Canadian wheat which passed through the U.S. canal at Sault Ste. Marie. With respect to that which passed through the Canadian canal, however, the figures work out in the following percentages:—

	1909.	1910.	1911.
Fort William to Montreal.....	21.9	25.5	20.1
Fort William to Georgian bay.....	27.9	24.6	15.6
Fort William to other Canadian ports.....	21.1	18.5	18.7
Fort William to Buffalo.....	26.7	30.3	43.8
Duluth to Canadian ports.....	1.3	.6	.7
Duluth to American ports.....	1.1	.5	1.1

In commenting on these figures the Comptroller of Statistics, J. L. Payne, says:—"It will be seen that 54.4% of all

the Canadian wheat which came down in 1911 through the Canadian canal at Sault Ste. Marie clung exclusively to Canadian channels. The proportion in 1910 was 68.6%; so that the diversion to U.S. channels was considerably greater in 1911.

"Of the 63,641,000 bush. of Canadian wheat which were transported through the Canadian canal at Sault Ste. Marie during 1911, 43.8% went to Buffalo, N.Y. Wheat is supposed to follow the channel offering the lowest freight rates, other things being equal. In this instance, however, distance and freight rates were substantially in favor of Montreal; and yet other considerations caused nearly half of the wheat which came down last year from the Canadian west to find its outlet to the ocean through Buffalo.

"The course of the wheat trade during Nov., 1911, may be taken as illustrating the situation. In that month 18,021,300 bush. of Canadian wheat were passed through the Canadian canal at Sault Ste. Marie, or nearly one-third of the total volume for the year. The all-water freight rate from Fort William to Montreal in November was 4½c. per bush. The water rate from Fort William to Buffalo was 3½c. per bush., plus 5½c. by rail from Buffalo to New York. Montreal and New York are the essential points of comparison. Thus in November the freight rate from Fort William to Montreal was 4½c., as compared with 9c. to New York. This would seem to establish a controlling advantage in favor of Montreal, and, other things being equal, it would be; yet in that month 48.3% of all the Canadian wheat which came down from the west, including that which passed through the U.S. canal, went out by way of Buffalo-New York.

"Careful inquiries were made as to the conditions which operated in November last, and which in some degree operate in all seasons, as a countervail to the lake freight rates in favor of Montreal. They were ascertained to be: First, availability of ocean tonnage at New York; second, lower ocean rates between New York and foreign ports; and, third, lower ocean insurance rates from New York. These factors were obviously sufficient to divert, in November last, nearly half of all the Canadian wheat from the west into U.S. channels.

"November is the rush month in the wheat trade. Market considerations may, under such circumstances, rise above the immediate question of rates. Delivery at a foreign port within a specified time may depend upon the choice of the dearest available channel, rather than the cheapest, and it is probable that this very situation caused the diversion of millions of bushels from the port of Montreal in 1911. Under such conditions, mere uncertainty as to ocean tonnage may turn the scale.

"Marine insurance rates remained unchanged during the year. In November they ran from 65c. to \$1.10 per \$100 from Montreal, as compared with 12½ to 15c. from New York.

FREIGHT RATES BY WATER.

"The department has very frequently been asked the question: What are the transportation rates per ton per mile on Canadian canals? It has always been impossible to give an answer. The information upon which to base an accurate calculation, so as to make, for example, a comparison between freight rates by water and freight rates by rail, has never been available. Carriers by water have not at any time been asked to disclose their freight charges. There is no good reason, however, why they should not be. Such carriers enjoy rather extraordinary privileges, and the whole question of transportation rates by land and water is manifestly of deep public interest. Railway corporations are required by law to give an exceedingly analytical statement of their operations, and carriers by water should at

least be asked to give such information as will enable the important question of freight rates to be definitely determined. Acting upon instructions, I propose to inaugurate for 1912 such changes in our statistical methods as will fully and definitely ascertain the freight charges per ton per mile by vessels operating on the inland waters of the Dominion.

Meanwhile, careful study has been given to the data in hand in order to estimate the rate per ton per mile *cna.* by carriers using the canals. For this purpose three factors are required: first, the number of tons moved; second, the length of the haul in miles; and, third, the freight charges. Not one of them is definitely available at present. It is not known, for example, how many tons were transported through the canals. It is accurately known how many tons passed through each particular canal; but it has been found impracticable under the system which has long been in vogue to prevent some measure of duplication in making up the total. Under the methods to be adopted hereafter the tonnage will be absolutely accurate. The length of the haul in each instance has not been made a matter of record up to this moment. This will be corrected hereafter. The schedules in use have not taken cognizance of freight rates, and that, too, will be taken care of in the plan to be given effect in 1912.

In this situation, it has been found necessary to select one of the gateways of our inland water system, and apply certain tests to the traffic flowing through it. The Welland canal was chosen. All through business between the lower and upper lakes, moving up or down, must pass that point. Here, then, is the first factor—the volume of traffic. The total number of tons which passed through the Welland canal during 1912 was 2,537,629. Of this aggregate, 842,919 were moved up, or westward; while 1,694,710 were moved down, or eastward. The relative proportions were 34% and 66% respectively. It is assumed that all the business which passed through the Welland canal was moved the whole distance between Montreal and Fort William—1,223 miles—or vice versa. This gives the second factor—the length of the haul.

In an effort to ascertain the freight charges which prevailed in 1911, it was found that the rate on only one commodity, wheat, was definitely known. That is put down at \$1.50 a ton for carriage between Fort William and Montreal. It is probably the lowest rate at which any commodity is carried through the canals. The total volume of wheat transported through the Welland canal in 1911 was 562,282 tons, or a little over 22% of the total volume of traffic. Among the 32 commodities moved, there were 187,411 tons of general merchandise, on which a rate two or three times as high as \$1.50 a ton was probably charged. Having regard to the whole list, it is thought fair to assume, for the purposes of this estimate, that an average rate of at least \$2 a ton was levied. This is probably a low figure, in view of the fact that the average rate on the Erie canal in the last year for which information was obtainable, was equal to \$2.45 a ton for the distance between Fort William and Montreal; and the Erie canal is a barge canal, which provides the cheapest known form of transportation by water. This, then, gives the third factor—the freight charge.

It will be seen that 2,537,629 tons carried 1,223 miles, would be equal to 3,103,520,267 tons carried one mile. The freight bill on 2,537,629 tons, at \$2 a ton, would be \$5,075,258. Dividing the ton miles into the freight earnings gives the quotient of 0.163c. a ton per mile. The rail rate from Fort William to Montreal on wheat is \$4 a ton, or 0.421c. a mile, so that the water rate is, by comparison, quite low. But in comparing the rail and water rates between these two points, it must be remembered that the railway

has to maintain its right-of-way, pay interest on capital invested, and meet all incidental operating expenses. In the case of transportation by water, the Government keeps up the right of way, pays the cost of operating the canals, and makes no charge of any kind to the vessel owner or shipper. The question at once suggested is: What is the contribution of Government toward the reduction of the freight rate by water?

To answer this question, the first item to be taken into account is interest on capital invested. Without going into details, let it be said that the Government has expended \$80,000,000 in constructing the canals between Fort William and Montreal, and in providing otherwise for the navigation of that chain of waterways. In this \$80,000,000 is not included the very considerable cost of harbors and lighthouses. It represents practically the direct cost of the canal system by itself. The interest charges on that capital outlay, at 3½%, would amount to \$2,800,000 a year. This would be equal to a contribution of 0.090 a ton per mile on account of interest on capital. To this must be added the expenditure for maintenance and operation, which represents an average of \$1,400,000 a year. The contribution of Government on that account is equal to 0.045 a ton per mile. The account would thus stand, per ton per mile, as follows:—

Freight charges	0.163c.
Government contribution, interest.....	0.090c.
Government contribution, maintenance, etc.....	0.045c.

Total.....0.298c.

I am quite confident that when all the facts are positively ascertained for 1912, it will be found that the foregoing estimate is quite too low. It is below the results on the Erie canal, and not more than about one-third of the rate per ton per mile charged by European canals. However that may be, it will be observed that the contribution of Government in 1911 was equal to 0.135c. a ton per mile, or 83% of the freight rate charged by vessel owners.

There is still another important and vital aspect of this matter. Of the 2,537,629 tons of freight which passed through the Welland Canal in 1911, only 1,296,480 tons, or 51% of the whole, consisted of Canadian products. The remaining 49% was composed of U.S. commodities, most of which passed from a U.S. port to a U.S. port. This would not in any way affect the freight rate; but it may be worth while to show what was the contribution of Government toward the transportation of exclusively Canadian business through the canals between Fort William and Montreal in 1911. The number of tons carried one mile in that case would be 1,585,595,040. Without going into the details of the calculation, as was done in a preceding paragraph, let it be said that on Canadian traffic only the account per ton per mile would stand as follows:—

Freight charges	163c.
Government contribution, interest	177c.
Government contribution, maintenance, etc.....	108c.

Total.....428c.

It will be seen that the Government contribution amounted to 0.265c. a ton per mile, as compared with 0.163c. charged by the vessel owners. Of course, as has been said, the actual freight rate is probably higher than 0.163c. per ton mile. Be that as it may, the calculation which has been made shows the probable freight rate by water, between Fort William and Montreal, to be slightly higher than the actual rate by rail between those points.

(There will probably be considerable divergence of opinion in regard to the Comptroller's calculations respecting the comparative cost of water and rail carriage as above quoted. We will be pleased to hear from any of our readers on this subject, which is a most important one and worthy of very full discussion.—Editor.)

B.C. Joint Stock Companies' Non-compliance with Regulations.

The following companies have been officially notified that they will be struck off the register of British Columbia companies unless they show cause to the contrary, having failed to comply with the regulations:—Vancouver Improvement Co.; Esquimalt Marine Railway Co.; British Columbia Towing and Transportation Co.; Victoria Towing Co.; Victoria Sealing and Trading Co.; People's Steam Navigation Co.; Westminster Steam Navigation Co.; British Columbia Deep Sea Fishing Co.; Fraser River Fish Co.; American Fish Co.; Imperial Steamship Co.; Burrard Inlet Sealing and Trading Co.; Pacific Traders and Navigation Co.; British Columbia Fishing and Trading Co.; Vancouver Steamship Co.; Slovan Trading and Navigation Co.; San Juan Fishing, Canning and Trading Co.; Northern Shipping Co.; Pacific Fish Co.; Western Dredging Co.; Clayoquot Fishing and Trading Co.; British Columbia Tug Co.; Victoria Fishing and Trading Co.; Lower Fraser River Navigation Co.; Vancouver Marine Ry.; Kelowna Shippers Union Co.; North British Columbia Navigation Co.; Rothesay Shipping Co.; Yukon Hootalinkwa Navigation Co.; Teslin Transportation Co.; Stikine Navigation Co.; Glenora Steamship Co.; Teslin Yukon Steam Navigation Co.; Casca Trading and Transportation Co.; Victoria, Bennett and Dawson Transportation Co.; Big Bend Transportation Co.; Dominion Steamboat Line Co.; Fraser River and Coast Navigation Co.; Card Steamship and Trading Co.; Yukon Flyer Line; Atlin Transportation Co.; Sandon Forwarding Co.; Vancouver Coast Line Steamship Co.; British Yukon Navigation Co.; British Columbia Fish Co.; Western Steamboat Co.; Pacific Barge Co.; Western Canadian Fish Co.; Victoria Steamship Co.; Coulti Shipping Co.; Venture Steamship Co.; British Pacific Fishing and Canning Co.; Vancouver Skeena River Navigation Co.; Everett G. Griggs Ship Co.; Skeena River Navigation Co.; C. Gardiner Johnson Shipping, Insurance and Wharfage Co.; British Columbia Transportation and Commercial Co.; G. H. Trench Tug Boat Co.; Virginia Dredging Co.; Greer, Courtney and Skene; Steamer H. C. Henry; Twin City Transportation Co.; North British Columbia Navigation Co.; Skeena River Transportation Co.; Cariboo Navigation and Development Co.; Island Dock and Warehouse Co.; Queen Charlotte Whaling Co.

A new steel yacht, costing \$11,500, with capacity for about 150 passengers, was launched from Polson Iron Works, Toronto, early in June, for the Royal Canadian Yacht Club. The hull is divided into five watertight compartments with steel transverse bulkheads between. Her dimensions are, length 70 ft., breadth 15 ft., depth 6 ft. 2 in., with a draught of four feet. She is equipped with compound jet condensing engines, with cylinders 7 and 14 ins. diam. by 10 ft. stroke, and is lighted by electricity.

The U.S. Senate recently passed a bill making it unlawful for any ocean or lake steamer of the U.S., or any foreign country, carrying 50 or more persons, whether passengers or crew, to leave any U.S. port unless equipped with an efficient apparatus for radio communication, in good working order, in charge of two or more skilled operators, one of whom must be on duty at all hours of the day or night, the apparatus to be capable of transmitting at least 100 miles. An auxiliary plant, independent of the vessel's main electric plant, must be provided, which will enable the operator for at least two hours to transmit messages 100 miles under all conditions of atmospheric disturbance, when it is safe for the operator to work.

Atlantic and Pacific Ocean Marine.

The arrivals of ocean going steamships at Montreal, for May, were 73, with an aggregate gross tonnage of 478,073.

The Elder Dempster Co.'s s.s. Canada Cape, from St. John, N.B., to Cape Town, South Africa, which was reported beached after a fire on board, has been floated and docked at Cape Town.

The Thomson Line s.s. Cairn Dhu sailed from Newcastle, Eng., June 13, on her maiden trip, and arrived at Montreal, June 25, being the first vessel by the Belle Isle route this season.

The Canadian Brazilian Shipping Co., Ltd., has been incorporated under the Dominion Companies Act, with \$300,000 capital, and office at Toronto, to carry on a general ship owning and navigation business.

A Montreal press dispatch of June 8 stated that the Canadian Northern Steamships, Ltd., would probably add another steamship to its fleet this year. Enquiry of the management fails to confirm this, and it is not probable that there will be any addition to the fleet during this year.

The British steamship Fishpool, which loaded grain at Montreal, early in June, for European ports, is a new vessel, having just been built at West Hartlepool, Eng., this being her maiden trip. Her dimensions are, length, 399 ft.; beam, 56 ft.; depth 26 $\frac{3}{4}$ ft.; tonnage, 4,552 gross, with cargo capacity of 8,200 tons.

The Dominion Government is calling for tenders for a fast steamship service between Canadian ports and British Guiana, calling at islands in the British West Indies, which have signed trade agreements with the Dominion, and for a second steamship service between the Maritime Provinces and Jamaica, calling at Bermuda.

E. J. Chamberlin, President, G.T.R. and G.T. Pacific Ry., is reported to have stated, June 20, in Montreal that a line of steamships would be placed on the Pacific by the company as soon as the railway was completed. The sailings will take place from Prince Rupert, from which port to the Orient, it is said, there will be a saving of two days.

It is reported at Victoria, B.C., that the underwriters have declined the offer of a Japanese syndicate for the purchase of the wrecked s.s. Empress of China, the sum not being high enough, and that they will take the vessel to Hong Kong, where temporary repairs will be carried out, sufficient to allow of her being taken to England, where she will again be offered for sale.

Holt and Co., operating the Blue Funnel Line, are reported to have withdrawn from the North Pacific conference, and notice is stated to have been given for shippers in the Orient that any consignment of freight given to that line will invalidate any claim to participate in the deferred rebates payable by the lines constituting the conference, amongst which is the C.P.R.

A press report from London, Eng., June 11, states that the Cunard Line has declined the offer of the White Star Line to pay the company for its services in connection with the saving of life in the Titanic disaster, but it will allow the crew of the s.s. Carpathia to receive gifts from the White Star Line as follows:—To the captain, 100 guineas; to the surgeon, purser and chief steward, 50 guineas each, and to each of the crew, one month's pay.

Sir Thomas Shaughnessy, on his recent return from Great Britain, is reported to have stated in Montreal, June 10, that no doubt the matter of new vessels for the Atlantic service, so constructed that they could be converted into auxiliary cruisers, would be discussed with the British Government, in the course of

the Dominion Premier's visit to England. He is also reported to have stated that he could not say whether the C.P.R. would tender in connection with the proposed West Indies service.

J. H. Welsford and Co., Liverpool, Eng., who control the Union Steamship Co., and who recently acquired the Canadian Mexican Pacific Steamship Co., and the Boscowitz Steamship Co., have made an offer to inaugurate a steamship service between Canada and Australia, if the Dominion Government will allow an adequate subsidy for three years. The matter is being discussed by the Vancouver board of trade, and probably a resolution urging the Government to take up the matter will be passed.

In connection with the report that the White Star-Dominion Line was having two steamships built for the St. Lawrence service, to replace the Teutonic and Canada, the company has issued a statement to the effect that no new vessels are being built at present for this route, nor is the construction of any contemplated in the immediate future, but the company intends to keep abreast of its competitors by adding to its tonnage on the St. Lawrence and other routes, as occasion may require.

Maritime Provinces and Newfoundland.

The Department of Public Works received tenders, June 27, for the construction of a breakwater wharf at Carrs Brook, N.S.

The Dominion Atlantic Ry., at the end of May, commenced a new steamship service between St. John, N.B., and Halifax, N.S., by way of Digby, making two trips each day, with the steamships Prince Rupert and Yarmouth.

Work is proceeding on the construction of the wharf on the west side of St. John Harbor. The crib work is being pushed forward as quickly as possible, and the complete concrete construction plant arrived on the site, June 12.

The Reid Newfoundland Co. commenced a daily express steamship service between Port aux Basques and North Sydney, N.S., June 3, replacing the old tri-weekly service. The steamships Bruce and Invermore are being operated on the route.

The Island Tug Co., Charlottetown, P.E.I., has appointed the following officers for its vessels for the current year:—Fred M. Batt, captain W. P. Bourke, chief engineer W. McEachern; Harland, captain J. T. McLaine, chief engineer A. Roebuck; Islander, captain G. Batt, chief engineer J. Stewart.

Following the submission of Prof. Kirkpatrick's report on ice floes and currents between the main land and Prince Edward Island, the Minister of Railways and Canals has decided that Cape Tormentine, N.B., and Carleton Point, P.E.I., shall be the points between which the proposed car ferry service between the main land and the island shall be operated. The distance is given as 10 miles, and it is stated that not only is the route selected the shortest, but it offers the least difficulty to navigation at all seasons. Tenders will be asked shortly for the vessels, as soon as the type to be adopted is decided on.

Province of Quebec Marine.

Capt. L. A. Demers, heretofore Dominion Wreck Commissioner, has been appointed harbor master at Montreal.

W. S. Jackson is reported to have been appointed Superintendent of the Government shipyard at Sorel vice L. J. Papineau, resigned.

A resolution was adopted by the Quebec board of trade, June 11, urging the

Dominion Government to put the law respecting the reduction of the Quebec Harbor Commission to three members, in force, so that they could devote their whole attention to the many questions affecting the port.

The Minister of Railways and Canals, accompanied by the Ministers of Customs and Agriculture, inspected the canals between Prescott and Montreal, early in June, arriving at Montreal, June 6, where they were met by the Harbor Commissioners, and proceeded to Viauville, inspecting the harbor works en route.

The Quebec board of trade on June 11, again discussed the matter of the carrying of transatlantic freight intended for Quebec, to Montreal, and returning it to Quebec by rail. It was suggested that European shippers should be advised only to ship Quebec freight by those vessels which would land same at Quebec.

The Montreal Harbor Commissioners have added a bylaw to their regulations, requiring that the agent of every vessel arriving in the harbor, the cargo of which is subject to wharfage rates, shall within four days after arrival deposit in the Commissioners' office a certified copy of the manifest, giving names of consignees, description of goods, and weight, or measurement, according as the goods were carried by ton weight or ton measurement.

The steamboat Iona, owned by F. E. Hall and Co., Montreal, was burned recently on Lake Ontario, near Oswego, N.Y., while bound from Sodus Point, N.Y., to Quebec, with coal. She was a wooden vessel, and was built at Trenton in 1892. Her dimensions were, length, 123 ft.; breadth, 24.2 ft.; depth, 10.2 ft.; tonnage, 232 gross, 157 register, and she was equipped with engine of 10 n.h.p., driving a screw. The loss is stated as \$20,000, which is covered by insurance.

Plans for the improvement of the harbor at Quebec are in course of preparation, and it was expected that they would be submitted to the Public Works Department for approval, towards the end of June. It is reported that they provide for the commencement of a deep water dockage along the St. Lawrence River front from the west end of the Allan Line property in the direction of Sillery, and the erection of a grain elevator of considerable capacity. The plans for pier 2 have been approved, and it is stated that tenders will be invited shortly.

Ontario and the Great Lakes.

Capt. T. Lundy, a well known lake mariner, died at Toronto, June 14, aged 83. He was born in England, but lived in Canada for 70 years.

The vessel Toiler, which grounded recently near Cardinal, was released May 31, with very little damage, and proceeded to Montreal under her own power.

The North West Steamship Co. is reported to have decided to have built at Port Arthur a full size lake freighter, for trading between Port Arthur, Port Colborne, Georgian Bay ports and Buffalo.

A survey party is engaged in taking levels, etc., for the construction of the dock at New Liskeard, by the Dominion Government, at a cost of about \$15,000. The site selected for the dock is stated to be south of the old dock facing the lake.

The Ontario and Quebec Navigation Co.'s plans for 1913 include the construction of an additional steamboat for the Toronto and Quebec route. She will probably be 217 ft. long, with 43 ft. beam, and will be of similar type to its steamboat Geronia.

The Richelieu and Ontario Navigation

Co. is stated to have decided to build, for operation in the Montreal service, at the opening of navigation in 1913, a ferry steambot, 200 ft. long, capable of carrying about 3,000 passengers. The cost is estimated at \$150,000.

The Richelieu and Ontario Navigation Co.'s steamboats Rapids Prince and Rapids Queen, recently completed their first trips, using oil as fuel, and C. J. Smith, General Manager, is reported to have stated that the change from coal to oil had proved a success.

The steam tug Home Rule, owned in Amherstburg, is reported to have been sold to Jas. Whalen, Port Arthur. She was built at Thorold in 1890, and is screw driven, with engine of 50 n.h.p. Her dimensions are: Length 74.9 ft., breadth 17 ft., depth 9.4 ft., tonnage 81 gross, 45 register.

The steambot Ella Ross, which was burned at Parry Sound, June 5, was built at Deseronto in 1879, and was at one time named Gipsy. Her dimensions were: length 99.2 ft., breadth 27.8 ft., depth 6.4 ft.; tonnage, 228 gross, 125 register, and she was equipped with engine of 85 n.h.p., driving a paddle wheel.

The Canadian Interlake Line steambot Hamiltonian was launched at Port Arthur, June 1. It was expected that she would be ready for service before the end of June. The company's freighter Indian, equipped with Diesel engines, was expected to arrive on the lakes, from Newcastle, Eng., by the end of June.

The Minister of the Interior, in speaking at Regina, Sask., June 11, stated that the Government had acquired 68 acres of water frontage at Port Arthur, on which would be built a terminal elevator, which, he stated, would, with the expected keeping open of navigation a month longer than customary, considerably minimize the chances of future grain blockades.

The Canadian Lake and Ocean Navigation Co. is reported to have withdrawn its abandonment of the wrecked steambot Turret Cape, to have accepted \$35,000 from the underwriters in settlement of its claims, and to have resumed possession of the vessel. She was taken to Collingwood for overhauling and repairs, and it was expected that she would again be ready for service by the end of June.

The U.S. Lake Survey reports the levels of the Great Lakes in feet above tide water, for May, as follows:—Superior, 602; Michigan and Huron, 579.93; Erie, 572.54; Ontario, 246.82. Compared with the average May levels for the past 10 years, Superior was 0.07 ft. below; Michigan and Huron, 0.81 ft. below; Erie, 0.15 ft. below, and Ontario, 0.12 ft. above. It was anticipated that, during June, there would be a rise in Superior, Michigan and Huron, of 0.3 ft., in Erie, 0.2 ft., and in Ontario, 0.1 ft.

G. J. Guy, chairman of the Hamilton Harbor Commission, on his recent return from Ottawa, was reported to have stated that the commission's scheme for harbor improvements, covering the construction of a new landing dock, extension of the revetment wall, warehouses and railway switches, had been approved, and the work would be proceeded with at once. It was stated that the Government would spend about \$300,000 on the revetment wall this season, and that tenders would be asked shortly.

The District Engineer, Public Works Department, reports that soundings recently taken at Port Stanley indicate that the water has shoaled in a tongue from the westward outside the end of the new breakwater, and that soundings of less than 18 ft. extend 300 ft. outside the end of the breakwater and 225 ft. to the eastward of the alignment of the two lights. By approaching the outer

light on a course 311 deg., the shoal will be cleared. Soundings taken inside the breakwater indicate that vessels may draw 18 ft. as far in as the inner end of the east Government pier, from that point inward, 16 ft. only is available.

Manitoba, Saskatchewan and Alberta.

The Lake Winnipeg Shipping Co., Ltd., is applying for supplementary letters patent varying the provisions as to the number and amount of the shares of capital stock, and confirming a bylaw changing the number of shares from 5,000 to 100,000, and the amount of each share from \$100 to \$5.

The Department of Public Works has authorized the construction of a 40 ft. canal at Lacalle Falls, on the Saskatchewan River, where the city of Prince Albert, Sask., has a power plant. The settlement of this matter has been somewhat delayed, owing to the demand for a 50 ft. canal, but it is now considered that one of 40 ft. will be sufficient to carry any craft operating on the Saskatchewan River.

British Columbia and Pacific Coast Marine.

The G.T. Pacific Coast Steamship Co.'s s.s. Prince John was recently docked at Esquimalt for examination and repairs after stranding on Masset bar. She returned to service early in June.

The Board of Railway Commissioners has authorized the Vancouver, Victoria and Eastern Ry and Navigation Co. to build a dock and warehouse at Burrard Inlet, and has rescinded order 15093, Oct. 16, 1911, which authorized similar work.

The B.C. Marine Association has advanced the wages of longshoremen on the Vancouver waterfront from 35 to 40c an hour for day work, and from 40 to 50c an hour for night work and overtime. The wages of dockers and truckers are still under consideration.

The report of the Canadian North Pacific Fisheries, Ltd., for 1911, shows net earning from operation for the year of \$478,073, of which \$100,000 is required for interest on debenture stock, leaving a surplus for sinking fund, reserves and dividend on ordinary shares of \$378,073.

The Union Steamship Co.'s s.s. Che-lohsin, which was recently damaged in the Skeena River, has had her repairs completed at North Vancouver, at a cost of about \$25,000, and has returned to service. The report that she was being equipped with oil burning apparatus is denied.

The steamship companies operating between Vancouver and Prince Rupert have increased their passenger rates between these two points, including intermediate ports. No change has been made in the rates to the south, and nothing is contemplated in regard to freight rates.

The Dominion Government has granted permission to the Victoria Sealing Co. to sell its fleet of sealing schooners, without prejudice to its claim for compensation advanced as a result of being deprived of its rights under the sealing treaty of last year, between Canada, the United States, Japan and Russia.

The Point Grey, South Vancouver, Burnaby and Richmond boards of trade have passed a joint resolution calling upon the municipalities to engage the services of an engineer to report on the dredging of the North Arm to 20 ft. at low water, and to build a suitable wing dam and protection works at the mouth.

Capt. H. G. Jarvis, Secretary-Treasurer of the Merchant Service Guild of British Columbia, has sent a complaint

to the Marine Department, that U.S. vessels when navigating British Columbia waters, consistently ignore the International Rules of the Road, which are in force there, and use the U.S. Inland Rule of the Road.

E. J. Fader, New Westminster, has applied to the city council for approval of plans for the extension of his wharf and for building a large warehouse, making the wharf 400 by 50 ft., the new warehouse being 42 by 200 ft. He stated that his business had been acquired by an English company with a capital of £250,000, and registration under the B.C. Companies Act would shortly be asked. It is said to be the intention to operate a steamboat service between New Westminster and Victoria.

The West Vancouver Transportation Co. has offered to transfer the whole of its ferry equipment to a new company for \$65,000, stipulating that an adequate ferry service be maintained between Hollyburn and Vancouver. The West Vancouver council has recommended the ferry company in course of formation to accept the offer of the ferry steamboats Sea Foam and West Vancouver, with all equipment, the same to be taken over and paid for as soon as the money by-law for that purpose has been carried and the municipality authorized to subscribe for shares in the company. A by-law is being prepared authorizing the issue of debentures for \$30,000 to purchase 300 shares of \$100 each in the company.



Department of Railways and Canals, Canada.

WELLAND CANAL.

NOTICE TO CONTRACTORS.

SEALED TENDERS, addressed to the undersigned, and endorsed "Tender for Port Colborne Entrance Improvements," will be received at this office until 16 o'clock on Wednesday, the 9th July, 1912.

Plans, specifications and form of contract, to be entered into can be seen on and after this date at the office of the Chief Engineer of the Department of Railways and Canals Ottawa, and at the office of the Superintending Engineer of the Welland Canal, St. Catharines, Ont., at which places forms of tender may be obtained.

Parties tendering will be required to accept the fair wage schedule prepared, or to be prepared by the Department of Labor, which schedule will form part of the contract.

Contractors are requested to bear in mind that tenders will not be considered unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signature, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque for the sum of \$20,000, made payable to the order of the Minister of Railways and Canals, must accompany each tender, which sum will be forfeited if the party tendering declines entering into contract for the work at the rates stated in the offer submitted.

The cheque thus sent will be returned to the respective contractors whose tenders are not accepted.

The cheque of the successful tenderer will be held as security, or part security, for the due fulfilment of the contract to be entered into.

The lowest or any tender not necessarily accepted.

By order,

L. K. JONES, Secretary.

Department of Railways and Canals,
Ottawa, June 25, 1912.

Newspapers inserting this advertisement without authority from the Department will not be paid for it.—25029.

Dominion Government Steamship for St. Lawrence Ship Channel.

The C. G. S. Bellechasse, the launching of which at Kingston, Ont., was mentioned in our last issue, has the following dimensions:—Length over all, 140 ft.; length b.p., 130 ft.; breadth, moulded, 27 ft.; depth, moulded, 13½ ft.; draught mean, 9½ ft.; i.h.p. maximum, 1,300.

The Bellechasse has been specially designed as a survey and inspection steamer for the St. Lawrence ship channel service and will be used by the Superintendent Engineer to the Government, V. W. Forneret, for the furtherance of the schemes below Quebec.

The vessel is built of steel throughout to Lloyds 100 A1 class and has a straight stem, elliptical stern, and five main watertight bulkheads. The hull has been specially strengthened forward and along the vicinity of the water line, as it is intended to utilize the vessel in light ice work during certain periods. Duplicate electric generating plants are installed on board, of 9½ k.w. capacity, each unit being capable of running the complete lighting of the ship, and in ad-

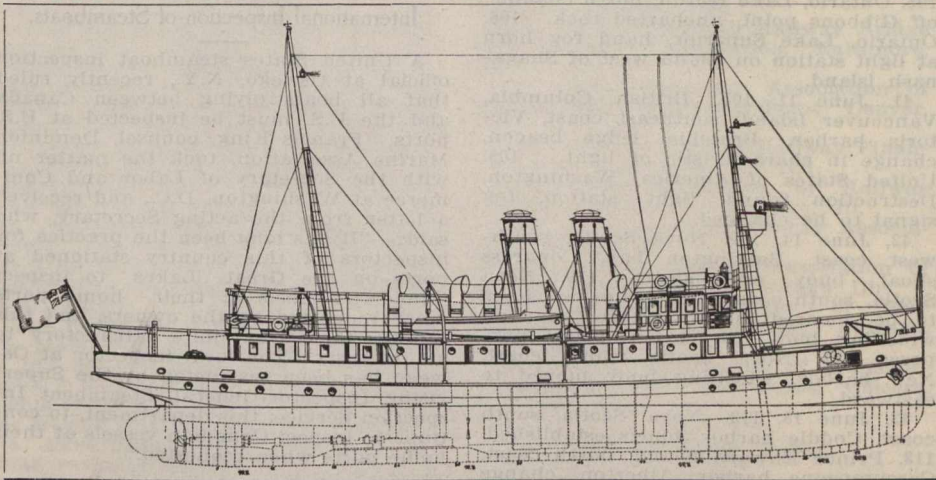
under a pressure of 180 lbs. per sq. in. The motive power is supplied from two cylindrical boilers fitted with Morison furnaces and working under a system of air pressure, the fan and engine being placed in the engine room. Each boiler is fitted with a patent temperature balance. The condensers are of the uniflux type and all the auxiliaries, circulating pumps, air pumps, feed pumps, bilge pumps, general service pumps, fresh water and sanitary pumps are independent of the main engines.

On completion the Bellechasse will undergo a series of exhaustive trials. In addition to the usual dock trials progressive trials from six knots upwards will be held, after which the full power trials will take place.

The Bellechasse has been designed by and built under the superintendence of Chas. F. M. Duguid, Naval Constructor to the Marine and Fisheries Department.

The Proposed Dry Dock at Quebec.

The Dominion Government, which recently asked for tenders for the construction of a dry dock and ship build-



The C.G.S. Bellechasse.

dition a set of Edison accumulators is provided capable of running 25 lamps for 10 hours. The search light, of 16,000 c.p., is placed on the foremast. The deck auxiliaries include the usual windlass, capstan, steering gear and boat hoisting winch, the former being specially designed for channel sweeping operations.

Accommodation has been provided for a total complement of 22, including staff, officers and men. The crew's quarters are placed forward on the lower deck, the staff's quarters on the lower deck aft, and on the main deck are the staff dining saloon, officers' cabins, mess room, galley, pantries, baths and wash houses. A special draughting room is provided in a large teak deck-house on the boat deck adjacent to the lower navigating position. Throughout the accommodation a complete service of hot and cold water is supplied, the pumps for this installation being placed in the engine room. In addition to the usual ship's boats there is provided on the boat deck a motor launch having a speed of about 10 miles. The cold storage chambers are fitted on the lower deck forward of the crew's quarters.

The bunkers are placed longitudinally on each side of the boiler room and have a capacity of about 100 tons, providing a radius of action under reduced power of about 2,000 knots. The propelling machinery consists of two sets of triple expansion surface condensing engines having cylinders 12½, 21 and 34 ins. diam. by 21 ins. stroke, and working

ing plant for Quebec or Levis, has received a report, from M. F. G. Wilson, C.E., of England, who was specially engaged for the purpose, on the merits of the various sites suggested for the construction. In conversation with a representative of the local press, June 5, Mr. Wilson is reported to have stated that he had made a careful examination of all the plans submitted for plants at St. Joseph de Levis and Beauport, and had taken information from practical shipping men on ice conditions, etc., and learned their opinions as to the most desirable site. The opinions he had gathered from others would in no way influence his personal judgment, and his recommendation as to the site to be chosen would be discovered from his report.

It was stated in Ottawa, June 14, that the report submitted recommended the site at St. Joseph de Levis, it being stated to be the easiest of approach and less difficult for the proposed construction.

Capt. J. J. Riley, heretofore Superintendent of Pilots, has been appointed Dominion Wreck Commissioner, vice Capt. L. A. Demers, appointed harbor master at Montreal.

The investigation which is being undertaken by the Department of Trade and Commerce, with a view to the adoption of a strong policy for the development of Dominion trade channels, will cover the question of insurance rates generally, and also the proposal to establish a Canadian Lloyd's, which is now deemed to be essential.

Wireless Telegraphy on the Great Lakes.

We were officially advised, June 8, by the Naval Service Department's Radio Telegraph branch that the wireless telegraph stations at Sault Ste. Marie, Tobermory and Midland were practically completed, and would be in operation in a week or ten days thereafter. They are equipped with the latest type of wireless apparatus, and are up to date in every way.

These stations, and also the one at Port Arthur, which was put in operation in Dec., 1910, are owned and controlled by the Government, and will be operated under contract by the Marconi Wireless Telegraph Co. of Canada.

Tenders have been invited for the erection of a wireless station at Point Edward, near Sarnia, Ont., on which construction will be started as soon as possible. It is also intended to establish stations at Port Stanley, Port Colborne, Toronto and Kingston, Ont., and it is expected to have them ready by the opening of navigation next year.

The Marconi Wireless Telegraph Co. is operating wireless telegraph apparatus on all the C.P.R. upper lake vessels, Alberta, Assiniboia, Athabasca, Keewauwin and Manitoba, on three of the Northern Navigation Co.'s vessels, Hamonic, Huronic and Saronic, and on the Canadian Towing and Wrecking Co.'s barges, Empire, Imperial and Provence. These vessels are fitted with the 1½ k.w. apparatus, their range depending on the height of their masts and the distance between them, but it is generally in the neighborhood of 200 miles.

There are a large number of vessels on the great lakes operated by the Marconi Wireless Telegraph Co. of America, some of which are, 5 of the G. and M. Line, 10 of the Goodrich Line, 3 of the Northern Michigan S.S. Line, 5 of the P. and M. Rd. car ferries, 4 of the A.A. Rd. ferries, 5 steamboats of the Schenango S.S. and Rd. Co., 5 of the Detroit and Cleveland Navigation Co., 9 of the United States Naval Militia, 4 of the Chicago and Duluth Transportation Co., and between 10 and 20 belonging to companies of lesser importance. Of course a large number of these vessels ply in Lake Michigan and will not communicate with the Canadian stations.

Dry Dock and Shipbuilding Plant for Sydney, N.S.

The ratepayers of Sydney, N.S., on June 4, decided by a vote of 1,041 to 172, to grant a bonus of \$1,000,000 to the British Canadian Shipbuilding and Dry Dock Co., for the construction of a dry dock and shipbuilding plant there. The bonus will be paid in four instalments of \$250,000, on a minimum expenditure of \$6,000,000. The site selected is on what is known as the Brookdale property, just below the International pier, and within the city limits.

A. C. Ross, who is interested in the project, is reported to have stated, June 4, that work would probably be under way by the early fall, and that it is the intention to form a Canadian construction company to build the plant, but a large portion of the work, such as dredging, excavation, etc., would be sublet to local contractors. In order to carry out the Government requirements in regard to dry dock of the first class, the work will occupy about five years, but the marine railway and shipbuilding yards should be ready for operation within two years, and the first vessel should be launched within three years. A wrecking and salvage plant will also be operated.

Sir Henry M. Pellatt, Toronto, is one of the promoters of the company.

New Freighter for Ottawa Forwarding Company.

The steamboat which is under construction at Kingston, Ont., for the Ottawa Forwarding Co., has the keel plate of steel, with keelson 18 by 6 ins., 70 lbs., of I beam type, with steel stem forging from keel turn, rivetted to keelson, and extending above the forward deckhouse to form support for the railing. The stern post is a steel casting with bulb for stern tube and shoe, all in one casting. The frames are 2½ by 3 by 5-16 in. angles, and the floor plates are 10 by 5-16 in. The frames throughout are spaced 18 ins. centres, and the deck beams 5 by 3 ins. steel angles are spaced 18 ins. centres and bent to 6 ins. in 25 ft. Deck stringers are 48 by 5-16 in., and side sheeting is formed up with a 48 by ¾ in. sheer strake and a 41 by 9-16 in. sheeting bolted below, from the bilge to the shear line. The sides are protected by 2½ by 3 ins. angles, fitted with heavy oak wales, and the bottom is planked with 3 ins. oak planking securely bolted to the frames.

The deck house forward is of steel 24 ft. long, and provides quarters for the captain, first and second officers and quarters below deck for the crew in the fore peak of the hull. A collision bulkhead separates this section from the main hold of the vessel. On the top of the deck house is the wheel house, equipped with steam steerer and fresh water tanks. The after deck house is also of steel, 40 ft. long, forming enclosures for machinery and quarters for the engineers and cook. The galley and mess rooms are arranged aft of the engine room. The vessel's dimensions are, length over all, 113 ft.; beam, 25 ft.; depth, 9 ft. The machinery consists of a compound engine with cylinders 11, 22, 22 ins. diar. by 16 ins. stroke, open front type with link motion, supplied with steam by a boiler for a working pressure of 137 lbs. The equipment includes high duty duplex boiler feed pump, independent air pump and jet condenser, arranged to pump from the bilge in case of accident, two hand capstans and one double drum steam winch with mast and boom for handling cargo.

She is intended for the general river trade in lumber, coal, grain and package freight.

Improvements for Vancouver Harbor.

E. D. Lafleur, of the Public Works Department, has advised that in order to work out a comprehensive scheme of improvements for Vancouver harbor, to meet the future requirements of the port, a complete survey of the harbor be made, including Burrard Inlet, up to, and beyond the Second Narrows, False Creek and the North Arm of the Fraser River. He recommends that a pier or dock should be built at some point on Burrard Inlet most suitable for shipping, about 800 ft. long by 250 ft. wide, with at least 30 ft. of water at low tide at the shore end, with warehouses, tracks and full equipment for handling merchandise; a similar pier or dock at North Vancouver; the maintenance of a channel with a minimum of 15 ft. depth at low water from New Westminster through the sandheads to the Gulf of Georgia; improvement of False Creek, by locks or dam at the outlet, or both combined; the relocation of the C.P.R. bridge, and the continued dredging of the First Narrows until the widening is completed and the Parthia shoal removed, and the Capilano River diverted to the west to prevent sand being washed into the dredged channel. The Minister of Public Works has approved the outlines of the scheme and instructions have been given for the prosecution of the work.

Canadian Notices to Mariners.

The Department of Marine has issued the following:—

37. May 29. 95. British Columbia, Prevost passage, uncharted rock, buoy established. 96. British Columbia, Queen Charlotte islands, Hecate strait, Skidegate inlet, eastward of Deadtrees point, buoy established.

38. May 30. 97. Nova Scotia, south coast, Peggy point, hand fog horn at light station. 98. Quebec, Restigouche river, changes in buoyage. 99. Quebec, River St. Lawrence, St. Pierre les Becquets, light discontinued.

39. June 8. 100. Prince Edward Island, north coast, Tracadie, change in position of front range lighthouse. 101. Quebec, Chaleur bay, Newport point, light improved. 102. Quebec, St. Lawrence river, Saguenay river entrance, Tadousac, new wharf. 103. Quebec, River St. Lawrence, Montreal harbor, Ile Ronde range, light on Guard pier discontinued, temporary back range light shown on new pier at Ile Ste. Helene.

40. June 10. 104. Ontario, Lake Ontario, Welland canal entrance, Port Dalhousie, change in front range light. 105. Ontario, Lake Huron, north channel, off Gibbons point, uncharted rock. 106. Ontario, Lake Superior, hand fog horn at light station on island west of Shaganash island.

41. June 11. 107. British Columbia, Vancouver Island, southeast coast, Victoria harbor, Brochie ledge beacon, change in characteristic of light. 108. United States of America, Washington, Destruction island light station, fog signal to be changed.

42. June 14. 109. Nova Scotia, southwest coast, Barrington bay, Congress shoal, buoy established. 110. Nova Scotia, south coast, submarine bell buoy to be moored near Sambro gas and whistling buoy for experimental purposes. 11. Nova Scotia, south coast, New harbor, whistling buoy moved to eastward.

43. June 18. 112. Nova Scotia, south coast, Coddle harbor, buoys established. 113. Prince Edward Island, north coast, Cascumpeque harbor, Alberton, change in position of range lights. 114. Quebec, Gulf of St. Lawrence, Gaspé coast, Great Fox river, change in position of front range light.

44. June 19. 115. Caution when approaching Canadian ports (Halifax, Quebec, Esquimalt), closing of ports, examination service. 116. Canada, signals

to be made by vessels approaching defended ports when inconvenienced by search lights.

New Steamship for C.P.R. British Columbia Coast Service.

The vessel which is under construction at Esquimalt, B.C., for the C.P.R. service on the west coast of Vancouver Island, as noted in previous issues, has the following dimensions:—Length between perpendiculars 232 ft., beam moulded 38 ft., depth moulded 17 ft.

She will be built of steel, in accordance with Lloyd's rules for a 100 A1 awning deck class of vessel, and will have double bottom throughout, and special tanks for oil fuel. The accommodation for both passengers and freight will be of the most modern type, specially suited for the trade in which she will be engaged.

The machinery will consist of triple expansion engines, with cylinders 20, 34 and 53 ins. diar. by 36 ins. stroke, supplied with steam by two boilers 13½ ft. diar. by 12 ft. long, and she will be capable of a speed of 12 knots an hour in the open sea.

International Inspection of Steamboats.

A United States steamboat inspection official at Oswego, N.Y., recently ruled that all boats plying between Canada and the U.S. must be inspected at U.S. ports. Francis King, counsel, Dominion Marine Association, took the matter up with the Secretary of Labor and Commerce at Washington, D.C., and received a letter from the acting Secretary, who said:—"It has long been the practice for inspectors of this country stationed at ports on the Great Lakes to inspect Canadian vessels at their home ports when requested by the owners, and this practice has been quite satisfactory to all interests. The local inspector at Oswego has been instructed by the Supervising Inspector-General, Steamboat Inspection Service, this department, to continue to inspect Canadian vessels at their home ports when requested."

F. E. Stearns, A.M. Can. Soc. C.E., has been appointed Assistant Engineer for the construction of the new Welland canal. He is a graduate of McGill University and has been engaged since 1907 on lock gate design on the Panama canal.

Sault Ste. Marie Canals Traffic.

The following commerce passed through the Sault Ste. Marie Canals during May, 1912:

ARTICLES	CANADIAN CANAL	U. S. CANAL	TOTAL
Copper	1,136	16,909	18,045
Grain	7,553,918	4,283,583	11,837,501
Building stone		2,250	2,250
Flour	281,720	655,360	937,080
Iron ore	3,923,545	1,589,854	5,513,399
Pig iron			
Lumber	784	67,516	68,250
Silver ore			
Wheat	27,122,703	7,450,808	34,573,511
General merchandise	1,120	24,585	25,705
Passengers	933	689	1,622
Coal, hard	9,646	8,202	17,848
Coal, soft	255,396	1,350,847	1,606,243
Flour			
Grain			
Manufactured iron	25,659	75,409	101,068
Iron ore		500	500
Salt	23,594	105,428	219,022
General merchandise	65,743	81,549	147,292
Passengers	1,501	436	1,937
Summary.			
Vessel passages	1,164	2,083	3,247
Registered tonnage	3,686,019	4,086,344	7,772,363
Freight—Eastbound	4,908,670	2,122,888	7,031,558
" Westbound	359,814	1,545,821	1,905,635
Total freight	5,268,484	3,668,709	8,936,693

Dominion Steel Corporation, Ltd.

At the annual meeting at Montreal, June 12, the report for the period commencing July 1, 1910, the date of the present incorporation, to Mar. 31, 1912, was presented. The net earnings, after paying preferred and common stock dividends, were \$1,484,945.98. Of this \$700,000, forming part of the \$500,000 written off last year from the coal properties, and \$500,000 from the steel properties, as a special appropriation from the surplus earnings in addition to the usual full provision for depreciation, must also be deducted, leaving a surplus to be carried forward of \$784,945.98. The coal company's operations were satisfactory in every respect, and the prospects for the current year excellent. Up to June 11, the company was 192,291 tons ahead of the previous year's production, the output since Apr. 1, being 792,753 tons. The St. Lawrence business will show a heavy increase, if no serious drawbacks are met with.

Regarding steel, the company has suffered in common with all other manufacturers of iron and steel on this continent, from depressed conditions prevailing in the U.S., where prices were demoralized, but business there is improving and prices advancing. In addition the new finishing mills will soon provide a more profitable outlet for the steel, hitherto used as wire rods. The output of steel was substantially larger than in last year, and so far this year the output is well ahead of last year. The completion of the new plant has been subject to many delays, but the wire mills are running in a partial way to get the machinery and organization into shape. The first of the new blast furnaces is rapidly approaching completion, and the remaining extensions are well forward.

The Corporation has issued \$7,000,000 6% preference shares, and with regard to the issue of 2,500 shares of common stock it was explained that the requirements of the coal and steel companies in the way of lumber, piles, ties, pit props, etc., have grown to very large dimensions, reaching not less than 8,000,000 ft. annually, and to this supply is being added staves, heading and other things required in the new mills. To buy these supplies has become more and more difficult and costly, so it was decided to acquire the Sydney Lumber Co., Ltd., Dalhousie, N.B., consisting of saw mills, timber limits, etc., in running order, which will be used to serve both coal and steel companies, the corporation holding the stock. The same principle will be followed in the case of the Black Diamond Steamship Line, to which two vessels have been added this year.

The following were elected directors for the current year:—

Dominion Steel Corporation, Ltd.—President, J. H. Plummer; Vice President, Sir Wm. C. Van Horne; other directors, Sir Montagu Allan, G. Caverhill, Hon. G. A. Cox, Hon. R. Dandurand, Hon. R. Mackay, Hon. D. McKeen, Sir Wm. Mackenzie, W. McMaster, Jas. Mason, F. Nicholls, Sir Henry Pellatt, W. G. Ross and J. R. Wilson.

Dominion Coal Co., Ltd.—President, J. H. Plummer; Vice President, J. R. Wilson; other directors, Hon. G. A. Cox, Hon. R. Dandurand, Hon. R. Mackay, Sir Wm. Mackenzie, W. McMaster, Jas. Mason, W. D. Matthews, Sir Henry Pellatt, Lord Strathcona, Sir Wm. C. Van Horne, F. L. Wanklyn, E. R. Wood and M. Workman.

Dominion Iron and Steel Co., Ltd.—President, J. H. Plummer; Vice President, W. McMaster; other directors, Sir Montagu Allan, G. Caverhill, Hon. G. A. Cox, Hon. R. Dandurand, Hon. R. Mackay, Hon. D. McKeen, F. Nicholls, Elias Rogers, W. G. Ross, Sir Wm. C. Van Horne, J. R. Wilson, E. R. Wood and M. Workman.

Transportation Conventions in 1912.

July 9.—American Railway Tool Foremen's Association, Chicago, Ill.

July 23-26.—International Railway General Foremen's Association, Chicago, Ill.

Aug. 15.—International Railroad Master Blacksmiths' Association, Chicago, Ill.

Aug.—Travelling Engineers' Association.

Sept. 9.—International Association of Ticket Agents, Muskoka, Ont.

Sept. 10-13.—Roadmasters' and Maintenance of Way Association, Buffalo, N.Y.

Sept. 10-13.—Master Car and Locomotive Painters' Association of United States and Canada, Denver, Col.

Sept. 12.—American Association of General Passenger and Ticket Agents, Seattle, Wash.

Oct.—American Railway Bridge and Building Association, Baltimore, Md.

Oct. 7-11.—Association of Transportation and Car Accounting Officers, Chicago, Ill.

Oct. 7-11.—American Electric Railway Association, Chicago, Ill.

Oct. 8-9.—Canadian Ticket Agents' Association, Ottawa, Ont.

Oct. 15-17.—American Railway Bridge and Building Association, Baltimore, Md.

Oct. 17-19.—American Association of Dining Car Superintendents, Denver, Col.

Oct. 23-25.—Society of Railway Financial Officers, Atlantic City, N.J.

Nov. 6-10.—Association of Railway Electrical Engineers, Chicago, Ill.

Nov. 15.—American Railway Association, Chicago, Ill.

Nov. 15-16.—American Association of Freight Traffic Officers, Chicago, Ill.

Nov. 19-21.—Maintenance of Way Master Painters' Association, Chicago, Ill.

Dec. 12-13.—Association of Transportation and Car Accounting Officers, Louisville, Ky.

Trade and Supply Notes.

The matter which appears under this heading is compiled, in most cases, from information supplied by the manufacturers of, or dealers in, the articles referred to, and in publishing the same we accept no responsibility. At the same time, we wish our readers to distinctly understand that we are not paid for the publication of any of this matter, and that we will not consider any proposition to insert reading matter in our columns for pay or its equivalent. Advertising contracts will not be taken with any condition that accepting them will oblige us to publish reading notices. In other words, our reading columns are not for sale, either to advertisers or others.

The Canadian Locomotive Co., Kingston, Ont., has increased its output from five locomotives a month to eight, and by the end of this year will be able to turn out 15 to 18 a month.

The American Vanadium Co. and its associated companies, also the Flannery Bolt Co., have moved their offices to the Vanadium Building, Forbes and Meyran Avenues, Pittsburgh, Pa.

The Nova Scotia Steel and Coal Co. now employs at its Trenton works, near New Glasgow, 1,100 men, their wages aggregating over \$500,000 a year. Its output of finished steel is 26,000 tons a year.

The Canadian H. W. Johns-Manville Co. has moved its Winnipeg office, to 92 Arthur St. The building 100 by 50 ft., six stories and basement, will be occupied solely by the company's staff, which is being increased, and for carrying stock.

The Safety Car Heating and Lighting Co.'s monthly publication, Safety Heating and Lighting News, for June, contains a number of illustrations of the company's exhibit at the Atlantic City conventions, with detailed descriptions of its various types of heating and lighting equipment.

Jacobs and Davies, Inc., consulting engineers, New York and London, Eng., have opened an office at 263 St. James St., Montreal, for the practice of general consulting and construction engineering, under the management of Paul Seurot, M. Am. Soc. C.E., as Canadian representative.

The Standard Underground Cable Co. of Canada, Ltd., has recently established a plant in Hamilton, Ont., where it has a site 400 x 600 ft., on which it has erected a three story brick and structural iron building 335 x 64 ft.; two one story saw tooth buildings 224 by 60 and 250 by 60 ft.; two one story buildings 90 by 64 ft. and 70 by 30 ft., an office building and some small buildings, the buildings and their equipment representing, we are advised, an investment of \$500,000. The company manufactures electric wires and cables of all kinds for electric railway, light, power, signal, telephone, telegraph, fire alarm, and any other service involving transmission of electric current by underground, aerial or submarine circuits. These products also include cable accessories such as terminals and junction boxes, insulating materials, cable splicing tubes, hangers, etc.

The company's officers are:—President, J. W. Marsh; Vice President and Manufacturer, W. A. Conner; Vice President and General Sales Manager, P. H. W. Smith; Secretary and Sales Manager, W. H. Marsh; Treasurer, F. A. Rinehart; Assistant to Sales Manager, H. G. Burd. W. H. Marsh has been connected with the Standard Underground Cable Co. of Pittsburgh, Pa., as Superintendent of Construction for the past 10 years, and H. G. Burd has also been connected with that company as sales engineer in the New York office. The parent company began business in Pittsburgh in 1882 and now has also plants at Perth Amboy, N.J., and Oakland, Cal., with a total floor space of over 12 acres.

NOTICE TO CONTRACTORS.

TENDERS will be received by the undersigned for the substructures and superstructures of ten (10) bridges over the Fraser, Thompson and North Thompson Rivers on that section of the Canadian Northern Pacific Railway between Port Mann and the Yellowhead Pass, Province of British Columbia.

Tenders are to include any or all portions of the construction or the delivery of metal work only.

Detailed drawings, specifications, and forms of contract may be obtained on or after June 5th, 1912, at the office of the Consulting Engineers, Waddell & Harrington, Winch Building, Vancouver, B.C., upon the payment therefor of fifty (50) dollars. This amount will be refunded to those who bid on the work, upon the return of the bidding papers in good condition.

Total work to be completed before June 1st, 1913.

Tenders to be received at the offices of the undersigned, Metropolitan Building, Vancouver, B.C., not later than noon of July 8th, 1912, and to be enclosed in sealed envelopes marked "Tender for Bridge Construction."

The lowest or any tender not necessarily accepted.

MACKENZIE, MANN & COMPANY, LTD.

POSITION WANTED.

Technical Graduate, experienced in all classes of freight and passenger equipment in plant office and engineering, will make permanent change to company offering good opening. Apply box 117 S., The Railway and Marine World, Toronto.

POSITION WANTED.

Superintendent or Master Car Builder open for position. Thoroughly familiar with all branches of car building and general mechanical industries; young, active, practical, with executive ability. Good references. Apply box 5880, The Railway and Marine World, Toronto.



Department of Railways and Canals, Canada

HUDSON BAY RAILWAY.

Notice to Contractors.

SEALED TENDERS addressed to the undersigned and endorsed "Tender for construction of Hudson Bay Railway" will be received at this office, until 16 o'clock, on Thursday, the 1st of August, for a section of about 68 miles from Thicket Portage to Split Lake Junction.

Plans, specifications and form of contract to be entered into can be seen on and after Friday, June 7th, at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa, and at the office of the Chief Engineer of the Hudson Bay Railway, Winnipeg, at which places forms of tender may be obtained.

Parties tendering will be required to accept the fair wages schedule prepared or to be prepared by the Department of Labor, which schedule will form part of the contract.

Contractors are requested to bear in mind, that tenders will not be considered, unless made strictly in accordance with the printed forms, and in the case of firms,

CRANES AND HOISTS



NORTHERN CRANE WORKS, Limited
Walkerville, Ontario.

unless there are attached the actual signature, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque for the sum of \$150,000.00 made payable to the order of the Minister of Railways and Canals, must accompany each tender, which sum will be forfeited if the party tendering declines entering into contract for the work, at the rates stated in the offer submitted.

The cheques thus sent in will be returned to the respective contractors whose tenders are not accepted.

The cheque of the successful tenderer will be held as security, or part security, for the due fulfilment of the contract to be entered into.

The lowest or any tender not necessarily accepted.

By order,
L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, 7th June, 1912.

Newspapers inserting this advertisement without authority from the Department will not be paid for it.—23384.



NAVAL SERVICE OF CANADA

Sale by Tender of Steamer
"KESTREL."

SEALED TENDERS addressed to the undersigned and accompanied by a certified cheque for \$500 will be received up to noon on Wednesday the third day of July, 1912, for the purchase of the Canadian Government steamer "Kestrel," lately employed in Fishery Protection /duties on the British Columbia coast and now lying at H.M.C. Dockyard, Esquimalt, B.C.

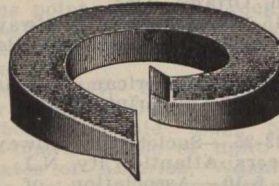
Forms of tender, conditions of sale, full particulars of the steamer and permission to inspect her may be obtained on application from the Officer in charge, H.M.C. Dockyard, Esquimalt, B.C.

Unauthorized publication of this advertisement will not be paid for.

G. J. DESBARATS,
Deputy Minister.

Department of the Naval Service,
—22725. Ottawa, May 3rd, 1912.

THE POSITIVE LOCK WASHER
is the BEST Nut LOCK
for all purposes

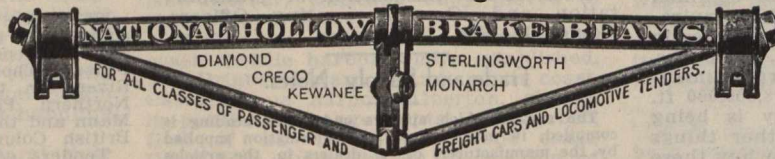


We also make plain coils and tail nut locks.
The Positive Lock Washer Co.
Sole Mfrs., Newark, N.J.
F.H. HOPKINS & CO., Agts., Montreal

Car Closets

FLUSH OR DRY
DUNER CO. 101 S. Clinton St.
Chicago

CHICAGO RAILWAY EQUIPMENT CO.



Our "PC Creco" Brake Beams are for use on new heavy steel passenger equipment and withstand a load of 40,000 lbs. with 1-16 in. deflection. Greater capacity if desired, without increase in Diamond Special depth of strut or change of adjustable brake head.

CANADIAN OFFICE, 22 ST. JOHN STREET, MONTREAL.



THE ALGOMA STEEL CO., LIMITED

SAULT STE. MARIE, ONTARIO

IS NOW BOOKING
ORDERS FOR

STEEL RAILS

FOR DELIVERY DURING
THE SEASON OF 1912

Parties intending purchasing will find it to their interest to let us have their specifications at an early date so as to insure desired deliveries.

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