

Canadian Railway and Marine World.

November, 1913

Design of Large Bridges, with Special Reference to the Quebec Bridge.

By Ralph Modjeski, C.E., Member Board of Engineers, Quebec Bridge.

Where no limitation is placed by the Government as to length of all spans, the spans should be made of economical length, provided the piers do not reduce the cross section of the river sufficiently to cause an undesirable increase in the current velocity. This economical length may be determined by trials, and will be attained approximately when the cost of the superstructure and of the substructure are nearly equal.

In the case of the Quebec bridge, while the navigation interests fixed the clear height of the structure above high water at 150 ft., the length of span is entirely due to the physical conditions of the crossing. The stream at this point is narrow and deep, the depth in the centre of the stream being about 190 ft. The current velocity at ebb tide is very high—about 9 miles an

utilitarian structure would be entirely out of harmony with the surroundings.

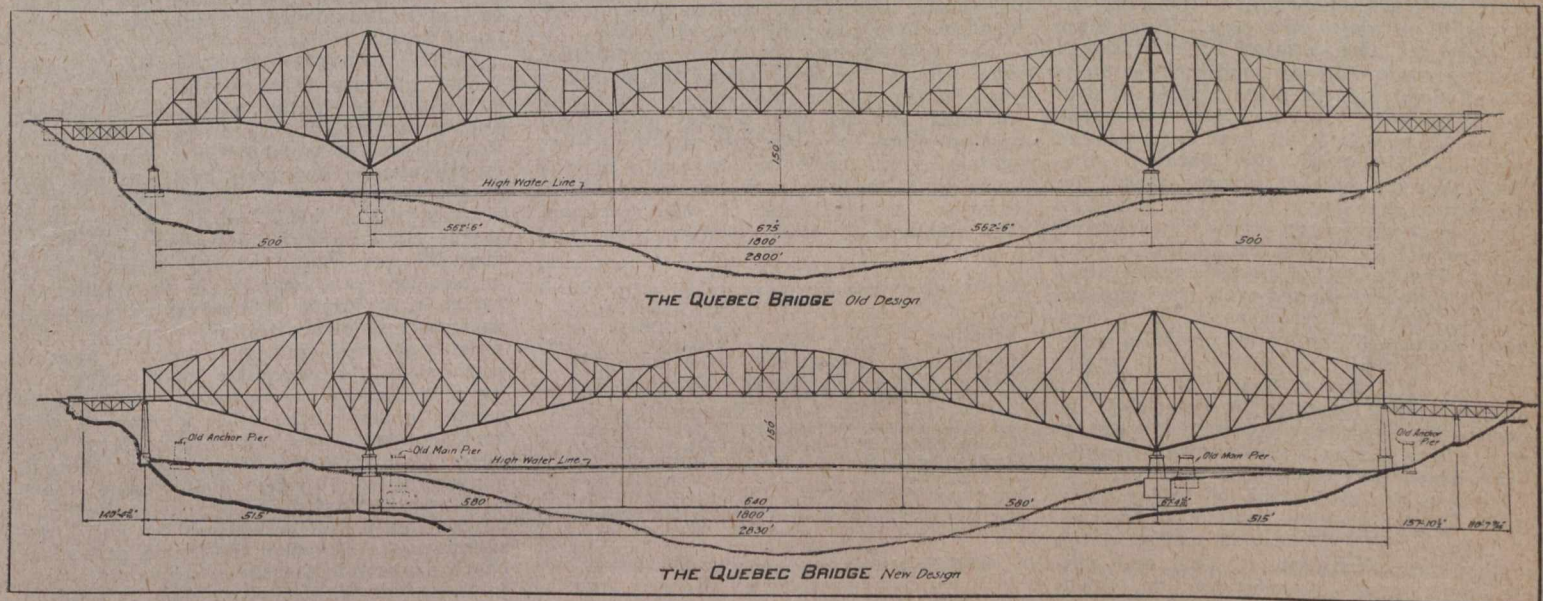
A project to build a large bridge at Quebec, presumably in the same location as the present one, was seriously considered in 1884 and 1885. James Brownlee, A. Luders Light, and T. Claxton Fidler designed a structure with a clear span of 1,442 ft. The description of that project mentions rock foundations. The more complete information we now have, and which was obtained by a costly series of borings, shows that at the present location rock could not have been attained in both piers with any known method of foundation if the piers had been spaced only 1,442 ft. apart, even if the great depth of water could have been overcome.

After the disaster of Aug. 29, 1907, the

ders were asked. It developed later, from the experience of sinking the north caisson, that the method proposed for enlarging the south foundation would not be safe, even if it were practicable, and so an entirely new foundation and pier were decided on for the south shore. The new north pier could not be placed further out in the river because of the sloping bed rock and great depth of water. The south pier could not be placed on the north, or river, side of the old south pier because of the old wreckage, so it was placed 64 ft. 8 in. south of the old pier, or as close as possible to it. Both new piers being placed 64 ft. 8 in. south of the old piers, measured between centres, the new span remains 1,800 ft. long.

Substructure.

The piers are all of granite, backed with



hour. Very heavy ice runs at times and tends to gorge. The bed rock, as shown by the borings, while accessible near the shore lines, dips rapidly toward the centre of the stream. All these conditions made it imperative to build a span of great length. The information as to bed rock which we now have would indicate that the original project could have been designed with a somewhat shorter span. Yet we should remember that this original project was undertaken by a private corporation, and we should perhaps recognize the value to it of such advertisement as the building of the longest span in the world would obviously afford. The next longest span is that of the Firth of Forth bridge, and is 1,700 ft. long. It is doubtful if a shorter span than 1,700 ft. would have been practicable at the location adopted for the Quebec bridge. I consider it perfectly legitimate to build a more expensive structure than economy of the work itself would call for; if the more expensive structure will afford sufficient advertisement and publicity to compensate for the additional expenditure. Cases also often arise where a purely economical and

Dominion Government took up the reconstruction of this bridge. A board of three engineers, including myself, was appointed to design and construct the bridge. After some study of the situation, the board decided that the new bridge should be made wider between trusses and designed to carry heavier loads than those originally contemplated; that, further, none of the old steel work could be used to advantage. It also decided to keep the same location. The final outcome is a double track span 1,800 ft., with a width of 88 ft. between centres of trusses, designed to carry on each track a live load consisting of two E 60 engines placed in any position in a train weighing 5,000 lbs. per foot so as to produce greatest strains. The old piers were not large enough for the new design and could not, therefore, be used. At first the board contemplated building an entirely new pier 57 ft. south of the present north pier, and enlarging the foundation of the south pier by sinking additional caissons adjacent to the old caisson. The necessary span length would then have been 1,758 ft., and it was on that length of span that ten-

concrete. There is an increasing tendency now to build everything of concrete. Certainly, concrete is a most convenient material and quite economical. When it comes, however, to providing supports for a very important and expensive structure, cut stone masonry should be used in preference to concrete, except for backing. There are many varieties of excellent building stone on this continent. I have used granite, some varieties of oolitic limestone, also sandstone, which all show excellent lasting qualities in works constructed many years ago, while concrete presents some uncertainties and requires expert care to give good results. Concrete may in ages prove to be as lasting as stone masonry, but as yet we do not know. We know that well constructed stone masonry will last for centuries. A notable example of this is the great Aqueduct of Gard, built by the Romans in the first century B.C.

TYPES OF SUPERSTRUCTURE.—Having fixed the span lengths of a bridge, the next thing to determine is the type of superstructure to be used. The various types usually applied to long spans may be classi-

ned as follows: (1) Arches (steel)—(a) three-hinged; (b) two-hinged. (2) Simple spans. (3) Cantilever structures—(a) with suspended span; (b) without suspended span. (4) Suspension bridges. I have purposely omitted masonry and concrete arches as structures not coming clearly within the scope of this paper. Steel arches have a rational application only where nature has provided natural abutments, as at Niagara Falls, for instance, or where natural surroundings lend themselves to ornamental construction.

Crooked River Arch.—I have recently completed an arch bridge for the Oregon Trunk Ry. in the Crooked River Canyon. It is a two hinged spandrel braced arch. Three hinged arches are now seldom used for a railway bridge because they are less rigid than two hinged arches. They still have a good application in roof trusses which are not subject to heavy and rapidly moving loads. In several large arch spans the central connection offered considerable difficulties. The reason is that the top chords at the centre of a purely two hinged arch are calculated to have stresses in them, due to dead load and temperature, when the span is riveted up and ready to receive the rolling load. These stresses had to be introduced by powerful jacks, or other means, before the final point could be riveted up. To avoid this difficulty, I have proceeded as follows in the Crooked River arch. It was assumed that the dead load and temperature stresses at 60 deg. Fahr. in the top chord at centre are zero. This being the case, the arch acts as a three hinged structure under those conditions—namely, with all dead load in place and at 60 deg. Fahr. The span was, therefore, erected as a three hinged arch, all dead load, or the equivalent, including the decking, was placed thereon, and at a time when the temperature was very nearly 60 deg. the centre panel of the top chord was inserted and riveted up. The calculations were simple. The dead load stresses were calculated as in a three hinged arch, the temperature and live load stresses as in a two hinged arch, and the various results combined.

Types of Span.

A two hinged spandrel braced arch is probably the best type to use for railway traffic, where the natural abutments permit of sufficient rise; which will often be the case where the arch type of bridge is a logical solution. This particular type of arch is more rigid and less subject to vibration than the other types of arch, and presents the advantage of easier erection, which can then be simply performed by treating each half as a cantilever arm held back by suitably temporary anchorages until the centre connection is made. An arch bridge is a somewhat special structure, and is rarely used for very long spans, except, as I remarked before, where nature has provided abutments.

SIMPLE SPANS.—Twentyfive or 30 years ago the system of truss most favored for long simple spans was a double intersection Pratt truss with parallel chords. Nowadays the type most used is a single intersection Pratt truss with subdivided panels and curved top chord. The curved top chord is an element of economy. The single system has also a slight advantage of more definite stresses. It has its disadvantages, such as, for instance, the lack of uniformity in deflection, about which I will speak more in detail in connection with cantilever system. There is no doubt that a bridge composed of simple truss spans is a better bridge than a cantilever system or a suspension design, chiefly because of its rigidity. This rigidity results from the fact that a load placed on one span has no lifting action on the adjacent spans, as in a canti-

lever system, or on other portions of the same span, as in a suspension bridge. But long simple spans must be erected on falsework or floated into position. The first method is often admissible on account of the necessity of keeping the channel open for navigation or excessive depth of wafer combined with navigation requirements, or other local conditions. The floating of a span into position is not only costly but hazardous. It has been successfully performed, but is not always feasible or safe. Then, too, generally speaking, a cantilever bridge is more economical for long spans. These considerations often lead to the adoption of a cantilever design in preference to simple spans. A cantilever span can always be erected without false work, although the adjacent or anchor spans must generally be erected on falsework. Sometimes simple spans are erected without falsework.

The length of simple spans has been growing from year to year. The Cincinnati Southern bridge at Cincinnati, built in 1877, contains a simple span of 515 ft. In 1891 G. S. Morison built the Cairo bridge, connecting a span 518 ft. in length, single track. The Municipal bridge in St. Louis has three simple spans of 668 ft. in length, 110 ft. high at the centre, double track and road ways. The metropolis bridge over the Ohio River, if the present design is carried out, will have a simple span 720 ft. long, double track. This increase is due largely to the use of high grade materials, such as nickel or chrome nickel steel, and to the improvement in shop and field methods.

And here we may say a few words about wind forces. In small spans the action of wind rarely affects the main members of the span, and the wind bracing used is calculated more to make the structure rigid against lateral motion under rapidly moving loads than to take care of actual wind stresses. As the length of span increases, this element of wind becomes more and

PROPORTIONS OF SIMPLE SPANS WITH CURVED TOP CHORDS

	Per cent ratio height to length	Per cent ratio width to length
Municipal bridge, St. Louis, Mo.	16.47	5.24
Cincinnati, Ohio, over Ohio River.	15.41	5.60
Pennsylvania Rd., over Delaware, Phila.	15.76	5.82
Ohio Connecting Ry., Pittsburgh.	14.5	5.57
McKinley bridge, St. Louis, Mo.	15.07	5.73
Merchants bridge, St. Louis, Mo.	14.47	5.80
Mobridge, Mo.	15.18	5.48
New Brunswick bridge, N.D.	16.25	5.50
Quebec suspended span	17.19	.....
Thebes suspended span	15.03	.....
Average	15.56	.....

more important, until in very long spans it may become as important as the moving load. In a simple span the heaviest members, as well as the greatest height of truss, occur near the centre of the span. In other words, the resistance to wind per lineal foot of truss in a simple span is greatest at the centre of the span, and, owing to the overturning moment due to wind, grows in importance with the height. In a cantilever span the greatest height of truss and the heaviest members are near the piers, hence the greatest resistance to wind per lineal foot of truss is near the piers. This remark is sufficient to explain why wind stresses are easier to provide for in a cantilever structure than they are in a simple span of the same length.

LONGEST SIMPLE SPAN.—No hard and fast rule can be laid down as to the length at which a simple span becomes uneconomical as compared with a cantilever span. Generally speaking, considering the present knowledge of materials, a simple span of 700 ft. may be taken as the practical economical limit, beyond which it is not advisable to go without a thorough investigation and comparison with a cantilever system. Where

conditions require unusual methods of erection this limit may be much lower. For instance, in the Thebes bridge it was necessary to erect the 671 ft. channel span without falsework. A simple span would have required the addition of a considerable amount of metal, both in the span itself and in the adjacent spans, to permit of its being erected as a cantilever; this excess of metal would have been useless after the completion of the bridge, and its cost would have made the bridge more expensive than the adopted cantilever design.

DIMENSIONS OF SIMPLE SPANS.—In designing long simple spans the following general principles should be observed. The width, centre to centre of trusses should not be less than one-twentieth of the span, preferably one eighteenth. In double track spans the width required for clearance generally governs, except in very long spans. The height at centre of span, for a Pratt system of truss with subdivided panels, should be from one seventh to one fifth of the length. The table on this page shows the proportions of the width and height to the length of span in some of the curved top chords bridges built recently. The height at the ends should be only sufficient for an effective portal. A rigid mathematical research by Jos. Mayer, Principal Assistant Engineer of the Quebec bridge, leads to a theoretical proportion between the height at centre and length of span equal to 0.18, or somewhere between one fifth and one sixth, for heaviest loads and double track spans.

PANEL LENGTH.—The best panel length is not so easy to determine. Since the economical inclination of diagonals is very nearly 45 deg., it would result that in a Pratt truss with subdivided panels their length should approach one half of the height of truss. This would mean that in a truss with a curved top chord the panels in the centre should be longer than those near the end. This has been done at least in one instance, namely, in the Municipal bridge in St. Louis. The advantages of such an arrangement are a slight economy in the weight of steel and an improved appearance, since the diagonals have nearly the same inclination throughout. The equal panels, however, present, in my opinion, two decided advantages, which may more than offset the advantages of the former system, namely, that, all panels being equal, there is a greater duplication of parts, the floorbeams are all alike, except at ends, the stringers are all alike, the length of bottom chord eyebars is the same throughout; and, further, that the falsework may be built in uniform panels, and the traveller, which is usually designed with a view to have the uprights in proper relation to the panel points, so that the connections may easily be made, preserve its relation to the various panels points as it is moved from panel to panel. For these reasons uniform panels should be preferred in the majority of cases of simple spans.

Maximum Span Lengths.

I have already stated that the greatest practical length of a simple span is about 700 ft. With the use of certain known alloys of steel of greater strength than medium carbon steel this limit may become as much as 750 ft. Beyond this limit the weight of simple spans becomes so great, in comparison with cantilever spans, that the latter must be considered. A mistaken idea sometimes prevails that the weight of steel in a span increases in proportion to the square of the length. This is, in a measure, true for short spans, say 100 to 300 ft. This ratio of increase, however, is not a constant, but increases with the span. A simple span above 1,200 ft. in length increases in weight approximately as the cube of the length, and this exponent increases more and more

rapidly until at about 2,000 ft. the weight of carbon steel required to carry the weight of such a span and of a moderate live load becomes infinite. For a span built of nickel steel the weight becomes infinite when the length reaches 2,700 ft. Simple spans much below those limits, even if possible, would still be very uneconomical until we get down to spans 700 ft. or under.

CANTILEVER SPANS.—This leads us to cantilever spans. I mentioned two types of such spans—one without a suspended span and the other with a suspended span. A remarkable example of a cantilever bridge without a suspended span, which may be called a semi continuous structure, is the Blackwell's Island, or Queensboro bridge, in New York. There seems to be no advantage in omitting the suspended span; on the contrary, the structure differs from a true continuous bridge over several supports only by the introduction of a hinge at the centre of the main span which transmits shears but not moments. The vibrations and deflections of each segment are, therefore, transmitted through those hinges to all the other segments. Furthermore, since the stresses in such a structure depend on deflections, there is more or less uncertainty in the calculations. I do not wish to be understood as objecting to any type of structure seriously, because of the uncertainty of calculations. In any logical construction the calculations can always be made with sufficient accuracy for the safety of the work. It is only when everything else is equal that determinate stresses should be preferred.

Let us consider the usual type of cantilever bridges, the one in which two cantilever arms support a suspended span. We may assume that in bridges requiring the construction of a cantilever span the length of the main span is usually determined by local conditions. The general dimensions to be fixed by the designer are, therefore, the length of the suspended span, the length of the anchorage spans, when these are not determined by local conditions, the height of the trusses at various points and the relative distances and positions of trusses to one another. Let us discuss these various dimensions in connection with the new Quebec bridge. The Quebec bridge, with its longest span in the world, has justly attracted much attention among engineers and has naturally elicited comment and criticism. It is acknowledged that a discussion of a scientific subject by professional men is often of greater value than an elaborate paper on this same subject by one individual. If I refer to some of the criticisms, let it be considered as a friendly discussion which may be of value to the profession.

New Quebec Bridge.

The new Quebec bridge has been finally designed with two anchor arms 515 ft. long, a suspended span 640 ft. long, and two cantilever arms 580 ft. long. The moving loads finally adopted for the Quebec bridge are: On each track two Cooper's class E 60 engines, followed or preceded, or followed and preceded, by a train load of 5,000 lbs. per foot per track. In addition to the actual dead load of the structure, a load of 500 lbs. per lineal foot on suspended span and 800 lbs. on balance of bridge was allowed for snow.

THE WIND LOADS were taken as follows: A wind load normal to the bridge of 30 lbs. per sq. ft. of the exposed surface of two trusses and one and a half times the elevation of the floor (fixed load), and also 30 lbs. per square foot on travellers and falsework, etc., during erection.

A wind load on the exposed surface of the train of 300 lbs. per lineal foot applied 9 ft. above base of rail (moving load).

A wind load parallel with the bridge of 30 lbs. per sq. ft. acting on one half the area

assumed for normal wind pressure.

In the Forth bridge the enormous wind load of 56 lbs. per sq. ft. was assumed. This load was imposed on the designers by the Board of Trade soon after the Tay bridge disaster. The Tay bridge was not designed to withstand even a 30 lbs. pressure. This assumption of a 56 lbs. wind in the Forth bridge results in a very large addition of metal in the bottom chords through which the wind stresses are transmitted to the piers. The material in those members is distributed as follows:

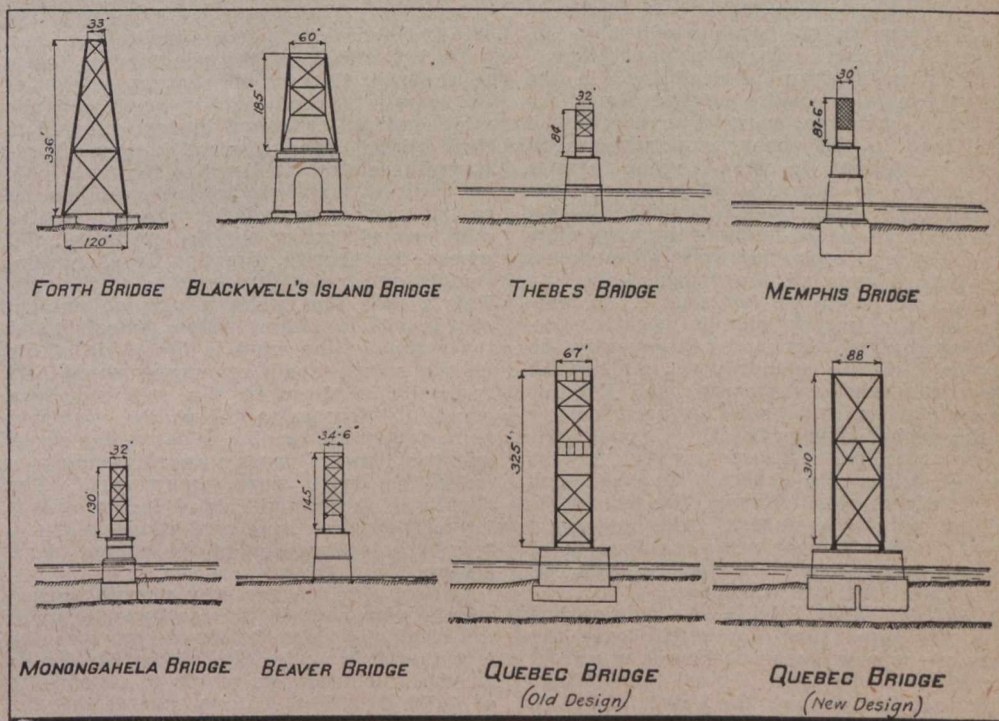
	Gross tons
Dead load.....	2282
Live load.....	1022
Wind load.....	2920
Total.....	6224

The metal here provided for the wind is nearly three times that provided for the live load, and is about 47% of the total required. In the new Quebec bridge design the wind pressure is equivalent to about 35% of the uniform live load near the piers and to about 20% of the live load near the ends of the cantilever arms.

A pressure of 30 lbs., according to German experiments with electric cars, would

over restricted areas. Such storms are very rare in Canada; but even should such an extraordinary disturbance happen, causing a wind pressure of as much as 60 lbs. to be applied to the entire Quebec bridge as now designed—the stresses in the truss members would be less than with the maximum live load and a 30 lbs. wind—and although the stresses in the laterals would be increased above the specification limits, they would still remain within the elastic limit of the members.

LENGTH OF SUSPENDED SPAN.—The length of the suspended span does not depend merely upon the most economical distribution of material required for carrying the live loads and the dead load of the bridge after it is completed. Where there are no other considerations beyond the actual working stresses in the finished structure, the most economical length of the suspended span for a total span of 1,800 ft. would be in the neighborhood of 1,000 ft. But to erect a simple span of such unprecedented length, either by floating or by cantilever method, would be impracticable. Furthermore, the cantilever method of erecting a suspended span of even a moder-



Comparative Height Over Piers of Various Bridges.

correspond to a wind of a velocity of over 100 miles an hour. Other experiments made at various times on small surfaces show that a velocity of 85 miles would correspond to a pressure of about 30 lbs.

The following formula for wind pressures is generally used: $P = kv^2$, in which P = pressure per square foot, v = velocity in miles per hour, and k = a coefficient.

Eiffel's 200 or more experiments show this coefficient to vary from 0.0026 to 0.0032, and the average is 0.0030, which he recommends. Trautwine makes $k = 0.0050$, which seems too high. But, even using the latter, a pressure of 32 lbs. would correspond to a "hurricane" of a velocity of 80 miles. The German experiments agree with Eiffel's. Making $k = 0.0030$, a pressure of 30 lbs. would correspond to a velocity of 100 miles an hour, which, according to Trautwine, is a violent hurricane uprooting "large trees."

With a wind of this velocity there would be no traffic on the bridge—empty freight cars or even light passenger cars would be overturned. Velocities of more than 85 miles may occur in cyclones and tornadoes

ate length always requires additional material, both in the cantilever arms and in the suspended span, to take care of the erection stresses.

The longer the suspended span in relation to the total main span, the greater will be the required addition—so that whether it be contemplated to erect the suspended span by cantilever method or by floating into position, the length of the suspended span finds itself limited not by mere economic considerations of the finished bridge, but by either the excess of material required during erection by cantilever method, and difficulties arising therefrom, or by the difficulties attending the floating of a very long and heavy span into position. These difficulties increase very rapidly with the length of the span to be floated. In the new design the suspended span is the longest which the board considered safe to float, and it fits the entire design very well.

Erection by Floating.

The erection of this span by floating made it possible to design it with the view to greatest economy. Its various members will

not be subjected to any greater stresses during erection than they would be in a simple span of the same length resting on two piers. It was, therefore, possible to design it as economically as to weight as a well designed simple span would be. It is more important to save weight in a suspended span than in an independent simple span, because each pound in the former requires several pounds in the entire structure to carry it. The importance of economy in the suspended span of the Quebec bridge will be appreciated when it is considered that 1 lb. uniformly distributed over the trusses of the suspended span needs 3 lbs. of metal added to the bridge to carry it, making an addition of 4 lbs. in all. This accounts for curved top chords in the span in question, as well as for the use of nickel steel for the trusses thereof.

LENGTH OF ANCHOR ARMS.—It has been pointed out that the length of the anchor arms is uneconomical—that a shorter arm would have been cheaper. It must not be forgotten that a shorter anchor arm increases the pier reactions, as well as the steel in the anchorage proper. The present anchor piers are founded on rock ledges, which dip rapidly toward the river. To move them nearer to the river would have involved much more expensive foundations.

While an addition of dead load in the main span will require several times the weight of metal to carry it, an addition of dead load in the anchor arm requires no increase of metal to carry it when there is an upward or negative reaction on the anchor pier. This is explained by the fact that any load placed between the main piers or on the main spans increases all moments and shears over all the spans, while any load placed on the anchor arm, if the reaction on the anchor pier is negative, decreases that reaction and consequently the moments in the anchor arm, but has no effect whatever on the main span. For this reason carbon steel will be used mostly in the anchor arm on the new design. The carbon steel unit stresses adopted for the Quebec bridge are generally five sevenths of the nickel steel stresses, the former requiring heavier members. The additional weight in the anchor arms is a source of economy when the relative prices of carbon and nickel steel are considered.

HEIGHT OVER PIERS.—An opinion has been expressed that the height over the piers of the new Quebec bridge is not great enough for economy. Actual calculations show that for economy the height of 310 ft. in the Quebec design is too great by about 20 ft. for the K system of trussing adopted; further, that this height would have been at least 40 ft. too great for the original system of the official design. The height of the Forth bridge towers, while 26 ft. higher than the Quebec bridge, though the span is 100 ft. shorter, is no doubt economical for the form of trussing adopted for it. The economical height is not only a function of the length of the span, but also of the panel length next to the pier. This height should be such as to correspond to an inclination of the diagonals not far from 45 deg. A double intersection system, with very long panels near the pier, such as adopted in the Forth bridge, would have been economical for the Quebec bridge, except that it requires a system of secondary members or subposts, or very heavy longitudinal girders, or both, to carry the load from panel to panel. Then, too, it is well to reduce in the members the stresses due to their own weight—which in long panels become quite important. The 20 ft. excess in height of the present Quebec design over what would have been the economical height is justified by the resulting reduction in the sections of the bottom chords, which are of considerable size at best.

STRAIGHT VERSUS CURVED CHORDS.

—In long cantilever spans the bottom chords of the cantilever and anchor arms should be straight when possible. With a curved chord the joints must be made at the panel points. These joints are of great importance, as has been shown in the report of the Royal Commission on the Quebec bridge disaster. They should be fully spliced to take care of secondary stresses due to deflections of the span during erection and under the action of live load. It is advisable, therefore, to place them outside of the point of connection with the diagonals and keep them clear of gusset plates. The same objection does not exist in top chords of simple spans, which are of moderate sizes, even in the longest spans known. The economy in simple spans resulting from such curved chords is worth while and quite important, while if any economy were to result from curving the bottom chord of the cantilever and anchor spans, such economy would certainly be of little importance in comparison with the resulting disadvantages. The vertical deflections from live loads are not as great in a straight chord design as in a curved chord design.

Another consideration in favor of the straight chords is that the most important, in fact the bulk, of the wind forces travel to the pier through the bottom chords of the cantilever and anchor arms and the wind bracing, or lateral system situated in their plane. The straight bottom chords carry these stresses direct to the piers without transmitting any appreciable components to the web system of the trusses. Not so with curved bottom chords. At each point where the chord's direction is changed a component stress is transmitted to the web. This means that while a pair of straight chords with its lateral system deflects under the action of the wind in the plane of the chords only, a pair of curved chords, by transmitting shear to the web members, causes the trusses to deflect, the windward truss downward, tending to flatten the curve, and the leeward truss upward, tending to make the curve more pronounced. The rigidity of the straight chord design against lateral deflection and oscillations is therefore greater than that of the curved chord design.

One of the reasons why curved bottom chords were used in the cantilever arms of the original Quebec bridge design was the fact that it was the aim of that design to provide full headroom of 150 ft. on a width of 1,000 ft. The bottom chords of the anchor arms were then made curved also for the sake of symmetry. The width on which the full headroom will be obtained has been reduced in the new design to about 760 ft., which certainly is more than ample to accommodate navigation. Only the highest vessels will be limited to this width of 760 ft., and that only at high water.

The top chord of the Quebec bridge cantilever and anchor arms is straight. The Forth bridge cantilever arms have straight top chords also. While there was good reason for making the Forth bridge top chord straight, there was no serious reason, beyond a slight increase in vertical rigidity, for making it straight at Quebec. The two trusses on the Forth bridge are in planes inclined toward each other at the top. The two top chords are parallel. Had they been made curved they could not have been parallel, since they must necessarily be situated in the inclined planes of the trusses. The appearance of tension chords having a greater distance apart at the centre of the arm than at either end would have been very bad. But there is no such reason at Quebec. The trusses are in vertical planes and the top chords could have been curved without serious inconvenience, but also without any advantage. The board consid-

ered that, aside from the additional vertical stiffness, a straight chord will present an appearance of strength which a curved chord would not do.

The foregoing is the first part of a paper read by Mr. Modjeski before the Franklin Institute in Philadelphia. It will be continued in the next issue.

Birthdays of Transportation Men in November.

Many happy returns of the day to —

F. W. Alexander, A.M. Can. Soc. C.E., Division Engineer, Alberta Division, C.P.R., Calgary, born at Fredericton Jct., N.B., Nov. 22, 1878.

J. O. Apps, General Baggage Agent, C.P.R., Montreal, born at Tara, Ont., Nov. 9, 1877.

A. B. Atwater, Assistant to President, lines west of Detroit and St. Clair Rivers, G.T.R., Detroit, Mich., born at Sheffield, Ohio, Nov., 1845.

G. B. Burchell, ex-General Manager, Maritime Coal Ry. and Power Co., Montreal, born at Sydney, N.S., Nov. 1, 1877.

J. R. Cameron, Assistant General Manager, Canadian Northern Ry., Winnipeg, born at Truro, N.S., Nov. 5, 1865.

L. D. Chetham, City Passenger Agent, C.P.R., and District Passenger Agent, Esquimalt and Nanaimo Ry., Victoria, born at Matlock, Eng., Nov. 5, 1869.

F. H. Clendenning, District Freight Agent, B.C. Coast Service and Trans-Pacific Steamships, C.P.R., Vancouver, B.C., born at Montreal, Nov. 9, 1881.

F. Conway, City Freight and Passenger Agent, C.P.R., Kingston, Ont., born at Ernestown, Ont., Nov. 19, 1850.

A. S. Cook, Inspecting Engineer, National Transcontinental Ry., Ottawa, born at Penobscus, N.B., Nov. 20, 1873.

W. L. Crighton, Advertising Agent, Canadian Government Railways, Moncton, N.B., born at Derby, Eng., Nov. 9, 1871.

W. B. Cronk, ex-General Superintendent, National Transcontinental Ry., Montreal, born at Footville, Wis., Nov. 11, 1862.

W. Downie, General Superintendent, Atlantic Division, C.P.R., St. John, N.B. (on leave), born at Rock Currie, Ireland, Nov. 12, 1850.

Jos. Dubrule, jr., Manager, Canadian Pacific Car and Passenger Transfer Co., and President, Prescott and Ogdensburg Ferry Co., Ltd., Prescott, Ont., born at Spencer-ville, Ont., Nov. 14, 1872.

R. L. Fairbairn, General Passenger Agent, Canadian Northern Ry., Toronto, born at Stillwater, Minn., Nov. 24, 1880.

P. J. Flynn, Terminals Manager, Winnipeg Joint Terminals, C.N.R., G.T. Pacific Ry. and National Transcontinental Ry., born at Fishers, N.Y., Nov. 22, 1872.

Grant Hall, General Manager, Western Lines, C.P.R., Winnipeg, born at Montreal, Nov. 27, 1863.

John L. Hodgson, Master Car Builder, G.T. Pacific Ry., Transcona, Man., born at Simcoe, Ont., Nov. 15, 1858.

W. M. Hood, Travelling Passenger Agent, Canadian Northern Ry., and Canadian Northern Steamships, Ltd., Toronto, born at Harrow, Ont., Nov. 25, 1872.

W. E. Ladley, Superintendent of Motive Power, Reid Newfoundland Co., St. John's, Nfld., born at Leeds, Eng., Nov., 1875.

J. McGillivray, General Manager, Inverness Ry. and Coal Co., Inverness, N.S., born at Nairn, Scotland, Nov. 13, 1867.

J. McMillan, General Superintendent of Telegraphs, Western Lines, C.P.R., Winnipeg, born at Liverpool, Eng., Nov. 2, 1866.

T. E. Martin, Local Freight Agent, C.P.R., Quebec, Que., born at Beauharnois, Que., Nov. 23, 1852.

A. S. Munro, Commercial Agent, G.T.R., London, Ont., born at Hamilton, Ont., Nov. 10, 1880.

C. Murphy, General Superintendent, Mani-

toba Division, C.P.R., Winnipeg, born at Prescott, Ont., Nov. 20, 1865.

A. C. O'Neil, Travelling Freight Agent, G.T.R., London, Ont., born at Point Edward, Ont., Nov. 30, 1866.

W. J. Quinlan, District Passenger Agent, Grand Trunk Pacific Ry., Winnipeg, born at Montreal, Nov. 21, 1883.

H. P. Sharpe, General Agent, Dominion Express Co., Toronto, born at Brockville, Ont., Nov. 24, 1864.

G. H. Shaw, General Traffic Manager, Canadian Northern Ry., Toronto, born at Smiths Falls, Ont., Nov. 25, 1859.

F. M. Spaidal, General Manager, Cana-

dian Northern Quebec Ry., and Quebec and Lake St. John Ry., Montreal, born at Gananoque, Ont., Nov. 13, 1858.

J. Sparks, Assistant General Baggage Agent, Western Lines, C.P.R., Winnipeg, born in London, Eng., Nov. 25, 1874.

H. P. Timmerman, Industrial Commissioner, Eastern Lines, C.P.R., Montreal, born at Odessa, Ont., Nov. 6, 1856.

H. E. Whittenberger, General Superintendent, Ontario Lines, G.T.R., Toronto, born at Peru, Ind., Nov. 9, 1869.

C. G. Washbon, Resident Engineer, C.P.R., Winnipeg, born at Morris, N.Y., Nov. 27, 1887.

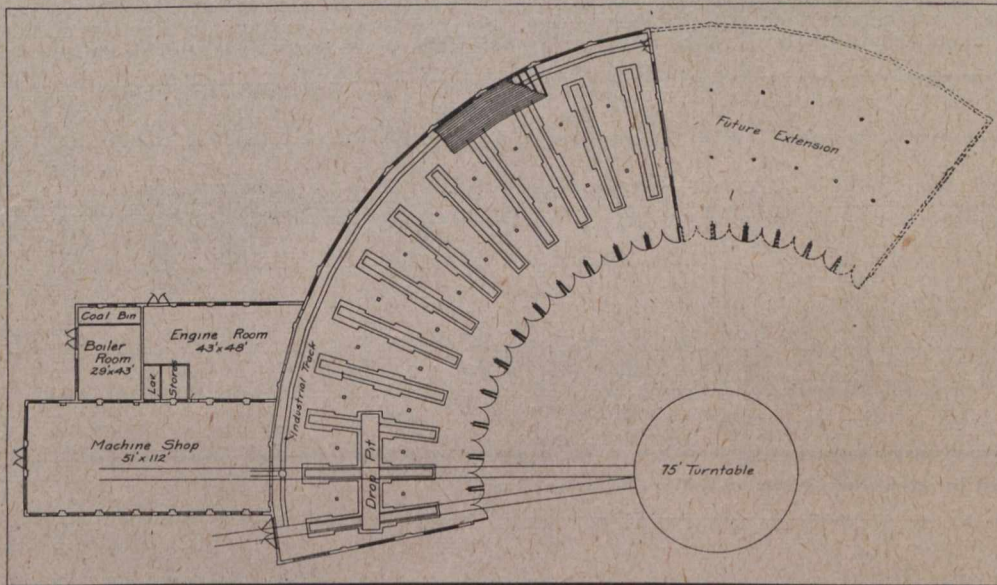
National Transcontinental Railway Standard Locomotive House.

The latest standard type of locomotive house for the N.T.R. is shown in the accompanying illustrations. In Canadian Railway and Marine World for Sept., 1912, a plan of the standard locomotive house, as then approved, was described, with illustrations, but it was subsequently found that the design then decided upon might be improved in some particulars, resulting in the present design.

In general arrangement, the new design is similar to the former, the principal point of variation being in the shifting of the machine shop and auxiliary buildings from their former location on the outside of the

the inside radius of the building to the centre line of the door posts being 114 ft. 5 1/4 ins., and the outside radius, 205 ft. 5 1/4 ins., giving a locomotive house depth of 91 ft. In the centre of the circle is a 75 1/2 ft. turntable.

At the lower end of the locomotive house are three drop pits, communicating with each other through a cross pit. The lower one of the three drop pits is on the through track provided in the new arrangement for the reasons explained. The central drop pit track runs through into the machine shop to the rear, a 112 by 56 1/2 ft. building. Adjoining the machine shop are the engine



Standard Locomotive House and Shop for National Transcontinental Railway.

locomotive house, so as to leave the outside track clear for a through connection, the idea being that when a crippled locomotive is brought into the terminal, it may be run on the through track alongside the machine shop by the yard crew, where it may be picked up when convenient by the mechanical department and run in on the pit. In the former arrangement, the dropping off of a crippled locomotive on the turntable side of the locomotive house left the latter blocked, necessitating the immediate removal of the locomotive, which would not always be convenient. The normal handling of the motive power will not be disturbed in the new arrangement.

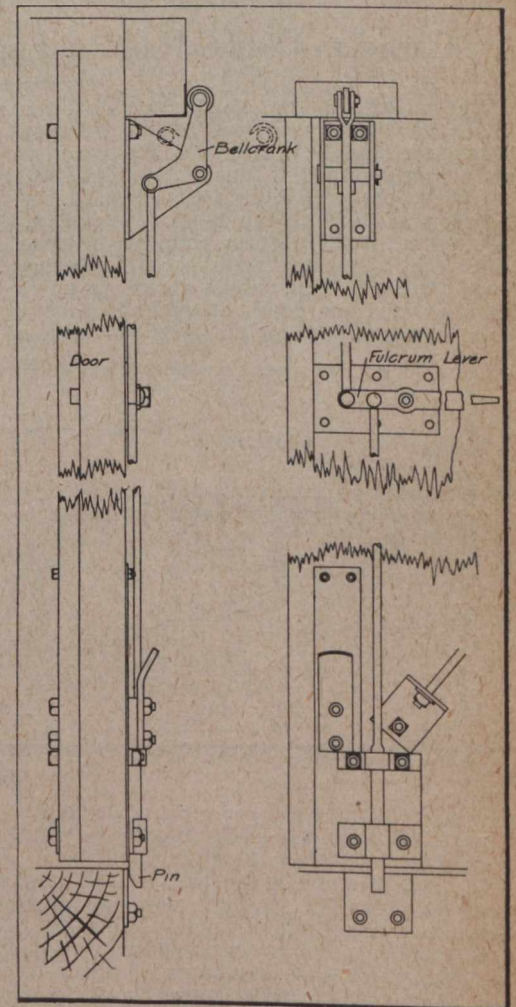
The new design is for a 12 stall house, so designed with the auxiliary buildings to one end that future pit extensions may be added without in any way interfering with the original plans, the auxiliary buildings being made of sufficient size to meet the demands of future enlargements to the motive power accommodation. The main building has the stalls, forming chords of a circle, on a central angle of 7 degs. 46 mins.,

and boiler rooms, 48 and 29 ft. long respectively by 43 ft. wide. All these buildings are to be on concrete foundations up to 4 ft. above the base of the rail, with the remainder of the walls of red brick. The roof of the locomotive house will be supported on wooden columns, girders and beams, with brick walls at the rear and side, and steel columns at the door posts. The roof of the machine shop and engine and boiler rooms will be supported on steel trusses. Over the drop pits and machine shop there will also be skylights.

The pits are to be 60 ft. long, 3 3/4 ft. wide, and 2ft. 11 ins. deep at the rear, rising to 2 1/4 ft. at the front from the base of rail to a 3 in. crowning in the bottom of the pit. depression at the rear of the pit will drain off the pit water through a 4 in. cast iron pipe. The pit construction will be concrete throughout, the top of the pit walls being surmounted by two, and in places three, 3 by 12 in. timbers, spiked on rods bedded in the concrete walls, the 80 lb. rails resting on the timbers. The locomotive house will have a 4 in. cinder floor, except around

the inner wall, which will be floored with 3 in. planking to the rear end of the pit. Around the inner wall of the house, at 5 ft. centre from the wall, there will be a 2 ft. industrial track, laid with 40 lb. rails, with a turntable between the central drop pit track, leading back into the machine shop.

Around the inner wall, at the end of the pits, there will be a concrete heating duct of varying size, largest at the engine room end, where connection with the heating fans is made. At the end of each pit there will be a 9 in. heating opening, and from the heating duct for each pit there will be a heating pipe running alongside the pit, with three 9 in. openings leading in along one side at equidistant points along the pit length. The drainage of the buildings will be provided for by an 8 in. tile pipe outside the outer wall of the locomotive house, with a 4 in. cast iron connection from each pit, and a 6 in. connection from each end of



Door Fastening Device for N.T.R. Locomotive House.

the cross drop pit, and a 4 in. pipe from the boiler room.

The machine shop will have the usual running repair equipment. The engine room will contain air compressors, heating plant and washing plant. The boiler room will contain two boilers, with coal bin to the rear. From the boilers there will be a 4 in. drain, connecting with a drain from the lavatory and thence through a 6 and 10 in. pipe to the main drain before mentioned.

The arrangement of the through track over the lower drop pit, in addition to providing facilities for handling cripples more expeditiously, will also make possible a handier store for heavy material. It is anticipated that it will be possible for the yard crew to shunt in on the through track a car of store material, leaving it on the track adjoining the machine shop until required,

when the shop hands can easily pinch bar it into the locomotive house without calling on outside assistance. It is the intention to use the portion of the shop adjoining this through track drop pit for a heavy store.

In the design of the building some unique features have been embodied, principal among which is the door fastening device shown herewith. Locomotive house doors have a tendency to warp, and frequently leave large gaps when closed, making the heating of the building difficult, this warping tendency being more pronounced at the top of the door, where it is difficult to apply local pressure. The locking arrangement shown consists of a bell crank pinned to a bracket at the top of the door. The upper end of the bell crank carries a roller that bears on the outside of a steel plate on the door jamb. The lower end of the bell crank

connects with a rod, fastened at its lower end to a fulcrum lever, the depressing of which swings the bell crank roller up into engagement, tightly closing the door. The same action depresses a fastening pin at the bottom of the door.

The whole building will be electrically wired, with drop lights in minor positions, and flaming arc lamps in the more important places. The engine room will contain one flaming arc light, the machine shop six, and the locomotive house 12, each being independently controlled. There will also be two flaming arc lights in front of the locomotive house.

The designs for the whole standard locomotive house, with auxiliary buildings, were prepared under the direction of W. J. Press, M. Can. Soc. C.E., Mechanical Engineer, N.T.R., to whom we are indebted for the information on which this article is based.

towers, which are shown very clearly in the illustration, dated Sept. 30, 1912. There are also in the approach part of the work two Warren trusses, one 131 1/4 ft. long, and the other 129 3/4 ft. long. These 15 spans, which form the major part of the approach work, have trusses which are 19 ft. deep and spaced 25 ft. apart centre to centre, and are similar to the large trusses, as regards the arrangement on their decks, while they have their bottom chords immediately under the highway floor and sidewalks.

Near each end of the bridge the roadway and sidewalks curve out from beneath the tracks upon the deck, and from these points of curving to the abutments are supported by a deck plate girder system with rolled I beam stringers and built up floor beams and brackets. The main girders are themselves carried on steel bents.

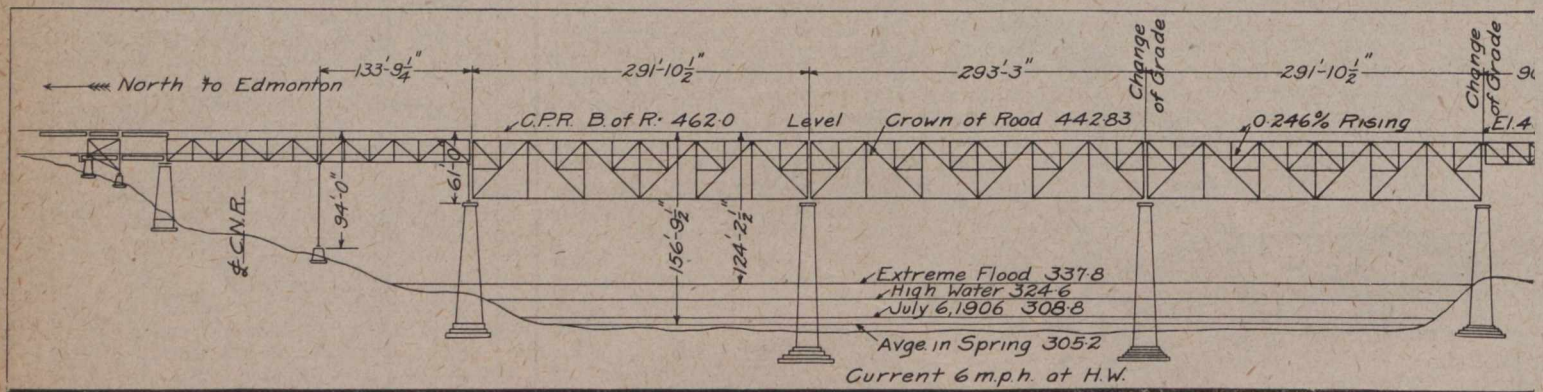
The general diagram shows in detail the arrangement of the highway floor, and gives in general the arrangement of the spans, of the towers, and of the girders and turnouts at the ends of the bridge.

An excellent idea of the method of erection may be obtained from the accompanying illustrations. In the one dated Sept. 30, 1912, the staging is shown complete for one of the 288 ft. main spans, with the span resting upon it. Between the second and third of the high piers may be seen the capped and braced piling, upon which false work similar to that shown between the first and second pier was afterwards erected for the support during the erection of the second of the large spans. This falsework

Canadian Pacific Railway High Level Bridge at Edmonton.

The valley of the North Saskatchewan River, at the site of this bridge, between Edmonton and Strathcona, is about half a mile wide and 160 ft. deep. Of this width the river occupies from 800 to 900 ft., depending on its stage, the depth varying from about 8 ft. at the deepest point at the time when the ice goes out, to about 40 ft. during flood time. The current is about six miles an hour, and the depth of water is a very uncertain quantity, as the river sometimes

of the C.P.R. track. The top of roadway is situated 19 ft. 2 ins. below the base of rail, and is of concrete construction, floored with creosote blocks, this combination having a thickness of 14 ins. at the crown. The roadway is carried in the usual manner on steel stringers connected to floor beams, which attach to the verticals at the panel points of the trusses. Two sidewalks, 8ft. in the clear, are carried, one at each side of the bridge at about the level of the roadway, on

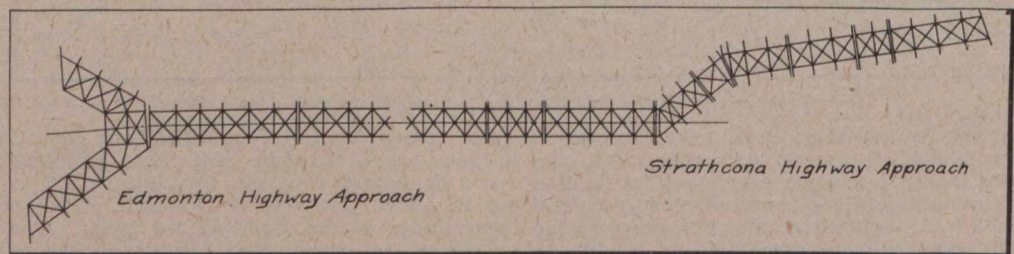


Canadian Pacific Railway Edmonton Bridge—Edmonton End.

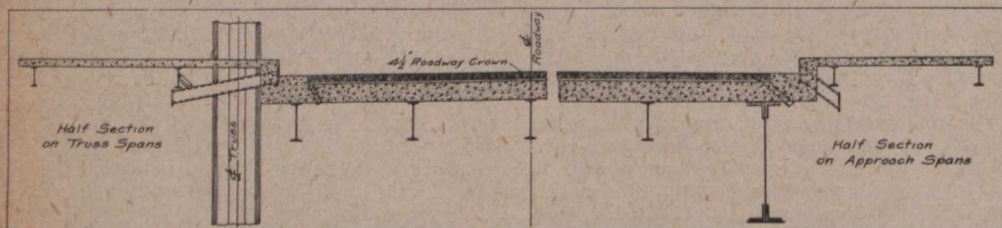
risers more than 10 ft. over night after heavy rains. The ground is sticky blue clay, with heavy boulders below the river bed.

The substructure of the bridge is of concrete, and consists of four main or river piers, each about 125 ft. high, and further, of 62 smaller piers which support the viaduct legs which carry the approach spans.

In the superstructure there are three main spans of the Pratt type, with subdivided panels; 12 subpanels at 24 ft. = 288 ft. centre to centre of end bearings. Trusses are 50 ft. deep, and are spaced 25 ft. apart



Highway Approach and Main Decks on C.P.R. Edmonton Bridge.



Highway Floors on C.P.R. Edmonton Bridge.

centre to centre. The main floor beams are 33 1/4 ft. long, and extend 4 1/4 ft. over the truss carried three tracks, a railway track for at each end. On the deck of the bridge are the C.P.R. upon the centre line of the bridge, and one electric railway track on each side

brackets which fasten to the ends of the roadway floor beams.

The approach spans consist of seven Pratt truss spans 96 ft. 1/2 in. long, and six similar spans 47 ft. long; the shorter spans are the tower spans, and occur over the

consisted essentially of five strongly braced towers, which support the span at its bottom chord panel points. An excellent idea of the traveller used is given in the illustration dated May 27, 1913. This traveller was arranged to erect not only the main spans, which were set upon falsework, but all the other spans of the structure without the use of falsework. In this illustration, it will be noted that a locomotive had just pushed cars through the under part, and had furnished its outstanding booms with the material which they were to presently put in position.

The work in connection with the steel for the bridge was carried out by the staff and forces of the Canadian Bridge Company, Ltd., of Walkerville, Ont., under the direc-

tion of P. B. Motley, M. Can. Soc. C.E., Engineer of Bridges C.P.R. G. E. Roehm is the Canadian Bridge Co.'s Contracting Engineer; C. M. Goodrich is its Designing Engineer, and S. H. Young was in charge of its field work.

An illustration of the completed bridge

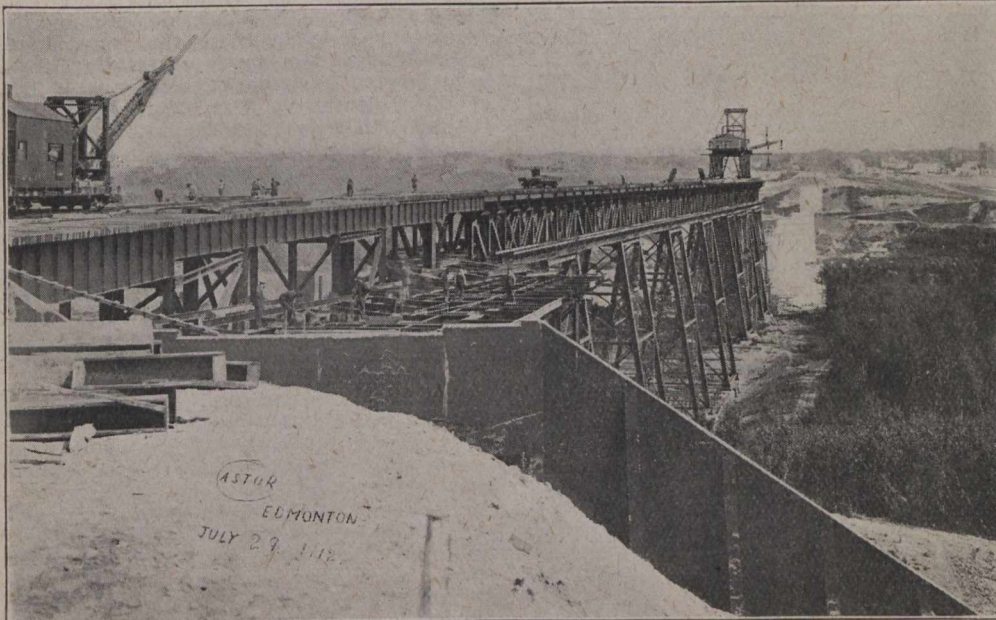
First Aid to the Injured on the Canadian Northern Railway.

Canadian Railway and Marine World for Aug., 1912, contained an article describing the activities of the St. John's Ambulance Association in its first aid work on the

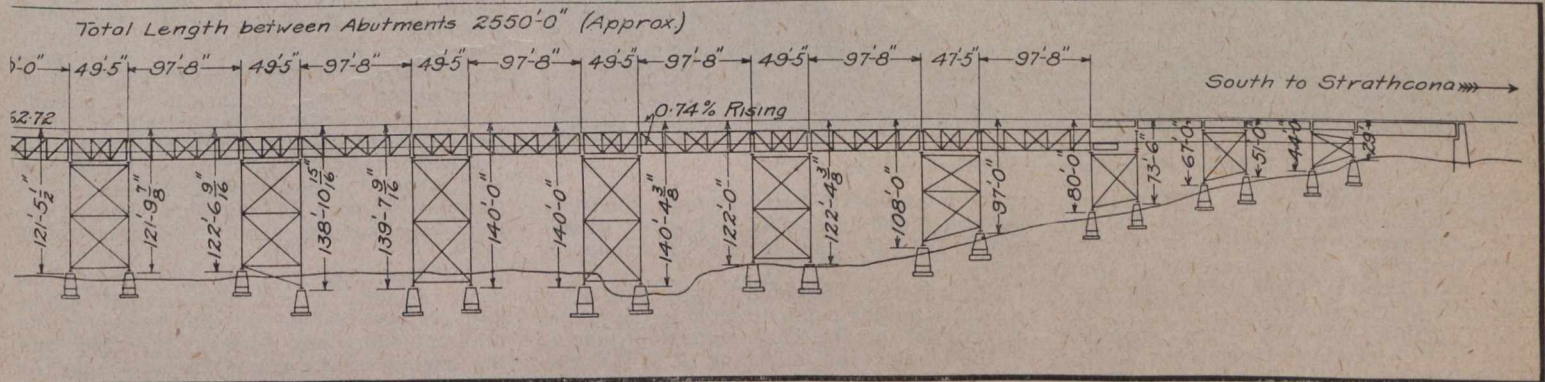
ally with the first mentioned organization. An understanding exists between the two associations that neither will enter upon the other's home territory, but that abroad the field is equally open to both.

The first seeds of the new work on the C.N.R. were sown in 1911 by recently arrived Scotchmen who had been connected with the Association in the old land, and by whose enthusiasm the work has been brought to the new world, the organization on the C.N.R. being the first on this side of the Atlantic. For the whole C.N.R. system, there is what is called a local committee, with jurisdiction over the work through the entire system. What are termed sections are organized locally for the different shops and terminal yards on the system as desired. As yet, only one section has been put in operation, with the shop section for the Fort Rouge shops at Winnipeg, where the introduction of the work has been attended with a high degree of success, the men taking to it enthusiastically.

To qualify for membership in the association, it is necessary to take a course of instruction, under the direction of a qualified medical man, which takes the nature of lectures and practical work, nine lectures in all. The text book followed is the "Ambulance Hand Book," by Sir Geo. Thos. Beatson. The following is a synopsis of the work covered, outlined according to lectures:



Edmonton Bridge Construction July 29, 1912.



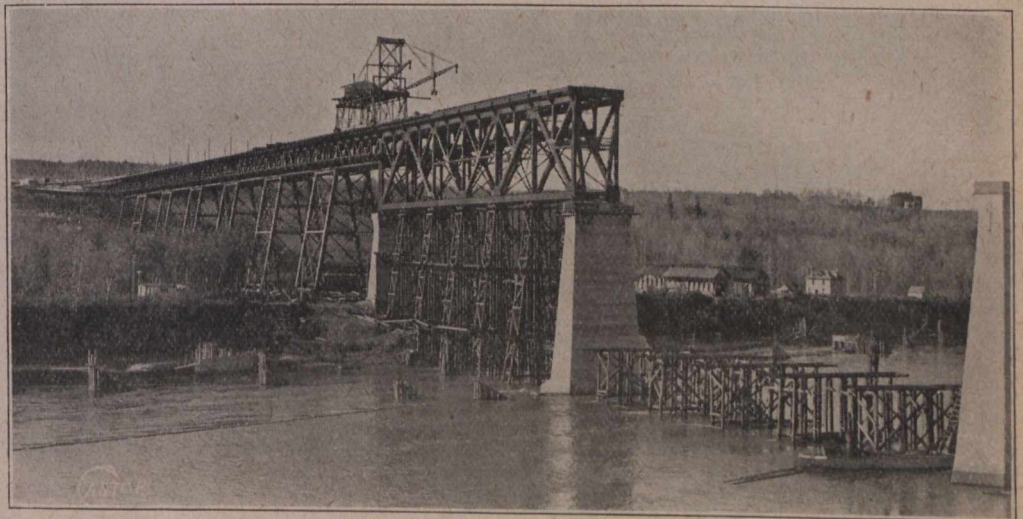
Canadian Pacific Railway Edmonton Bridge—Strathcona End.

appeared in Canadian Railway and Marine World for August.

Icing Refrigerator Cars.—In replenishing of ice on refrigerator cars in transit, the rule generally observed is that the bunkers shall not sink below half full before refilling. A good rule is to never let the ice fall below the level of the top of the load in the car. In general practice, it is the custom to replenish the ice every 24 to 30 hours, and on long runs the filling stations are so located as to make this possible.

Concrete Telegraph Poles.—Having demonstrated the utility of concrete telegraph poles on its New York Division, the Pennsylvania Rd. is said to be contemplating the placing of this material on its Western Pennsylvania Division, in the expectation that they will serve the purpose as practically in that locality as in the semi tidal swamp districts of the New York Division.

Railway Operating Revenue for June on the large steam roads of the United States amounted to \$253,356,489.71, an increase of \$15,992,193.36 over June, 1912; operating expenses were \$178,394,785.37, an increase of \$15,744,779.64; and net operating revenue was \$74,961,704.34, an increase of \$247,413.72. The operating ratio increased from 68.52 to 70.41%.



Edmonton Bridge Construction Sept. 30, 1912.

Canadian Pacific Ry. The Canadian Northern Ry. is also coming along with similar aims in view, under the St. Andrew's Ambulance Association, an organization with headquarters in Glasgow, Scotland, and which outside of Scotland is in friendly riv-

First lecture—Introductory remarks, explanation of the scope and object of lay help in ambulance work, special attention being drawn to the need for it as well as the usefulness and simplicity of it. Short sketch of the principal features of the

human anatomy, and a description of the functions of circulation, respiration, excretion, secretion.

Second lecture. Short account of the skeleton, with a brief description of the structure and variety of joints. Fractures, their varieties, causes, symptoms and dangers; their temporary treatment and the

the members will exercise themselves in performing artificial respiration, and in the arrest of hemorrhage from supposed cases of ruptured varicose veins, stabs, tears from machinery, and gunshot wounds.

Eighth lecture—Symptoms and first treatment of shocks and collapse. First aid in cases of those stunned by a fall or injury

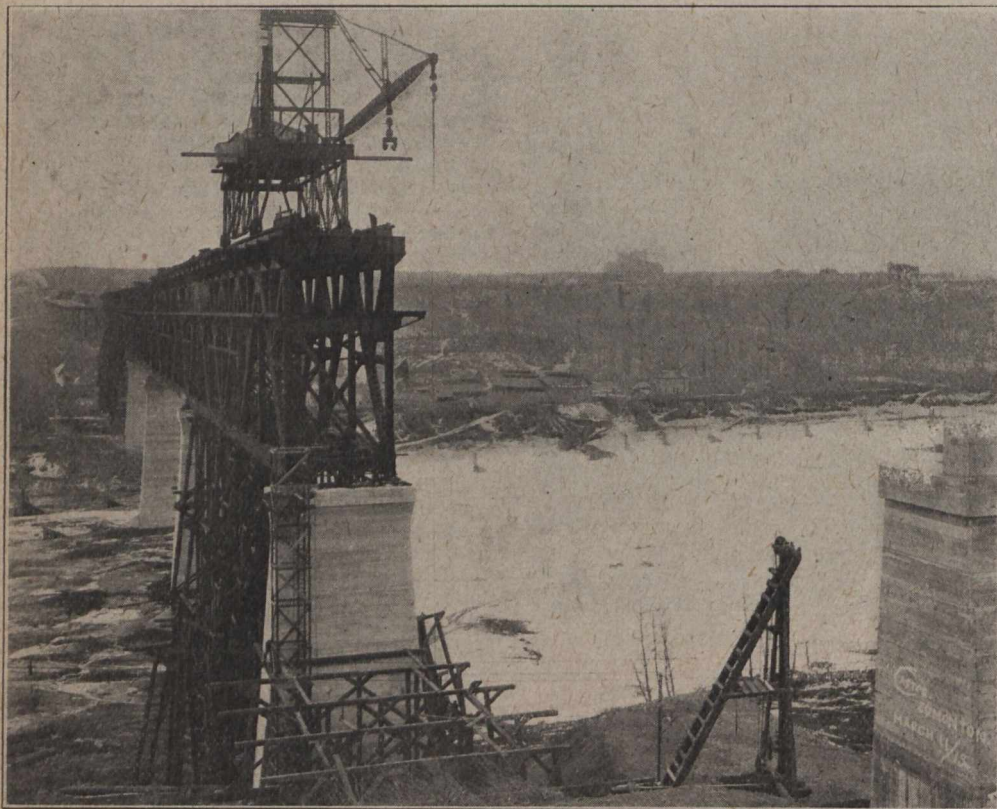
lecture a week. With the Fort Rouge shop section, all the instruction work is conducted by the C.N.R. surgeons, of whom there are three, Dr. C. A. MacKenzie giving the lectures, and the other two assisting in the work of demonstrating the methods followed.

A roll book of the attendance at the lectures and demonstrations is kept, and in order to be eligible to try the examination which follows the course of training, it is necessary to have an attendance at 8 out of the 9 lectures. The examination consists of a thorough questioning on the work covered in the course, and demonstrations on the part of those undergoing the examination on their ability to perform the various first aid methods previously taught. The examination is conducted by an outside surgeon and 50% is necessary to pass. The names of the successful candidates are forwarded to the head office in Glasgow, where they are entered in the the association's books, and certificates of qualification sent to the successful ones.

The member must remain the balance of the year in which he passes without further advancement, but on the expiration of that period he can take a similar course to that previously taken, going more deeply into the subject as the work progresses, and also studying such matter as nerves, digestion, etc. For this there is no prescribed course of training, it being left to the instructor to give more advanced knowledge along the lines already followed. This is followed by an examination as before, in which the candidate must obtain 70%, entitling the successful ones to a bronze medallion. This is as high as the association takes a man. The holder of the bronze medallion must submit himself yearly to an examination along the lines he has already passed in, in order to retain this qualification. Yearly vouchers are issued to the successful retainers of the qualification. A gold medal for long service is issued to all those possessors of a bronze medal who have been connected with a section for 15 years.

The first year men, as they qualify, become members of the local section. These sections are divided up into teams in the different shops and parts of the shop, and the leaders of the teams are as a rule the bronze medallists, who captain the work. Four usually comprise a team.

In the Fort Rouge shops the work is well



Edmonton Bridge Construction March 11, 1913.

apparatus necessary for it. Dislocations, how they differ from fractures, and the first aid in such cases. Illustrations of the temporary treatment of fractures, collar bone, upper arm, forearm, hand, thigh, leg, foot, lower jaw, pelvis, spine.

Third lecture—Practical work, when the members will exercise themselves on the use of the triangular bandage, and the temporary treatment of the different fractures mentioned in the previous lecture.

Fourth lecture—General description of the circulation of the blood and the mechanism by which it is carried on. Distinction between arterial, venous and capillary hemorrhage. Names of the arteries of the body, with their situations. Points where arterial circulation may be arrested by pressure. Dangers of hemorrhage. General treatment of hemorrhage, internal or external. Three kinds of tourniquets for arresting hemorrhage. Showing method of applying tourniquets and making improvised ones, giving illustrations of the arrest of hemorrhage from any part of the body.

Fifth lecture—Practical work, when the members of the class will exercise themselves in the arrest of hemorrhage in various situations, and in the temporary treatment of compound fractures.

Sixth lecture—Respiration, its objects and mechanisms. Fainting, its causes, symptoms, and treatment; treatment of those apparently drowned, or suffocated by hanging, poisonous gases or choking. First aid in cases of burns and scalds, bites by animals possibly rabid, tears from machinery, crushed and bruised parts, stabs. Show modes of performing artificial respiration (five methods), and also the temporary treatment of fractured ribs.

Seventh lecture—Practical work when

to the head, convulsions, epilepsy, sunstroke, persons found insensible, suspected poisoning, frost bite, lime in the eye, supposed death.

Ninth lecture—Devoted to transport work, special attention being directed to the proper carrying of the stretcher, manner of placing it, the loading and unloading of it, the position of the patient in it, suggestions as to overcoming difficulties in the road, hints as to conveyance of stretchers by rail and



Edmonton Bridge Construction May 27, 1913.

other means of conveyance. General account of the improvised methods of removing injured persons when no stretchers or regular conveyances are available.

The above gives a brief survey of the scope of the work touched upon in the first year. There is one such class each year, the lectures extending over nine weeks, a

planned. In the stores department there is kept a large stock of first aid appliances and drugs from which are supplied local first aid kits in the different shops. These local kits contain the following equipment: 9 triangular bandages; 2 each of 1, 1½, 2 and 3 in. roller bandages; packet of gauze; ¼ lb. cotton wool; packet of styptic wool;

packet or boracic wool; 8 oz. bottle each of carbolic acid, salvolatile, carron oil, arnica and olive oil; bottle of smelling salts; box of carbolic salve; box of boracic ointment; card of safety pins; tourniquet; scissors; tweezers; adhesive plaster; boracic lint; needles; eye shade, and small towel. With each kit, there is a stretcher and a full set of 14 splints. In the car department, additional provision is made by having a local store of stretchers, splints, etc., in the office of the general foreman, which is centrally located to all the buildings.

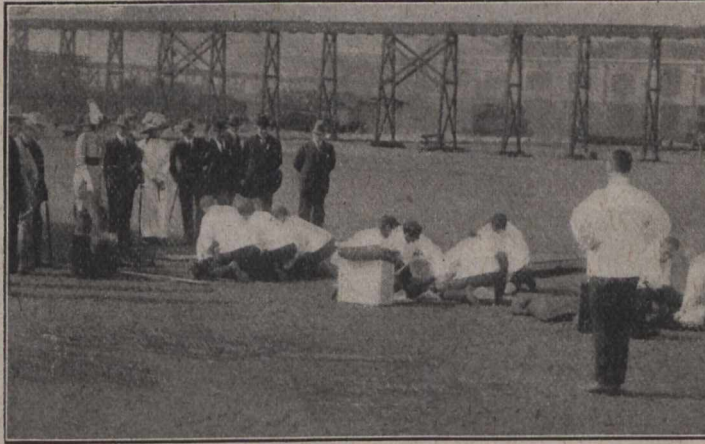
loving cup, presented by D. B. Hanna, Third Vice President, to be competed for annually, and five gold medals extra for the members of the winning team, the donation of M. H. MacLeod, General Manager. These are to be competed for by teams from all over the system, and as the sections at various points expand, some keen competition is to be expected.

The Fort Rouge section is highly elated over the successes of last fall. On the C.P.R., the St. John's Ambulance Association holds sway. The winners of the competi-

tion followed by a train load of 4,750 lbs. per lin. ft.; or, in other words, the structure could safely be loaded from end to end with locomotives, each weighing in working order 180 tons.

The ties used are 10 by 12 ins. by 14 ft., with every fourth tie 18 ft. long, on which is carried on one side of track a foot walk, with substantial hand railing.

The concrete substructure was started May 3, 1912, and finished July 30, 1912. The first span of the superstructure was placed Aug. 20, 1912, and the last span, or most



Inspection of C.N.R. St. Andrew's Ambulance Association First Aid Work by the Duke of Connaught.

Demonstration of First Aid Work Before the Duke of Connaught by C.N.R. St. Andrew's Ambulance Association.

At convenient points in each building there are steam connected hot water heaters attached to the columns of the buildings, marked on the outside with a red cross. These hot water connections must only be used for first aid purposes, use for other causes being prohibited.

In each shop, alongside the first aid kit, there is a small blackboard, on which are entered the names of the members of the team who are to use that particular kit. An air whistle alongside is the signal in the case of an accident for those men to instantly drop their work and prepare to render first aid to the injured.

The officers of the Fort Rouge shop section are: President, A. M. McCowan, General Car Foreman; Commandant, D. Mowat, Assistant Foreman Freight Repair Yard; Assistant Commandant S. Angus; and Sec-Treas. J. Candline, Assistant Foreman Freight Repair Track. Considerable activity is being demonstrated in this section, as in the short time of its existence about 40 members have qualified.

The local committee for the Canadian Northern Ry. has the following officers: Honorary President, Sir Wm. Mackenzie; Honorary Vice President, Sir Donald Mann; President, A. E. Cox, General Storekeeper; Vice President, A. H. Eager, Supt. of Shops; Secretary, E. J. Gillingwater, Chief Clerk to General Storekeeper; Treasurer, J. E. M. Firby, Foreman of Mill; Committee, T. J. Lowe, Chief Clerk to General Manager, O. C. Bishop, Asst. Supt. of Dining Cars, J. Hough, Foreman Machine Shop, G. Lyons, Foreman Upholsterer, W. Clegg, Foreman Air Brake Dept., F. McDowell, Asst. Storekeeper, D. Galloway, General Foreman Locomotive Dept., W. Watt, General Foreman Freight Sheds, and T. A. Musgrave, Foreman Freight Car Repair Tracks. On this committee devolves the work of organizing sections all over the system, several of which are already in contemplation.

The heads of the Canadian Northern are doing their best to encourage the work, many valuable prizes being offered individually and to the teams competing in the general competitions held annually. Among the team prizes may be mentioned a large silver

tions of the Western and Eastern Lines met last fall, the team from the Western Lines being declared the winners. The C.N.R. Fort Rouge section challenged this winning team, and in the demonstration which followed, proved capable of defeating the champions of the C.P.R. system.

Blende River Viaduct, Canadian Northern Ontario Railway.

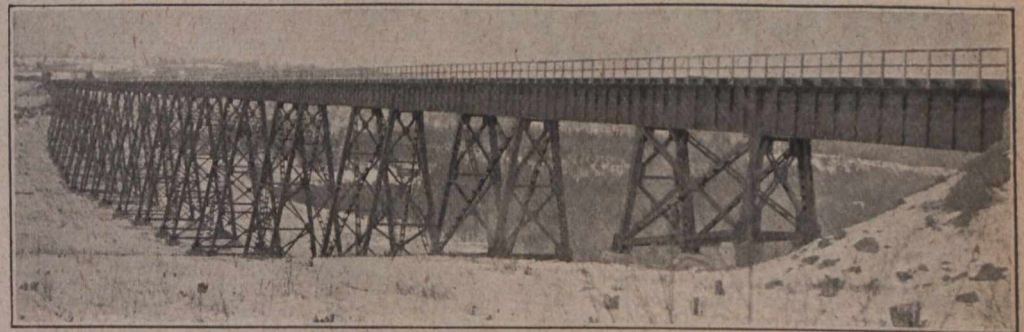
The Blende River viaduct, at mileage 24 east of Port Arthur, on the C.N.O.R., recently completed, is the largest of the many steel structures on that line. Although the stream crossed is but a rivulet, the wide and deep valley necessitated a structure of

easterly, in position Dec. 28, 1912.

The concrete substructure was built by J. A. Whalen, subcontractors Kennedy Construction Co., the total yardage being about 3,600 cu. yds. About 2,000 piles were used in the foundations. The steel superstructure was built by the Canadian Bridge Co., Walkerville. The weight of steel is about 5,000,000 lbs. The total cost was nearly \$350,000.

The viaduct was designed under the supervision of W. P. Chapman, Bridge Engineer, Mackenzie, Mann and Co., Ltd.

Telephone Train Dispatching on the Intercolonial Ry.—F. P. Gutelius, General Manager, Canadian Government Railways, is reported to have stated recently, that a



Blende River Viaduct, Canadian Northern Ontario Railway.

some magnitude to conform to the location and grade adopted, the alternative being a more circuitous route, which would have increased the length of line several miles.

The structure is 2,300 ft. long, the maximum height above water level being 130 ft. It comprises 14 spans of 75 ft., 15 towers of 45 ft., with six 60 ft. spans and four 40 ft. towers at the ends. The foundations of the two abutments and end pedestals are on rock; the remaining pedestals are built upon pile foundations.

The structure is designed to Dominion Government Specification, 1908, Class heavy loading—that is, a capacity to safely carry two 180 ton locomotives, coupled together,

telephone dispatching system will be installed almost immediately on the St. John-Moncton section of the Intercolonial Ry., and that tenders have been asked for the necessary equipment. It is said that at the same time the automatic block signalling system will be installed.

Railway Lands Patented.—Letters patent were issued, during August, in respect of railway lands in Manitoba, Saskatchewan, Alberta and British Columbia, as follows:—

	Acres.
Canadian Northern Ry.	5.14
Grand Trunk Pacific Ry.	141.26
Qu'Appelle, Long Lake and Saskatchewan Rd. and Steamboat Co.	2,332.00
Total	2,378.40

Railway Mechanical Methods and Devices.

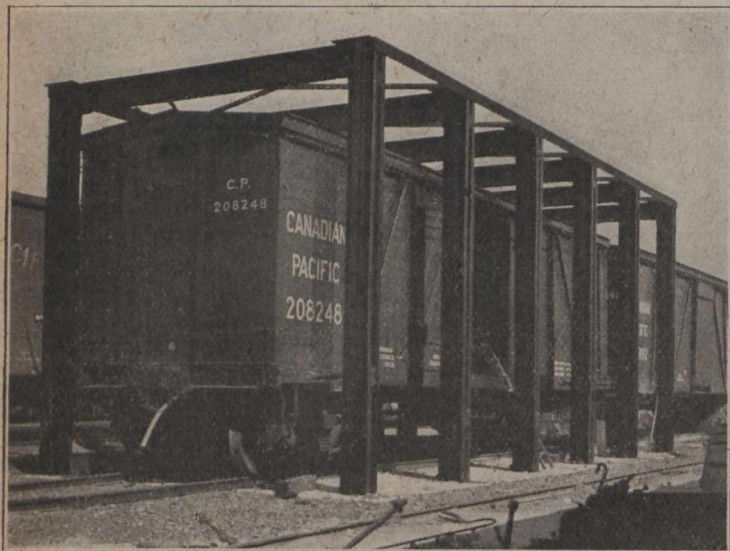
Steel Car Straightener at Canadian Pacific Railway West Toronto Shops.

The advent of all steel, and steel frame cars, into modern railway practice has involved a readjustment of the means of handling repairs on such equipment. Whereas, in wooden equipment, when a car became partly wrecked, the members were either left more or less intact, or else completely destroyed, with steel construction, the ability of the members to be distorted

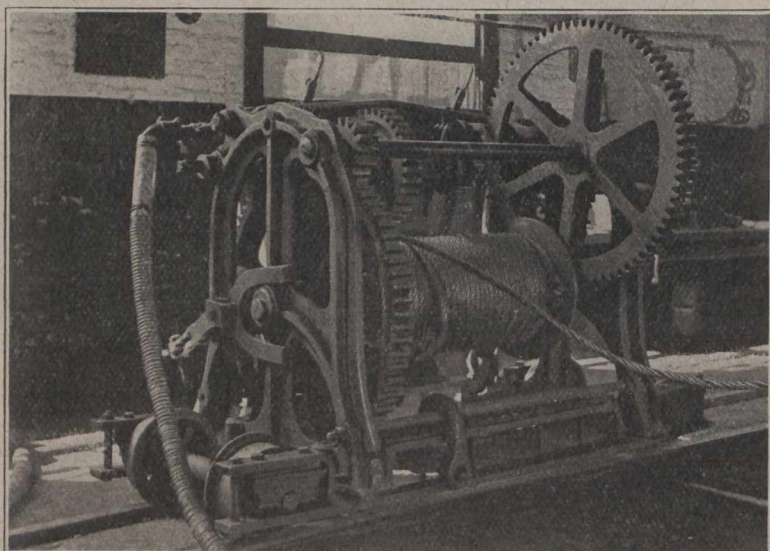
inch. The inner end of the screws have bearing plates for bearing up against any part of the car, and the outer end is squared for a wrench. By means of the $\frac{3}{4}$ in. tying bolts, the jack screws may be located in position on the column, so that the sills or any part of the frame may be pressed back into position. In cases where the screws are not sufficiently powerful to press the frame back into shape, the practice is to use a jack between the frame column and the member of the car that is to be straightened.

Locomotive Tractor in Grand Trunk Railway Shops.

In the G.T.R. Toronto Shops, E. Logan, General Foreman, the old Northern Ry. locomotive house is used for light locomotive repair work principally, the size of the old stalls precluding its use as a locomotive house for the general run of modern motive power. It is large enough to take in a large locomotive without tender, and it is generally in this unattached condition that



Frame for Straightening Bent Steel Cars.



Locomotive Tractor for Drawing in Locomotives.

without serious injury to the material, other than the necessity of bending back into shape, has made possible the continued use of the same members, the necessary repairs being made thereto without renewal.

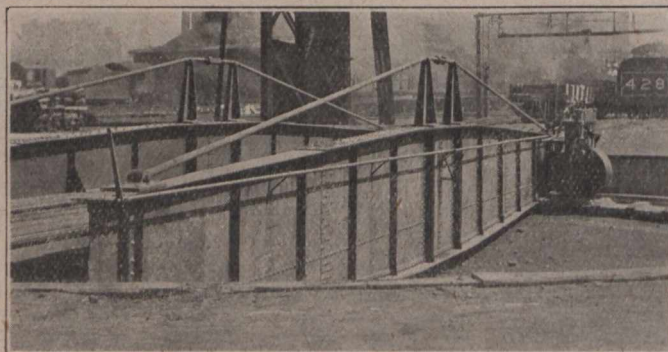
One of the most frequently encountered difficulties with steel equipment in a wreck is that either the sills or frame become sprung, either from a too heavy end blow, or from a side swipe. In wooden equipment, this would require the replacing of the damaged member, but with the steel, if the proper facilities be at hand, the member may be bent back into shape and is then, to all practical purposes, provided it was not cracked in the accident, as good as new.

The C.P.R. has a great many steel frame cars of the outside Z bar frame construction. Many of these are damaged in the course of service, and to facilitate repairs to them, the bending frame shown in the accompanying illustration, is used. The frame shown is in use in the West Toronto shops, and is similar in design, but somewhat larger, than the original one of this type built at the company's Hochelaga, Montreal, shops.

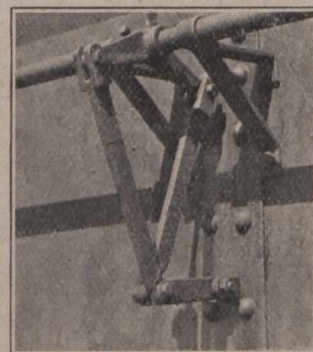
The frame comprises a double row of steel columns at 14 ft. centres, there being 6 pairs, 7 ft. apart. The columns are built up of two 12 by 3 in. channels, $3\frac{1}{2}$ ins. apart, back to back. Rivetted to each channel web, there is 6 by 3 in. I beam, stiffening the column in both directions. These columns are mounted in a concrete base, 17 ft. wide, and the columns are tied together and diagonally braced at the top. In each column, between the channel backs, there is a cast iron block, 8 ins. deep, on each side, the pair being tied together by two $\frac{3}{4}$ in. bolts. Passing through the pair of blocks is a $2\frac{1}{2}$ in. square thread screw, 24 ins. long, with a pitch of two threads per

Not only are the members of steel cars twisted side ways, but it frequently happens that, from an end thrust, the sills are sprung upwards in the centre. To meet this difficulty, provision is made in this straightening frame. Between the end pair of columns, bedded in the concrete base, there are at each end four $1\frac{1}{4}$ in. eye bolts, spaced 1 ft. each side of the rails. In each eye bolt there is a 10 in. ring. To straighten a sill, it is the practice to tie the car down

the locomotives are brought in. As it is only used for repair work, the locomotives are seldom under steam, and cannot come in under their own power, requiring some other agency. Formerly, it was the custom to bring the locomotive in from the turntable by block and tackle, with a locomotive attached to the rope out in the yard. This was a slow process, and required the assistance of the yard crew. A tractor of the design shown in the accompanying illus-



Turntable, with Tractor Control Rod Jointed.



Motion Reversal Links.

to these rings by passing a chain from the rings over the body bolster or the middle section of the sills. Then, by placing a jack under the ends of the car and jacking up, it is usually possible to bend the sills back.

At the recent annual meeting of the Great North Western Telegraph Co., at Toronto, the board of directors was elected as follows for the current year:—Z. A. Lash, K.C., President; Adam Brown, Vice President; Jas. Hedley, Hon. J. K. Kerr, Æmilius Jarvis, F. B. Hayes, N. Carlton and J. B. Van Every.

tration is now employed.

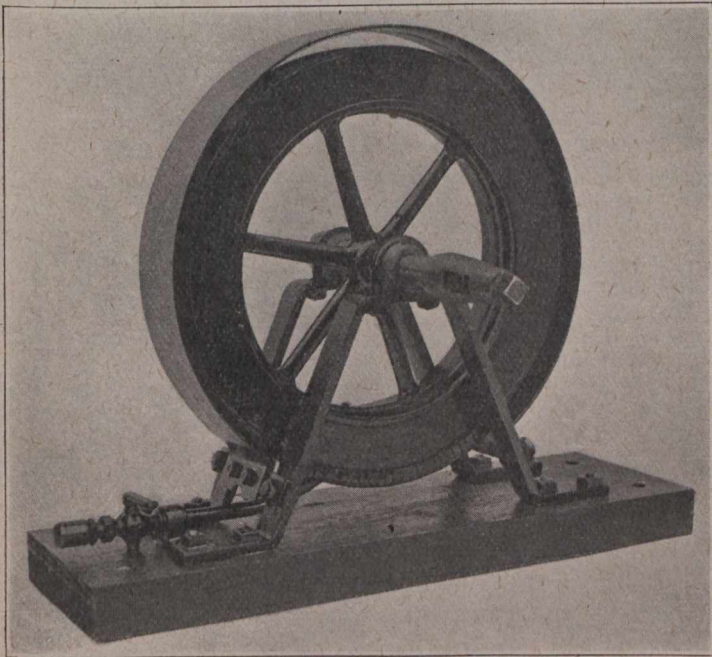
The tractor consists of a cast iron frame mounted on wheels, and carrying a steel wire drum, driven from a small air engine on the back of the frame through a train of gears, the air engine being supplied with air through an air hose from the nearest connection. Around the inside of the outer wall of the locomotive house there is a narrow gauge track on which the tractor operates. In the wall at the head of each of the tracks there is an eye bolt to which the tractor is secured at the head of the desired track, by a clamp on each side of

the frame, as shown, each side of the clamp containing a turnbuckle to tighten the tractor back into place. This tractor is found most useful.

Turntable Tractor Control in Grand Trunk Railway Toronto Yards.

No G.T.R. locomotives are held over in Toronto, the Mimico locomotive house, west of the city, being used for all locomotives that must remain over. The motive power facilities in the city are in consequence very limited, consisting principally of a coaling plant, and plant for turning the locomotives, the turntable in the accompanying illustration serving that purpose.

This turntable has an air operated tractor, of a type recently described in these columns. Briefly, it consists of a heavy cast iron plate, for weight, mounted on a wheel running on the outside turntable track, the whole attached to the turntable by a hinge connection. The air operating mechanism consisting of a couple of air cylinders, connecting through a train of gears with the track wheel, is mounted on



Machine for Grinding in Angle Cocks.

the back of the cast iron frame.

The air connection from external sources comes to the turntable through its centre bearing, and thence to the air motor. The turntable is arranged as to enable operation from either end. Along the side of the turntable there runs a rod, with vertical levers at each end. This rod is broken at the centre, the two portions being connected together through the system of levers shown in the small illustration, which transmit the motion from the one rod to the other in an opposite direction. The object desired in so arranging this rod was that the turntable might be operated positively in either direction, there being no uncertainty as to which direction the table will move when the control lever is swung over. In this arrangement, the swinging of the lever away from the operator at either end causes the table to move in the direction the lever points.

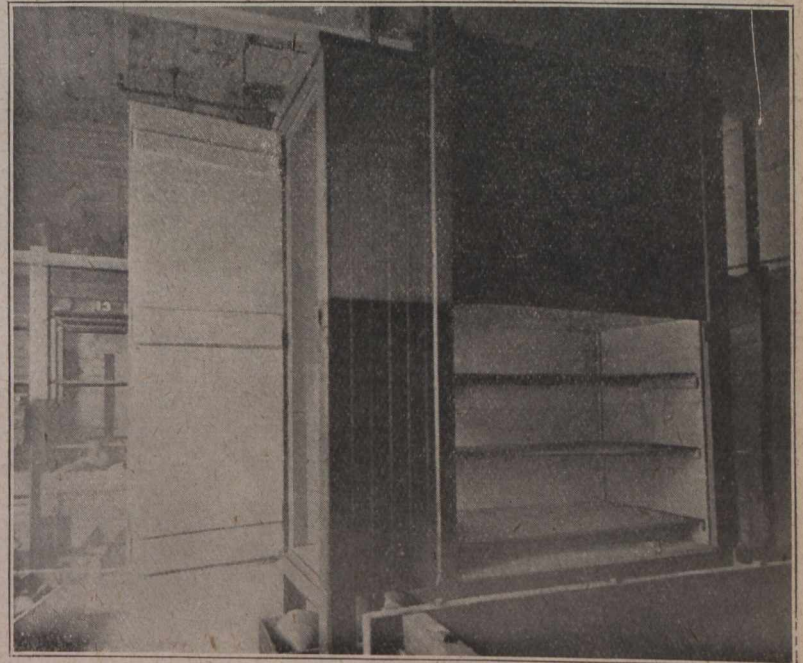
During August, three men were killed and three were injured in the course of railway construction throughout the Dominion. During the same month, 16 were killed and 107 were injured in steam railway service.

Machine for Grinding Angle Cocks at Grand Trunk Railway Port Huron Shops.

In the G.T.R. shops at Port Huron, Mich., there is a small air power machine for grinding in the valves of angle cocks, which is said to be in use in other shops on the system as well. This machine is shown in the accompanying illustration. The propelling means closely resembles the construction of the rotors on impulse turbines. On the periphery of a small wheel there are projecting blades of thin plate, held in place at the sides by annular plate rings secured to the side of the wheel rim. This forms chambers, into which the air blast from the pipe on the left end of the base is directed, this blast striking the forward radial blade, propelling the wheel. Between the supporting members on the wooden base of the machine, there is a section of thin plate, closely fitting up under the rotating wheel, retaining the air blast in the impinging cavity without dissipating. Beyond the end of this piece, and around the balance of the circumference, the rim is protected with a guard strip, as shown.

shown in the accompanying illustration is the solution of the problem. On the right is the main oven, lined with galvanized iron, and heated with steam coils in the bottom. The work to be baked is carried on shelves made of smoke box netting. The door is of the vertically sliding type, counterbalanced by weights. For the general run of articles, this small, almost square, oven meets all requirements. To have made it long enough to hold the racks mentioned would have given a greater length than that normally required. To accommodate these long racks, a vertical oven section was built on the left end of the oven as shown, with a swing door in front. This section has no heating coil, but between the main oven and this part there are two sliding doors, which are removed when the long oven is required. This gives a combined oven capable of holding all classes of work, and, at the same time one that requires very little room in proportion to the volume.

A Railway Speeder for Fire Protection is in use by the U.S. Forest Service on the San Joaquin & Eastern Rd., which runs



Lacquer Bake Oven for General Work, with Vertical End Section for Long Parts.

The valve of the angle cock to be ground is mounted on the end of the air motor shaft, in the manner indicated, and the high speed of the machine rotates the valve in the body of the cock in the usual manner, customarily done by hand or in the lathe.

Lacquer Bake Oven at Canadian Pacific Railway West Toronto Car Shops.

In the passenger car department of the C.P.R. West Toronto Shops, H. R. Naylor, General Foreman, it was necessary recently to build a new lacquer bake oven. As it was required to have the oven of such size as to be able to accommodate all sizes of work, the problem was how to build it to handle all classes of work economically, especially when the major portion of the work is small stuff, requiring small oven space. Consideration had to be given to the best size that would handle all classes of work.

The largest piece that will require to be handled is the long parcel rack over the car seat. These form a very small portion of the total work to be handled. The oven

through the Sierra National Forest, California. The speeder is a Ford roadster with a wooden rear seat and flanged wheels. It is used to transport fire fighters and fire fighting equipment, as well as supplies from one part of the forest to another. It is also used for patrol purposes. The ranger, or fire guard, who runs the speeder, carries with him an axe, hoe and rake. If he discovers an incipient fire along the right of way of the railway he puts it out by beating the flames or digging a trench surrounding the burning area. Other equipments of this sort may possibly be used in the national forests later on, but there is particular need for the speeder in the Sierra Forest because of the difficulty of transporting fire apparatus by trails and roads there.

The Associated Boards of Trade of Western Canada, meeting at Winnipeg, recently, passed a resolution urging Parliament to take steps to prevent the renewal of charters for the building of railways to companies which did not do a reasonable amount of construction within a specified time, and making it impossible to obtain the renewal of a charter if the line was not put in operation within five years.

The Forging Machine at the Montreal Locomotive Works.

In the blacksmith shop, it is doubtful if there is a much more useful machine for all sorts of duplicate forging work than the one which is commonly called the upsetting or forging machine. The prime requisite, of course, to make the installation of such a machine a paying proposition is that there is a sufficient quantity of work passing through of a duplicate nature, so that, with the same set of dies, the machine can produce the desired quantity at one setting. In fact, this feature may be varied within

form a small shoulder against which the pipe for the tender tank handle fits. This is a simple operation. On a further heat, after changing the dies, the end plunger upsets the reverse end, spreading the metal to the triangular shape indicated at B, the forward part of each half of the impression being contained in the stationary and moveable cross rams. The completion of the job is apart from the upsetting machine, the formed stock being bent by hand to a right angle as in C, completing the job except

cross ram grips the two parts, while the end ram forces the metal of the longer piece over on to the short section, welding it together into a homogeneous whole as indicated. The boss thus formed, on being drilled, and the strap likewise drilled for the retaining rivets, is completed.

The next piece to be considered, a boiler brace jaw, is a somewhat more difficult piece of work, being made up of three separate pieces, welded together and upset to the required final form. The base consists of two pieces of flat bar stock as at A in fig. 3, which are first of all welded together at one end to the shape indicated at B, under

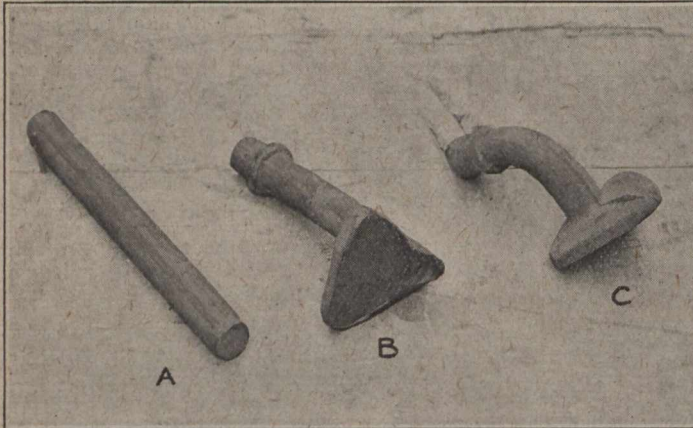


Fig. 1.—Tank Handle Produced on the Forging Machine.

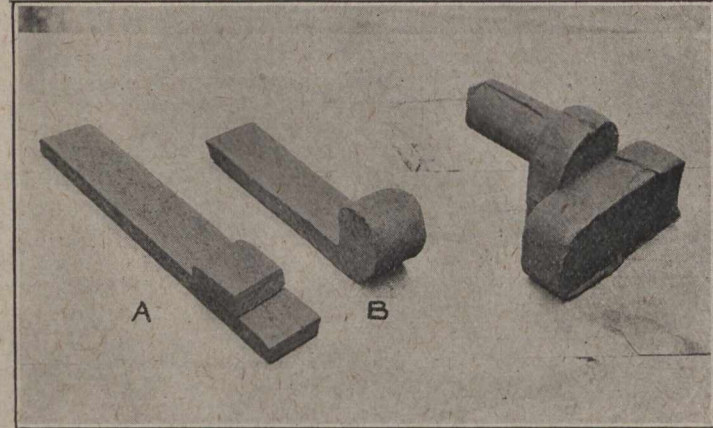


Fig. 2.—Hinge and Link Block Produced on the Forging Machine.

a large range, as many of the jobs undertaken are of such an intricate or complicated nature as to require a great deal of time were the parts so made to be produced from the solid by machining, or to be made from the same size of stock as used in the upsetting machine by hand forging. As with nearly all such rapid production machines, the local conditions alone decide the general advantages of making any such installation.

As an example of what can be done on the upsetting machine under skilful management, the writer was impressed with the

for a certain amount of grinding off of the fins, and the making of the shoulder end fit the pipe of the handle. Before the use of the upsetting machine for the making of such parts, they were usually castings, and when small like this one, were liable to be weak and tend to break. To make them by hand forging would be out of the question, but by the machine they are produced even more cheaply than would be possible by casting. It is of interest to note that a new type of tank handle has been developed as the result of using the forging machine, the whole handle being solid,

a Bradley hammer, leaving the near ends of the original flat stock open, and of the same shape, not broken down in any way. Into the spread ends of the forged rod at this stage a small piece of square stock is slipped, making the member ready for the forging machine, where it is forged to the shape at C. The shape of each jaw is contained in the stationary and movable jaws, and the ram has a projecting blade that enters the separated ends, and when entered to the set depth, forms the rounded ends of the jaws. For this complicated forging operation, the member must necessarily be

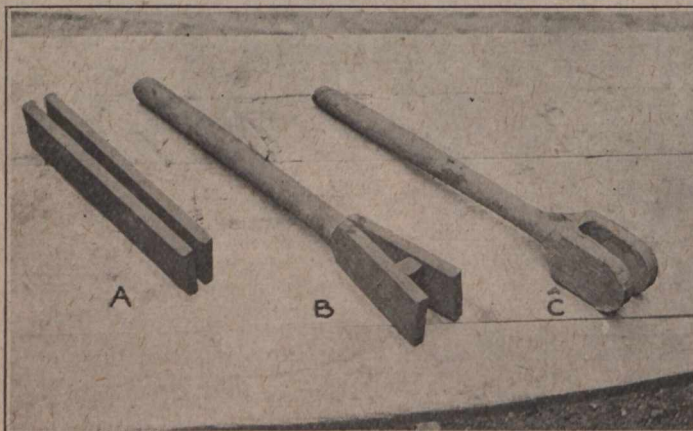


Fig. 3.—Boiler Stay End Produced on the Forging Machine.

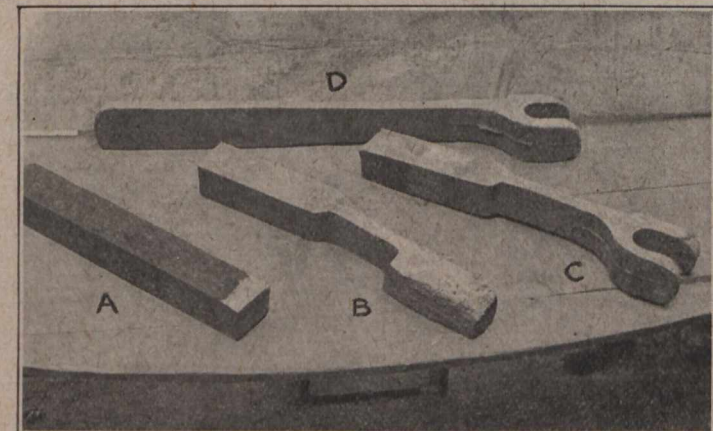


Fig. 4.—Eccentric Rod Produced on the Forging Machine.

class of work being produced on a 5 in. machine in the blacksmith shop of the Montreal Locomotive Works. Under the direction of the foreman, J. G. Boyer, who has made a specialty of upsetting or forging machine work, some rather remarkable pieces of machine forging are being produced in the course of the daily work. A few of these will be described here.

One of the simpler pieces produced, a tank handle post, is shown in fig. 1 in the successive stages of production. The stock for this is a short piece of 1 in. round iron as at A in the illustration. After heating, the first operation is to upset the far end to

formed from 1¼ in. bar stock. The ends are drawn to 1 in., and upset as in the foregoing to form two triangular feet.

Another rather simple example is shown to the left in fig. 2, but, while in no way complicated, it emphasizes how the forging machine may be used to advantage in reducing hand and steam hammer forging work. The piece shown is a coal door hinge. A piece of stock of the required end section is heated to a working heat with a short piece of the same stock laid on top of it near the end in the position indicated at B, with an intermediate layer of flux between the two parts. In the forging machine, the

heated to an almost white heat to give the required flow to the metal, as the displacement at some points is considerable. The completed boiler stay, which is used for staying the heads of the boiler, is made by forging two of these forged ends on the end of a round bar, for the different length of stays required in the boiler. This is a simpler and better method of forming the stay rods than that used in many places of forming them from two looped square bar pieces welded to the end of the stay rod, forming the jaw ends in this way.

A somewhat similar but more complicated job is shown in fig. 4. This piece, an eccen-

tric rod, is made entirely from a single bar of stock, $3\frac{1}{2}$ by 3 ins., without the addition of any further pieces as in the last instance. The original stock piece may be seen at A. The centre of the stock piece is first of all broken down as indicated at B, to the thickness of the final body of the rod, the breaking down being all on one side with regard to the end to be machine forged, the other end being broken down centrally. The next step is the machine forging. The offset broken down part is placed downward in the machine, with the form of the outside part of the jaw contained in the stationary and movable rams, along the lines of cleav-

stock. The first step in its production is to put a bow in the stock at the point where the offset arm is to be located. The centre of the bar stock at the eccentric point is $3\frac{1}{2}$ ins. from the centre of the main bar centre line. This bend in the stock is given under the steam hammer. The stock at this stage resembles an offset crank shaft. With the offset upward, the stock is placed in the forging machine, the rear face of the offset arm being formed in the cross dies of the forging machine, the end plunger forcing the bent part of the arm up into these side dies, spreading it upward in the die cavity, the front being formed by this plunger,

Another instance of heavy forging machine work on small stock will suffice to illustrate the usefulness of the machine in the railway blacksmith shop. The ends of the

chime is the pilot heel brace shown in fig. 7. This heavy end forging is upset and formed in one heat in the same operation. The 2 in. round stock is held between the cross dies, the latter containing the form of the rear portion of the brace head, the plunger carrying the four faced form of the end projection. The forward movement of the ram upsets the stock end, forming it out into the final shape.

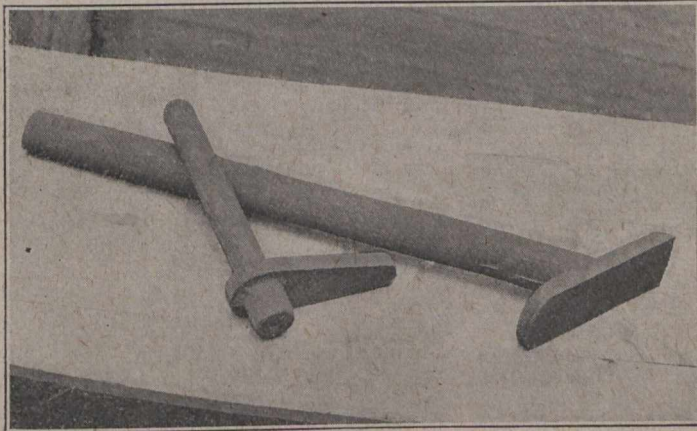


Fig. 5.—Grate Shaker Shaft and Smokebox Brace Produced on the Forging Machine.

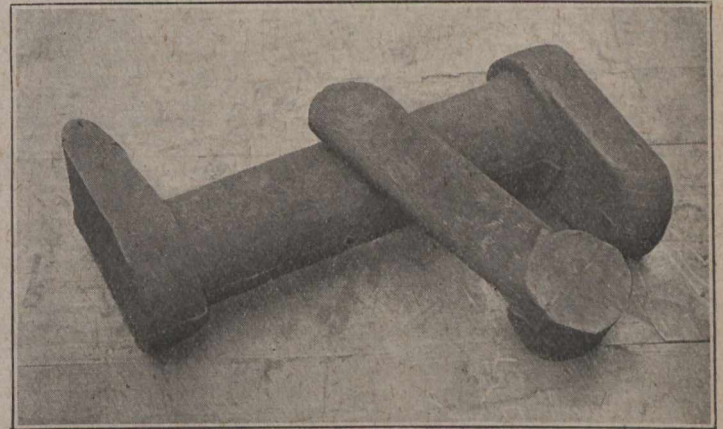


Fig. 6.—Spring Hanger and Rocker Barrel Produced on the Forging Machine.

age, which may be noted at C in fig. 4. The end ram, with a projecting blade, as in the former instance, is forced into the body of the metal, the metal flowing outward and backward along the blade of the plunger. This is a rather remarkable piece of machine forging, as the end plunger has no assistance in entering as in the last example, having to force its way through the solid metal, displacing the latter into the form of the side plunger, with the ends formed in the face of the end plunger itself. The opposite end to this forged part is next drawn out under the steam hammer to form the part that is attached to the eccentric. The whole is subsequently machined.

A very complicated piece of machine forging is shown to the right in fig. 2. This is a link saddle for the Stephenson link motion, and is made in the forging machine, from $3\frac{1}{2}$ by 3 in. stock, in one blow, the

which at the same time upsets the end from $1\frac{3}{4}$ to 2 ins. in size to the shape shown in this illustration.

The other part shown in fig. 5 is a smoke box foot brace. The original stock is first of all bent at the end at right angles, leaving sufficient stock in this bent end to form the finished foot. The bent stock is then gripped in the cross rams of the machine, which contain the form of the rear face of the foot, the lengthwise ram forcing the metal into the pockets of the side rams, the metal at the same time from the squeezing of the

superheater pipes in the Schmidt superheater are of the form shown in fig. 8. When first introduced, the end swelling was made on the tubes by shrinking a collar over the end, and then machining down on the outside to the final form. This latter part of the operation was a long and expensive one, as only the ball surface on the very end required a finished surface. These tube ends are now upset in the forging machine, all in one operation. The outer form of the tube end, with the exception of the portion required to be finished, is carried in the cross dies of the machine. On the ram of the machine is a long tit, the internal diameter of the tube, around the shoulder of which is the die formation for the finished end part of the tube. The ram tit prevents the inward collapse of the tube, the end upsetting to the shape shown. Along the edge indicated there is a projecting flash following the upsetting, which is trimmed off in the machine when cold. With this method of forming the end only one surface requires to be machined.

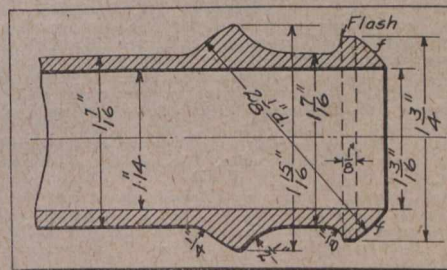


Fig. 8.—Forged End of Schmidt Superheater Tube.

end plunger, floating downward to form the lower part of the foot from the part of the bar that was bent upward.

The small spring hanger in fig. 6, the boss of which was formed in the forging machine, is a simple job, the stock being first of all drawn down roughly to shape under the steam hammer and finished by machine forging. The other member in this illustration is a rocker barrel, and serves as a fair sample of the size of work that can successfully be handled in the forging machine. Both ends of the rocker are formed in the machine, without any preliminary preparation under the steam hammer, as in some of the other examples. A straight squeeze of the ram on the end causes the metal to flow upward to form the arms. The ends are formed separately, heating each independently and upsetting. This piece is considered to be probably the most difficult undertaken, on account of its large size.

Wireless Train Dispatching.—After a careful investigation the Superintendent of Telegraphs of the Atchison, Topeka and Santa Fe Ry. has come to the conclusion that it is not advisable to install wireless telegraph apparatus along the railway, not only because of the expense of installing and maintaining the stations, but also for the reason that wireless telegraph communication can too easily be interfered with to make it sufficiently reliable for railway use.

As an Adjunct of Car Refrigeration, pre-cooling applied to loaded cars has been in operation for a period of from 2 to 3 years. There are three pre-cooling plants of large capacity in California, and one in Texas, all giving satisfactory results. In addition to these large plants, there are smaller ones operated by individual shippers, giving varying degrees of success. It is claimed that pre-cooling is destined to become an important factor in transportation refrigeration, especially in the case of the more perishable fruits.

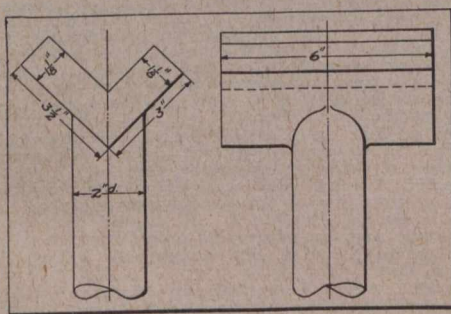


Fig. 7.—Pilot Heel Brace from Forging Machine.

stock having first of all been roughly shaped to size under the steam hammer. This being considered a specially fine sample of machine forging, no details of the steps involved could be obtained. It is a most interesting piece of work, and demonstrates probably as well as it is possible to do, the scope of the machine and its possibilities under skilful management.

A couple more examples of the forging machine work are shown in fig. 5. The member on the left is a grate shaker shaft, made from a single length of $1\frac{3}{4}$ in. round

Orders by Board of Railway Commissioners for Canada.

Beginning with June, 1904, Canadian Railway and Marine World has 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.

20089. Aug. 19.—Authorizing C.P.R. to build spur for Dominion Brick Co., Montreal.

20090. Aug. 19.—Authorizing C.P.R. to build extension of meeting siding at Islington Jct., Ont., across Mimico Ave., at grade.

20091. Aug. 19.—Authorizing C.P.R. to build road diversion in Lot 9,002, Tp. 23, R. 18, w. 5 m., B.C.

20092. Aug. 19.—Authorizing C.P.R. to rebuild bridge 115.1, Sherbrooke Subdivision, Que.

20093. Aug. 15.—Approving revised location of portion of C.P.R. as built, and the building of double track on same, from Lot 10, Con. 3, Balfour Tp., westerly through Balfour, Dowling and Cascades Tps. to Lot 1, Con. 1, Cartier Tp.

20094. Aug. 19.—Authorizing C.P.R. to build bridges 114.01, 128.79, and 5.5 on its Lake Superior Division.

20095. Aug. 18.—Amending order 19852 re C.P.R. road diversion on its Suffield-Blackie Branch at mileage 41.

20096. Aug. 16.—Authorizing Campbellford, Lake Ontario and Western Ry. to build overhead farm crossing for Mrs. M. J. West.

20097. Aug. 18.—Dismissing complaint of business men and residents of East Calgary, Alta., against removal of C.P.R. station known as Maharg, formerly Calgary Jct., East Calgary, Alta.

20098. Aug. 16.—Ordering Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build cattle pass under its tracks, for F. S. Parrott, Thurlow Tp., Ont.

20099. Aug. 16.—Authorizing C.P.R. to build across highway, at grade, in Lot 2,566, Kootenay District, mileage 41.27 from Golden, B. C.

20100. Aug. 18.—Authorizing C.P.R. to build road diversion from mileage 5.23 to 5.69, on its Gleichen-Shepard Branch, Alta.

20101. Aug. 18.—Authorizing C.P.R. to build its Bromhead ballast pit spur, at grade, across roadway in Sec. 6, Tp. 3, R. 13, w. 2 m., Sask.

20102. Aug. 18.—Authorizing C.P.R. to build diversion of road allowance and cross same at grade at mileage 45, Suffield-Blackie Branch, Alta.

20103. Aug. 14.—Ordering C.P.R. to build farm crossing near J. M. Carroll's farm in Beaver, B.C.

20104. Aug. 18.—Approving location of portion of C.P.R. Bassano Easterly Branch from mileage 116, easterly to mileage 118.39; and approving revised location of portion of same from mileage 115.59, easterly to mileage 116, Alta.

20105. Aug. 18.—Approving revised location of G.T. Pacific Ry. mileage 321.6 to 330.1, Prince Rupert east, through Tibbets Indian Reserve, Range 5, Coast District, B.C.

20106. Aug. 15.—Dismissing application of Empire Flour Mills, Ltd., St. Thomas, Ont., for order restoring milling-in-transit arrangement on U.S. corn, product of which is shipped from St. Thomas to points on or via the G.T.R. and C.P.R.

20107. Aug. 15.—Authorizing Niagara, St. Catharines and Toronto Ry. to build across Michigan Central Rd. siding to Dominion Cannery's factory, Niagara-on-the-Lake, Ont.

20108. Aug. 16.—Authorizing C.N. Ontario Ry. to build across Wilma St., O'Connor Park, Sudbury, Ont.

20109. Aug. 15.—Ordering Canadian Northern Ry. to remove Peace Ave. siding at corner of Twenty-fifth St., Edmonton, Alta., by Sept. 1.

20110. Aug. 18.—Authorizing C.N. Ontario Ry. to take portion of east part of Lot 10, Con. 6, Nepean Tp., the property of D. Finlay.

20111. Aug. 13.—Authorizing C.N. Ontario Ry. to build across Dell St., O'Connor Park, Sudbury, Ont.

20112. Aug. 16.—Authorizing C.N. Ontario Ry. to build bridge across Indian River, at mileage 106.4 from Ottawa.

20113. Aug. 16.—Authorizing C.N. Ontario Ry. to build bridges at mileage 188.1 from Toronto, and 98.06 from Ottawa.

20114. Aug. 19.—Authorizing C.N. Ontario Ry. to build bridge over Indian River at mileage 88.2 from Ottawa.

20115. Aug. 15.—Authorizing Canadian Northern Ry. to build highway crossing west of station grounds at Bayard townsite, Sask.

20116. Aug. 19.—Approving location of Canadian Northern Ry. station grounds at MacRorie, Sask.

20117. Aug. 16.—Authorizing Canadian Northern Ry. to cross Manitoba and Saskatchewan Coal Co.'s spur and to cross and join with Western Dominion Collieries' spur in s.e. ¼ Sec. 19, Tp. 2, R. 6, w. 2 m., Sask.

20118. Aug. 18.—Further extending to March 1, 1914, time for use of C.N. Ontario Ry. connection with C.P.R. at Meadowside.

20119. Aug. 14.—Authorizing G.T. Pacific Branch Lines Co. to build across Eighteenth Ave. East, Strathcona, Laurier, Rupert and Connaught Aves., 1st Ave. West, 4th Ave. West, Sixth Ave. West, and 8th Ave. West.

20120. Aug. 15.—Approving revised location of G.T. Pacific Ry., Yellowhead Pass West, mileage

43.24 to 49.26, Cariboo District, B.C.

20121. Aug. 15.—Authorizing G.T. Pacific Ry. to build spur for Town of Tofield, Alta.

20122. Aug. 19.—Authorizing G.T. Pacific Ry. to build highway across its main line in Lot 14, Headingly Parish, Man.

20123. Aug. 15.—Authorizing C.P.R. to operate over crossing at Delson Jct., without first stopping trains.

20124. Aug. 14.—Approving changes in location of G.T.R. tracks leading to its coach yard in the vicinity of St. Marguerite St., St. Henri, Montreal.

20125. Aug. 18.—Authorizing G.T. Pacific Branch Lines Co. to build across and divert highway at mileage 10.4, Elton Municipality, Brandon District, Man.

20126. Aug. 16.—Authorizing G.T. Pacific Branch Lines Co. to build spur from its Yorkton Branch to the power house, Yorkton, Sask.

20127. Aug. 18.—Authorizing G.T.R. to build siding for MacDonald Agricultural College, St. Anne de Bellevue Parish, Que.

20128. Aug. 19.—Authorizing Lake Erie and Northern Ry. to build under G.T.R. at station 1192+42.9, near Simcoe, Ont.

20129. Aug. 14.—Authorizing Lake Erie and Northern Ry. to build across Townsend, McCall, Wilson and Victoria Sts., Simcoe, Ont.

20130. Aug. 14.—Authorizing Lake Erie and Northern Ry. to raise Grand Valley Ry. tracks 2 ft. to meet L.E. & N.R. elevation at county line between Brant and Waterloo Cos. at station 868+97.

20131. Aug. 16.—Authorizing Edmonton, Dunvegan and British Columbia Ry. to build across highway between Secs. 36 and 1, Tps. 68-69, R. 2, w. 5 m., Alta.

20132. Aug. 18.—Approving revised location of Edmonton, Dunvegan and British Columbia Ry. from mileage 112.33, through Tps. 68-69, R. 2, w. 5 m., Alta.

20133. Aug. 15.—Ordering C.N. Ontario Ry. to restore former connection between Napance and Tamworth, Ont.

20134. Aug. 16.—Authorizing Toronto, Hamilton and Buffalo Ry. to divert highways at four points in Pelham Tp., Ont.

20135. Aug. 15.—Dismissing application of Empire Limestone Co. for authority to build tunnel under Carroll Bros.' right of way on Lot 5, Con. 1, Humberstone Tp., Ont.

20136. Aug. 11.—Dismissing application of Dominion Sugar Co. for readjustment of rates on sugar, in carload quantities, from Wallaceburg to Toronto and from Wallaceburg to Hamilton, over C.P.R., G.T.R., P.M.R., and Chatham, Wallaceburg and Lake Erie Ry.

20137. Aug. 21.—Authorizing Vancouver, Victoria and Eastern Ry. and Navigation Co. to build spur to Kilgard Fire Clay Co.'s works, Kilgard, B.C.

20138. Aug. 19.—Authorizing New York Central Ry. to remove station at Primeau, Que., to the east of G.T.R. at Kanawaki Golf Club grounds.

20139. Aug. 19.—Ordering C.N. Quebec Ry. to build passenger station at Arundel.

20140. Aug. 19.—Ordering C.P.R. to install improved type of illuminated electric bell at Main St. crossing, Milverton, Ont.

20141. Aug. 20.—Authorizing G.T. Pacific Ry. to carry traffic over portion of its line between Ter. Jaune and second crossing of Fraser River, B.C., mileage 1095.3 to 1189.0.

20142. Aug. 15.—Approving revised location of portion of C.P.R. from mileage 37.35 southeasterly to mileage 57.18, Kootenay Central Branch, East Kootenay District, B.C.

20143. Aug. 19.—Approving location of Esquimalt and Nanaimo Ry. stations at Union Bay and Courtenay, B.C.

20144, 20145. Aug. 20.—Approving revised location of G.T. Pacific Branch Lines Co.'s Tofield-Calgary Branch through north half of Sec. 10, Tp. 42, R. 21, and through Sec. 21, Tp. 29, R. 24, w. 4 m., Alta.

20146. Aug. 20.—Authorizing C.P.R. to build bridge 0.16 for double tracking, over Yamaska River, near Brigham Jct., Que.

20147. Aug. 22.—Approving location of Georgian Bay and Seaboard Ry. (C.P.R.) shelter on west half of Lot 3, Con. 2, Eldon Tp., Ont.

20148. Aug. 20.—Authorizing C.P.R. to build bridge 88.6 and additional track at mileage 88.73, Toronto Subdivision, across and over G.T.R.

20149. Aug. 20.—Approving revised location of C.P.R. Bassano Easterly Branch from mileage 98.72 easterly to mileage 115.59; and authorizing building of same across certain highways.

20150. Aug. 20.—Authorizing C.P.R. to build bridge 37.9, near Bethany Jct., Toronto Subdivision, Ont.

20151. Aug. 25.—Authorizing C.P.R. to divert surveyed trail in Secs. 23 and 14, and between Secs. 14 and 11, Tp. 22, R. 3, w. 4 m.; and to build at grade across same at mileage 102.2 on its Bassano Easterly Branch, Alta.

20152. Aug. 22.—Authorizing Essex Terminal Ry. to build at grade across Langlois Road, and existing highway, being boundary between Sandwich West Tp. and Ojibway, Ont.

20153. Aug. 22.—Ordering Campbellford, Lake Ontario and Western Ry. (C.P.R.) to provide cattle pass of same dimensions as that furnished by C.N.R. for J. R. Irwin, Cobourg, Ont.

20154. Aug. 22.—Authorizing Montreal Tramways Co. to build across G.T.R. on Notre Dame St., at

intersection of St. Ferdinand St., Montreal.

20155. Aug. 21.—Authorizing Winnipeg North Eastern Ry. to build across C.P.R. Emerson Branch, in Roman Catholic Mission Lot 312, St. Boniface, Man.

20156. Aug. 25.—Authorizing Canadian Northern Ry. to build across trail in S.W. ¼ Sec. 9, Tp. 7, R. 25, w. 4 m., Alta.

20157. Aug. 25.—Authorizing G.T. Pacific Ry. to build bridge across Cottonwood Creek, mileage 211.6, Wolf Creek West, B.C.

20158. Aug. 23.—Approving revised location of Dominion Atlantic Ry. North Mountain Branch, between Grafton and Tory Lane, Cornwallis Tp., N.S.

20159. Aug. 23.—Approving plans of Dominion Atlantic Ry. station at Annapolis Royal, N.S.

20160. Aug. 22.—Authorizing Midland Ry., C.P.R., C.N.R. and G.T.P.R. to operate trains over crossings within the scope of interlocking plant installed in Parish Lot 55, St. Boniface, Man.

20161. Aug. 22.—Authorizing C.P.R. to divert road in Lot 10540, Kootenay District, B.C.

20162. Aug. 22.—Authorizing C.P.R. to build spur for British Columbia Sugar Refining Co., Regina, Sask.

20163. Aug. 18.—Approving location of Canadian Northern Ry. Alsask Branch through Tp. 26, R. 23-26, w. 3 m., Sask., mileage 105.42 to 125.45.

20164. Aug. 18.—Approving revised location of G.T. Pacific Ry. main line, mileage 138.19 to 149.41, Prince Rupert East, through Squin-Lix-Stat Indian Reserve, Cassiar District, B.C.

20165. Aug. 25.—Authorizing C.P.R. to cancel siding agreement of July 17, 1909, with Nelson-Ford Lumber Co.

20166. Aug. 23.—Amending order 19236 by providing that Campbellford, Lake Ontario and Western Ry. (C.P.R.) and Canadian Northern Ry. build the bridge and approaches over its own line on farm of J. Pearse, in south ½ Lot 4, Con. 4, Scarboro Tp., Ont.

20167. Aug. 19.—Amending order 19500, May 29, re removal of C.P.R. tracks at Herbert, Sask.

20168. Aug. 25.—Authorizing G.T. Pacific Ry. to build bridge across Dome Creek, mileage 273, Wolf Creek West, Cariboo District, B.C.

20169. Aug. 26.—Approving revised location of G.T. Pacific Ry. main line from west boundary of Lot 4900 into Fort George Indian Reserve, mileage 459.61 to 466.11, east of Prince Rupert, B.C.

20170. Aug. 19.—Authorizing G.T. Pacific Branch Lines Co. to build spur for Lyall-Mitchell Co. from its Melville-Regina Branch across Regina Municipal Ry. to the G.T.P.R. hotel site in Regina, Sask.

20171 to 20174. Aug. 26.—Authorizing G.T.R. to build spurs for C. Mould, Caledon Tp.; Ontario Granite Crushed Stone Co., Muskoka Wharf, Ont.; Brandon's Pressed Brick and Tile Co., Milton, and Britnell and Co., Somerville Tp., Ont.

20175. Aug. 26.—Authorizing Town of Sudbury, Ont., to build grade crossing over C.P.R. Sault Branch at intersection of Regent and Riverside Sts. with Copper Cliff Road.

20176. Aug. 18.—Authorizing County of Richelieu, Que., to build highway under Quebec, Montreal and Southern Ry., St. Joseph Parish.

20177. Aug. 26.—Authorizing New Brunswick Coal and Ry. to build bridge 1.1.

20178. Aug. 26.—Approving location of extension of Niagara, St. Catharines and Toronto Ry. to Lake Front, Lot 12, Con. 1, Grantham Tp., Ont., mileage 0 to 0.68.

20179. Aug. 26.—Approving location of C.N. Ontario Ry. station grounds at Bratton, Sask.

20180. Aug. 21.—Approving location of C.N. Ontario station grounds at Cedar Lake, mileage 162.06 from Ottawa.

20181. Aug. 26.—Approving revised location of Canadian Northern Ry. De Lourdes spur through Sec. 36, Tp. 6, R. 9, w.p.m., Man., mileage 0 to 2.627.

20182. Aug. 26.—Approving plans of Algoma Central and Hudson Bay Ry. station at Frater, Ont.

20183. Aug. 23.—Ordering the G.T. Pacific Ry. to erect fences and cattle guards at east end of its station grounds at Ingelow, Man.

20184. Aug. 19.—Extending to Oct. 30, time within which the C.P.R. move and complete stock pens at Shellburne, Ont.

20185. Aug. 25.—Ordering Toronto, Hamilton and Buffalo Ry. to employ day and night watchmen at crossing of Bailey St., Hamilton, Ont.

20186. Aug. 25.—Relieving G.T.R. from providing further protection of the first highway west of St. Hilaire Station, Que.

20187. Aug. 23.—Amending order 19957, Aug. 2, re Toronto Suburban Ry. crossing of G.T.R. at Acton, Ont.

20188. Aug. 18.—Authorizing Esquimalt and Nanaimo Ry. to build siding for Scott and Peden, Victoria, B.C.

20189. Aug. 26.—Authorizing Saskatchewan Government to build highway over C.P.R. and G.T. Pacific Ry. in Sec. 28, Tp. 32, R. 27, w. 2 m., Sask.

20190. Aug. 26.—Approving location of C.P.R. station at Conrad, Alta.

20191. Aug. 27.—Extending to Nov. 1, time within which C.P.R. shall install gates at the crossing of Montcalm St., St. Boniface, Man.

20192. Aug. 26.—Authorizing C.P.R. to build additional track across certain highways in Balfour Tp., Ont., Sudbury, Ont.

20193. Aug. 27.—Approving location of C.P.R. station at Port Burwell, Ont.

20194 to 20201. Aug. 19, 18, 26.—Authorizing C.P.R. to build spurs for Pease Foundry Co., Winnipeg; P. Verigin, Brilliant, B.C.; East Kootenay Lumber Co., Jaffray, B.C.; Canadian Rolling Mills

- Co., Montreal; Canada Produce Co., Montreal; O. Minnis, Markdale, Ont.; Quinlan and Robertson, Huntingdon Tp., Ont., and International Harvester Co., Lethbridge, Alta.
20202. Aug. 19.—Authorizing C.P.R. to divert road allowance in Sec. 4, Tp. 21, R. 9, w. 4 m., Alta., and to cross same at grade at mileage 60.78 of its Bassano Easterly Branch.
20203. Aug. 27.—Authorizing City of Edmonton, Alta., to extend Peace Ave. across Edmonton, Yukon and Pacific Ry. at grade.
20204. Aug. 27.—Ordering G.T. Pacific Branch Lines Co. to build its Prince Albert Branch across highway in s.e. $\frac{1}{4}$ Sec. 4, Tp. 33, R. 27, w. 2 m., at mileage 1.5, Sask., by Sept. 15.
20205. Aug. 27.—Authorizing Canadian Northern Ry. and G.T. Pacific Ry. to operate trains over junction of C.N.R. with National Transcontinental Ry. at St. Boniface, Man.
20206. Aug. 28.—Authorizing G.T. Pacific Branch Lines Co. to carry traffic over portion of its Biggar-Calgary Branch between Doddsland and Loverna, Alta., mileage 48 to 104.06.
20207. Aug. 27.—Authorizing Saskatchewan Government to build road under Canadian Northern Ry. right of way in s.w. $\frac{1}{4}$ Sec. 21, Tp. 29, R. 17, w. 3 m., Sask.
20208. Aug. 27.—Ordering Canadian Northern Ry. to build standard portable passenger and freight shelter and platform and two-car cattle pen at Mulvihill, Man.
20209. Aug. 28.—Relieving C.N. Ontario Ry. from providing further protection at crossing of Ontario St., Cobourg.
- 20210, 20211. Aug. 28, 27.—Authorizing C.P.R. to build spurs for Moose Jaw Flour Mills, Ltd., Moose Jaw, Sask., and for Sherwin-Williams Co., Winnipeg.
20212. Aug. 28.—Rescinding order 17282, re revised location of C.P.R. Crownsnest Pass Branch, in so far as it approves the location between mileage 15.1 and 31.5; providing that if C.P.R. file new plan showing connection at mileage 19, Board will approve revision from mileage 15.1 to 19.
20213. Aug. 27.—Authorizing C.P.R. to build at grade additional track across certain highways in Sudbury District, Ont.
20214. Aug. 27.—Relieving C.P.R. from speed limitation of 15 miles an hour on its Lauder extension from Tilson to Alida, Man., mileage 28.78 to 54.72.
20215. Aug. 27.—Approving revised location of portion of C.P.R. as built, from mileage 16.91 to 21.79, Schreiber Subdivision, Ont.
- 20216 to 20218. Aug. 27.—Authorizing C.P.R. to change grade at crossings of road allowances between Lots 28 and 29, Con. 2; between Cons. 2 and 3, and between Lots 26 and 27, Con. 2, Scarborough Tp., Ont., and authorizing building of double track at each point.
20219. Aug. 28.—Approving Express Classification for Canada 3, superseding present Classification 2.
20220. Aug. 28.—Authorizing City of Peterboro, Ont., to build De Laval St. across G.T.R. Midland Branch.
20221. Aug. 28.—Amending order 19036, July 31, re C.P.R. connection with Canadian Northern Ry. spur to Government elevator at Port Arthur, Ont.
20222. Aug. 26.—Recommending to Governor in Council for approval, rules and regulations of Montreal and Southern Counties Ry. Transportation Department.
20223. Aug. 29.—Approving clearances at coaling station at G.T.R. locomotive terminals, St. Lambert, Que.
20224. Aug. 29.—Authorizing City of St. John, N.B., to build a highway bridge over C.P.R. Cantilever Branch at Alexandra St. extension.
20226. Aug. 29.—Approving location of C.P.R. station at Willows, Sask.
- 20226, 20227. Aug. 20.—Authorizing C.P.R. to build spurs for H. J. Heinz Co., Leamington, Ont., and Western Canada Flour Mills Co., Winnipeg, and to divert highway to Campbellford, Lake Ontario and Western Ry. (C.P.R.) to divert highway between Lots 8 and 9, Con. B, Hamilton Tp., Ont.; to build across the Cobourg and Grafton Road by a subway, carrying the road under the C.L.O. & W.R. and G.T.R.
20229. Aug. 26.—Approving location of C.P.R. station at Limerick, Sask.
20230. Aug. 30.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to divert Fourth Depot River in Lot 12, Con. 8, Hinchinbrooke Tp., and to build bridge across same at mileage 33.54 from Glen Tay, Ont.
20231. Aug. 20.—Extending to Oct. 15, time within which C.P.R. was required by order 18512 to install gates at North Vancouver Ferry, Columbia Ave., and G.T.P.R. team crossings at Vancouver, B.C.
20232. Aug. 30.—Amending order 20102 by substituting Suffield for Sheffield where it occurs. (This error had been noticed and corrected in our summary before this amending order was passed.—Ed.)
20233. Sept. 2.—Authorizing C.P.R. to open for traffic portion of double track on its Swift Current Subdivision from Chaplin to Ernfold, mileage 54 to 66.5, Sask.
20234. Sept. 2.—Authorizing C.P.R. to build second track across highways at mileage 82.2 and 81.5, B.C.
- 20235 to 20237. Aug. 30.—Authorizing Lake Erie and Northern Ry. to build across certain highways in Oakland and Townsend Tps., Ont., and approving location from station 240+54 to 850+54.8.
20238. Sept. 2.—Authorizing C.N. Ontario Ry. to connect its Montreal-Port Arthur Line with the G.T.R. temporarily, pending expiration of lease from J. Morrison, across Eganville Road, Pembroke Tp., Ont.
20239. Aug. 30.—Authorizing C.N. Ontario Ry. to build spur for Point Anne Quarries, Thurlo 1p.
20240. Sept. 2.—Authorizing Alberta Government to build highway across Canadian Northern Ry. in n.e. $\frac{1}{4}$ Sec. 30, Tp. 29, R. 20, w. 4 m.
- 20241, 20242. Sept. 2, Aug. 30.—Authorizing C.N. Ontario Ry. to build across public roads between Lots 32 and 33, and 30 and 31, Con. C, Scarborough Tp., Co. York, Ont.
20243. Sept. 2.—Amending order 20058, Aug. 11, re spur across Canadian Northern Ry. in Cory Municipality, Sask., same to be built by W. A. Silverwood, Saskatoon, Sask., and not by W. Alexander, Silverwood, Sask.
20244. Aug. 30.—Authorizing C.P.R. to build spur for Dunmore Development Co., Medicine Hat, Alta.
- 20245, 20246. Aug. 30.—Suspending for 30 days from date the effective date of advanced rates in Supplement 17 to Tariff C.R.C. W-1615, and Supplement 24 to Tariff C.R.C. W-1713.
20247. Sept. 2.—Approving revision in grade of portions of C.P.R. main line from Farnham north-westerly to St. Johns, Que., mileage 6.35 to 10.80.
20248. Sept. 2.—Relieving G.T.R. from providing further protection at the first public crossing west of Colborne station, Ont.
20249. Sept. 2.—Authorizing C.N. Alberta Ry. to build spur to Jasper Park Collieries across public road between Sec. 7, Tp. 49, R. 27, and Sec. 12, Tp. 49, R. 28, w. 5 m., Alta.
20250. Aug. 30.—Approving plans of C.P.R. bridge 112.0 over Wyandotte St., Windsor, Ont.
20251. Sept. 2.—Authorizing Edmonton, Dunvegan and British Columbia Ry. to build across certain highways in Alberta.
20252. Sept. 5.—Authorizing Lake Erie and Northern Ry. to build across 3 highways in Brantford Tp., Ont.
20253. Sept. 3.—Amending order 20134, Aug. 16, re diversion of highways in Pelham Tp., Ont., by Toronto, Hamilton and Buffalo Ry.
20254. Sept. 5.—Authorizing Ontario Hydro-Electric Commission to erect 40,000 volt line across C.P.R. on Arthur St., Elmira.
20255. Sept. 4.—Authorizing Edmonton, Dunvegan and British Columbia Ry. to build across 26 highways in Alberta.
20256. Sept. 4.—Approving plans and specifications of Morrison drain, to be built under Michigan Central Rd. in Harwick Tp., Ont.
20257. Sept. 5.—Recommending to Governor in Council for sanction London & Lake Erie Ry.'s Book of Rules.
20258. Sept. 3.—Authorizing C. N. Alberta Ry. to build spur to Wellman Gravel and Supply Co. across public road between Secs. 30 and 29, Tp. 54-1, w. 5 m.
20259. Sept. 4.—Authorizing Canadian Northern Ry. to build across Coteau St., Moose Jaw, Sask., by structure carrying highway over railway.
20260. Sept. 3.—Authorizing Canadian Northern Ry. to build spur for A. MacDonald Co., Ltd., across Vickers St., to serve Lots 417 and 418, Wiley Addition, Fort William, Ont.
20261. Sept. 5.—Authorizing C.N. Western Ry. to cross C.P.R. main line overhead in Sec. 2-13-6, w. 4 m., Alta.
20262. Sept. 4.—Authorizing C.P.R. to build additional track across Quebec, Montreal and Southern Ry., at mileage 18.81 from Farnham, on its main line from Farnham to St. Johns, Que.
20263. Sept. 4.—Authorizing C.P.R. to open for traffic portion of its Weyburn Westerly Branch from Assiniboia to Woodrow, mileage 112 to 145.7, Sask.; speed of trains to be limited to 18 miles an hour.
20264. Sept. 4.—Authorizing C.P.R. to build additional track on bridge across C.N. Ontario Ry. at mileage 92.84, Toronto Subdivision, in Lot 4, York Tp.
20265. Sept. 5.—Approving location of C.P.R. station at Dand, Man.
20266. Sept. 4.—Authorizing C.P.R. to build bridges 19, near Mitigan, B.C., and 97.2, over Vermillion River, near Larchwood, Ont.
20267. Sept. 4.—Extending, to Nov. 1, time within which C.P.R. is required to complete diversion of Nine Mile Road, in Lots 5 and 7, Con. 9, South Gower Tp., Ont.
20268. Sept. 3.—Authorizing C.P.R. to open for traffic portion of its double track from Farnham to Iberville Jct., Que., 12 miles.
20269. Sept. 3.—Authorizing C.P.R. to build bridge 88.29, near Glacier, B.C.
20270. Sept. 6.—Authorizing C.P.R. to build additional track across 56 highways, mileage 55.39 to 110.5, Swift Current Subdivision, Alta.; and mileage 0 to 6, Medicine Hat Subdivision, Alta.
20271. Sept. 4.—Authorizing G. T. Pacific Ry. to build two spurs for Northern Lumber Co., Edmonton, Alta.
20272. Sept. 4.—Authorizing G. T. Pacific Branch Lines Co. to build Y from its Cutknife Branch at mileage 47, in n.w. $\frac{1}{4}$ Sec. 10-45-23, w. 3 m., Sask.
20273. Sept. 5.—Authorizing G.T. Pacific Branch Lines Co. to carry traffic over portion of its Regina-Boundary Branch, between Talmage and Boundary Lane, mileage 66.5 to 155; speed of trains to be limited to 25 miles an hour.
20274. Sept. 3.—Amending order 19643, June 16, re location of G. T. Pacific Branch Lines Co.'s stations in Cariboo District, B.C., by substituting G. T. Pacific Ry. for G. T. Pacific Branch Lines Co.
20275. Sept. 3.—Approving location of G. T. Pacific Ry. stations at Mount Robson, Albrede and Eddy, B.C., and rescinding order 19010, April 8, in so far as it approves of stations at Mount Robson and Albrede.
20276. Sept. 3.—Authorizing G. T. Pacific Ry. to build its Lake Superior Branch across highway between Lots 20 and 21, Con. 3, and Arthur St., Neebing Tp., Ont.
- 20277, 20278. Sept. 4, 2.—Authorizing G.T.R. to build sidings for Goodyear Rubber Co., Bowmanville, and John Heney and Son, Ottawa, Ont.
- 20279, 20280. Sept. 5, 3.—Authorizing G.T.R. to rebuild bridges 113, over Coaticook River, at milepost 164.98, District 2; and 241, at mileage 52.29, over Portage Creek, Dewittville Parish, Que.
- 20281, 20282. Sept. 3, 5.—Authorizing G.T.R. to build siding on Lot 23, Raleigh Tp., now in Chatham, Ont., westerly, connecting with C.P.R. spur there, and siding and spur from south of Main St., Welland, Ont., for Canada Forge Co.
20283. Sept. 5.—Approving clearances of tramway at G. T. R. siding at Lindsay, Ont.
20284. Sept. 5.—Authorizing G.T.R. to build siding for MacDonald Thresher Co., Stratford, Ont.
20285. Sept. 3.—Authorizing Quebec, Montreal and Southern Ry. to use bridge over St. Francois River, between St. Francois du Lac and Pierreville, Que.; speed of trains to be limited to 5 miles an hour.
20286. Sept. 4.—Authorizing Quebec, Montreal and Southern Ry. to build branch across St. Thomas St., Longueuil, Que., for D. Brisette & Co.
20287. Sept. 3.—Authorizing C.P.R. to build spur and two sub spurs for Dwyer Elevator Co., Fort William, Ont.
20288. Sept. 8.—Authorizing G.T.R. to build siding from its Ashbridge's Bay spur, east of Cherry St., Toronto, along and across what is known as the 150 foot roadway and across Keating's Channel, for 135 ft.; thence for 2,415 ft. in Toronto Harbor Industrial District.
- 20289, 20290. Sept. 5.—Authorizing C. N. Western Ry. to build across C.P.R. in Sec. 18-13-6, w. 4 m. and across C.P.R. spur at Redcliffe, Alta.
20291. Sept. 8.—Authorizing C.P.R. to build highway crossing opposite Ninth Ave., Blairmore, Alta.; and rescinding order 18368, authorizing it to open up original road allowance known as Twelfth St., across its tracks.
20292. Sept. 8.—Authorizing Quebec, Montreal and Southern Ry. to build, subject to consent of Montreal South Village, spur for Lapointe and Mailloux.
20293. Aug. 18.—Approving revised location Edmonton, Dunvegan & British Columbia Ry. from mileage 120.7 to 122.88, through Tp. 70, R. 1, w. 5 m., Alta.
20294. Sept. 8.—Approving location of Alberta Central Ry. from mileage 10 to 20, Red Deer to Sounding Creek; and authorizing crossing of 11 highways.
20295. Sept. 8.—Amending order 19532, June 9, re express delivery and collection limits in Steelton, Sault Ste. Marie, Ont.
20296. Sept. 2.—Ordering Canadian Northern Ry. to build standard portable station and loading platform at Eriksdale, Man.; work to be completed within 30 days.
20297. Sept. 6.—Authorizing C.P.R. to build spur and two sub spurs for Manitoba Rolling Mills Co., St. Clements Parish, Man.
20298. Sept. 9.—Extending, for three months from date, time within which G.T.R. shall complete branch for Dominion Cannery, Ltd., Simcoe, Ont.
20299. Sept. 9.—Extending, to Sept. 30, time within which C.P.R. and G.T.R. shall install electric bells at crossing of Perth Road, one mile north of Kingston, Ont.
20300. Sept. 9.—Extending, to Nov. 30, time within which C.P.R. shall complete spur for T. Jackson & Son, Winnipeg, as authorized by order 19450.
20301. Sept. 10.—Authorizing C.P.R. to build bridge 24.20 over Cray Creek, Shuswap Subdivision, B.C.
- 20302, 20303. Sept. 9.—Authorizing C.P.R. to build additional track, at grade, across highway between Sec. 4-18 and Sec. 33-17-6, at mileage 59.69; and across highway between Secs. 16 and 17-17-9, w. 3 m., at mileage 80.97, Swift Current Subdivision, Sask.
20304. Sept. 9.—Amending order 19842, July 19, re Campbellford, Lake Ontario and Western Ry. spur across C. N. Ontario Ry. at mileage 122.02 from Glen Tay.
- 20305, 20306. Sept. 10.—Authorizing C.N. Ontario Ry. to build bridges across Petawawa River, middle crossing, mileage 150.15 from Ottawa, Montreal-Port Arthur Line; and across Petawawa River, east crossing, mileage 142.5 from Ottawa, Ottawa-Capreol Line.
- 20307, 20308. Sept. 11, 9.—Authorizing Campbellford, Lake Ontario and Western Ry. to swing scaffolds temporarily, for 30 days, under structure carrying its line over G.T.R. at mileage 69.25 and 121.52 from Glen Tay, with a height of not less than 18 ft.
20309. Sept. 10.—Authorizing C.P.R. to open for traffic portion of its Suffield West Branch, from mileage 0 to Terrace, 26.4 miles.
20310. Sept. 9.—Authorizing C.P.R. to build spur for R. Graham & Sons Shale Products (Ltd.), near Inglewood Jct., Ont.
20311. Sept. 9.—Extending, to Jan. 1, 1914, time within which C.P.R. shall comply with requirements of general order 108, re Board's uniform rules regarding yard limits.
20312. Sept. 9.—Authorizing Quebec, Montreal and Southern Ry. to build spur for Sir W. G. Armstrong, Whitworth and Co., at Longueuil, Que.
20313. Sept. 11.—Authorizing Brantford Tp., Ont., to build Linden Ave. over Brantford and Hamilton Electric Ry.

20314. Sept. 11.—Authorizing Essex Terminal Ry. to build, at grade, across Lloyd Ave., Ojibway, Ont.
20315. Sept. 10.—Approving revised location of G. T. Pacific Ry. station at mileage 422, Prince Rupert East, Lot 833, B.C.
20316. Sept. 11.—Authorizing G. T. Pacific Branch Lines Co. to carry traffic over its Tofteld-Calgary Branch, between Beiseker, mileage 163, and mileage 197.7, Alta.
20317. Sept. 11.—Authorizing C.P.R. to build, at grade, across road allowance between s. w. ¼ Sec. 4, and s. e. ¼ Sec. 5-2-14 w. p. m., Napinka Sub-division, Man.
20318. Sept. 12.—Authorizing C.P.R. to terminate agreement with D. Silver, dated Dec. 1, 1910, under which siding was built in s. w. ¼ Sec. 26-21-20, e.p.m., Man.
20319. Sept. 12.—Authorizing C.P.R. to change grade crossing in road allowance between Lots 30 and 31, Con. 2, Scarborough Tp., and build additional track at grade across same.
20320. Sept. 12.—Approving C.P.R. standard 20 ft. concrete arch plan B-14-29.
20321. Sept. 9.—Approving location of Edmonton, Dunvegan and British Columbia Ry. station grounds in Morinville, Alta., station to be located 400 ft. east of Rue Champlain, on north side of track.
20322. Sept. 11.—Authorizing Essex Terminal Ry. to build at grade across Weaver Ave. and Elliott Road, Ojibway, Ont.
20323. Sept. 12.—Authorizing Canadian Northern Ry. to build across public road between Secs. 2 and 27, Tp. 36, R. 10, w. 2 m., on its Thunderhill Branch.
20324. Sept. 11.—Authorizing C.N. Ontario Ry. to build spur for Point Anne Quarries, Ltd., at about mileage 126.08, Toronto-Ottawa Line, through Lots 21 and 20, Point Anne Concession, Thurlow Tp., to join spur to be built by Point Anne Quarries, Ltd.
20325. Sept. 11.—Approving G.T. Pacific Branch Lines Co. revised location and station grounds between mileage 57 and 58, Melville-Regina Branch, in Sec. 12-20-15, w. 2 m., Assiniboia District, Sask.
20326. Sept. 12.—Authorizing Lake Erie and Northern Ry. to build across two highways in Townsend Tp., Ont.
20327. Sept. 15.—Extending, to Sept. 30, time within which London St. Ry. shall complete half interlocking plant at crossing of Adelaide St.; and authorizing it and C.P.R. to operate cars and trains over same, to be flagged across by day and night watchmen, employed by C.P.R. at expense of London St. Ry.
20328. Sept. 12.—Relieving G.T.R. from providing further protection at first crossing east of Ste. Madeleine station, Que.
20329. Sept. 13.—Ordering Michigan Central Rd., T.H. & B. Ry., and C.P.R., jointly, to reduce their rate on coal, in carloads, from Suspension Bridge, Black Rock and Buffalo, N.Y., to Islington and Lambton, Ont., from 75 to 70c. a ton of 2,000 lbs., to become effective not later than Oct. 27, and rescinding order 20047, Aug. 8, in this connection.
20330. Sept. 5.—Authorizing C.N. Alberta Ry. to build spur from n. e. ¼ Sec. 30-54-1, w. 5 m., for Wellman Gravel and Supply Co., to be completed within three months.
20331. Sept. 16.—Approving location of Campbellford, Lake Ontario and Western Ry. (C.P.R.) station at Brighton, Ont., mileage 97.1 from Glen Tay; provided that whenever traffic on highway is blocked for more than 5 minutes at any one time, the Board be at liberty to relocate same; and approving change in location approved by orders 16325 and 16912, so as to include extra land required for station grounds.
20332. Sept. 16.—Authorizing G. T. Pacific Branch Lines Co. to carry traffic over portion of its Moosejaw Northwest Branch from Moosejaw, mileage 40.1 on Regina-Moosejaw Branch, to Mawer, mileage 44.9 on Moosejaw Northwest Branch, 47.3 miles; speed of trains limited to 15 miles an hour.
20333. Sept. 17.—Approving location of Edmonton, Dunvegan and British Columbia Ry., from Sec. 25-72-5, mileage 156.11, to Sec. 30-74-17, w. 5 m., mileage 238.89, Alta.
20334. Sept. 16.—Ordering Canadian Northern Ry. to grade approaches to crossing of road allowance between Secs. 13 and 14-54-5, w. 5 m., Alta.; to raise south approach to crossing of public road between Secs. 17 and 18-54-4, 2 ft., and make it at least 20 ft. wide, and cattleguards to be properly adjusted; work to be completed within 30 days from date.
20335. Sept. 17.—Authorizing Dominion Atlantic Ry. to use drawbridge at south end of its bridge over Shubenacadie River, South Maitland, N.S.
20336. Sept. 15.—Authorizing C. N. Western Ry. to build its Red Deer-Calgary Branch across G. T. Pacific Ry. Tofteld Branch, in n. e. ¼ Sec. 4-25-28, w. 4 m., Alta.
20337. Sept. 16.—Approving location of Canadian Northern Ry. Alsask Branch, through Tps. 26-28, R. 26-29, w. 3 m., Sask., mileage 125.45 to 148.34.
20338. Sept. 15.—Authorizing C. N. Quebec Ry. to build across 9 highways in Lussier, Rawdon, Chertsey and Chilton Tps.
20339. Sept. 16.—Relieving G. T. Pacific Ry. from erecting fences on its line east of Prince Rupert, to mileage 164, such relief to cease as soon as any land on either side, or in vicinity, becomes settled or improved.
20340. Sept. 15.—Approving Canadian Northern Ry. third-class station at Webster, Sask.
20341. Sept. 15.—Approving G. T. Pacific Branch Lines Co.'s station site and station at Dorence, Alta.
20342. Sept. 15.—Removing speed limitation of 15 miles an hour on trains over C.P.R. Bassano to Irricana Branch, between Bassano and Standard, Alta.
20343. Sept. 17.—Approving location of C.P.R. stations at Melaval, Readlyn, Woodrow, and Lafleche, Sask.
20344. Sept. 16.—Authorizing C.P.R. to divert road in Sec. 25-14-19, w. 4 m., Alta; and to build its Suffield-Blackie Branch at grade across same.
20345. Sept. 15.—Authorizing C.P.R., after diversion of Front St. is made, to close portion of road allowance within its right of way at Broadview, Sask.
20346. Sept. 17.—Extending, to Nov. 15, time within which C.P.R. shall complete spur for Canada Wire & Cable Co., Toronto, authorized under order 19471.
20347. Sept. 16.—Approving location of Canadian Northern Ry. Grosse Isle Branch, mileage 74.47, to 80.88, Man.
20348. Sept. 17.—Ordering C.P.R., within 60 days, to install improved type of automatic electric bell at crossing of Port Burwell Road, mileage 32.7, Port Burwell Branch; 20% to be paid out of the railway grade crossing fund.
20349. Sept. 11.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to cross Prospect St., at grade; crossing to be protected by gates installed by company; to cross Albert St. by diverting and carrying it over railway; to take whatever additional land may be required for such purposes, and to cross Simcoe St. by carrying street over railway, and to divert Centre St. by extending Hall St. easterly to Simcoe St., and to close existing crossing on Centre St.; also approving location of station, all at Oshawa, Ont.
20350. Sept. 17.—Approving G. T. Pacific Ry. station and station site at mileage 179.2, Cariboo District, B.C.
20351. Sept. 18.—Amending order 20148, Aug. 20, re C.P.R. bridge over G. T. P. at mileage 88.6, Toronto Subdivision.
20352. Sept. 17.—Authorizing C.P.R. to open for traffic portion of second track between mileage 86.8 and 47.8, Cascade Subdivision, B.C.
20353. Sept. 18.—Amending order 19832, July 18, re Alberta Government highway crossings over G. T. Pacific Ry. Calgary Branch, at Duhamel.
- 20354, 20355. Sept. 17.—Authorizing G.T.R. to build sidings for Dominion Textile Co. and Grasse-elli Chemical Co., Montreal.
20356. Sept. 17.—Authorizing C.P.R. to build spur for Ogilvie Flour Mills Co., Calgary, Alta.
20357. Sept. 17.—Authorizing C.P.R. to divert road allowance in Sec. 14-16-20, w. 4 m., Alta.; and to build its Suffield-Blackie Branch at grade across same at mileage 83.97.
20358. Sept. 17.—Authorizing Dominion Atlantic Ry. to build bridge over Cambridge Brook, 77.9 miles from Halifax and about 300 ft. east of Cambridge station, N.S.
20359. Sept. 17.—Authorizing C. N. Alberta Ry. to build spur for Jasper Park Collieries through Secs. 7-49-27 and 12-49-28, w. 5 m.
20360. Sept. 19.—Relieving G.T.R. from providing further protection at Tecumseth Road crossing, one mile east of Stoney Point station, Ont.
20361. Sept. 19.—Approving amended location of G.T. Pacific Ry. station at Smithers, mileage 226.5, Prince Rupert East, B.C.; and rescinding approval of station at mileage 227, under order 16278, Apr. 9, 1912.
20362. Sept. 19.—Authorizing C.P.R. to build bridges for double track at mileage 78.4 and 3.2, Moose Jaw Subdivision; and at mileage 87.0, Rush Lake; at 92.1 over Antelope Creek, and 101.2, Swift Current Subdivision, Sask.
20363. Sept. 19.—Amending order 18931, Mar. 27, re C.N. Quebec Ry. station and freight shed at Maisonneuve.
20364. Sept. 19.—Ordering Canadian Northern Ry. to provide standard one pen, two car capacity, stock yard, with platform and chute, at Sturgis, Sask., by Oct. 10.
20365. Sept. 20.—Authorizing C.P.R. to build spur for Canadian Concrete Products Co., Chatham, Ont.
20366. Sept. 20.—Authorizing C.P.R. to build two bridges at mileage 52.5, Moose Jaw Subdivision; and extension of bridge at Rush Lake, mileage 73.4, Swift Current Section, Sask.
20367. Sept. 20.—Authorizing G.T. Pacific Ry. to carry traffic over portion of main line east of Prince Rupert, B.C., between Morricetown, mileage 205 and mileage 301; trains limited to 25 miles an hour between mileage 205 and 245; 15 miles an hour between mileage 245 and 301; and 6 miles an hour over uncompleted bridges and temporary crossing of Bulkely River, mileage 263.
20368. Sept. 20.—Authorizing G.T.R. to build bridges 59, mileage 147.53, from Black Rock, over Bayfield Creek, London Division, and 202, mileage 150.75, near Huntsville, over Big East River, Barrie Division, Ont.
20369. Sept. 22.—Extending for 30 days from date, time within which G.T.R. shall complete spurs for Pilkington Bros., Thorold Tp., Ont., authorized by order 19601, June 17.
20370. Sept. 20.—Approving location of C.P.R. stations at Lemsford, Abbey and Prelate, Sask.
20371. Sept. 20.—Ordering G.T.R. to employ watchman at crossing of Edinburgh St., Guelph, Ont., between 7 a.m. and 7 p.m.
20372. Sept. 22.—Approving plan, etc., of John Beck drain, to be built under G.T.R. at mileage 20.14, South Norwich Tp., Ont.
20373. Sept. 20.—Authorizing C.P.R. to open for traffic portion of double track, from Kennay to Griswold, mileage 8.2 to 24.8, Man.
20374. Sept. 22.—Authorizing C.P.R. to build bridges 9.3, near Red Deer, Alta., and 113.1, near West Shefford station, Que., and rescinding order 20092, authorizing building of bridge 113.1.
20375. Sept. 20.—Authorizing C.N. Quebec Ry. to build across public road in Lot 154, R. 5, Rawdon Tp.
20376. Sept. 20.—Authorizing Canadian Northern Ry. to build bridge to carry its line across C.P.R. and Moose Jaw Creek (third crossing), at mileage 86.1, Sask.
20377. Sept. 22.—Authorizing C.P.R. to build spurs for Whitlock and Riddell, Moose Jaw, Sask., one from station grounds across North Railway Ave. and Edgell Ave., Camrose, Alta., and one each for Vernon Fruit Co. and Provincial Telephone Co., Camrose, Alta.
20379. Sept. 22.—Exempting C.P.R. from complying with requirements as to publication of notice of application, and recommending to Governor in Council for sanction, agreement of Aug. 15, with the Minister of Railways and Canals.
20380. Sept. 22.—Authorizing C.P.R. to build extension to spur for Western Coal Co., St. John Parish, Winnipeg.
20381. Sept. 22.—Authorizing Montreal and Southern Counties Ry. to operate trains over G.T.R. crossing, 7.45 miles from Montreal, in St. Antoine de Longueuil Parish, without stopping.
20382. Sept. 23.—Authorizing C.N. Ontario Ry. to build overhead across St. Denis St. (now Albert St.), Montreal.
20383. Sept. 23.—Authorizing C.P.R. to divert road along south westerly side of right of way, from road allowance along northerly side of n.e. ¼ Sec. 35-39-23, w. 4 m., to Leon St., Alix, Alta.
20384. Sept. 19.—Amending order 20230, Aug. 30, re diversion of Fourth Depot River, Hinchinbrooke Tp., Ont., by Campbellford, Lake Ontario and Western Ry. (C.P.R.)
20385. Sept. 22.—Authorizing C.P.R. to build a switching lead northerly from Vine St., Toronto.
20386. Sept. 23.—Authorizing C.P.R. to operate trains over 17 bridges, Lake Superior Division, Ont.
20387. Sept. 22.—Extending, to Nov. 30, time within which C.P.R. shall install gates at Osler Ave., North Toronto; pending installation, crossing to be protected by day and night watchmen employed by the company.
20388. Sept. 22.—Authorizing C.P.R. to build spurs for Dominion Bridge Co. on Saskatchewan Ave., Winnipeg.
20389. Sept. 22.—Authorizing C.P.R. to build road diversion in Sec. 15-18-15, w. 2 m., across its double tracks at station 877, Moose Jaw Subdivision, Sask.
20390. Sept. 24.—Authorizing C.P.R. to open for traffic portion of second track from Iberville Jct. to Iberville station, Que., mileage 18.7 to 19.2.
20391. Sept. 23.—Approving clearances of C.P.R. train shed at Windsor St., Montreal.
20392. Sept. 22.—Authorizing Dominion Atlantic Ry. to build its North Mountain Branch across Burgess, Grafton and Chute Roads, between Centreville and Weston, N.S.; and rescinding authority under order 16582, May 22, 1912, in same connection.
20393. Sept. 23.—Amending order 20075, Aug. 15, re C.N. Ontario Ry. temporary crossing in Westmeath Tp.
20394. Sept. 23.—Approving plan, dated Sept. 18, showing proposed changes in Algoma Steel Corporation's power canal at Sault Ste. Marie, where it crosses C.P.R. bridge at mileage 181.49, Lake Superior Division, Ont.
20395. Sept. 24.—Authorizing Lake Erie and Northern Ry. to use, pending installation of interlocking plant required under order 19248, June 4, the crossing of Grand Valley Ry. at Station 1059.06, for construction purposes only; trains and cars to be flagged over crossing by signalman provided by L.E. & N.R.
20396. Sept. 24.—Authorizing C.P.R. to open for traffic portion of its Estevan Northwest Branch from Estevan to Neptune, mileage 0 to 54, speed of trains limited to 20 miles an hour.
20397. Sept. 22.—Ordering C.P.R. to cause its western officials to issue a circular to employes, similar to circular 34, issued by its eastern officials applying to Eastern Lines.
20398. Sept. 24.—Authorizing C.P.R. to open for traffic portion of its double track between Roberts and Ramsay, Ont., mileage 60 to 70.9, Chapeau Subdivision.
20399. Sept. 24.—Authorizing Algoma Central and Hudson Bay Ry. to use overhead bridge between Cathcart St. and Wilde Ave., Tagona, Ont.
20400. Sept. 23.—Approving revised location G.T. Pacific Ry. through Lot 2012-A, mileage 360, east of Prince Rupert, R. 5, Coast District, B.C.
20401. Sept. 23.—Authorizing G.T.R. to use subway carrying Coxwell Ave., Toronto, underneath its tracks.
20402. Sept. 24.—Authorizing Saskatchewan Board of Highway Commissioners to build highway over G.T. Pacific Ry. in n.e. ¼ Sec. 18-14-18, w. 2 m.
20403. Sept. 24.—Authorizing C.P.R. to build spur for J. B. Tudhope and R. A. Carman, and change location of International Harvester Co.'s spur, Regina, Sask.
20404. Sept. 24.—Approving location of C.P.R. stations at Strathmead and Strangmuir, Alta.
20405. Sept. 24.—Approving Campbellford, Lake Ontario and Western Ry. (C.P.R.) plan showing general layout and masonry details of bridge 87.14 over Sidney St., Trenton, Ont.
20406. Sept. 24.—Authorizing Canadian Northern Ry. to build branch line to gravel deposit near Findlater, Sask., and to cross surveyed road between stations 21.66 and 22.33.

20407. Sept. 23.—Ordering Kettle Valley Ry. to build two farm crossings where it crosses M. W. Smith's farm, Beaverdell, B.C.

20408. Sept. 24.—Authorizing Ottawa and New York Ry. and St. Lawrence and Adirondack Ry. to use on their locomotives wire mesh netting with openings 3-16 in. by $\frac{3}{4}$ in., made of wire not less than 0.135 in. dia., in lieu of requirements as to wire mesh netting in general order 107.

20409. Sept. 24.—Authorizing C.P.R. to take certain lands for completing diversion of Nine Mile Road, South Gower Tp., Ont., as provided by orders 18958 and 20267, Apr. 1 and Sept. 4.

20410. Sept. 25.—Authorizing C.P.R. to build passing track across road allowance between s.w. $\frac{1}{4}$ Sec. 27 and s.e. $\frac{1}{4}$ Sec. 28-16-25, w. 2 m., Sask.

20411. Sept. 23.—Ordering that within 90 days from date Campbellford, Lake Ontario and Western Ry. (C.P.R.) and G.T.R. each install improved type of automatic electric bell at crossing of road allowance between Lots 16 and 17, Con. A, Haldimand Tp.

20412. Sept. 25.—Relieving C.P.R. from providing further protection at crossing of highway at Moffatt station, Nassagaweya Tp., Ont.

20413. Sept. 24.—Amending order 18761, Feb. 20, re Campbellford, Lake Ontario and Western Ry. (C.P.R.) subway in Scarborough Tp., at mileage 180.56 from Glen Tay, Ont.; and amending order 19381 re C.N. Ontario Ry. subway and road diversion at the same point.

20414. Sept. 25.—Establishing Dominion Ex. Co.'s delivery limits in Bassano, Alta.

20415. Sept. 24.—Rescinding order 20246, Aug. 30, suspending for 30 days effective date of advanced rates in Supplement 24 to Tariff C.R.C. W-1713, filed by C.P.R.

20416. Sept. 25.—Authorizing Algoma Central and Hudson Bay Ry. to open for traffic its main line from Franz to Oba, Ont., mileage 30.08 to 81.

20417. Sept. 25.—Authorizing Algoma Eastern Ry. to open for traffic its main line from West River to Goat Island, Ont., mileage 60.76 to 80.49.

20418. Sept. 25.—Authorizing Canadian Northern Ry. to build across 7 highways on its Alsask South-easterly Line, Sask.

20419. Sept. 25.—Approving proposed revision of grade on C.N. Ontario Ry. Montreal-Hawkesbury line from mileage 46.69 to 48.62 from Hawkesbury, Cartierville Tp., Que.

20420. Sept. 25.—Authorizing G.T.R. to build siding across Wellington St., Berlin, Ont.

20421. Sept. 25.—Authorizing G.T. Pacific Branch Lines Co. to build spur for International Harvester Co., Yorkton, Sask.

20422. Sept. 25.—Approving amended location of G.T. Pacific Ry. station at McBride, B.C., and rescinding approval under order 19643, June 16.

20423. Sept. 25.—Authorizing City of Ottawa to build sewer across C.P.R. lands under its tracks, work to be done under supervision of an inspector or engineer appointed by the company, city to indemnify company against any loss or damage by reason of the construction.

20424. Sept. 25.—Approving M.C.R. plan showing bridge 27.74 to be built over Alexander drain, between Comber and Ruscomb, Ont.

20425. Sept. 25.—Approving location of C.P.R. station at Schepler, mileage 51.4, on Port McNicoll Subdivision, Ont.

20426. Sept. 25.—Authorizing G.T.R. to build siding for S. L. Lambert, Welland, Ont.

20427. Sept. 26.—Authorizing C.P.R. to build Y at Balgonie, Sask., across highway adjoining its right of way.

20428. Sept. 18.—Authorizing City of Toronto to rebuild Gerrard St. bridge over C.P.R., G.T.R., C. N. Ontario Ry., and Toronto industrial siding.

20429. Sept. 24.—Authorizing Bell Telephone Co. to erect poles and wires along De Biencourt St., Montreal, from Boulevard Monk to Raxilly St.

20430. Sept. 27.—Approving Campbellford, Lake Ontario and Western Ry. (C.P.R.) revised location at Cobourg, Ont., until Nov., to enable it to remove Crossen Car Co.'s sheds, after which the revision be abandoned and it revert to location approved Apr. 14; authorizing it to cross G.T.R.'s Y; same to be protected by a watchman, and ordering it to submit new plans for approval, showing land required to be taken from G.T.R.

20431. Sept. 26.—Approving revised location of G. T. Pacific Branch Lines Co.'s Brandon Branch, mileage 0 to 0.46, Brandon District, Man.; authorizing building of same across Government road allowance between Secs. 4 and 5-12-15, and authorizing the building of a junction between same and G. T. Pacific Ry. main line.

20432. Sept. 26.—Authorizing G. T. Pacific Branch Lines Co. to carry traffic over its Tofield Branch from mileage 197.7 to 20.15 (Calgary), Calgary Branch from mileage 197.7 to be proceeding of highway at mileage 197.8 to be protected by electric bell, and pending installation all tected by either direction be stopped 75 ft. from crossings and proceed over crossing under control, preing and stop at any moment; that temporary station or platform be provided at Calgary, and speed of trains be limited to 10 miles an hour through thickly settled portions within city limits.

20433. Sept. 26.—Authorizing G.T.R. to build sidings for Otis-Fensom Elevator Co., Hamilton, Ont.

20434. Sept. 26.—Authorizing C. N. Ontario Ry. to build across public road in Lot 7, Con. A, Etobicoke Tp., said public road to be connected with Islington Ave., north of C.N.O.R. tracks.

20435. Sept. 26.—Approving location of Moncton and Northumberland Strait Ry. from Richibucto to Buetouche, N.B., 19 miles.

20436. Sept. 27.—Authorizing C.P.R. to build its Forsyth St. Branch across Montreal Tramways Co.,

on Davidson St.; provided M. T. Co. change location of tracks at crossing, to provide safe clearance between sides of cars and vertical support of overhead structure; cost to be paid by C.P.R.

20437. Sept. 23.—Authorizing City of Toronto to build viaduct carrying Bloor St. across C.P.R., C. N. Ontario Ry., and G.T.R., to connect with Danforth Ave., east of Don River, subject to conditions that piers shown on plans be moved 45 ft. to the east, and providing there be room between river and pier D to enable C.N.O.R. to place tracks.

20438. Sept. 24.—Extending express collection and delivery area in Walkerville, Ont., as prescribed by order 19534, June 9.

20439. Sept. 26.—Authorizing Montreal and Southern Counties Ry. to operate its trains and cars over Central Vermont Ry. between Richelieu and Marieville, Que., and to use C.V.R. stations, yards and other facilities.

20440. Sept. 27.—Authorizing C.P.R. to build bridge 75.6, Havelock Subdivision, Ont.

20441. Sept. 27.—Approving, temporarily, G. T. Pacific Ry. Standard Freight Mileage Tariff C.R.C. 19, incorporating and superseding C.R.C. 17 by extension of mileage, to apply between stations in British Columbia, Prince Rupert to Siding 9, mileage 301, inc., pending judgment in inquiry into rates charged generally in B.C.

20442. Sept. 26.—Approving location of C.P.R. station at Regent, Man.

20443. Sept. 30.—Extending to Apr. 30, 1914, time within which C.P.R. shall complete branch lines for P. Burns & Co., Calgary, Alta., authorized under order 19761, July 5.

20444. Sept. 30.—Approving location of C.P.R. station at Foremost, Alta.

20445. Sept. 29.—Ordering C.P.R. to fence its right of way from mileage 91.3 to 91.8, north of Rutter Station, Ont., on both sides of track; and from mileage 89.8 to 89.3, south of Rutter Station, on west side of track only.

20446. Sept. 30.—Authorizing C.P.R. to build diversion of road allowance in Sec. 7-22-25, w. 4 m., Alta., and authorizing it to build at grade its Gleichen-Shepard Branch across same at mileage 19, and to close portion of road allowance within its right of way.

20447. Sept. 30.—Authorizing C.P.R. to open for traffic portion of its Swift Current Northwest Branch from Cabri to Westerham, Sask., mileage 34.8 to 94, and relieving it of speed limitation of 15 miles an hour between mileage 34.8 and 33.0, imposed under order 16869, June 25.

20448. Sept. 29.—Authorizing Lachine, Jacques Cartier and Maisonneuve Ry. to take certain lands in Montreal required for diversion of Harbor St., lands being required to give effect to order 16181, Mar. 28, 1912, authorizing crossing of certain streets, including diversion of Harbor St.

20449. Sept. 29.—Ordering that crossing of Wallace Ave., Toronto, by G.T.R., be protected by gates operated by day and night watchmen appointed by company; cost of installing and maintenance to be paid by city; work to be completed within 60 days from date, and rescinding order 9247, Jan. 12, 1910, upon installation of gates.

20450. Sept. 26.—Authorizing G.T.R. to build siding and spur for Ogilvie Flour Mills Co., west of Mill St., Montreal.

20451. Sept. 27.—Authorizing G.T.R. to build siding from west of Gore St., Stratford, Ont., easterly across Gore St., to be completed within three months from date.

20452. Sept. 29.—Extending for three months from date time within which G.T.R. shall build branch lines in Port Colborne, Ont., authorized by order 19535, June 4.

20453. Sept. 29.—Authorizing C. N. Ontario Ry. to build temporary grade on its Montreal-Hawkesbury line from mileage 46.69 to 48.62, for construction purposes only for one year, and to cross the Monkland Boulevard, Bois Franc Road, Montreal Park and Island Ry., and St. Laurent Road.

20454. Sept. 30.—Authorizing Canadian Northern Ry. to build across 22 highways on its Grosse Isle Branch, Man.

20455, 20456. Sept. 30.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build at grade across side road in Lot 14, Con. 13, Bathurst Tp., Ont.; to build temporary diversion at mileage 2.1, and to build ballast pit spur line at grade across road allowance between Lots 10 and 11, Con. 1, Murray Tp., Ont.

20457. Sept. 30.—Approving consolidation of C.P.R. Standard Passenger Tariffs C.R.C. W. 38 and E. 664, providing maximum passenger tolls of 3c. $\frac{1}{2}$ mile on its lines east of and including line between Macleod, Calgary and Edmonton, Alta., and 4c. a mile west of and including Macleod and Calgary, Alta.

20458. Sept. 30.—Ordering C. N. Ontario Ry. to build farm crossing and cattle pass for W. and R. Wilson, in Lot 26, Con. B, Westmeath Tp.

20459. Sept. 11.—Authorizing C.P.R. to build spur for Northern Elevator Co., Winnipeg.

20460. Sept. 30.—Authorizing G. T. Pacific Ry. to build Y at mileage 29 west of Yellowhead Pass, Cariboo District, B.C., and rescinding order 17618, Sept. 25, 1912, in same connection.

20461. Sept. 30.—Extending for 30 days from date time within which G.T.R. shall complete culvert under its tracks in Tecumseh Tp., Ont., authorized by order 19988, Aug. 5.

20462. Oct. 2.—Confirming Alberta Ry. and Irrigation Co.'s joint tariff C.R.C. 165, and disallowing C.P.R. supplement 16 thereto. This order is given in full on another page.

20463. Sept. 30.—Establishing Dominion Ex. Co. collection and delivery limits in Swift Current, Sask.

20464. Oct. 1.—Authorizing Edmonton, Dunvegan and British Columbia Ry. to build across two highways in Alberta.

20465. Oct. 1.—Extending for 60 days from date time within which G.T.R. shall install electric bell at crossing of Mill St., Milverton, Ont., as required by order 19893, July 24, 1913.

20466. Oct. 11.—Authorizing G.T.R. to build siding for The Ham and Nott Co., Brantford, Ont.

20467. Sept. 30.—Authorizing G. T. Pacific Ry. to build spur for Park Lumber and Planing Mills, Ltd., Edmonton, Alta.

20468. Oct. 2.—Approving location of C.P.R. stations at Cambray and Franklin, Ont.

20469. Oct. 1.—Authorizing C.P.R. to build spur for G. F. Stephens & Co., St. Boniface, Man.

20470. Oct. 1.—Authorizing C.P.R. to build spur for Swift Current Grocery Co. and Winnipeg Paint & Glass Co., Swift Current, Sask.

20471. Oct. 1.—Approving location of C.P.R. station at Musquash, N.B.

20472. Sept. 30.—Authorizing C.P.R. to build its Weyburn-Stirling Branch across 29 highways between mileage 37.94 and 65.20, from Stirling, Alta.

20473. Oct. 1.—Authorizing C.P.R. to build sidings for McGregor and McIntyre, Toronto.

20474. Oct. 2.—Authorizing National Transcontinental Ry. Commissioners to make siding connection with C.P.R., to their shop site in Lot Cadastral 2345, St. Sauveur Parish, Que.

20475. Oct. 2.—Authorizing G.T.R. to use bridge over Richelieu River, Lacolle Jct., Que.

20476. Oct. 2.—Authorizing C. N. Ontario Ry. to build spur for J. H. Dunlop, Markham Tp.

20477. Oct. 2.—Authorizing C.P.R. to build extension to town siding, at grade, across public road between Lot 12 and 13, Con. 3, Hagar Tp., Ont.

20478. Oct. 3.—Amending order 20226, Aug. 29, re C.P.R. spur for H. J. Heinz Co., Leamington, Ont.

20479. Oct. 2.—Authorizing C.P.R. to change grade crossing, necessitated by double track, and to build at grade across road allowance at mileage 18.61, London Subdivision, Ont.

20480. Oct. 3.—Amending order 16874, June 26, 1912, re erection of fences on C.P.R. Mountain Subdivision, B.C.

20481. Oct. 2.—Ordering Canadian Northern Ry. to place caretaker at Sandy Lake, Man., by Oct. 5, to look after passengers and freight.

20482. Oct. 3.—Authorizing C. N. Ontario Ry. to build bridge across Kiosh-Koqui Lake, Pentland Tp., at mileage 186.6 from Ottawa.

20483. Oct. 3.—Ordering that \$4,700, deposited in a bank in Fort William, Ont., under order 18908, Mar. 20, re C.P.R. spur at Neebing Ave., Fort William, be paid on request of C.P.R.

20484. Oct. 3.—Approving C.P.R. plans showing location of stairway from Arlington St. bridge to engine house at Winnipeg, Man., and rescinding order 16860, June 22, 1912, in same connection.

20485. Oct. 3.—Authorizing C.P.R. to build second track or siding across road allowance on east boundary of Sec. 5-9-21, w. 4 m., Alta.

20486. Oct. 3.—Relieving G.T.R. from providing further protection at second highway crossing north of Corbeyville, Ont.

20487. Oct. 4.—Authorizing C.P.R. to lay, by means of a bridge, additional track of its main line over road allowance between Secs. 21 and 22, Tp. 18, R. 13, w. 2 m., Sask.

20488. Oct. 3.—Ordering Canadian Northern Ry. to erect a third class station building at St. Gregor, Sask., to be completed by July 31, 1914.

20489. Oct. 2.—Amending order 20009, Aug. 11, re G. T. Pacific Ry. diversion of Toronto St., Moose Jaw, Sask.

20490. Oct. 4.—Authorizing C.P.R. to build spur for Manitoba Cold Storage Co., Winnipeg.

20491. Oct. 4.—Authorizing C.P.R. to use undercrossing during building of Heffernan St. bridge, Guelph, Ont., providing men keep off cars and tops of cars when using same, and approving clearances as shown on plan of false work.

20492. Oct. 4.—Authorizing City of Edmonton, Alta., to open Spadina Ave. across Canadian Northern Ry. at grade within city limits.

20493. Oct. 3.—Authorizing British Columbia Telephone Co. to erect its wires across G.N.R. on Oscar St., Abbotsford, B.C.

20494. Oct. 1.—Authorizing C. N. Ontario Ry. to build spur for Laberge & Sons, Sudbury.

20495. Oct. 4.—Authorizing C.P.R. to build, at grade, spur for Tillsonburg Electric Car Co., Tillsonburg, Ont.

20496. Oct. 4.—Approving Michigan Central Rd. plan showing bridge at mileage 32.98, carrying Little Creek Drain under railway in Tilbury West Tp., Ont.

General Order 108, Aug. 11.—Ordering C.P.R. to withdraw its special rule F applying to western lines and hereafter observe the uniform rules of the Board regarding yard limits.

General Order 109.—Suspending, until further order, mileage rates on less than carload shipments of grain and grain products.

General Order 110.—Requiring railway companies, subject to Board's jurisdiction, to accept and carry by freight, trunks containing wearing apparel and personal effects when securely corded.

General Order 111.—Dismissing application of H. W. Riley, Calgary, Alta., for reconsideration of orders 17492 and 17384, prescribing express rates on cream and terms and conditions of service in connection therewith, and substituting certain rules for those included in tariff prescribed by order 17384.

General Order 112. Sept. 18.—Amending general order 111, Aug. 20, re express rates on cream.

General order 111, as amended by 112, was given in full in our last issue, pg. 477.

Model Construction Camp at Canadian Pacific Railway Rogers Pass Tunnel Site.

The model camp illustrated on this page, which Foley, Welch and Stewart are having built at Glacier, B. C., for the accommodation of their employes on the 5 mile tunnel which they are boring for the C. P. R. at Rogers Pass, will cover an area of about 2½ acres, close to the eastern portal of the tunnel. The village is divided into three sections:

No. 1 section will consist of bunk rooms for first and second class workmen, with lounge rooms, writing rooms, lavatories, etc.; and at one end a row of six bungalows for married men. Each bungalow consists of living room, dining room, kitchen, three bedrooms and bathroom. This section will be 360 by 30 ft.

No. 2 section:—The main block will consist of general offices, with offices for Manager, Superintendent, Master Mechanic, Accountant, Paymaster and general clerk's of-

tubular boilers, and an engine room comprising a 3 stage compressor and generating plant. This is for supplying the air pressure required for the drilling. The camp will be also heated and lighted and supplied with hot water from this source. On one end of the boiler house will be a laundry to be fitted with modern appliances. The dimensions of this section will be about 134 by 45 ft.

The whole of the village will be built upon piles, 12 ft. centres, and the buildings will be timber-framed covered with 12 in. ship-lap. The roofs will be covered with ruberoid, and will be constructed to stand the stress of 12 ft. of snow. The floors of the houses will be 8 ft. above the ground level, and will be connected with a covered in, high level walk between the two blocks, down to the right of way at the tunnel portal.

A railway siding is built to the right of way at the portal, and is connected with a coal trestle at the rear of the power house.

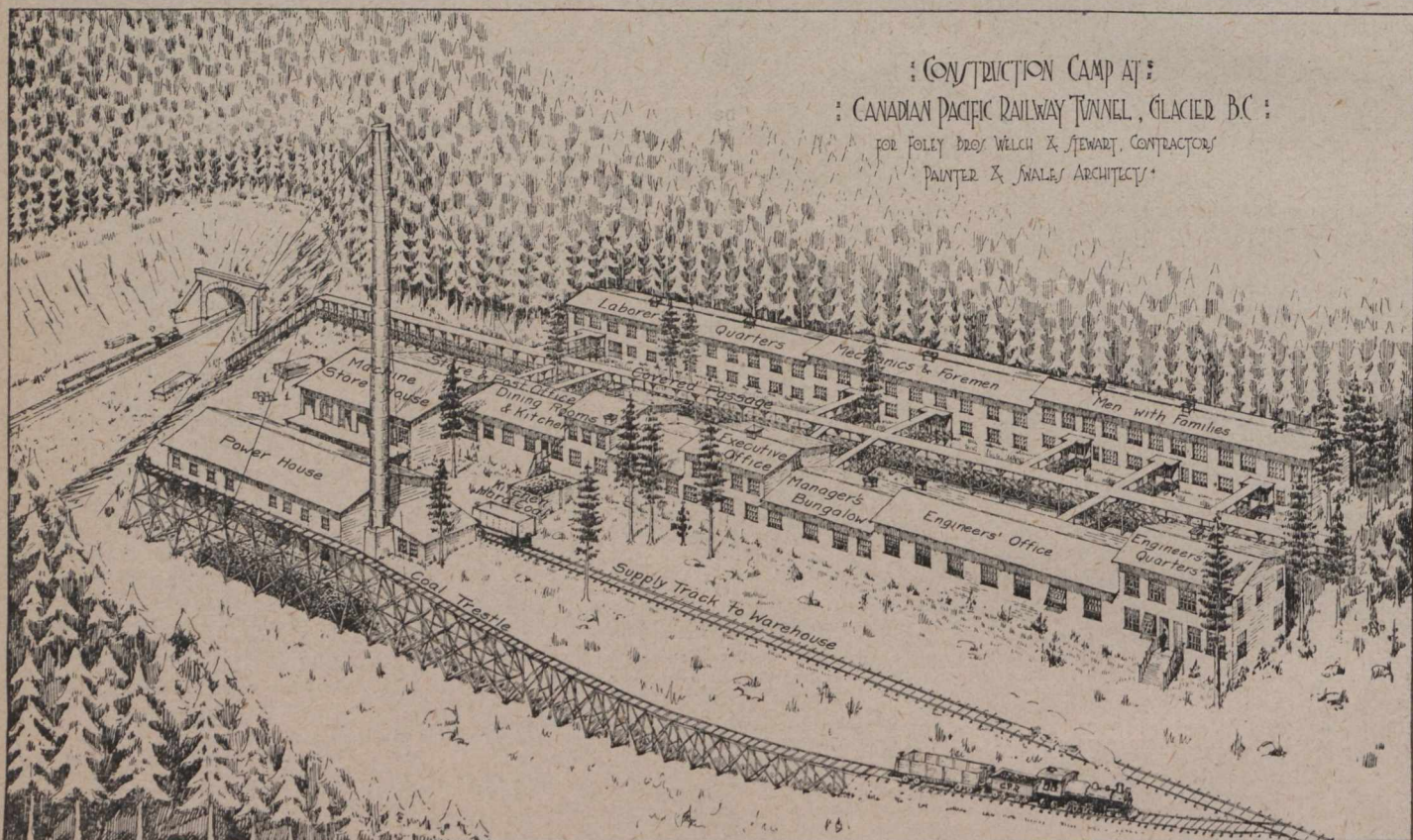
The village is designed for the accommo-

Railway Finance, Meetings, Etc.

Kettle Valley Lines.—Application is being made to the Board of Railway Commissioners for the sanction of an agreement, dated June 2, made between the K.V. Ry. and the C.P.R. for an interchange of traffic between the lines of the two companies.

Temiscouata Ry.—At the annual meeting at Quebec, Sept. 30, the report showed a considerable increase in gross and net earnings for the year ended June 30. All the fixed charges, covering interest on prior lien bonds, and sinking fund, were met, and a slightly increased interest payment made on the consolidated mortgage income bonds. Following are the officers and directors for the current year:—President, J. H. Walsh; Vice President, E. O. Grundy; Secretary and General Manager, G. G. Grundy; other directors, A. H. Cook, F. Murphy, A. Laurie and W. N. Campbell.

Timiskaming and Northern Ontario Ry.—The act passed last session of the Dominion



rice. Attached to the office block will be the Manager's bungalow, and officers' dining room. The main kitchen will be in the centre of this block, with foremen's dining room on one side, and general dining room on the other. At one end of this block will be a general dry goods store, connecting off the main stores for the contractors. Above the kitchen will be arranged sleeping accommodation for the kitchen staff and over the general offices will be sleeping accommodation for the clerical staff. Ground space is being left for the accommodation of the C. P. R. engineers, attached to which will be two bungalows for married members of the staff. The whole of this main block will be 396 by 36 ft. These two sections will be placed 50 ft. apart and connected to each other by a central raised, covered walk with side walks leading off to various parts of the camp.

No. 3 section. At the rear of the main block will be the power plant, comprising boiler house containing five 150 h. p. return

dation of 300 men, and for all the necessary office work on the contract. It was designed by W. S. Painter, formerly Chief Architect, C. P. R., Montreal, and now of Painter & Swales, Architects, Vancouver, to whom we are indebted for the foregoing data.

Railway Fire Protection Association.—This association was organized at Chicago, Ill., Oct. 7 and 8, with about 40 members representing the fire protection or insurance departments of railways. The chief object is to promote the interest in, and improve the methods of, fire protection and prevention, to obtain and circulate information on these subjects, and secure the co-operation of its members in establishing proper safeguards against loss of property and life by fire, and to standardize practices through the interchange of ideas and experiences with regard to such matters in connection with railway properties. The Secretary-Treasurer is C. B. Edwards, Fire Insurance Agent, Mobile and Ohio Rd., Mobile, Ala.

Parliament, granting a cash subsidy not exceeding \$6,400 a mile for 333.45 miles of main line and branch lines, was brought into effect by proclamation, Oct. 16.

Victoria Terminal Ry. and Ferry Co., Victoria and Sidney Ry.—The annual meetings were held at Victoria, B. C., Oct. 8. Following are the officers and directors for the current year:—President, A. H. MacNeill; Vice President, L. C. Gilman; Secretary-Treasurer, A. M. Thomas; other directors, F. Van Sant and F. V. Brown.

Records of a number of similar locomotives showed that for every 0.01 in. wear of the driving wheel axles, the mileage of those made of vanadium steel was 39,145, as compared to 17,019 for those of carbon steel.

A case is on record of a locomotive that under the standard boiler horse power rating would develop 400 h. p., which has developed as high as 1994 h. p., or 398% in excess of its rating.

Canadian Pacific Railway Company's Annual Meeting.

The annual meeting was held at Montreal Oct. 1. In moving the adoption of the report for the year ended June 30, which was published in detail in Canadian Railway and Marine World for September, the President, Sir Thomas Shaughnessy, said:—

With the active business conditions that prevailed throughout the year, your gross earnings reached the high water mark of nearly \$140,000,000, but since the turn of the year there has been a decrease, due to the falling off in the movement of westbound traffic, as well as in the building and other trades throughout Canada. However, thus far in the year your gross revenue is larger than it was in 1911, and, with the renewed confidence and courage that will develop everywhere as the result of the bountiful crops and the general improvement in the money market that begins to make itself manifest, there is every reason to anticipate another satisfactory year.

Your issue of additional capital stock early in the year, while it bore rather severely on shareholders who had to find money to meet their calls during the period of stringency that prevailed in Europe and elsewhere, was of great advantage to you, because it enabled you to proceed with important works essential to the future welfare of your property, and it was a distinct boon to the country, providing as it did wages for thousands who would otherwise have been unemployed, and furnishing circulation in a large way when it was most useful.

The constant demand for additional railway mileage, the recurring necessity for providing second tracks, larger stations, shops, yards and more cars and locomotives, to cope with your enormous traffic, involve expenditures that are almost startling, but we cannot afford to stop. In ten years the annual gross income has grown from \$43,000,000 to \$139,000,000, and if Canada is to meet our expectations in point of population and prosperity, as beyond doubt it will, there should be proportionate increase during the next ten years, provided that we have the roadbed, equipment and facilities to handle the traffic as against all comers. This does not mean that the expenditures for these purposes during the next few years need be anything approaching those of the past, because, when the lines now being built are completed, our construction programme may be substantially modified, and, with the exception of important improvements at one or two points in Eastern Canada where congestion during the busy season is annoying as well as expensive, and the completion of a second track on portions of the main line, we will, by the end of this season, be well ahead of our requirements.

This year the company's bond, debenture and share capital, including the recent issue of \$60,000,000, is \$283,000,000 more than it was in 1903. Of this, \$124,000,000 was expended in the construction and acquisition of additional mileage and the purchase of ocean, lake and river steamships; and the additions to car and locomotive equipment absorbed \$101,000,000. The balance of \$58,000,000 was used for the general improvement of your property, but this amount was supplemented by premiums on stock issues and appropriations from surplus earnings to the amount of \$105,000,000, nearly all of which will have been expended by the end of the current year, so that you will have invested in your property in those ten or eleven years this large sum of \$105,000,000 that will represent no capital liability and will consequently make no draught upon your revenue. Only a very small portion of the earnings of your Atlantic and Pacific

steamship lines were, during the past few years, included in your net revenue, having been transferred instead to the steamship replacement fund. As this fund now approximates the entire cost of your original Atlantic fleet, it is neither necessary nor desirable to increase it by liberal appropriations hereafter. Your Atlantic fleet has, in recent years, been supplemented by the acquisition of 18 steamships with a gross tonnage of 146,361. The earnings of these steamships have been utilized in reducing their cost, which now stands at about \$2,750,000, included temporarily in advances and investments pending a determination of policy. The Transpacific steamships, while useful as contributors of traffic to your railway system, have never been particularly profitable, and, indeed, the Atlantic Ocean traffic varies considerably from year to year in volume and value, but I think that we may, with safety, anticipate an annual net revenue of \$2,000,000 from the Transatlantic and Transpacific steamship lines after making due provision for interest on their cost and for depreciation. The formation of a steamship company to acquire the vessels whose cost has not been capitalized, to charter or lease those purchased with the proceeds of securities, and to provide means for the construction or purchase from time to time of additional vessels of a suitable type to maintain the character of the fleet and to strengthen its earning power, is receiving some consideration.

Most of the company's hotels are yielding a fair return, but some of them provided as necessary accessories to tourist traffic during the summer are operated at a loss. However, on the whole your hotel system is reasonably profitable, and hereafter the net profits, which have been used in the past for additions and improvements, will be treated as special income.

Legacies that came to you with acquired lines, the utilization of coal lands, and other circumstances have involved you in a number of enterprises that do not ordinarily come within the province of a railway company. There are mining, smelting and water power interests, of considerable value as compared with what they cost, from which revenue in the current year will be approximately \$250,000; coal mines at Bankhead, Hosmer and Lethbridge, from which you received in the year upwards of \$300,000, and lumber mill at Bull River, B.C., where ties and timber are manufactured for the company's use, a doubtful commercial enterprise excepting in so far as it serves to keep prices within reasonable bounds.

Railway companies in the United States are required to segregate their railway earnings proper and their income from other sources, and, while there is as yet no similar legal requirement in Canada, we have, as you know, recently made such a change in our system of accounting as to practically conform to the practice of other railway companies, but we still include in the earnings of the railway the returns from commercial telegraph system and our Pacific Coast steamships. In the next annual report the revenue from these sources will be treated as special income, and, of course, there will be a corresponding reduction in the gross and net earnings of the railway.

To prevent large areas of your land from being purchased and held for speculative purposes, regulations were adopted last autumn limiting sales to actual settlers, and, in order that it may be as easy as possible for settlers to purchase and develop lands, only one-twentieth of the purchase price is required to be paid down, and the balance is spread over 20 years with inter-

est at 6%. This policy should have the effect of bringing your lands under cultivation with increased rapidity, and, while the cash installments will be less than heretofore, the deferred payments carrying interest will yield a larger income.

Your ownership of 6,287,250 acres of land in Manitoba, Saskatchewan and Alberta is mentioned in a footnote to the balance sheet, but it plays no part in your accounts, excepting when the lands are sold. With established conditions in Western Canada and the experience of the last few years there would appear to be no difficulty about determining, with a fair degree of accuracy, the present value of this asset. Of course, as the lands are disposed of and the country becomes more thickly populated the market value of the remaining areas will naturally tend upward, but, in order to be quite on the safe side, let us adopt a figure that is somewhat below the average of the last few years, namely, \$14 an acre. On this basis your unsold lands are worth \$88,021,500, but you have spent a large sum on irrigation works in the Calgary district, with the result that 500,000 acres of the irrigable land should bring an average of \$25 an acre above the price mentioned, or \$12,500,000 additional. The unsold Esquimalt and Nanaima lands on Vancouver Island, and your residuary interest in other lands acquired with railway lines constituting a portion of your system, will realize at least \$7,000,000. Then you have over 600 townsites, including Vancouver, appraised by the officers of the Land Department at \$21,500,000. The present estimated market value of these lands and townsites still belonging to the company is, therefore, \$129,021,500.

Your directors have been considering the desirability of conveying these lands, townsites and other interests to a company in exchange for all its capital stock, to be held in your treasury and taken into the balance sheet with your other assets, but a conveyance of that description has its disadvantages, particularly with reference to the lands, and it is probable that the same end may be accomplished by the creation of an investment fund to be administered by trustees or by officers of the company specially designated. In any event your directors will endeavor, before the next annual report is published, to devise some plan for reconstructing the special income account and showing your extraneous assets in more definite and tangible form. Meantime, while the present policy in dealing with your land sales will remain unchanged and the proceeds will be conserved as heretofore, it is felt that the cash proceeds of sales in your townsites, which, last year, amounted to \$1,409,747.44, may, with propriety, be taken into special income, to be dealt with as the directors deem best.

The report was unanimously adopted.

It was resolved, that the construction and equipment of the following branch lines and extensions of other branch lines which have been authorized be approved:—

A branch from Gleichen to Shepard, Alta., 40 miles;

A branch from Bassano easterly, Alta., 118 miles;

A branch from Snowflake, Man., westerly, 9 miles;

An extension northerly of the Selkirk Branch, Man., 26 miles;

An extension westerly of the Weyburn-Lethbridge Branch, 240 miles.

An extension northwesterly of the Sutherland Southwesterly Branch, 27 miles;

An extension northwesterly of the Swift Current Northwesterly Branch, Sask., 175 miles,

and for the purpose of aiding the construction and equipment of the said branch lines and extensions of branch lines, the directors

may, from time to time, as may be necessary, and in accordance with the statutory provisions in that behalf, issue and dispose of consolidated debenture stock of the company to such amount as they may deem expedient, not exceeding in the aggregate an amount equal to £6,000 a mile in respect of the Gleichen-Shepard Branch, Bassano Branch, Suffield Southwesterly Branch extension and Swift Current Northwesterly Branch extension, £5,000 a mile in respect of the Weyburn-Lethbridge Branch extension, £4,000 a mile in respect of the Snowflake Branch, and £3,000 a mile in respect of the Selkirk Branch extension.

Resolutions were also adopted authorizing the issue of £1,000,000 consolidated debenture stock at 4%, to pay for the two intermediate class passenger steamships for the Atlantic Service, and two turbine passenger steamships for the British Columbia Coast Service, at present under construction in Scotland; and amending bylaws 40, 44 and 45 relating to stock certificates and transfer books.

The retiring directors, D. McNicoll, C. R. Hosmer, Hon. Robert Mackay and Jas. Duñmair were re-elected.

At a subsequent meeting of the board, Sir Thos. Shaughnessy and D. McNicoll were re-elected President and Vice President, respectively, and the following were appointed as the executive committee:—R. B. Angus, D. McNicoll, Sir Edmund Osler, Sir Thos. Shaughnessy, Lord Strathcona and Mount Royal, and Sir William Van Horne.

The Railway Companies and Outward Cartage Charges.

Considerable information on this subject was given in Canadian Railway and Marine World for October. The action of railways operating west of Port Arthur in giving notice that the practice of advancing cartage charges on outward shipments and collecting the same from consignees at destination would be discontinued Oct. 1, having been brought before the Board of Railway Commissioners, Commissioner S. J. McLean gave the following judgment Sept. 25:—

Under date of Aug. 5, the railways in Western Canada issued a notice that, effective Oct. 1, the practice of advancing cartage charges on outward shipments and the collection of same from consignees at destination would be discontinued. The position of the railways in the matter may be taken as set out in the following statement from the Canadian Northern:—"For many years the Canadian Pacific, Canadian Northern, and Grand Trunk Pacific included in their Winnipeg tariff the cost of cartage. This practice was discontinued on May 15, 1913, but during the period when Winnipeg was eliminated from tariffs, including the cost of cartage, important jobbing interests developed in such cities as Regina, Calgary, Saskatoon and Edmonton, and under arrangement with the draymen performing the service in these cities, the cost of cartage on outward business was added to the freight bill and collected from consignee. With the abrogation of cartage in Eastern Canada, Oct. 1, the action was taken to harmonize the practice throughout Canada. Following the discussion respecting the abrogation of cartage in Eastern Canada, the Retail Merchants' Association of Prince Albert appealed to the Board against paying the cost of cartage on shipments received from Winnipeg, Saskatoon, Regina, and other points where this arrangement was in force, and as the Board intimated to them that this practice was irregular we abandoned same."

Various protests against the terms of this notice were subsequently received from the jobbing interests concerned. On the other

hand, a strong protest against the continuance of the arrangement was made in a telegram from H. L. Montgomery, of Deloraine, Man., setting out the existing arrangements as unjust to the country merchant, and that the jobbers should "meet the country merchants in the open by adding the cartage to their invoices."

The proposed change comes at an awkward time so far as business is concerned. It is not only a busy season because of the laying in of fall stocks by the consignees; it is also a time when the traffic handled by lake and rail is being rushed forward for Western dealers. It is further represented to the Board that the existing cartage arrangements are dependent upon the arrangement as to advance charges which has been entered into by the railways. The railways state that as a matter of business practice, they cannot agree to look after the advance charges and collection business of every individual drayman, since it would lead to their books being cumbered with a multiplicity of accounts. This plea, from the standpoint of business practice is, however, aside from the question of the legal right of the railways so to act.

The Board has already made clear its position as to the legal status of the matter. It desires that the proper arrangement should take place, and as soon as possible. But in desiring that the proper arrangement should take place as promptly as possible, it at the same time recognizes that, in view of the custom which has in this respect developed, it is in the interest of all concerned that the change should be made with a minimum of dislocation of business in respect of cartage to and from the railway. When the protests against the disturbance of the existing arrangement were received, there were at the time negotiations pending in Eastern Canada regarding the cartage service, cancellation notices in regard to which had been fled, effective Oct. 1. Bearing in mind the tiding over the transition period, the Board suggested to the railways that the existing arrangements as to advance charges and collection in Western Canada might be continued until Jan. 1, 1914.

It has been represented to the Board that the shippers will, at the earliest possible moment, take up with the railways and the cartage companies the question of working out some system which will obviate the present objectionable features. It has not the power, nor is it attempting to exercise power, to change or modify in any way the rights and obligations of the parties to the shipping contract. The question as to whether the consignees should or should not pay advanced cartage to the railway is one entirely of contract between the parties. The Board has nothing to do with it, nor is the work done by the railways in any manner a railway service or facility within the meaning of the Railway Act. Changes of long standing practices always involve more or less inconvenience, dislocation of business, and delay. Oct. 1 is about as bad a time for the proposed cancellation as could well be selected. Under these circumstances, the Board will make no order in this matter until after Jan. 1, 1914.

Dominion Railway Subsidy Contract.—The Dominion Government has entered into a contract with the C. P. R., under the act granting aid in the construction of railways, for the construction of a line from Gimli, Man., to the Icelandic River, at or near Riverton, 30 miles.

The towers for the wireless telegraph station at Pas, Man., have been completed. They are 400 ft. high. The contract for the power house has been let to Boyle and Hughes.

Canadian Northern Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, compared with those for 1912-13, from July 1, 1913:—

	Gross Earnings	Expenses	Net Earnings	Increase
July	\$1,928,800	\$1,414,500	\$514,300	\$19,700
Aug.	1,824,800	1,416,200	408,600	37,800
Sept.	1,994,900	1,470,000	524,900	101,400
	\$5,748,500	\$4,300,700	\$1,447,800	\$158,900
Incr.	\$ 501,500	\$ 342,600	\$ 158,900	.....

The mileage under operation in Sept. was 4,520, against 4,297 in Sept., 1912.

Canadian Pacific Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, compared with those for 1912-13, from July 1, 1913:—

	Gross Earnings	Expenses	Net Earnings	Decrease
July	\$11,993,062.27	\$7,876,269.09	\$4,116,793.18	\$31,388.72
Aug.	11,484,459.88	7,473,320.64	3,961,139.24	756,786.42
	\$23,427,522.15	\$15,349,589.73	\$8,077,932.42	\$1,088,170.14
Incr.	.....	\$ 211,577.84	.....	.....
Decr.	\$ 876,592.30	.....	\$1,088,170.14	.....

Approximate earnings for Sept., \$11,887,000, against \$11,322,000 for Sept., 1912.

Grand Trunk Railway Earnings, Etc.

The following figures show the earnings and expenses of the G.T.R., C.A.R., G.T. Western Ry. and D.G.H. & M.R. for August:—

Grand Trunk Railway.		
Earnings	.....	\$4,090,000
Expenses	.....	2,796,100
Net earnings	.....	\$1,293,900
Canada Atlantic Railway.		
Earnings	.....	\$219,000
Expenses	.....	241,200
Deficit	.....	\$22,200
Grand Trunk Western Railway.		
Earnings	.....	\$630,900
Expenses	.....	557,500
Net earnings	.....	\$73,400
Detroit, Grand Haven and Milwaukee Ry.		
Earnings	.....	\$214,200
Expenses	.....	208,000
Net earnings	.....	\$6,200

TRAFFIC RECEIPTS OF THE SYSTEM.

Aggregate from July 1 to Sept. 30:

	1913	1912	Increase
G.T.R.	\$11,899,207	\$11,359,777	\$539,430
C.A.R.	659,164	620,311	38,853
G.T.W.R.	1,877,477	1,781,962	95,515
D.G.H. & M.R.	641,428	615,359	26,069
Totals	\$15,077,276	\$14,377,409	\$699,867

Grand Trunk Pacific Railway Earnings.

Approximate earnings for Sept., \$4,870,641, against \$4,759,282 for Sept., 1912.

The earnings of the Prairie Section and Lake Superior Branch for September were \$756,779, and from July 1 to Sept. 30, \$1,738,371.

Western Kootenay Light and Power Co.—

C. R. Hosmer, a director of the C. P. R., has been elected President of the W. K. L. and P. Co., succeeding the late W. M. Doult. The other directors are W. R. Baker, F. Paul, E. Hanson, F. F. Benson and J. S. C. Fraser. This company is developing power in the Rossland district of British Columbia, and will supply current to the C. P. R. in connection with the electrification of the Rossland branch.

Leonard Shops, National Transcontinental Ry.—The shops which the N. T. R. is having built in St. Malo, a suburb of Quebec, and which were fully described in Canadian Railway and Marine World for September, are to be called the Leonard shops, in honor of R. W. Leonard, Chairman of the N. T. R. Commission, under whose administration they are being built. The contract for their erection has been awarded to J. Gosselin, Point Levi, Que.

Windsor Street Station and Terminal Yards, Montreal, Canadian Pacific Railway.

The remodelling and extension of the Windsor St. station, Montreal, is now nearing completion, and a portion of the new part has been in service for some months. The trackage arrangements have been completed, the layout at present in use being shown in the accompanying plan of the station and terminal. All the portion of the station and office building south of the division line shown is new. The ground floor is being used for waiting rooms, restaurant, etc., and the other floors for general and local officials' offices. In the old layout, all the portion of the property south of the division line, through the new and old parts of the station, did not belong to the railway, so that all the terminal facilities were to the north of this line. In the former arrangement, there were 6 station tracks, all projecting into the station building about 40 ft. further than in the new arrangement, the latter giving greater concourse accommodation. All the station tracks branched off from the main line just west of Aqueduct St., with none of the station tracks of a greater length than 900 ft.

In the arrangement shown in the plan, and now in use, the number of tracks has been increased from 6 to 11, and their length

south, makes the bridge column heights vary.

The train shed formerly used is being removed, and the newer Bush type used instead. Over the northerly 7 tracks, it will extend to beyond Mountain St., or 1,140 ft., while the shed for the lower four tracks cuts off in pairs 950 and 810 ft. long respectively. The Bush terminal construction calls for a low shed building in spans bridging two tracks, with a longitudinal opening in the roof for the escape of the locomotive gases. This shed is supported on columns between every other track. The longitudinal opening for the escape of gases is encased in concrete, and is in consequence not subject to attack from the fumes.

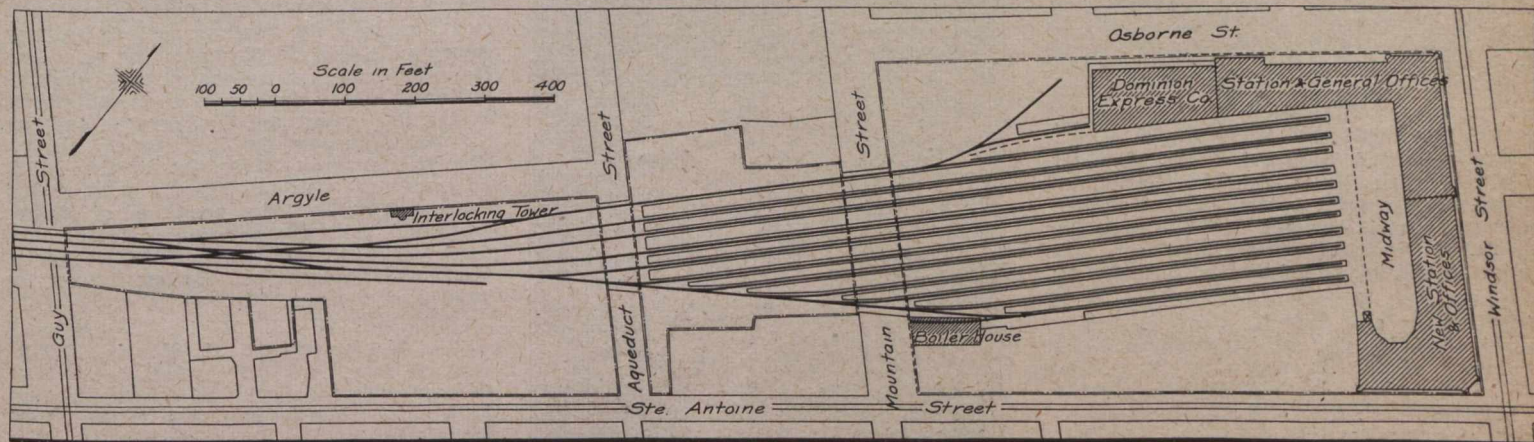
The passenger platforms are 16 ft. wide, and it is along this platform that the train shed columns are placed. The intermediate platform is 10 ft. wide, and is for baggage handling, this arrangement segregating the passengers from the baggage. The platforms are of concrete, and the track ballast of crushed stone, the track being laid with 85 lb. rails.

The whole switching arrangements of the yard are to be controlled from the interlocking tower shown. The initial installa-

Canadian Ticket Agents' Association's Annual Meeting.

The association's 27th annual meeting was held at the Hollenden Hotel, Cleveland, Ohio, Oct. 8, 9 and 10, the members and their guests having travelled from Buffalo, N.Y., on the Cleveland and Buffalo Transit Co.'s s.s. City of Buffalo. At the opening of the meeting addresses of welcome were delivered by the mayor of Cleveland, the President of the Chamber of Commerce and the chairman of the local reception committee. R. W. Wallace, G.P.A., Erie Rd., and C. L. Kimball, A.G.P.A., Pennsylvania Lines, representing the American Association of General Passenger Ticket Agents, and the President and Secretary of the international Association of Ticket Agents, extended fraternal greetings. Among other visitors present were: W. Stitt, G.E.P.A., Canadian Pacific Ry.; W. S. Cookson, A.G.P.A., Grand Trunk Ry; M. G. Murphy, D.P.A., Canadian Pacific Ry., and a number of officials of U. S. lines were also among the visitors, and several of them spoke.

The veteran Secretary-Treasurer and one of the founders of the association, E de la Hooke, presented his annual statement showing the association to be slowly increasing in numbers and the finances to be in a satisfactory position. The President, G. J. Alexander, read an address.



Plan of Canadian Pacific Railway Windsor Street Station and Terminal Trackage and Approaches, Montreal.

increased by the acquisition of the property to the south of the old tracks in the station, and the property to the north of the tracks west of Aqueduct St. The northerly of the station tracks has been straightened out to give a clear length of 1,400 ft. at the point where it strikes the main line. With one lead track leading into all the station tracks, the tracks vary from the maximum mentioned down to about 400 ft., giving a total station capacity, making due allowance for locomotive length, of 120 cars, varying in train length from 5 to 14 cars.

In increasing the size of the yard, it has been necessary to build new retaining walls on the south side of the station grounds. Osborne St., on the north side of the station, is on the crest of a hill, which drops off quite rapidly to the south, so that while the station level is that of Osborne St., on the St. Antoine side there are three stores below that level. In consequence, the southerly portion of the yard had to be reclaimed by retaining walls and filling to the lines shown in the plan.

The station crosses two streets on overhead bridges. That at Aqueduct St. is a 5 span bridge, and at Mountain St. a 9 span bridge, both of steel construction, with steel floor, waterproofed deck. The elevation of the rails above the streets on the north side being considerably less than on the

tion calls for 70 electrically operated switches, with accommodation for 88 when required.

We are indebted to J. M. R. Fairbairn, M. Can. Soc. C.E., Assistant Engineer, and N. E. Gutelius, Resident Engineer, for the data on which the foregoing article is based.

Prohibiting Riding on Pilots of Locomotives.

The Board of Railway Commissioners passed order 20597, Sept. 22, directing the C.P.R. to cause its Western Lines officials to issue a circular to employes similar in terms to circular 34, issued by its Eastern Lines officials and applying to Eastern Lines.

Circular 34 referred to was issued Mar. 20, 1912, by C. Murphy, then General Superintendent of Transportation, Eastern Lines, and reads as follows: "To all concerned. Accident to employes through riding on pilots of engines. The practice of riding on pilots of engines, except when switching in yards, must be discontinued, under penalty of discipline."

A. J. SHAPTER, engine tester, G. T. R., Montreal, in remitting his renewal subscription writes, "I may say that I am very pleased with Canadian Railway and Marine World."

Two papers were read, one by Dr. Shaw, the association's honorary physician, on precautions to be observed by travellers from the standpoint of health, and the other by P. V. G. Mitchell, Passenger Traffic Manager, White Star-Dominion Line, Montreal, on ocean steamship business. A number of questions submitted to the question box were discussed and committees were appointed to deal with some of the subjects. J. A. Mackenzie, of Woodstock, Ont., exhibited his device for filing tariffs.

The officers, etc., were unanimously re-elected as follows:—President, G. J. Alexander, Richmond, Que.; 1st Vice President, J. Kidd, Goderich; 2nd Vice President, C. B. Jones, Orillia; 3rd Vice President, J. A. Mackenzie, Woodstock; Secretary-Treasurer, E. de la Hooke, London; Auditor, A. M. Hare, Tillsonburg; Honorary Counsel, J. H. Flock, London; Executive Committee, W. Jackson, Clinton; W. McIlroy, Hamilton; F. W. Churchill, Collingwood; J. P. Hanley, Kingston, and W. Fulton, London. All the officers, etc., except the President, are located in Ontario.

Among the entertainments, etc., was a smoker-concert, and a visit to a daily newspaper office for the men, a tally ho drive and theatre party for the ladies, a motor drive through the city and suburbs for the whole party, as well as a dance.

Mainly About Transportation People.

DR. G. A. KENNEDY, who died at Winnipeg, Oct. 8, was for several years a C.P.R. surgeon there.

G. CONDON, the National Steel Car Co.'s representative at Montreal, sailed from New York, Oct. 4, for Europe on a two months holiday.

Mrs. Macpherson, wife of W. MOLSON MACPHERSON, director G.T.R. and G.T. Pacific Ry., died at Quebec, Que., Oct. 7, after a prolonged illness.

A large statue of LORD MOUNT STEPHEN, the first President of the C.P.R., is to be placed in the waiting room of the Windsor St. Station, Montreal.

JOHN TOWNSEND, baggage master, Michigan Central Rd., St. Thomas, Ont., who has been in the company's service for 41 years, retires under the provisions of the pension fund, Nov. 1.

Lady SHAUGHNESSY, who underwent an operation in the Royal Victoria Hospital, Montreal, a few weeks ago, returned home at the end of September, and was reported to have completely recovered.

A. D. DAVIDSON, Land Commissioner, Canadian Northern Ry., has bought the Wells property, on the escarpment facing Davenport Road, near Walmer Road, Toronto, the house on which he will replace by a modern one.

G. R. G. CONWAY, Chief Engineer, British Columbia Electric Ry., and Chairman of the Vancouver branch of the Canadian Society of Civil Engineers, delivered the opening address at the first meeting of the winter session in Vancouver, October 13.

F. C. SALTER, European Traffic Manager, G.T.R., London, Eng., with Mrs. Salter and their younger son, arrived in Canada Oct. 11. While he is engaged with the executive heads of the company in Montreal, Mrs. Salter is visiting friends in California.

Lieut. F. A. Wanklyn, of the Royal Field Artillery in the British Army, has been gazetted as Captain, and has been appointed Adjutant of the Royal Flying Corps. He is a son of F. L. WANKLYN, General Executive Assistant, C.P.R., Montreal.

T. A. GORHAM, County Judge of Halton, Ont., who died at Milton, Ont., Oct. 4, aged 59, was in C.P.R. service from 1882 to 1885, rising to the position of Assistant General Superintendent at Winnipeg. He resigned in 1885 to recommence legal practice.

R. J. TAIT, formerly Freight Agent, Pere Marquette Rd., London, Ont., who resigned in the early part of the year on account of ill health, died there, Oct. 20, aged 55. He was born at Shelburne, Ont., and commenced his railway service with the Great Western Ry., now a portion of the G.T.R.

D. POTTINGER, I.S.O., who recently retired from the position of Assistant Chairman, Canadian Government Railways Managing Board, with Mrs. Pottinger, are on a trip to the Pacific Coast. They hope to spend the winter in Ottawa and return to their summer home at Shediac, N.B., in the spring.

The estate of the late JAMES ROSS, M. Can. Soc. C.E., whose death was announced in our last issue, has been valued at from \$12,000,000 to \$15,000,000. The public bequests approximated \$400,000. It is said that he owned 25,000 C.P.R. shares, and that he was the largest individual shareholder in the company.

J. B. LAMBKIN, formerly District Passenger Agent, Intercolonial Ry., Halifax, N.S., and GEO. SKEFFINGTON, formerly in the I.R.C.'s police service at Moncton, N.B., have been appointed to exercise con-

trol over the ocean ports and railways in Eastern Canada, in connection with the suppression of the white slave traffic.

EDMUND DESCHENES, Jr., whose appointment as Auditor, Central Vermont Ry., St. Albans, Vt., was announced in our last issue, was born there Sept. 7, 1878, and entered C.V.R. service as messenger Mar., 1893, since when he has been, clerk on freight accounts, Travelling Auditor, chief clerk on passenger accounts, and chief clerk to Auditor.

C. S. CUNNINGHAM, who has been appointed a member of the Michigan State Railroad Commission, was formerly in G.T.R. service, holding positions as Superintendent at London, Ont., St. Thomas, Ont., acting Superintendent and Superintendent, Western Division, Detroit, Mich., resigning in Jan., 1913, when the official staffs of the various divisions were reorganized.

JOHN L. HODGSON, whose appointment as Master Car Builder, G.T. Pacific Ry.,



W. G. Robb,
Superintendent of Motive Power, Grand Trunk
Pacific Railway.

Transcona, Man., was announced in a recent issue, was born at Simcoe, Ont., Nov. 15, 1858, and entered G.T.R. service Aug. 1, 1888, carpenter at Brantford, Ont.; Apr. 1 to Sept. 1, 1888, Car Inspector, Toronto; Sept. 1, 1888, to Mar. 1, 1897, Car Foreman, Toronto; Mar. 1, 1897, to Aug. 12, 1913, Master Car Builder, Western Division, Port Huron, Mich.

H. D. MACKENZIE, who has been appointed District Master Mechanic, District 4, Intercolonial Ry., Stellarton, N.S., was born at Churchville, N.S., July 22, 1864, and entered I.R.C. service, July 24, 1881, since when he has been, to Sept. 1, 1897, machinist apprentice; Sept. 1, 1897, to Oct. 16, 1899, charge hand at Moncton and Stellarton, N.S.; Oct. 16, 1899, to Feb. 1, 1909, Mechanical Foreman, Stellarton, N.S.; Feb. 1, 1909, to Sept. 30, 1913, General Locomotive Foreman, Moncton, N.B.

F. E. WARREN, whose appointment as General Car Foreman, C.P.R., Winnipeg, was announced in our last issue, was born

at Chelsea, Que., Aug. 29, 1872, and entered C.P.R. service Dec., 1897, since when he has been, to Dec., 1902, carpenter at Farnham, Que.; Dec., 1902, to Dec., 1905, charge hand, Farnham, Que.; Dec., 1905, to Oct., 1909, Assistant Foreman, Farnham, Que.; Oct., 1909, to Mar., 1912, Car Foreman, Hoche-laga, Que.; Mar., 1912, to Aug., 1913, Division Car Foreman, Ontario Division, Toronto.

W. B. GAIR, who is stated to be a director of the Great Central Ry., of England, was in Canada recently with a view, as stated in press reports, to acquiring knowledge of methods of handling of passengers and freight on this side, and for this purpose, travelled considerably on the G.T.R. and C.P.R. We have no official knowledge as to Mr. Gair's position with the Great Central Ry., but it is not generally thought requisite in England, that a director should acquire knowledge as to the handling of either passengers or freight.

WALTER MAUGHAN, whose appointment as Assistant District Passenger Agent, C.P.R., Toronto, was announced in our last issue, was born at Toronto, Sept. 4, 1876, and entered C.P.R. service, Mar., 1892, since when he has been, to Sept., 1892, Assistant Agent, York St. office, Toronto; Sept., 1892, to July, 1895, assistant agent, Hamilton, Ont.; July, 1895, to July, 1897, ticket agent, York St. office, Toronto; July, 1897, to Mar., 1898, in Advertising Department, Toronto; Mar., 1898, to Sept., 1913, City Passenger and Ticket Agent, Toronto.

J. R. SPRAGGE, who died at Toronto, Oct. 10, aged 64, commenced his railway career with the old Northern Ry. as a fireman, and was later promoted to locomotive driver. On the construction of the Credit Valley Ry. he entered that service, and ran the first train over the line. On the absorption of the Credit Valley Ry. by the C.P.R. he remained with the latter company, and subsequently held the positions of Master Mechanic, Atlantic Division; Master Mechanic, Ontario Division, and District Master Mechanic, Toronto Jct. He left the service in 1912 on account of ill health.

CHARLES H. TILLET, who has been appointed Supervisor of Signals, G.T.R., Montreal, was born at Peru, Ind., Dec. 8, 1885, and entered transportation service in Aug., 1907, since when he has been, to Dec., 1907, signal repair man, Pennsylvania Rd., Fort Wayne, Ind.; Apr. to Nov., 1908, interlocking work, Great Northern Ry., Seattle, Wash.; Nov., 1908, to Feb., 1910, interlocking maintenance, Cascade Division, G.N.R.; Feb., 1910, to July, 1913, Signal Inspector, Chicago and Eastern Illinois Rd., Chicago, Ill.; July to Oct., 1913, Chief Draughtsman, Signal Department, G.T.R., Montreal.

T. G. ARMSTRONG, whose appointment as Assistant Master Car Builder, Western Lines, C.P.R., Winnipeg, was announced in a recent issue, was born at Waterloo, Que., Apr. 30, 1863, and entered railway service Apr., 1888, since when he has been, to 1895, successively, bridge foreman, C.P.R., Orford Mountain Ry., and Quebec Central Ry., during construction; 1895 to 1902, in private business as general contractor and builder; 1902 to 1906, Foreman, C.P.R., Farnham, Que.; 1906 to Feb. 1, 1908, Car Foreman, C.P.R., Winnipeg; Feb. 1, 1908, to July 3, 1913, General Car Foreman, C.P.R., Winnipeg.

R. A. KLOCK, whose appointment as General Tie and Timber Agent, Canadian Government Railways, Moncton, N.B., was announced in our last issue, was born at Aylmer, Que., and was educated there, at Ottawa, and graduated from McGill University, Montreal, in arts, and later took a short military course at Kingston, Ont. He was, at one time, Tie and Timber Inspector, Atlantic Division, C.P.R., St. John, N.B., and prior to his present appointment

had been engaged by the Government to inspect and ship hard pine dimension timber from Louisiana and Texas to Port Nelson on Hudson Bay.

KARL FRITJOF NYSTROM, whose appointment as Chief Draughtsman, Car Department, G.T.R., Montreal, was announced in our last issue, was born in Sweden, Sept. 2, 1881, and entered transportation service on this continent, in 1905, since when he has been, to 1908, draughtsman, Pressed Steel Car Co., Pittsburgh, Pa.; 1908 to 1909, draughtsman, Pullman Co., Chicago, Ill.; 1909 to 1911, designing engineer, Southern Pacific Co., San Francisco, Cal.; 1911 to 1912, Assistant Mechanical Engineer, American Car and Foundry Co., St. Charles, Mo.; 1912 to Oct., 1913, Mechanical Engineer, Acme Supply Co., Chicago, Ill.

ERNEST HUMPHRYS, whose appointment as Fuel Agent, Alberta Division, C.P.R., Calgary, was announced in our last issue, was born at Hull, Eng., Sept. 24, 1869, and entered C.P.R. service Aug., 1897, since when he has been, to Sept., 1898, clerk in Mechanical Department, Donald, B.C.; Sept., 1898, to Aug., 1899, stenographer, Mechanical Department, Vancouver, B.C.; Aug., 1899, to May, 1904, chief clerk to Master Mechanic, Revelstoke, B.C.; May, 1904, to Jan., 1908, chief clerk to Assistant to Second Vice President, Winnipeg; Jan., 1908, to Aug., 1913, chief clerk to Superintendent of Motive Power, Western Lines, Winnipeg.

E. H. WOOD, whose appointment as Divisional Car Foreman, Ontario Division, C.P.R., Toronto, was announced in our last issue, was born at St. John, N.B., Dec. 30, 1880, and entered C.P.R. service July 4, 1899, since when he has been, to Nov. 7, 1899, car repairer, St. John, N.B.; Dec. 4, 1899, to Apr. 30, 1900, car repairer, West St. John, N.B.; May 24, 1900, to July 31, 1903, car repairer, St. John, N.B.; Aug. 1, 1903, to Jan. 31, 1904, Car Inspector, St. John, N.B.; Feb. 1, 1904, to June 23, 1911, Car Foreman, St. John, N.B.; Jan. 24, 1911, to Apr. 8, 1912, Assistant Car Foreman, Hochelaga, Que.; Apr. 9, 1912, to Sept. 4, 1913, Car Foreman, Hochelaga, Que.

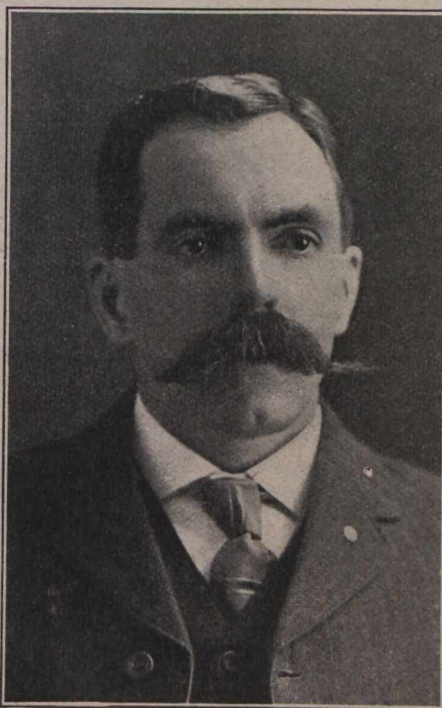
COLIN D. MACKINTOSH, A.M. Can. Soc. C.E., whose appointment as Division Engineer, Saskatchewan Division, C.P.R., Moose Jaw, was announced in our last issue, was born at Auckland, New Zealand, Sept. 24, 1882, and served his apprenticeship and student years, from 1900 to 1905, with Kyle, Dennison and Laing, Civil Engineers, and at the Glasgow and West of Scotland Technical College, Glasgow, Scotland. He entered C.P.R. service in 1905, during which year he was on location survey, Toronto; 1905 to 1909, transit man; 1909 to 1910, Resident Engineer; 1910 to 1911, Locating Engineer; 1911 to Aug., 1913, Assistant Engineer on construction of double track, all on Western Lines.

W. U. APPLETON, who has been appointed General Master Mechanic, Intercolonial Ry., Moncton, N.B., was born there, Jan. 29, 1878, entered I.R.C. service as a messenger, and was transferred to the locomotive shops, serving an apprenticeship to Dec., 1899, since when he has been, to Apr., 1901, clerk in Mechanical Superintendent's office; Apr. to Sept., 1901, machinist; Sept., 1901, clerk in 1902, clerk to Superintendent of Machinery and Rolling Stock; Oct., 1902, to May, 1903, clerk in Master Car Builder's office; May, 1903, to May, 1904, clerk in General Superintendent's office; May, 1904, to Mar., 1909, chief clerk to Superintendent of Motive Power; Apr., 1909, to Sept., 1913, Assistant to Superintendent of Motive Power.

G. W. ROBB, whose appointment as Superintendent of Motive Power, G.T. Pacific Ry., Transcona, Man., was announced in our last issue, entered transportation service in

1880, since when he has been, to 1885, car repairer and apprentice, G.T.R., at Montreal, Brockville, Ont., and Point Levi, Que.; 1885 to 1886, improver, Northern Ry., Toronto; 1886 to 1888, machinist and leading hand, C.P.R., Winnipeg and Broadview, Man.; 1888 to 1889, night foreman, G.N.R., Breckenridge, Minn.; 1889 to 1891, day foreman, G.N.R., Willmar, Minn., and Glasgow, Mont.; 1891 to 1893, Locomotive Foreman, Chicago and Great Western Ry., South Des Moines, Ia.; 1893 to 1895, Shop Foreman, Canada Atlantic Ry., Ottawa; 1895 to 1907, General Foreman, Canada Atlantic Ry., Ottawa; 1907 to 1909, Assistant Master Mechanic, G.T. Pacific Ry., Rivers, Man.; 1909 to Oct., 1913, Master Mechanic, G.T. Pacific Ry., Rivers, Man.

JAMES ROSS, who died in Montreal recently, is said to have left an estate of about \$13,000,000. He bequeathed about \$400,000 to hospitals and other public institutions. Mrs. Ross receives \$100,000 in cash and an annuity of \$75,000 a year for life, together with the Montreal house, its contents, etc. The only son, J. K. L. Ross,



F. E. Warren,
General Car Foreman, Manitoba Division, Canadian
Pacific Railway.

and Mrs. J. K. L. Ross, get \$50,000 each in cash. \$1,000,000 is also to be paid the son to enable him to carry on any industry in which he may now be interested. He is also to get an annuity of \$75,000 a year, and when 40 years old is to get the residue of the estate. A number of legacies and annuities are left to relatives and friends, including the following: To Mr. Ross's only sister, who is the wife of Jas. Grace, Secretary, Toronto, Esq., \$10,000 a year for life, the annuity to be continued to her daughter; Granville C. Cunningham, formerly of Toronto and Montreal, and now of London, Eng.; F. L. Wanklyn, General Executive Assistant, C.P.R., Montreal; Phelps Johnson, Vice President and Managing Director, Dominion Bridge Co., and G. H. Dugan, General Manager, Dominion Bridge Co., get \$5,000 each.

F. W. FORSTER, Agent, C.P.R. and Dominion Ex. Co., Liverpool, Eng., who died at Blundellsands, Liverpool, Eng., Oct. 7, was born at Sunderland, Eng., in 1871, and entered transportation service in the office

of Culliford, Clark and Co., Liverpool. Prior to the opening of the Manchester Ship Canal in 1894, he moved to Manchester, and, until 1896, was in charge of the Neptune Navigation Co. there, leaving to join Elder, Dempster and Co.'s Liverpool staff. He was appointed Traffic Agent, C.P.R., Bristol, in Oct., 1903, and Agent, C.P.R. at Liverpool in July, 1911. He was a brother of Lieut. Forster, R.N.R., who has recently resigned from the command of the C.P.R. s.s. Empress of Ireland on his appointment as Marine Superintendent for the company at Liverpool. A circular announcing the death, issued by G. McL. Brown, European Manager, reads as follows: "In the passing of Mr. Forster, the company loses one of its most promising officers. Conscientious and able, his devotion to duty was apparent in all his actions, and his upright character, his kindly heart and delightful personality endeared him to all with whom he came in contact."

GUY SEBERN LYTLE, whose appointment as Car Service Agent, Manitoba Division, C.P.R., Winnipeg, was announced in our last issue, was born at Denison, Iowa, Sept. 23, 1878, and entered railway service Sept. 1, 1891, since when he has been, to Feb. 1, 1893, messenger, Seattle and Northern Ry., Anacortes, Wash.; Feb. 1, 1893, to Jan. 7, 1897, agent, Seattle and Northern Ry., and Seattle, Lake Shore and Eastern Ry., at various points in Washington; Jan. 7, 1897, to May 2, 1898, operator and clerk in Superintendent's office, Seattle, Lake Shore and Eastern Ry., Seattle, Wash.; May 2, 1898, to Mar. 31, 1901, dispatcher, Seattle and International Ry., and Northern Pacific Ry., Seattle, Wash.; Mar. 31, 1901, to Feb. 16, 1907, dispatcher, Northern Pacific Ry., Tacoma, Wash.; Feb. 16, 1907, to Sept. 1, 1909, dispatcher same road, Missoula, Mont.; Sept. 1, 1909, to May 16, 1911, Assistant Chief Dispatcher, same road, Missoula, Mont.; May 16, 1911, to Sept. 5, 1912, Inspector of Train Dispatching, same road, St. Paul, Minn.; Sept. 5, 1912, to Apr. 9, 1913, Chief Dispatcher, same road, Missoula, Mont.; Apr. 9 to Aug. 25, 1913, Inspector of Transportation, C.P.R., Winnipeg.

Railway Subsidies in Alberta.

The Alberta Legislature was asked by the Premier, Oct. 18, to extend the guarantee of bonds for the construction of return lines of the Canadian Northern Ry., and of the Grand Trunk Pacific Branch Lines Co. These lines are either under construction, or their construction has been authorized, and the present extension of time is necessary to enable them to be completed.

Another resolution was submitted guaranteeing the Central Canada Ry. bonds to the extent of \$20,000 a mile, for the building of a line from a point on the Edmonton, Dunvegan and British Columbia Ry., to Peace River Crossing, about 100 miles. At least 50 miles is to be constructed before Dec. 31, 1914, and the line completed and ready for traffic before December 31, 1917. Specifications are to be the same as those of the Edmonton, Dunvegan and British Columbia Ry.

Another resolution was for the purpose of encouraging the building of light railways into parts of the country away from the main lines, similar to the Blindman Valley, near Lacombe, as branches of the main lines. The resolution provided for making of grants of \$2,000 a mile, towards the construction of such lines as may be from time to time approved by the Government.

The measures setting out in detail the lines affected, and the conditions of the grants, were subsequently submitted to the Legislature.

Current Track Construction on the Canadian Pacific Railway.

We have been favored with the following official statement of new single track and of new second track under construction on the C.P.R. System this year, together with the miles of track laid up to Aug. 31:—

SINGLE TRACK.			Under Construction.	Track Laid.
LINE.	From	To	Miles.	Miles.
C.L.O. & Western	Glen Tay	Agincourt	182.3	150.5
Boissevain-Lauder	Boissevain	Lauder	37.0	28.8
Estevan N. West. Br.	Estevan	Neptune	55.0	54.5
Viriden Branch	Two Creek	McAuley	52.5	22.5
S. Current N. West.	Cabri	Empress	80.0	57.8
Weyburn West.	Assiniboia	Mile 317.0	205.0	33.7
Stirling East.	Stirling	Foremost	50.0	39.0
Lacombe East.	Consort	Kerrobert	84.0	12.0
Kerrobert N. East.	Kerrobert	Reford Jct.	36.1	36.1
Suffield S. West.	Suffield	Mile 87.0	87.0	26.6
Bergen cutoff	Bergen	Northeast	10.0	9.7
Alberta Central	Red Deer	Loch Erne	65.0	10.3
Kootenay Central	Fort Steel	Golden	143.5	63.5
			1,087.4	545.0
DOUBLE TRACK.				
Farnham Sub. Div.	St. Johns	Farnham	13.2	12.2
London Sub. Div.	Islington Jct.	Guelph Jct.	29.1	11.4
Cartier Sub. Div.	Azilda	Cartier	28.5	10.9
Chapleau Sub. Div.	Nemegos	Devon	12.4	5.9
White River Sub. Div.	Ester	Shumka	32.9	
Schreiber Sub. Div.	Tarpon	Mobert	20.2	5.2
	Pringle	Heron Bay	12.0	
Nipigon Sub. Div.	Semlin	Pays Flat	15.0	9.5
	Gravel	Dublin	11.0	3.8
Broadview Sub. Div.	Kemnay	Virden	39.0	25.5
Moose Jaw Sub. Div.	Indian Head	Regina	42.0	10.0
	Regina	Pasqua	34.8	34.8
Swift Current Sub. Div.	Caron	Swift Current	94.5	60.3
Cascade Sub. Div.	Ruby Creek	Westminster Jct.	64.4	64.4
			449.0	253.9

Electrification of the Mount Royal Tunnel, Canadian Northern Railway.

Work on this tunnel is progressing so rapidly that a contract has been let by the Canadian Northern Montreal Tunnel and Terminal Co. for the equipment for the electrification of the tunnel and approaches through the suburban district back of Montreal. The electric service will extend from the Montreal station through the tunnel to yards which will be built near the Riviere des Prairies, at the back of Montreal Island, where the trains will be changed from electric to steam traction, or vice versa. In addition to the operation of through trains through this district with electric locomotives, there are to be multiple unit trains for handling suburban traffic from Montreal to the new model city at the back of the mountain, which will be largely dependent on this service for rapid communication with the city. There will be storage yards in Mount Royal and freight yards at Cartierville at Riviere des Prairies.

The 2,400 volt d.c. system has been definitely decided on, and the order which has been placed with the Canadian General Electric Co., calls for 7 electric locomotives, 8 multiple unit motor cars, and complete substation apparatus to serve the electrified zone comprising 10 miles of double track. The locomotives will weigh 80 tons each, with all the weight on the drivers. They will be equipped with two four wheel trucks, articulated together, with four motors geared to the drivers through twin gears. The motors will be of the commutating pole type, wound for 1,200 volts and insulated for 2,400 volts, operating two in permanent series. The control will be multiple unit, series parallel, the current for the contractors being furnished by a motor generator set. The motors for the multiple unit four motor car equipments will be rated at 125 h.p., 1,200 volts each, and the control will be in general similar to that of the locomotives. The locomotive cabs will be divided into a main compartment for the control apparatus and two end compartments for the operator, these two being exactly alike, so that locomotives can be operated from either end. An overhead catenary trolley system, supported by steel bridges, will be

used, the current being collected by a pantograph.

The substation is to be located at the west portal of the tunnel, where 3 phase, 60 cycle power at 11,000 volts will be delivered from outside sources, and converted to d.c. in motor generator sets. The motor generator set will consist of two d.c. generators on the same shaft and driven by a synchronous motor, and will be rated 1,500 k.w. at 2,400 volts, with a 5 minute overload capacity of 200%. The generators will be of the commutating pole type, each wound for 1,200 volts and insulated for 2,400 volts, in permanent series. The synchronous motor will be 2,100 k.w. at 11,000 volts. The station is to be designed for an ultimate capacity of 4,500 k.w., or three sets, only two of which it is intended to instal at present.

Railway Rolling Stock Notes.

The G.T.R. has received six Mikado type locomotives, 62 ins. wheel, nos. 544 to 549, from Baldwin Locomotive Works.

The Canadian Northern Ry. has ordered three snow ploughs (mentioned in our last issue), and 5 electrically lighted first class cars, from Canadian Car and Foundry Co.

The Pacific Great Eastern Ry., 404 Welton Building, Vancouver, B.C., advises us that it is about to purchase its rolling stock for the ensuing year, which will include several locomotives and about 200 freight cars.

The Dominion Coal Co. has ordered one consolidation locomotive from the Montreal Locomotive Works. The cylinders will be 21 by 26 ins., driving wheels 50 ins. diam., and the approximate total weight in working order, 179,000 lbs.

The Intercolonial Ry., between Sept. 18 and Oct. 15, received one box car, 60,000 lbs. capacity, from its Moncton Shops; 52 platform cars, 80,000 lbs. capacity, from Canadian Car and Foundry Co., and 147 box cars, 60,000 lbs. capacity, from Nova Scotia Car Works.

It was announced, Oct. 1, that 20, or about a half, of the locomotives which the C.P.R. is using between North Bend and Vancouver, B.C., have been remodelled so as to

use oil as fuel. Oil storage stations have been established at Coquitlam, Mission Jct. and North Bend, and a regular tank car service is operated from Vancouver to these stations.

The C.P.R., between Sept. 14 and Oct. 14, ordered the following additions to rolling stock:—2 steel ballast cars and 2 steel coal cars from its Hochelaga Shops; 278 steel frame box cars, 53 stock cars, 7 vans, 9 freight refrigerator cars, from its Angus Shops; 500 steel frame box cars from Canadian Car and Foundry Co., and 1 Jordan ballast spreader.

The Eastern Car Co. made its first shipment of cars to the G.T.R., on account of an order of 2,000, Oct. 4, and was delivering at the rate of 15 a day during the earlier portion of October, increasing to 25 a day towards the end of the month. The order is for 2,000 steel underframe box cars, with steel side posts and braces, inside metal roof, etc. Up to Oct. 18, 125 cars had been delivered.

The Canadian Northern Ry., between Sept. 15 and Oct. 14, received the following additions to rolling stock:—4 second class cars and 60 stock cars, from Crossen Car Co.; 52 box cars, from Nova Scotia Car Works; 90 box cars and 85 flat cars, from National Steel Car Co.; 2 combination cars, from Preston Car and Coach Co.; 6 sleeping cars, from Barney and Smith Co.; 2 consolidation locomotives, from Canadian Allis-Chalmers, Ltd.

The C.P.R., between Sept. 14 and Oct. 14, received the following additions to rolling stock:—127 wooden box cars, 25 steel frame box cars, 80 vans, 2 stores supply cars and 6 class V3 locomotives, from its Angus Shops; 650 steel frame box cars, 6 first class cars and 6 tourist cars, from Canadian Car and Foundry Co.; 19 class P1 locomotives, from Montreal Locomotive Works; 8 class D10 locomotives, from Canadian Locomotive Co.; 2 Jordan ballast spreaders, from F. H. Hopkins and Co., and 680 steel frame box cars, from Barney and Smith Co.

The gas electric car which, as announced in a recent issue, is being operated by the Victoria and Sidney Ry. on Vancouver Island, is stated to be giving complete satisfaction. The average daily mileage is given as 110 miles, and on two days in each week, a 30 ton trailer is handled. The body of the car is mainly of steel. The motive power equipment consists of one 2-cylinder, 4-cycle gasoline engine with two integral air pumps directly connected with the lighting generator, one 8-cylinder, 4-cycle main engine with low tension magneto and air starters, and two G.E. 600 volt, series, commutating pole railway motors mounted directly on the axle of the forward truck with nose suspensions. The auxiliary lighting generator is of the multipolar compound wound type and is direct connected to the auxiliary engine. Following are the chief dimensions:—

Weight	51 tons
Length, total	70 ft. 7 3/4 ins.
Length, passenger compartment	9 ft. 11 ins.
Length, baggage compartment	10 ft. 11 7/8 ins.
Length, cab	11 ft. 11 ins.
Bolsters, centre to centre	51 ft. 6 ins.
Wheel base, truck	6 ft. 10 ins.
Wheel base, total	57 ft. 11 ins.

The Busiest Railway Terminal.—Although the Grand Central station, New York, is the largest, it is not the busiest terminal in America. Statistics for the year ended June 30 show the total number of passengers in and out of the Grand Central station was 22,403,295, whereas for the same year the total for the South station at Boston was 38,411,507. Of this total, 28,347,399 represented passengers of the New York, New Haven and Hartford Rd. lines, and 10,064,108 were passengers on the Boston and Albany.

Canadian Railway AND Marine World

ESTABLISHED 1898.

Devoted to Steam and Electric Railway, Marine, Express, Telegraph, and Railway and Canal Contractors' Interests. Official Organ of the various Canadian Transportation Associations. Published on the first of each month.

ACTON BURROWS, LIMITED - Proprietors.
70 Bond Street, Toronto, Canada.

ACTON BURROWS, A. Can. Soc. C.E.,
Managing Director and Editor-in-Chief.

AUBREY ACTON BURROWS - Secretary and
Business Manager.

Associate Editor - JOHN KEIR
Associate Editor - DONALD F. KEIR
Mechanical Editor - FREDERICK H. MOODY, B.A.Sc.

BUSINESS REPRESENTATIVES.

W. H. HEWITT, 70 Bond Street, Toronto
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J. MEREDITH MCKIM, 17 Cockspur St., London, S.W., Eng.

Authorized by the Postmaster General for Canada, for transmission as second class matter, July 3, 1912.

Entered as second class matter, July 25, 1913, at the Postoffice at Buffalo, N.Y., under the Act of Congress of March 3, 1879.

SUBSCRIPTION PRICES, INCLUDING POSTAGE:

TORONTO AND WEST TORONTO POSTAL DELIVERY, \$1.25 a year.

To other places in CANADA, and to NEW-FOUNDLAND AND GREAT BRITAIN, \$1 a year.

To the UNITED STATES and other countries in the Postal Union, except those mentioned above, \$1.50 a year, or six shillings sterling.

SINGLE COPIES, 15 cents each, including postage.

The best and safest way to remit is by express money order. Where one cannot be obtained, a post office money order, or bank draft, payable at par in Toronto, may be sent. Cheques or drafts not payable at par in Toronto cannot be accepted. Remittances should be made payable to CANADIAN RAILWAY AND MARINE WORLD.

NOTICE TO ADVERTISERS.

ADVERTISING RATES furnished on application.

ADVERTISING COPY must reach the publishers by the 10th of the month preceding the date of publication.

TORONTO, CANADA, NOVEMBER, 1913.

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Grand Trunk Pacific Railway Company's Annual Meeting.

The G.T.P.R. Co.'s adjourned annual meeting was held in Montreal Sept. 25. The directors' report is not made public, the reason therefor, officially given, being that the line is still under construction. The following statement has, however, been supplied for publication:—

"The construction of the main line to the Pacific has reached mile 1204 west of Winnipeg, and from Prince Rupert eastward construction has reached mile 305, leaving a section of 236 miles in British Columbia on which the grade is to be completed and the track laid, when the steel will be connected through to the Pacific Ocean. This work is being rushed forward vigorously, and it is expected that the last spike in the construction of the main line will be driven at some point in British Columbia probably within the next nine months. After this is accomplished, however, considerable work will still remain to be done along the line to put it in suitable condition for daily train service. As the line is nearing completion, interest in the vast undeveloped country through which it runs, particularly in British Columbia, is increasing, and there is every prospect that the rapid settlement of the country will take place as soon as adequate transportation facilities are provided.

"Good progress is reported on the company's chain of hotels being built across the continent as an adjunct to its transportation business. It is expected that the Fort Garry hotel at Winnipeg will be completed, ready for opening, the end of November. The construction of the Qu'Appelle hotel, which was recently commenced in Regina, Sask., at a cost of \$1,000,000, is making good progress. The Macdonald hotel, under construction at Edmonton, Alta., occupies one of the finest situations in the city, overlooking the Saskatchewan River and surrounding country for many miles. It is expected that it will be completed so that it may be opened within the next twelve months. Other hotels, of the most modern architecture and equipment, are projected for attractive resorts along the line in the Rocky Mountains, and the excavation for a large hotel at the terminal at Prince Rupert was also recently commenced.

"Traffic along the line is being carried in ever increasing volume each year, and there is every prospect that the prime object for which this vast undertaking is being executed will not be lacking at any period in the company's future history."

The directors for the current year are:— E. J. Chamberlin, President; W. Wainwright, M. M. Reynolds, Vice Presidents; A. W. Smithers, Sir Henry M. Jackson, J. A. Clutton Brock, Lord Welby, H. G. Kelley, W. H. Biggar, E. B. Greenshields, R. Dandurand, W. M. Macpherson, Hon. G. A. Cox, E. R. Wood, and J. R. Booth. The officers were re-elected.

Canadian Pacific Railway Electrification in British Columbia.

Sir Thos. G. Shaughnessy visited his birthplace, Milwaukee, Wis., on his way to Winnipeg recently, and one of the enterprising individuals who provide the daily press with fairy stories telegraphed a report which was published with big headlines, stating that Sir Thomas had announced that the company's experiments with electrification in British Columbia were only preliminary to the electrification of the entire system, should the experiment prove successful. Of course, the report telegraphed was an absolute invention by the press correspondent, and was not taken seriously by

transportation men. On Sir Thomas' arrival at Winnipeg, where he was interviewed about it, he laughed at the story and said that if the electrification of the Rossland subdivision, which was decided on some time ago, and the electrification of Rogers Pass tunnel proved satisfactory, the mountain section of the main line between Field and Revelstoke, B.C., would also probably be electrified.

A good deal of preliminary information about the electrification of the Rossland subdivision was given in Canadian Railway and Marine World for May, 1912, and Aug., 1913. As previously stated, an order for electric locomotives and the electric machinery was given some little time ago to the Canadian General Electric Co. We have already published general dimensions, etc., of the locomotives, of which four are said to have been ordered, and which we learn will have a regenerating electric braking device.

American Railway Bridge and Building Association.

The 23rd annual convention was held at Montreal, Oct. 21-23, this being the second time the convention has taken place in Canada, the last time being at Quebec, ten years ago. The members were welcomed by the President, A. E. Killam, formerly Inspector of Bridges and Buildings, Intercolonial Ry., and W. McNab, Principal Assistant Engineer, G.T.R., and about 100 new members, chiefly Canadians, were elected. A number of reports were received and discussed, the one dealing with the association's finances, being especially satisfactory. The entertainments included a drive round Mount Royal, a trip to the Lachine Rapids, inspection of the two bridges crossing the St. Lawrence, and a visit to Ottawa by special train provided by the C.P.R.

Railway Route Maps Approved.

The Minister of Railways has approved railway route maps as follows:—

Alberta Central Ry.—Oct. 15.—Revision of line from Tp. 26, r. 23, w. 3 m., to Tp. 27, r. 25, w. 3 m., about 14 miles;

Canadian Northern Quebec Ry.—Oct. 10.—From St. Michel to Bout de l'Isle, about 8.25 miles;

Canadian Northern Ry.—Oct. 10.—Revision of line between Sturgis and Hudson Bay Jct., Man., 47.71 miles;

Canadian Pacific Ry.—Oct. 10.—Revision of Swift Current Northwesterly line near Empress, Sask., 23.2 miles;

Montreal and Southern Counties Ry.—Oct. 10.—From St. Cesaire to Granby, Que., about 14.5 miles.

Canadian Northern Ry. Organization.

Charles Hine, who recently resigned his position at Tucson, Arizona, as Vice President and General Manager of the Southern Pacific Rd. of Mexico, and of the Arizona Eastern Rd., two subsidiaries of the Southern Pacific Co., to take up expert railway work along organization and efficiency lines, with headquarters in New York, N.Y., has been retained by the Canadian Northern Ry. executive for a limited period to go over its system and make suggestions in regard to organization, etc. He has already been over the eastern lines and will now go over the western ones.

There are five possible methods for the abatement of smoke from locomotives: 1. The use of comparatively smokeless coals; 2. The use of air jets; 3. The use of mechanical stokers; 4. The instruction of the men operating the locomotives and the supervision of their work; and 5. The elimination of the steam locomotive.

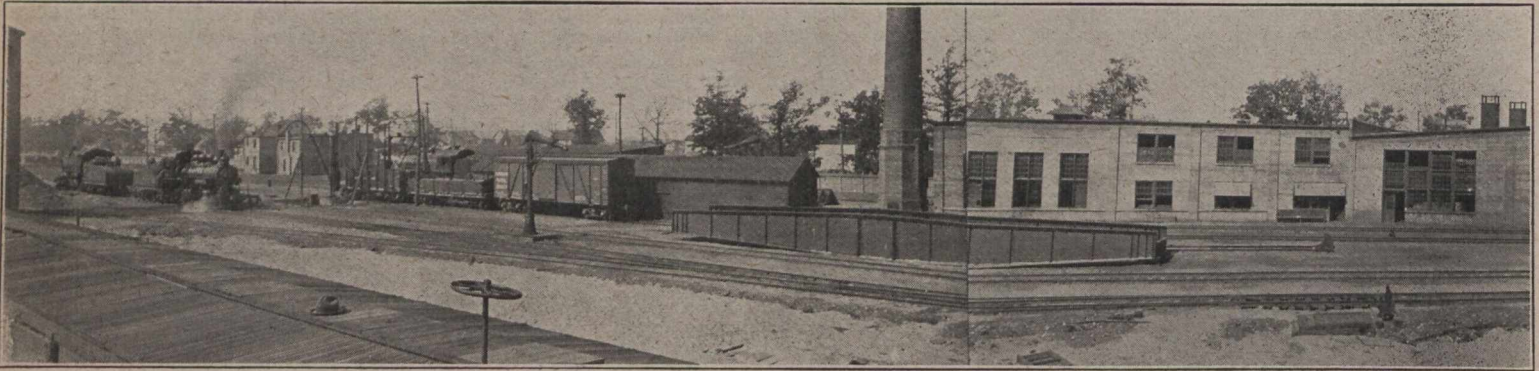
Lambton Freight and Mechanical Yards, Canadian Pacific Railway.

The C.P.R.'s terminal facilities at West Toronto having become overtaxed recently, it was decided, as mentioned in these columns at the time, to build new facilities to the west of those then in use. The site selected is on the north side of the main line to Detroit, near Lambton, just beyond the city limits, which are at Runnymede Road, as shown in the accompanying plan. The terminals extend from Runnymede Road on the east to Chadwick Ave. on the west, which is near the approach of the high

ing a car capacity of 22, with the outside tracks accommodating only three or four. Between every other pair of tracks there is a 2 ft. service track, connecting at the east end by turntables to a track running along behind the earth bumpers. The wheel storage tracks are at the north end of this track, in the open space opposite Ryding Ave., where four sets of storage tracks are being installed. At the south end of the locomotive house there is a pneumatic jib crane over the service track for unloading

85 ft. As mentioned, it is of concrete construction, with large window area in the outer wall. The roof is of 2 by 4 in. planking, laid on edge, and covered with fireproof sheeting. It is supported on the walls and two intermediate circular rows of concrete columns. Over the forward end of each track there is a Johns-Manville asbestos smoke jack.

Each locomotive house track has a 65 ft. concrete pit, with convex bottom, sloping to the inner edge for drainage, a pit for this purpose and for the piping being located at the forward end of the pits, passing around the building just inside the inner wall. The



Panoramic View, Lambton Freight and Mechanical Yards, C.P.R., West End.

level bridge across the Humber River. The site for the terminals is in many ways ideal, as from Runnymede Road westerly for 2,200 ft. there are no highway crossings, Jane St. being the first, this street passing under the narrow western end of the terminal yards in a 30 ft. subway, with double approaches on the St. Clair Ave. end. Scarlett Road, further west, also passes under the line in a 44 ft. subway. At the eastern end of the terminals, the layout has been hampered to a certain degree by the presence of Runnymede Road, which made it impossible to make the yards double ended. This street is carried under the tracks at that end of the yards in a 56 ft. subway, which has at present a 6 track crossing, but the abutments are built for an additional 6 when traffic conditions warrant.

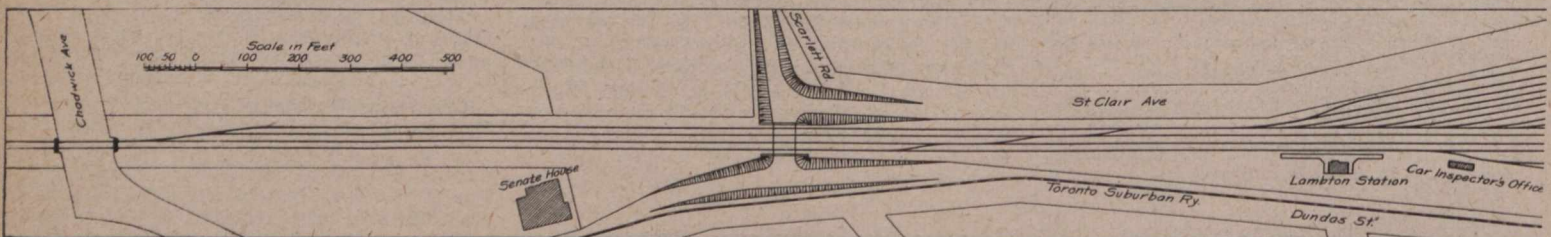
The main line from Toronto, and beyond these new terminals, is double tracked. The westerly entry to the terminals leaves the main line at Chadwick Ave., from which point into the yard ladders there are two leads 2,000 ft. long for arriving and departing trains. These will accommodate 55 car trains. The main part of the yard is double

the wheels from cars on the northerly of the car repair tracks on the track leading into the storage yard. This track is arranged for both standard and narrow gauge. On the track behind the bumpers there is a narrow gauge car, with a carriage top, on which the wheels are run for distribution throughout the yard. The car foreman's office is in the building to the east of the repair track yard, and in the same building are housed the car stores and a small blacksmith shop of one forge. The front of the building is planked, and against the building are material bins for rough car stores. The car stores in the building are contained in 4 tiers of double bins. The building also contains an oil room, lunch room for the men, lavatory and tool room. This yard is not intended for the handling of very heavy repairs, these being handled for the most part in the main shops at West Toronto. The average capacity is 100 pairs of wheels and 100 long sills per month. The yard is in charge of J. J. Bannon, Car Foreman.

The new locomotive house and motive power handling facilities form the main part

sides of each pit are planked with heavy planking for a width of 2 ft., the balance of the floor being of cinder construction, with the exception of the central section of 10 stalls, which is paved with concrete. The three pits at the shop end are drop pits, the first one for front truck wheels, and the next two for driving wheels. The intervening space between these pits at the shop end is floored with heavy planking, on which the wheels can be run from the wheeling tracks, and then into the machine shop.

Alongside each smoke jack, at about 8 ft. centres, there is suspended a light trolley with a 6 ft. rod attached thereto, the tracks being about 36 ft. long. This length covers the locomotive forward of the cab, and is found most useful in the handling of the exterior locomotive fittings such as the bell stand, etc., without the necessity of slinging a block and tackle over a beam. A block and tackle is attached to the trolley to be used, and can be moved along the length of the locomotive at will. The trolley capacity is about 1,000 lbs., which is ample for the handling of such light fittings as would come under running repairs. Only light repairs



Plan Lambton Freight and Mechanical Yards, C.P.R., West End.

ended, and is divided into two sections—for arriving and departing trains, each with a capacity of 500 cars. The arriving yard is the southerly of the two, and extends from Jane St. to the easterly end. The outgoing yard extends the full length of the yards, from the Lambton Station. The combined yards have 20 tracks, located at 13 ft. centres.

To the north of the east end of the yards there is a 12 track freight car repair yard with capacity for about 150 cars. It is arranged with two leads from the north side of the main yards, the central tracks hav-

of the new terminals. The locomotive house is built entirely of concrete, and has 30 stalls, the building being divided into three sections. It opens to the southwest, the entering tracks coming from the west, there being provision for the addition of a further 10 stall unit when required. This locomotive house handles all the power formerly accommodated in the old building adjoining the locomotive shops in West Toronto.

In the centre there is an 80 ft. turntable, operated by an air motor tractor. The inner radius of the locomotive house is 95 ft., and the outer radius, 180 ft., giving a depth of

are handled here, the heavy ones being sent to the nearby locomotive shop in West Toronto.

The general lighting of the locomotive house is by clusters of three 32 c.p. incandescent lamps suspended from the roof near each of the columns. These lights are controlled from a central switchboard panel in groups of 3 pits. In addition to this general lighting, there are incandescent lamp sockets around the walls, and in each pit there are two lamp cord connections.

The indirect system of heating is employed throughout the locomotive house by

means of batteries of pipes in the pits and along the walls. In the pits along each wall there are four lengths of pipe, with similar units along the outer wall. Exhaust steam is employed, supplied through a pipe in the circular pit. The pit also contains a 2 in. steam main, 3 in. water main, and a 1½ in. air main. These all have connections to the columns between the pits.

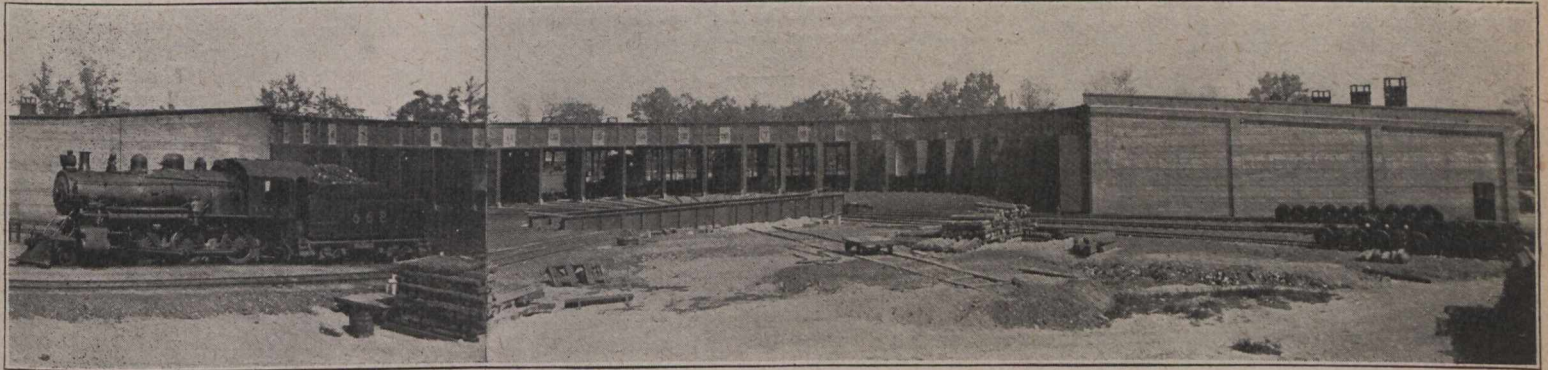
Near the entrance from the locomotive house into the machine shop there is a Miller washout plant which is found very useful. Three sets of piping run from this plant, suspended from the roof, to a column between every other pit. All the column

register trips. This section of the machine shop building is only half the height of the shop, and over the offices, open to the machine shop, there is an air brake testing department, and accommodation for the electricians.

The machine shop contains the following equipment: 16 in. double punch and shear, small press, large press, 2 in. bolt machine, heavy drilling machine, small drilling machine, 26 in. shaper, 18 and 36 in. lathes, grindstone and double emery. The tool room for the shop is in the V corner, adjoining the door into the locomotive house. In the opposite corner is the power equipment,

these rooms are in the charge of an attendant. This man's duties also consist in recording departures, detentions, etc., a system that has been found valuable in locating the cause of delays. Along the west wall in this building there is a small room for the ashpit men, and in the northwest corner of the building there is a room used as a general storing room by the locomotive department, in which are kept winter stores out of season, patterns of buffer beam and other parts, curtains, and such material.

Charcoal is employed for lighting fires, and is contained in a frame building to the



Panoramic View, Lambton Freight and Mechanical Yards, C.P.R., East End.

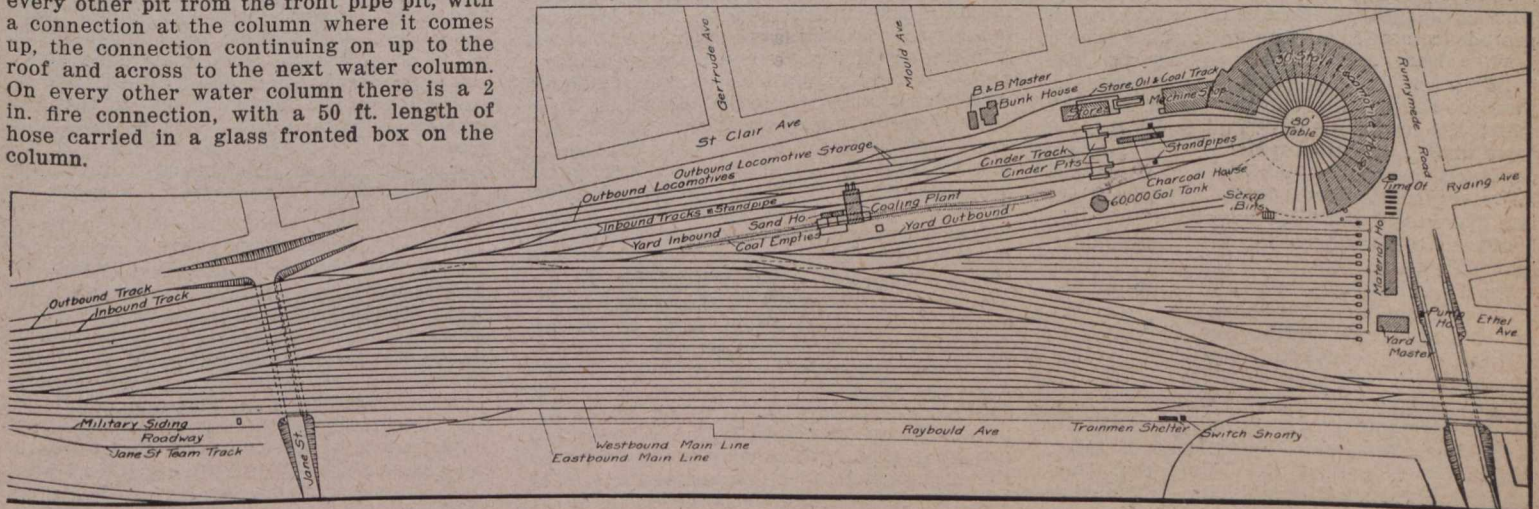
connections are 2 in., branching from 4 in. mains. Through these connections, the blow off water can be drawn off to the washout plant, where it is held in one compartment of the large tank, and is used over again for washout purposes, one line being provided for this purpose. The third line is for filling the locomotive boiler with clear water at about 200 degrees. The temperature of the washout water is automatically regulated to 125 degrees for convenience of the men in handling.

On every water column there is an air connection for blowing purposes, this connection coming up through the floor between every other pit from the front pipe pit, with a connection at the column where it comes up, the connection continuing on up to the roof and across to the next water column. On every other water column there is a 2 in. fire connection, with a 50 ft. length of hose carried in a glass fronted box on the column.

consisting of a small vertical high speed engine for shop drive, and a 16 by 16 by 9 in. air compressor. The westerly section of the shop is divided off for the boiler room, containing three 120 h.p. locomotive boilers carrying 120 lbs. of steam. Outside the boiler room there is a 95 by 10 ft. stack. Adjoining the stack there is a standard C.P.R. air storage tank, with a similar one at the opposite end of the locomotive house for supplying air to the freight car repair yards, which are piped for air. The pressure carried is 100 lbs.

To the west of the machine shop is the stores building, equipped in the usual man-

southeast of the stores building. The east end of this building is a window sash storing room, in which all the double windows of the locomotive house are stored in summer, all the windows in the plant being provided with double storm sashes. The charcoal house portion, which comprises the westerly three quarters, is divided into two equal rooms, both of which have a storage capacity of about one carload of charcoal. The practice followed is to draw from the one room at a time, completely emptying it before commencing on the second. In this manner, better check is kept on the material, and the charcoal is kept in a better



Plan Lambton Freight and Mechanical Yards, C.P.R., East End.

In addition to the foregoing special facilities, in the shop end of the locomotive house there is a small forge for general work, with iron rack adjoining. These are both located in the space between adjoining pits. Here are about 100 expanded metal lockers for the employes in the building, ranged along the partition walls.

The machine shop is contained in a 50 by 90 ft. addition to the west end of the locomotive house. The south side of this building is separated from the machine shop, and contains the offices for the locomotive foreman and his staff, and a room for the men to

ner with racks, etc., for the accommodation of the stock material, and a Bowser equipment for the oil, with storage tanks in the basement. The floor is on a level with that of a car, with a platform along two sides of the building for unloading stores. At the east end of the platform there are stores bins for the rough supplies.

The west end of the stores building is used by the locomotive department, a room in the southwest corner of the building containing racks for the enginemen's clothes and tool boxes. An adjoining room contains the enginemen's oil cans, etc. Both

form for use than if it were constantly being trampled over as in a single room store.

To and from the locomotive house, there are 2 inbound and 4 outbound tracks, with four immediate tracks connecting with the turntable pit. For the handling of the ashes on the locomotives there are two Ord ash handling plants of the type described in Canadian Railway and Marine World, Oct., 1911. Over each there are two tracks, with a blind track between for spotting ash cars. In the accompanying panoramic view of the mechanical terminals a locomotive is shown on the left dumping ashes.

The coal handling plant is of the C.P.R. standard type, consisting of a chain of buckets raising the coal from lower hoppers to hoppers over the service tracks. The plant is of 300 tons capacity, and has four chutes. Coal cars come into the plant up a ramp, which is continued 9 car lengths beyond the plant. A string of cars can thus be fed through the plant as required from the stub end without assistance from the yard crew, once the train of 10 cars is run up the ramp. Adjoining the coaling plant there is a sand storage bin, from which the sand is elevated into hoppers on the coal hopper frame for feeding into the locomotive.

Locomotive water is obtained from the city service, there being a 60,000 gal. tank on the grounds. Between each of the pairs of asphalt tracks, and between two of the coaling plant tracks, as well as on one of the tracks passing the tank, there are water spouts, so that a locomotive can be watered on any one of 7 tracks.

On the St. Clair Ave. side of the yards there is an old house, now used by the locomotive department as a bunk house for the locomotive drivers and firemen. In the rear of the bunk house there is a well equipped kitchen where the men may cook meals, and the centre room is for dining. The front room of the house is fitted up for a reading room, with current railway technical literature, as well as books and general periodicals. This room also contains a series of air brake charts that are handy for the men's reference. The upstairs section of the house has a chain of bedrooms, containing 12 beds. Below stairs is a register book for the men's calls.

The Locomotive Foreman of this new locomotive terminal is F. Ronaldson, to whom we are indebted for the data on which this article is based.

Construction of the Alberta and Great Waterways Railway Arranged For.

After considerable difficulty, political and legal, for over three years, the Alberta Legislature has passed a new act, which is expected to settle all the difficulties which have arisen, and which provides for the building of the line under new auspices. The act repeals the one passed in 1910, by which the funds of the A. and G. W. Ry. Co. were declared to be part of the general funds of the province; ratifies the provincial guarantee of \$7,000,000 of bonds, authorizes the Provincial Treasurer to deliver the bonds to the trustees for the bondholders, in exchange for the interim bonds issued, authorizes the banks to pay over the money now held to such banks as the province shall appoint; and authorizes the building of the line, the work to be started by Dec. 31.

In introducing the measure the Premier announced that the line would be built by J. D. McArthur, the Winnipeg contractor, who is President of the Edmonton, Dunvegan and British Columbia Ry. The offer made by Mr. McArthur was dated Sept. 22, and the main sections of the bill were drawn on the lines of the offer. The work is to be done on the general lines laid down in the original guarantee act, and the railway is to be finished by Dec. 31, 1915.

During the discussion on the bill, which continued every day for nearly three weeks, in the House and in Committee, a large number of amendments were considered. The principal one of these dealt with an offer put in by Janse Brothers and associates, to build the line at \$16,766 a mile, which is less than the McArthur offer. This was defeated by a considerable majority.

The original act was passed Mar, 1909,

and provided for the guarantee of bonds for \$20,000 a mile for the construction of the main line from Edmonton to Lac la Biche and Fort McMurray, 350 miles; and an additional amount of \$400,000 to provide terminals at Edmonton. The country through which the line will run is reported to be rich in minerals and the railway would give connection between Edmonton and the great waterways of the Mackenzie River basin, on to the Arctic ocean.

Railway Transportation Problems of the Future.

By J. Grant MacGregor, M. Can. Soc. C.E., Assistant Engineer, Construction Department, Canadian Pacific Railway R.ed Deer, Alta.

It is to be hoped the writer may be excused if he again refers to a subject which, although by no means a dead issue, can only be dealt with summarily in the columns of a technical journal. Mr. Wicksteed's reference to the subject in Canadian Railway and Marine World for October and his able elucidation of some of the more salient points referred to under the same heading in the September issue, suggest to the writer means by which his views can be expressed more fully on certain points, calculated otherwise to remain obscure or misinterpreted. For instance, in discriminating between the advantages of the operation of easy and steep grade standards of roads, regard should be had to the fact that, as the former has been constructed, or perhaps reconstructed, at apparently greater cost than the latter, every opportunity should be afforded the more expensive line to earn revenue proportionate to its cost, and where the volume of traffic is unlimited, this can only be done by equipping the road to its fullest capacity with modern equipment.

Generally speaking, the main object of grade reduction would be to provide for a prospective increase of business, the rate of which may be already taxing the efforts of the mechanical and operating departments to their utmost limits. But, for economy in operation, there should be a certain limit to the number of trains necessary, and in order to handle an increased volume of business with the same number of train units, lower grades and heavier train loads are sought. Again it is evident that if we assume that the modern steam locomotive has attained its highest degree of efficiency, a perpetual saving on cost of train mileage operated can only be looked for in the direction of grade reduction and curve elimination. It is this perpetual saving in cost of operation of an easy grade standard line that often fails to be appreciated to the fullest extent, when the line is turned over for operation. The remark is often made that lines with continuous stretches of low ruling grade are harder to operate than a line with broken grades, some of which may be steeper than the ruling grade. The reason should not be hard to find, nevertheless the idea is apparently a fallacious one, that it is impossible for a locomotive of the proper type, i.e., with sufficient boiler capacity and grate area, etc., to keep up a uniform speed over long stretches of low ruling grade. Experiments made by the various railways with mechanical stokers have, to a large extent, proved the fallacy of this idea, and locomotives of the proper type should no longer be held responsible for a defect which is apparently a physical one on the part of the fireman. The minimum speed of 10 miles an hour usually given on speed diagrams is no doubt too low, and tractive power should be provided for a speed of not less than 15 or 20 miles an hour on di-

visions where long stretches of ruling grade are developed. The writer's contention, however, is not to the end that it is necessary for all these ideal conditions to exist, and that obsolete locomotives should be consigned to the scrap heap, otherwise the business of a railway must be run at a loss, but rather that they are factors and possibilities which sooner or later must be counted upon, and should now enter into all calculations for future development.

In dealing with new location, or grade reduction problems, it is wise, no doubt, as Mr. Wicksteed's remarks would appear to indicate, to have due consideration for the imperfections and frailties of our present means of operation, providing that what can be accomplished under those conditions is a step in the right direction. The writer is aware of the menace to the operating department of the type of profile certain topographical features will develop, but would be sceptical about the advantage of taking an occasional jump over a summit, if at all in excess of the ruling grade, unless, of course, in cases where momentum is a factor. Pusher grades of proper length, however, can very profitably be introduced at places where convenient for operation, such as at divisional points, but generally speaking they are unsatisfactory in the quick handling of passenger trains.

It would be interesting to know to what extent the practice of locating for future grade reduction is carried on throughout the Dominion. By this practice the results obtained are extremely gratifying, on account of the light character of profile obtained for immediate construction and the enormous saving in the cost of future grade reduction. By locating important lines, capable of future development, with this end in view, right of way, bridges, townsites, etc., need not necessarily be abandoned during reconstruction.

Mr. Wicksteed has treated the question of the comparative advantages of steam and electric motive power in a very interesting manner, but unfortunately leaves us without a ray of hope as to the future, because of the enormous capital already invested in steam power equipment. The change, of course, must be a gradual one, but if a systematic start were once made, and a practicable method of interchange instituted for the carrying on of the two systems simultaneously, it is possible that great strides could be made by the time the steam locomotive now being built at the shops is relegated to service on some unimportant branch line.

Canadian Railway Club.—Consequent on the removal of C. Murphy, formerly General Superintendent of Transportation, C. P. R., from Montreal to Winnipeg, as General Superintendent, Manitoba Division, C. P. R., and the removal of D. Crombie, formerly General Superintendent of Transportation, G. T. R., from Montreal to Detroit, Mich., in Pere Marquette Rd. service, L. C. Ord, General Car Inspector, C. P. R., Montreal, has been elected Second Vice President, Canadian Railway Club, vice C. Murphy; C. Manning, secretary to Superintendent of Motive Power, G. T. R., Montreal, has been elected a member of the Executive Committee, vice D. Crombie, and H. Osborne, Assistant Superintendent of Motive Power, C. P. R., Montreal, has been elected a member of the Executive Committee, vice L. C. Ord.

W. M. DUNLOP, chartered accountant, Ottawa, in renewing his subscription to Canadian Railway and Marine World, writes: "I enclose express order to cover my annual subscription to your valuable paper, and may just say it is quite worthy of due appreciation for its useful information."

Appointments and Territorial Divisions for Canadian Pacific Railway Atlantic and Pacific Steamship Lines.

The following appointments and territorial divisions for the Transatlantic and Transpacific Steamships Services, have been announced, effective from Oct. 1:—

St. John, N. B., District Passenger Agent, W. B. HOWARD, with territory covering Nova Scotia, New Brunswick, Prince Edward Island, Quebec, St. Charles and east, except on Intercolonial Ry. from Quebec to New Brunswick boundary; Newfoundland, and Maine from eastern boundary to and including Bangor.

Montreal, General Agent, Passenger Department, W. WEBBER, with territory covering Quebec west of St. Charles, and Megantic along Intercolonial Ry. from Quebec to New Brunswick boundary; C. P. R. main line east of Port Arthur and Sault Ste. Marie, Ontario, east of Kingston, including Kingston and Pembroke Ry. north of Sharbot Lake; C. P. R. between Richport and Newport inclusive, and Boston and Maine Rd. between North Derby and Newport inclusive, also Oswego, Sackett's Harbor and ports along the St. Lawrence in New York State.

Toronto, District Passenger Agent, M. G. MURPHY; Assistant District Passenger Agent, I. E. SUCKLING, with territory, Ontario west of and including Kingston and Sharbot Lake to Windsor, and south of Sudbury and North Bay; Buffalo and points in New York State along Niagara River.

Winnipeg, General Agent, Passenger Department, J. S. CARTER, with territory covering the Canadian West, from Port Arthur and Fort William to British Columbia boundary.

Vancouver, General Agent, Passenger Department, J. J. FORSTER, with territory covering British Columbia and Alaska.

Boston, Mass., General Agent, Passenger Department, F. R. PERRY, with territory covering Connecticut, except N. Y., N. H. & H. Rd. coast line between New York and Woodmont; Rhode Island, Massachusetts, Vermont, excepting C. P. R. between Richford and Newport; and Boston and Maine Rd. between North Derby and Newport; New Hampshire and Maine, as far east as, but not including, Bangor.

New York, N. Y., General Agent, Passenger Department, W. H. SNELL, with territory covering Connecticut along N. Y., N. H. & H. Rd. coast line from New York to Woodmont; New York, except Buffalo and points along Niagara River and Oswego, Sackett's Harbor and points along St. Lawrence River; New Jersey; Pennsylvania, east of a line drawn from Hyndman, Altoona and Clearfield north to Pennsylvania line and along Buffalo, Rochester and Pittsburgh Ry. main line; Delaware, Maryland, east of Cumberland, Virginia; North and South Carolina, Georgia, Florida and Washington, D. C.

Pittsburgh, Pa., General Agent, Passenger Department, C. L. WILLIAMS, with territory, Ohio, east of a line drawn from Marietta to Newark, up to but not including Mansfield, Akron and Youngstown to the Pennsylvania line; Pennsylvania, west of a line drawn from Hyndman, Altoona and Clearfield north to Pennsylvania line and along Buffalo, Rochester and Pittsburgh Ry. main line; Maryland, Cumberland and west, and West Virginia.

Cincinnati, Ohio, General Agent, Passenger Department, M. E. MALONE, with territory, Ohio, except portion east of line drawn through Marietta to Newark up to Mansfield, Akron and Youngstown to Pennsylvania State line and north thereof;

Indiana except portion on and north of Wabash Rd.; Kentucky, Tennessee, Alabama, Mississippi and Louisiana.

Detroit, Mich., District Passenger Agent, A. E. EDMONDS, with territory covering lower peninsula of Michigan and Lake Shore and Michigan Southern Ry. from Toledo to Sandusky, Ohio, and portion of Ohio east and north of line drawn from Sandusky to Bucyrus, thence east through Mansfield, Akron and Youngstown to Pennsylvania State line.

Chicago, Ill., General Agent, Passenger Department, G. A. WALTON; Assistant General Agent, H. M. MacCALLUM, with territory covering, Illinois; Iowa, southeast of Chicago, Milwaukee and St. Paul Ry.; and Northwestern Line from McGregor to Sheldon, Sheldon to Sioux City (Sioux City neutral with Minneapolis District); on and north of Wabash Rd. in Indiana and portion of South Dakota west of Missouri River; Missouri, Oklahoma, Arkansas, Texas, Mexico, except Lower California and Sonora; Kansas, Nebraska, Colorado, New Mexico, Utah, Wyoming and Wisconsin as far north as line drawn from Kawaunee through Wausau, Marshfield and Merrillan to La Crosse, excluding Green Bay and Fort Howard.

Minneapolis, Minn., General Agent, Passenger Department, H. M. TAIT, with territory, northern Michigan, Wisconsin north of line from Kawaunee through Wausau, Marshfield and Merrillan to La Crosse; Minnesota, North and South Dakota.

Los Angeles, Cal., General Agent, Passenger Department, A. A. POLHAMUS, with territory, California, Bakersfield, Santa Barbara and south; Arizona, and Sonora, in Mexico.

San Francisco, Cal., General Agent, Passenger Department, G. M. JACKSON, with territory, California, north of Bakersfield and Santa Barbara, and Nevada.

Portland, Ore., General Agent, Passenger Department, F. R. JOHNSON, with territory covering Oregon west of line drawn southerly from Hood River on Oregon-Washington Rd. and Navigation Co.'s line not including Hood River, to California-Oregon State line, including Southern Pacific Line and branches; Washington south of Kalama on O. W. R. & N. Co.'s line, G. N. and N. P. Rys., and west of White Salmon on Spokane, Portland and Seattle Ry.

Seattle, Wash., General Agent, Passenger Department, E. E. PENN, with territory covering Washington west of line drawn northeasterly from Kalama on G. N. and N. P. Rys. and O. W. R. & N. Co.'s line, including Kalama, through Ellensburg on N. P. and Chicago, Milwaukee and Puget Sound Rys., thence northerly through Leavenworth on G. N. R. to International boundary, not including Ellensburg and Leavenworth.

Spokane, Wash., General Agent, Passenger Department, T. J. WALL, with territory covering, Montana and Idaho, and Washington east of and including White Salmon, Ellensburg and Leavenworth, Oregon east of and including Hood River.

W. G. ANNABLE is General Passenger Agent, Transatlantic Steamship Service, and C. E. BENJAMIN is General Passenger Agent, Transpacific Steamship Service, both with offices at Montreal.

To obtain from modern locomotives the average power required from them, it is necessary to consume fuel at the rate of about 100 lbs. of coal per sq. ft. of grate per hour, and to obtain the maximum power required, it is necessary to increase this amount to 150 lbs., and at times, even in excess of this amount.

Halifax Ocean Terminals, Intercolonial Ry.

Tenders are under consideration by the Railways Department for contract 3 of the first work of the docks, etc., to be built at Halifax, N.S., in connection with the new ocean terminals for the I.R.C. The works covered by the contract will be situated along the west shore of Halifax harbor, and will extend from the northern boundary of His Majesty's lumber yard southwesterly to the northern boundary of the Royal Nova Scotia Yacht Squadron's property, a distance of 3,200 ft. The works will include the following quay walls and quays:—North return end of bulkhead passenger landing quay, 83 ft.; bulkhead passenger landing quay, 2,006 ft.; north quay of basin no. 1, 1,208 ft.; west quay of basin no. 1, 95 ft.; north quay, pier A, 1,250 ft.; east quay, pier A, 320 ft.; south quay, pier A, 1,250 ft.; west quay, basin no. 2, 320 ft.; the dredging of the harbor or front, north and east of the bulkhead passenger landing quay, to give a minimum depth of 45 ft. at low water of ordinary spring tides, and in basins 1 and 2 to give minimum depths varying from 30 to 35 ft. at low water of ordinary spring tides; filling and grading to such levels as may be required for quays and sheds, and of all such areas as may be required behind the quay walls to complete the filling and grading of the whole terminal area to be reclaimed from the harbor for the first work of the ocean terminals; the construction of sewers; concrete and timber piling and concrete foundations and substructures for passenger and cargo transit sheds and buildings to be erected on the bulkhead passenger landing quay, north quay of basin no. 1, and north and south quays of pier A. Prior to starting any new work the contractor is to clear the site, and to remove therefrom existing buildings, wharves and structures.

All the works north of the cope line of the north quay of pier A are to be completed by May 1, 1916, and the remainder by May 1, 1917. The whole is to be carried out under the direct charge of Jas. McGregor, M. Can. Soc. C.E., Superintending Engineer, F. W. Cowie, M. Can. Soc. C.E., being Consulting Engineer, both acting under F. P. Gutelius, M. Can. Soc. C.E., General Manager Canadian Government Railways.

The C.P.R.'s Operations in Austria.—During October, following charges against S. Altman, Agent, C.P.R., Vienna, Austria, for alleged breaches of the emigration laws in assisting persons liable for military service to emigrate, the C.P.R. offices throughout Austria were raided and closed, as also were the offices of the Uranium Steamship Co. It would appear that the Austrian Government fears that owing to the increasing numbers emigrating to Canada, and to the unsettled condition in the Balkan States, the numbers from whom the reserves would be drawn for active service, would be depleted. The matter has become entangled with politics, and a number of charges have been made involving members of the Government and others. A rigid investigation is promised.

Electrification of London and Port Stanley Ry.—The ratepayers of London, Ont., on Oct. 22, approved by a vote of 2,820 to 2,074, a bylaw providing \$700,000 for the electrification of the London & Port Stanley Ry. between London and Port Stanley, Ont., 24 miles, which is operated by the Pere Marquette Rd. under a lease, which is about to expire. It is said that the work of electrification will be started as quickly as possible, and that it is expected to have it completed by July 1, 1914. A London dispatch says that the city council will name a commission of five, of which the mayor will be one, to equip, maintain and operate the line.

Transportation Appointments Throughout Canada.

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.

Algoma Central and Hudson Bay Ry., Algoma Eastern Ry.—G. A. MONTGOMERY, heretofore Superintendent, Algoma Central and Hudson Bay Ry., Sault Ste. Marie, Ont., has been appointed General Superintendent, A.C. & H.B.R. and A.E.R. Office, Sault Ste. Marie, Ont.

Algoma Central and Hudson Bay Ry.—A. J. DONEGAN, heretofore Assistant Superintendent, Hawk Jct., Ont., has been appointed Superintendent, Agawa, Northern and Michipicoten Divisions. Office, Hawk Jct., Ont.

Canadian Government Railways.—G. R. JOUGHINS, Superintendent of Motive Power, has had his title changed to Superintendent Rolling Stock. Office, Moncton, N.B.

E. P. CRONK, formerly Superintendent, National Transcontinental Ry., Edmundston, N.B., has been appointed City Freight Agent, Toronto.

See also Intercolonial Ry.

Canadian Northern Ry.—C. WHEATON, heretofore Car Foreman, Edmonton, Alta., has been appointed Car Foreman at Port Arthur, Ont., vice J. Grant transferred.

J. GRANT, heretofore Car Foreman, Port Arthur, Ont., has been appointed Car Foreman, Dauphin, Man., vice C. R. Stokes, transferred.

The position of Travelling Dining Car Conductor, heretofore held by P. ACKERMANN, has been abolished.

C. H. WORBY has been appointed Inspector of Sleeping and Dining Cars, vice G. S. Andrews, resigned. Headquarters, Winnipeg.

G. H. CULLINGFORD and A. E. KNIGHT have been appointed Inspectors of Sleeping and Dining Cars. Headquarters, Winnipeg.

C. R. STOKES, heretofore Car Foreman, Dauphin, Man., has been appointed Car Foreman, Saskatoon, Sask., vice C. A. Abbott, transferred.

C. A. ABBOTT, heretofore Car Foreman, Saskatoon, Sask., has been appointed Car Foreman, Edmonton, Alta., vice C. Wheaton, transferred.

Canadian Pacific Ry.—H. R. NAYLOR, heretofore General Car Foreman, West Toronto, Ont., has been appointed Division Car Foreman, Eastern Division, vice G. E. Smart, resigned to enter Canadian Government Railways service. Office, Montreal.

F. W. FOX, heretofore assistant to G. H. Ham in the Publicity Department, has been appointed editor of the Press Bureau, which is now part of the General Publicity Department, under J. M. Gibbon, General Publicity Agent.

W. K. THOMPSON, heretofore Superintendent, District 1, Ontario Division, has been appointed Superintendent, District 3, Ontario Division, vice W. Coulter transferred. Office, Toronto.

W. J. UREN, heretofore Superintendent, District 2, Alberta Division, Calgary, has been appointed Superintendent, District 1, Ontario Division, vice W. K. Thompson transferred. Office, Toronto.

JAMES COWLEY, heretofore Foreman, West Toronto shops, has been appointed acting Car Foreman, Toronto, vice G. G. Gagnon, transferred to Hochelaga, Que., as announced in our last issue.

W. H. POLLEY has been appointed Assistant City Passenger Agent, Toronto.

A. R. LAUDER has been appointed acting District Master Mechanic, District 2, Lake Superior Division, vice J. H. Brooks, who is acting as a member of the examining board visiting different points on the

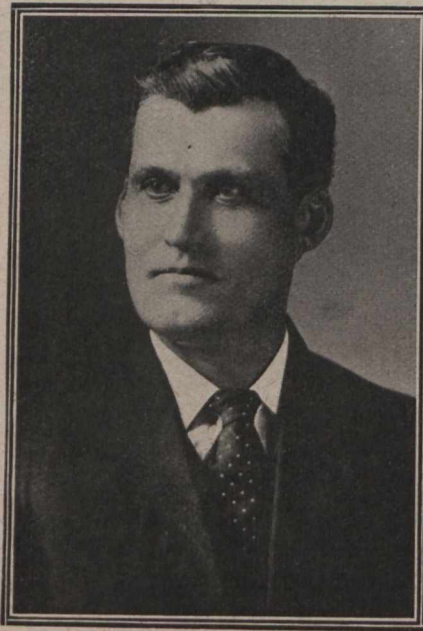
Eastern Lines, examining firemen for promotion as locomotive drivers. Office, Chapleau, Ont.

S. A. SIMPSON, heretofore Superintendent, Sleeping, Dining and Parlor Cars and News Service, Alberta Division, Calgary, has been appointed Superintendent, same department, Manitoba Division, vice A. W. Porter, transferred. Office, Winnipeg.

A. J. MEGRUND, Roadmaster in charge of double track construction west of Brandon, Man., on Broadview Subdivision, and who has also been acting Roadmaster, Broadview Subdivision, will return to the Brandon Subdivision with headquarters at Winnipeg, during November, when double track will be discontinued for the season.

T. M. FRASER, heretofore Roadmaster, Winnipeg, has been appointed Roadmaster, Broadview Subdivision, vice A. J. Megrund, who has been acting during the absence on sick leave of M. Lillis. Office, Broadview, Sask.

A. W. PORTER, heretofore Superintendent, Sleeping, Dining and Parlor Cars and News Service, Manitoba Division, Winnipeg, has been appointed Superintendent, same



H. D. Mackenzie,
Master Mechanic, District 4, Intercolonial Railway.

department, Saskatchewan Division, vice D. S. Fraser, transferred. Office, Moose Jaw.

W. WHITTAKER has been appointed Inspector, Investigation Department, Saskatchewan Division, Moose Jaw, vice H. O. Wunderling, transferred to the British Columbia Division at Vancouver.

P. F. WEISBROD, heretofore acting Superintendent, Calgary Terminals, has been appointed Superintendent, Calgary Terminals. Office, Calgary, Alta.

D. S. FRASER, heretofore Superintendent, Sleeping, Dining and Parlor Cars and News Service, Saskatchewan Division, Moose Jaw, has been appointed Superintendent, same department, Alberta Division, vice S. A. Simpson, transferred. Office, Calgary.

E. OFFICER, heretofore in General Passenger Department, Winnipeg, has been appointed Travelling Passenger Agent, Calgary, Alta., vice A. G. Brooker, transferred to Regina, Sask., as announced in our last issue.

H. O. WUNDERLING has been appointed Inspector, Investigation Department, British Columbia Division, Vancouver, and not Chief of Special Service Department for

that division, as stated in our last issue.

T. McNEIL, heretofore Agent, Antwerp, Belgium, has been appointed Agent, Liverpool, Eng., vice F. W. Forster, deceased.

W. D. GROSSET, who is reported to have been chief assistant in the General Offices in London, Eng., has been appointed Agent at Antwerp, Belgium, vice T. McNeil, transferred to Liverpool, Eng.

Appointments and territorial divisions relating to the Transatlantic and Transpacific Steamship Service will be found under a separate heading on another page of this issue.

Grand Trunk Pacific Ry.—W. CASH has been appointed Car Foreman, Fort William, Ont., vice H. E. Jell, transferred.

E. HACKING, General Car Foreman, has had his office moved from Melville, Sask., to Transcona, Man.

R. MOORE, heretofore Car Foreman, Melville, Sask., has been appointed Car Foreman, Rivers, Man., vice E. C. Ferguson, transferred.

W. MILLS, formerly Master Car Builder, Algoma Central and Hudson Bay Ry., Sault Ste. Marie, Ont., has been appointed Car Foreman, G.T.P.R., Melville, Sask., vice R. Moore, transferred.

H. E. JELL, heretofore Car Foreman, Fort William, Ont., has been appointed Car Foreman, Biggar, Sask., vice J. Robby, assigned to other duties.

E. C. FERGUSON, formerly Car Foreman, Rivers, Man., and subsequently transferred to Edson, Alta., in a similar position, having left the service. C. A. MUNROE has been appointed Car Foreman at Edson.

G. A. NICHOLL, heretofore Superintendent, Prince Rupert, B.C., has been appointed Commissioner, Colonization and Industrial Department. Office, Prince Rupert.

The following agents have been appointed:—Raith, Ont., D. R. Rorke; G.T.P. Jct., Man., H. McCreadie; Uno, Man., C. E. Fletcher; Lazare, Man., G. A. Swan; Spy Hill, Sask., W. Harte; Birmingham, Sask., A. J. Cantin; Balcarres, Sask., V. D. Sibbald; Duff, Sask., C. McMahon; Northgate, Sask., S. Anderson; Frobisher, Sask., R. J. Wilson; Minard, Sask., M. E. Evans; Dodsland, Sask., W. R. Stockdale; Loverna, Sask., R. W. Pearsall; Trochu, Alta., A. G. Sinclair; Mile 145, B.C., A. W. Bennett.

Grand Trunk Ry.—THOMAS RODGER, heretofore Inspector of Telegraphs and Telephones, has been appointed Supervisor of Plant, with jurisdiction over all matters appertaining to telegraph and telephone traffic, and his former title has been abolished. Office, Montreal.

C. H. TILLET, heretofore Chief Draughtsman, Signal Engineer's Office, Montreal, has been appointed Supervisor of Signals, vice R. A. Becker, resigned. Office, Montreal.

The following agents have been appointed:—St. Hyacinthe, Que., F. C. Bouvette; Chaudiere Jct., Point Levi and Quebec (Freight), Que., E. Fournier; Levis, Que., A. J. Roy (Pass.); Concord, Ont., A. G. Mortson; Aurora, Ont., W. J. Buchanan; Powassan, Ont., T. A. Wickett; Milton, Ont., J. E. Bell; Glen Huron and Nottawa, Ont., J. B. Snowden; New Hamburg, Ont., W. A. Cober; Mandaumin, Ont., S. P. O'Neil (Pass.); Brussels, Ont., S. E. Smith.

Intercolonial Ry.—W. U. APPLETON, heretofore Assistant to Superintendent of Motive Power, has been appointed General Master Mechanic, in charge of all engine houses and shops, except Moncton shops, locomotives and machinery, and will perform such other duties as proper authority may direct. Office, Moncton, N.B.

A. C. BARKER has been appointed Inspector of Stations, Trains and Train Dispatching, including the instructing of

all employes in Standard Code Rules. Office, Moncton, N.B.

G. E. SMART, heretofore Division Car Foreman, Eastern Division, C.P.R., Montreal, has been appointed Master Car Builder in charge of all car shops, and will be responsible for maintenance, repair and cleaning of all cars and efficient and economical operation of shops, and will perform such other duties as proper authority may direct.

J. C. FULMORE, heretofore Roadmaster, Halifax, Truro and Stellarton District, Truro, N.S., has been appointed Roadmaster, Point Tupper to Sydney District, vice W. P. Mills, promoted. Office, Sydney, N.S.

A. E. WELLWOOD, heretofore Inspector, Point Tupper to Sydney District, Sydney, N.S., has been appointed Roadmaster, Stellarton to Mulgrave District, vice A. B. Gray, retired on the pension fund. Office, New Glasgow, N.S.

H. D. MACKENZIE, heretofore General Locomotive Foreman, Moncton, N.B., has been appointed District Master Mechanic, District 4. Office, Stellarton, N.S.

W. P. MILLS, heretofore Roadmaster, Point Tupper to Sydney District, Sydney, N.S., has been appointed Bridge and Building Master, Truro to Sydney District. Office, Sydney, N.S.

C. W. ARCHIBALD, heretofore Resident Engineer, Truro to Sydney District, New Glasgow, N.S., has been appointed Roadmaster, Halifax, Truro and Stellarton District, vice J. C. Fulmore, transferred. Office, Truro, N.S.

G. COOPER, heretofore section foreman, has been appointed Roadmaster, Painsec Jct. to Truro District, vice W. J. Lockhart, retired on pension fund. Office, Moncton, N.B.

W. E. BARNES, heretofore Division Master Mechanic, Moncton, N.B., has been appointed District Master Mechanic, District 13. Office, Moncton.

JOSEPH GRAHAM, heretofore Foreman of Erecting Shop, has been appointed Superintendent Locomotive Shops, vice H. D. McKenzie, General Locomotive Foreman, transferred. Office, Moncton, N.B.

T. MCPHERSON, heretofore General Roadmaster, Moncton, N.B., has been appointed Roadmaster, Point du Chene to St. John District, vice A. H. Somers, transferred. Office, Moncton, N.B. The position of General Roadmaster has been abolished.

A. H. SOMERS, heretofore Roadmaster, Point du Chene to St. John District, Moncton, N.B., has been appointed Roadmaster on the National Transcontinental Ry. section between Moncton and Edmundston, which is being operated by the I.R.C. Office, Edmundston, N.B.

T. W. HENNESEY has been appointed District Master Mechanic, District 2. Office, Campbellton, N.B.

H. W. SHARPE, heretofore acting Division Master Mechanic, Riviere du Loup, Que., has been appointed District Master Mechanic, District 1. Office, Riviere du Loup, Que.

See also Canadian Government Railways.

Michigan Central Rd.—With reference to the appointment of S. D. WILLIAMS, Jr., as Division Engineer, St. Thomas, Ont., vice W. C. Houston, transferred to Jackson, Mich., as announced in our last issue, we were officially advised, Oct. 15, that though he had been appointed as stated, he had not then taken charge of the office, but was still acting Division Engineer, Niles, Mich.

Prince Edward Island Ry.—See Canadian Government Railways.

Southern New England Ry.—R. D. GARNER has been appointed Engineer of Construction. Office, Grosvenor Bldg., Providence, R.I.

Traffic Orders by the Board of Railway Commissioners

Rattan Furniture Rates from British Columbia.

20415. Sept. 24.—Re Supplement 24 to Tariff C.R.C., no. W-1713, filed by C.P.R. Co., and effective Sept. 7, increasing rate on rattan furniture from Vancouver and Victoria to points in Manitoba, Ontario, and Quebec; and order 20246, Aug. 30, suspending the effective date of the advanced rates in the said supplement for 30 days from the date of the order. It is ordered that the said order 20246 be rescinded.

C.P.R. Local Standard Passenger Tariff.

20457. Sept. 30.—Re application of C.P.R., under sec. 331 of the Railway Act, for approval of its Local Standard Passenger Tariff L. 48, being C.R.C. no. E 2279, cancelling C.R.C. no. E 664 and C.R.C. no. W. 38 and supplements thereto. It is ordered that the maximum tolls to be charged for passengers for all distances on C.P.R. lines in Canada now in operation or under construction, as specified in the company's Standard Passenger Tariff C.R.C. no. 2279, Aug. 12, become effective Sept. 1, viz., 3c. a mile east of and including the company's railway between Macleod, Calgary, and Edmonton, Alta., and 4c. a mile west of and including Macleod and Calgary, the said tariff being a consolidation of the company's approved Standard Passenger Tariffs C.R.C. nos. W. 38 and E 664, be approved, subject to the provisions of subsec. 2 of sec. 327, and subsec. 1 of sec. 331 of the Railway Act.

Mill Feed Rates from Lethbridge.

20462. Oct. 2.—Re complaint of A. Robertson, of Keremeos, B.C., that the combination of the Canadian Pacific and Great Northern Railway Companies' local rates now paid on mill feed, in carloads, from Lethbridge to Keremeos, viz., C.P.R., 27c.; G.N.R., 38c.; total, 65c., if routed via Nelson; and C.P.R., 37c.; G.N.R., 27c.; total, 64c., if routed via Grand Forks; as against the rate of 42c. through the United States, hitherto charged, is excessive. It is ordered and declared that the joint tariff of the Alberta Ry. and Irrigation Co. C.R.C. no. 165 is lawfully in effect; and that Supplement 16 thereto, filed by the C.P.R., to take effect Aug. 18, be disallowed. That the Board will be prepared to consider an application for the annulment of the said C.R.C. no. 165 on the publication and filing by the C.P.R. of local and joint tariffs of rates from Lethbridge, and from points on the Alberta Ry. and Irrigation Co.'s line via Lethbridge, which shall not be greater than those shown in the said C.R.C. no. 165, via Coultts, to points in British Columbia on the Great Northern and Canadian Pacific Railways to which the rates of the said C.R.C. no. 165 are now lower than via C.P.R. from Lethbridge, having regard to the provisions of the Railway Act.



Canadian Government Railways

TENDER

SEALED TENDERS addressed to the undersigned and marked on the outside, "Tender, Diversion of Line, North Sydney to Leitches Creek," will be received up to and including Monday, November 10th, 1913, for the construction of a line of Railway from North Sydney to Leitches Creek, N. S. Plans and specification may be seen at the office of the undersigned at Ottawa, Ont., at the Station Master's Office, North Sydney, N. S., at the Office of the Resident Engineer, at New Glasgow, N. S., and at the Office of the Chief Engineer, Moncton, N. B., where forms of tender may be obtained.

All the conditions of the specification must be complied with.

L. K. JONES,
Assistant Deputy Minister and Secretary,
Department of Railways and Canals.
Ottawa, Ont., Oct. 24th, 1913.



Department of Railways and Canals, Canada.

WELLAND SHIP CANAL.

Section No. 5.

NOTICE TO CONTRACTORS.

SEALED TENDERS addressed to the undersigned and marked "Tender for Section No. 5, Welland Ship Canal," will be received at this office until 12 o'clock noon on Tuesday, November 18th, 1913.

Plans, specifications and form of contract to be entered into can be seen on or after this date at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa, and at the office of the Engineer in Charge, St. Catharines, Ontario.

Copies of plans and specifications may be obtained from the Department on the payment of the sum of fifty dollars. To bona fide tenderers this amount will be refunded upon the return of the above in good condition.

Parties tendering will be required to accept the fair wages schedule prepared or to be prepared by the Department of Labour, 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 on a chartered bank of Canada for the sum of \$100,000.00 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 cheque 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,

Assistant Deputy Minister and Secretary,
Department of Railways and Canals.

Ottawa, 29th October, 1913.

Newspapers inserting this advertisement without authority from the Department will not be paid for it.—50010.



The Commissioners of the Transcontinental Railway

NOTICE TO CONTRACTORS.

Tenders for the Installation or Completion of Electric Wiring System for the N. T. Ry. Car Shops, Transcona, Manitoba.

SEALED TENDERS, addressed to the undersigned and marked on the envelope: "Tender for Electric Wiring System," will be received at the office of The Commissioners of the Transcontinental Railway, at Ottawa, Ontario, until 12 o'clock noon of the 4th day of November, 1913, for the furnishing and installing of the Electric Wiring Systems required in connection with the equipment of the National Transcontinental Railway Car Shops at Transcona, Man., about six miles east of Winnipeg.

Plans may be seen and forms of tender and specifications obtained at the office of Mr. W. J. Press, Mechanical Engineer, Ottawa, Ont., and at the office of Mr. H. H. Pinch, Assistant Engineer, Transcona, Manitoba.

Persons tendering are notified that tenders must be made on the forms supplied by the Commissioners, and that each tender must be signed and sealed by all the parties to the tender, and witnessed, and be accompanied by an accepted cheque on a Chartered Bank of the Dominion of Canada, payable to the order of The Commissioners of the Transcontinental Railway, for a sum equal to five per cent. (5 p.c.) of the amount of the tender.

The cheque deposited by the party whose tender is accepted will be deposited to the credit of the Receiver-General of Canada as security for the due and faithful performance of the contract according to its terms. Cheques deposited by parties whose tenders are rejected will be returned within ten days after the signing of the contract.

The right is reserved to reject any or all tenders.

By Order,

P. E. RYAN,

Secretary.

The Commissioners of the Transcontinental Railway.
Dated at Ottawa, October 8, 1913.

Newspapers inserting this advertisement without authority from the Commissioners will not be paid for it.—49048.

Electric Railway Department.

The Proposed Sale of the Toronto Railway to the City.

Following on the recent negotiations between the City and the Toronto Ry. Co. regarding the proposed purchase by the former of the physical assets, franchises, etc., of the Toronto Ry. and its subsidiary company, the Toronto Electric Light Co., and including such portions of the Toronto and York Radial Ry., and Toronto Suburban Ry., as are within the city limits, Mayor Hocken, at a meeting of the City Council, Oct. 13, brought down the reports prepared by B. J. Arnold, Chicago, Ill., assisted by J. W. Moyes, Toronto, regarding the railway portion of the proposal, and R. A. Ross and Co., Montreal, regarding the Toronto Electric Light Co.

In commenting on the report, the Mayor related the history of the negotiations leading up to the engagement of experts to report on the physical assets and the conditions of a tentative agreement, which would form the basis of a definite proposal to submit to the ratepayers for approval or rejection, and also dealt with the condition of affairs in which the city was involved in providing efficient transportation for a large and expanding city, especially in view of the peculiar nature of the terms of the franchise granted to the company, in connection with which there has been continuous litigation for several years, all more or less of an unsatisfactory nature so far as the city is concerned. The situation has to a certain extent been complicated by the construction and operation by the city of three disconnected lines serving outlying portions, each of which is being operated at a loss. The net operating loss on these three lines for the remaining portion of the Toronto Ry. franchise, which expires in 1921, is estimated at \$1,341,772.72.

After considerable negotiations, Sir William Mackenzie, President, Toronto Ry., expressed his willingness to arrange for the city to acquire the physical assets of the Toronto Ry. Co., comprising track, substructures and all underground conduit work, overhead trolley, feeder system, rolling stock, including electrical equipment, being all rolling stock in operation, head office property, power house and equipment at Frederick and Front Sts., substations and equipment, storage batteries, carhouses and barns, carbuilding shops, motor equipment shops, warehouse for stores, repair parts in stores, foundry, carpenter shops, stables, and all real estate and other physical assets held by the company and used or intended for use in connection with the railway; the physical assets of the Toronto Electric Light Co., comprising land, wharves and docks, buildings, steam and electric plant, incandescent light plant, storage batteries, overhead and underground lines and feeders, motors, meter boards and equipment, motors, lamps and installations, tools and equipment. To avoid any misunderstanding as to the physical assets proposed to be transferred, it is stated that with respect to the two foregoing companies the following assets are not included:—Stocks, bonds, securities of companies, bills, notes, claims and accounts receivable, monies, and any interest the Toronto Ry. Co. may have in the property known as Scarborough Beach, held by the Scarborough Securities, Ltd.

In addition to the foregoing items which the city may acquire are all cars in course of construction and equipment therefor, and all material on hand for new tracks, overhead construction and extensions, paying

the actual cost thereof in addition to the consideration agreed upon; so much of the tracks, substructures, underground and overhead construction appertaining to such tracks as are built upon the streets, roads and highways, except crossings thereof within the present city limits, the property of the Toronto and York Radial Ry. Co., on its several divisions, viz., the Metropolitan division, Toronto and Mimico division, and Toronto and Scarboro division; so much of the tracks, substructures, underground and overhead construction appertaining to such tracks as are built upon the streets, roads and highways, except crossings thereof within the city limits as are the property of the Toronto Suburban Ry. Co., and so much of the light, heat and power wires and poles and appurtenances belonging thereto, the property of the Toronto Suburban Ry. Co., and forming part of the lighting system within the city limits; so much of the franchises of the respective companies as may be necessary to enable the city to operate the assets, tracks, etc., purchased, and to carry on within the city the business appertaining thereto; the Toronto and York Radial Ry. Co. and the Toronto Suburban Ry. Co. shall be granted rights and facilities for connecting their overhead wire and cable lines with the lines and central stations of the Toronto Power Co. and the Toronto and Niagara Power Co., and with their own terminals in the city, for transmitting electricity over the said lines and cables for all purposes, and also the right to erect wires to connect their telephone systems with the said power stations or terminals in the city; the purchase price is to be \$30,000,000, which is arrived at by allowing \$8,000,000 for the assets, etc., of the Toronto Electric Light Co., and \$22,000,000 for those of the Toronto Ry. Co. and other companies mentioned, the amount to be paid as follows:—The city to make an issue of debentures amounting to \$30,000,000 with interest at 4½% per annum, payable half yearly, maturing in 30 years, with an adequate sinking fund; these debentures to be specially secured by mortgage of trustees covering the assets acquired, and to be a general obligation of the city, the terms of these debentures and the trust mortgage to be mutually agreed upon; of the purchase price, \$8,090,000 is to be paid in cash, and the balance in debentures at par, forming part of the issue mentioned; the city to assume bonds as follows:—Toronto Ry. Co., \$3,659,000, secured upon its lines; Toronto Electric Light Co., \$1,000,000, secured upon its properties, and Toronto and York Radial Ry. Co., \$1,640,000, secured upon its lines, etc., including the portions within the city limits, and to deposit with trustees its debentures to an equal amount to provide for the redemption of these bonds, or for getting them in by exchange, and so far as the portions of the Toronto and York Radial Ry. within the city limits are concerned, so that such portions may be released from their charge, meantime any transfers to be made out subject to such charge, and when so released any balance of debentures to be handed over; the city is to assume and carry out all lighting and power contracts of the Toronto Electric Light Co., and the Toronto Suburban Ry. Co. within the city limits, and all contracts of the Toronto Ry. Co. and Electrical Development Co., which run to Sept. 21, 1921, subject to renewal on

the terms of the contract, the city to give three years' notice in writing if it does not desire renewal; also to assume all contracts between the Toronto Electric Light Co. and the Toronto and Niagara Power Co., of Jan. 30, 1903; and after Nov. 13, 1919, being the first period of the contract, the city agrees through the Hydro Electric Commission of Ontario, to purchase from the Toronto and Niagara Power Co. not less than 30,000 horsepower per annum for 30 years from the latter date, under the terms of the existing contract, the power companies agreeing that during such contract they will only sell power in the city, to the city through the Hydro Electric Commission, but nothing contained in this clause shall be construed as to prevent the companies mentioned from supplying power to the railway companies for their purposes; the city will collect arrears and current accounts under the lighting and power contracts, and account to vendors and pay them their share, and will honor passenger tickets outstanding, the Toronto Ry. to redeem from the city at sale prices its honored tickets over the parts of their lines within the city limits; the parts of the radial lines taken over by the city are to be double tracked by the city, standard railway gauge to be adopted so as to permit of the operation of Toronto and York Radial cars thereon, the city to put down a third or composite rail if it desires to operate over these parts in connection with the city system; the radial companies are to have running rights over the portions taken over by the city, including the double tracks laid by the city, upon the wheelage basis for maintenance, and without charge for capital expenditure, and the right to connect the double tracks with the companies' car barns and terminals or property acquired for such purposes, but shall not, except on terms to be agreed upon, have the right to take up local passengers on the lines within the city limits, that is, passengers destined from one point on these lines in the city to another point on these lines in the city; the companies to have the right to carry express and light package freight over these tracks to their present terminals within the city limits, including the necessary property for terminals and station for the Toronto and York Radial Ry., adjacent to the C.P.R. at or near Yonge St., the classes of such express and freight to be settled by the Ontario Railway and Municipal Board; neither the Toronto Ry. Co., nor either of the other companies shall, except under the agreement for running rights, operate railways along streets within the present city limits, and should these limits be extended, the city to have the right to acquire so much of their lines, etc., as may be built upon streets, roads and highways, but not the crossings thereof within the extended limits, and in estimating the value of the lines so acquired compensation to be allowed to the companies for the franchise and for depreciation, if any, similar double tracking and running rights to be provided for as previously mentioned.

It will thus be seen that the city desires to acquire the whole street railway system within the city limits, as at present defined, and also within any future extensions, and in order to do this it has been found necessary to acquire also the assets of the Toronto Electric Light Co., a subsidiary of the railway company, and by so doing the

city will be enabled to control the transportation and light and power delivery within the city with some slight reservations on behalf of the power companies concerned. Although the Toronto Ry. Co., should the city carry out the scheme, will maintain its corporate capacity, more or less as a holding concern for other allied concerns, all rights to build and operate railways on any streets within the city limits will be obliterated under the city's agreement to purchase.

The valuation placed on the Toronto Ry. Co.'s physical assets by the experts engaged for the purpose is \$9,894,482, and for the intangible assets, consisting chiefly of the franchise rights to operate surface railways exclusively, in Toronto, \$10,713,553. The value of those portions of the radial lines within the city limits is placed at \$411,447, including \$193,649 for an exclusive franchise on a part of Yonge St., and the value of the assets of the Toronto Electric Light Co. is placed at \$6,132,754. The actual value thus placed on the total physical assets, which the city desires to take over, is \$16,245,034, thus leaving \$13,754,966 difference between the value of the physical assets, and the price proposed to pay, viz., \$30,000,000, as representing the value of the total intangible assets. So far as the railway proper is concerned, the valuator has estimated the net surplus earnings of the company up to September, 1921, to be worth \$10,713,533, based on the present earning capacity, with the operating cost kept to 55% of the gross earnings. It cannot of course be claimed that the city could operate at so low a figure as 55% of the gross earnings, but allowing 65% of the gross earnings for operation, and with the estimated loss on the present civic lines, for the same period, viz., \$1,341,772.72, practically the same figure is reached. The remaining difference, apart from \$193,649 for the exclusive radial franchise on a part of Yonge St., would therefore represent the value to the city of the goodwill of the Toronto Electric Light Co.'s business, and the extinguishing of competition in the lighting and power business, as well as creating a monopoly of street railway transportation for the city.

Following are the valuation figures as summarized in the report laid before the city council:

the value placed on the Toronto Electric Light Co., of \$6,132,754, totals, \$27,077,236. The value of the Toronto and Mimico Division of the Toronto and York Radial Ry. is not included in the figures above quoted, nor is it dealt with in the valuator's report, as such valuation has already been dealt with by arbitration under the Ontario Railway and Municipal Board, and the value fixed at, approximately, \$75,000.

It has been decided to have a report from a firm of accountants on the commercial

value of the proposition, and John Mackay and Co. have been engaged for this purpose. H. H. Couzens, General Manager, Toronto Hydro Electric system, has also been instructed to report on the actual utility of the physical assets of the Toronto Electric Light Co., and to what extent they can, with advantage, be incorporated with the civic Hydro Electric system. When these reports are received a special meeting of the council will be called to deal with them.

Report on Proposed Municipal Electric Railways by the Ontario Hydro Electric Power Commission.

The engineers of the Hydro Electric Power Commission of Ontario have prepared a report and estimate of the proposed municipal hydro electric railway for the district north east of Toronto, as requested by the different municipalities in that territory, as mentioned in previous issues of Canadian Railway and Marine World. In May, 1913, the councils of the townships of Scarborough, Markham, Uxbridge, Pickering, Whitby and Reach and some of the towns and villages in that district forwarded resolutions to the Commission requesting a report and estimates on a municipally owned electric railway to connect that district with Toronto. The Commission's engineers were instructed to obtain the necessary information, and prepare estimates showing the traffic that might be expected, the capital cost, operating revenue, and expenses of the proposed line. This has been accomplished most thoroughly, and very detailed information is given in the report.

Briefly speaking, as every point on the proposed line is within 45 miles of Toronto, and the service given by the steam lines is said to be insufficient to meet the requirements for purposes of best development, it is believed that a good portion of the existing traffic might be diverted to the proposed line, which with new traffic that an electric line always develops, is expected to make the project a profitable one. The agricultural section of the country traversed is said to be the equal of any in Ontario, with the exception of from 15 to 20 miles, and is one

liminary lines, and from data secured, it was decided to make a study of three different routes from the north east boundary of Toronto to Unionville. From this point both easterly and northerly, the route was more or less fixed by the centres of population, and the contour of the country. The surveyed lines are all shown on the accompanying plan, but these lines were only run for trial and estimating purposes, and may be deviated from in the event of actual construction.

Of the three parallel routes at the Toronto end, the easterly one was run to pass through the centre of Scarborough Tp., but was found unfavorable for actual construction, the middle route offering almost equal service, with a much lower construction cost. As it is anticipated that a considerable portion of the district traversed by the westerly line will be annexed by Toronto within the near future, and it is controlled by three large estate companies, the financing of their portion would be simplified. The construction of this line would be less than either of the others, and while half a mile longer, it brings the line 1½ miles nearer the centre of the city. Estimates on the westerly and middle routes were prepared, but in view of the disadvantages of the easterly route, it was not considered in the report.

From Toronto north to the height of land at Goodwood, there is a difference in elevation of 700 ft., giving an average ascending grade of 0.5% that cannot be avoided. All grades have been kept below 2%, with a

SUMMARY OF EXHIBITS, TORONTO RAILWAY CO. REPORT.

	Net cost new	Eng. % added	Total	Net present value	Eng. % added	Total	Net cost new	Depreciation	Net present value
	\$	\$	\$	\$	\$	\$	\$	\$	\$
Track.....	1,668,021.14	250,221.94	1,918,243.08	1,088,700.44	155,805.07	1,244,505.51	1,668,021.14	629,920.70	1,038,100.44
Electrical distribution system.....	940,602.46	141,103.54	1,081,706.00	790,991.95	118,650.05	909,642.00	941,602.46	149,700.51	791,901.95
Rolling stock.....	4,529,911.00	228,445.50	4,758,356.50	3,075,644.10	159,732.71	3,235,376.81	4,529,911.00	1,454,266.90	3,075,644.10
Power plant equipment.....	1,478,685.00	147,867.00	1,626,552.00	1,090,609.00	109,069.00	1,199,678.00	1,478,685.00	388,076.00	1,090,609.00
Shop equipment and tools.....	163,648.16	8,182.41	171,830.57	104,324.82	5,216.24	109,541.06	163,648.16	59,223.34	104,424.82
Furniture and fixtures.....	16,049.20	.....	16,049.20	12,969.99	.....	12,969.99	16,049.20	3,079.21	12,969.99
Realty and buildings.....	2,408,974.00	.....	2,408,974.00	2,146,759.00	.....	2,146,759.00	2,408,974.00	262,215.00	2,146,759.00
			11,979,801.35			8,802,513.37			
Legal expenses, carrying charges, incidentals on total at 5%.....	598,990.07	.....	598,990.07	598,990.07	.....	598,990.07	598,990.07	.....	598,990.07
Bond discount at 5%.....	628,939.57	.....	628,939.57	167,717.22	.....	167,717.22	628,939.57	461,222.35	167,717.22
Stores.....	309,773.00	15,489.00	325,262.00	309,773.00	15,489.00	325,262.00	325,262.00	.....	325,262.00
	12,745,683.60	789,309.39	13,532,992.99	9,336,479.50	558,008.07	9,894,482.66	12,750,172.60	3,407,204.01	9,351,968.50

Recapitulation: Net cost new and engineering organization, etc., added \$13,532,992.99; Net present value and engineering organization, etc., added \$9,894,482.66; Net depreciation \$3,407,204.01.

In connection with the radial lines within the city limits, the Metropolitan Division of the Toronto and York Radial Ry. is valued at \$64,354, and the Toronto and Scarborough Division at \$27,300, with \$193,649 as the value of the exclusive franchise for operating on a part of Yonge St. The value of the portion of the Toronto Suburban Ry. proposed to be acquired is fixed at \$51,144, thus making \$20,944,482, the value of the railway properties in question, including physical assets, franchises, etc., and which, added to

of the most thickly settled portions of the province. The ability of an electric line to stop at frequent intervals, such as cross roads, would, it is claimed, give it a marked advantage over steam railways with their infrequent stops. The layout of the steam lines radiating from Toronto, makes necessary in many cases a roundabout trip to go a short distance across country, which the electric line proposes to ameliorate in several sections of the district to be traversed.

A survey party was organized to run pre-

maximum curvature of 5 degrees. The soil throughout the entire district, with the exception of a sandy stretch in Uxbridge Tp., is a light loam, with gravel present in sufficient quantities near the trial lines to ensure an ample and cheap supply of ballast. The estimates on track construction have been prepared on a 14ft. roadbed, 80 lb. rails, 6 by 8 in. by 8 ft. cedar ties spaced 3,000 to the mile, gravel ballast, 8 bar woven wire fence with gates, cattle guards, etc.

All culverts have been designed to carry

100 ton locomotives, to meet the requirements of intercommunication with steam lines. Plate girder bridges on concrete abutments would be used in most cases, but some steel viaducts would be required. Following the practice of the steam lines in the district, all overhead railway crossings were estimated on crossing two tracks. Half interlocking plants would be used for the protection of all grade crossings, to be operated by such employes as would have other duties in the vicinity. These plants would consist of a small central tower with interlocking machine controlling home and distant signals on the steam lines, and derails and home signals on the electric line. The electric line signals would be located close to the crossing, to be conveniently operated by conductors when the regular attendants were not on duty.

The estimates include the cost of brick

work may be properly handled without the capital cost being raised to an amount that would cause unusually heavy expenses for normal operation. These systems have also been chosen so that the line may be able to take care of freight traffic and be extended short distances without installing additional sub station equipment and trolley feeders. Should it be decided to construct only a short portion of the complete line, it would be possible to use the low voltage d. c. until such time as extensions warrant the system figured on. The single catenary bracket arm type of construction has been the basis of computation, with 35 ft. wooden poles spaced at 150 ft. intervals, with 7-16 in. steel messenger, and 4-0 grooved copper trolley wires.

Heavy double truck cars would be used for the through service, with lighter cars on the suburban traffic. The car equipment

motors with multiple control would be the probable equipment. Standard steam line freight cars would be required for feight and express business, and it is planned to have sidings between stations, so locating the loading and unloading points as to reduce team haulage on large shipments.

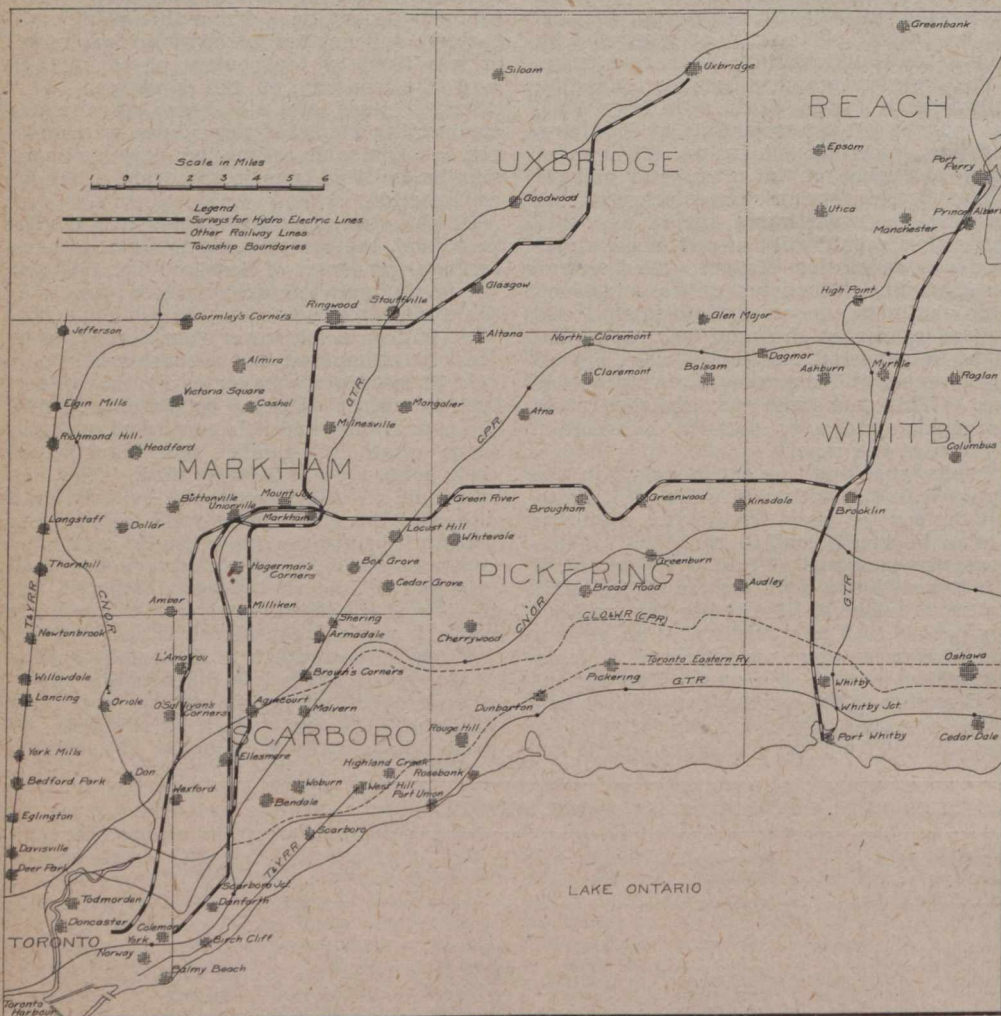
In estimating the probable capital costs, the cost of the right of way was obtained from information obtained in the field. It is said that the costs will probably be less than estimated, as several owners have expressed a willingness to give a free right of way through their property. Information on the cost of bridges over grade and level railway crossings, signalling, interlocking plants, etc., was obtained from the present railways in the district. Sufficient data and costs were also obtained from manufacturers of bridges, rails and track fittings, interlocking plants, cars, electrical equipment for rolling stock and sub stations, etc., to enable accurate figures to be prepared on the capital cost of the line. Plans and profiles have been prepared of the lines surveyed, and the quantities of grading, draining, etc., figured for the different sections. To all this has been added an overhead charge of 7% to cover engineering, interest during construction, and bond discount.

The total revenue of the proposed line has been divided between passenger, freight, milk, express and mail business, and the sum deduced under each of these headings has been checked with statistics obtained from electric lines operating through a somewhat similar territory. The similarly situated electric lines of which data are given are the Brantford and Hamilton Electric Ry., Chatham, Wallaceburg and Lake Erie Ry., Hamilton Radial Electric Ry., Niagara, St. Catharines and Toronto Ry., Toronto and York Radial Ry., and Windsor, Essex and Lake Shore Rapid Ry. Of these several lines, statistics for 1912 are tabulated: Showing length, passenger number and revenue, freight tonnage and revenue, express revenue, advertising revenue, and operating expenses. From these figures, some interesting comparisons can be drawn.

As a further comparison of probable revenue, the estimated revenue obtained by the steam lines operating in the Toronto northeastern territory from the centres of population along the lines has been obtained from reliable sources, for the different classes of traffic that are to be handled. The places considered are Agincourt, Milliken, Unionville, Markham, Stouffville, Uxbridge, Locust Hill, Brooklin, Myrtle and Port Perry, and where the place is served by more than the one line, separate estimates are tabulated. From these several centres, the estimated total passenger revenue is \$92,500; milk, \$16,300; freight, \$340,000; express, \$21,000; with a total combined revenue obtained by the steam lines from this territory of \$469,800. Basing the estimated revenue on the conditions existing in similarly situated electric railway territory, using the estimated revenue of the steam lines to obtain a detailed analysis of the probable revenue, the following table has been compiled:

Passenger revenue—900,000 at 4 cts.	\$36,000	
Passenger revenue—600,000 at 40 cts.	240,000	
Freight revenue—60,000 tons at \$2.25..	135,000	\$276,000
Milk Revenue—150,000 cans at 20 cts. ...	30,000	
Express and mail revenue	8,000	
Advertising revenue	1,500	
Total revenue from operation		\$450,000

Further checks on the estimated traffic that might be expected from the district were made. For the passenger traffic, a study of interurban lines, on the basis of a return per head, shows that this varies un-



Routes of Proposed Municipal Hydro Electric Lines from Toronto.

passenger and freight stations at important towns, and shelters, with small loading platforms, at the most important road crossings. It is proposed to have a car barn and shops of brick construction located near Markham, at the junction of the Uxbridge and Port Perry lines, and galvanized iron shelters on steel frames and concrete footings at termini, for housing cars over night. Sub stations would be provided by fireproof station additions at Markham and Brooklin.

The 2,400 volt d. c. system has been used in figuring the cost of the electrical equipment, but the layout and traffic would give very similar results with single phase a. c., or 1,200 volt d. c. These systems, while more expensive in first cost and operating expenses than the lower voltage d. c. systems, for short lines, are necessary for a line of this type, in order that holiday traf-

would be quadruple 100 or 125 h. p. motors, hot water heaters, automatic air brakes, pantograph trolleys and double end multiple control. The cars would have smoking and baggage compartments in addition to the passenger section. Main line cars would be capable of operating up to 60 m. p. h., with schedule speeds of from 25 to 35 m. p. h., the stops varying from 4 per mile to one every 2 miles. Trailer cars would be operated on holidays and during the rush hours on a reduced schedule. Express cars for milk and light freight traffic would be equipped with large motors, capable of shifting or hauling freight cars short distances. The locomotives considered would weigh up to 60 tons, and would be capable of hauling from 6 to 20 freight cars, or 3 or 4 passenger trailer cars for excursion business. Quadruple 100 or 150 h. p.

der local conditions from \$8 to \$14 per head. Using the 1911 Dominion census as a base, in those portions of the townships of York, Scarboro, Markham, Uxbridge, Pickering, Whitby and Reach affected by the proposed lines, and in the towns of Stouffville, Markham, Uxbridge, Port Perry and Whitby, there is an estimated tributary population of 18,219, with an average population per square mile of territory affected in the country districts of 63. Taking into consideration the local conditions and average width of territory served, it has been estimated that the per capita return would be \$12, which for the 18,219 tributary population, would give a passenger return of \$219,000. To this must be added the suburban receipts, which for an estimated number of 900,000 at 4 cts., would give \$36,000, bringing the passenger total to \$255,000. As these figures are based on the present population, it is a safe assumption that the passenger revenue on the completion of the line would be as estimated.

The estimated freight traffic of the steam lines was obtained from reliable sources. From this, and from data obtained in other towns surrounding the city, it was ascertained that more than one half the freight revenue within a radius of 50 miles of Toronto, results from traffic to and from the city. An average freight rate between Toronto and the Markham-Stouffville district would be 17 cts. per 100 lbs., so that the estimated average rate of 11 cts. per 100 lbs. should be conservative. It is assumed that a subsidiary cartage company would be formed in Toronto to handle the city deliveries, and considering the frequency and rapidity of an electric service specializing in local business, it is believed that the proposed line could secure at least one half the present freight business, as well as developing new business.

In checking up the milk business, the inadequacy of the steam lines in being able to pick up milk at frequent points, makes it appear certain that an electric line, with collection points at almost every cross road would be able to get a lot of new business as well as much of the present.

The big difference between the estimated express revenues of the present steam and proposed electric lines, is accounted for by the consideration given to the fact that a large amount of the steam railway express traffic is for service rendered outside the Toronto district, for which the electric line could not compete. Consideration is also given to the fact that the fast schedule possible on electric lines tends to reduce the express traffic, the latter going as freight, which has nearly as quick a schedule as observations on other lines have shown.

In estimating the operating expenses, the number of car crews necessary to give the service desired, was estimated from train sheets prepared on the schedule planned. The number of station and repair men was determined from the requirements of other steam and electric lines. The cost of maintenance and repairs of track and rolling stock is more or less standard. All operating expenses were deduced from comparisons with roads operating under similar conditions. To cover annual charges of interest and sinking fund on the cost of the line, 6.3% of the capital investment has been added to the other operating expenses.

In order to examine the project with regard to the effect of adding to or reducing the length of the line, five separate estimates have been made, considering primarily the complete line, and this line with certain sections omitted.

Scheme 1. This is the main estimate, including the following lines: Toronto to Markham, 16 miles; Markham to Uxbridge,

20 miles; Markham to Brooklin, 16 miles; and Port Perry to Whitby, 19 miles; total, 71 miles.

Scheme 2. This considers the same line as scheme 1, with the exception of the line between Brooklin and Whitby. Total, 64 miles.

Scheme 3. This considers the line from Toronto through Markham to Uxbridge, without connection to Brooklin, Whitby or Port Perry. Total, 36 miles.

Scheme 4. This considers a line from Toronto through Markham to Stouffville only. Total, 24 miles.

Scheme 5. This considers a line from Toronto to Markham only. Total, 16 miles.

Provision has been made in the shorter schemes for extending the system at some future date to the full 71 miles, and where possible, portions of the ultimate equipment are figured upon, but this has not always been possible. In scheme 5, the 16 miles is planned to be operated at least partially by long distance equipment, necessarily giving a proportionately higher overhead operating cost than would result if the equipment were selected for the shorter line only.

In estimating the effect of each section of the road on the operating revenue, credit was given to each for the travel between sections that each would induce, recognition being given to the fact that the further a person resides from the city, the less frequent will it be used by him. The following gives the division of the 600,000 passengers among the various sections:

	Passengers.
Toronto-Markham	218,000
Markham-Stouffville	109,500
Stouffville-Uxbridge	88,500
Markham-Port Perry	157,800
Brooklin-Whitby	26,200
Total	600,000

In the table below are shown the net results of the detailed estimates on the five schemes, for capital cost, operating revenue and operating expenses:

Scheme	1	2	3	4	5
Mileage	71	64	36	24	16
Capital cost, total	\$2,470,776	\$2,291,200	\$1,274,807	\$995,991	\$693,003
Per mile	34,800	35,800	34,800	41,400	43,300
Operating revenue	450,500	446,200	300,800	203,100	137,500
Operating expenses*	396,660	372,430	232,780	194,260	152,600
Surplus	53,840	73,770	68,020	8,840	
Deficit					15,100

* Including interest and sinking fund.

In order to compete with a service which the steam lines might feel forced to give under competition, it was necessary to figure on the quadruple 100 to 125 h. p. motor equipment. With these motors, it would be possible to travel between Toronto and Uxbridge in 1½ hour, and to Port Perry, some 8 miles further, in from 10 to 15 minutes more time because of the fewer stops. The present analysis does not make provision for limited cars, as the estimated traffic between centres would not warrant their use, but the same equipment might be used for this service if it should be found advisable to inaugurate such a service.

A study of the accompanying map will show that the section east and north of Brougham and Greenwood is served by the main lines of three steam railways and one electric railway, and on this account the municipalities within this district may not see the necessity of the enterprise. This will not affect the scheme greatly, as an examination of the estimated revenue from the section between Brougham, Brooklin, Myrtle and Whitby has purposely been made small, as the traffic developed must be divided between five other lines that are in a position to give direct and fast service to the city. The bulk of the electric traffic would be local, with small fares. The town-

ship of Whitchurch, to the northwest of the district outlined, has requested a report on lines through there which might change the proposition should the district mentioned above not desire the service.

If all the municipalities that requested the report desire to have the line constructed through their districts, the line as laid down in the accompanying map is recommended as the preferable one, but in the event of any changes being desired by reason of the section to the east and south of Brougham not desiring to be served, there are two alternative plans of connecting the Uxbridge and Port Perry districts: First, Toronto to Unionville, Unionville to the vicinity of Cashel and Almira, north west from Cashel to Newmarket, eastward from Cashel through Stouffville and Altoona to Glen Major, Glen Major to Uxbridge, Glen Major to Port Perry, and Unionville to Locust Hill. Second, Toronto to Markham, Markham to Stouffville to Newmarket, Markham to Glen Major via Locust Hill and Greenwood, Glen Major to Uxbridge, and Glen Major to Port Perry.

To build a line as set forth in the report, with the omission of the Brooklin-Whitby section, would mean a line 64 miles long, whereas either of the lines just outlined would only be from 55 to 60 miles long. The new routes would also pass through a greater section of unserved territory, and probably cross the height of land to Uxbridge and Port Perry at a lower elevation.

The report concludes by stating that schemes 1, 2 or 3 would be the only ones that could be profitably built, as the revenue estimated for the shorter schemes 4 and 5 appears too small to warrant the outlay.

The lines as outlined are estimated on a Toronto terminal in the northeastern section of the city, but it is desired that at some time, a terminal be secured in the heart of the city, and with that object in view, it is the intention to approach the city authorities. It has been suggested

that the proposed line use a street to the north of and parallel to Danforth Road to the Don ravine, crossing the latter on the lower deck of the new bridge projected at that point, reaching the centre of the city by way of Ontario, Gerrard, Jarvis and Mutual Sts., giving a route close to the business and financial districts, also providing access to the market districts at the lower end of Jarvis St.

The report is followed by complete detailed estimates of the five schemes, which have of necessity been omitted from this summary from lack of space.

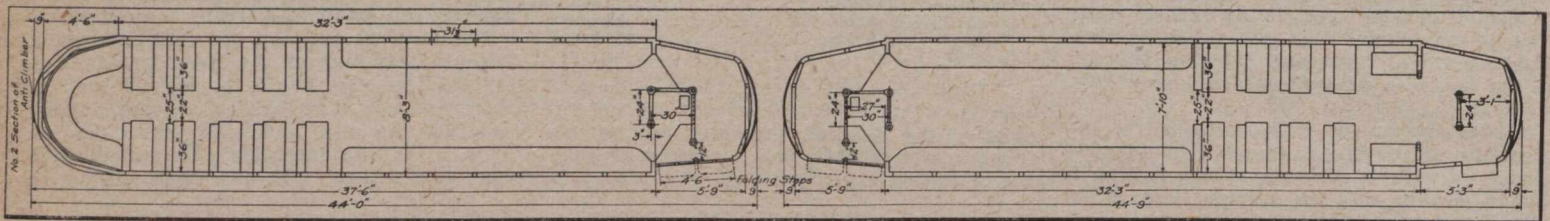
The report was prepared by W. G. Hewson, Assistant Engineer to the Commission, under the direction of F. A. Gaby, Chief Engineer, to whom we are indebted for the data on which this article is based.

The Municipal Railway Tax Association is the name of an organization consisting of a union of counties and townships in Ontario, which interviewed the Provincial Government recently with a view to effecting a change in the matter of taxation of railways within the province. It is suggested that the assessment act be amended to provide for the assessment at a specific value per mile of the structures, substructures, rails, ties, poles and other property.

Trailer Operation by Montreal Tramways Company.

Traffic on St. Catherine St., the Montreal Tramways Co.'s main cross town line, has become so great that it was recently realized that to increase its density by the addition of more individual units would only increase the congestion and not relieve the situation. The St. Catherine St. cars, through the main section of the district, operate on an average headway of a minute and a half, with additional radiating lines using the tracks through a section of the more congested district. The traffic on this through line is such that at all hours of the day the traffic density is very uniform, which has been an important factor in evolving a solution of the problem of providing additional accommodation for the overtaxed line. Trailer operation has been used with success in other cities in Canada, principally Toronto, but the system adopted in the latter employs trailer cars only during the rush hours, the trailers being attached at the car shed just prior to the period of maximum traffic, and removed immediately after. This has the objection of congesting traffic at the car shed.

Consideration of the conditions existing on St. Catherine St. led the General Manager, J. E. Hutcheson, to the conclusion that not only would intermittent trailer operation not be satisfactory, but the uniformity of the traffic density during all hours of the day would make advisable the use of trailers from early morning until late at night, leaving them in operation all day.



Motor and Trailer Car for Operation by Montreal Tramways Company.

The congestion at the car sheds, which reaches its maximum during the rush hours, will be relieved to this extent. The steady use of trailers will eliminate one of the principal objections to trailer operation.

In adopting trailer operation, it was decided to have the trailer design follow that of the motor car as closely as possible, resulting in the combination shown herewith. The distinctive type of car most recently developed in Montreal was described in detail in Canadian Railway and Marine World for Mar., 1912. This is the model practically followed in all subsequent designs, there being more recent changes that do not involve any radical departure in the car design such as occurred between that design and its predecessors. A small order of cars delivered to the company early this year departed from the fundamental design by using a monitor instead of a decked roof. This has been followed in these new cars, and forms one of principal points of difference in design.

In the original cars of this design there were 10 cross seats, arranged along a central aisle, near the centre of the car. This has been found to cramp the interior capacity of the car by bottling all the standing passengers in the rear end during the rush hours. In consequence, many of these cars had the cross seats rearranged so as to give a very short longitudinal seat at the forward end of the car, with long seats, extending nearly half the length of the car at the rear end, increasing the useable standing room materially. This change has been retained in motor trailer cars.

A novel departure in the design of these cars has been made in having motor and trailer of practically identical design, the only difference between the two being in the vestibule design. In both the body length is 32 $\frac{3}{4}$ ft., with the overall length of the motor car 44 $\frac{3}{4}$ ft., and of the trailer 44 ft. The width over sills of both is 8 $\frac{1}{4}$ ft., and overall 8 ft. 4 $\frac{1}{4}$ ins. The height to car floor from rail is 36 $\frac{1}{2}$ ins., height overall, 11 ft. 2 $\frac{1}{2}$ ins. The trucks in both are at 20 ft. 8 ins. centres.

Reference to the accompanying illustration will show that the motor and trailer are of almost identically similar arrangements, the trailer being the reverse of the motor. The reason for this is apparent. For centralizing the control, it was desirable to have the entrances to both cars as close together as practicable, and this has been secured in this design by having the entrance at the rear of the motor and at the front end of the trailer, both entrances within view of the forward conductor.

The motorman's platform of the new cars is very nearly the same as formerly, with the exception that instead of the partition separating him from the back portion of the front vestibule, in the absence of the front bulkhead dispensed with in the former design, there is only a guard rail separating his section from the remainder of the front vestibule. The front door is of the folding type, controlled by the motorman as in the former cars.

The rear vestibule is shorter by about 2 ft. than formerly, largely made possible by the elimination of the back bulkhead. This rear vestibule of the motor is similar to the front vestibule of the trailer. The conductor's railing is similarly located to the former design, but in order to have the interior of the car visible to the conductor from his stand, in order to secure the full benefit of the bulkhead removal, the floor of the vestibule at the conductor's stand is raised to that of the car body from the 28 in. level of the vestibule. The shortening of the vestibule has necessitated the removal of the rear rail behind which smoking passengers were allowed to stand.

The conductor's vestibules of both motor and trailer have double folding doors, one each for entrance and exit respectively, the former being that nearest the car end. These double doors are controlled from swing handles in the rail in front of his stand. The steps for the vestibule fold and operate in unison with the car doors, operated by the conductor.

The front end of the trailer is the only entry and exit end, the rear end being blind. The longitudinal seats in the front end of the trailer are slightly longer than in the motor, setting the cross seats back in the car to the rear of the body. The rear vestibule end is on a level with that of the car body and is shorter than at the other end. This end is rounded off, and contains a circular seat, giving an increased seating capacity over the motor by that amount.

In the preliminary description of these cars in the last issue of Canadian Railway and

Marine World, it was explained that while the underframing of the cars will be steel, the bodies will be of wood construction, sheathed in steel. The interior trim will be cherry. Among the special equipment are the following:—Cables, conduits and junction boxes, gears and pinions, and motors, Westinghouse; couplers, Tomlinson; destination signs, Keystone. Delivery of the 25 motor cars and 25 trailers included in the order is expected in December. We are indebted to E. Blair, Superintendent of Rolling Stock, M.T. Co., for the information on which this article is based.

Double Deck Car Barn for British Columbia Electric Railway.

The Vancouver City Council, Oct. 7, authorized the drawing up of an agreement with the B. C. E. R. Co. relative to the building of a double deck car barn on Quebec St., between 13th and 14th Avenues. The lower deck will have an entrance from Main St., and the entrance to the upper deck will be from Quebec Ave. The estimated cost of the building is \$300,000.

Referring to the project the Vancouver World says: The company has two barns of a temporary type on the north half of the block. The new car barn will take up the entire south half and be of the double deck or two story type, entrance to the lower floor being made from Main St., and to the upper story from Quebec St., and to the possible by reason of the difference in grades of the two streets. The new barn will

have a frontage of 132 ft. on Main and Quebec Sts., and extend along Fourteenth Ave. for over 300 ft. On Main St. the height will upper story from Quebec St., this being The estimated cost of over \$300,000 for an open structure of this size may seem somewhat large, but the company's engineers state that it is intended to have the building of a permanent and thoroughly fireproof type, the reinforced concrete type of construction being probably followed. The barn will be 45 feet back from the property line on either street, thus making it possible for a considerable portion of the entrance trackage to be located on the company's property. The elevations on the two streets will be of an ornamental character.

It is expected that work on the barn will be started as soon as the agreement is signed.

Traffic Regulation in Halifax.

The Halifax, N.S., City Council has added the following regulation to the city ordinance relating to streets:

"OVERTAKING TRAM CARS."

"56A. The driver of every vehicle, including a motor vehicle, coming up with or overtaking any tram car, and intending to pass on the left side thereof shall, if the tram car is at a standstill or about to come to a standstill or stop, bring his vehicle to a standstill in the rear of said tram car until after the tram car is again in motion."

Regina Municipal Railway Finances.

At a meeting of the Street Railway Committee of the Regina, Sask., City Council held Sept. 20, upon consideration of the accounts of the municipal railway for the eight months ended Aug. 30, it was decided to adopt certain altered methods of book-keeping. In accordance with these recommendations the City Treasurer and City Auditor prepared a new statement, which was submitted to the Committee, Oct. 4. They add that while the original statement, which has not been published, was a certified one, the present statement, although the operating accounts are the same, is not. The statement is as follows:—

Income.	
Fares	\$113,022.50
Advertising	1,840.79
Miscellaneous	1,029.41
	\$115,892.78
Expenditure.	
Maintenance of way and structure	\$3,573.63
Maintenance of rolling stock	4,327.74
Conducting transportation	56,135.30
Power	29,729.80
Salaries, insurance and miscellaneous	8,649.34
	\$102,615.81
Surplus of operation carried forward ...	13,276.97
	\$115,892.78
Income.	
Surplus on operation brought forward ...	\$13,276.97
Interest on monthly capital credit balances from Jan. 1 to Aug. 31	4,936.93
	\$18,213.90
Deficit after providing for capital charges	\$31,872.34
	\$50,086.24
Expenditure.	
Capital expenditure to be provided out of revenue, debenture and consolidated stock services.	
Proportion of interest due:	
Jan. 1, 1913	\$ 9,750.00
Jan. 1, 1914	23,500.00
July 1, 1913	9,750.00
(Provided for in revised estimates approved by Council.)	
Sinking Fund:	
Proportion of contribution for 1913	13,145.08
	\$56,145.08
Deduct amount to be charged against property sales receipts, 1912	9,750.00
	\$46,395.08
Interest for eight months at 6% on \$92,278, being amount expended on construction out of property sales receipts	3,691.16
	\$50,086.24

It shows the road to have now a deficit of \$31,872.34, which is slightly more than \$10,000 less than in the Auditor's certified report.

Windsor, Essex and Lake Shore Rapid Railway Annual Meeting.

The report presented at the annual meeting at Windsor, Ont., Oct. 9, showed a gross revenue for the year ended June 30, of \$147,813.39, with operating expenses of \$82,991.22, leaving \$64,822.17 as net operating revenue. Taxes were \$1,871.31, interest on bonds, \$37,500 and other interest \$17,696.19, leaving a net income of \$7,837.37.

A. Eastman, heretofore General Manager, was elected a director, the board for the current year being constituted as follows:—President, W. C. Crawford, Tilbury, Ont.; Vice President and General Manager, A. Eastman; Second Vice President, John P. Pigott, Chatham, Ont.; Secretary, W. R. Philimore, Chatham, Ont.; Treasurer, J. W. McCall, Toronto; other director, E. G. Stevenson, Toronto. J. T. Baird, of Kingsville, Ont. has been appointed Assistant Secretary Treasurer.

The same interests have organized the Mettawas Co., Ltd., to build a summer hotel at a cost of about \$20,000. Its directors

are W. C. Crawford, President; A. Eastman, Vice President and General Manager; J. L. Baird, Secretary Treasurer.

Large Single Truck Cars for Toronto Railway.

The Toronto Ry. built in its shops, and has had in use in regular service since the middle of the summer, a single truck car that, in carrying capacity and size, in all probability exceeds anything ever built in Canada. M. Power, Master Car Builder, having seen a non parallel axle truck, as made in the United States, prevailed upon the management to have a single truck car built, utilizing this truck, as, by its means, a much longer body might be employed. This was done, a single car being built for experimental purposes.

Essentially the car is in almost all particulars the same as the company's latest double truck cars, the body being an almost exact duplicate in design and size, the only differences being in making the platforms at each end slightly shorter, with the space between the cross seats at the end, when used as an open car, closer together than in the double track car. These changes shorten the car slightly, without affecting the seating capacity, making possible a double truck car body on a single truck.

The overall car length is 40 ft., made up of a body length of 29 ft., 5 ft. platforms at each end, and 6 in. bumpers. The overall width is 7 ft. 11 ins. The body contains 14 cross seats, ranged in pairs, back to back, at 4 ft. 2 in. centres, giving a seating capacity of 70. The truck wheels are at 12 ft. centres, and each pair of wheels has a G80 motor, operated from a K10 controller. The truck is equipped with standard air brake apparatus. The car weight complete is 17½ tons.

This car has proved its abilities in service to date, riding very smoothly, and taking sharp curves without trouble. Its experimental use in regular service is to be continued through the winter to demonstrate its worth under those conditions, and if its operation is satisfactory, it will doubtless be followed by additional cars of the same type.

Electric Railway Finance, Meetings, Etc.

British Columbia Electric Ry. and Allied Companies.—Gross earnings for August, \$770,628; operating expenses, maintenance, etc., \$566,541; net income, \$204,087, against \$675,272 gross earnings; \$480,341 operating expenses, maintenance, etc.; \$194,931 net income for Aug., 1912. Aggregate gross earnings for two months ended Aug. 31, \$1,526,571; net earnings \$410,083, against \$1,325,517 aggregate gross earnings; \$376,899 net earnings, for same period 1912.

A prospectus was issued in London, Eng., recently offering £650,000 4½% perpetual guaranteed debenture stock of the Vancouver Power Co., Ltd., guaranteed unconditionally as to principal and interest by the B. C. Electric Ry. Co., and ranking identically, when fully paid, after Jan. 9, 1914, with similar stock quoted at the date of the prospectus at 92 to 94. The price of issue was 88.

A resolution was passed by the Vancouver City Council, Oct. 9, that overtures be made to the company, with a view to purchasing the lines in the city. The proposition is of a general character, and does not disclose any basis of negotiation.

Cape Breton Electric Co.—Gross earnings for August, \$33,454.18; operating expenses and taxes, \$17,299.94; net earnings, \$16,154.24; interest charges, \$4,891.67; balance, \$11,262.57; bond sinking and improvement

funds, \$1,190; net balance, \$10,072.57, against \$31,598.38 gross earnings; \$16,100.77 operating expenses; \$15,497.61 net earnings; \$4,495.83 interest charges; \$11,001.78 balance; \$1,206.67 bond sinking and improvement funds; \$9,795.11 net balance, for Aug., 1912.

Grand Valley Ry.—Brantford St. Ry.—An adjourned meeting of shareholders was called for Oct. 31, to consider a report of a special committee. It is said that the committee decided to recommend that an appeal be made against the recent judgment as to the Brantford St. Ry., and that no offer for the settlement of the company's affairs with the city of Brantford be made.

Halifax Electric Tramways Co.—The Nova Scotia Public Utilities Commission has decided that there is no reason why the company should not pay off its bond issue by the issue of shares as proposed, but it decided not to grant the application to issue \$600,000 new capital, on the ground that sufficient evidence had not been produced as to the propriety of the proposed method of financing.

Lethbridge Municipal Ry.—Earnings for September, \$4,675; and for nine months ended Sept. 30, \$44,242.02. Number of passengers carried in September, 112,266.

Montreal and Southern Counties Ry.—Following are the officers and directors elected for the current year at the recent annual meeting:—President, W. Wainwright; Vice President and Treasurer, F. Scott; Secretary, J. A. Yates; other directors, W. H. Biggar, K.C., and W. H. Ardley. W. B. Powell is General Manager.

Montreal Tramways Co.—The second call of \$10 a share upon the new stock issued April 15 is due Nov. 3.

Montreal Tramways Co.—There has been listed on the New York stock exchange, \$13,335,000 of first and refunding 30-year 5% collateral trust notes, series A, falling due in 1941.

Regina Municipal Ry.—Passenger receipts for Sept., \$17,950.65. The number of passengers carried was 439,993, and including transfers, 502,898.

Toronto Ry., Toronto and York Radial Ry., and allied companies.—Gross earnings for August, \$850,222; operating expenses, maintenance, etc., \$411,300; net earnings, \$438,922, against \$727,925 gross earnings; \$325,519 operating expenses, maintenance, etc.; \$402,406 net earnings, for Aug., 1912. Aggregate gross earnings for eight months ended Aug. 31, \$6,317,674; net earnings, \$3,098,367, against \$5,453,100 aggregate gross earnings; \$2,821,327 net earnings, for same period 1912.

Gross earnings for Toronto Ry. for September, were \$549,859.35, against \$496,359.70 for Sept., 1912. The percentage paid to the City in Sept. was \$43,988.75, and in Sept., 1912, \$39,788.78.

Windsor, Essex and Lake Shore Rapid Ry.—The annual meeting was held at Windsor, Ont., Oct. 10. Following are the officers and directors for the current year:—President, W. C. Crawford; First Vice President and General Manager, Albert Eastman; Second Vice President, John Pigott; Secretary, W. R. Philmore; Treasurer, J. W. McCall; other directors, E. G. Stevenson and W. T. Pigott; Assistant Secretary-Treasurer, J. L. Baird.

Winnipeg Electric Ry.—Gross earnings for August, \$340,507; operating expenses, \$184,335; net earnings, \$156,172, against \$303,764 gross earnings; \$162,431 operating expenses; \$141,333 net earnings for Aug., 1912. Aggregate gross earnings for eight months ended Aug. 31, \$2,649,702; net earnings, \$1,186,294, against \$2,427,830 aggregate gross earnings; \$1,133,895 net earnings for same period 1912.

Electric Railway Projects, Construction, Betterments, Etc.

British Columbia Electric Ry.—We are officially advised that the company has not entered into any negotiations with the Great Northern Ry., for the purchase of the abandoned right of way of the Cloverdale-Blaine line, as recently reported in daily papers.

The extension from Victoria Road to Joyce Road, on Kingsway, Vancouver, 1.5 miles, was opened for traffic, Oct. 1. (Oct., pg. 494.)

Dominion Power and Transmission Co.—An announcement is reported to have been made, Oct. 21, by W. C. Hawkins, Managing Director, that work will be started as soon as possible on the construction of a steam power plant on the site of the old power plant on Guise St., Hamilton, that the new plant will be laid out to generate 27,000 h. p., that it will cost \$1,350,000, and that provision will be made so that additional units can be added so as to permit the production of 90,000 h. p. The cost of the fully completed plant is estimated at \$3,500,000. Plans have been completed, we are officially advised, for the erection of sheds to be placed on the same location as those which were burned in Hamilton some months ago. The estimated cost is \$15,000, and bids for the work have been asked.

We are also advised that nothing further has been done in regard to the projected extension of the Hamilton and Brantford Ry. to Galt, Ont. (July, pg. 344.)

Edmonton Interurban Ry.—Press reports stated recently that it was expected to start a car service on the first section of this line from Edmonton to St. Albert, Alta., early in October. We have no information that the line has been opened for traffic. (Oct., pg. 494.)

London, Grand Bend and Stratford Ry.—Press reports state that an intimation has been given to the London, Ont., City Council that if the city will guarantee bonds for \$1,000,000 there will be no difficulty in finding the capital to build the lines proposed, and an additional one to Sarnia.

The lines proposed are: London to Bryanstown, Granton, Woodham, St. Marys, Mitchell and Stratford, looping back to London; London to Ailsa Craig, Parkhill, Grand Bend, Dashwood and Goderich. These are included in the proposed charter of the L., G.B. and S. Ry., and the third line, for which there is a charter in existence would serve London, Lobo, Coldstream, Strathroy, Arkona, Forest and Sarnia. (Oct., pg. 494.)

Medicine Hat Tramways, Ltd.—We are officially advised that when construction is started on the electric railway in Medicine Hat, Alta., early in 1914, it will be in charge of J. B. D'Aeth of the Montreal Engineering Co.'s staff as Superintendent of Construction. (Oct., pg. 494.)

Melita, Man.—The bylaw passed by the town of Melita grants to R. E. Denny, Brandon, Man., a franchise for 30 years for a lighting, heating and power plant, a waterworks system, and a street railway system. The principal reason for which the bylaw was passed was for the purpose of obtaining light, as there are good indications of natural gas in the vicinity. Mr. Denny proposed to make tests, and to install a lighting system, and the other franchises were included. It is not expected that anything will be done about waterworks or a street railway for some years. (Oct., pg. 494.)

Montreal and Southern Counties Ry.—The Montreal City Council has passed a resolution granting the company permission to extend its car line across McGill St., east on Youville Square to St. Peter St., and north

on St. Peter St. to Youville Square, and thence west again on the Square to McGill St.

The Board of Railway Commissioners has authorized the opening for traffic of the electrified portion of the Central Vermont Ry. between Richelieu and Marieville, Que., and has given the M. & S.C.R. permission to use the C.V.R. station yards, etc., between these points. The distance from the terminus in McGill St., Montreal, to Marieville is 24 miles. The completion of the line from Marieville to St. Cesaire is near at hand and it is expected to have the line ready for operation by the end of the year.

Contracts are reported let for the building of a bridge across the Yamaska River on the St. Cesaire extension. It is said that the concrete substructure will consist of four piers and two abutments, which will be put in by John Ross, Montreal, and the steel work will be erected by the Dominion Bridge Co. It is reported that a contract has been let to Ross and McComb for grading and other work on the extension of the line through Granby, Que. It is expected that the entire line will be completed into Granby early in the summer of 1914.

Tenders are being asked for the erection of a power substation at Rougemont. (Oct., pg. 494.)

Montreal Tramways Co.—A press report states that the M.T. Co. proposes at an early date to open negotiations with the Montreal City Council with regard to the construction of underground lines in the city, which it has power to build. The company's franchise for surface lines in the city has about nine years to run. It is stated that the proposed underground lines would be built so as to relieve congestion on the surface lines, and to give accommodation to outside areas which at present are not adequately served. It is further stated that the double fare question, the snow removing difficulty, and differences about street paving would be taken up during the proposed negotiations.

J. E. Hutcheson, General Manager, made a statement as to the work in progress on the lines, Oct. 18. He is reported to have said that in the early part of the year \$3,750,000 had been appropriated for betterments. Of this \$3,000,000 has already been expended. Since the work started seven miles of new track have been laid, and 20 miles of track renewed. On the renewed track the old 87 lb. steel has been replaced with 116 lb. steel. There have been other improvements carried out on the lines, and the work of betterment will be carried on as long as the weather will permit. (Oct., pg. 494.)

Morrisburg and Ottawa Electric Ry.—The annual meeting of shareholders was held at Ottawa Oct. 13, when it was reported that \$20,000 had been expended on surveys, etc., during the year; that there was \$40,000 on hand, and \$100,000 immediately available for construction. About 25% of the arrears on calls had been paid by the shareholders. The President stated that the company's affairs were progressing satisfactorily and that construction had actually been started. Following are the officers and directors for the current year: President, J. G. Kilt; Vice President, R. J. Biggar; other directors: J. W. Bogart, Morewood, Ont.; A. H. Coplan; Secretary-Treasurer, R. A. Bishop; Auditor, G. L. Blatch; Chief Engineer, L. Von Sydow. With the one exception, above named, the directors and officers live in Ottawa.

Niagara, St. Catharines and Toronto Ry.—Press reports state that the line from St.

Catharines to Niagara on the Lake was practically completed Oct. 1. The line starts from Geneva St., St. Catharines, and is built partly on the highways and partly on private right of way. At Ten Mile Creek, which will be the entrance to the new Welland Canal, there is a spur to the lake front. The track is laid with 85 lb. rails to this point, and with 65 lb. rails for the remainder of the distance. An additional transformer station is being equipped at St. Catharines and a 750 k.w. rotary converter at Niagara on the Lake, where a freight yard is being laid out, and a connection will be made with the Michigan Central Rd. (Oct., pg. 494.)

Ottawa and St. Lawrence Electric Ry.—Press reports state that a contract has been let to a Toronto construction company, of which J. A. Morden is President, for the building of this line, which is to connect Ottawa, Morrisburg, Brockville and Arnprior, Ont. The contracting company is taking over the entire bond issue of the company. The company's offices are to be removed to Toronto. (Aug., pg. 395.)

Porcupine Rand Belt Line Ry.—Application is being made to the Ontario Government to subsidize the building of 100 miles of electric railway, either by a bond guarantee or a land grant. The proposed line would extend along the Ontario-Quebec boundary from Abitibi Lake to Haileybury, with branches connecting with or crossing the Timiskaming and Northern Ontario Ry., north of Swastika, near Porcupine, and at other points; and a connection with the Canadian Northern Ontario Ry. at Flying Post. (Jan., pg. 20.)

Port Arthur and Fort William Electric Ry.—The Fort William, Ont., City Council has deposited with the Public Works Department, Ottawa, plans of a 500,000 c.m., 556 volt direct current subaqueous armoured cable for conveying electrical energy for the operation of its electric railway extension, from the Kaministikwia Power Co.'s supply across the Kaministikwia River to Island 2.

The new belt line in Port Arthur was expected to be ready for operation Oct. 30. It leaves the main line at Clavet St., runs up that street to Alberta, along Alberta to Shuniah St., along Shuniah and across the city property to Balsam Ave., thence to Senico, and Bromlow, and along High St. to River St., down River St. to Pine St., where it connects with the Arthur St. line. (Oct., pg. 494.)

Regina Municipal Ry.—H. Doughty, Superintendent, in a recent report said: "This year's construction includes 23,700 ft. of single track laid with 60 lb. rails, 5,110 ft. laid with 80 lb. rails, 2,050 ft. single track of better construction laid with 80 lb. rails, 13,600 ft. of double track permanent construction laid with 80 lb. rails, or a total of 64,460 ft. in all. This does not include the Country Club line or about three miles still to be constructed. The cost to date this year is \$637,000. Four miles of single track was replaced with double track permanent construction. The whole system now comprises: 63,000 ft. 60 lb. rails, single track, gravel construction; 5,110 ft. single, 80 lb. rails, gravel construction; 13,300 ft. single track, 80 lb. rails, concreted and partly paved; 32,150 ft. double track, 80 lb. rails, partly paved. This makes a total already constructed and exclusive of the Country Club line of 145,710 ft. or 27.75 miles. There is still about three miles to be constructed and this with 3.25 miles of the Country Club line will make a total of 34 miles." (Sept., pg. 442.)

St. John Ry.—Press reports state that construction on the extension to East St. John, N.B., is well advanced, and that it is

expected to have this loop line in operation at an early date. (May, pg. 235.)

Sandwich, Windsor and Amherstburg Ry.—Application is being made to the Ontario Railway and Municipal Board to direct specific performance of an agreement between Tecumseh Tp. and the Essex, Windsor and Tecumseh Ry., now leased to the S. W. and A. R. Under the agreement the E. W. and T. R. was to make extensions when the line became profitable. The Board is being asked to decide whether the time has come when these extensions have to be made. (Oct., pg. 494.)

Saskatoon Municipal Ry.—The City Electrical Engineer notified the Saskatoon, Sask., City Council, Oct. 7, that the electric railway from Saskatoon to Sutherland, 4.5 miles, would be completed and ready for the city to take over very shortly. It was decided to take over the line as soon as the engineer certified that it was fully completed, and to put it in operation as soon as the new cars arrived. (Oct., pg. 494.)

Sudbury-Copper Cliff Electric Ry.—A by-law granting a franchise for an electric railway in Sudbury, Ont., has been approved by the ratepayers. (June, 1912, pg. 310.)

Thorold, Ont.—The Town Council of Thorold, Ont., Oct. 8, decided to submit a bylaw to the ratepayers in January to raise \$20,000 by debentures to build a street railway connecting with the factories at the south end of the town.

Winnipeg Electric Ry.—The Manitoba Public Utilities Commissioner has ordered the company to provide the necessary appurtenances and equipment for crossing the C.P.R. on Selkirk Ave.

The Assiniboine Municipal Council is asking the Manitoba Public Utilities Commissioner to order the company to move its tracks to the middle of the road throughout the municipality.

The extension of the car line to St. Vital was opened for traffic, Oct. 8. The line, which is three miles long, extends from the corner of Marion and Tache Sts., St. Boniface, to the south of Windsor park. (Oct., pg. 495.)

Electric Railway Notes.

The British Columbia Electric Ry. has ordered three standard single truck snow sweepers from the Ottawa Car Co., for delivery by Nov. 15.

During August, three men were killed and four were injured in the course of their employment in the operation of electric railways in the Dominion.

The Ottawa Electric Ry. has ordered two standard locomotive type, steel double truck snow sweepers from the Ottawa Car Co., for delivery about Nov. 15.

The average daily number of passengers carried on the Brandon Municipal Ry. during September was 2,500, against 2,776 in August. The car mileage averaged 900 miles a day.

The Montreal Tramways Co. has decided to obtain the ruling of the highest court, if necessary, in order to test its powers over passengers who refuse to comply with the company's antismoking regulations.

The Manager of the Port Arthur and Fort William Electric Ry. reported to the joint board of management, Oct. 6, that the line was paying too much for its power in comparison with what was charged other city utilities.

A number of residents along the Hamilton, Grimsby and Beamsville Ry. route, recently applied to the Ontario Railway and Municipal Board, for an order to fix certain additional stops for passengers. The

matter was adjourned to enable the Board to go over the route.

The Montreal Tramways Co. is operating 775 cars on its various lines, about 100 in excess of those in service in 1912. New cars are being delivered at the rate of four a week, and it is said that there are still 250 on order.

The Montreal City Treasurer, in his annual report, recently compared the amounts paid to the cities of Montreal and Toronto by the street railways. The amount received by Montreal for 1912 was \$411,001.69, against which was quoted the amount received by Toronto in 1911, viz., \$772,108.64.

The Nipissing Central Ry., operated by the Timiskaming and Northern Ontario Ry. Commission, we are officially advised, is considering the matter of ordering two additional cars, but that if by the arrangement of a new schedule a certain end can be effected, the cars will not be ordered.

The Lethbridge, Alta., City Council is reported to have adopted the following schedule of wages for motormen and conductors on the municipal street railway:—First 6 months, 25c. an hour; second 6 months, 28c.; second year, 30c.; third year, 32c. On public holidays time and a half will be paid, and on Sundays 9 hours' pay will be given for 7½ hrs. work.

American Electric Railway Association's Convention.

This convention, which was held at Atlantic City, N.J., Oct. 13 to 17, was one of the most successful in the Association's history, the attendance of electric railway officials, etc., being very satisfactory, although not quite so large as at Chicago in 1912. A number of meetings were held of the American Electric Railway Association, and its subsidiary associations, accounting, engineering, claims agents, transportation and traffic, at which papers were read and discussed as well as reports of committees. The supply exhibits were on a larger scale than ever before.

The Canadian Electric Railway Association was officially represented by Patrick Dube, President, and Acton Burrows, Secretary-Treasurer. It had its headquarters in the American Electric Railway Association's space at the entrance to the exhibit pier, and held a separate registration for Canadians attending, which was much appreciated.

The Ontario Railway and Municipal Board was represented by D. M. McIntyre, Chairman; A. B. Ineram, Vice Chairman; H. N. Kitson, Commissioner; and H. C. Small, Secretary. The Province of British Columbia was represented by W. Rae, Inspector of provincial railways there.

Among the Canadian electric railway officials attending were the following:—J. Anderson, Manager, Sandwich, Windsor and Amherstburg Ry.; R. A. Baldwin, Master Mechanic, Ottawa Electric Ry.; H. H. Beasley, Purchasing Agent, Toronto Ry.; D. E. Blair, Superintendent Rolling Stock, Montreal Tramways Co.; J. A. Burnett, Electrical Engineer, Grand Trunk Ry.; F. D. Burpee, Superintendent, Ottawa Electric Ry.; A. S. Byrd, Superintendent Power Plants, Montreal Tramways Co.; D. Campbell, Inspector, Toronto Ry.; W. P. Cooke, Chairman, Public Utilities Commission, Port Arthur, Ont.; H. Cowan, Chief Night Inspector, Toronto Ry.; W. Craig, Master Mechanic, Hull Electric Co.; H. Doughty, Superintendent, Regina Municipal Ry.; Patrick Dube, Secretary-Treasurer, Montreal Tramways Co.; F. S. Easton, Engineer Hydro Electric Construction, British Columbia Electric Ry.; R. W. Ennis, Assistant Master Mechanic, Toronto and York Radial Ry.; A. L.

Farquharson, Superintendent Street Railway Construction, Fort William, Ont.; A. Gabboury, Superintendent, Montreal Tramways Co.; G. Gordon Gale, General Superintendent, Hull Electric Co.; W. F. Graves, Chief Engineer, Montreal Tramways Co.; D. W. Harvey, Assistant Engineer, Toronto Ry.; J. B. Holder, Foreman Carpenter, Kingston, Portsmouth and Catarqui Electric Ry.; G. K. Hyde, Storekeeper, Toronto and York Radial Ry.; W. M. Kirkwood, Superintendent, Galt, Preston and Hespeler Street Ry.; T. H. McCauley, Manager, Calgary Municipal Ry.; V. S. McIntyre, Superintendent, Berlin and Waterloo Street Ry.; J. S. Mackenzie, Purchasing Agent, Winnipeg Electric Ry.; W. R. McRae, Master Mechanic, Toronto Ry.; W. H. Munro, Local Manager, Peterborough Radial Ry.; H. C. Nickle, General Superintendent, Kingston, Portsmouth and Catarqui Electric Ry.; O. A. Oakes, Foreman, Kingston, Portsmouth and Catarqui Electric Ry.; L. Palk, Claims Agent, Winnipeg Electric Ry.; H. E. Phillips, Superintendent Power Station, Winnipeg Electric Ry.; Wilson Phillips, Superintendent, Winnipeg Electric Ry.; M. O. Robinson, General Manager, Port Arthur and Fort William Electric Ry.; G. C. Royce, Manager, Toronto Suburban Ry.; H. G. Salisbury, Architect and Structural Engineer, Toronto Ry.; A. E. Shaw, Chief Claims Agent, Montreal Tramways Co.; J. M. Smith, Comptroller, Toronto Ry.; M. F. M. Werth, Assistant Mechanical Superintendent, British Columbia Electric Ry.; C. L. Wilson, Assistant Manager, Toronto and York Radial Ry.; J. A. Wilson, Chief Draughtsman, Ottawa Electric Ry.

Among the Canadian supply men in attendance were H. C. Anderson, Sales Department, John Millen and Son, Ltd., Toronto; H. D. Bayne, Special Agent, Canadian General Electric Co. and Canadian Allis-Chalmers Co., Toronto; G. Broughall, Secretary, and F. Erickson Brown, General Manager, Northey-Simmen Signal Co., Toronto; D. M. Campbell, General Manager, Preston Car and Coach Co.; W. A. Chapman, Manager, Rail Joint Co. of Canada, Montreal; J. A. Dawson, Dawson and Co., Ltd., Montreal; P. A. Hinds, District Sales Agent, Eastern Canada, Ohio Brass Co., Toronto; W. K. Jeffrey, General Manager, Ottawa Car Co.; A. C. Lewis, Vice President, Templeton-Kenly and Co., Toronto; F. D. Lyman, Manager, Railway Supply Co., John Millen and Son, Ltd., Montreal; G. Shenton, Salesman, Railway Supply Department, John Millen and Son, Ltd., Montreal.

The Canadian Westinghouse Co. sent a large delegation, including P. J. Myler, Vice President, N. S. Braden and H. U. Hart, Hamilton; C. F. Medbury, A. B. Brown and H. E. Blatch, Montreal; J. F. Dryden, Toronto; W. A. Duff, Winnipeg; R. A. Davis, Calgary, and J. R. Read, Vancouver.

Comparative Salaries on an Electric Railway.—During the recent hearings in Boston, Mass., to take evidence on the controversy between the Boston Elevated Ry. Co. and its carmen the following facts were brought out in regard to the salaries of the various officers: The salaries are: President, \$36,000 a year; First Vice President, \$20,000; Second Vice President, \$15,000; Treasurer, \$12,000; Real Estate Agent and Asst. Secretary, \$10,000; Clerk, \$10,000; General Auditor, \$7,500; General Counsel, \$25,000; Assistant Counsel, \$15,000; Publicity Agent, \$4,000; Chief Engineer, \$9,500.

The storage bin annex of the C.P.R. elevator at Transcona, Man., on Oct. 18 sank about 20 ft., the cupola of concrete slipping off and the bins remaining at an angle of about 26 degrees. There were about 900,000 bush. of wheat in storage, which it was expected would be removed and shipped without damage.

Marine Department.

Additional Car Ferry for the Intercolonial Railway's Strait of Canso Service.

The Intercolonial Ry. has invited tenders for a new car ferry steamboat for transporting trains across the Strait of Canso from the mainland of Nova Scotia to Cape Breton Island on the Truro-Sydney line. The new ferry is to be similar to the present ferry Scotia as far as practicable, the principal point of difference being an additional length of 18 ft. The principal dimensions will be as follows:—Length overall, 300 ft.; length between perpendiculars, 276 ft.; breadth over fenders, 48 ft.; moulded breadth on deck, 46 ft.; breadth at load water line, 43½ ft.; moulded depth, 19 ft.; draught when laden with 1,400 tons of car load and 150 tons of coal, water and stores, 14 ft.; and i.h.p., 3,000.

The vessel is to be flushed decked with 3 lines of car rails, and is to have one screw propeller at each end, with rudder in stern and ram in front of bow propeller to break ice. The hull is to be specially formed and strengthened at the water line fore and aft for working amongst ice. It is to have close bulwarks on the sides and a small pilot bridge carrying a pilot house. The hull is to be divided into 8 water tight compartments, the two compartments amidships being occupied by the engines and boilers. Mess room accommodation is to be provided below decks for the officers and crew. Each propeller is to have an independent triple expansion engine, the two engines together to be capable of indicating about 3,000 h.p. The vessel is to be built under Lloyd's special survey, and classed in its register as 100 A1 single deck, and to comply with the British Board of Trade requirements. Special framing and plating is to be fitted in way of the water line to protect the vessel when working amongst ice. The deck is to be specially framed to support the weight of locomotives of class "special heavy" of the Dominion Government specification on the centre track, and a live load of 38,500 lbs. per axle on the side tracks.

The keel will be formed of flat steel plates, connected to the propeller posts at each end. The propeller and rudder posts will be of cast steel, shaped for working in ice, the post being curved up the face of the counter line, and having a deep web to protect the rudder, the necessary gudgeons for the latter to be cast in the post. The rudder will be cast steel or forged scrap iron with single steel plate blade with portable steel pintles. The stock is to be stopped short of the main deck beams to allow of a double tiller and quadrant being fitted. The rudder will also have a locking arrangement. The main and intermediate frames will be formed of steel bulb angles spaced 12 ins. apart at the water line, the main frames being 24 ins. apart and in one piece from the keel to the deck. The bottom framing is to be of the open floor type, with the intermediate frames at the ends of the vessel over the stern post to have floor plates the same as fitted to the main frames.

There will be 7 transverse bulkheads carried from the keel to the deck, with no watertight doors to be fitted except a 4 by 6 ft. one in the bulkhead between the engine and boiler compartments. The beams on the main deck will be spaced not over 2 ft. apart, connected at the outer ends to the top of the main frames by rivetted plate knees. There will be 2 lattice girders formed of steel angles and plates extending as far forward and aft as possible. These

girders will be connected at the bottom to the side keelsons, and the top to intercostal plates running fore and aft and connected to the beams and deck plating. The main deck is to be formed of steel plates, sheathed with 2½ in. pitch pine overall. The under side of the deck over the engine and living rooms is to be insulated by providing air spaces and insulating materials, to eliminate all condensation with a maximum outside temperature of 20 degrees below zero.

The coal bunkers are to be arranged to carry 75 tons or more if practicable, to be loaded by chutes from the centre track. Four coaling doors are called for in the bunker sides to suit the boiler firing.

A close steel bulwark, 8½ ft. high, is to extend along both sides and stern, with portable wrought iron stanchions in the bow. The bulwark is to have a steel bulb angle stiffening rail along the top, and is to be stayed every 6 ft. with a bulb plate. 80 lb. rails will be used at the standard 4 ft. 8½ in. gauge, supported on elm runners on a steel girder formed of two steel angles. Scupper holes will be cut in the girders for drainage. Oak fenders, 10 by 12 ins., will be fitted all around the vessel, between steel angles, and protected on the outside by thick plate of steel, 10 ins. deep.

There is to be a steel pilot house 7½ ft. high, arranged for the steering standard and a wheel for the steam steering gear, and other pilot house fittings. The pilot bridge, of 2½ in. pitch pine, carried on a steel frame from the sides of the vessel, is to be placed forward on the vessel. It is to be of sufficient width to afford a passage-way in front of the pilot house, and will be reached by two steel ladders. A combined hand and steam steering gear is to be connected to the rudder, working directly on the quadrant, and fitted with all necessary fittings, to be controlled from the pilot house by geared rods.

There will be four steam warping capstans for working the anchor cables and mooring ropes, all but the capstan heads to be placed below the deck, and to be operated by levers on the deck. Wooden chain lockers will be conveniently located as regards the capstans. Two anchor davits, complete with blocks and falls, etc., will be fitted on deck at each end near the cable capstans. There will also be six pairs of mooring bits with necessary mooring pipes, with hawse pipes for the cables formed of heavy castings securely fastened to the deck.

Four rooms will be provided for the officers and engineers, arranged with separate rooms for the day and night captains, and two for the chief engineers. There will also be a mess room, pantry and provision room. All these rooms are to be completely fitted in a comfortable manner. The crew's space will be an open compartment below the main deck, fittingly furnished. All these rooms will be sheathed in white wood, and the roofs will be cork painted and wood and insulation lined against any possible condensation. The galley will be conveniently located to officers' and crew's quarters, and to have all the necessary fittings. Skylights will be fitted to all rooms, and deck lights where necessary. Ample provision will be made for lavatories, water closets, and urinals for officers, crew and passengers. All rooms will be steam heated. A 1,000 gallon drinking water tank will be

conveniently located, with necessary fittings, and a connection to the galley.

The vessel will be equipped with two 24 ft. life boats and an ice boat. The inside and outside of the vessel will receive 3 coats of oil paint, finished in appropriate colors. The officers' quarters will be painted in colors and varnished, and the crew's quarters painted only. The bottom of the vessel will be coated with Portland cement. The floors of the crew's lavatory will be cemented, and the lavatories of officers and passengers will be finished in tile.

The engines will be of the triple expansion, inverted, direct acting, surface condensing type, working on three cranks, each set of engines being a duplicate one of the other in the working parts. They are to be designed so that they will stand, without injury, the sudden stoppages of the screws when working amongst ice. One surface condenser will be fitted to both sets of engines. The machinery will be so placed that by the introduction of a short length of shafting between the two engines, one can be arranged to work both propellers, and the other can be disconnected from the shafting when desired. A starting valve is to be fitted, working from the starting platform. The reversing gear will be of the latest direct acting hydro steam type, with hand gear and handles conveniently arranged, with the weight shaft supported on long bearings.

The general purpose pump will be connected to the condenser for use when required. The circulating pump will be of the twin centrifugal type, driven by a single cylinder engine, taking steam from the auxiliary steam pipe and exhausting directly to the condenser. It will be arranged to draw from the ice box and bilges, and to discharge through the condenser overboard. The air pump will be of the twin independent vertical type, having single acting air pumps worked from either end of a beam actuated by a single steam cylinder, the working barrel of brass to draw from the bottom of the condenser and deliver to the feed pump control tank. The main feed pump is to be of the independent duplex direct acting type, fitted with tank having a float and automatic control gear, the pump to be capable of dealing with the water from both engines when working at full speed. It will draw from the control tank, and also from the sea and fresh water tanks, and discharge to the boilers. There will also be a general purpose pump, capable of discharging 90 tons of water an hour, to draw from the bilges and from the sea, and discharge overboard and into wash deck and service pipes. An auxiliary feed pump of the duplex type will draw from the sea, from the fresh water tank and from the control tank, and discharge into the boilers, on deck and overboard, and also arranged to circulate water in the boilers when getting up steam and to discharge through the condenser.

The electrical equipment will comprise a complete installation of electric lights, with two separate 25 k.w. 80 volt multipolar generators, direct connected to 35 h.p. vertical cross compound Belliss and Morcom engines, approximating 350 to 400 r.p.m. There will be a separate switchboard for each generator, containing the necessary control and recording apparatus. There will also be a feeder panel for the searchlight, arc lamp and incandescent lamp circuits. The search-

light will be of the 15,000 c.p. pilot house type, supplied with the necessary gear and connections in the pilot house.

The size of the vessel precludes the possibility of builders on the Great Lakes bidding on the proposition, as they are limited in production to the capacity of the St. Lawrence canals.

Lake Shippers' Clearance Association.

Canadian Railway and Marine World for October contained the President's address and the General Manager's report at this association's annual meeting in Winnipeg, Aug. 26.

The following resolution was adopted:—"Seeing that both shippers and vessel owners are quite satisfied with the present conditions, that the existing rates be continued for the coming season, and that the new board, at an early date, consider the disposal of any surplus made after \$75,000.00 is reached as a reserve."

It was decided to raise the entrance fee from \$1,000 to \$1,500.

The profit and loss account showed balance from previous year \$5,289.45, balance from operating account, \$32,619.58; total, \$37,909.03. Of this \$30,000 was transferred to reserve.

ASSETS		
Bank balances:	Winnipeg.....	\$ 44,791.86
	Fort William.....	25,415.65
	Duluth.....	975.90
		\$ 71,186.41
Accounts Receivable:	Vessel charges	2,124.40
	Shippers.....	72,721.25
	Sundry.....	3,403.16
		78,248.81
Sundry shippers:	for accrued storage	32,006.53
Investments:	Traders' Building Association	14,694.00
	of Lion.....	1,600.00
	Grain Exchange Seat.....	3,963.07
Office Furniture:	Winnipeg.....	1,031.44
	Fort William.....	
		4,094.51
		\$202,730.26
LIABILITIES		
Accounts Payable:	Elevator charges.....	\$102,578.75
	Sundry.....	875.92
		\$103,454.67
Sundry elevators:	for accrued Storage	20,716.56
	Members' fees.....	5,650.00
	Reserve.....	65,000.00
Balance:	Profit and Loss.....	7,909.03
		\$202,730.26

SCHEDULE OF VESSEL TARIFF.

(a) Vessels up to 125,000 bush. of wheat capacity—30c. per 1,000 bush. for loading within 24 hours of arrival, loading weather.

(b) Vessels of 125,000 to 200,000 bush. of wheat capacity—30c. per 1,000 bush. for loading within 48 hours of arrival, loading weather.

(c) Vessels of 200,000 or over bush. of wheat capacity, as follows:—40c. per thousand for loading in 24 hours, 30c. per thousand for loading in 48 hours, 20c. per thousand for loading in 60 hours, 10c. per thousand for loading in more than 60 hours.

If above time limits are exceeded in classes (a) and (b) the charge is to be 10c. per thousand bush.

If delay is caused by non-surrender of documents, the shippers are to be penalized by the Lake Shippers' Clearance Association to the extent of the estimated loss of revenue to the Association by reason of such delay.

Sample cargoes to be loaded at 15c. per 1,000 bush. straight.

After Nov. 25 and until the close of navigation, the charge to be 20c. per 1,000 bush. flat on all boats loaded.

Time shall start from time of arrival ready for loading, if such time is prior to 4 p.m. on a working day. If after that hour, time shall start at 7 a.m. on the following morning, if elevators not working during the night.

John Corbett on the Ocean Freight Rate Question.

John Corbett, of Montreal, who was for 28 years Foreign Freight Agent, C.P.R., writes as follows:—I should be favored if you could find space for this letter, which expresses my views as a practical business man, on the ocean freight rates agitation, which after a tenuous and querulous existence, appears at last to have nearly exhausted itself. Born of personal interest, and sustained by ignorance, misconception and misstatements, it has not been able to withstand the searchlight of hard facts.

The first mistake its initiators made was that they sought to violate one of the first principles of the commercial world, and one which before now has been upheld by the highest courts of the empire, viz., the undeniable right of the private trader to conduct his legitimate affairs without interference. In spite of the fact that the conference system has given us advantages and facilities which otherwise would not now be in force, the agitators have allowed themselves to put before the public a picture of the conference, as a bloodsucking monopoly of the worst type. One of the worst monopolies that we have to endure at present in this country is that of the millers. As was pointed out in an evening paper the other day, Canadian flour is much cheaper in London than in the industrial centres in Canada. This fact should be specially interesting to consumers in the Dominion, and should make them ask themselves what is the reason? There is an old saying "that people who live in glass houses should not throw stones."

A prime mistake made by the agitators was the attempt to institute comparisons between railway rates and ocean rates. A little consideration would have shown them that railways were chartered with certain privileges, and had practically a monopoly in the districts they served, whereas there are no privileges on the ocean, which is open to any steamship owner of any nationality who can obtain a freight.

A very interesting statement of the fluctuations in ocean freight rates was published in one of the leading shipping papers some time ago. That statement, which was illustrated by a diagram, took the boom year of 1900 as a basis for its remarks. As is well known to everyone, the high rates prevailing in 1900 were not the result of an increase in trade, but of a spasmodic increase due to the large requirements of tonnage of all kinds by the British Government in the South African affair. From 1884 to 1889 trade was steady, and very little variation in rates took place, but from 1889 to 1895 rates again fell, till in the latter year they were 40% less than in the former. Unsettled political conditions had again had an effect on rates, which rose to within 9% of the basis of 1900. When the British Government were finished with the large amount of tonnage employed by it, the effect of so many vessels being replaced on their regular trades was seen by a fall of 26% in that year. Rates remained so unremunerative that shipowners refrained from building new vessels until in 1911 a natural increase in the demand for tonnage having taken place, the supply available was overtaken, and rates began again to move upwards to a paying basis. The great coal and transport workers' strike of that year in Great Britain had a very serious effect on freight rates, tying up thousands of tons of steamships, and resulting afterwards for a short period in a fictitious rise in rates for the time being, in order to overtake lost time. As is well known, a marked improvement has taken place in the class of tramp steamships. They are better built, better equip-

ped, and therefore they can be handled more expeditiously and economically than was formerly the case with that class of vessel. That, besides being of advantage to the owners, is of great benefit to the shippers and merchants.

The report of the British Royal Commission on shipping rings and rebates states the case fairly and temperately. While it is admitted that there are weaknesses in the system, it is shown that such weaknesses could be dealt with and eradicated by simple means, and it completely repudiated the right of the state to interfere with an industry to which it granted neither a trading monopoly nor a guarantee of profit.

Government Wharf at Burrard Inlet, Vancouver.

A contract has been let by the Department of Public Works, Ottawa, to Henry, McFee and McDonald, Vancouver, B.C., for the construction of a wharf on Burrard Inlet, between Salisbury and Commercial Drives, Vancouver. The work to be done consist of excavation in earth and rock to a depth of 35 ft. at low tide over the slips on each side of the wharf, and 36 ft. over the area covered by the cribs, or such other depth as may be ordered; the construction of lines of timber cribs sheathed with reinforced concrete, and filled with stone ballast with a mass of concrete superstructure forming a wharf 800 ft. by 300 ft.; construction of two bulkheads of timber crib-work sheathed with reinforced concrete with a mass of concrete superstructure at the shore end of the wharf, each 40 ft. long; the filling in between the two lines of cribs to the level of the coping of the mass concrete superstructure and at the back of the bulkheads to the railway right of way; and to deposit layers of rubble and broken stone and level the same to receive the cribs.

The total quantity of rock excavation is approximately 108,000 cubic yards, plan measurement, of which 100,000 cubic yards, it is assumed, may be used as ballast in cribs and for foundations, and the remainder used in other parts of the work as may be approved by the engineer.

The sides and outer end of the wharf are to be built of timber cribs, 100 ft. long, 37 ft. wide, and 39 ft. high, so that when sunk the tops shall stand four feet above low water at spring tides. The cribs are to be built on platforms constructed of 18 by 12 in. timbers 39 1/4 ft. long, all the pieces bolted to each other every three feet by one inch round drift bolts, each 24 ins. long. The platform and sides of the cribs to be rendered watertight by being caulked with oakum. The cribs are to be towed into place, and then to be sheathed to a thickness of 2 ft. on the outer face, and 1 ft. thick on the other three faces, with reinforced concrete, and sunk into position by being filled with rock ballast. The bulkheads at the inner end of the wharf shall consist of one crib each, of similar construction and proportionate size to the cribs in the main pier. The superstructure will consist of a concrete mass, finished with granolithic concrete 6 ins. thick. The area enclosed by the concrete walls and at the back of the bulkheads is to be filled with approved material, with a top filling of broken stone and fine gravel 1 ft. thick, the whole made compact by being rolled with an 8-ton steam roller. On the outer face of the wharf and bulkheads there shall be placed two walings of B.C. fir, 15 by 13 ins.

The contract calls for the employment of Canadian labor, the use of Canadian material, and the completion of the work in two years. Its estimated cost is \$1,250,000.

The Steamship Whakatane's Collision with a Wharf in the St. Lawrence.

Commander H. St. G. Lindsay, R.D., R.N.R., Dominion Wreck Commissioner, gave the following decision Oct. 17, which was concurred in by Captains F. Nash and R. S. Clift, assessors:—The British steamship Whakatane, official no. 11648, on a voyage from Cardiff, South Wales, for Montreal, via Sydney, N.S., and apparently well manned and equipped in every respect, arrived at Father Point, Gulf of St. Lawrence, on the afternoon of Sept. 12 and took on board a licensed pilot and proceeded at once on her voyage towards Quebec and Montreal. Fine weather was experienced during the trip up the river until shortly after passing St. Jean light, Orleans Island, which was abeam at 3.20 a.m. of Sept. 13, when slight mist or smoke lying close to the water was met with, and the pilot, who appears to have been in full and complete charge of the navigation of the vessel, ordered the speed to be reduced to half speed and shortly after that to slow. At 3.50 a.m. St. Laurent light was abeam, and the light on Beaumont Shoal buoy, almost opposite on the south side of the channel, was also observed quite distinctly, and the vessel, according to the evidence, although no bearing was taken, passing about midway between these two lights, and the course was then altered by the pilot about half a point to the westward. After proceeding on this course for about 5 or 10 minutes, the course was again altered with the intention of passing to the southward of West Point light at the usual distance off, viz., about half a mile. Shortly after this the master called the pilot's attention to some lights on the south shore, being, as he thought, rather close aboard, and the pilot gave orders to alter the course a quarter of a point to the westward, which was done, and some minutes after the lookouts reported something right ahead, which ultimately proved to be a portion of a wrecked steamer lying on the south bank of the river. Orders were at once given to put the helm aport, full speed astern on the engines, and let go the anchor; but the ship's head had barely started to swing to starboard, under the influence of the port helm, when she ran with great force into Gilmour's wharf at Indian Cove, remaining aground there for some 13 hours, when she was pulled off at high water by tugs and taken into Louise Basin, Quebec, and from there to the Levis drydock, where temporary repairs were effected.

The court, after carefully considering the evidence, which, in some particulars, appears to be of a conflicting nature, is unanimous in its opinion that both the master and pilot are to blame for the casualty, inasmuch as the master did not take sufficient interest in the navigation of his vessel after leaving Father Point, leaving it almost entirely in the pilot's hands, and his example appears to have been followed by the officers, as it would appear that no particular attention was given to the steering, the navigating of the ship being carried out by courses set on the steering compass in the wheelhouse, instead of on the standard compass, and if the times given in the log book are correct, which is, in the court's opinion, very doubtful, no one seems to have taken the true speed the ship was making into consideration, between the various lights, as it would appear that instead of six knots, which the court was informed was the supposed speed of the vessel when passing St. Laurent light, it appears by the time given in the log book to be nearer 12 knots. The time from abeam of St. Laurent light to the time of the stranding is given as 33 minutes, and the exact distance

being six miles between these points, shows in itself how much reliance the court can put on either evidence or log book entries. The court, therefore, not wishing to deal with the certificate of J. H. Squires, the master, taking into consideration his want of experience as master, and his seeming ignorance as to the regulations connected with the St. Lawrence pilotage, severely reprimands him for his unfortunate lack of initiative pertaining to the safe navigation of his vessel, and the court hopes that this reprimand may prove beneficial to him in the future. With respect to the actions of L. T. Delisle, the pilot, which, in the court's opinion, are inexplicable, as the courses steered and given by him in his evidence after leaving St. Laurent light, put the ship exactly where she struck the wharf, and even if he had been misled by the wheelhouse compass being locally affected, which is quite possible, the fact of being able to see the lights on both sides of the river some time before the accident, makes it more difficult for the court to understand how he allowed the vessel to get so far out of her proper course without noticing that fact in time to avert the accident. The court therefore suspends his license for the balance of the present season of navigation, and also orders that he pay all costs and personal expenses pertaining to himself with respect to this inquiry. The court, in taking into consideration the number and similarity of accidents occurring in the St. Lawrence within the last 12 months, cannot but recognize the fact that the masters do not seem to realize that, although a pilot is on board, the responsibility for the safety of the ship still rests with them, just as if no pilot were engaged, as only the payment of pilotage dues is compulsory, and not the employment of pilots. This is clearly set forth in sec. 473, chap. 113, of the Revised Statutes of Canada, 1906, and if those in charge of vessels navigating in Canadian pilotage waters were to live up to this, especially in the St. Lawrence trade, there would be fewer accidents of the like nature. The court also severely criticizes the fact of the pilot leaving the vessel when he did, instead of standing by her to assist in getting her afloat.

Work on Panama Canal.

By the blowing up of the Gamboa Dyke, the signal for which was given by telegraph from Washington, D.C., by the U.S. President, Oct. 10, the water was let into the Culebra cut, and practical connection made between the Atlantic and Pacific Oceans. The work of excavation was first commenced on the Culebra cut Jan. 20, 1882, by the original French company, and the amount of material removed by it and its French successor was approximately 17,000,000 cu. yds. The U.S. Government took over the work May 4, 1904, and continued the use of the equipment left by the old companies, until it could be replaced by more modern machinery. The first modern steam shovel was put into use Nov. 11, 1904, and the last of the old equipment was displaced by June 16, 1905. Since the U.S. Government undertook the work, 97,049,601 cu. yds. of material have been removed from the Culebra cut, the maximum output being in 1911, when 16,596,891 cu. yds. were dealt with. Considerable trouble has been experienced with earth slides, and the removal of these will be dealt with as a regular part of the dredging work of keeping a clear channel. The total length of the canal is 47 miles.

Vessels will not proceed through the canal under their own steam, but will be towed through by electric locomotives, specially designed for the work. A series

of tests took place recently, with a sample locomotive, with a view to detecting defects and making the necessary modifications and alterations. As a result, 40 locomotives have been ordered from the General Electric Co., at a net cost of \$13,217 each. The first locomotive is to be delivered in seven months from the date of the order, and the remainder at the rate of four a month.

Proposed Dry Dock and Shipbuilding Plant for Sault Ste. Marie.

The project for the establishment of a dry dock and shipbuilding plant at Sault Ste. Marie, Ont., has been before the local authorities for some time, and a bylaw was passed by the ratepayers in 1909 confirming an agreement with J. O'Boyle for the construction of such works, by him or a company formed for the purpose, at an estimated cost of \$500,000. The dimensions of the dock were to be:—Length from sill to head of dock, 620 ft.; width on floor, 53 ft.; width at level of sill, 70 ft.; width at top, 85½ ft., with a depth of water over the sill of 17½ ft. under normal conditions. The city was to pay an annual subsidy of \$5,000 a year for 20 years, the first payment becoming due when \$100,000 had been expended on construction work, and the second payment being due when the dock was completed and ready for operation. A company was formed to undertake the work, under the name of the Sault Ste. Marie Dry Dock and Shipbuilding Co., and in 1911 the city agreed that the terms of the agreement with J. O'Boyle were binding with the company. Nothing was done by the company in connection with the project, and in March, 1912, it was announced that the charter had been acquired by F. H. Clergue, who was formerly connected with the Lake Superior Corporation, and some associates, and that construction would be proceeded with at once, that plans had been deposited with the Dominion Public Works Department, and that \$1,500,000 would be spent on the plant. No steps were, however, taken towards commencing the work, and it was recently stated that the charter had lapsed, and that the whole scheme had fallen through.

Fresh proposals were placed before the city council, Oct. 6, by which the city is asked to give a bonus of \$20,000 a year for 20 years, with exemption from all taxes, except school taxes, for the first five years, a fixed assessment of \$250,000 for the next five years, and a fixed assessment of \$500,000 for the next ten years. It is proposed to build a plant to cost approximately \$2,000,000, to employ 1,500 men when in full running order, and capable of handling vessels of 15,000 tons displacement. F. H. Clergue, Sault Ste. Marie, and F. H. Bromwich, London, Eng., are interested in the scheme, and are reported to have stated that funds are available for the commencement of the work as soon as the city assents to the terms. The Mayor, at a meeting of ratepayers, Oct. 8, stated that the promoters had agreed to deposit \$25,000 with a local bank as evidence of good faith, and had undertaken that construction commence not later than Apr. 1, 1914, and that the plant would be ready for operation in two years from that date. The sum deposited in the bank was not to be released until \$100,000 had been spent on construction, and taxes would be paid on a fixed assessment of \$500,000 for 15 years, instead of as originally suggested. It is also stated that the contract will be undertaken by Sir Douglas Fox and Partners, London, Eng. A bylaw is in course of preparation for submission to a vote at an early date.

Dominion Government Steamboat for St. Lawrence Light and Buoy Service.

The Dominion Government has awarded the contract for the construction of a single screw steamboat for the Department of Marine, for use on the St. Lawrence light and buoy service, to Polson Iron Works, Toronto, for \$173,399.

The principal dimensions are, length between perpendiculars 155 ft., length over all 164½ ft., depth moulded 30 ft., coal capacity full supply, about 100 tons, accommodation, officers and men, 24.

The vessel will be built of steel throughout, except where specially specified, under Government survey and classed 100 A1 at Lloyd's under its special survey. There will be six main transverse watertight bulkheads and a watertight flat at the bow and stern, which, with the bulkheads adjoining, will form trimming tanks. She will have a straight stem and cruiser stern, and lower, main, bridge and fore-castle decks. The steel and other materials, equipment, auxiliaries and stores used in the construction and completion of the vessel, are to be of Canadian or British manufacture throughout. The draught with 183 tons of dead weight on board is not to exceed 9½ ft.

The propelling machinery will consist of one single screw, inverted triple expansion engine, jet condensing, with cylinders 14, 22½ and 38 ins. diam. by 24 ins. stroke, working on cranks at 120 degrees, to develop 900 i. h. p. during a 6 hrs. trial when running at about 185 r. p. m. under a steam pressure of 180 lbs. Steam will be furnished by two Scotch marine boilers of the single ended type arranged to work under Howden's patent system of forced draught.

The auxiliary equipment will include, one 15 ton derrick crane, two 4 ton derrick cranes, two life boats, engine room telegraphs, complete electric light installation, including search light, air, bilge feed, fresh water, sanitary, ballast and general service pumps, windlass, boat hoist, heavy derrick winch, small derrick winch, steam and hand steering gear, etc. The general crew's quarters will be located on the lower deck forward, and the officers' quarters on the main deck, aft.

Delivery is to be made at Prescott, Ont., in nine months from the awarding of the contract, after satisfactory progressive speed trials from six knots upwards, with 100 tons dead weight on board, for six hours.

Government Dry Dock at Lauzon, Quebec.

The dry dock which has been placed under contract by the Dominion Government, to be built at Lauzon, Que., and which was fully described in Canadian Railway and Marine World for October, will, when completed, be the largest dry dock in the world. Engineering News, in commenting on this, refers to the three largest dry docks, the first two of which are under construction and under design, respectively, the third one being in operation. The dimensions of the three are as follows:—Lauzon, Que., 1,150 ft. clear length, 120 ft. width, 45 ft. maximum depth; Boston, Mass., 1,150 ft. clear length, 120 ft. width, 35 ft. maximum depth; Gladstone Dock, Liverpool, Eng., 1,020 ft. clear length, 120 ft. width, 46 ft. maximum depth.

The press report that E. A. Hoare, M. Can. Soc. C.E., Quebec, has been appointed to supervise the execution of the construction work is, we are officially advised, incorrect.

Grounding of s.s. Mount Temple.

The Dominion Wreck Commissioner, Commander H. St. G. Lindsay, assisted by Capt. F. Nash, John Mitchell and Joseph Ostens, as assessors, investigated recently the cause of the grounding of the C.P.R. s.s. Mount Temple in Montreal harbor, Sept. 24. The evidence showed that the vessel left her loading berth with a general cargo, drawing 26 ft. 10 ins. forward and 27½ ft. aft, under the direction of Pilot L. Z. Bouille. The weather appears to have been fine and clear, and everything worked satisfactorily while proceeding to the ship channel, and the engines were ordered full speed ahead, with the vessel proceeding down the river. On account of the range lights astern being obscured by smoke from the town and factories, the vessel, after passing the Tarte pier, was being navigated by the buoys marking the south side of the channel, and grounded about 500 ft. below buoy 181M, and remained fast until the morning of Sept. 26, when she was pulled off after discharging part of her cargo. She was later drydocked at Montreal, and it was found that considerable damage had been done to the bottom of her hull. The evidence tended to show that the vessel is slow in answering her helm, but this peculiarity was well known to those in charge of the bridge at the time of the accident. The court was unanimous in its

opinion that the cause of the grounding was due to an error in judgment on the part of the pilot in not altering his course to port, knowing that the vessel was slow in answering her helm, and bringing buoy 177M on his starboard bow before getting abreast of buoy 181M, which, in the court's opinion, was passed too close for safe navigation under the circumstance, taking into consideration the speed of the vessel, about 15 knots, and the proximity of the bank to starboard, on which she grounded. Pilot L. Z. Bouille was therefore severely censured. The court attached no blame to the master or officers of the vessel, but considers that the manner in which the entries are written in the engineer's log book is open to criticism. With regard to the positions of buoys 191M and 193M, which were found to be incorrect, the court did not consider that this had any bearing on the stranding, as the pilot having buoy 181M almost alongside and buoy 177M plainly in sight ahead, he had no reason to depend on the buoys westward to assist him in keeping his vessel in the channel.

Canadian Notices to Mariners.

The Department of Marine has issued the following:—

309. Sept. 18.—Ontario, St. Clair River, lower end, southeast bend, lights established.

310. Sept. 19.—Quebec, Gulf of St. Lawrence, north side, off Great Mekattina Island, Flat Island, lighthouse established.

311. Sept. 19.—Quebec, Gulf of St. Lawrence, north side, St. Mary Island, lighthouse established.

312. Sept. 22.—Nova Scotia, Cape Breton Island, east coast, Sydney harbor entrance, off Cranberry Head, Cran Rock, gas and bell buoy to be established.

313. Sept. 22.—Quebec, Gulf of St. Lawrence, Magdalen Islands, Alright Island, extension to Pointe Bass wharf.

314. Sept. 22.—Quebec, Richelieu River, St. Denis, lighted buoy established.

315. Sept. 22.—Quebec, River St. Lawrence, ship channel between Quebec and Montreal, Varennes Traverse, change in character of buoy, Ile aux Vaches Traverse, change in character of buoy.

316. Sept. 25.—Quebec, Ottawa River, Lake of Two Mountains, Hudson, buoy established.

317. Sept. 25.—Ontario, Lake Ontario,

List of Steam Vessels Registered in Canada during September, 1913.

No.	Name	Port of Registry	When and Where Built		Length	Breadth	Depth	Gross Tons	Reg. Tons	Engines, Etc.	Owner or Managing Owner
133756	G. S. Mayes	St. John, N.B.	St. John, N.B.	1913	79 6	19 8	10 1	110	74	37n.h.p. sc.	Beaver Dredging Co., St. John, N.B.
131017	Ha-Ha	Quebec, Que.	Isle St. Louis, Que.	1913	51 2	15 0	6 0	38	22 17	" "	J. Page, Alphonse, Que.
133986	I. S. Rayside	Ottawa	Montebello, Que.	1913	66 0	17 8	6 6	49	28 17	" "	Owens Lumber Co., Montreal.
13 975	Lynn B.	Collingwood, Ont.	Midland, Ont.	1913	80 0	20 0	9 1	124	84 37	" "	C. S. Boone Dredging & Construction Co., Toronto.
85075	Selma	Vancouver, B.C.	Glasgow, Scotland	1881	141 8	22 1	11 6	203	96 80	" "	The All Red Line, Vancouver, B.C.

List of Sailing Vessels and Barges Registered in Canada during September, 1913.

No.	Name	Port of Registry	Rig	When and Where Built		Length	Breadth	Depth	Reg. Tons	Owner or Managing Owner
132836	A. M. G. No. 1	Vancouver, B.C.	Scow	North Vancouver	1913	81 0	30 9	8 2	193	A. M. Garnett, Cobble Hill, B.C.
133746	Cara Mia	Toronto	Cutter	Bristol, R.I.	1910	50 0	10 0	5 5	13	M. L. Gordon, Toronto.
134141	Dorval Ferry	Montreal	Scow	Sorel, Que.	1913	50 2	25 0	2 4	45	Dorval Island Park Co., Montreal.
133908	Fowling	Chatham, N.B.	Dredge	Little Branch, N.B.	1913	34 0	14 5	3 8	20	F. A. Fowling, Little Branch, N.B.
133997	Hibbert C.	"	Schr.	Miminegash, P.E.I.	1913	60 0	18 2	7 0	56	P. T. Costain, Miminegash, P.E.I.
133819	James Burton Cook	Lunenburg, N.S.	"	Lunenburg, N.S.	1913	109 8	26 3	10 4	100	W. Smith, M.O., Lunenburg, N.S.
133889	John C. Potter	Vancouver, B.C.	Barge	Seersport, Me.	1869	190 0	36 7	24 0	1145	Granby Consolidated Mining, Smelting & Power Co., Grand Forks, B.C.
133820	Lobelia L.	Lunenburg, N.S.	Schr.	Little Tancook, N.S.	1913	48 8	13 0	7 8	25	C. Levy, M.O., Little Tancook, N.S.
122614	Menesetzung	Goderich, Ont.	Dredge	Goderich, Ont.	1913	73 0	27 0	7 0	205	W. Marlon and W. L. Horton, J.O., Goderich, Ont.
133838	Philomene C.	Montreal	Sloop	St. Aime, Que.	1913	54 1	15 0	4 4	25	B. Caron, St. Aime, Que.
134061	Puget Sound	Vancouver, B.C.	Dredge	U.S.		107 0	41 0	12 0	61	West Coast Bridge & Dredging Co., Vancouver, B.C.
131019	St. Stanislas	Quebec, Que.	Yawl	Lotbiniere, Que.	1907	76 7	23 2	6 5	54	X. Marion, Lotbiniere, Que.

east end, south of Amherst Island, Big Bar shoal, depth less than charted.

318. Sept. 25.—Ontario, Detroit River, Ballard Reef channel, float lights placed.

319. Sept. 25.—Ontario, St. Joseph Channel, Wilson Channel, intended change in position of back range lighthouse, shoal east of Chicora shoal, buoy to be established.

320. Sept. 25.—Ontario, Lake Superior, channel to Silver Islet landing, buoy established.

321. Sept. 25.—Ontario, Lake Superior, Thunder Bay, Fort William, Mission Channel, temporary range lights.

322. Sept. 27.—New Brunswick, east coast, Sabin Ledge, buoy established.

323. Sept. 27.—Newfoundland, west coast, Gulf of St. Lawrence, Ferolle Point, lighthouse established.

324. Sept. 30.—British Columbia, Vancouver Island, west coast, Clayoquot Sound, Browning Passage, change in character of buoys.

325. Sept. 30.—British Columbia, Dixon Entrance, Queen Charlotte Islands, Graham Island, Rose Spit, gas lighted beacon established.

326. Sept. 30.—British Columbia, Dixon Entrance, Queen Charlotte Islands, Graham Island, Masset Harbor, Entry Point, range lights established.

327. Sept. 30.—United States of America, Admiralty Inlet, Wilson Point light station, type and characteristics of fog signal changed.

328. Oct. 6.—New Brunswick, south coast, Bay of Fundy, off Negro Head, submarine fog bell to be replaced by a submarine bell buoy.

329.—Oct. 6.—Nova Scotia, south coast, Tuffin Shoal, buoy established, eastern entrance to Mary-Joseph harbor, buoys established.

330. Oct. 6.—Prince Edward Island, south coast, Bedeque harbor, Summerside harbor, Island Shoal, change in character of buoy.

331. Oct. 6.—Prince Edward Island, north coast, Malbecque harbor, change in buoy, Fish Island inner range front light, light pole replaced by tower.

332. Oct. 6.—Quebec, River St. Lawrence below Quebec, Traverse of St. Roch, change in position of gas buoy.

333. Oct. 6.—Quebec, Montreal harbor, Forsyth Shoal, change in character of buoy.

334. Oct. 6.—England, southwest coast, Selliv Isles, Round Island, fog signal established.

335. Oct. 7.—New Brunswick, Bay of Fundy, Grand Manan Island, entrance to Grand Harbor, Ox Head ledges bell buoy, correction.

336. Oct. 7.—Nova Scotia, south coast, Halifax approach, telephone connection between Devil Island life saving station and the main land.

337. Oct. 7.—Nova Scotia, Cape Breton Island, south coast, off Petitdegrat Island, Green Island, intended change in character of light.

338. Oct. 7.—Nova Scotia, George Bay, northern entrance to the Gut of Canso, North Canso Lighthouse, intended change in character of light.

339. Oct. 7.—Prince Edward Island, south coast, Hillsborough bay, Pownell bay, appearance of midchannel buoys.

340. Oct. 7.—Quebec, Chaleur Bay, Port Daniel, West light station, hand fog horn established.

341. Oct. 9.—Nova Scotia, Bay of Fundy, Brier Island, temporary light, character of light to be changed.

342. Oct. 9.—New Brunswick, east coast, Northumberland Strait, Richibucto harbor entrance, change in position of Bar range lights.

343. Oct. 10.—Nova Scotia, south coast,

Mahone bay, approach to Gold River, and Gold River, list of buoys.

344. Oct. 13. British Columbia, Burrard Inlet, Vancouver harbor, Burnaby Shoal, change in position of float carrying light and fog bell.

345. Oct. 13. United States of America, Haro Strait, Stuart Island, Turn Point, fog signal to be out of commission temporarily, characteristic of fog signal to be changed.

346. Oct. 13. Alaska, Chatham Strait, Bay of Pillars, Ellis Point light established, rock discovered in vicinity of Ellis Point.

347. Oct. 13. Ontario, Great Lakes and River St. Lawrence, dates to which lights will be kept in operation.

348. Oct. 14.—Ontario, Ottawa River, L'Orignal wharf, light established.

349. Oct. 14.—Ontario, Lake Huron, north channel, approach to Blind River, non-existence of reported rock.

350. Oct. 14.—Ontario, Lake Superior, Thunder Cape light, new illuminating apparatus.

351. Oct. 15.—Nova Scotia, south coast, Sheet Rock, change in character of light.

352. Oct. 15.—Nova Scotia, North Atlantic Ocean, Sable Island east bar, dry bar forming.

353. Oct. 15.—Quebec, Gulf of St. Lawrence, Gaspé coast, Cloridorme, change in position of range lights.

354. Oct. 15.—Quebec, Gulf of St. Lawrence, Ste. Anne River, Ste. Anne des Monts wharf, change in color of light.

355. Oct. 15.—Quebec, River St. Lawrence ship channel between Quebec and Montreal, Batiscan anchorage, change in position of buoys.

356. Oct. 15.—Quebec, Montreal harbor, buoy placed temporarily.

357. Oct. 15.—Newfoundland, north coast, Strait of Belle Ile, Cape Norman lighthouse, correction.

358. Oct. 22.—Canada, change in night storm signals.

359. Oct. 22.—New Brunswick, east coast, Northumberland Strait, Jourimain Islands, intended change in character of light.

360. Oct. 22.—Quebec, Lake St. John, east side, Grande Decharge, Mistook wharf, red sector inserted in light.

361. Oct. 22.—Quebec, River St. Lawrence, chart, Malbaie to Goose Island issued.

362. Oct. 22.—Manitoba, Hudson Bay, chart of Nelson roads issued.

The Dominion Government's Projected Canal Improvement at Sault Ste. Marie, Ont.

In previous issues of Canadian Railway and Marine World very full information has been given in connection with the construction of the projected Welland Ship Canal, which work, though of very great importance in itself, could not possibly reach its full height of usefulness in the navigation of Canadian waters from the head of the lakes to the ocean, unless it was followed by considerable improvements to the canal system on either side. This was made perfectly clear by the Minister of Railways and Canals at Sault Ste. Marie, Ont., recently, when he stated that the new Welland Canal, to be of the greatest use to Canada, must be followed by improvements in the great waterway at other points, and that it would be foolish to carry out the Welland Canal work, if it was not intended correspondingly to improve the Sault Canal.

In order to be prepared to take up the work at the proper time, and with the view of saving expense, the Government is appropriating certain land in the vicinity of the Sault Canal, with the ultimate object of building a new canal, or altering and enlarging the present one. Matters relating to the nature of the work to be undertaken, the extent of any proposed enlargement, etc., are all yet to be considered, and any dimensions mentioned in the daily press from time to time are merely conjectural.

The Revolving Ship is one of those inventions which, although they are obviously impracticable, seem to have a fascination for the inventor, which is rather difficult to explain. Several years ago there was built and tried in Toronto a boat of the revolving type which reached a stage at which it was launched and an attempt was made unsuccessfully to propel it. According to a dispatch from London, a Paris inventor is now busy upon another of these craft, and judging from the meagre descriptions available, the designer is following along the lines that were proved to be altogether impracticable several years ago.

The first terminal elevator to be built and operated by the Dominion Government received its first shipment of grain at Port Arthur Oct. 2. The storage capacity is about 5,000,000 bush.

Sault Ste. Marie Canals Traffic.

The following commerce passed through the Sault Ste. Marie Canals during September, 1913.

ARTICLES	CANADIAN CANAL	U. S. CANAL	TOTAL
Copper..... Eastbound..... Short tons	312	6,223	6,535
Grain..... "..... Bushels	2,298,137	6,308,275	8,606,412
Building stone..... "..... Short tons		208	208
Flour..... "..... Barrels	266,970	1,140,861	1,407,831
Iron ore..... "..... Short tons	5,052,746	2,151,079	7,203,825
Pig iron..... "..... ".....			
Lumber..... "..... M. ft b. m.	3,686	79,652	83,338
Silver ore..... "..... Short tons			
Wheat..... "..... Bushels	12,380,056	8,385,055	20,715,111
General merchandise..... "..... Short tons	1,743	44,229	45,972
Passengers..... "..... Number	1,781	2,791	4,572
Coal, hard..... Westbound..... Short tons	51,750	249,788	301,538
Coal, soft..... "..... ".....	593,495	1,463,861	2,057,356
Flour..... "..... Barrels		500	500
Grain..... "..... Bushels			
Manufactured iron..... "..... Short tons	16,143	26,748	42,891
Iron ore..... "..... ".....			
Salt..... "..... Barrels	9,312	47,075	56,387
General merchandise..... "..... Short tons	55,060	96,284	151,344
Passengers..... "..... Number	2,473	1,616	4,110
Summary.			
Vessel passages..... Number	1,041	2,141	3,182
Registered tonnage..... Net	3,642,951	4,481,305	8,124,256
Freight—Eastbound..... Short tons	5,510,252	2,838,549	8,348,801
" — Westbound..... ".....	717,778	1,843,786	2,561,564
Total freight..... ".....	6,228,030	4,682,335	10,910,365

Atlantic and Pacific Ocean Marine.

The Norwegian s.s. Bjorgvin, bound from Pugwash, N.B., ran ashore near Charlottetown, P.E.I., Oct. 5, during a heavy fog, and it is feared will become a total loss.

G. M. Bosworth, Vice President, C.P.R., is reported to have stated in Montreal, Oct. 3, that the company would withdraw entirely from the North Atlantic Conference, which regulates steamship passenger traffic between Europe and America.

During September, 65 ocean going vessels arrived in Montreal harbor, compared with 57 in September, 1912, and from the commencement of the St. Lawrence season to Sept. 30, 366 vessels arrived, against 302 for the same period 1912.

The Union Steamship Co. of New Zealand, operating the Canadian-Australian mail line, will, it is reported, place an order shortly for another vessel for the service, of a similar type to the s.s. Niagara, a recent addition, but larger, possibly about 16,000 tons.

The C.P.R. s.s. Mount Temple, which recently grounded in the St. Lawrence just outside Montreal harbor, was docked in the Canadian Vickers dry dock at Montreal for examination and repairs Oct. 3. A number of plates were found to be damaged, but the whole of the work was done in the dock, and she resumed her service a few days later.

Promoters of the scheme for establishing a fast steamship service between the west coast of Ireland, and Cape Charles on the Labrador coast, were reported to have been in Ottawa recently to urge the proposal on the Government and to request a bond guarantee or other aid. It is stated that a request has been made for a bond guarantee for \$15,000,000.

The s.s. Imperator, the largest steamship afloat, which is scheduled to sail from Hamburg for New York Nov. 1 on her last trip of the season will, on her return to Europe, be docked at Liverpool for a general overhauling. It is stated that the decision to dock her at Liverpool has been arrived at because there is no other dock available of sufficient dimensions for a vessel of her size.

The s.s. Ceranus, under charter to the Dominion Government for the carrying of supplies, etc., to Port Nelson on Hudson Bay, was reported, Oct. 1, to have been wrecked within a short distance of her destination. The vessel and cargo is said to be a total loss. As the wireless telegraph equipment for the station connecting with the one at Pas, Man., was on board, it is stated that the inauguration of a wireless telegraph service between these two points will be delayed nearly a year.

The Royal Mail Steam Packet Co.'s new s.s. Cardiganshire is announced to sail from London, Eng., Dec. 20, for Victoria, B.C., and other North Pacific ports by way of the Suez Canal and the Orient. She will be followed by other vessels of similar type, now under construction, and which will be placed in service as they are completed. In the same service, the s.s. Monmouthshire was scheduled to sail from London, Oct. 25, to be followed, Nov. 22, by the s.s. Glenroy.

In dealing with the C.P.R. annual report for the year ended June 30, at the annual meeting Oct. 1, the President, Sir Thomas Shaughnessy, announced the issue of £1,000,000 consolidated debenture stock at 4%, in part to pay for the two steel twin screw passenger steamships of the intermediate class for the Atlantic Service. These vessels will be about 500 ft. long, with beam about 64 ft., and a moulded depth of about 41 ft., and will be equipped with

quadruple expansion engines, and have a tonnage of about 11,600. These vessels, details of which we have already given, are under construction at Glasgow, Scotland.

The C.P.R. has decided that during the forthcoming winter its steamships Empress of Britain and Empress of Ireland will make Halifax, N.S., their terminus, and will not, as hitherto, merely call there to disembark passengers and mail. When interviewed on the subject recently, Sir Thomas Shaughnessy is reported to have stated that the call at both Halifax and St. John involved undue risk in making the trip between the ports in all sorts of weather, and that as the company's other vessels would continue to go to St. John, which was the company's winter port, and in view of the large number of other vessels using this port, he considered the facilities would be overtaxed if the Empresses were added. The arrangement is only a tentative one, and subject to revision when the St. John harbor and wharf facilities are arranged so as to accommodate the ocean traffic naturally tributary to the port.

Maritime Provinces and Newfoundland.

It is reported that work will be commenced shortly on the construction of a marine slip at Southport, P.E.I., an appropriation of \$2,500 for which was included in the last parliamentary estimates. The slip will be built between Hillsboro bridge and the wharf.

The Department of Public Works has completed the dredging of a channel 333 ft. wide in the harbor at Yarmouth, N.S. It extends for 1,800 ft. inside of Bunker Island southwest light, locally known as the Bug light. In the channel there is a patch with 18½ ft. of water immediately eastward of Sollows rock, and 60 ft. from the east edge of the channel, which will be removed before the close of the season, but there is no danger to any vessel in mid-channel.

The Department of Marine announces the establishment of a lighthouse on Ferolle Point, on the west coast of Newfoundland, in the Gulf of St. Lawrence. It is situated one third of a mile northward of the extremity of the point, about 350 ft. back from the water edge and 39 ft. above high water mark. The structure consists of a hexagonal tower, with six buttresses and a circular lantern. The tower is white, 64 ft. high from base to lantern vane, and the light is of the third dioptric order, burning petroleum vapor under an incandescent mantle of 40,000 candle power, and is visible for 15 miles from all points of approach by water.

Province of Quebec Marine.

Capt. Wotton, of the Canadian Northern s.s. Royal Edward, demonstrated his patent boat releasing gear before the Montreal Harbor Commissioners recently.

It was stated recently by H. Driver, Secretary, Canadian Vickers, Ltd., Montreal, that it was expected the whole of the work of reclaiming and making the land on the site of the dry dock in Montreal harbor would be completed by the end of the season, or that only a negligible portion would be left over to be completed in the spring.

The construction of the grain elevator on the Louise Embankment at Quebec is proceeding rapidly, and it is expected that the building itself will be completed during November, and the machinery installed ready for operation by the opening of navigation next spring. It has been designed for a storage capacity of 3,000,000 bush., the

first unit now approaching completion having 1,000,000 bush. capacity.

The Marine Department has established a telephone line for the protection of shipping between the life saving station on the west side of Devil Island and the Nova Scotia Construction Co.'s office near Halifax, N.S. There is a land line on Devil Island, a cable from the Island to the mainland, and a land line from the company's office, which are connected with Dartmouth and Halifax.

The Marine Department has placed in operation on the southerly summit of Flat Island, in the Gulf of St. Lawrence, a lighthouse showing a white flashing light of the fourth dioptric order, 15,000 c.p., burning petroleum vapor under incandescent mantle. The tower is 34 ft. from the base to the vane of the lantern, and the light is visible for 14 miles all around the horizon. A similar one has also been established, of 25,000 c.p., and a range of visibility of 16 miles, on St. Mary Island, in the Gulf of St. Lawrence.

Ontario and the Great Lakes.

The second of the two dredges under construction at Collingwood for the Dominion Government was launched there Oct. 6.

Press reports from Winnipeg state that the C.P.R. has sold its elevators A and C at Fort William, Ont., to James Richardson and Sons, Ltd., Kingston, and granted long leases of the sites occupied.

The s.s. Prince Rupert, owned by the Calvin Co., Garden Island, Ont., and the s.s. W. D. Rees, owned by the Wilson Transit Co., Cleveland, Ohio, collided just above the Canadian canal at Sault Ste. Marie Sept. 30. Both were considerably damaged.

The Richelieu and Ontario Navigation Co.'s s.s. Bickerdike, which ran ashore in Lake St. Louis, Oct. 13, was floated the next day, after having had a considerable portion of her cargo of grain removed by the Montreal Harbor Commissioners' floating elevator.

The U.S. Lake Survey s.s. Surveyor, which has been carrying out operations in the east end of Lake Ontario, has developed a minimum depth of but 8 ft. below water datum on the Big Bar shoal, south of Amherst Island. At the chart plane of standard low water, the depth is 7 ft.

The Ontario Car Ferry Co. is preparing plans for a car ferry to operate between Cobourg and the south shore of Lake Ontario as an addition to the service now being performed by its car ferry Ontario No. 1. Press reports to the effect that a contract for its construction has been awarded are incorrect.

The Minister of Marine, while in Prescott, Ont., Oct. 2, stated that additional property had been secured for the enlargement of the Government lighthouse depot there, and that a considerable amount of the material for lights and buoys, now being imported, would, in future, be manufactured at the enlarged depot.

The Dominion Government dredge Port Nelson, which was built by Polson Iron Works, Toronto, for work in the Port Nelson harbor, Hudson Bay, and which has been fully described in previous issues, arrived at Port Nelson, Sept. 27, after its long voyage from Toronto, in tow. The time occupied between Sydney and Port Nelson bar was 20 days and 6 hours.

The s.s. City of London, owned in Chicago, Ill., which was sunk near Pelee Island, in Lake Erie, by collision with the s.s. Joseph S. Morrow recently, is considered a total loss. It is said that the wreck will probably be left until removed by the Dominion

Government. She was built in 1891, her dimensions being:—Length, 297, ft.; breadth, 41 ft.; depth, 23 ft.; tonnage, 2,003 gross, 1,675 register.

The Dominion Dredging Co., contractors on section 1 of the Welland Ship Canal, commenced dredging operations, Oct. 9, placing a dredge and two tugs about 2,000 ft. from the shore, where the new Lake Ontario entrance will be. Quinlan and Robertson, subcontractors under O'Brien and Doheney, general contractors for section 3, have commenced operations with one steam shovel at Thorold, and have another nearly ready for work.

The name of the s.s. Chili, which has been purchased in Chicago, Ill., and transferred to the Canadian register, has had its name changed to Sarnian. She is a steel vessel, built in 1895, equipped with triple expansion engines with cylinders 20, 33 and 54 ins. diam. by 40 ins. stroke, supplied with steam by two Scotch boilers, each 12½ by 11½ ft., at 170 lbs. Her dimensions are:—Length, 324 ft.; beam, 42 ft.; depth, 27 ft.; tonnage, 2,584 gross, 1,845 register.

Tenders for the removal of a triangular section of the west bank of the Detroit River, in order to widen the approach to the Livingstone Channel, are under consideration of officers of the U.S. War Department at Detroit, Mich. It is stated that the lowest tender is \$1.90 a cub. yd. for material excavated, and 60c a sq. yd. for clearing and sweeping a small portion of the area. The estimated quantity of rock to be removed is quoted as 43,500 cub. yds., widening the approach about 200 ft., the estimated cost of the work being \$200,000.

The United States Lake Survey reports the levels of the Great Lakes in feet above tidewater for September as follows:—Superior, 602.83; Michigan and Huron, 580.93; Erie, 572.76; Ontario, 246.74. As compared with the average September levels for the past ten years, Superior, Michigan and Huron were 0.05 ft. above, Erie 0.33 ft. above and Ontario 0.46 above. It was anticipated that Superior would remain stationary during October and that Michigan and Huron would fall about 0.2 ft., and Erie and Ontario about 0.3 ft.

The St. Lawrence and Chicago Steam Navigation Co. is issuing \$140,000 capital stock, being the balance of an authorized \$1,000,000. It is offered to shareholders of record on Nov. 15 at par in the proportion of one new share to six shares held. The amounts are payable, 25% on Dec. 15 and the balance on Jan. 5, 1914. The amount realized will be used to pay for an additional steamship of the same capacity as the s.s. James Carruthers, and it will be built at Collingwood. The new vessel will probably be ready for service by the fall of 1914.

The Montreal Transportation Co. is acquiring the s.s. Prince Rupert, and the barges Burma and Ceylon from the Calvin Co., Garden Island, Ont., for operation on the Great Lakes and St. Lawrence route. The Prince Rupert was built at Dumbarton, Scotland, in 1908, and is screw driven by engine of 170 n.h.p. Her dimensions are:—Length, 249 ft.; breadth, 43 ft.; depth, 19.5 ft.; tonnage, 1,908 gross, 1,172 register. The Burma was built at Garden Island in 1901, her dimensions being:—Length, 183.6 ft.; breadth, 39.5 ft.; depth, 15 ft.; 885 tons, and the Ceylon was built at Garden Island in 1891, her dimensions being:—Length, 205.4 ft.; breadth, 36.3 ft.; depth, 15.2 ft.; 908 tons.

The Northern Navigation Co. has practically decided to remodel its s.s. Huronic, so far as the cabin accommodation and upper works are concerned, so as to make her equal in accommodation to the com-

pany's steamships Hamonic and Noronic. It is not the intention to have this work carried out during the forthcoming winter, as the time is too short in which to obtain the necessary material, and have the vessel ready for service on the reopening of navigation next spring. The present intention is to carry out the alterations without lengthening the vessel. The matter will be taken up in time next year, and tenders will probably be called for during the summer for carrying out the alterations during the winter of 1914-15.

The attempt to raise the Keystone Transportation Co.'s s.s. Keystorm, which is lying in deep water near Kingston, will be watched with considerable interest, as, owing to the position occupied by the wreck, and being in very deep water, it is considered that, if successful, it will be one of the most remarkable achievements in the use of compressed air in salvage work. All the work will have to be done under water, such as covering hatches, connecting air hose and placing air locks, etc., after which the real work of the air men will commence. They will descend through the air locks to the holds, repair any breaks and reclaim as much of the hold space as possible. Each hold will thus be worked separately until sufficient buoyancy is obtained to float the vessel, when air will be put on all the holds and an attempt made upper works are concerned, so as to make to bring her to the surface. So far, in the use of compressed air for salvage purposes, there has been no failure, but the present case is considered an extreme one, and A. J. Lee, Westmount, Que., who has undertaken the work, is doing it chiefly with the view of developing certain theories of his own in this line.

Manitoba, Saskatchewan and Alberta.

The Winnipeg Harbor Commissioners have drawn up a comprehensive scheme of harbor development, and it is reported that the Dominion Government will be asked to include \$100,000 in the next estimates, for a series of docks on the Red River.

British Columbia and Pacific Coast Marine.

The Dominion Government has awarded the contract for the construction of a wharf in Victoria harbor, at a cost of \$15,124.40, to Macfarlane, Pratt and Hanley.

Navigation on the Yukon River for points north of Dawson, was announced to close for the winter by the sailing of the steamboat Norcott from Dawson, Oct. 17.

The Dominion Government is reported to be having plans prepared for the construction of a dredge for use on the interior waters, at an approximate cost of \$100,000. The dredge is being designed by Cartwright, Matheson and Co., consulting engineers, Vancouver.

Press reports from Vancouver, state that O. L. Dickeson, President, White Pass and Yukon Ry., has announced there, that the company will start a direct passenger steamship service from Vancouver to Skagway, Alaska, using vessels which will be built at a cost of about \$1,000,000 each.

The All Red Line, Ltd., operating the s.s. Selma out of Vancouver, in the coast trade, has transferred its vessel from the British, to the Canadian, register. The Selma, which was formerly known as Santa Cecilia, and was built at Glasgow, Scotland, in 1881, is screw driven by engine of 80 n.h.p. Her dimensions are, length 141.8 ft., breadth 22.1 ft., depth 11.6 ft.; tonnage 203 gross, 96 register.

The s.s. Rupert City, owned by the Marine Transportation Co., Vancouver, has been sold to United States purchasers and has been transferred to the U. S. register. She was built at Barrow in Furness, Eng., in 1886, and is screw driven by engines of 300 n.h.p. Her dimensions are, length 310.3 ft., breadth 38.1 ft., depth 25.2 ft.; tonnage, 2,536 gross, 1,640 register.

A press report from Victoria states that the Dominion Public Works Department will shortly award contracts for the equipment of all its tugboats and dredges with the necessary apparatus to enable them to use oil as a fuel. It is stated that there are about 15 of such vessels in operation on the Pacific coast, some of the dredges being very powerful vessels consuming large quantities of coal. It is also stated that reservoirs for oil will be built at Victoria and Vancouver to act as bases of supply.

The C.P.R. s.s. Princess Maquinna has resumed her service to the west coast of Vancouver Island, after having undergone repairs necessitated by grounding while on her recent trip to Alaska ports with members of the Geological Convention. The C.P.R. is asking the Dominion Government to provide better wharfing accommodation at ports on the west coast touched by this vessel, and it is reported that should nothing in the way of improvement there be done, the Princess Maquinna may be withdrawn from the service.

It is reported that the C.P.R. s.s. Beaver, which has been run on the New Westminster-Chilliwack route for several years, has been withdrawn from the service on account of having been operated at a loss since the opening of the British Columbia Electric Ry. line between the points named. She was built at Victoria in 1898, and was originally intended for the Yukon trade during the Klondyke gold rush of that year, but was taken over by the Canadian Pacific Navigation Co., which was later absorbed by the C.P.R.

Sir Thomas Shaughnessy, President, C.P.R., in dealing with the report for the year ended June 30, at the annual meeting, Oct. 1, announced the issuing of £1,000,000 consolidated debenture stock at 4%, in part to pay for the two first class steel two compartment turbine passenger steamships, for the British Columbia Coast Service. These vessels will be about 395 ft. long with beam 54 ft., and moulded depth of 20 ft., and will be propelled by two independent sets of Parsons compound steam geared turbine engines, and will have a tonnage of about 5,000. They have already been dealt with in Canadian Railway and Marine World and are under construction at Dumbarton, Scotland.

British Columbia and United States papers have recently renewed the reports which have been circulated at regular intervals during the past two years, to the effect that the Canadian Northern Ry. has awarded contracts for the construction of two turbine steamships, to be named Duke of Connaught and Duke of Clarence, for a service between Port Mann, Vancouver and San Francisco, with possible calls at Victoria. The older reports are amplified by the statement that the vessels have been actually ordered, and are in fact now being built at Glasgow, Scotland. In connection with these reports, Canadian Railway and Marine World has had occasion frequently to state that no doubt when the C.N.R. line is completed, a coast steamship service will naturally follow, but we are officially advised that no such order as that mentioned has been placed.

As announced in our last issue, under Canadian Notices to Mariners, the Department of Marine has installed a submarine

bell on the light ship stationed on the Sandheads off the Fraser River in the Strait of Georgia. It is probable that this installation will be followed by others if a sufficient number of steamships operating on the Pacific will supply themselves with the necessary receiving apparatus. The Department has a number of these installed along the Atlantic, and on inland waters, and it is expected that the number will be materially increased during next year. Experience has shown that bells placed on stands on the bottom, and bells electrically connected with the shore cannot be kept in operation with sufficient reliability to be satisfactory, and the Department's later installations are now placed from a light ship, where they can be raised for examination and overhaul without delay, or they are attached to a buoy and rung by the action of the waves alone.

The Burning of the s.s. Volturno.

The s.s. Volturno, which was burned at sea Oct. 10, when a number of lives were lost, was owned by Canadian Northern Steamships Ltd., Toronto, and operated under charter by the Uranium Steamship Co., a British concern, on a line between Hamburg, Halifax and New York. D. B. Hanna, Second Vice President, Canadian Northern Steamships Ltd., Toronto, is representative of the Uranium Company in America. The Volturno, which was bought about the end of 1909, on the incorporation of Canadian Northern Steamships Ltd., was built at Glasgow, Scotland, in 1906. She was of steel construction, and of the following dimensions:—length 340 ft., breadth 43 ft., depth 20.7 ft., tonnage 3,581 gross. She had accommodation for about 1,300 third class passengers and about 24 cabin passengers. The absolute necessity of having all transatlantic passenger steamships equipped with wireless telegraph apparatus was again demonstrated by the success which attended its use in this case, as within a comparatively short time of the distress signals being dispatched, sufficient help was at hand, though the heavy seas hampered the work of removing the passengers. Another interesting detail of this work is undoubtedly the use of oil in calming the sea. A large quantity was poured from an oil tank steamship, and there is no doubt that this enabled a greater number of lives to be saved than would otherwise have been the case.

Great Lakes Navigation and the Montreal Route.

A deputation representing navigation companies operating on the Great Lakes waited on the Ministers of Marine and of Trade and Commerce in Ottawa Oct. 17 to discuss a number of matters. The chief subject dealt with was the coasting regulations. Last year the coasting regulations were suspended in order to allow U.S. vessels to load grain at Port Arthur and Fort William, where they were to remain for the winter, and then proceed to a Canadian port on the opening of navigation in the spring. This was done with the view of obviating congestion at the head of the lakes, and providing additional storage accommodation for grain during the winter. At the time, the Dominion Marine Association opposed the suspension of the regulations in this respect, but did not press the matter very vigorously, as it was designed to relieve an abnormal condition, but it is now presenting a vigorous opposition to a renewal of the suspension for the coming winter. The ground taken by the Association is that if the Dominion Government allows such a suspension this year, it should

only be done on the condition that the U.S. Government should abrogate its dues and limitations so as to allow free entry to U.S. ports of Canadian shipping in a similar manner. On this matter, the Minister of Trade and Commerce stated that no decision had been reached or considered.

The question of rates between the head of the lakes and Georgian Bay ports was also discussed. It had been stated that these rates were higher than those of U.S. vessels from the same ports to Buffalo, and it is contended that this is not so, figures being quoted to show that on the general average the Canadian rates are as low as those on the U.S. route. The Minister of Trade and Commerce, in dealing with the matter, stated that in 1912 over 40% of the wheat from the west went out by way of Buffalo, and this year the proportion promises to be larger, and it is believed that the question of rates has a material bearing on the subject. Figures compiled by the Railways and Canals Department show the Canadian lake rate to be higher than the U.S. rate; the rate from Fort William to Buffalo being 0.103, and from Fort William to Georgian Bay ports 0.163 per ton per mile. We stated that shipping men are inclined to place the blame for the divergence of traffic on the Montreal end, alleging a lack of facilities there, and maintaining also that a large factor is more favorable insurance rates at U.S. ports. Another influence is the uncertainty of ocean tonnage from Montreal.

Wreck Commissioner's Judgment Reversed in the Lake Manitoba Case.

The Dominion Government has reversed the judgment of the Wreck Commissioner, Commander H. St. G. Lindsay, re the grounding the C.P.R. Lake Manitoba on the Isle of Orleans, July 28, by which judgment, A. Lachance, the pilot, who is President of the Corporation of Pilots of Quebec, was suspended until the completion of the present season of navigation. After hearing the evidence in the case, the Wreck Commissioner, assisted by two assessors, came to the conclusion that the casualty was entirely due to the negligence of the pilot, inasmuch as he totally disregarded the rule of the road in porting for a bright light on his port bow, and also in not being aware of the exact position of his vessel with regard to the land. The pilot has now been reinstated, the reason as published, being that he has always been regarded as an efficient officer, and that it has been urged that as conditions of navigation in the river are constantly changing, a pilot under temporary suspension would have no knowledge of the changes when he resumed his calling, and it is stated that the reinstatement is regarded as being in the interests of navigation.

It is a question whether it is good policy to interfere with a judgment to the extent of practically reversing it, especially when neither the evidence nor the finding is questioned. The grounds quoted for the reinstatement of the pilot have no connection with either the evidence or the judgment, but are quite outside all the points concerned, and such a decision can only mean, to carry the thing to its logical conclusion, that in future no sentence of suspension can be passed on any pilot. In view of this the Pilotage Act should be amended forthwith, and the pilot of the New Zealand Shipping Co.'s s.s. Whakatane, who was recently suspended, should be immediately reinstated. At least, one of the weak points of the reason given for Pilot Lachance's reinstatement is that he has already been under suspension for nearly three months, and the navigation season has only another month

to run, so if any loss of knowledge of the condition of affairs in the St. Lawrence was likely to occur, it has already taken place, and any further problematical loss of knowledge for the remainder of the season would not much matter.

The matter has given rise to considerable comment in marine circles, and a number of suggestions have been made to obviate what is becoming a ridiculous state of affairs. Some of these cover the entire removal of wreck investigations from the jurisdiction of the Marine Department, making the Wreck Commissioner's Court subsidiary to the Department of Justice, and depriving the Marine Department of any right to revise judgments and sentences, and also fining only of pilots for errors of judgment, etc., which result in the damage to, or loss of, a vessel, grading such fine according to the gravity of the offence, and extending payments over a stated period, by deducting a percentage from fees due the pilot for services rendered to each vessel during that period. There are certainly some good points in the suggestions mentioned, especially the bringing of the Wreck Commissioner's Court under the Department of Justice, leaving one of the superior courts of justice to be the final court of appeal in all matters pertaining thereto. In all cases where a pilot has committed any offence under the Pilotage Acts, in addition to a fine, the conviction should be endorsed on his license.

Since the foregoing was put in type, we have been officially advised that the Minister of Marine made a full and careful enquiry into all the facts of the case, and having satisfied himself that the period for which the license in question was suspended might be shortened, he so ordered and the license was accordingly returned to the pilot forthwith.

This confirms our opinion, as previously expressed, that decisions of the Wreck Commissioner should not be subject to reversal by the political head of a government department, on whom political influence may be brought to bear, but should be only appealable to a judicial body.

Welland Ship Canal Contracts Awarded.

The contract for section 2 of the Welland Ship Canal is reported to have been awarded to Baldry, Yerburch and Hutchinson, a British firm with a branch at St. Catharines, Ont. The amount of the contract is approximately \$5,500,000. Section 2 extends from bridge 2 to bridge 5, about 4½ miles, and includes locks 2 and 3. Lock 3 will be located immediately north of the present canal, and at its head on the east side will be an equalizing basin or pond of 150 acres. Below lock 3 there will be a heavy cutting through Homer village to the bed of Ten Mile Creek above Carleton St., St. Catharines, and just below Carleton St., lock 2 will be located. The canal at the head of lock 2 will be at an elevation of 335½ ft. above sea level. Full details of the complete work, including lock construction, were given in Canadian Railway and Marine World for July and August.

The contract for section 3 was awarded to O'Brien and Doheny, and Quinlan and Robertson, Montreal, jointly, and not to the first named firm only, as mentioned in our last issue.

The Edward Sinclair Lumber Co., Newcastle, N.B., have been given a contract for 41,000 ties for the construction railway in connection with the new canal.

The Department of Public Works will receive, to Nov. 17, tenders for the construction of a pile protection work at Rainy River, Thunder Bay and Rainy River District, Ont.

Telegraph, Telephone and Cable Matters

T. G. Galbraith, heretofore chief clerk to Superintendent, Ontario Division, C.P.R. Telegraphs, Toronto, has been appointed Inspector, C.P.R. Telegraphs, Ontario Division, Toronto.

R. N. Young, heretofore Superintendent of Telegraphs, Saskatchewan Division, C.P.R., has been appointed Superintendent of Telegraphs, Alberta Division, vice D. Coons, who has been appointed Superintendent of Telegraphs, Saskatchewan Division.

The Canadian Northern Telegraph Co. has opened offices at Algar, and Vista, Man., and has closed its office at Birch River, Man. Telephones have been installed at Hafford, Speers and Richard, Sask., and messages are accepted for these places, via Denholm, Sask.

The report of the Marconi Wireless Telegraph Co. of Canada for the year ended June 30 was presented at the annual meeting at Montreal Oct. 1. The statement shows a considerable improvement over the previous year, there being a profit of \$62, against a net operating loss of \$5,467 for 1911-12. The balance sheet shows assets of \$5,573,959. The directors were re-elected.

D. H. Bowen, heretofore Assistant Superintendent, Ontario Division, C.P.R. Telegraphs, Toronto, has been appointed Superintendent, Lake Superior Division, C.P.R. Telegraphs, Sudbury, Ont., vice F. T. Jennings, resigned to enter private business. The position of Assistant Superintendent, Ontario Division, C.P.R. Telegraphs, has been abolished.

The erection of the steel tower for the Universal Radio Syndicate's wireless telegraph station at Newcastle, N.B., is practically complete. The steel arrived from England Oct. 2. The plant will occupy about 54 acres, and there will be the steel tower 506 ft. high, and 6 wooden towers, each 300 ft. high, all on concrete foundations. It is stated that it will have a 40 kilowatt station, with a voltage of 1,000, and that it will be the most powerful station in the world.

The Dominion Government wireless telegraph station at Pas, Man., which will be operated chiefly in connection with a similar station to be erected at Port Nelson on Hudson Bay, is practically complete. Owing to the wreck of the vessel in Hudson Bay, which was carrying the construction material and equipment for the Port Nelson station, all of which is entirely lost, the completion of the station at the latter point will be delayed, possibly for a year.

Among the Express Companies.

The American Ex. Co. has closed its offices at Port Hope and Cobourg, Ont.

W. F. Campbell has been appointed acting agent, Dominion Ex. Co., Charlottetown, P.E.I., vice G. Waller, resigned.

The Board of Railway Commissioners has extended the collection and delivery area for express companies in Ottawa by including the Isolation Hospital.

W. C. McGonagal, heretofore agent, American Ex. Co., Cobalt, Ont., has been appointed agent at North Bay, Ont., vice H. C. M. Parritt, transferred to Toronto.

The Board of Railway Commissioners has established express delivery and collection limits for Knowlton, Que., and Kelowna, B.C.

The Canadian Northern Ex. Co. has opened offices at Algar and Vista, Man. The office, which it was announced would be opened at Gravelburg, Sask., will not be opened.

The American Ex. Co. and the National Ex. Co., which, as stated in our last issue, had for many years carried on their business in Montreal under a joint arrangement with the Canadian Ex. Co., in the latter company's offices, commenced their operations apart from the Canadian company, at new offices, 231 St. James St., Oct. 1. J. B. Davies has been appointed General Agent, American and National Ex. Cos., A. B. Howard will be in charge of the financial departments, and G. H. McGrane of the foreign freight department, as heretofore.

The Canadian Ex. Co.'s receipts and expenditures in the United States, for April, as reported to the Interstate Commerce Commission, show total receipts from operation, \$276,922; express privileges, \$121,473; total operating revenue, \$155,488; total operating expenses, \$130,814; net operating revenue, \$24,634; taxes, \$3,000; operating income, \$21,634. As compared with the same month of 1912, there is a general increase, that for the total receipts from operation being \$17,814, and for the net income \$3,466.

Book Reviews.

Any of the books reviewed may be obtained through Canadian Railway and Marine World at the published price.

SAFETY FIRST—By Geo. Bradshaw. 130 pages, 5 by 7½ ins., 99 illustrations, paper covers. McGraw-Hill Book Co., New York. 50c.

Coming at a time when the subject of safety in all walks of life is receiving so much consideration, this book is particularly valuable. For the purpose intended, it leaves little to be desired, as the information contained is set forth in such a concise and interesting manner as to make it acceptable to all classes of railway employes. A great many men will not wade through a lengthy discourse on a subject, but if the same subject is outlined for them graphically, it is rarely that an unappreciative reader is found. In this book, the 99 illustrations graphically depict unsafe conditions as they actually exist, and in some instances the remedy for the condition is also illustrated. The reading matter is confined to a short paragraph (with few exceptions), accompanying each illustration, making the perusal of the book most interesting. About two thirds of the book is devoted to general railway conditions, the balance covering special shop conditions. While the book primarily covers railway

conditions, there will be found in it many valuable suggestions that may be applied to other lines of industry.

BLUE BOOK OF AMERICAN SHIPPING—367 pages, 10 by 7¼ ins. Price \$5. Penton Publishing Co., Cleveland, Ohio.

The 1913-14 edition, which is revised to date, lists all the U.S. vessels on the Atlantic and Pacific coasts and the Great Lakes and western rivers, ship owners, ship, engine and boiler builders, manufacturers of gas and gasoline engines, naval architects, marine engineers, admiralty lawyers, ship chandlers, wrecking companies, etc. The Canadian section contains a list of vessels on the Great Lakes, names of shipping officials, and leading particulars of the Dominion Government graving docks, and of the canal system. In addition, there is a quantity of general information and statistics relative to seaboard and inland marine, and particulars of the various associations associated with the marine interests. While a considerable amount of the matter quoted relates to naval and seaboard matters, special attention seems to have been given to shipping and general traffic on the inland waters, which is of more immediate concern to those for whom the book is intended.

A Safety Exhibit Car for use in connection with the work of the safety department of the New York Central Lines has recently been put in service. It will serve as an instruction car, in teaching the principles of safety first to the employes. Along each side of the car are models of the machines used in the different shops to safeguard the workmen against injury. By means of photographs arranged on the walls, the safe and the unsafe methods of doing various kinds of work are depicted. Other framed pictures show how it comes about that, annually, over 10,000 trespassers are killed and injured on railways in the U. S.

The Department of Trade and Commerce is asking for tenders to Nov. 5 for the construction of a grain elevator with a capacity of 1,500,000 bush. at Port Nelson, Hudson Bay.

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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 distinctly to 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.

Canadian Westinghouse Co., Ltd., has issued circular 1205 on carbon circuit breakers.

Canadian Allis-Chalmers, Ltd., is distributing a bulletin on wizard rock drills, issued by McKiernan-Terry Drill Co., New York, for which it is selling agent.

The Cooper Heater Co., Carlisle, Pa., which was burned out last winter, has moved into its new factory, and is again in a position to fill orders without delay.

The Steel Co. of Canada, Ltd., has issued in booklet form an illustrated description of its electrically operated blooming, billet, rod and bar mills at Hamilton, Ont.

Canadian General Electric Co. is distributing catalogue 154 of Cochrane separators, live steam, exhaust steam, compressed air, ammonia cases, etc., issued by Harrison Safety Boiler Works, Philadelphia, Pa.

Thomas A. Edison, Inc., announces the election of E. E. Hudson as Fourth Vice President. He will continue as heretofore in charge of the sales of the primary battery department, with headquarters at Orange, N.J.

The Hiram L. Piper Co., Montreal, has issued catalogue 31; 82 pgs., 6 by 9 ins., fully describing and illustrating their two direction train order signal, locomotive headlights, standard rule train lamps, switch, semaphore, marine and street lamps, gasoline and coal oil torches, etc.

The Ottawa and Hull Power and Manufacturing Co. has decided to increase its power plant by the addition of two water wheel type alternators, each 6750 k.v.a., 120 r.p.m., 2300 volts, and also two transformers, each 6750 k.v.a., 2300/12000 volts, and has given a contract for the same to Canadian General Electric Co.

The Independent Pneumatic Tool Co., Chicago has added two Thor electric drills to its line, which will be sent to any responsible party for 10 days test to ascertain their merits and adaptability. Their principal feature is that they are equipped with a universal motor so that the machine may be attached to the ordinary incandescent lamp socket of 110 or 220 volts, direct or alternating current, 60 cycles or less and single phase.

The U. S. Light and Heating Co. announces the removal of its New England sales office, formerly located at 84 State St., to 25 Irvington St., Boston, Mass. This change brings its New England service station and sales office under one roof, an arrangement which it was deemed advisable to make because of increase in business and because of the greater opportunity afforded for close co-operation between the two departments.

The Canadian General Electric Co. has issued bulletins on fractional horse power motors and applications, drawn shell type; on the illumination of construction work, and on efficient locomotive roundhouse lighting. It is distributing a bulletin on new types of condulets for railway requirements, issued by Crouse-Hinds Co. of Canada, for which it is selling agent.

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given a contract by the Canadian Northern Ry. for seven electric locomotives and eight multiple unit control motor cars for the Mount Royal tunnel and Montreal terminals, also the plant and machinery for the complete electrification of the tunnel and terminals, the total amount of the contract being stated as about \$500,000. As previously stated in Canadian Railway and Marine World, Canadian General Electric Co. also has the contract for the electrification of the Rossland Branch, C.P.R.

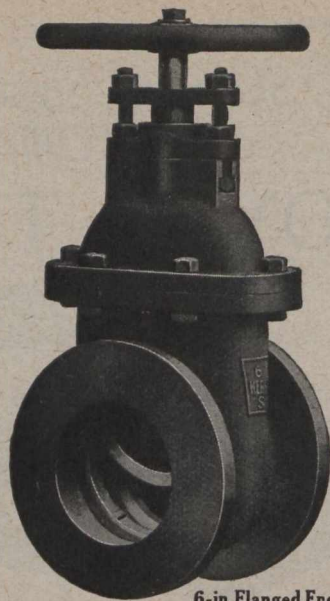
Coleman Fare Box Co., Ltd., has been incorporated under the Ontario Companies Act, with a capital of \$75,000, to manufacture fare boxes for electric railways, etc. It has bought the business carried on for many years at Tottenham, Ont., by the late J. H. Coleman, who was the pioneer in the field, and also the business of the Coleman Fare Box Co., incorporated under New York State laws. The Canadian works will remain at Tottenham, but the head office and sales department will be at 70 Bond street, Toronto. The directors are Acton Burrows, W. H. Knowlton, Noel Marshall, R. B. Nordheimer and A. A. Burrows, of Toronto, the last named being the Manager.

Transportation Conventions in 1913 and 1914

- Nov. 19.—American Railway Association, Chicago, Ill.
- Dec. 9, 10.—Association of Transportation and Car Accounting Officers, Galveston, Texas.
- Jan. 20-22.—American Wood Preservers' Association, New Orleans, La.
- Apr. 21.—American Association of Freight Agents, Houston, Texas.
- May.—Association of Railway Claims Agents, St. Paul, Minn.
- May 17-20.—American Railway Engineering Association, Chicago, Ill.
- May 18-22.—International Railway Fuel Association, Chicago, Ill.
- May 19.—American Association of Demurrage Officers, St. Louis, Mo.
- May 20-22.—Freight Claim Association, Galveston, Texas.
- May 20-23.—Association of Railway Telegraph Superintendents, New Orleans, La.
- May 28.—Association of American Railway Accounting Officers, Atlantic City, N.J.
- Sept. 8-11.—Roadmasters and Maintenance of Way Association, Chicago, Ill.

Transportation Associations, Clubs, Etc.

- The names of persons given below are those of the secretaries.
- Canadian Car Service Bureau, J. Reilly (acting), 401 St. Nicholas Building, Montreal.
 - Canadian Electric Railway Association, Acton Burrows, 70 Bond Street, Toronto.
 - Canadian Freight Association (Eastern Lines), G. C. Ransom, Canadian Express Building, 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, 176 Mansfield St. West, Montreal.
 - 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.
 - Dominion Marine Association, Counsel, F. King, Kingston, Ont.
 - 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.
 - Great Lakes and St. Lawrence River Rate Committee, Jas. Morrison, Montreal.
 - International Water Lines Passenger Association, M. R. Nelson, New York.
 - Niagara Frontier Summer Rate Committee, Jas. Morrison, Montreal.
 - Nova Scotia Society of Engineers, A. R. McCleave, Halifax, N.S.
 - Quebec Transportation Club, J. S. Blanchet, Quebec.
 - Ship Masters' Association of Canada, Capt. E. Wells, 239 Hollis St., Halifax, N.S.
 - Ship Masters' Association of Canada, H. O. Jackson, 376 Huron St., Toronto.
 - Shipping Federation of Canada, T. Robb, 526 Board of Trade, Montreal.
 - Western Canada Railway Club, W. H. Rosevear, 23 1/2 Princess St., Winnipeg. Meetings at Winnipeg 2nd Monday each month, except June, July and August.



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New York . . . Nov. 7	Philadelphia . Nov. 28

Atlantic Transport
New York—London Direct

Minneapolis . Nov. 1	Minnewaska . Nov. 22
Minnehaha . . Nov. 8	Minnetonka . Nov. 29

Red Star
London, Paris, via Dover—Antwerp

Zeeland Nov. 5	Vaderland . . Nov. 19
Lapland Nov. 12	Kroonland . . Nov. 26

White Star
New York—Queenstown—Liverpool

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Celtic Nov. 13	Baltic Dec. 4

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Majestic Nov. 1	OLYMPIC Nov. 15
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