

Canadian Railway and Marine World

April, 1914.

Double Tracking of the Canadian Pacific Railway's St. Lawrence River Bridge.

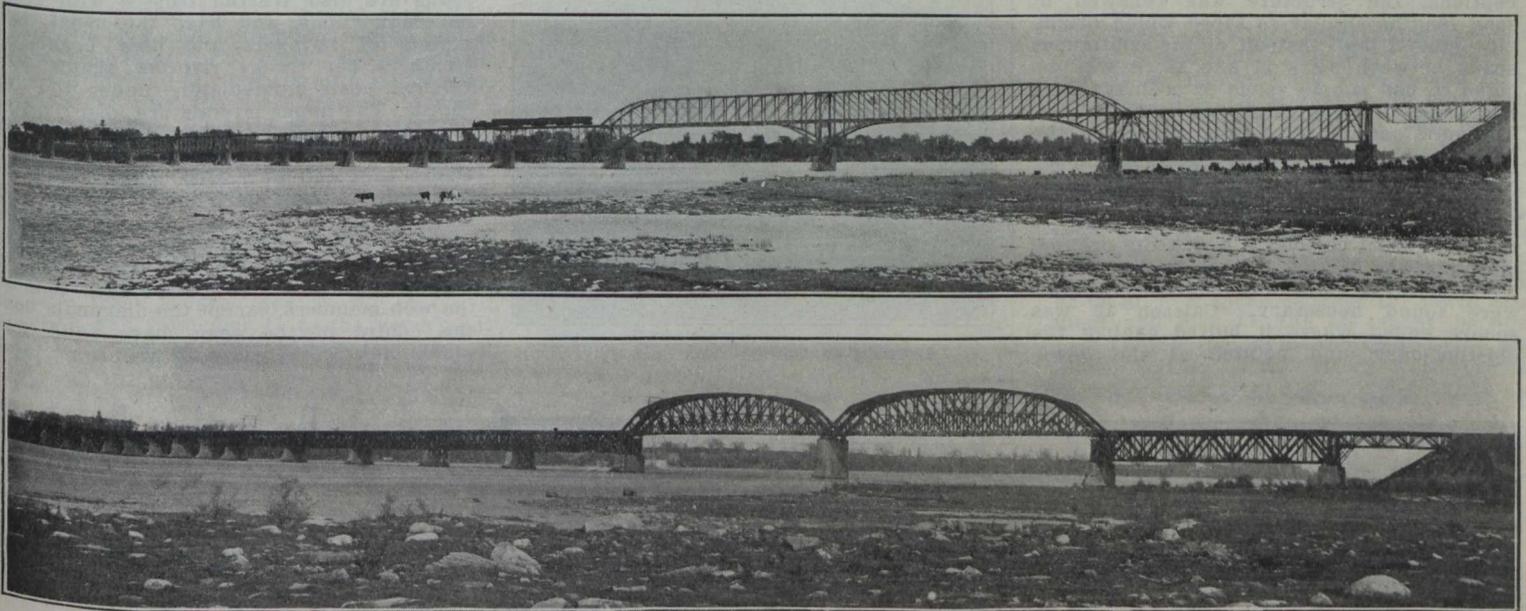
By P. B. Motley, M. Can. Soc. C.E., Engineer of Bridges, C.P.R.

The C. P. R. crosses the St. Lawrence River about seven miles above Montreal, near the Indian village of Caughnawaga. This crossing is on the best of several trial lines which were located and estimated on, in the years 1883-1885. Amongst the more important were the Nuns' Island line and the Heron Island line, besides the Caughnawaga line which was eventually chosen. These trial lines are located between the G. T. R. Victoria Bridge and Lachine, the object in all cases being to obtain an outlet from Montreal towards the east and south with the least possible expenditure when the crossing of the river, as well as mileage, were taken into account. The Victoria Bridge is approximately 2 miles long, and

flow in the river.

The decision as to the crossing having been made, the substructure of the bridge was begun, with the late P. A. Peterson, M. Can. Soc. C. E., as Chief Engineer, in the spring of 1885, and the erection of the steelwork was carried out during the winter of 1886-7. The contractors for the substructure were R. G. Reid & Co. (the late Sir Robert Reid), and the engineer in charge for the company was the late G. H. Massy, M. Can. Soc. C. E. The steel work was designed by the late C. Shaler Smith and the Dominion Bridge Co. was given the contract for its manufacture and erection. The steel was especially designed with a view to quick and simple erection, as it was im-

but, considering that the pier supports were founded on rock and, in addition, had adjusting screws, so that the ideal conditions upon which the calculations had been made, could be at all times maintained (if necessary), the design was considered justifiable. The engines, for which the old structure was designed, were equal approximately to Coopers E35 loading, followed by a trainload of 2,500 lbs. per lineal foot, and the material in the structure was steel, except stringers, counters and windbracing where it was iron. The design lent itself admirably to rapid erection, which was borne out by the fact that the steel took only twelve months to erect ready for traffic. By 1910, the requirements of traffic had necessitat-



Lachine Bridge, C.P.R. Old and New Bridges from Caughnawaga Side, Looking Down Stream.

the engineers sought, if possible, to obtain a considerably less expensive crossing.

The Nuns' Island line gave a long crossing of the river in comparatively deep water. The Heron Island line gave a shorter bridge, located for the most part in shallow but very swift water composing the Lachine Rapids. In both these crossings the question of navigation had to be considered and difficulties connected with it weighed considerably in the discussions. The Caughnawaga crossing was finally adopted as being the most economical and as suiting best the requirements of navigation. The bridge is approximately five-eighths of a mile long, and navigation was taken care of by using two through spans of 408 ft. each over the deepest portion of the river to allow for highwater, and a headway of 60 ft. above highwater. This avoided the use of a swing or other movable span which, in this part of the swift flowing St. Lawrence River, would constitute a serious menace to navigation. The span lengths in the balance of the bridge were generally 270 ft. and 240 ft., and were dictated by the judgment of the engineers with respect to ice

possible to place falsework in the deeper portions of the river where the 408 ft. spans are located. For these reasons the designers decided upon a peculiar type of construction. This consisted of a set of 4 spans (2 deck and 2 through) continuous over five supports, which enabled the steel work of the side or flanking spans to be erected first on falsework, and the main channel spans to be erected by the cantilever method, the flanking spans being used as anchors,—some steelwork was also cantilevered both ways from pier 13 located in the centre of the channel. When these several spans were connected, they formed, as aforesaid, a continuous span over five supports, fixed at the centre on pier 13 and expanding both ways therefrom. The channel spans, as noted above, were made of through design to allow steamers to pass under at full speed, and Mr. Shaler Smith solved the problem of combining deck and through spans by a very beautiful and interesting method, that of curving the ends of the spans, as shown in the photographs and plans. This procedure is open to criticism from a mathematical point of view,

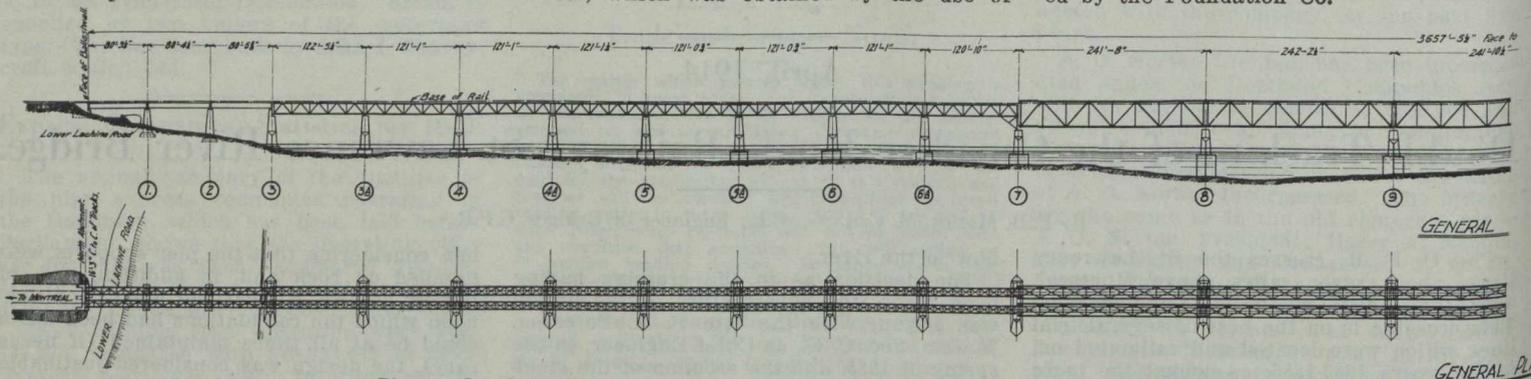
ed the use of much heavier locomotives than were considered in the original design and, in addition, the increasing volume of traffic made it advisable to double track the line from Montreal eastward. Bids were, accordingly, called for on designs prepared by the C. P. R. engineers, and a contract was subsequently entered into with the Dominion Bridge Co. for the removal of the old spans and the erection of the new. A contract was also made with The Foundation Co. for the extension of the substructure to accommodate the extra steelwork. In the old structure there was no traffic to be taken care of, but in the new it was not allowable to interfere with the regularity of passing trains. This considerably complicated the problem, and, under the circumstances, it was decided that the only possible way of ensuring all the requirements was to build two independent single track bridges, and remove the old bridge in sections, transferring traffic from side to side, as will be described later.

SUBSTRUCTURE.—From observations during the life of the old bridge, it was noted that the ice of Lake St. Louis generally

grounded on the Lachine side of the river in shallow water, and, after breaking up, floated under the Lachine end of the bridge in small pieces in a manner which did not

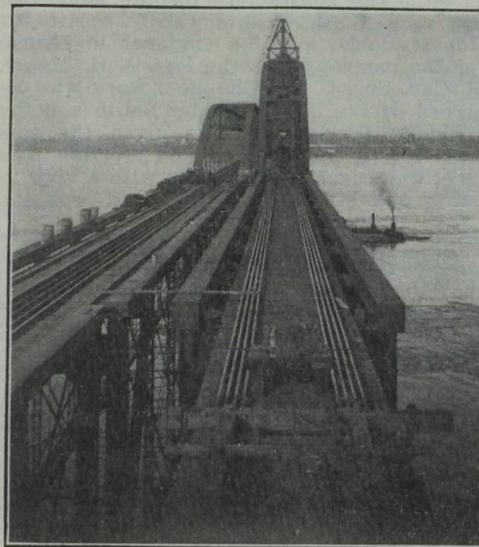
of course, would result in serious cracks in the bonding above the water line. The work at piers 8 to 14 was carried out in still water, which was obtained by the use of

which it was built up by the C. P. R.'s forces. The pneumatic plant used on piers 9 to 13 was of the type designed and operated by the Foundation Co.



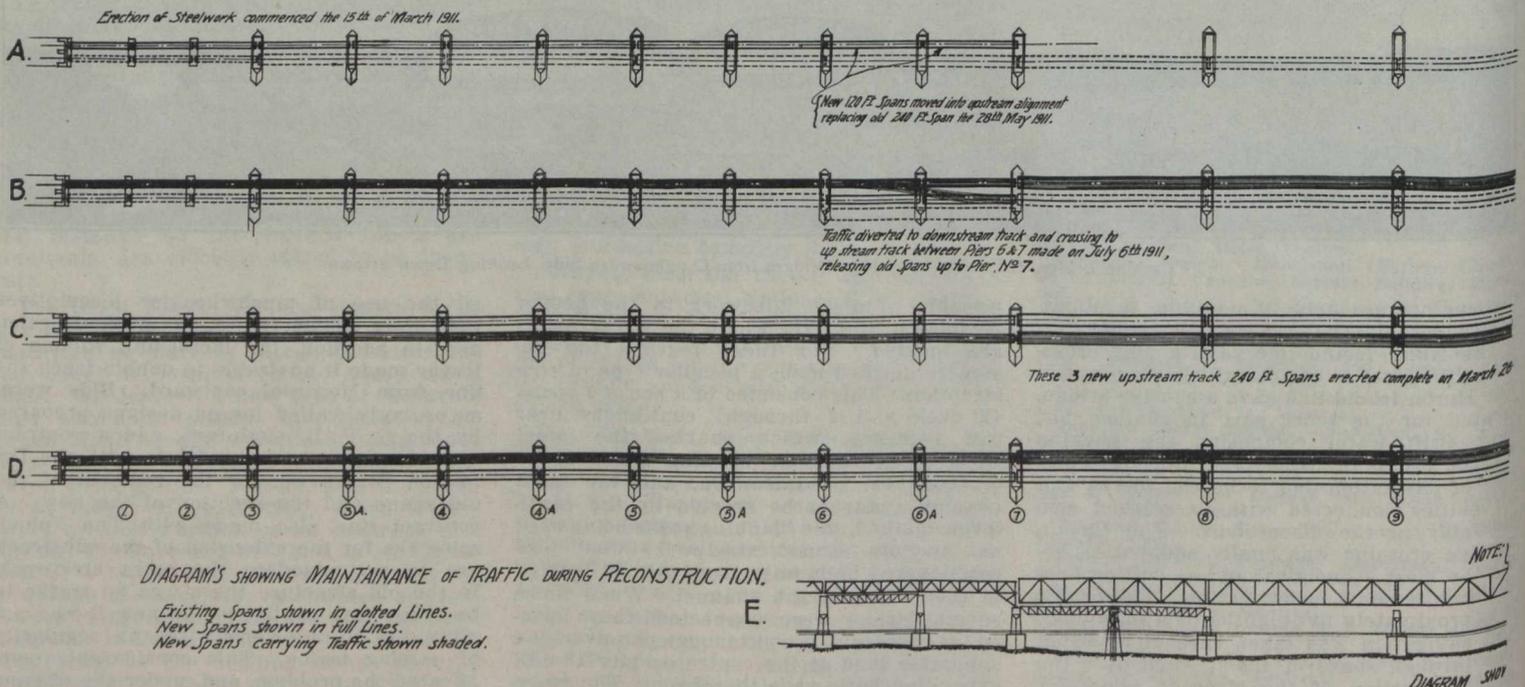
Plan 1.—Lachine Bridge, C.P.R. General Elevation and Plan. (See opposite page.)

seem to justify the existence of four 240 ft. spans between piers 3 and 7. It was, therefore, decided to bisect these spans by the building of new intermediate piers 3a, 4a, 5a and 6a), and using eight 120 foot spans instead of four 240 ft. This resulted in considerable economy in cost. Between piers 7 and 11, it was not considered advisable to make a change. With these exceptions, the structure was renewed in span lengths similar to those which originally existed, but, instead of the continuous spans between piers 11 and 15, it was decided to use simple spans of ordinary deck and through types, as shown on the plates. The new second track was placed on the downstream side of the existing bridge. The added masonry was bonded into the old above water line, while below the water line open caissons were sunk generally to the same hard bottom to which the original masonry was carried, except in the case of piers 9 to 13, where pneumatic caissons were found necessary. Caisson 13 was square ended where it butted against the old masonry, and pointed at the down-



Skidways on Down Stream Span 13-14.

SUPERSTRUCTURE.—The 80 ft. deck plate girders at the Lachine end of the bridge are the C. P. R. standard design, and are single track spans placed alongside each other. The 120 ft. spans are deck Warren truss spans with rivetted connections, their ties resting upon the top chords. These spans are also simple single track spans laid abreast of each other. The 240 ft. spans are also Warren trusses with rivetted connections, and have the usual floor system of stringers and floor beams (2 stringers per track) rivetted against the vertical posts immediately under the top chord. The upper laterals are also rivetted immediately below the top chord, and connected with the top flanges of the stringers, where they intersect with same. The 270 ft. flanking spans are Warren trusses, and, while longer in the panel lengths than the 240 ft. spans, are the same in general description. Typical details are shown on plan 4, from which it will be seen that all the web members, except the diagonals near the centre of the span, have solid web plates down the centre of the same, and,



Plan 2.—Lachine Bridge, C.P.R. Diagrams Showing Maintenance of Traffic During Reconstruction, and Method of Erection. (See opposite page.)

stream end. It was carried about 7 ft. lower than the bottom of the old pier, because it was found that the shale immediately under the same was of such a description as to make it advisable to go deeper in order to make sure that there would be absolutely no settlement, which,

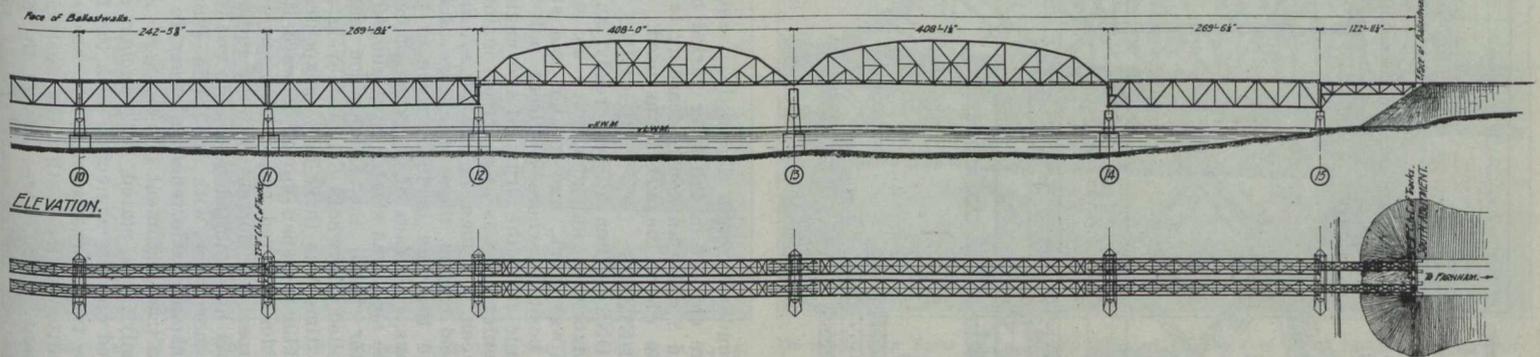
wing dams composed of rock-filled cribs sunk immediately upstream at an angle of about 45 degrees so as to deflect the current. Masonry was started in June 1910 and was finished in Nov. 1911, except the upstream end of pier 13, which was left till the removal of the old steelwork, after

where necessary, double lattice on the flanges. For the deck spans the Warren type of truss was found to be more economical than any other. The general dimensions and typical details of the 408 foot spans are shown on plan 3. These spans are of the subpanelled Pratt truss

type, and the top chords are curved, as far as possible, to an approximate parabola. In the web members, solid web plates have been largely used instead of lattice bars.

work. There were on an average 10 trains between 8 a.m. and 12 noon, and sometimes an average of eight in the afternoon during the usual working hours. In order to carry

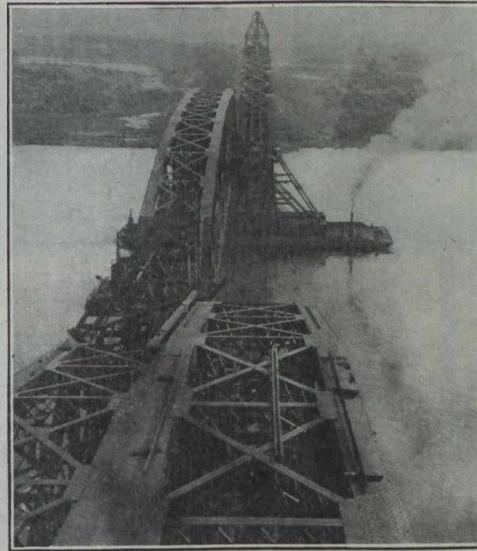
bodily into the location of the old 240 ft. span, and the latter moved upstream upon timber towers prepared for it. The downstream new spans between piers 6 and 7



Plan 1.—Lachine Bridge, C.P.R. General Elevation and Plan. (See opposite page.)

In addition to this, the vertical posts are all of I sections, composed in most cases of bulb angles and web plates, and, where necessary, there are stiffeners on the webs especially of the longer vertical posts. The top and bottom chords are of very stiff cross section, partly to allow them to be cantilevered out during erection. The 408 ft. spans were also calculated for the stresses caused by the special method of cantilevering and launching, which will be described later. The portal and other subsidiary bracing is generally of a stiff design, consistent with the main trusses, to which it is attached. The 270 ft. spans were also calculated for the concentrated weight of one end of the 408 ft. spans, which was to be carried upon them during the process of launching.

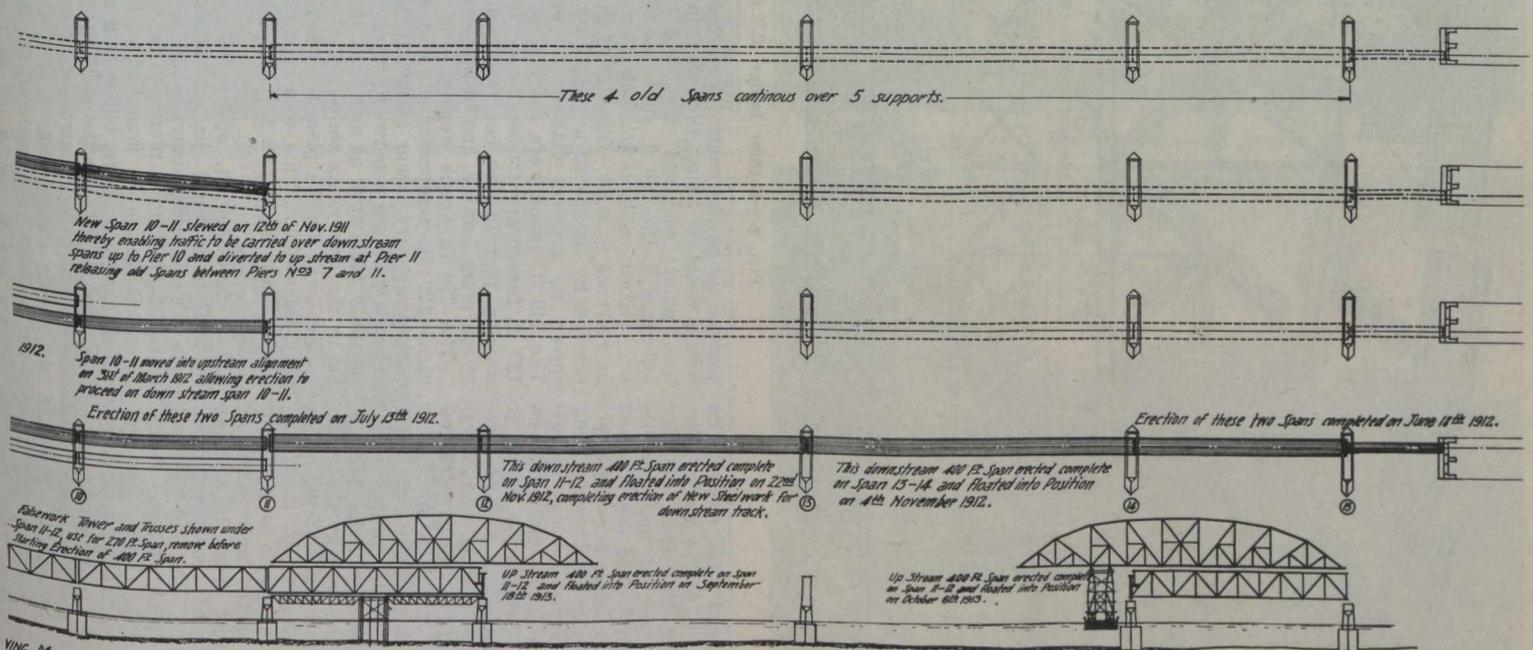
The alignment on the bridge is ruled by the overall width of the 408 ft. spans. At pier 11, and the south abutment, the two single track bridges are 27 ft., centre to centre, and from pier 11 to the north abutment the spans grow closer together till they are 16 ft. 4 ins. at the north abutment. This slight kink in the alignment is quite im-



Bird's Eye View from Top of Up Stream Span 12-13, Looking South.

were then erected. Traffic was now diverted over the four new spans between piers 6 and 7 by means of a cross-over laid on suitable wooden ties spanning from span to span, so that all old spans between pier 7 and the north abutment were thus released. These were taken down, and new spans erected. Next, the new spans on the downstream side between piers 7 and 11 were erected.

In order to release some more upstream spans, it was simply necessary to slew over the 240 ft. span between piers 10 and 11, as shown on diagram B, plan 2, all new spans between the north abutment and pier 11 now being under traffic and all old spans between these points being released. After the new spans on the upstream side between the north abutment and pier 10 had been erected, it was simply necessary to pull span 10-11 into alignment, as shown on diagram C, plan 2, and thereby put the traffic on all new spans between the north abutment and pier 11, the old spans between pier 11 and the south abutment being still under traffic. Then spans were erected between piers 10 and 11, 11 and 12, 14 and



Plan 2.—Lachine Bridge, C.P.R. Diagrams Showing Maintenance of Traffic During Reconstruction, and Method of Erection. (See opposite page.)

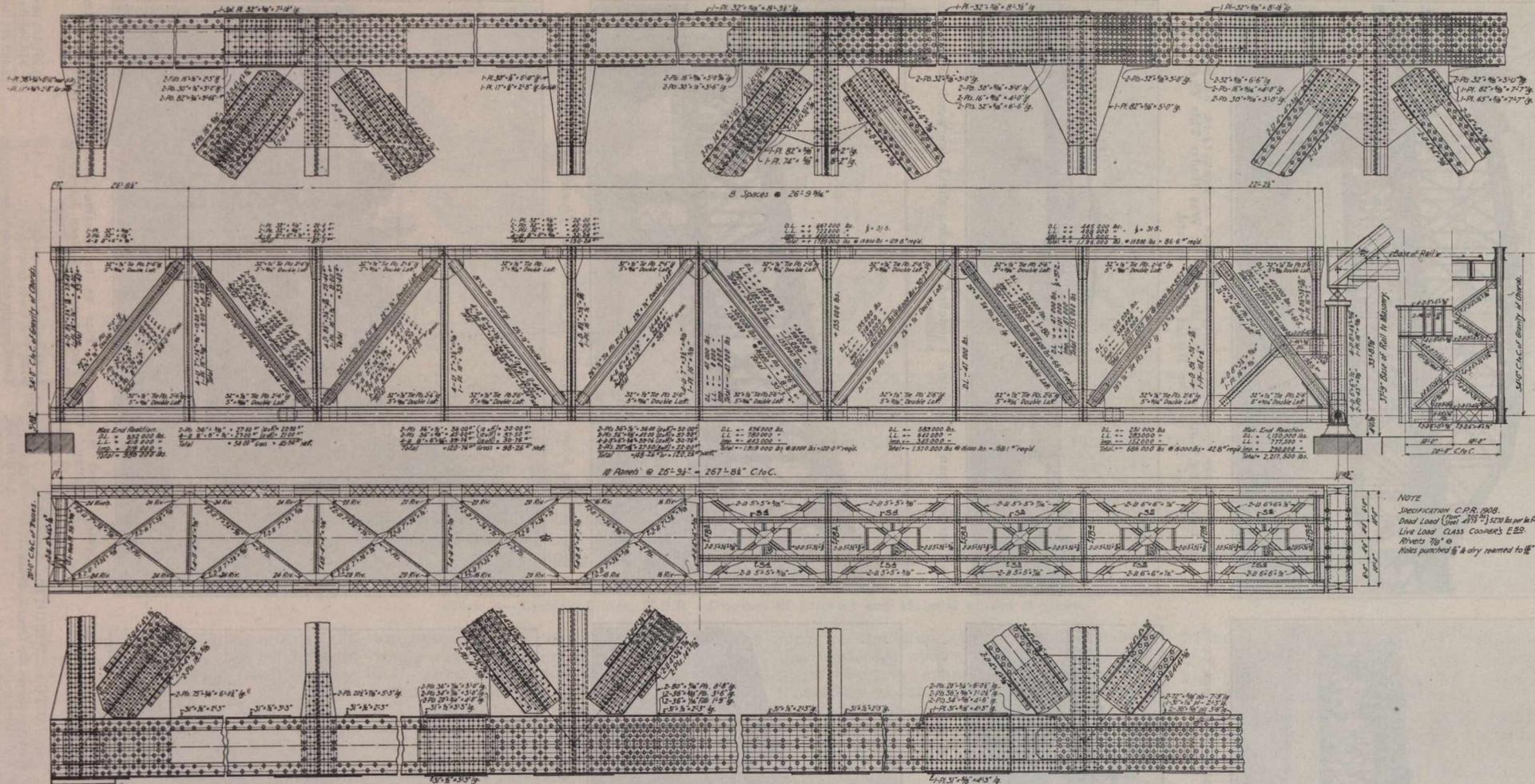
material from an operating point of view, and allowed a valuable saving in masonry from pier 11 northwards.

ERECTOR.—One of the most important problems in the work was the maintenance of traffic during the erection of the steel-

work without interference with traffic, it was decided to erect first, all spans on the downstream side from the north abutment to pier 7 (See diagram A, plan 2.) When this was done the two new 120 ft. spans between piers 6 and 7 were moved

15, and 15 and south abutment. After these were finished, the 408 ft. downstream spans were erected on top of the 270 ft. spans, as shown in the photographs and in diagram E, at the lower portion of plan 2.

The modus operandi in connection with



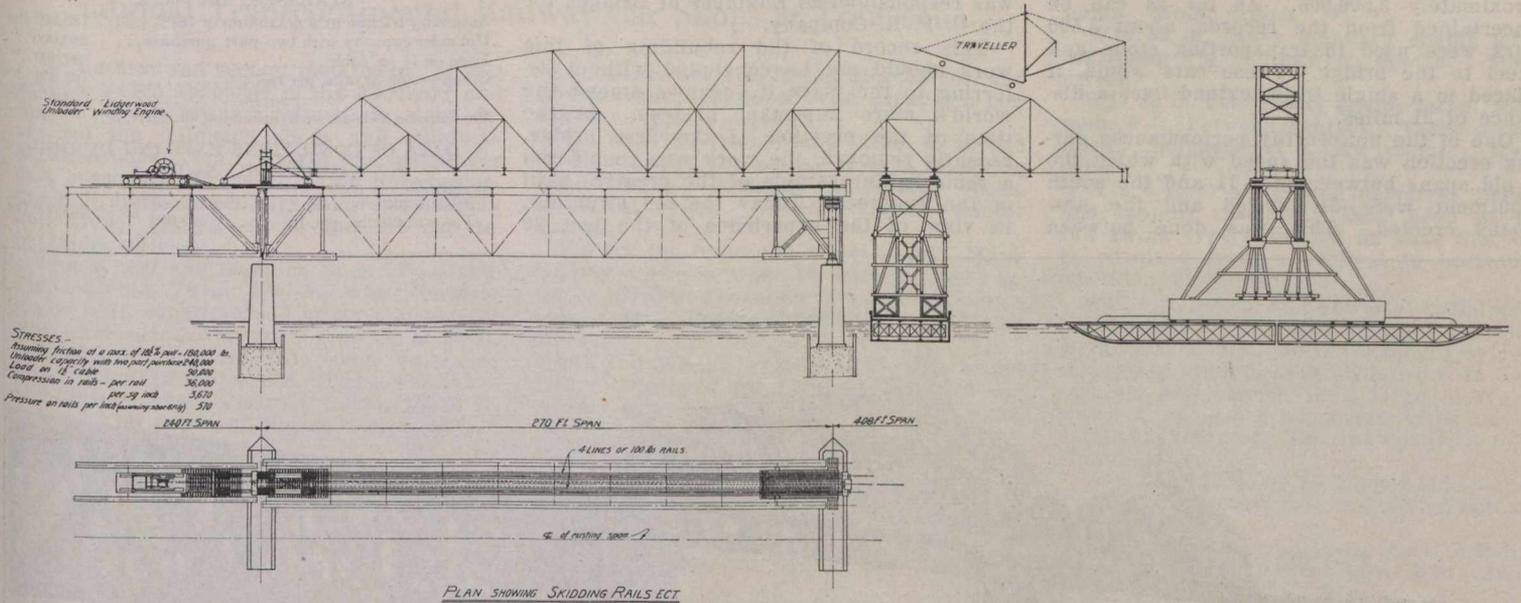
Plan 4.—Lachine Bridge, C.P.R. Stresses, Material and Typical Details, 270 ft. Deck Truss Span.

while launching was 1,300 tons. During each of the operations, all the regular trains were allowed to pass on the adjoining spans, which necessitated stopping the floating operations, because the work of signalling and superintendence was interfered with. The difference between the net time and the gross, was occupied in overhauling cables, taking up slack, and in dismantling some of the steelwork connected with the special truck or buggy when it reached the last panel of the 270 ft. span. At this point, it was necessary to remove certain steelwork which became no longer necessary on account of the load being shifted, from a 3 point to a 1 point bearing. A diagram of this buggy is shown on plan 5. The perfection of the control under which the span was at all times, is exemplified by an incident which occurred during one of the floating operations. The span had reached a point 3 ins. short of its correct

location, and after the necessary signalling over the intervening distance of nearly 800 ft. the Lidgerwood engine driver made exactly the 3 ins. movement called for, no more and no less. This is remarkable considering the tonnage being handled. As has already been stated, the 408 ft. spans were skidded upon the deck of the adjacent 270 ft. deck spans, and after each pair of the large spans (on one track) were floated into correct location they were at an elevation approximately 12 ft. higher than their permanent levels. This required that they be jacked down to their correct bridge seat levels, which was done by means of 150 ton jacks and blocking, the end floor beams having been designed for this purpose as were also the end cross beams of the 270 ft. spans. The 240 ft. spans were also provided with special end bracing to enable them to be jacked up on the piers, if necessary, during erection. The

time occupied in erecting the steel was as follows:—
 March, 1911.—Erection started at north end.
 May 28, 1911.—New 120 ft. spans moved into upstream alignment replacing old 240 ft. span between piers 6 and 7.
 July 6, 1911.—Traffic diverted to downstream track between piers 6 and 7.
 Nov. 12, 1911.—New downstream span between piers 10 and 11 slewed over, thereby releasing old spans between piers 7 and 11.
 Mar. 31, 1912.—Span 10-11 moved into upstream alignment allowing erection to proceed on downstream spans 10-11.
 June 18, 1912.—Span 14-15, and 15-south abutment erected.
 July 13, 1912.—Downstream spans 10-11 and 11-12 erected.
 Nov. 4, 1912.—Downstream 408 ft. span 13-14 floated.

Nov. 22, 1912.—Downstream 408 ft. span 12-13 floated.
 April, 1913.—Started taking down old spans between pier 11 and south abutment.
 June 10, 1913.—All old steel dismantled.
 Sept. 18, 1913.—Upstream 408 ft. span 12-13 floated.
 Oct. 6, 1913.—Upstream 408 ft. span 13-14 floated.
 Nov. 4, 1913.—All new steel erected and double track put into service.
 The total weight of metal work in the old bridge was about 4,100 tons, in the new it was 14,231 tons. The total quantity of masonry and concrete in the original piers and abutments was approximately 12,400 cubic yards. In the additions to old piers and in new piers there were 13,300 cubic yards. The total length of the bridge and height above watermarks were not changed, and are indicated on the plates. The number of rivets in the new bridge is ap-

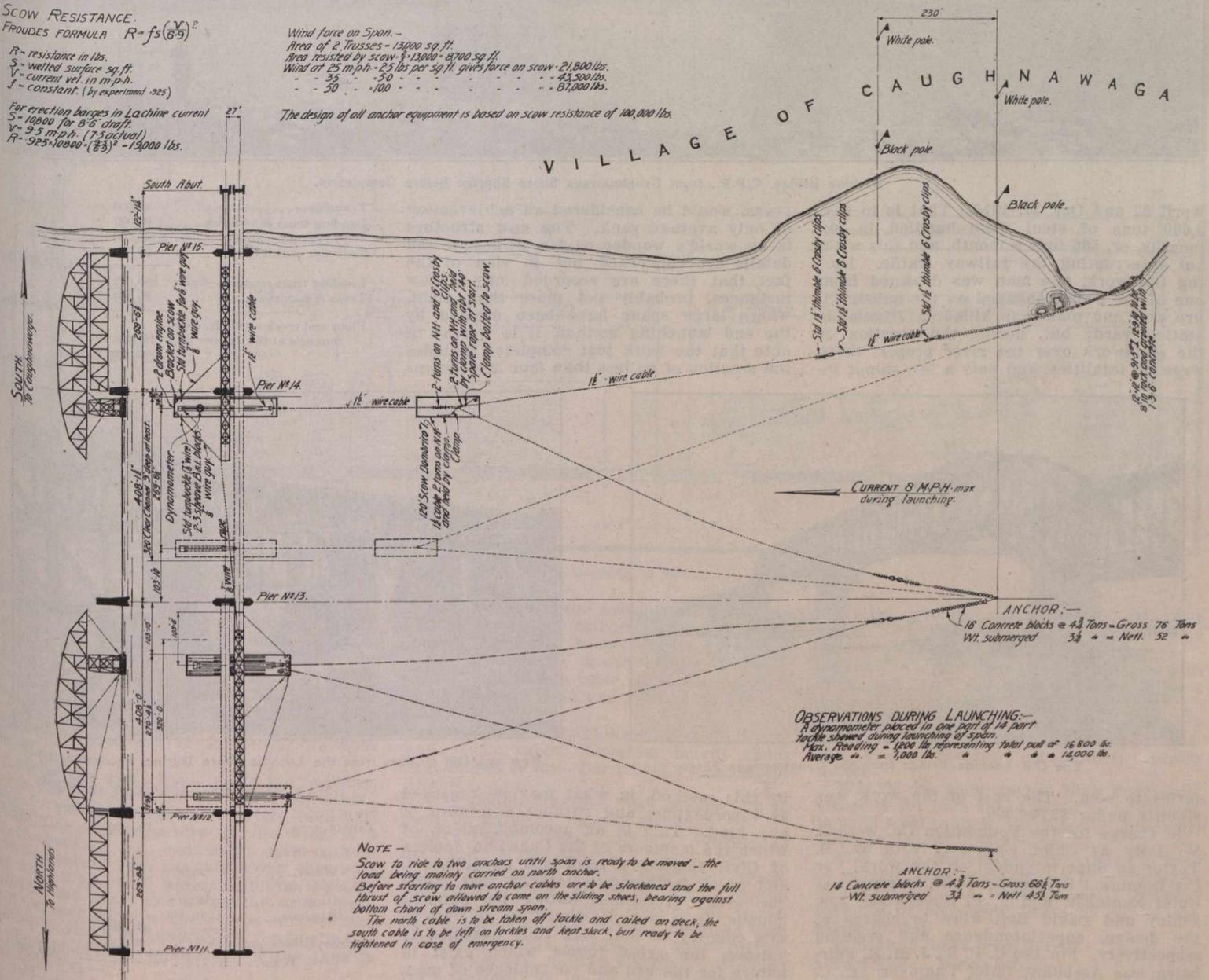


Plan 5.—Lachine Bridge, C.P.R. Scheme for Launching 400 ft. Span.

SCOW RESISTANCE.
 FROUDE'S FORMULA $R = f_3 \left(\frac{V}{69}\right)^2$
 R - resistance in lbs.
 S - wetted surface sq. ft.
 V - current vel. in m.p.h.
 f - constant. (by experiment .325)
 For erection barges in Lachine current
 S - 10,000 for 8'-6" draft.
 V - 9.5 m.p.h. (7.5 actual)
 R - $925 \times 10,000 \times (.325)^2 = 10,000$ lbs.

Wind force on Span -
 Area of 2 Trusses - 13,000 sq. ft.
 Area resisted by scow - 13,000 - 6,700 sq. ft.
 Wind at 25 m.p.h. - 25 lbs. per sq. ft. gives force on scow - 21,800 lbs.
 - 35 - 50 - - - - - 43,500 lbs.
 - 50 - 100 - - - - - 87,000 lbs.

The design of all anchor equipment is based on scow resistance of 100,000 lbs.



Plan 6.—Lachine Bridge, C.P.R. Location of Anchors, Scows, Etc.

proximately 3,500,000. As far as can be ascertained from the records, about 3,500 cars were used in transporting stone and steel to the bridge. These cars would, if placed in a single train, extend over a distance of 21 miles.

One of the noteworthy performances during erection was the speed with which the 5 old spans between pier 11 and the south abutment were dismantled and the new spans erected. This was done between

was responsible, as Engineer of Bridges for the C. P. R. Company.

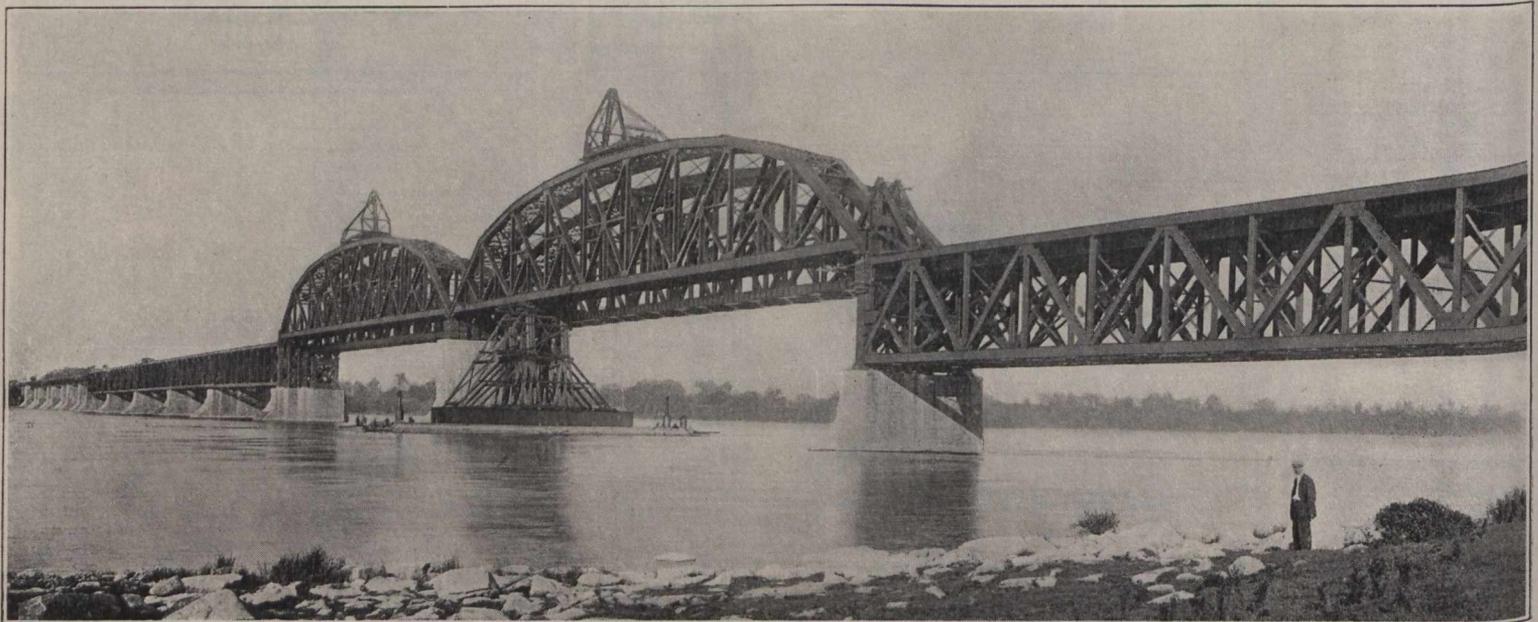
This record of the rebuilding of this work should not be concluded without referring to the place it occupies among the world's more important bridges. At the time of the erection of the first bridge, recently removed, the work was considered a remarkable example of the creative skill of the engineer. Today the old structure, in view of the experience of the last 20

STRESSES. See Plan 5.

Assuming friction at a maximum of 18 1/2% pull	180,000 lbs	
Unloader capacity with two part purchase	240,000 "	
Load on 1 1/2 in. cable	90,000 "	
Compression in rails, per rail	36,000 "	
" " " " per sq. in.	3,670 "	
Pressure on rails per inch (assuming shoe 6 ft. lg.)	570 "	

DATA OF CONDITIONS EXISTING DURING LAUNCHING. See Plan 5.

Weights—		
Steel in 1-400 ft. span	2,550,000 lbs.	} 2,650,000 lbs
Floor at 250 lbs. per ft.	100,000 "	

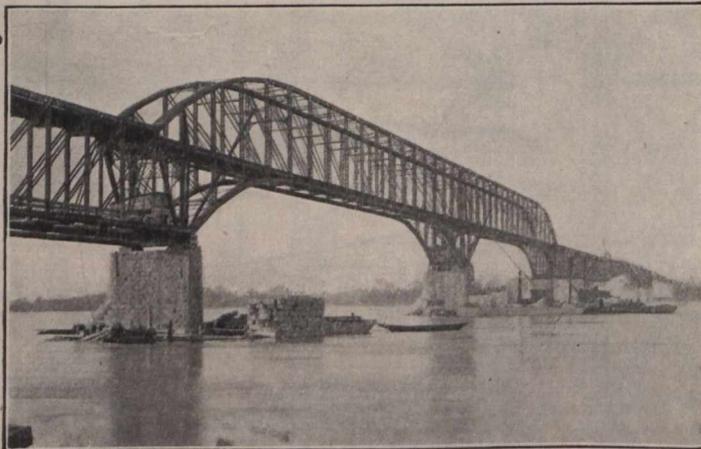


Lachine Bridge, C.P.R., from Caughnawaga Shore Shortly Before Completion.

April 22 and Oct. 31, 1913. That is to say, 4,000 tons of steel were handled in six months, or, 666 tons a month, and this without interrupting the railway traffic. During the work, one man was drowned from one of the scows engaged on the substructure and one man was killed in Highlands station yard; but, during the erection of the steelwork over the river proper, there were no fatalities, and only a few minor in-

juries to men. The cost of the work was slightly under \$2,000,000. In charge for the Foundation Co. were J. W. Doty as Chief Engineer, with W. B. Taylor as Superintendent on the work. For the Dominion Bridge Co. G. H. Duggan was Chief Engineer, and F. P. Shearwood, Jas. Finley and David Bell were in charge of the design, superintendence and erection respectively. For the C. P. R., J. M. R. Fairbairn was Assistant Chief Engineer. C. C. Schneider was connected with the work as Consulting Engineer, and for the design and approval of all detail plans the writer

Traveller	80,000 "	
Loading truss & sundries	99,000 "	
Scow reaction—Span	1,765,000 "	
Traveller cantilevered	90,000 "	
		1,855,000 lbs.
Loading truss reaction—Span	885,000 "	
Truss & sundries	99,000 "	
		984,000 lbs.
Floor and track on 270 ft. span		
9 panels at 660 lbs. per ft.	165,000 "	
1 " " 800 " " " "	20,000 "	
		185,000 lbs.



The Old Lachine Bridge from the Caughnawaga Shore.



New and Old Bridges from the Lachine Shore During Reconstruction.

by this method, in what may be regarded as record time, and without a mishap of any kind. This is an accomplishment, of which the members of the Canadian Society of Civil Engineers need not be ashamed, and which further goes to show that, while our great profession knows no national bounds, it is not necessary to go outside this country to find men fully qualified to harness the great forces which exist in nature for the use and convenience of man.

The foregoing paper was read before the Canadian Society of Civil Engineers recently.

by this method, in what may be regarded as record time, and without a mishap of any kind. This is an accomplishment, of which the members of the Canadian Society of Civil Engineers need not be ashamed, and which further goes to show that, while our great profession knows no national bounds, it is not necessary to go outside this country to find men fully qualified to harness the great forces which exist in nature for the use and convenience of man.

MAXIMUM DISPLACEMENT OF SCOW.

Span	1,855,000 lbs.
Tare of scow	700,000 "
FALSE WORK.	
Wood	140,000
Steel pls	10,000
Girders	240,000
Sundries	10,000
	400,000 "
Engines, boilers, pumps, etc.	30,000 "
Total	2,985,000 lbs.
Draught of Scow = $\frac{2,985,000}{180 \times 37 \times 62.5} = 7 \text{ ft. } 2 \text{ in. } = 84 \text{ ft.}$	
Displacement per inch immersion	35,200 lbs.

National Transcontinental Railway Car Shops at Transcona.

In the first and second instalments of this article, which appeared in the February and March issues, respectively, there were described the following shops and buildings at Transcona, Man.: freight car, passenger car, passenger car paint, paint stores, planing mill, lumber shed, dry kiln, upholstering and nickel plating shops, and the car department offices.

The Wheel and Machine Shop is a standard building, 70 by 160 ft., with concrete lower wall, superimposed by an upper brick wall, and spanned by steel trusses, at 20 ft. centres, which divide the shop crosswise into sections of that width. The lower chord of the steel spans clears the floor by 24 ft. 8 ins. The depth of the roof span at the centre is 7 ft., dropping to 5 ft. at the wall. A 23 ft. wide skylight extends down the centre of the shop, surmounted by a 24 in. copper ventilator over each section, in the peak of the skylight. There are four doors to the building, all 12¾ ft. wide, one in each

of speed, power hub facing attachment, and power crane. Equipped with expansion boring bar. Motor driven.

W4 and W5 Double axle lathe, to turn 8 ft. 4 ins. between centres. Hole in revolving head 12 ins. Variable automatic feeds. Equipped with overhead crane. Motor driven.

W6 200 ton hydraulic wheel press. Maximum distance between tie bars, 66 ins. 9 in. ram. Distance between ram and resistance post, 8 ft. Equipped with hoist. Motor driven.

W7 and W8 42 in. steel tire coach wheel lathe. Designed for turning steel tire car wheels from 28 to 42 ins. diameter. Maximum centre, 7½ ft. Equipped with heavy self centring chucks for gripping journals, and 4 jawed chucks to grip tires. Fitted with four sets of bushings, 3¾ by 7 ins., 4¼ by 8 ins., 5 by 9 ins., 5½ by 10 ins., for M.C.B. standard journals. Equipped with automatic gap piece, opened and closed by

pump. Motor driven.

W16 30 in. heavy standard engine lathe. Maximum 7½ ft. between centres. Motor driven.

W17 18 in. heavy duty engine lathe. Maximum 4 ft. between centres. Taper attachment. Independent 4 jaw chuck. Motor driven.

W18 6 ft. triple geared universal drilling and tapping machine. Drill head of the full swing type, mounted on base that can be revolved from a vertical to horizontal position. Motor driven.

W19 6 ft. strong and powerful radial drilling, boring, tapping and studding machine. High carbon, high tensile strength spindle, accurately ground, truly cylindrical in dead centres, and carried in a large sleeve in which it is firmly supported when out at maximum traverse. Gearing cut from solid. Motor driven.

W20 72 by 72 in. by 16 ft. open side planer. Two heads on cross rail, and one on column. Motor driven.

W21 6 spindle automatic cock grinding machine. Capacity from ½ to 3 in. valves.

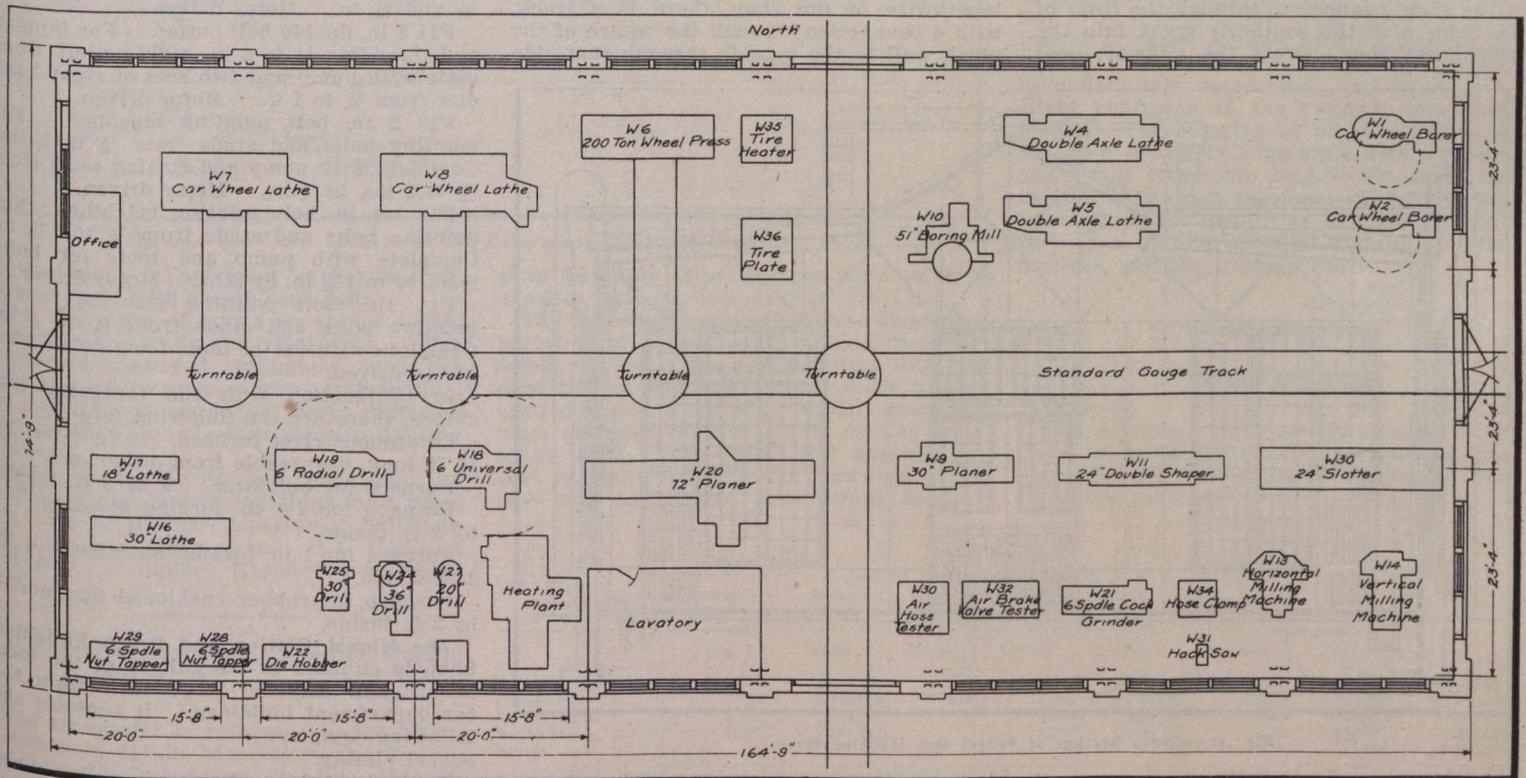


Fig. 10.—Plan and Machinery Location of Wheel and Machine Shop.

end and side. The end doors, for the standard gauge entry tracks, on which the raw material is brought into the shop, are double swinging doors. The side doors are of the same size, but slide upward inside the building in balanced ways. The shop is spanned by a 10 ton crane, that runs the length of the shop on crane girders, the rails of which are 17 ft. above the floor level.

Along the south wall, inside the building, is a low structure, 13 by 20 ft., containing the foreman's office, and lavatory facilities. Adjoining this structure on the west is a 9 ft. heating fan, connecting with a concrete heating duct running along that side of the shop, with a line running directly across the shop, and along the other wall. Under each window, midway in each section, there is an 18 in. square grid for heating.

The machinery equipment of the shop is as follows:—

W1 and W2 Car wheel boring machine. To bore wheels up to 42 ins., with 48 in. swing. Table has 5 chuck jaws, 6 changes

the movement of the axle in and out of position. Pneumatic tailstock and tool clamping attachments. Wheel lifting device operated by separate motor. Motor driven.

W9 Planer. 8 ft. table. Distance between housings and height under cross rail, 30 ins. Motor driven.

W10 Boring and turning mill. 53 in. swing and 51 in. table. Greatest height under tool holder, 36 ins. Bar travel, 24 ins. Motor driven.

W11 Double traverse head shaper. 12 ft. bed, 36 ins. deep. Motor driven.

W12 Double emery grinder. Wheels, 12 by 2 ins. Motor driven.

W13 Horizontal milling machine. Working table surface, 60 by 18 ins. Longitudinal feed, 40 ins. Cross feed, 14 ins. Greatest height of spindle, 20 ins. Equipped with full set of cutters, and pump. Motor driven.

W14 Vertical milling machine. Working table surface, 60 by 20 ins. Longitudinal feed, 50 ins. Traverse feed, 20 ins. 24 in. circular table, with automatic and cross feeds. Complete set of cutters and lubricant

Spindles independently operated. Handles angle cocks, plug valves, or valves with disc sides. Motor driven.

W22 Die hobbing machine. Equipped with right and left hand die taps from ⅜ to 2 ins. Motor driven.

W23 New Yankee drill grinder. Capacity up to 3½ ins. Complete equipment, including point thinning attachment. Motor driven.

W24 36 in. back geared high duty drill. Capacity for high speed drills up to 2½ ins. in solid steel to their full capacity. Equipped with pump, etc. Motor driven.

W25 30 in. high duty drill. Drive in base of column, and transmitted to spindle by vertical shaft and bevel gears. Working surfaces of compound table, 20 by 36 ins. Motor driven.

W27 20 in. back geared drill. Power and hand feeds. Motor driven.

W28 6 spindle semi-automatic nut tapper. Capacity from ⅜ to 1 in. square or hexagon nuts. Equipped with pump and set of taps. Motor driven.

W29 6 spindle semi-automatic nut tapper. Capacity from $\frac{3}{4}$ to $1\frac{1}{2}$ in., square or hexagon nuts. Equipped with pump and set of taps. Motor driven.

W30 Geared slotting machine. 36 in. circular table. Motor driven.

W31 Universal power hack saw. Capacity up to 6 in. round bars. Quick return and automatic lifting device. Circulating pump.

W32 Improved triple valve testing machine.

W33 Air hose press machine.

W34 Hose clamping machine.

W35 Tire heater. Capacity up to 36 in. tires.

W36 Tire plate.

W37 Car axle grinding machine. Especially designed for grinding new car axles to standard specifications, and for the repairing of standard car axles. Weight about 23,000 lbs. Motor driven. This machine has not been definitely decided on as yet, owing largely to its cost. All of the foregoing list of machinery is on order, the contracts having been signed some time ago.

A standard gauge track runs the length of the shop, connecting through the front of the shop with the southerly track into the freight car shop, across the midway, over

extension by the addition of a third unit to each group.

The Forge Shop is 100 by 260 ft., of the usual concrete subwall, brick upper wall, and spanned by steel trusses at 20 ft. centres. It is centrally situated on the east side of the midway between the locomotive and car departments, the locomotive department occupying the greater portion, as reference to the previous article on that department will show. The car department equipment is contained in the north side of the building, principally toward the west end. The 100 ft. truss spans have a clearance above the cinder floor of 24 ft. 8 ins. The central depth of the span is 10 ft., sloping off to a 7 ft. depth at the side walls. Down the centre of the roof, there is a monitor roof, 20 ft. wide, and 10 ft. deep, with a 36 in. cast iron ventilator over each section. With spacious windows in the side and end walls, and the windows along the sides of the roof monitors, the shop is well lighted.

The shop interior is well served by a 2 ft. service track. Through the centre, running lengthwise of the shop, there is a track, with a connection through the centre of the north wall to the outside through that side

F5 100 lb. rubber cushioned hammer. Average blows per minute, 275. Motor driven.

F6 Double end punch and shear. 15 in. throat. To shear 8 by $1\frac{1}{4}$ in., punch $2\frac{1}{2}$ in. hole in $1\frac{1}{8}$ in. plate. Complete with shears and 12 punches and dies from $\frac{5}{8}$ to 2 ins. Motor driven.

F7 Quick acting guillotine frame bar shears. 30 ins. wide. Shears for cutting round bars from $\frac{1}{2}$ to $2\frac{1}{2}$ ins. 3 sets of shears. Motor driven.

F8 Special spring stock shear. Guillotine type, with capacity to shear 6 by $\frac{5}{8}$ in. block. Motor driven.

F9 $2\frac{1}{2}$ in. double bolt cutter. For tapping and threading from $\frac{5}{8}$ to $2\frac{1}{2}$ in., right or left. Complete with pump and two sets of right hand and one set of left hand dies from $\frac{5}{8}$ to $2\frac{1}{2}$ ins., and one set each of right and left nut taps. Motor driven.

F10 $1\frac{1}{2}$ in. triple bolt cutter. For tapping and threading from $\frac{3}{8}$ to $1\frac{1}{2}$ ins., right or left. Complete with pump and two sets of right and one set of left hand dies from $\frac{3}{8}$ to $1\frac{1}{2}$ ins., and one set of attachments and four dies for threading coach screws $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$ and $\frac{3}{4}$ in. Motor driven.

F11 1 in. double bolt cutter. For tapping and threading $\frac{1}{4}$ to 1 in., right or left. Complete with pump and two sets of right hand dies from $\frac{1}{4}$ to 1 in. Motor driven.

F12 2 in. bolt pointing machine. For pointing bolts and studs from $\frac{1}{2}$ to 2 ins. Complete with pump and cutting tools from $\frac{1}{2}$ to 2 ins. by 8ths. Motor driven.

F13 $1\frac{1}{2}$ in. bolt pointing machine. For pointing bolts and studs from $\frac{1}{2}$ to $1\frac{1}{2}$ in. Complete with pump and tools for bolts from $\frac{1}{2}$ to $1\frac{1}{2}$ in. by 8ths. Motor driven.

F14 1 in. bolt pointing machine. For pointing bolts and studs from $\frac{1}{4}$ to 1 in. Complete with set of tools from $\frac{1}{4}$ to 1 in. Motor driven.

In conjunction with the foregoing machines, there are the following forges:
Continuous rivet furnace. 2 ft. 7 ins. by 16 ft. long, chargeable from either end.

Furnace for bulldozer. 5 by 8 ft. inside.
Furnace for $2\frac{1}{2}$ in. forging machine. 4 by 2 ft. inside.

Furnace for 1 in. forging machine. 4 by 2 ft. inside.

Furnace for rubber cushioned hammer. 4 by 2 ft. inside.

The Nickel Plating and Brass Finishing Shop is situated in the gallery of the locomotive and machine shop, away from the car department buildings. It contains the following equipment:

Nickel plating.
Buffing machine. Driven from line shaft.

Buffing machine. For scratch buffing.

Driven from line shaft.

Sand blast machine.

Plating dynamo. 338 amperes. Driven from line shaft.

Brass finishing.

Turret lathe. 1 by 10 in. with 6 ft. bed.

Driven from line shaft.

Fox lathe. 6 in. swing, 8 ft. bed. Driven from line shaft.

Turret lathe. 1 7-16 in., with 6 ft. bed.

Driven from line shaft.

14 in. shaper. Driven from line shaft.

16 in. vertical drill. Driven from line shaft.

Two buffing wheels. Driven from line shaft.

Lacquer oven. Suitable size for drying general run of small work.

The Car Department Office is a building similar in size and design to that of the

motive power office building, and is situated to the south of the planing mill, back some distance from the midway, a location necessitated by the rearrangement of car department buildings which W. J. Press,

Mechanical Engineer, made shortly after

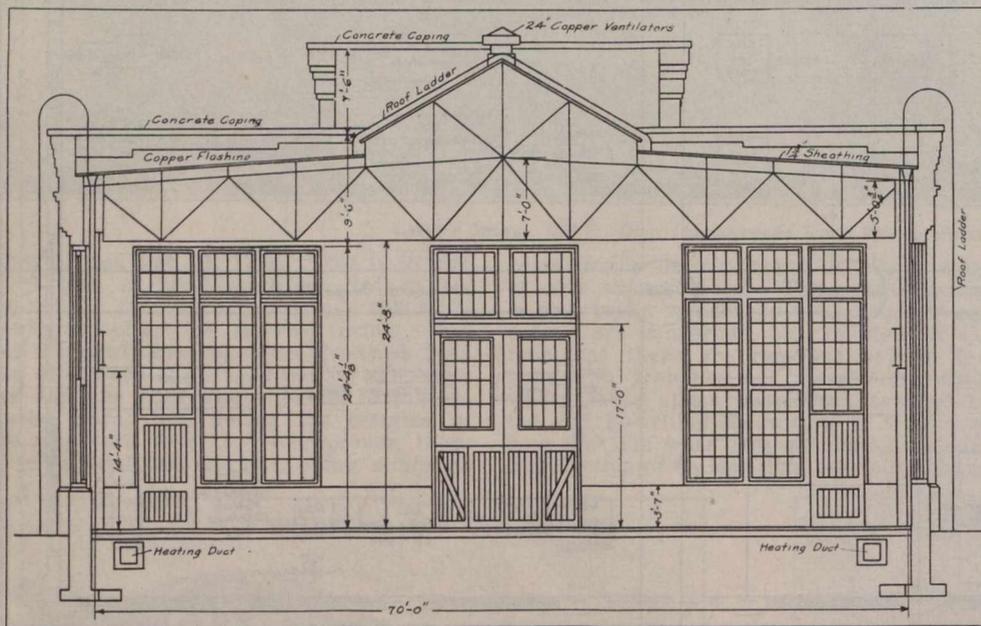


Fig. 11.—Cross Section of Wheel and Machine Shop.

which the mounted wheels can be removed from the shop without trucking. There is no connection from the shop to the rear. At right angles to this through track, there is a track crossing the shop, in one of the central sections, passing through side doors, to the local storage space outside. A central turntable connects the cross tracks. Leading from the lengthwise track, and connecting with it through turntables, there are tracks leading into each of the wheel lathes, and also into the wheel press, making it very convenient for handling the mounted wheels in and out of the machines.

Most of the machinery, it will be observed, is well grouped according to continuity of handling, and so as to minimize the amount of handling between operations. This is especially emphasized by the arrangement along the north side of the shop. At the west end are the wheel lathes for the steel wheel turning. At the other end, are the car wheel borers for the cast iron wheels, with the axle lathes adjoining. Nearly midway in the shop length, is the wheel press for assembling the wheels and axles. The arrangement of the car wheel borers and axle lathes at the east end is capable of

door. Another service track runs midway down the shop in the section north of the central shop track. This track crosses the north and south track, and also has two other north and south connections as shown, these cross connections passing through the car department forge shop principally, as the work to be handled for the car shop is of a small nature principally, and can be carried away in lots on service track lorries.

The equipment of the forge shop for car department use is as follows:

F1 Automatic feed continuous motion heading machine. Capacity up to 1 in. rivets. Set of dies from $\frac{1}{2}$ to 1 in. Motor driven.

F2 Improved $2\frac{1}{2}$ in. bolt heading, upsetting and forging machine. Dies for bolts from 1 to $2\frac{1}{2}$ ins. by 8ths. To be used for making rivets, hexagon and square head bolts. Motor driven.

F3 1 in. bolt heading, upsetting and forging machine. Capacity for heading up to 1 in. bolts at one blow. Set of dies for $\frac{3}{8}$ to 1 in. by 16ths., for square and hexagon head bolts. Steel gear, motor driven.

F4 Bulldozer. Crosshead face, 12 by 63 ins. 20 in. stroke. Motor driven.

taking hold of the work. In the initial layout, the office faced on the midway, but the present arrangement of shop buildings was considered to be preferable to the former, even at the cost of moving the office back from the midway.

It is a brick structure with steel interior frame, 60 by 68 ft., consisting of two stories and basement. The basement contains the storage and lavatory accommodation. The ground floor has offices for the department's officials and clerks, and on the first floor is the draughting room, file room and blue-

tion of the necessary equipment and the Intercolonial to undertake, without charge, such deadhead movements as may be necessary to properly care for the traffic; it being agreed that the C.P.R. will not be asked to hold its cars in Halifax more than seven days at any one time. The I.R.C. will assume the cost to transfer of baggage between cars and shed floor. The I.R.C. will pay the same rental and other charges on cars in this service as at present paid on C.P.R. equipment handled over the line between St. John and Halifax. The C.P.R.

Fuel Consumption on Steam Railways in 1912-1913.

The statistics of fuel consumed on the steam railways for the year ended June 30, 1913, are given in a little more detail than in former years, and show some interesting developments.

The total weight of fuel consumed was 9,263,984 tons, the cost of the same being \$28,426,355, against 7,783,736 tons, costing \$24,180,823 in the previous year. Distributed among the different classes of locomotives the consumption was:

	1912-13. Tons.	1911-12. Tons.
Freight	5,361,839	4,480,042
Passenger	2,249,320	1,983,238
Mixed trains	502,631	407,970
Switching	1,138,531	890,650
Construction	11,663	21,150
Total	9,263,984	7,783,736

The cost of fuel for road locomotives was \$25,089,445, and for yard locomotives, \$3,336,910. The average cost of fuel was \$3.07 a ton, against \$3.15 a ton in 1911-12. This calculation, however, is subject to qualification. In 1912-13 there were 31,078,252 gallons of oil used, against 1,729,577 gallons in 1911-12. The coal equivalent for oil has not been definitely determined, and there is a slight confusion in the returns for that reason. The bringing of oil into use as a fuel on a relatively large scale within recent years will inevitably lead to an early re-casting of the fuel accounts. The following table gives the quantities of each class of fuel used by the different classes of locomotives, and the mileage run:

	Per 100 Miles.	
	Consumption. Tons.	Cost. \$ c.
Freight	8.31	25 51
Passenger	4.89	15 01
Mixed trains	5.59	17 16
Switching	4.47	13 72
Construction	5.46	16 76

The average weight of fuel used by each class of locomotive, and the cost of the same per 100 miles run are given in the following table:

shall pay the same charges for cleaning, supplies, etc., as now paid by the I.R.C.

The following rates will govern the transportation of freight:—All classes, in either direction, 75c. a ton of 2,000 lbs., with the exception of flour and grain, which will be carried at 60c. a ton of 2,000 lbs.; the maximum earnings for this traffic on any train to be \$300. The C.P.R. will assume the cost of transferring freight between ships and cars at Halifax. All grain handled

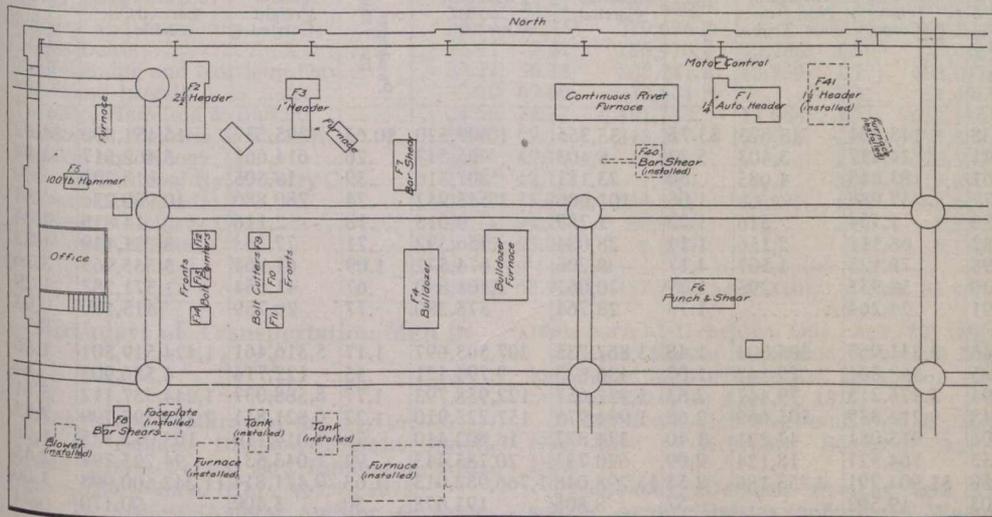


Fig. 12.—Machinery Location of Car Department Section of Blacksmith Shop.

printing room. Vaults are carried up from the basement, with one on each floor.

The floors are of maple on spruce joists, carried on the walls and steel work. The interior is plastered throughout, and the halls and stairs have a wood wainscoting. The building is heated by direct radiation coils and has incandescent electric lighting fixtures.

The C. T. Pacific Ry. has been using the locomotive department buildings for a year, and some of the car department buildings have also been taken over. J. L. Hodgson is Master Car Builder, Grand Trunk Pacific Ry.

The Intercolonial and Canadian Pacific Traffic Agreement.

The agreement in reference to the transportation of C.P.R. passengers and freight over the I.R.C. between Halifax and St. John, in connection with the four C.P.R. and Allan Line steamships carrying British mails and making Halifax the winter port, about which there has been some discussion in Parliament, was entered into Sept. 30, 1913, between F. P. Gutelius, General Manager, Canadian Government Railways, and G. M. Bosworth, Vice President, C.P.R. We are officially advised that it is for the present winter season of navigation only and has to do with one steamship each week. It does not supersede the traffic agreement which has been in force between the I.R.C. and the C.P.R. for some years in regard to traffic between Halifax and St. John. Following is the text of the agreement:—

The following rates will govern the transportation of passengers:—Passengers and their baggage between Halifax and St. John in either direction on special or regular trains, \$2 first class and \$1.50 second class for each adult passenger, with a maximum earning on this traffic on any one train of \$300. When special trains are run they shall handle, if necessary, up to 12 cars, making same time as regular through trains. The C.P.R. to supply a reasonable propor-

Class of Locomotives	COAL.		WOOD.		OTHER FUEL.		Total.	Miles Run.
	Anthra-cite.	Bitu-minous	Hard.	Soft.	Oil.	Charcoal.		
	Tons.	Tons.	Cords.	Cords.	Gallons.	Bushels.		
Freight	1,208	5,223,973	463	21,057	20,153,877	70,562	5,361,839	64,541,731
Passenger	754	2,186,069	470	10,758	9,103,495	55,120	2,249,320	49,926,857
Mixed train	1,465	494,547	68	3,208	489,720	4,597	502,631	8,981,330
Switching	1,235	1,124,857	.....	5,591	1,320,882	27,070	1,138,531	25,456,533
Special .....	.....	11,517	.....	83	19,778	179	11,663	213,770
Total	4,662	9,040,963	1,001	40,647	31,087,252	157,528	9,263,984	145,119,721

NOTE: One and one half cords hard wood equal one ton. Two cords soft wood equal one ton.

through the Halifax elevator shall pay the usual elevator charge current at other points. The C.P.R. will assume the clerical work, the checking, waybilling and accounting. The I.R.C. will pay the usual per diem, or other charge on freight car equipment engaged in this business and also all loss or damage which may occur to the freight while in transit between Halifax and St. John.

The I.R.C. will provide the necessary berthing accommodation for the C.P.R. and Allan Line ships and will make no greater charge for wharfage and dockage dues than is charged other steamship lines. This arrangement will remain in effect from Nov. 15, 1913, to May 15, 1914.

To drill chilled cast iron, a contemporary states that the piece should be laid on a forge, the spot to be drilled covered with sulphur and the blast applied slowly until the sulphur is burned off. The chill will then be drawn and the piece can be drilled.

The American Railway Engineering Association's annual convention was held at Chicago, Ill., Mar. 17-20. The committee reports dealt with included those on rules and organization, signals and interlocking, yards and terminals, roadway, wooden bridges and trestles, iron and steel structures, masonry, track, electricity, wood preservation, grading of lumber, water service, buildings, rail, ties, signs, fences and crossings, conservation of natural resources, economics of railway location, uniform general contract forms, records and accounts, and ballast.

Viaducts Over Great Northern Ry. at Vancouver.—The Vancouver, B.C., City Council has let the contract to the Union Contracting Co. for the erection of what is known as the east end viaducts over the G. N. Ry., at a cost of \$304,936. Four viaducts are to be built, viz., at Hastings, Pender, Keefer and Harris Streets, and the company is to lower its tracks so as to permit of the elimination of the level crossings at these points.

Steam Railway Statistics for Year Ended June 30, 1913.

The table given in our last issue showed the financial results of the operations of steam railways for the year ended June 30, 1913. The following table gives the percentages and the principal statistical information compiled by the companies. The table published last issue and the one given below contain all the information given prior to 1910 in our compilation of these statistics, but the columns have been rearranged so as to combine in the first table the financial and in the second the statistical information:—

Name of Railway	Proportion of total Passenger service revenue to total earnings	Proportion of freight revenue plus switching revenue, &c., to total earnings	Revenue Train Mileage	Mileage of Non Revenue Trains	Earnings per Train Mile	Passengers Carried	Passengers Carried One Mile	Passenger Earnings per Train Mile	Tons of Freight Carried	Tons of Freight Carried One Mile	Freight Earnings per Train Mile
Algoma Central & Hudson Bay.....	9.23	53.38	143,384	13,823	\$3.75	35,355	1,609,520	\$0.63	395,537	16,451,300	\$4.02
Algoma Eastern.....	2.71	91.41	24,647	3,403	5.22	8,403	95,547	.26	614,661	5,462,517	4.94
Atlantic, Quebec & Western.....	57.29	42.61	83,645	4,985	.50	23,181	807,316	.39	18,305	618,298	.80
Bay of Quinte.....	18.26	77.77	237,288	.....	1.08	107,606	1,545,952	.24	280,880	10,980,236	.84
Bedlington and Nelson.....	15.05	84.85	1,754	316	1.22	1,289	9,013	.18	2,116	14,815	1.04
Brandon, Sask. & Hudson Bay.....	40.90	58.82	68,118	2,156	1.11	28,084	956,392	.71	77,333	3,271,119	1.83
British Yukon.....	20.94	77.98	78,125	1,507	4.17	8,206	674,572	1.09	61,964	5,555,965	3.36
Brockville, Westport & N. W.....	50.47	49.39	58,935	295	1.29	70,061	2,101,830	.67	41,554	1,371,282	1.29
Canada and Gulf Terminal.....	44.79	53.91	24,264	.....	1.73	28,764	575,280	.77	20,759	415,180	.93
Canadian Government Railways											
Intercolonial.....	32.69	66.45	8,341,963	305,004	1.48	3,867,735	207,505,697	1.17	5,316,461	1,424,519,501	1.56
Prince Edward Island.....	50.76	46.25	363,801	29,142	1.07	436,833	9,794,121	.55	122,714	4,586,905	.84
Canada Southern.....	31.62	67.94	3,875,213	79,447	2.83	1,422,657	122,958,793	1.77	8,588,037	1,244,337,112	3.61
Canadian Northern.....	17.95	76.48	9,212,339	505,669	2.63	1,984,978	157,225,910	1.27	6,821,811	2,366,393,799	2.83
Canadian Northern Ontario.....	29.34	68.06	913,081	47,221	1.40	374,877	16,602,410	.70	1,014,110	103,038,325	1.78
Canadian Northern Quebec.....	25.30	72.55	764,527	18,124	2.09	620,753	20,785,443	.92	1,043,531	94,725,724	2.45
Canadian Pacific.....	30.27	67.88	51,904,291	2,253,186	2.51	15,298,048	1,766,982,013	1.63	29,471,814	11,242,600,998	3.00
Cape Breton.....	52.74	42.03	19,592	.....	.57	8,805	193,678	.30	5,409	90,170	.24
Caraquet.....	30.12	69.88	49,635	.....	1.47	17,387	712,377	.44	34,960	1,398,400	1.03
Central Ontario.....	31.44	64.48	318,720	8,950	1.17	203,451	3,977,166	.51	294,244	10,252,674	1.77
Crow's Nest Southern.....	10.72	89.29	102,557	4,881	2.21	22,807	557,688	.53	282,298	14,445,599	3.56
Cumberland.....	16.44	83.28	48,665	.....	2.27	44,797	463,194	.63	366,489	5,281,000	1.89
Dominion Atlantic.....	44.32	54.58	612,019	47,019	1.60	411,418	18,308,101	.87	367,879	20,258,699	1.75
Eastern British Columbia.....	8.08	91.70	7,814	120	6.98	7,683	76,600	.57	163,869	1,533,712	6.47
Elgin and Havelock.....	29.00	69.54	17,256	.....	.78	11,096	299,457	.22	12,178	308,706	.54
Esquimalt & Nanaimo.....	38.90	58.92	275,575	34,039	3.38	446,034	10,085,054	2.58	478,570	17,576,036	3.87
Essex Terminal.....	.....	96.14	20,900	.....	2.28	.....	161,874	.....	.....	809,370	2.19
Grand Trunk.....	33.45	65.40	20,221,257	964,678	1.99	12,174,924	626,203,301	1.52	21,041,806	3,758,487,790	2.23
G. T. R. (Canada Atlantic).....	23.00	75.06	1,693,431	97,778	1.40	614,829	20,242,100	.69	1,928,864	243,023,658	1.74
Grand Trunk Pacific.....	19.65	78.54	3,743,120	763,268	2.18	551,620	66,006,086	1.02	1,561,437	816,646,434	2.54
Halifax and South Western.....	46.29	52.98	411,379	11,914	1.29	228,806	7,624,064	.68	295,077	16,038,266	.88
Hereford.....	23.78	75.11	87,239	2,346	1.02	34,998	797,094	.31	137,532	3,309,127	1.25
International of New Brunswick.....	37.72	61.76	124,042	5,389	.90	32,143	1,443,257	.40	106,632	4,264,173	1.26
Inverness Ry. and Coal Co.....	10.99	88.48	111,462	.....	1.91	37,078	836,425	.54	302,732	17,782,674	1.69
Irondale, Bancroft & Ottawa.....	31.68	66.52	34,980	.....	.86	17,346	299,259	.27	26,829	626,638	.57
Kent Northern.....	41.48	58.52	16,902	.....	1.30	9,000	180,000	.51	11,541	230,830	.76
Kettle Valley.....	15.67	84.33	2,300	.....	1.50	781	14,029	.23	2,637	34,061	1.27
Kingston and Pembroke.....	30.62	71.99	81,542	.....	1.64	58,669	1,701,401	.53	88,860	4,175,420	1.97
Klondike Mines.....	.....	99.99	14,186	.....	1.76	2	26	.....	44,400	495,594	7.76
London & Port Stanley.....	26.15	73.29	127,240	800	1.15	161,501	2,360,279	.47	642,920	9,875,390	1.72
Lotbiniere & Megantic.....	17.77	82.16	18,960	.....	1.83	12,678	186,934	.32	51,912	702,753	1.52
Maine Central.....	66.34	33.66	14,613	281	1.26	124,806	636,511	1.18	188,942	963,604	.57
Manitoba Great Northern.....	10.99	88.47	42,752	11,839	1.55	10,121	225,604	.22	98,815	5,263,465	1.14
Maritime Coal Ry. & Power Co.....	11.20	88.80	26,354	5,581	2.58	22,280	208,661	.49	209,067	2,257,813	2.29
Massawippi Valley.....	26.86	72.67	209,416	70	1.26	152,825	2,815,645	.72	734,025	22,907,778	1.73
Midland Ry. of Manitoba.....	43.88	52.54	181,446	266	2.57	123,749	8,097,755	1.76	227,302	16,219,042	3.76
Moncton and Buctouche.....	39.32	58.47	23,232	.....	1.32	25,612	534,318	.52	23,588	469,567	.77
Montreal and Atlantic.....	21.49	76.52	666,377	18,025	1.65	363,499	8,756,192	.77	1,369,462	71,224,193	1.72
Montreal and Province Line.....	53.95	44.68	99,396	12,035	1.45	250,656	3,661,262	1.08	100,012	2,632,985	1.51
Montreal and Vermont.....	52.38	47.53	101,548	2,088	1.26	122,755	2,520,990	1.02	390,604	8,622,702	1.72
Morrissey, Fernie & Michel.....	7.73	92.27	41,626	.....	3.66	150,600	918,660	.29	851,758	5,195,723	3.37
Napierville Jct.....	6.34	93.53	32,442	.....	3.11	17,652	218,374	.37	410,729	11,597,532	2.91
Nelson & Fort Sheppard.....	35.19	61.24	57,024	11,237	1.45	21,913	683,699	.77	31,112	1,284,568	2.60
New Brunswick Coal & Ry. Co.....	21.22	65.90	57,138	.....	1.07	20,908	426,532	.22	68,370	2,973,170	.70
New Brunswick & P. E. I.....	29.30	70.52	56,810	.....	.76	22,292	601,570	.50	49,793	796,688	.59
New Westminster Southern.....	20.60	72.34	20,720	16	2.79	20,696	238,811	.57	63,303	839,988	2.01
North Shore.....	20.12	79.88	4,800	.....	.49	1,671	13,368	.08	3,930	31,440	.32
Ottawa and New York.....	40.48	56.99	153,485	17,387	1.42	147,822	3,783,993	1.10	323,163	14,556,986	1.68
Pere Marquette.....	7.20	90.58	1,136,229	3,196	2.36	377,936	7,492,358	.70	2,881,897	445,513,342	2.89
Quebec Central.....	27.97	71.17	858,165	263,927	1.83	418,482	18,168,457	.89	1,105,011	89,238,653	3.36
Quebec & Lake St. John.....	32.55	65.82	558,899	6,663	1.71	405,896	13,622,264	1.27	540,351	47,340,978	1.75
Quebec, Montreal & Southern.....	40.86	58.94	273,215	1,953	1.44	265,142	5,998,116	.76	462,418	19,614,272	1.59
Quebec Oriental.....	48.26	51.69	120,093	5,567	.84	27,249	1,781,213	.77	42,074	2,906,201	.92
Quebec Ry., Light & Power Co.....	15.91	82.89	30,805	5,062	2.66	115,364	1,384,368	1.97	193,075	1,668,176	2.81
Red Mountain.....	17.32	80.63	8,812	245	1.94	7,296	65,321	.45	22,812	196,898	1.56
Rutland and Noyan.....	62.57	37.43	7,856	.....	1.85	128,741	436,432	1.67	336,889	1,142,054	2.25
Salisbury and Albert.....	32.77	65.43	31,587	.....	1.17	16,100	356,368	.38	47,489	1,020,030	.76
Schomberg and Aurora.....	45.51	54.32	23,197	.....	.57	20,546	200,734	.26	10,863	108,630	.31
Stanstead, Shefford & Chambly.....	43.77	54.02	85,069	11,393	1.23	183,523	1,307,419	.74	414,512	2,127,092	1.39
St. Clair Tunnel.....	100.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

(Continued on page 161)

Steam Railway Statistics for Year Ended June 30, 1913 (Continued from page 160).

Name of Railway	Proportion of total Passenger service revenue to train revenue to total earnings	Proportion of freight revenue plus switching revenue, &c., to total earnings	Revenue Train Mileage	Mileage of Non Revenue Trains	Earnings per Train Mile	Passengers Carried	Passengers Carried One Mile	Passenger Earnings per Train Mile	Tons of Freight Carried	Tons of Freight Carried One Mile	Freight Earnings per Train Mile
St. Lawrence & Adirondack	39.94	59.34	342,445	8,070	1.99	656,322	14,983,927	1.27	1,046,271	38,967,540	3.15
St. Martins	42.19	55.51	17,640		.82	10,463	204,136	.35	12,458	185,150	.46
Sydney and Louisburg	6.14	91.36	279,676		2.92	156,599	1,767,477	1.17	4,911,053	69,382,774	2.91
Temiscouata	25.41	72.41	156,970	12,266	1.59	73,015	2,313,809	.44	187,553	8,131,193	2.18
Timiskaming and Northern Ont.	39.71	56.48	882,241	63,759	1.77	498,041	22,750,448	1.24	650,247	75,111,559	1.92
Thousand Islands	32.20	62.40	32,604		1.41	51,496	308,976	.45	45,770	274,620	.88
Toronto, Hamilton & Buffalo	24.56	74.37	491,738	17,084	3.71	654,116	19,057,320	1.48	2,788,028	108,735,895	7.36
Vancouver, Victoria & Eastern	28.38	69.11	343,287	135,045	2.89	295,867	8,210,728	1.19	1,447,789	41,721,730	3.44
Victoria and Sidney	48.38	49.18	31,898		2.47	123,599	1,347,529	1.76	45,282	620,317	3.61
Victoria Terminal Ry. & Ferry Co.	47.32	42.18	1,987		3.36	118,899	117,710	2.34	43,732	43,295	4.26
Wabash (in Canada)	25.99	73.80	1,638,852	53,197	1.58	586,841	35,768,226	.92	2,019,027	438,916,279	2.08
Wellington Colliery Co.	5.74	94.26	30,000		2.80	8,536	91,761	.16	278,542	2,947,435	2.64
York and Carleton	34.80	65.20	8,597		.68	6,156	61,560	.23	13,018	130,180	.44
	28.99	68.98	113,437,208	5,837,310		46,185,968	3,265,192,886		106,992,710	23,032,951,596	

Birthdays of Transportation Men in April.

Many happy returns of the day to:—
 F. G. Adams, Division Freight Agent, Grand Trunk Pacific Ry., Edmonton, Alta., born at St. John's, Nfld., Apr. 6, 1878.
 W. H. Ardley, General Auditor, G. T. R., Montreal, born at London, Eng., Apr. 24, 1858.
 Jas. Black, Freight Claim Agent, C. P. R., Vancouver, B. C., born near Seaforth, Ont., Apr. 19, 1858.
 C. G. Bowker, General Superintendent, Eastern Lines, G. T. R., Montreal, born at Medford, N. J., Apr. 21, 1871.
 S. P. Brown, M. Am. Soc. C. E., M. Am. Soc. M. E., Chief Engineer, Mount Royal Tunnel and Terminal Co., Montreal, born at Dover, Me., Apr. 29, 1877.
 W. J. Camp, Assistant Manager Telegraphs, C. P. R., Montreal, born at Oakville, Ont., Apr. 22, 1855.
 G. Cobb, Superintendent, Reid Newfoundland Co., St. John's, Nfld., born at Coupar Angus, Scotland, Apr. 21, 1885.
 A. V. Collins, Canada Steamship Lines, Ltd., Toronto, born at Island Pond, Vt., Apr. 21, 1868.
 J. E. Crossley, Travelling Passenger Agent, G. T. R., Montreal, born at Keighley, Eng., Apr. 14, 1879.
 W. A. Duff, A. M. Can. Soc. C. E., Engineer of Bridges, Intercolonial Ry., Moncton, N. B., born at Hamilton, Ont., Apr. 20, 1877.
 A. E. Edmonds, District Passenger Agent, C. P. R., Detroit, Mich., born at Woodstock, Ont., Apr. 8, 1866.
 B. C. Gesner, Moncton, N. B., formerly Air Brake Inspector, I. R. C., now Eastern Sales Agent, Galena Signal Oil Co., born at Cornwallis, N. S., April 23, 1850.
 J. Murray Gibbon, General Publicity Agent, C. P. R., Montreal, born at Udewella, Ceylon, Apr. 12, 1875.
 V. A. Harshaw, Superintendent, District 1, Atlantic Division, C. P. R., Brownville Jet., Me., born at Mono, Ont., Apr. 26, 1865.
 A. Hatton, Superintendent of Car Service, Western Lines, C. P. R., Winnipeg, born at London, Eng., Apr. 12, 1869.
 J. M. Horn, District Freight Agent, Canadian Northern Ry., Edmonton, Alta., born at Allanton Mills, Lanarkshire, Scotland, Apr. 12, 1880.
 B. S. Jenkins, ex General Superintendent, C. P. R. Telegraphs, Winnipeg, born Apr. 8, 1859.
 J. H. Johnston, Superintendent of Bridges and Buildings, Eastern Lines, G. T. R., Mont-

real, born at Uxbridge, Ont., Apr. 22, 1860.
 J. Kyle, Master Mechanic, Western Division, Canadian Northern Ry., Edmonton, Alta., born at Toronto, Apr. 11, 1877.

D. McNicoll, Vice President, C. P. R., Montreal, born at Arbroath, Scotland, Apr. 7, 1852.

P. Mooney, General Freight and Passenger Agent, Halifax and South Western Ry., Halifax, N. S., born at St. Catherines, Que., April 19, 1871.

J. O. Norrie, Travelling Passenger Agent, Cunard Steamship Co., Winnipeg, born at Belfast, Ireland, Apr. 20, 1879.

G. D. Perry, General Manager, Great North Western Telegraph Co., Toronto, born at Whitby, Ont., April 19, 1858.

R. A. Pyne, Superintendent of Shops, C. P. R., Winnipeg, born at Toronto, April 10, 1874.

R. S. Richardson, Assistant Superintendent, Intercolonial Ry., Moncton, N. B., born at Napanee, Ont., April 9, 1865.

F. Rioux, Assistant to President, Reid Newfoundland Co., St. John's, Nfld., born at Trois Pistoles, Que., Apr. 18, 1867.

W. A. Ritchie, District Superintendent, Pullman Co., Montreal, born at Edinburgh, Scotland, Apr. 13, 1854.

E. W. Smith, Superintendent, Dining and Parlor Car Service, G. T. R., Toronto, born at North Bridge, Mass., Apr. 21, 1869.

W. S. Tilston, Chief of Montreal Board of Trade Transportation Bureau, born at Manchester, Eng., Apr. 14, 1877.

W. Wainwright, Vice President, G. T. R., and G. T. P. R., Montreal, born at Manchester, Eng., Apr. 30, 1840.

W. Woollatt, Walkerville, Ont., ex-General Superintendent, Buffalo Division, Pere Marquette Rd., born at Weedon, Hertfordshire, Eng., Apr. 2, 1855.

H. J. White, General Car Foreman, Canadian Northern Quebec Ry., and Quebec and Lake St. John Ry., Joliette, Que., born at Brownington, Vt., Apr. 1, 1871.

For gas coal, a smaller grate than normal may be used, but it is better practice a sufficient volume of forebox for proper portion of the front end in order to obtain combustion because nearly all large modern locomotives are deficient in firebox volume.

The most desirable proportion of boiler capacity to aim for is 100%, but if it is to use the larger grate, and brick off a in excess of this, it is optional whether the cylinder proportions should not be increased and the factor of adhesion reduced, provided there is sufficient weight on the drivers.

Regulations Regarding Conduct of Government Railways Employees.

An order in council has been passed respecting the general conduct of those engaged on the Canadian Government Railways, as follows:—

To enter or remain in the service is an assurance of willingness to obey the rules; Obedience to the rules is essential to the safety of passengers and employes, and to the protection of property;

The service demands the faithful, intelligent and courteous discharge of duty;

To obtain promotion, capacity must be shown for greater responsibility;

Employes in accepting employment assume its risks;

The use of intoxicants by employes while on duty is prohibited; the use or the frequenting of places where intoxicants are sold is sufficient cause for dismissal;

The use of tobacco by employes while on duty in or about passenger stations, or on passenger cars, is prohibited;

Employes must always be vigilant to protect, and must promptly report anything detrimental to, the railways' interest.

Railways in Alaska.—The United States Senate has passed an act authorizing the President to arrange for the building of 1,000 miles of railway in Alaska at a cost not exceeding \$40,000,000. The railway is to be from tidewater to the interior of Alaska. In deciding upon the route the President may arrange for the purchase of any existing line, or of any line partially constructed, and is authorized to utilize in the building of the line any of the plant recently used on the Panama Canal. The suggestion is that a line be built from Seward or other point right across Alaska to the Yukon River near Dawson, and that the partially constructed line of the Alaska Central Ry., which the Sovereign Bank, Toronto, now in liquidation, was interested in as the principal bondholder, should be acquired as part of the line.

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

	Acres.
Alberta Central Ry.	3,33
Calgary and Edmonton Ry.	2,233-27
Canadian Northern Ry.	2,303-13
Canadian Pacific Ry.	160-00
Grand Trunk Pacific Branch Lines Co.	27-96
Qu'Appelle, Long Lake and Saskatchewan Rd. and Steamboat Co.	2,569-93
Total	7,297-622

hose to be fitted is placed, the latter being clamped securely in place by similar blocks attached to the end of an equal arm lever suspended from the piston of the upper air cylinder, as shown in the detail view. The operation of this upper cylinder clamps the hose in place. The centre of the hose clamp blocks and the end cylinders are concentric, and in the heads of the piston rods there are receptacles for receiving the hose fittings. The inward movement of the pistons of these end cylinders forces the fittings into the stationary hose. Prior to this operation the clamping bands are slipped over the ends of the hose. The vertical cylinder beneath the table has another equal arm lever attached to the end of the piston rod, and to the outer end of the lever there are attached the lower ends of a pincer arrangement at each end of the hose. These pincers are fulcrumed at the level of the upper surface of the table, and fit over the hose clamps, the depression of the lower cylinder causing the pincers to close, tightening up on the hose clamps, the holding

rising, this has been an expensive undertaking, and has been one of the greatest causes for the introduction in wooden equipment of steel centre sills, and the tendency toward an all steel construction. The recent policy of the C.P.R., when centre sills have been damaged to such an extent as not to be readily repaired by splicing, has

sill useless. Quite frequently, however, these cracks do not develop beyond the incipient stage, and it would consequently be a needless expense to replace the whole sill or splice the end. To overcome this trouble, and at the same time place the cars in such a state of repair that they will not be refused at interchange points, this reinforcing member was devised.

As the illustration shows, this member is in the form of an angle iron, formed in the bulldozer from a piece of 5-16 in. plate, 4 ft. 4 ins. by 13 ins., with the flange, 8 1/2 ins. from one end, bent back at a right angle. After the removal of the draft gear this member is fitted to the centre sill, one angle to the lower side, and the other to the outer side of the sill, the right angle bend bearing against the end sill, the truss rod passing through a 2 in. clearance hole in this bent lug. Through the vertical flange there are five 3/4 in. bolts, which pass through the sill, binding the latter together laterally. The vertical holes in the sill for the attachment of the draft gear are laid out on

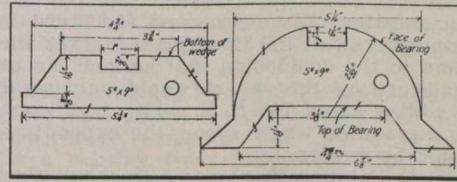


Fig. 5.—C.N.R. Journal Bearing and Wedge Gauges.

been to remove them entirely, and replace with steel centre sills, which can be slipped in place under the damaged car with but little more work than is required in renewing with wooden members.

The C.P.R. has long maintained that sills

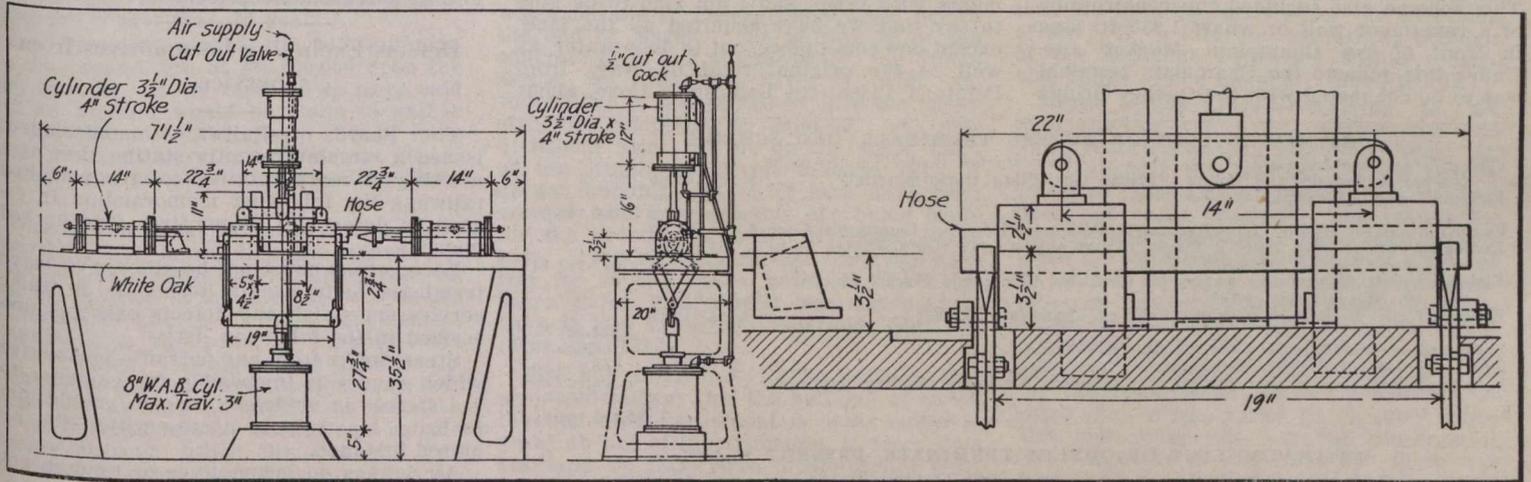


Fig. 6.—C.N.R. Hose Mounting Machine, with Detail of Clamping Heads.

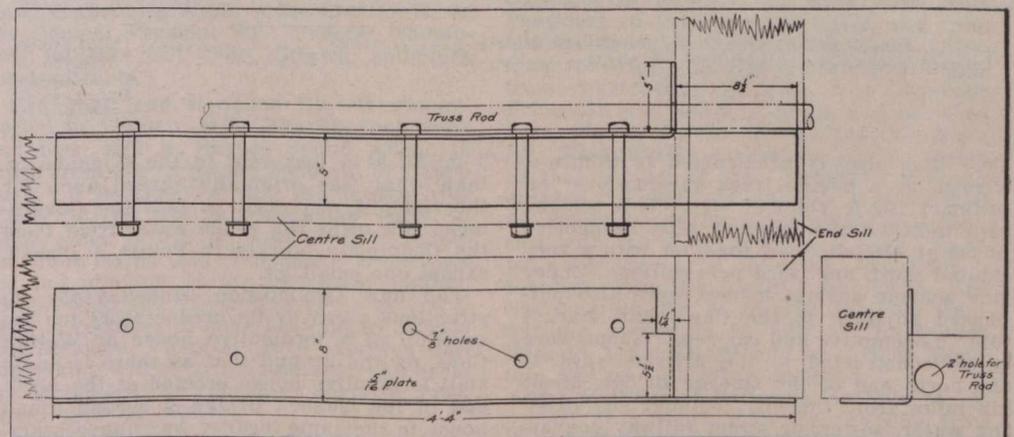
bolts for which can then be applied and tightened up before the release of the cylinders. This arrangement is very flexible, as varying lengths of hose may be handled in the same machine, taking up the difference in length by varying the piston travel of the horizontal cylinders, or shifting their location on the table. As the C.N.R. uses only 22 in. hose, this is unnecessary. A set of 1, 1 3/8 and 1 1/2 in. blocks for these sizes of hose is necessary with the machine. The principal feature of merit in this device lies in the operation developed by the lower cylinder, which is an old 8 in. air brake cylinder. This has a maximum travel of 3 ins., brought about by reducing the regular spring by 8 ins. This article has been compiled from one in the Railway Master Mechanic.

that are only slightly split at the ends are still useful, and do not need to be renewed. This opinion is not held by many roads, and difficulty has been experienced at interchange points by the inspectors of other lines refusing to accept these cars, which the C.P.R. claims are quite serviceable. To overcome this trouble, the reinforcing mem-

ber shown in the accompanying illustration was devised in the C.P.R. Car Department, the first application being made in Montreal in January. Those who are familiar with car repair work know that the ends of the centre sills have a tendency to develop slight cracks, which, in themselves, are generally negligible, but which sometimes develop to such a degree as to render the

Centre Sill End Reinforcing Member for C.P.R. Freight Cars.

Centre sills of freight cars have always been a subject for study for all car departments, as the expense of maintaining these members has been one of the most vital questions in freight car maintenance, more especially in recent years, when the motive power has been increased beyond the point for which the cars were designed. The starting and bumping strains in a train of freight cars all come through the two centre sills, and this has been the cause of their being frequently broken or split to such a degree as to necessitate renewal, either by introducing an entirely new sill, or else by splicing the sill. With the present high cost of these members, and the cost of labor



C.P.R. End Reinforcing Member for Slightly Damaged Centre Sills.

ber shown in the accompanying illustration was devised in the C.P.R. Car Department, the first application being made in Montreal in January. Those who are familiar with car repair work know that the ends of the centre sills have a tendency to develop slight cracks, which, in themselves, are generally negligible, but which sometimes develop to such a degree as to render the

of the end sill takes any thrust from the latter into the centre sill without in any way straining the end of the centre sill, and distributes the thrust through a considerable length of the end.

The key block construction of the centre sill is not required in this arrangement, as the vertical bolts from the draft gear, passing through the reinforcing plate, transmit

the drawbar strains to the sills over such a length and in such a manner as to make the use of the key block unnecessary.

This type of end reinforcement is to be applied to all cars where the centre sill is

but slightly damaged, and it is anticipated that a considerable saving will result. We are indebted to J. Cowley, Car Foreman, C. P.R., West Toronto, for the information on which this article is based.

The National Transcontinental Railway Terminals at Quebec.

In response to a motion by Hon. G. P. Graham, ex Minister of Railways, there was recently submitted to the House of Commons a return showing what changes have been made in the original scheme for N.T.R. terminals at Quebec, the estimated cost of the former and the estimated cost of the terminals under the present scheme. The return, which was prepared by R. W. Leonard, Commissioner, N.T.R., is as follows:—

The original scheme included the erection of a large and expensive passenger station on the Champlain Market site, at the south easterly extremity of the city, in connection with which there would be freight sheds, immigrant sheds, power house, etc., etc. This scheme also included the construction of a revetment wall or wharf 1,930 ft. long in front of the Champlain Market site. Under this scheme the Champlain terminal was to be connected with the Quebec Bridge

the question of the proposed \$1,000,000 revetment wall at the Champlain Market site, came to the conclusion that as such an expenditure on this wharf would only result in adding about 100 ft. in width to the present available wharf space, the expenditure would be unwise.

From Pointe a Pizeau to Lampson's Cove the original scheme only provided a right of way 100 ft. wide, except as shown on a map submitted with the return and the lots which the tracks ran through were not acquired out to the deep water line.

The new Commission, consequently, cancelled the old Commission's agreements with the lot owners and made new agreements with them, and I am glad to be able to say that we have acquired all the land, except one small piece, out to deep water, as well as the original right of way, from Pointe a Pizeau to Lampson's Cove, about

the Palais site, and for the convenience of river traffic a suitable station will be erected on the Champlain site. The advantages of a union passenger, express and local freight station in any city require no comment. This arrangement with the C.P.R. is necessary in order that the N.T.R. may obtain access to the present harbor at the mouth of the St. Charles River, now being extended by the Government, with magnificent grain elevator, immigrant buildings, etc. This arrangement also gives the N.T.R. rights over the C.P.R.'s Dalhousie St. tracks, so that communication may in future be established, if necessary, between the two new stations.

The Commission decided to move the shops site from Neilsonville, near the Quebec Bridge, to St. Malo, for the following reasons:—The new site is immediately adjacent to the labor centre of Quebec city, and reached by the electric railway. Economical sewerage disposal, free water and freedom from taxation have been obtained for 20 years, and also a large and favorable site at a reasonable price.

Defects Excluding Locomotives from Service.

The Board of Railway Commissioners issued a circular recently stating that at a meeting of representatives of the principal railways the following memorandum in regard to defects in locomotives was agreed upon:—

Locomotives must not be allowed to leave terminals, or be used at terminals, in traffic service, on which any defects exist, as prescribed in the following list:—

Steam leaks from any part of a locomotive which render it impossible for engineer to see signals in sufficient time to enable him to bring his train to a stop within the required distance.

Air brakes on locomotives or tenders not in serviceable condition.

Wheel defects. Locomotives with steel or steel tired leading engine truck wheels, leading or trailing driving wheels, or tender wheels with flanges worn 1-16 below M. C. B. wheel defect gauge for cars of less than 80,000 lbs. capacity or over.

Locomotives with cast iron engine truck wheels and cast iron wheels under tender weighing over 130,000 lbs. with flanges worn 1-16 below M. C. B. defect gauge for cars of 80,000 lbs. capacity or over.

Locomotives with cast iron wheels under tender weighing 130,000 lbs. or less with flanges worn 1-16 below M. C. B. defect gauge for cars of less than 80,000 lbs. capacity.

Locomotives with truck or tender wheels having shelled out or flat spots over 2 1/2 inches long or so numerous as to endanger the safety of the wheel.

Steel tires on locomotives worn hollow 3/8 in. in depth, or which are worn below safe limit of thickness. Railway companies to file with the Commission their standard limit of thickness of tire, on all classes of locomotives, for approval.

Flat or shelled out spots on locomotive driving wheels 3 in. long.

Springs. Locomotives with defective springs on any part of locomotive or tender which are unable to carry their respective weight when locomotive is standing.

The circular also asked railway companies to make by Feb. 23, what, if any, objections they might have to the addition to the memorandum of the following clause:—

"Railway companies are required to equip their locomotives with double windows in the front of the cabs during the winter season, Nov. 1 to April 30, the same to be made air tight."

ESTIMATED COST OF QUEBEC TERMINALS, OLD SCHEME.

Cost of work done and right of way taken over from Quebec Bridge Co. between Quebec Bridge site and Pointe a Pizeau (including track material)	\$ 287,169.00	
Estimated cost of completing above	213,600.00	
		\$ 500,769.00
Estimated cost of grading, including track, Pointe a Pizeau to Lampson's Cove	\$ 392,625.00	
Estimated cost of land, Pointe a Pizeau to Lampson's Cove (right of way only)	285,772.24	
		678,397.24
Estimated cost of grading, Lampson's Cove to Champlain Market, including 1930 ft. of revetment wall	\$1,872,638.10	
Estimated cost of land, Lampson's Cove to Champlain Market	2,155,647.71	
		4,028,285.81
Estimated cost of Wolfe's Cove locomotive house	90,000.00	
Estimated cost of Wolfe's Cove yard	108,700.00	
Estimated cost of passenger station at Champlain Market (including terminals)	1,100,000.00	
Total		\$6,406,152.95

ESTIMATED COST OF QUEBEC TERMINALS, PRESENT PLANS.

Cost of work done and right of way taken over from Quebec Bridge Co. between Pointe a Pizeau and Quebec Bridge (including track material)	\$ 287,169.00
Cost of grading to date, Quebec Bridge to Champlain Market	543,000.00
Estimated cost of completing grading, Quebec Bridge to Champlain Market ...	57,000.00
Cost of track material, Pointe a Pizeau to Champlain Market	40,000.00
Cost of land, Pointe a Pizeau to Champlain Market (includes to deep water line	1,368,050.00
Estimated cost of station and terminals at Champlain Market	60,000.00
	\$2,355,219.00

JOINT TERMINALS.—Estimated cost of joint terminals on which the Government pays as annual rental a sum equal to 2 1/4 %:—

C.P.R. property at Quebec	\$3,300,000.00
Additional land to be purchased for joint terminals	800,000.00
Terminal station and yards to be built by C.P.R.	1,500,000.00
	\$5,700,000.00

Annual rental, \$128,250.00, capitalized at 4%	3,206,250.00
Leonard Shops:—Land and right of way	285,780.10
	\$5,847,250.00

Co.'s line, already constructed to Pointe a Pizeau, by a double track railway over an ordinary 100 ft. right of way. This scheme also included the erection of a locomotive house at Wolfe's Cove, together with a very limited yard, and yard accessories. Under this scheme several houses were also purchased adjacent to the Champlain Market site. Locomotive and car repair shops were to be constructed in the division yard at the north end of the Quebec Bridge, about six miles from the city, without any existing water, sewer, or street railway connections.

The new Commission, after fully considering its predecessor's scheme for the erection of a \$1,000,000 passenger station on the Champlain Market site, came to the conclusion that it would be unwise to go on with the erection of such an expensive structure, as the passenger business, in and out of Quebec, that will be tributary to the N.T.R., would not, and could not, warrant this expenditure on a station building.

The new Commission, after going into

3 miles, at a less cost to the Commission than what was originally agreed upon for the right of way only, so that the Government now owns the whole water front from the Champlain Market to Pointe a Pizeau, except one small lot.

The new Commission cancelled the instructions given by its predecessors for the erection of a locomotive house at Wolfe's Cove, on the ground that as there is an 18 stall locomotive house erected at the north end of the Quebec Bridge, a second round house in the same locality was unnecessary, and more so as filling in Wolfe's Cove for the necessary yard tracks, subsidiary buildings, etc., etc., would add greatly to the cost.

The new Commission is of opinion that the public interest and the convenience of the travelling public would be best served by a union passenger and joint terminals, situated near the centre of the business section of Quebec. An agreement to that effect has been concluded with the C.P.R., and a union passenger station will be built on

Railway Development.

Projected Lines, Surveys, Construction, Betterments, Etc.

Alaska Railways.—The bill authorizing the construction by the U.S. Government of railway lines in Alaska, which has been passed by Congress, empowers the President to do practically anything he pleases in order to build railways in Alaska not more than 1,000 miles in extent and at a cost not to exceed \$35,000,000. While one purpose of the railway is stated to be the connection of one or more of the Pacific harbors on the southern coast of Alaska with the navigable waters of the Yukon and with the Alaska coal fields, other clauses give the President discretion to build railways in Alaska wherever he deems their construction is justifiable. While the bill authorizes the President to operate as well as construct the railway through any agency he may select, he is also authorized to lease the railways after completion for terms not longer than 20 years.

The President signed the bill authorizing the expenditure of \$35,000,000 upon the line, Mar. 12. He is reported to have said that an attempt would be made to gather the working force this year, and to have maps prepared showing the various routes proposed and the conditions prevailing along each.

Alberta and Great Waterways Ry.—J. D. McArthur, who is building this railway, is reported to have said in Winnipeg, Mar. 13, that the location of the line has been finally completed to Lac la Biche, a considerable distance from the point of junction with the Edmonton, Dunvegan and British Columbia Ry., and that construction work will be pushed forward as rapidly as possible. There is considerable settlement in the country through which the line will run for about 70 miles from Edmonton, but beyond that it is virgin territory. The region is specially adapted for dairying. (Feb., pg. 69.)

All Red Line Ry.—In connection with the building of this projected railway in Canada, a steamship line is suggested to run from some point on the Atlantic coast to Black Sod Bay in Ireland. Mr. Worthington, the Dublin, Ireland, man who is promoting the project in Ireland, recently made an application to the Midland Great Western Ry. for £15,000 to aid in the building of a line from Black Sod Bay to a junction with the M.G.W. Ry. The shareholders refused to have anything to do with the project. (Dec., 1913, pg. 579.)

Atlin Ry.—The Dominion Parliament has under consideration a bill to incorporate a company with this title to build a railway from the southern end of Atlin Lake, generally southerly to the Taku River, where it intersects the International boundary line between British Columbia and what is called the panhandle of Alaska. The provisional directors are:—Y. Kavanagh, G. W. Mitchell, Ottawa; P. Duryee, Vancouver, B. C.; R. E. Gosnell, Victoria, B. C.; C. W. Baker, Boston, Mass.

Bruce Peninsula Ry.—The Dominion Parliament has under consideration a bill to incorporate a company with this title to build a railway from Wiarton, or from the G.T.R. in Keppel tp., northerly to Tobermory, Ont. The provisional directors are:—J. J. Brown, D. Brown, R. Brown, Owen Sound, Ont.; S. C. Cooper, A. I. Cooper, Lions Head, Ont. (Feb., pg. 69.)

Calgary and Fernie Ry.—Fernie, B.C., press reports state that a start will be made with the construction of this projected railway as soon as the plans have been ap-

proved by the Board of Railway Commissioners. (Mar., pg. 121.)

Calumet and Northern Ry.—The Quebec Legislature has granted an extension of time for the building of this projected railway. (Dec., 1913, pg. 573.)

Canadian Alberta Ry.—The Dominion Parliament has under consideration a bill to incorporate a company with this title to build a railway from Blairmore, Alta., on the C.P.R., northerly and westerly, 14 miles, through townships 8 and 9, range four, west of the 5th meridian, to the section of section 20, tp. 9. The provisional directors are:—G. H. Salmon, C. A. Hancock, R. P. Stockton, R. Smith, J. A. Harvey.

Edmonton, Dunvegan and British Columbia Ry.—It was reported in Edmonton, Alta., Mar. 7, that it was expected that track would be laid to Lesser Slave Lake before the end of March. The putting in of the concrete piers and abutments for the bridge across the Athabasca River is well advanced and it is expected to have the superstructure completed by June 30. The first divisional point will be on the south bank of the Athabasca River, mileage 131. A station building and water tank have been erected, and arrangements are being made for the erection of other divisional buildings. It is also reported that track has been laid for several miles north of the Athabasca River, and that it was expected to have it laid to beyond Sawridge, Mar. 31. (Mar., pg. 121.)

Erie and Ontario Ry.—The route of this projected railway, for the building of which the Dominion Parliament is being asked to grant an act of incorporation, is from Port Maitland, on Lake Erie, to Smithville, Ont., and from Port Maitland to Port Colborne, Ont. The provisional directors are:—W. J. Aikens, Dunnville, Ont.; J. S. Hamilton, W. T. Henderson, K.C.; A. J. Wilkes, K.C., Brantford, Ont. (Feb., pg. 69.)

Farnham and Granby Ry.—Application is being made to the Dominion Parliament for the incorporation of a company with this title to build a railway from the C.P.R. at Farnham, Que., easterly to Granby, thence northwesterly to Windsor Mills or Sheford, connecting either with the C.P.R. or the Central Vermont Ry. Pringle, Thompson, Burgess and Cote, Ottawa, solicitors for applicants.

Esquimalt and Nanaimo Ry.—It was reported in Victoria, B.C., Mar. 10, that track had been laid to Baynes Sound, about 15 miles from the proposed terminal at Courtenay. It is expected that the bridge over Table River will be completed early in April, when it will be possible to complete the track laying into Courtenay. A contract for the erection of the passenger station, freight shed and locomotive house at Courtenay is reported to have been let to Shields and Newham, Victoria. It is expected that everything will be in readiness for the opening of the line to Courtenay early in June. (Dec., 1913, pg. 573.)

Fredericton and Grand Lake Coal and Ry. Co.—We are officially advised that there is no intention to add to the length of the company's railway lines, the only work in contemplation being the usual sidings in connection with the extension of its mining operations. (Dec., 1913, pg. 574.)

Intercolonial Ry.—Press reports state that a rearrangement of the route of the projected line from Sydney to Leitch's Creek is under consideration, that plans are being prepared for the laying out of new deep

water terminals at Sydney and for the rearrangement of the terminal facilities at Sydney and North Sydney, N.S.

It is also reported that surveys are in progress for the completion of a second track between Halifax, N.S., and Moncton, N.B. An Ottawa dispatch Mar. 12, stated that F. P. Gutelius, in a memorandum to the Department of Railways had shown that by reducing the gradient on the Halifax-Moncton section, and on the Point Tupper-Sydney section, and by the strengthening of the bridges, much heavier loads could be drawn, and the cost of transportation considerably reduced. The dispatch adds that the General Manager has been given authority to have the necessary surveys for this work made on the two sections mentioned.

Another press report states that certain interests are trying to get the Department of Railways to have a survey made for a line which would connect Fredericton with the Maine Central Rd. at Vanceboro, Me.

A resolution was passed in the House of Commons Mar. 16 expressing the opinion that the time had arrived for the extension of the I. R. C. into the non-railway sections of the Maritime Provinces within reasonable range of the railway. (Feb., pg. 69.)

Kettle Valley Lines.—Referring to the map showing the K.V.L. constructed and under construction in our Feb. issue, pg. 80, it appears that section D to E Osprey Creek to Otter Creek Summit, 65.5, has not been put under contract. The reason for this is that negotiations have been in progress for some time with a view of a change in location so as to reach the Hope Mountains by way of Princeton rather than via Aspen Grove. The British Columbia Legislature has authorized this change of route, and the applying of the subsidy granted for the construction of the previously located line to be applied to the new route. The new route will save the construction of 40 miles of line, from which there was very little prospect of traffic, and by building into Princeton would enable connection to be made with the Vancouver, Victoria and Eastern Ry. there. From Princeton the K.V. Lines will be given running rights over the V.V. and E. Ry. for 40 miles. The act also provides for the building of a branch line from near Princeton to Aspen Grove and to the Copper Mountain mining camps. The Premier, in explaining the new proposals to the Legislature, said the railway company is required to build only from Penticton to Princeton, 75 miles, and from Merritt to Otter Summit, about 30 miles, thus relieving the Kettle Valley company from constructing its own line between Princeton and Otter Summit and allowing it to use the tracks of the Great Northern Ry. The subsidy agreement will be varied so that in lieu of the amounts formerly granted the province will pay \$5,000 a mile for the line from Penticton wharf to a junction with the V., V. & E. at or near Princeton, not exceeding 75 miles, and from a junction with the Nicola, Kamloops and Similkameen Ry. at Merritt to Otter Summit not exceeding 30 miles. The branch lines to Aspen Grove and to Copper Mountain will be built when required.

The Minister of Railways, on Feb. 24, approved of a route map for the line from Siwash Creek to Otter Creek Summit, 63.5 miles.

A U.S. press dispatch states that a contract has been let for the construction of the line from Osprey Lake to Coldwater Summit, to Guthrie McDougall & Co., Portland, Ore. (Mar., pg. 121.)

Kettle Valley Ry.—An ice jam sweeping down the Fraser River, on Feb. 12, carried away 250 ft. of falsework which had been erected for the K.V.R. bridge at Hope. Work on the substructure was begun about two

months previously and the falsework had been extended 750 ft. from the south shore. Above Hope the river has been tightly packed with icefloes which had drifted down from the upper reaches of the Fraser, and when the temperature dropped suddenly the whole mass commenced to move. The contractors, Armstrong and Morrison, of Vancouver, had foreseen this occurrence, and one of the costly open caissons which was ready for launching was saved by being secured behind a breakwater. All the men on the work were warned in time to escape, but part of the falsework went out, and in so doing precipitated into the river two hoisting engines, a derrick and a concrete mixer. After some difficulty all this equipment was salvaged and is reported not seriously damaged. The contractors still hope to complete the substructure before high water, which is due about May 1. The bridge is to be a double deck structure supported on four 238 ft. spans.

Lake Erie and Northern Ry.—We are officially advised that no statement has been made by W. P. Kellett, General Manager, to the effect that the line when completed will be operated both as a steam and electric railway, as stated in press reports. It is, however, persistently reported that the line will in the main be operated by electricity, either by an electric locomotive, or by individual gasoline motor cars.

The bridge work at Paris on the Brantford-Galt section of the line was completed Mar. 12, and it was expected that track would be laid into Brantford, Mar. 24. (Mar., pg. 126.)

Lake Huron and Northern Ontario.—The Minister of Lands stated in the Ontario Legislature, Mar. 4, that the Government had been informed that the company had started construction work, but had no official information as to the nature of the operations, or of the progress made. No lands had been sold to the company for settlement under the provisions of the act passed in 1913. (July, 1913, pg. 331.)

Minneapolis, St. Paul and Sault Ste. Marie Ry.—It is reported that the company will put its new Chicago freight terminal in operation April 1. It has been under construction since 1912, and is estimated to have cost \$6,000,000. It covers an area of 18½ acres, of which 17.7 acres are under roof. In its construction, 108,000 cubic yards of concrete were used, and 6,500 tons of steel. All trackage is elevated and the part of the building on the street level constitutes one of the largest storage warehouses in the world. The terminal was constructed by the Central Terminal Co., a subsidiary company of the M.S.P. & S.M.R. line. The existing leased freight terminals at South Water and Lake Streets will be abandoned. Starting the same day, the company's passenger trains will be run into the Grand Central station, instead of the Illinois Central Rd., a contract for 99 years having been made with the Baltimore and Ohio Rd. (Aug., 1913, pg. 376.)

Norfolk and Elgin Ry.—The Dominion Parliament has under consideration a bill to incorporate a company with this title to build a railway from Simcoe to 1.5 miles northwest of Langton, thence to Port Burwell, Ont., and to operate steam and other vessels and car ferries in connection with its line. The provisional directors are:—S. F. Adalia, W. H. Price, C. M. Garvey, F. L. Somerville, J. Harris, Toronto. (Feb., pg. 70.)

Northwestern Ry. of Canada.—The provisional directors named in the application to the Dominion Parliament for the incorporation of a company with this title are:—C. W. MacLean, Pointe Claire, Que.; H. B. Stewart, Beebe Plain, Que.; F. G. Gillespie

G. B. Holme, F. D. Ames, J. P. Vincent, W. C. Thomson, New York. (Mar., pg. 121.)

Pacific Great Eastern Ry.—The British Columbia Legislature has granted a guarantee of bonds at the rate of \$35,000 a mile for 30 miles of line in addition to the 450 miles specified in par. 4 of the agreement forming schedule A of the original act; and an additional \$7,000 a mile in respect of the line from Vancouver to Fort George, 480 miles, as a second charge on the line, ranking next after the charge created by the deed of July 10, 1912. The 30 miles mentioned is the difference between the original estimate of distance between Vancouver and Fort George, and the actual mileage of the located route. The necessity for the increase of the guarantee of bonds of \$7,000 a mile was stated by the Premier to be the fact that the estimated cost of construction was found on final surveys to be \$58,000 a mile instead of the \$45,000 originally estimated.

The company has authority to extend the line to Peace River, 330 miles, and the Premier explained that this line will form part of a through line from Vancouver to the Yukon, and Alaska. The act aiding the construction of this line provides for the guarantee by the Province of the company's bonds for \$35,000 a mile at the rate of 4½% for 330 miles, more or less. An agreement for the construction of this line, in terms similar to that for the building of the Vancouver-Fort George line, is to be entered into between the Government and Foley, Welch and Stewart.

It was reported, Mar. 10, that it was expected to have track laid to Horseshoe Bay, 13 miles out of Vancouver, by June 30. From that point to Squamish, the terminal at Newport, the line will have to be built through solid rock, and is not to be finished until June 30, 1915. Track has been laid from Squamish to Swift Creek, 14 miles, which includes the seven miles of track laid by the old Howe Sound and Northern Ry. Grading is practically completed to the Pemberton Meadows, 60 miles from Squamish, and to the north east end of Anderson Lake, 30 miles beyond. For 12 miles beyond Anderson Lake there is some heavy rock cutting yet to be done, while beyond to the crossing of the Fraser River, near Lillooet, the grading is finished. The piers and abutments for this bridge are expected to be completed in June. Some grading has been done from the Fraser River crossing to Kelly Lake, mileage 200 from Vancouver. The work on the section from Kelly Lake to Fort George, 280 miles, is comparatively light, and will be gone on with during the summer.

Survey parties are to be sent out early in April from Fort George to locate the projected line to the Peace River, 330 miles. A reconnaissance party, in charge of L. C. Gunn, is now on the field. It is expected that a start will be made on construction in May. (Mar., pg. 121.)

Peace River Tramway and Navigation Co.—In passing through the House of Commons recently, the act of incorporation was changed to authorize the building of a standard gauge railway instead of the narrow gauge one originally contemplated. The total length of the projected line is about 16 miles, which will connect up breaks in the navigation on the Slave and Peace rivers. The principal break is at the Vermillion rapids. (Mar., pg. 122.)

Quebec Central Ry.—An extension of the Q.C. Ry. from St. Sabine, Dorchester County, to English Lake, also called Lac La Frontier, a distance of 25 miles, has been surveyed and located. Plans, profiles, etc., have been deposited with the Railway Department at Quebec, and the location approved of. Ten miles of the line from St.

Sabine to five miles east of St. Camille is under construction, a portion of which was actually built during last year, and the balance of the 10 miles will be completed during this year. It is expected that the other 15 miles will be constructed in 1915, so that the line to English Lake will probably be in operation by the end of 1915. The work is being done under the direction of J. T. Morkill, Chief Engineer, assisted by J. M. Hibbard. The route follows the water shed of the St. John River and is close to the boundary line between the Province of Quebec and State of Maine. At English Lake the line will be within 1,000 ft. of the International Boundary line. It is through a thickly wooded country with rich clay and loamy soil, and well adapted for cultivation when the land is cleared. (Feb., pg. 70.)

Rimouski International Ry.—The Dominion Parliament is being asked to authorize the company to change its name to the Interprovincial Ry. to build a railway from St. Germain de Rimouski, Que., in as direct a line as possible to Edmundston, N. B., and to extend the time for the building of the lines authorized by chap. 129 of the statutes of 1909. Asselin and Asselin, Rimouski, Que., solicitors for applicants. (May, 1909, pg. 173.)

Shefford, Bagot and Missisquoi Ry.—The Quebec Legislature has incorporated a company with this title to build a railway from St. George, on the International Boundary between Quebec and Vermont, to a junction with the Intercolonial Ry. between Bagot and St. Eugene, Que. The provisional directors are:—W. H. Robinson, Granby, Que.; A. R. McMaster, Montreal; J. G. Gibson, Dunham, Que.; A. W. Runnells, Springfield, Mass.; J. E. Runnells, Worcester, Mass. (Jan., pg. 22.)

St. John and Quebec Ry.—The plans of the proposed bridges across the River du Chute and Lake Olanabog, N.B., have been deposited with the registrar of deeds for the counties of Victoria, Carleton and Queens.

At the opening of the New Brunswick Legislature, recently, the Lieutenant Governor said it is hoped that the three sections of the line from Centreville to Gagetown will be ready for operating by June 30. (Feb., pg. 70.)

Taber Transit Co.—J. F. Kramer is reported to have stated in Taber, Alta., Mar. 6, that he is prepared to start construction on the proposed railway from Taber to the coal mines. (Sept., 1913, pg. 433.)

Toronto Union Station.—At a meeting of shareholders of the Toronto Terminals Ry. Co. held in Toronto, Mar. 6, the following directors were elected:—

E. J. Chamberlin, W. Wainright, H. G. Kelley, representing the G.T.R., and Sir Thomas G. Shaughnessy, D. McNicoll and J. W. Leonard representing the C.P.R. This company has been organized to construct the new union station and terminals at Toronto, in which the C.P.R. and G.T.R. each owns one half interest. All other railways entering Toronto, however, will have the privilege of using the station and terminals upon terms to be arranged. It is officially announced that construction will commence as soon as the preliminary arrangements can be concluded, and the work will be carried to completion as early as the conditions will permit. The company has an authorized capital of \$2,000,000 and bonding powers of \$10,000,000. It is said that the company will take over from the G.T.R. the areas on the waterfront expropriated by that company at the price it paid for them. From the C.P.R. it will take over the lease of the Don tracks. The companies will share equally in the interest charges on capital expenditure. That is, if \$15,000,000

is spent, the C.P.R. will pay 2½% on that amount each year, and the Grand Trunk will also pay 2½%. For operation and maintenance within the limits of the Terminal Co.'s territory, each road will pay on a wheelage basis.

The officers of the company are as follows: President, Wm. Wainwright; Vice-President, D. McNicoll; Secretary, H. Phillips; Treasurer, H. E. Suckling; General Auditor, W. H. Ardley; Chief Engineer, J. R. W. Ambrose.

Vancouver Railway and Ocean Terminal Co.—The Vancouver, B.C., City Council is preparing to oppose the bill which came before the Dominion Parliament, Mar. 21, asking for the incorporation of a company with this title. The provisional directors are said to be five Vancouver financial men. (Mar., pg. 122.)

Western Dominion Ry.—Application is being made to the Dominion Parliament to extend the time within which the company may build the railway authorized by chap. 168 of the statutes of 1912; to ratify an agreement whereby the Alberta Pacific Ry. and the W.D. Ry. were amalgamated, and to authorize the construction of the following branch lines:—From section 15, tp. 10, range 2, west of the 5th meridian, westerly and northwesterly along the north fork of the Old Man River, to the boundary between Alberta and British Columbia; from section 19, tp. 18, range 2, west of the 5th meridian, westerly along the Highwood River to the boundary between Alberta and British Columbia; from section 35, tp. 19, range 3, west 5th meridian, westerly along the south branch of Sheep River to the boundary between Alberta and British Columbia. O. E. Culbert, Ottawa, is Secretary of the company. (Oct., 1913, pg. 476.)

Winnipeg.—We are officially advised that the contract for building the construction railway from Winnipeg to Shoal Lake has been let to the Northern Construction Co. It was let sooner than was expected, because the Commission realized that it was necessary it should be finished during this year. If this is to be accomplished the contractors must have the work in hand early enough to get their supplies in and camps established before the winter breaks up.

Other contracts for supplies, etc., for the railway construction have been let as follows:—Steel rails, Algoma Steel Corporation; steel splice bars, Steel Corporation of Canada; clearing right of way, E. J. Bawlf, residences for division engineer, J. F. McInnes.

The Commissioners received tenders to Mar. 23 for the supply and delivery of a locomotive with tender, and a snow plough. (Mar., pg. 122.)

Traffic Orders by the Board of Railway Commissioners.

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

Carload Mileage Rates on Grain.
General order 121. Feb. 26. Re complaint of Dominion Millers' Association and Campbell Milling Co. against proposed increase in less than carload mileage rates on grain and grain products, published in tariffs of the railway companies, to take effect Sept. 1, 1913; and General Order 109, Aug. 27, 1913, suspending the increased rates until further order. Upon its appearing that an agreement has been reached between the millers and carriers' representatives for a basis of less than carload mileage rates to apply on grain and grain products in lieu of the rates suspended under order 109, the agreed rates to become effective Mar. 2, 1914. It is ordered

that general order 109 be rescinded from Mar. 1, 1914.

Suspension of Freight Tariffs Removed.

General order 122. Mar. 4. Re general order 116, Dec. 24, 1913, suspending, for the present and pending investigation, tariffs filed by railway companies, increasing the minimum carload weights on buckwheat, oats, bran (in bulk), dried beet pulp, oat hulls (in bulk), pea hulls (in bulk), shorts, beets (except sugar), onions, turnips and potato. Upon the return of the notice calling upon the railway companies to justify the proposed increase in the minimum weights on the commodities referred to, the C.P.R., the Toronto Board of Trade, the G.T.R., and the Canadian Manufacturers Association being represented at the hearing, and upon the report of the Board's Traffic Officer it is ordered that general order 116 be rescinded.

G.T.P.R. Standard Freight Mileage Tariff.

21356. Feb. 12. Re application of Grand Trunk Pacific Ry., under sec. 327 of the Railway Act, for approval of its Standard Freight Mileage Tariff, C.R.C. 21, incorporating and superseding C.R.C. 19, approved by order 20441, Sept. 27, 1913, by an extension of the mileage thereof, to apply between the company's stations in British Columbia between Prince Rupert and Wordsworth, inclusive. Upon the report and recommendation of the Board's Chief Traffic Officer it is ordered that the company's said tariff be temporarily approved, pending judgment in the inquiry into the rates charged generally by railway companies in British Columbia.

Building Papers and Pulpwood Rates.

21402. Feb. 21. Re supplement 40 to C.P.R. tariff, C.R.C. no. E-2353, and supplement 28 to G.T.R. tariff, C.R.C. no. E-2513, increasing minimum on building papers and pulpwood from 24,000 to 40,000 lbs., effective Feb. 23, 1914. Upon the application of the Canadian Manufacturers Association, complaining against the said increases, it is ordered that, for the present and pending investigation by the Board, the said increased minima on building papers and pulpwood be suspended.

Exclusive Use of Drawing Rooms, Etc.

21413. Feb. 24. Re tariffs filed by certain railway companies, requiring additional railway tickets for the exclusive use of drawing rooms or compartments in sleeping or parlor cars. It is ordered that the following schedules, in so far as they affect tolls between points, both of which are in Canada, be suspended, pending investigation by the Board: G.T.R. Tariff, C.R.C. No. E-1989; Wabash Tariff, C.R.C. 818; Wabash Supplement 1 to C.R.C. 818; Central Vermont Tariff, C.R.C. 378; Rutland Tariff, C.R.C. 514; Michigan Central Tariff, C.R.C. 1887; Toronto, Hamilton & Buffalo Tariff, C.R.C. 935; C.P.R. Tariff, C.R.C. no. E-2410; C.P.R. Tariff, C.R.C. no. W-1592; Quebec Central Tariff, C.R.C. 76.

Paper and Woodpulp Rates.

21434. Mar. 3. Re application of Canadian Manufacturers Association complaining against the advanced minimum weights per car on paper, woodpulp, and woodpulp board published in C.P.R. Supplement 40 to its Tariff, C.R.C. no. E-2353, and G.T.R. Supplement 28 to its Tariff, C.R.C. no. E-2513, and order 21402, Feb. 24, 1914, suspending the increased minimum, as provided in the said supplements, for the present and pending investigation by the Board. Upon hearing the matter at the sittings of the Board held in Ottawa this date, the Canadian Manufacturers Association and the C.P.R. being represented at the hearing, and what was alleged; and upon the consent of the said parties, filed, it is ordered that order 21402, in so far as it suspends Supplement 40 to C.P.R.'s Tariff, C.R.C. no. E-2353, be rescinded. That Supplement 44 to C.P.R.

Tariff, no. E-2353, substituting revised minimum weights per car on paper, woodpulp, and woodpulp board, be lawfully in effect from and including Feb. 25, 1914. That, upon the publication and filing of a supplement to G.T.R. Tariff, C.R.C. no. E-2513, substituting similar revised minimum weights on the said commodities for the minimum weight of 40,000 lbs., shown in its Supplement 28, suspended by order 21402, the said order shall lapse and cease to be effective.

Railway Finance, Meetings, Etc.

Atlantic, Quebec and Western Ry.—E. B. Read, Temple Chambers, London, Eng., has been appointed trustee, in place of Hon. C. M. Knatchbull-Hugesson, under the debenture trust deed of June 26, 1905, between the New Canadian Co. and others as trustees. A copy of the indenture, showing Ry. Co.'s line, and the deficit to be provided the change of trustees, was filed with the Secretary of State at Ottawa, Mar. 4.

Canadian Northern Ry.—There has been deposited with the Secretary of State at Ottawa a trust deed securing an issue of the company's 30 year 4½% bonds at \$15,000 a mile on certain lines in Saskatchewan, and dated Feb. 1; and trust deeds supplementary to those dated Jan. 21, 1912; Feb. 10, 1914, and May 18, 1909, securing bond issues and the building of lines in Saskatchewan.

Dominion Atlantic Ry.—Intercolonial Ry.—The lease of the line from Windsor Jct. to Windsor, N.S., known as the Windsor branch of the Intercolonial Ry., to the Dominion Atlantic Ry., expired Dec. 31, 1913. The House of Commons was informed recently that the company had made application for a new lease, and that negotiations were in progress as to terms and conditions.

New Brunswick Coal and Ry. Co.—The New Brunswick Legislature has under consideration a bill providing for the consolidation of all the acts respecting the issue of debentures for the company. The company, on the completion of its line, took over the Central Ry. of New Brunswick and subsequently got into financial difficulties. The property was taken over by the New Brunswick Government, together with its liabilities, and considerable sums were expended on putting the line into good condition and in meeting deficits. The C.P.R. has secured a lease of it for operation in connection with the Fredericton and Grand Lake Coal and Ry. Co.'s line, and the deficit to be provided for up to the date when the C.P.R. entered into possession is \$67,260.49. The bill provides for the consolidation of all the amounts of debentures issued on account of the line and the provision of a special sinking fund for the discharge of the same.

Quebec Southern Ry.—The settlement of the affairs of the old Q.S. Ry. Co. is being proceeded with slowly. The Exchequer Court of Canada is calling upon the creditors of the East Richelieu Valley Ry. to file their claims by April 21. The E.R.V. Ry. was one of the small lines which were amalgamated under the title of the Q.S. Ry., and are now controlled by the Delaware and Hudson Co.

White Pass and Yukon Ry.—A London, Eng., cablegram, Mar. 7, stated that more than ordinary interest was being evinced in the issue of a loan of £70,000 by the company, to take the form of 6% secured notes, redeemable by drawings at par, until Nov., 1918, when the whole issue will be paid off.

Railway Route Map Approved.—The Department of Railways, on Feb. 24, approved the route map of the Kettle Valley Ry., from Siwash Creek to Otter Creek Summit, B.C., 63.5 miles.

Mainly About Transportation People.

J. C. STUART, Assistant to President, Erie Rd., died at Garden City, N.Y., Mar. 4, aged 53.

D'ARCY TATE, Vice President, Pacific Great Eastern Ry., returned to Victoria during March, after a trip to Great Britain.

G. W. STEPHENS, formerly Chairman of the Montreal Harbor Commissioners, is a candidate for the mayoralty of Montreal.

W. H. POOLE, formerly G.T.R. station master at London, and later at Niagara Falls, Ont., died at Niagara Falls, Mar. 13, aged 75.

G. H. STREVEL, one of the earliest railway contractors in Northwestern Canada, died at Portage la Prairie, Man., Mar. 17, aged 79.

J. E. HUTCHINSON, Manager, Canadian Northern Ry. Prince Edward Hotel, Brandon, Man., was on leave of absence for a month during March.

H. E. BEASLEY, General Superintendent, Esquimalt and Nanaimo Ry., Victoria, B.C., returned to duty, Mar. 9, after an absence of two weeks, due to illness.

The engagement is announced of J. J. ASHWORTH, Secretary and Assistant Manager, Canadian General Electric Co., Toronto, to Miss A. L. Cooke.

JAMES PRINGLE, who died at Stratford, Ont., Mar. 3, aged 83, was formerly in G.T.R. service, having been stationmaster of the first station there.

C. H. NICHOLSON, Manager, G.T. Pacific Coast Steamship Co., returned to Vancouver, B.C., at the end of February, after a six weeks trip in Eastern Canada.

ROBERT BRUCE, of Ottawa, Ont., succeeds the late George Brophy as Superintending Engineer of the Ottawa River works under the Public Works Department.

F. H. PHIPPEN, General Counsel, Canadian Northern Ry., Toronto, Mrs. Phippen and their daughter, left Toronto early in March to spend two or three weeks in Europe.

N. S. DUNLOP, Tax and Insurance Commissioner, and Claims Adjuster, C.P.R., Montreal, left there early in March for a trip through Florida and the Southern States.

Miss Helen McNicoll, daughter of D. McNicoll, Vice President, C.P.R., Montreal, has had two of her pictures accepted by the Royal Society of British Artists, for exhibition.

SIR THOMAS SHAUGHNESSY, with Lady Shaughnessy and family, were visitors at Atlantic City, N.J., during March. Sir Thomas returned to Canada after a few days absence.

SIR JOHN MURRAY, who was killed in Scotland, Mar. 16, in an automobile accident, was a brother of the late James Murray, at one time Superintendent, C.P.R., at Winnipeg.

A telegram to Ottawa, Mar. 16, reported that the HON. F. COCHRANE, Minister of Railways and Canals, who is in the south of France for the benefit of his health, was progressing favorably.

T. AHEARN, President, and J. D. FRASER, Director and Secretary-Treasurer, Ottawa Electric Railway, left Ottawa, Mar. 3, for a three weeks trip to Florida and other southern points.

J. O. BROWN, who died at Fredericton, N.B., recently, aged 71, was identified with the construction of various railway lines in New Brunswick, among them being the Northern, C.P.R., and Central of New Brunswick.

D. B. HANNA, Third Vice President, Canadian Northern Ry., addressed the Toronto Y.M.C.A.'s Finance Forum, on Mar. 3, on the effect of railways on the civilization of new countries.

H. B. YEWDALL, one of the purchasing agents in the Right of Way Department, C.P.R., Winnipeg, was presented with a silver tea service by the local staff, on his marriage recently.

CARL R. GRAY, whose resignation as President, Great Northern Ry., St. Paul, Minn., was reported in our last issue, has been appointed President, Western Maryland Ry., Baltimore, Md.

J. S. DENNIS, Assistant to the President, C.P.R., in charge of the Natural Resources Department at Calgary, Alta., addressed the members of the Calgary Ad. Club, Mar. 11, on the colonization of Western Canada.

SIR THOMAS TAIT, formerly Chairman of the Victorian State Railway Commission,



D. M. Crawford,
Commercial Agent, Grand Trunk Ry.,
Pittsburgh, Pa.

addressed the Canadian Railway Club in Montreal, Mar. 10, on Australia, with special reference to its railway system.

D. B. HANNA, Third Vice President, Canadian Northern Ry., Toronto, is shown by the Directory of Directors, published in London, Eng., to be a director of 30 companies. Only 17 persons are shown to be directors of more than 22 companies each.

H. G. McMICKEN, formerly of Winnipeg, whose appointment as European Traffic Agent, Great Northern Ry. (U.S.A.), in London, Eng., ceased at the end of 1913, has established a general steamship ticket agency at 64 Haymarket, London.

W. K. BIXBY, Receiver of the Wabash Rd., has resigned on account of poor health. He is the second of the three receivers to resign recently, F. A. Delano having withdrawn to become President of the Chicago, Indianapolis & Louisville Ry. E. B. Pryor is now sole receiver.

G. E. FAIR, Managing Director and Secre-

tary Treasurer, Farrar Transportation Co., Collingwood, Ont., was presented with a cabinet of silverware and an address by a number of local citizens, on his leaving for Toronto, where the head office of the company has been moved to.

E. G. TRUMP, Chief Dispatcher, District 2, Manitoba Division, C.P.R., Winnipeg, was presented with a gold watch and a travelling bag, with a cut glass bowl for his wife, by the local dispatching staff, Mar. 6, on his transfer to Moose Jaw, Sask., as Chief Dispatcher, District 2, Saskatchewan Division.

A. C. GALBRAITH, General Superintendent of Construction, Edmonton, Dunvegan and British Columbia Ry., is being sued at Edmonton, Alta., by G. G. Whyte, a contractor, for \$5,000 for damages alleged to have been sustained through being forcibly ejected from the railway office recently.

C. E. JENNEY, who has been appointed General Agent, Passenger Department, G.T.R., G. T. Pacific Ry., and G. T. Pacific Coast Steamship Co., Vancouver, B.C., was presented with a purse of money by a number of his associates, Mar. 7, on his leaving Toronto, where he was City Passenger and Ticket Agent, G.T.R.

H. D. STOKER, who has been appointed Westbound Traffic Agent, Manchester Liners, Ltd., Montreal, was born in England, and has been in C.P.R. Steamships service for the past six years, three of which were in Vancouver, B. C., and the remainder in the Vice President's office in Montreal.

STEPHEN BURROWS, of Belleville, Ont., who, among other things, is city ticket agent, C.P.R., there, has organized Burrows of Belleville, Limited, which has been incorporated under the Ontario Companies Act with an authorized capital of \$50,000, to acquire and carry on his insurance, express and ticket agencies, etc.

A. BUTZE, Assistant Secretary and Purchasing Agent, National Steel Car Co., Hamilton, Ont., died at St. Louis, Mo., Mar. 3. He was born at Quincy, Ill., in 1845, and entered G.T.R. service in 1896, and retired in Jan., 1912, when General Purchasing Agent at Montreal. Prior to entering G.T.R. service he had served with the Wabash Rd., Missouri Pacific Ry., and the Monon Route, and had been in the general railway supply business.

T. S. SCOTT, President and Manager of Columbia Bitulithic, Limited, has resigned to practice as consulting engineer at Vancouver. He is a graduate of Queens University, Kingston. His experience includes contract work in connection with Niagara Falls power construction, maintenance on the Grand Trunk, and the Timiskaming and Northern Ontario Ry., and municipal work as principal assistant to the City Engineer of Toronto.

A. K. LEIGHS, whose appointment as Car Foreman, G.T. Pacific Ry., McBride, B.C., was announced in our last issue, was born in Great Britain, Mar. 6, 1883, and entered railway service Oct., 1908, since when he has been, to Nov., 1909, leading hand, C.P.R., Winnipeg; Nov., 1909, to Feb., 1911, Assistant Night Foreman, C.P.R., Winnipeg; Feb., 1911, to Feb., 1912, Night Foreman, C.P.R., Winnipeg; May to Aug., 1912, car repairer, G.T. Pacific Ry., Edson, Alta.; Aug., 1912, to Jan., 1913, Car Inspector, same road, Edson, Alta.; Jan., 1913, to Feb., 1914, air brake man, same road, Edson, Alta.

H. M. POTTICARY, whose appointment as Soliciting Freight Agent, Canadian Northern Ry., Montreal, was announced in our last issue, was born at Wallaceburg, Ont., Sept. 11, 1888, and entered railway service, June 20, 1904, since when he has been, to

May 31, 1906, yard clerk, night clerk, and chief clerk, consecutively, Toronto, Hamilton and Buffalo Ry., Hamilton, Ont.; June 1, 1906, to Oct. 13, 1912, billing clerk, claims, abstract and accounting clerk and joint cashier C.P.R. and T.H. & B.R., Hamilton, Ont.; Oct. 14, 1912, to Jan. 31, 1914, Soliciting Freight Agent, Canadian Northern Ry., Toronto.

ALPHONSE J. DONEGAN, who has been appointed Superintendent, Algoma Eastern Ry., Sudbury, Ont., was born at Perth, Ont., Feb. 17, 1882, and entered transportation service June 1, 1899, since when he has been, to May 1, 1900, freight clerk, C.P.R., London, Ont.; May 1, 1900, to Mar. 15, 1901, billing clerk, Dominion Express Co., London, Ont.; Sept. 1, 1910, to Mar. 15, 1911, storekeeper, Lake Superior Iron and Steel Co., Magpie Mine, Ont.; Mar. 15, 1911, to Oct. 15, 1913, Assistant Superintendent, Algoma Central and Hudson Bay Ry., Michipicoten, Ont.; Oct. 15, 1913, to Mar. 1, 1914, Superintendent, same road, Hawk Jct., Ont.

SYDNEY E. DEWEY, whose appointment as Commercial Agent, All Rail Lines, G.T.R., New York, was announced in our last issue, was born at Beckenham, Kent, Eng., July 4, 1879, and entered G.T.R. service, Jan. 1, 1896, since when he has been, to May 10, 1893, clerk, Division Freight Office, Toronto; May 10, 1903, to Mar. 1, 1904, Soliciting Freight Agent, Hamilton, Ont.; Mar. 1, 1904, to Apr. 16, 1906, Travelling Freight Agent, Hamilton, Ont.; Apr. 16, 1906, to Jan. 14, 1907, Contracting Freight Agent, New York; Jan. 14, 1907, to Oct. 23, 1911, Travelling Freight Agent, New York; Oct. 23, 1911, to Feb. 16, 1914, Commercial Agent, Pittsburgh, Pa.

DON MATTHEWS CRAWFORD, whose appointment as Commercial Agent, G.T.R., Pittsburgh, Pa., was announced in our last issue, was born at South Bend, Ind., May 28, 1886, and entered railway service, Sept. 1, 1901, since when he has been, to Mar. 1, 1903, clerk and stenographer, Freight and Passenger Departments, Chicago Great Western Ry., Pittsburgh, Pa.; Mar. 1, 1903, to June 1, 1905, similar position, Seaboard Air Line Ry., Pittsburgh, Pa.; Oct. 1 to Nov. 5, 1905, stenographer, Freight and Passenger Departments, Pittsburgh and Lake Erie Rd., Pittsburgh, Pa.; Nov. 5, 1905, to Nov. 1, 1909, stenographer and clerk, G.T.R., Pittsburgh, Pa.; Nov. 1, 1909, to Feb. 16, 1914, Travelling Freight Agent, G.T.R., Pittsburgh, Pa.

HAMILTON McMURRAY KILLALY, B.A.Sc., M. Can. Soc. C.E., who died at Montreal, Mar. 18, was born at St. Joseph, Mo., July 25, 1871, and graduated from McGill University. During 1897 he was in charge of the construction of a section of the C.P.R. at Crowsnest, B.C.; 1897 to 1898, Resident Engineer on construction, Kootenay Valley Ry.; 1899, Resident Engineer on construction, Erie and Detroit Rd.; and in the same year in charge of a locating party, Algoma Central and Hudson Bay Ry.; 1902 to 1906, Assistant Engineer, in charge of certain location and reconnaissance work, C.P.R.; 1906 to Aug., 1913, Engineer of Surveys, in charge of surveys and location, Eastern Lines, C.P.R., Montreal; Aug., 1913, to the date of his death, Engineer of Construction, Canadian Government Railways, Moncton, N.B.

FREDERICK GEORGE WOOD, whose appointment as Commercial Agent, Canadian Northern Ry., St. Louis, Mo., was announced in our last issue, was born at Toronto, Sept. 15, 1890, and entered railway service in 1906, since when he has been, to 1908, clerk, District Freight Agent's office, G.T.R., Toronto; 1908 to 1909, clerk, General Freight and Passenger Agent's office, Canadian Northern Ry., Toronto; 1909 to Aug., 1910, secretary to General Freight and Passenger Agent,

C.N.R., Toronto; Aug., 1910, to Feb., 1911, chief clerk, District Freight Agent, G. T. Pacific Ry., Edmonton, Alta.; Feb. to Apr., 1911, secretary to General Traffic Manager, Canadian Northern Ry., Toronto; Apr., 1911, to June, 1912, Contracting Freight Agent, C.N.R., Pittsburgh, Pa.; June, 1912, to Feb., 1914, Travelling Freight Agent, C.N.R., Pittsburgh, Pa.

WILLIAM APPS, who died at Toronto, Mar. 21, aged 66, was born at Helston, Cornwall, England, and was, from May, 1881, to Oct., 1887, General Foreman, Car Department, St. Paul, Minneapolis and Manitoba Ry.; Oct., 1887, to May, 1891, Master Car Builder, Western Ry. of Alabama and Atlantic and West Point Ry.; June to Sept., 1891, Master Car Builder, Chicago and Eastern Illinois Rd.; Oct., 1891, to Dec., 1895, Master Car Builder, Illinois Central Rd., Chicago, Ill.; Dec., 1895, to Sept., 1902, Master Car Builder, C.P.R., Montreal; Sept., 1902, to 1906, Master Car Builder, Algoma Central and Hudson Bay Ry., Sault Ste. Marie, Ont. He subsequently engaged in building operations in Toronto, which he later discontinued owing to failing eyesight, becoming totally blind about a year ago. J. O. App's, General Baggage Agent, C.P.R., Montreal, is a son.

ROBERT GRANT THACKRAY, whose appointment as chief clerk and Auditor, Midland Ry. of Manitoba, Winnipeg, was announced in our last issue, was born at Ottawa, Ont., May 23, 1889, and entered railway service in June, 1910, since when he has been, to Oct., 1910, clerk in Freight Claims Department, C.P.R., Winnipeg; Oct., 1910, to June, 1911, clerk, Local Freight Office, C.P.R., Regina, Sask.; June to Sept., 1911, clerk, Superintendent's office, C.P.R., Moose Jaw, Sask.; Sept., 1911, to June, 1912, railway claims clerk in private business, Moose Jaw, Sask.; June to Sept., 1912, clerk, District Freight Office, Canadian Northern Ry., Winnipeg; Sept. to Nov., 1912, clerk, General Freight Office, G.T. Pacific Ry., Winnipeg; Nov., 1912, to Feb. 1, 1914, clerk in Manager's office, Winnipeg Joint Terminals, C.N.R. and G.T.P.R.

CECIL WRAY JOHNSTON, whose appointment as Assistant to the Passenger Traffic Manager, G.T.R., Montreal, was announced in our last issue, was born at Actonvale, Que., July 27, 1879, and entered G.T.R. service Sept. 1, 1897, since when he has been, to Mar. 8, 1900, operator and agent at Richmond, Que.; Berlin, Ont.; Island Pond, Vt.; and Sherbrooke, Que., consecutively; Mar. 9, 1900, to June 21, 1901, clerk to Auditor of Freight Accounts, Montreal; June 22, 1901, to June 25, 1902, ticket clerk, Montreal; June 26, 1902, to Dec. 31, 1904, Travelling Passenger Agent, Montreal; Jan. 1, 1905, to Feb. 15, 1907, excursion clerk, General Passenger Agent's office, Montreal; Feb. 16, 1907, to May 10, 1909, Travelling Passenger Agent, Montreal; May 11, 1909, to Jan. 31, 1912, chief clerk, General Passenger Agent's office, G. T. Pacific Ry., Winnipeg; Feb. 1, 1912, to May 25, 1913, chief clerk, Assistant Passenger Traffic Manager's office, G.T.R., Montreal; May 26, 1913, to Feb. 15, 1914, chief clerk, Passenger Traffic Manager's office, Montreal.

W. E. DUPEROW, who has been appointed Assistant General Passenger Agent, G.T. Pacific Ry., Winnipeg, was born at Stratford, Ont., Sept. 4, 1872, and entered transportation service Nov. 3, 1893, since when he has been, to Oct. 15, 1894, in G.T.R. service at Seaforth, Ont.; Oct. 15, 1894, to June 1, 1896, ticket clerk, G.T.R., London, Ont.; June 1, 1896, to July 11, 1898, ticket clerk, G.T.R., Toronto; July 11, 1898, to Aug. 1, 1899, theatrical and excursion clerk, General Passenger Agent's office, G.T.R., Toronto; Aug. 1, 1899, to Apr. 19, 1902, chief clerk, same office; Apr. 19, 1902, to Feb. 15,

1907, General Manager, Secretary and Treasurer, Huntsville, Lake of Bays and Lake Simcoe Navigation Co., Huntsville, Ont.; Feb. 15, 1907, to June 1, 1910, Travelling Passenger Agent, G.T.R., Toronto; June 1, 1910, to Apr. 15, 1912, City Passenger and Ticket Agent, G.T.R. and G.T. Pacific Ry., Victoria, B.C.; Apr. 15, 1912, to Mar. 1, 1914, General Agent, Passenger Department, G.T.R., G.T.P.R. and G.T.P. Coast Steamship Co., Vancouver, B.C.

In our March issue it was stated that J. ALEXANDER HUTCHISON, M.D., had resigned his position as Chief Medical Officer, G.T.R. and G. T. Pacific Ry., and had been appointed Senior Surgeon of the Montreal General Hospital. Dr. Hutchison has not resigned his positions with the G.T.R. and G. T. Pacific Ry., but has, as stated in "Transportation Appointments throughout Canada," in our March issue, resigned as Chief Surgeon of the Central Vermont Ry., owing to pressure of work. He is still Chief Medical Officer of the G.T.R., which position he has held since 1891. During the whole of that time he has been a surgeon to the Montreal General Hospital. As Professor of Surgery and Clinical Surgery in McGill University, he has held the senior teaching surgical service in the hospital for some years, although not the senior in point of appointment or age. The recent resignation of Dr. Shepherd from the hospital staff, while not making any alteration in Dr. Hutchison's position or duties, makes his tenure of office longer than that of any other surgeon on the staff. There is no such position officially as Senior Surgeon on the hospital staff.

ROBERT McCHESNEY SMITH, who has been appointed City Passenger and Ticket Agent, G.T.R. and G. T. Pacific Ry., Detroit, Mich., was born at Milford, Mich., Sept. 14, 1851, and entered railway service, Aug. 9, 1871, since when he has been, to 1875, in general ticket office, Chicago, Rock Island and Pacific Rd., Chicago, Ill.; 1875 to 1876, City Ticket Agent, same road, Chicago, Ill.; 1876, in city ticket office, P. Ft. W. & C. R., Chicago, Ill.; 1876 to 1878, Travelling Agent, same road, Chicago, Ill.; 1878 to Apr., 1883, Travelling Agent and General Travelling Agent, Chicago, Rock Island and Pacific Rd., Chicago, Ill.; Apr., 1883, to 1888, Travelling Passenger Agent, Chicago, Burlington and Quincy Rd., Columbus, O.; 1888 to 1891, same position, Cleveland, O.; 1891 to Apr., 1893, same position, Detroit, Mich.; Apr. to Dec. 24, 1893, Traffic Manager, multiple speed and traction railway in the World's Fair, Chicago, Ill.; Apr., 1894, to May, 1896, Travelling Passenger Agent, G.T.R., Detroit, Mich.; May to Aug., 1896, in General Passenger Agent's office, G.T.R., Montreal; Aug., 1896, to Mar., 1902, Southern Passenger Agent, G.T.R., Cincinnati, O.; Mar., 1902, to June 1908, same position, Detroit, Mich.; June, 1908, to Feb. 16, 1914, Special Passenger Agent in charge of exhibition work, G.T.R., Montreal.

LOUIS CHARLTON FRITCH, who has been appointed Assistant to the President, Canadian Northern Ry., was born at Springfield, Ill., Aug. 1867. He took a course in civil engineering at the University of Cincinnati, and subsequently a law course, and was admitted to the bar in Ohio. He entered railway service in 1884, as supervisor's assistant, Ohio and Mississippi Ry., and was, from Jan. 1, 1886 to Oct. 1892, Assistant Engineer, same road; Oct. 1892 to Nov. 1, 1893, Engineer Maintenance of Way, same road, and was also Chief Engineer in charge of construction, Cincinnati and Bedford Ry.; Nov. 1, 1893, to Sept. 1, 1899, Division Engineer, Baltimore and Ohio Southwestern Rd., which absorbed the Ohio and Mississippi Ry.; Sept. 1, 1899, to Nov., 1902, Superintendent, Mississippi Division, same road; Feb.,

1904, to Mar. 1, 1905, engaged on special work, Illinois Central Rd., Chicago, Ill.; Mar. 1, 1905, to Nov., 1906, Assistant to General Manager, same road; Nov., 1906, to Mar. 1, 1909, Assistant to President, same road; Mar. 1 to Nov. 15, 1909, Consulting Engineer, same road; Nov. 15, 1909, to Mar. 31, 1914, Chief Engineer, Chicago Great Western Rd., Chicago, Ill. He was President, American Railway Engineering Association for the year 1909-10.

GEORGE SPENCER, whose appointment as Chief Operating Officer, Board of Railway Commissioners, Ottawa, was announced in our last issue, was born in London, England, Feb. 21, 1865, and entered railway service July 1, 1880, since when he has been, to Sept. 1, 1880, assistant agent, Toronto, Grey and Bruce Ry., Dundalk, Ont.; Sept. 1, 1880, to Mar., 1881, assistant agent, same road, Markdale, Ont.; Mar. to July, 1881, agent, same road, Waldemar, Ont.; July, 1881, to Oct. 1, 1882, telegraph operator, same road, Toronto; Oct. 1, 1882, to Nov., 1883, dispatcher, same road, Toronto; Nov., 1883, to June, 1884, dispatcher, Ontario and Quebec Ry., Toronto; June, 1884, to Aug. 15, 1887, dispatcher, C.P.R., Toronto; Aug. 15, 1887, to Oct. 1, 1889, dispatcher, C.P.R., Smiths Falls, Ont.; Oct., 1889, to Oct., 1891, dispatcher, C.P.R., Toronto; Oct. 1, 1891, to Nov., 1892, Chief Dispatcher, C.P.R. Smiths Falls, Ont.; Nov., 1892, to Feb., 1898, Trainmaster and Chief Dispatcher, C.P.R. Smiths Falls, Ont.; Feb., 1898, to May 1, 1901, Chief Dispatcher, C.P.R., Smiths Falls, Ont.; May 1, 1901, to May 25, 1903, Chief Dispatcher, C.P.R., Toronto; May 25, 1903, to Nov. 30, 1906, Superintendent, District 1, Ontario Division, C.P.R., Toronto; Dec. 1, 1906, to Jan. 1, 1911, Superintendent, District 1, Lake Superior Division, C.P.R., North Bay, Ont.; Jan. 1, 1911, to Sept. 1, 1913, Superintendent, same district, Sudbury, Ont.; Sept. 1, 1913, to Jan. 31, 1914, Assistant Chief Operating Officer, Board of Railway Commissioners, Winnipeg.

Quebec Bridge.—The foundations for the new Quebec Bridge, particularly the details of the shore piers, were discussed by C. N. Monsarrat, M. Can. Soc. C.E., Chairman and Chief Engineer, Quebec Bridge Commission, before the Toronto branch of the Canadian Society of Civil Engineers, Feb. 25. The lecture was illustrated by slides. Mr. Monsarrat also addressed the Canadian Club, in Montreal, Mar. 2, when the whole bridge was described in a general way, the address being also illustrated with slides. This latter address, being of a general nature to appeal to a non-technical audience, was replete with comparisons with many local landmarks with which the citizens of Montreal are familiar, thereby forcing home the immensity of the project.

Locking of Main Track Switches.—The Board of Railway Commissioners has issued a circular drawing railway officials' attention to the fact that it has from time to time received returns of a number of accidents resulting in serious, and sometimes fatal, injury to employes and passengers, as a result of non-compliance with par. 4 of rule 104, which reads as follows:—"Main track switches must be locked and other switches secured. After a switch is turned, the points must be examined to know that they are in proper position." The circular asks that such action be taken as will ensure strict compliance with the requirements of paragraph quoted.

F. C. WOOD, Commercial Agent, Canadian Northern Ry., St. Louis, Mo., writes:—"I have been reading the Canadian Railway and Marine World for some years and find the articles contained therein most interesting."

Canadian Northern Railway Construction, Betterments, Etc.

Canadian Northern Quebec Ry.—Press reports state that the company is preparing to erect a large coal discharging plant at Quebec and to extend its coal wharf 150 ft.

Mount Royal Tunnel and Terminal Co.—Work was started Mar. 10 on Cathcart St., Montreal, sinking a shaft to the level of the tunnel for the purpose of assisting to get in construction material.

The clearing of the buildings on the blocks bounded by Cathcart, Ste. Monique, Lagachetiere and Mansfield Streets is being pushed forward. The tenants of the buildings on the north side of Dorchester St., which have been acquired by the company for its terminals in the city, have been notified to leave. It is expected that excavation for the terminals will be started at an early date. The area will be excavated to 50 ft. below the ground level, involving the moving of over 500,000 cubic yards of earth and 95,000 cubic yards of rock. It is estimated that there will be required in the construction of the terminal buildings 100,000 cubic yards of concrete, 3,500,000 lbs. of reinforcing steel, and 8,000,000 lbs. of structural steel.

Montreal-Ottawa-Port Arthur Line.—Press reports state that grading on the unfinished portion of the Ottawa-Capreol section of the line is expected to be completed about Sept. 1 and the track laying finished Dec. 30.

Canadian Northern Ontario Ry.—The New York State Legislature has under consideration a bill for the incorporation of the Niagara-Ontario Connecting Bridge Co. to build a bridge across the Niagara River from Lewiston, N.Y., to the Canadian shore, for electric and steam railways. The incorporators are:—E. G. Connette, H. Holden, C. L. Ingham, F. A. Dudley, L. Albright. It is reported that Canadian Northern Ry. interests are associated with this project.

Canadian Northern Ry.—H. K. Wicksteed, M. Can. Soc. C.E., Chief Engineer of Surveys, Mackenzie, Mann & Co., and a representative of the company's legal staff had an interview with the Port Arthur City Council, Mar. 10, to discuss and settle various matters connected with the eastern entrance of the railway and the closing of certain street ends. An agreement is said to have been arrived at as to the closing of the streets, but the matter of the eastern entrance is to be further considered.

Press reports state that the company has under consideration plans for the erection of a new storage shed for incoming freight in the south section of Port Arthur.

It is reported that a new station is to be erected at Kakabeka Falls, Ont., during the summer.

The new station at St. Boniface, Man., has been opened for business.

Press reports state that a number of new sidings are to be put in at the quarries of the Manitoba Gypsum Co. at Gypsumville, Man., during the summer.

It is reported that a spur line is to be built from Radville, on the Maryfield branch, northerly to Weyburn, Sask.

Plans have been deposited in the Land Titles offices at Moose Jaw, Sask., and at Saskatoon, Sask., showing the right of way of the C.N.R. as located through tps. 26-28, ranges 26-29, west of the 3rd meridian.

Press reports state that the company will start construction this year on a line from Brudethelm to Vermillion, thence to Wainwright, and through Medicine Hat to the International boundary between Alberta and Montana. This line is one of the projected lines of the C.N. Western Ry., for the building of which an issue of bonds, guaranteed by the Province of Alberta, was recently

placed on the London, Eng., market. A press report states that a contract for building branch lines in Alberta has been let to Foley, Welch and Stewart, Spokane, Wash.

A train service has been put in operation out of Calgary on the newly completed line south from Vegreville, which is joined near Drumheller by a line from Saskatoon, Sask. At present only one station has been opened between Calgary and Drumheller.

Press reports state that it is expected to have about 20 miles of the line south from Calgary to Lethbridge open for traffic this year.

The line from Onoway, Alta., to the Peace River country is completed to the Pembina River, over which a large bridge is under construction. Grading has been completed for a considerable distance beyond the Pembina River. A. T. Fraser, district engineer in charge of construction, was in Edmonton, Mar. 14, and is reported to have stated that considerable further grading will be done during this year.

Canadian Northern Pacific Ry.—The British Columbia Legislature has granted further aid, by means of a guarantee of bonds, for the construction of this railway. The act sets out that in addition to the bonds guaranteed under chap. 3 of the statutes of 1910, the Government is authorized to affix the provincial guarantee to the company's bonds as to principal and interest for \$10,000 a mile for the line from the south end of New Westminster bridge to the Yellowhead Pass, 500 miles, and for a line from the north end of the New Westminster bridge to the terminals in Vancouver, 11 miles. The interest on this further issue of bonds is not to exceed 4½%, and the principal is payable April 2, 1950. These bonds are to be secured by a mortgage on the lines mentioned, and are to rank next after the bonds guaranteed under the act of 1910. The act also grants an extension of time to July 1, 1916, for the completion of the lines.

In support of the act the Premier informed the Legislature, Feb. 27, that 16 of the steel bridges across the Fraser and Thompson Rivers, having a total length of 12,214 ft., have been completed. There are still 19 bridges, having an average length of 224 ft., to be completed. The total construction cost of the line is now put at \$33,029,200, or about \$8,000,000 more than the original estimates. This is accounted for by the high standard of construction required and the increased cost of labor and materials. The extension of time granted applies only to the Okanagan and another branch line, as it is expected to have the main line finished this year.

T. G. Holt, executive agent, is reported to have stated at Ottawa, Mar. 12, that track would be laid on the entire line from the Yellowhead Pass to Vancouver by August.

Vancouver Island Lines.—Referring to the construction of the line on Vancouver Island, the Premier is reported to have said in the Legislature, Feb. 27, that the line from Patricia Bay to Alberni is expected to be completed by the end of this year, although, under the act, the time for completion has been extended to July, 1915. (Mar., pg. 126.)

The ninth annual dinner of the G. T. R. apprentices at the Stratford locomotive shops was held in the G.T.R. Assembly Hall, Stratford, Ont., Mar. 23, R. Patterson, Master Mechanic, occupying the chair. H. G. Kelley, Vice President, and W. D. Robb, Superintendent of Motive Power, were also present.

Canadian Pacific Railway Construction, Betterments, Etc.

Ontario Division.—Tenders are under consideration for the excavation, masonry and concrete work in connection with the double tracking of the bridge across the Humber River at Lambton. The line across this bridge is the only piece of single track between Toronto and Guelph Jct., and all trains have to stop just before reaching it, in order to obtain a clearance order. Gangs of men have been at work since Mar. 1 preparing for the starting of work on the substructure.

The question when the C.P.R. will start work on the union station for itself and the Canadian Northern Ry. in North Toronto depends very much on what action the Toronto City Council takes with regard to the project for widening Yonge St. The station plans are said to have been completed.

Lake Superior Division.—Press reports state that in all about 120 miles of second track work are being put in hand this season, west of Sudbury, on the Lake Superior Division. The building of second track on this division has been in progress for about three years. The work done to date consists of the building of short stretches of second track at various points along the line; and the improvement of alignment and the reduction of gradients, by the building of short lengths of new double track. This work is being continued along these lines, and in due course the various stretches will be connected up in one continuous second track.

The Board of Railway Commissioners has approved plans for the revision of gradients and alignment between a number of points on the Webbwood and Algoma subdivisions.

Saskatchewan Division.—A contract has been let to Dutton and Timson, Winnipeg, for grading on 13 miles of line, 15 miles southwest from Expanse, Sask. Expanse is about 34 miles southwest of Moose Jaw, at the terminus of a branch. The extension will connect up with the line southeasterly from Swift Current, which now has its terminal at Vanguard. The contract involves about 300,000 cubic yards of earthwork.

Press reports state that engineers are on the field making surveys for a line from Instown to Swift Current.

Tenders were received by the Division Engineer, Moose Jaw, to April 1, for the supply of labor and material and to complete all work in connection with the erection of concrete pier and abutments for two steel spans and trestle approach on the line at 8th Ave. West, Moose Jaw; and for the trenching and back filling 8 in. steel pipe line from sec. 9, tp. 84, range 22, west of the 2nd meridian, to Lanigan, Sask., 4.6 miles.

Alberta Division.—A train service is being operated on the Weyburn-Lethbridge line as far west as Shaunavon, Alta. A service has also been put in operation on the Sufield-Retlaw branch as far as Blackie, 57 miles; this is an extension of the service previously in operation to mileage 26.

Rogers Pass Tunnel.—George Bury, Vice President, was in New York recently in connection with the proposed electrification of the double track, 5½ mile tunnel which is being driven in the Selkirk Range. Westinghouse, Church, Kerr & Co. have been retained by the company as engineers to investigate and report on the type of system to be installed, the relative economies of steam and water power, and the effect of the electrification upon operating conditions.

Local press reports state that about six miles of the line on either side of the tunnel will be electrified. There are a number of water powers in the vicinity, any one of

which might be utilized to develop power for the operation of the tunnel and approaches.

Kootenay Central Ry.—The Board of Railway Commissioners has approved location plans from mileage 91.85 to 94.81.

Pacific Division.—Press reports state that the company will erect a large storage oil tank at Port Moody, B.C., adjoining which will be a pumping station, that a pipe line will connect the oil tank with the service tanks at Coquitlam, and that a wharf is to be built in connection, so that the oil steamships may lie alongside.

Rapid progress is being made with the erection of the new station at Vancouver, and press reports state that it is expected to have it completed early in May. (Mar., pg. 123.)

Railway Rolling Stock Notes.

The Intercolonial Ry. has ordered 10 Pacific locomotives from Montreal Locomotive Works.

The Canadian Furnace Co. has ordered 2 all steel dump cars, 50 tons capacity, from Eastern Car Co.

The G.T.R. has received 250 box cars from Eastern Car Co., and 61 box cars from Western Steel Car and Foundry Co.

The C.P.R., between Feb. 15 and Mar. 15, received 121 steel frame box cars from its Angus Shops, and 376 steel frame box cars from Canadian Car and Foundry Co.

The Robert McNair Shingle Co., Vancouver, B.C., has ordered a saddle tank locomotive, with cylinders 13½ ins. diam. by 18 ins. stroke, and 70,000 lbs. in working order, from Canadian Locomotive Co.

The Asbestos and Asbestic Co., Asbestos, Que., has ordered a saddle tank locomotive, with cylinders 13 ins. diam. by 16 ins. stroke, and weight in working order 54,000 lbs., from Canadian Locomotive Co.

The Canadian Northern Ry., between Feb. 14 and Mar. 13, received the following additions to rolling stock:—3 first class cars from Canadian Car and Foundry Co.; 25 box cars from National Steel Car Co., and 5 switching locomotives from Canadian Locomotive Co.

Baldry, Yerburgh and Hutchinson, St. Catharines, Ont., who have a contract on the construction of the Welland Ship Canal, have ordered a saddle tank locomotive, with cylinders 15 ins. diam. by 22 ins. stroke, and 80,000 lbs. weight in working order, from Canadian Locomotive Co.

With reference to the recent press reports that the G.T.R. was about to place gas electric cars in service on its Galt and Elmira Branch, Ont., we are officially advised that no such decision has been arrived at. Residents of the district are agitating for a more frequent service and have suggested that the branch be electrified.

The C.P.R., between Feb. 15 and Mar. 15, ordered the following additions to rolling stock:—18 steel frame box cars, 2 vans, 1 stock car, 1 freight refrigerator car, 2 all steel mail and express cars, 60 ft. long, from its Angus Shops; and 40 all steel Otis ore cars from Hart-Otis Car Co., which will be built by Canadian Car and Foundry Co.

The Intercolonial Ry. has received 125 box cars, 60,000 lbs. capacity, from Canadian Car and Foundry Co.; 6 vans from Nova Scotia Car Works; 4 first class passenger cars from Preston Car and Coach Co.; 2 switching locomotives from Canadian Locomotive Co., and 3 consolidation

locomotives from Canadian Allis-Chalmers, Ltd.

The Montreal Harbor Commissioners have ordered 15 Otis type all steel general service cars from Hart-Otis Car Co., to be built by the Canadian Car and Foundry Co. Following are the principal dimensions:—

Capacity	50 tons
Length over end sills	38 ft. 9 ins.
Length inside	36 ft. 9½ ins.
Width over all	9 ft. 11¼ ins.
Width inside	9 ft. 6 ins.
Height inside	5 ft.
Height from rail	9 ft. 4 13-16 ins.
No. of doors on each side	6

Following are the principal dimensions of the 40 Otis general service ore cars which the C.P.R. has ordered from Hart-Otis Car Co., and which will be built by Canadian Car and Foundry Co.:—

Capacity	50 tons
Length inside	22 ft. 5 ins.
Width over all	9 ft. 11¼ ins.
Width inside	9 ft. 6 ins.
Height inside	5 ft.
Height from rail	9 ft. 4 13-16 ins.
No. of doors on each side	4

The Pacific Great Eastern Ry. has ordered two consolidation locomotives, with superheaters, from Canadian Locomotive Co. Following are the chief details:—

Weight on drivers	156,000 lbs.
Weight in working order, total	176,000 lbs.
Wheel base, rigid	16 ft.
Wheel base, total	24 ft.
Wheel base, engine and tender	60 ft.
Heating surface, firebox	188 sq. ft.
Heating surface, tubes	2,500 sq. ft.
Heating surface, total	2,688 sq. ft.
Driving wheels, diam.	57 ins.
Driving wheel centres	Cast steel
Driving journals, diam. and length	9 by 12 ins.
Cylinders, diam. and stroke	21 by 28 ins.
Boiler, type	Extended wagon top, radial stays
Boiler, pressure	180 lbs.
Tubes, no. and diam.	158—2 ins.; 22—5½ ins.
Tubes, length	14 ft.
Injectors	Ohio
Safety valves	Star
Brakes	Westinghouse American
Superheater	Locomotive Superheater Co., Schmidt A
Weight of tender, loaded	144,000 lbs.
Length over end sills	24 ft. 4½ ins.
Capacity, fuel	2,500 imp. galls.
Truck	Equalizer type
Truck wheel, diam.	33 ins.
Truck wheel, type	Steel tired
Journals, diam. and length	5½ by 10 ins.
Brake beams	M.C.B. 2
Capacity, water	6,000 imp. galls.

F. P. Gutelius' Salary, Citizenship, etc.—In the House of Commons, Mar. 4, the acting Minister of Railways, Dr. J. D. Reid, stated, in answer to questions, that F. P. Gutelius, now General Manager Canadian Government Railways, was appointed Jan. 29, 1912, as one of the commissioners to investigate matters connected with the National Transcontinental Ry. construction, that he commenced his duties as commissioner Feb. 1, 1912, his salary being \$65 a day, which was paid up to May 1, 1913, when he was appointed to his present position. He was naturalized as a British subject in Montreal, Feb. 23, 1912. His salary as General Manager, Canadian Government Railways, is \$20,000 a year, his engagement being for two years from May 1, 1913, and thereafter during the Minister's pleasure.

Marker Light Sockets on Cabooses.—The Board of Railway Commissioners has issued a circular drawing railway officials' attention to the fact that several accidents have happened recently whereby trainmen have been injured while in the act of putting up or taking down marker lights on cabooses, and asking whether railway companies have any, and, if so, what, objection to an order being issued requiring that where cabooses are equipped with marker sockets in the lower position, markers be carried in such lower sockets; that all cabooses hereafter constructed be equipped with marker sockets in the lower position; that all cabooses now in use not equipped with marker sockets in the lower position be so equipped on or before Nov. 1.

National Transcontinental Railway Construction.

The expenditure on the eastern division, to Dec. 31, 1913, exclusive of interest, was stated by the acting Minister of Railways in the House of Commons recently to have been \$140,562,147, and the estimated cost of completing the line is \$20,745,653. The cost to the Government of the old Quebec Bridge was \$6,424,781; the cost of the Royal Commission as to the bridge was \$31,765.44; the expenditure to date on the reconstruction of the bridge is \$4,889,318.03, and the estimated cost of the completion of the same is \$12,000,000. On account of the N. T. Ry., \$41,966,890 has been paid out of borrowings, and the remainder out of revenue. The whole cost is a charge to capital account irrespective of the source from whence derived.

A few days previously, the acting Minister of Railways, in giving similar figures, added that \$2,448,867 was due to contractors on account of work done. The estimated amount required to complete the line is \$18,296,786. The cost of locomotive and freight car shops, but not passenger car shops, at Winnipeg, 16 roundhouses, seven being with machine shops, at different points on the line, was \$3,489,166.31. This amount includes what has already been expended and the amount required to complete the work.

A train service was put in operation, Mar. 3, on the section of the line between Levis, Que., and the Quebec-New Brunswick boundary, from St. Anselme to Monk, Que., 80 miles, by the Quebec Central Ry., under an arrangement with the Commission. The Q.C.R. is supplying the rolling stock and is furnishing the train crews. This is a temporary arrangement, and is expected to continue only until the entire section from Levis to the provincial boundary is taken over by the Commission, when it will be operated in connection with the Moncton-Edmundston section.

Tenders are under consideration for the supply of a shavings and sawdust exhaust system for the car shops plant at Transcona, Man. (Mar., pg. 124.)

Grand Trunk Pacific Railway Construction.

A return made to the House of Commons, Mar. 6, shows that the capital of the G.T. Pacific Ry. is \$20,000,000 of preferred and \$25,000,000 of common stock. The amount subscribed is \$1,034,000, of which \$1,000,000 is from the G.T.R.; and the amount paid up on account of the shares is \$203,600. The company held the following contracts for construction on the National Transcontinental Ry.:

From Moncton, N.B., westerly, 50 miles; completed, \$2,370,398.

From mileage 58 to I.R.C. crossing, about mileage 97.7; amount paid to Dec. 31, 1913, \$1,043,312. Total estimated cost, \$1,050,000.

From I.R.C. crossing to Tobique River, near mileage 165.7, amount paid to Dec. 31, 1913, \$2,790,679. Total estimated cost, \$2,840,000.

From 150 miles west of Quebec Bridge to Weymontachene, amount paid to Dec. 31, 1913, \$3,169,240. Total estimated cost, \$3,180,000.

Eight miles west of Abitibi crossing, easterly, 150 miles; amount paid to Dec. 31, 1913, \$5,445,762. Total estimated cost, \$6,710,300.

Track laying is being proceeded with westerly from Fort George, B.C., and it was reported at the company's Vancouver offices, Mar. 12, that steel had been laid to mileage 1,310 west of Winnipeg, or 30 miles west of Fort George. The track is also being laid

easterly from Prince Rupert, and it was stated, Mar. 12, that the steel had reached a point 89 miles from the point reached by the track laying gang working west. The bridge work yet to be completed will keep back track laying somewhat, but it was expected that the two sections will be joined up early in June, although one report states that the ends of steel will be joined up by April 30. If this is the case, says the report, it will be possible to have trains running through from Winnipeg to Prince Rupert by June 30. The point at which the track laying gangs are expected to meet is Nechaco, 373 miles east of Prince Rupert, and 112 miles west of Fort George. A train service is being operated westerly to Fort George, and easterly to Wardsworth.

Considerable progress has been made with construction on the floating dry dock and shipbuilding plant at Prince Rupert, B.C. Several of the pontoons for the dock are well advanced, and all the filling in and levelling work, which has been in hand at the site for nearly two years, have been completed. A large boiler house has been built and is ready for the installation of the machinery. It is expected that the entire plant will be ready for operation this year.

The excavations for the foundations of the company's hotel at Prince Rupert are going on at a rapid pace.

A train service has been put in operation on the Toftfield-Calgary line, between Calgary and Mirror, Alta. It is not expected, however, that a through service between Calgary and Edmonton will be inaugurated until April or May. There is considerable work yet to be done in the yards at Calgary, and the station buildings in use are merely temporary ones, pending the laying out and completion of the permanent yards and buildings on the site of the old police barracks. (Mar., pg. 124.)

The Central Railway of Canada and Its Land Grant Claims.

The Central Ry. of Canada, which has been considerably in evidence during the last few years, particularly on account of its claim to a land grant made in 1855-6 by the old Parliament of Canada, for the building of a railway from Montreal to Georgian Bay, is gradually being freed from the various entanglements which followed the assertion of the claim. One of the matters involved was the railway known as the Carillon and Grenville Ry., which was part of the original project, but which for many years was owned by the Ottawa Navigation Co., and operated by it in connection with its line of steamboats running on the Ottawa River. The O.R.N. Co. was acquired by the C. Ry. Co. of C., but how far it became really a part of the undertaking is uncertain. Anyway the C. and G. Ry. sold its property to Canadian Northern Ry. interests, retaining its charter and charter rights, by a resolution passed July 25, 1911. The O.R.N. Co. questioned the legality of the resolution, alleging among other things that the C. and G. Ry. had no authority to sell and the C.N.R. interests no authority to buy, and that the necessary proceedings prescribed by the Railway Act respecting sales had not been observed. An action was brought in the Quebec courts in the name of the O.R.N. Co. and certain other persons to have the sale set aside, and judgment was given Feb. 28, upholding the sale. During the trial of the action it was shown that 1,900 of the 2,000 shares of the C. and G. Ry. were owned by the O.R.N. Co., and 80 of the remaining shares by Senator Owens, who was at that time the owner or controller of practically the entire stock of the O.R.N. Co. Senator Owens at the meeting of the directors of the C. and G.

Ry. when the sale was authorized, voted as representing the O.R.N. Co., in favor of the resolution. The court held that technically, while Senator Owens might not have been authorized to vote for the resolution on behalf of the O.R.N. Co., yet being the owner of the shares voted, the passing of a resolution authorizing him to vote would be a mere formality. The court found that there was nothing in the Railway Act which would prohibit the sale.

The Canadian Northern Ontario Ry. is applying to the Dominion Parliament for an act vesting in it the right of way and other property acquired under the terms of the resolution referred to in the above mentioned action. The right of way so acquired is to form part of the Montreal-Ottawa section of the C.N.R. transcontinental.

The Central Ry. of Canada's application for an extension of time for the building of the various lines authorized, has been approved by the House of Commons. When the measure was before Parliament in 1913 there was a difference of view between the House of Commons and the Senate as to the inclusion of a section prohibiting the company carrying on litigation with a view of securing from Ontario and Quebec certain lands granted in pre-confederation days, which it was claimed were still available for the lines proposed to be built by the company. The following section is included in the present bill:—"It is hereby expressly declared and enacted that the C. Ry. of Canada shall not, nor shall the Ottawa River Ry., the Central Counties Ry., the Ottawa Valley Ry., the Carillon and Grenville Ry., or the Ottawa River Navigation Co., nor the assigns of any of the said companies, nor shall any other company or person whatsoever, be entitled to receive any land grant or grants under the provisions of the statutes of the late province of Canada, 19 and 20 Victoria, chap. 112, and 24 Victoria, chaps. 80 and 87, or any of them, or any amending or substituted acts, or any other statutes or acts of Canada or any of the provinces of Canada." (Sept., 1913, pg. 431.)

Earnings of Canadian Railways Per Mile of Line.

A. P. Landy, A.M. Can. Soc. C.E., Asso. R. Coll. Sc., Ireland, of Benton, N.B., has favored us with the following table which he has prepared from the railway statistics for the year ended June 30, 1913, showing the gross earnings per mile of track for 26 lines, having a length of 100 miles or upwards:—

Name of Railway.	Mileage.	Gross Earnings.	Gross Earnings per mile.
		\$	\$
Algoma Central & H.B. Atlantic, Quebec & Western	133.77	538,580	4,026
British Yukon	104.50	41,906	401
Canada Southern	101.12	326,348	3,228
Canadian Government:—	380.04	10,996,494	28,910
Intercolonial	1,462.48	12,349,296	8,444
Prince Edward Island	279.23	390,461	1,398
Canadian Northern	4,670.65	24,277,478	5,198
Canadian Northern Ont.	500.15	1,280,524	2,560
Canadian Northern Que.	371.02	1,599,546	4,311
Canadian Pacific	11,507.80	130,769,707	11,364
Central Ontario	149.73	375,048	2,505
Dominion Atlantic	279.67	984,497	3,520
Esquimalt & Nanaimo	152.00	931,892	6,131
Grand Trunk	3,103.91	40,424,397	13,025
G.T.R., Canada Atlantic	456.26	2,382,258	5,221
Grand Trunk Pacific	1,395.77	8,162,204	5,848
Halifax & South Western	378.46	531,338	1,404
International of N.B.	112.00	111,932	999
Montreal & Atlantic	163.40	1,104,926	6,762
Quebec Central	253.00	1,571,150	6,210
Quebec Oriental	100.00	101,687	1,017
Quebec & Lake St. John	286.40	959,380	3,350
Quebec, Montreal & Southern	191.91	395,466	2,061
Temiscouata	113.00	250,769	2,219
Timiskaming & Northern Ontario	330.78	1,569,226	4,680
Vancouver, Victoria & Eastern	236.08	994,614	4,213

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
J. V. KINSMAN, - - - 70 Bond Street, Toronto
A. FENTON WALKER, 143 Liberty Street, New York, N.Y.
J. MEREDITH MCKIM, 3 Regent St., London, S.W., Eng.

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

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 PRICE, including postage anywhere, \$2 a year.

SINGLE COPIES, 20 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, APRIL, 1914.

PRINCIPAL CONTENTS.

Birthdays of Transportation Men	161
Board of Railway Commissioners—	
Orders by, Summaries of	178
Traffic Orders	167
Canadian Northern Ry., Construction	170
Canadian Pacific Ry., Construction	171
St. Lawrence River Bridge	169
Central Ry. of Canada	172
Electric Railway Department	180 to 187
Chatham, Wallaceburg and Lake Erie Ry	
Power House Explosion	182
Dominion Power and Transmission Co.'s	
Report	186
Electric Railway Topics	183
Finance, Meetings, etc.	185
Galt, Preston and Hespeler St. Ry. Loco-	
motive Performance	186
Grand Valley Ry. and Its Subsidiaries ..	187
Notes	185
Personal	185
Projects, Construction, etc.	184
St. John Ry. Report	187
Sherbrooke Ry. and Power Co.'s System ..	180
Grand Trunk Pacific Ry., Construction ..	172
Grand Trunk Ry., and Canada Atlantic Ry. ..	173
Mainly About Transportation People	168
Marine Department	188 to 195
Canal Statistics	188
Coast, Lake and River Officers for 1914 ..	195
Lake Grain Shipments	194
Notice to Mariners	194
Ontario Car Ferry Co.'s New Vessel	191
National Transcontinental Ry., Construction ..	172
Quebec Terminals	164
Transcona Car Shops	157
Railway Development	165
Railway Earnings	174
Railway Finance, Meetings, etc.	167
Railway Mechanical Methods and Devices ..	162, 163
Railway Rolling Stock Notes	171
Railway Statistics	160
Southampton Ry., Construction	173
Station Agents, Regulations Respecting ..	176
Trade and Supply Notes	196

The C.P.R. Hotel Palliser at Calgary, Alta., will, it is announced, be opened about May 1.

Fraud Charged in Southampton Railway Constructoin.

The House of Commons agreed, Mar. 9, to a motion for the bringing down of all correspondence and papers relating to the payment of a subsidy to the Southampton Ry. Co. This railway runs from Millville, N. B., to the St. John River, near Pikiok bridge, 12.7 miles, and is being operated by the C.P.R. The company was incorporated by the New Brunswick Legislature, and in 1911 the Legislature voted a guarantee of bonds in aid of its construction at the rate of \$10,000 a mile, and in 1913, on account of increased cost of construction, an increased guarantee of bonds for \$2,000 a mile was granted. These securities have been issued and sold by the company. The Dominion Parliament, in 1912, voted a subsidy upon the usual terms and conditions in aid of the construction of the line, and on receipt of the necessary certificate that all the conditions had been complied with, paid over a subsidy at the rate of \$6,400 a mile, the cost of construction being certified to be \$291,517, or considerably more than is required to ensure the payment of what is known as the double subsidy.

The reason for asking for the papers and for an investigation into the matter was stated by F. B. Carvell, M.P., in making the motion. He said that a contract was let by the Southampton Ry. to J. E. Stewart in Sept., 1910, for the construction of the railway in consideration of the bonds, for the guarantee of which the New Brunswick Government had undertaken to secure legislative sanction, and the subsidy to be obtained from the Dominion Parliament. Construction was started under this contract, but in less than three months the company rescinded it, alleging that it had been obtained by fraud. Stewart prepared the plans and specifications upon which the line was built by J. K. Pender for the company, which, after the rescinding of the Stewart contract, consisted of J. K. Pender Geo. Pender, Dr. McNulty, Mr. Gilman, and Mr. Guthrie, a lawyer. With the exception of the latter, all the members of the company were connected with the Pender family.

Upon the rescinding of the contract Stewart brought an action against the company, which did not come to trial until January of this year. The main question of damage has not yet been decided, as the jury disagreed and there is to be a new trial. The hearing of the case lasted 11 days, and Mr. Carvell quoted from evidence given by contractors, engineers and others, which evidence, he said, was not assailed on behalf of the company, showing that the actual sum expended on the construction of the line did not exceed \$157,618. Even this amount, he said, was in excess of that actually expended. There were only two items upon which direct evidence of cost was not given, viz.: two steel bridges, and the water tower, and for these liberal estimates were made. When it was remembered, said Mr. Carvell, that this road simply followed the surface; that the engineers used seven degree curves when necessary; that only enough levelling was done to make ditches and a grade of 1½%, it could be understood that there was no necessity for removing solid rock. If they came to a rock they simply went around it. "That is why the road cost only \$12,000 a mile," he added. "I did not believe it was possible to build that kind of road, but I went over the route myself, and satisfied myself that my client (Stewart) was right." Wm. McDonald, who built practically the whole line, affirmed in his evidence that he was paid for 4,423 cubic yards of rock work, which was all the rock work done;

that there was no earth excavation under water, or any loose rock and hardpan, whereas in the estimates passed on to the Department upon which the double subsidy was paid, the following appeared:—Solid rock, 12,800 cu. yds.; earth excavation under water, 5,500 cu. yds.; loose rock and hardpan, 24,000 cu. yds. The cost of rails was set out at \$46,000 in the estimates sent on to the Department, and there was produced at the trial a statement from the C. P.R., and admitted by the Penders, showing the quantity of tracklaying materials supplied and the price of the same. The cost of these, with the additional materials required to complete the tracklaying, which came from the same source, and were of similar quality, worked out at \$28,000, while the spikes would cost an additional \$1,700.

Amalgamation of Grand Trunk and Canada Atlantic Companies.

The Dominion Parliament is being asked to confirm an agreement between these companies, under which the C. A. R. Co. is to be merged in the G. T. R. Co., and the former is to cease as a separate company. The agreement, dated Feb. 9, 1914, sets out that the G.T.R. is the owner of the 10,000 shares of preferred stock and of 60,725 shares out of a total of 62,000 shares of the ordinary stock of the C.A.R., and provides for the merging in the G.T.R. of all the rights, property, etc., and the taking over of all liabilities of the C.A.R. The schedules attached to the agreement set out liabilities of the two companies, which, under the agreement, become the liabilities of the united company. These are as follows:—

GRAND TRUNK RAILWAY CO.	
Description.	Amount.
Borrowed Capital:—	
Second mortgage equipment bonds ... \$	1,815,266.67
3rd preference bonds Northern Ry. ..	71,053.33
Wellington, Grey & Bruce Ry. Bonds	335,800.00
5½% bonds Great Western (matured)	
not paid off	486.67
Midland Ry. sectional bonds (matured)	
not paid off	1,946.67
Midland Ry. consolidated (matured)	
not paid off	8,273.33
Debenture Stock Grand Trunk	20,782,491.67
" " Great Western	13,252,322.67
" " Grand Trunk	112,538,406.00
" " Northern Ry.	1,499,979.67
	\$150,306,026.68
Share Capital:—	
4% guaranteed stock	\$ 60,833,333.32
First preference stock	16,644,000.00
Second preference stock	12,312,666.67
Third preference stock	34,884,535.43
Ordinary stock	109,363,053.40
	\$234,037,588.82

CANADA ATLANTIC RAILWAY.			
Description	Amount.	Held by G.T. Ry.	Held by public.
Borrowed capital:—			
First mortgage .. \$16,000,092			\$16,000,092
Share capital:—			
Capital stock .. \$6,200,000	\$6,072,500		\$127,500
Preference stock .. 1,000,000	1,000,000		
	\$7,200,000	\$7,072,500	\$127,500

Accidents on Joint Lines.—The Board of Railway Commissioners has decided that in case a railway company grants, or has granted, running rights or joint use of its line, or any portion thereof, to another railway company, and the latter company is concerned in an accident attended with personal injury on the joint section, both companies shall report to the Board, as set out in sec. 292 of the Railway Act and the forms issued thereunder.

Fred. Behan, Assistant Foreman Erecting Shop, G.T. Pacific Ry., Transcona, Man., in remitting renewal subscription for Canadian Railway and Marine World, writes: "Enclosed find postal note to pay yearly subscription to your valuable magazine."

Grand Trunk Railway Betterments, Construction, Etc.

Lachine, Jacques Cartier and Maison-neuve Ry.—Press reports, Mar. 17, stated that it is likely that construction will be started on this projected line during this year. The only matter at present unsettled is the final decision of the Montreal City Council, with respect to the closing of certain streets.

Montreal Track Elevation.—The Montreal City Council took up, on Mar. 16, the question of the cost of the proposed elevation of the G.T.R. tracks between Henri St. and Point St. Charles. The City Solicitor reported that the estimated cost is \$6,000,000, towards which the city has authority to contribute \$2,000,000. The city does not want to pay any more, but the company thinks it should. In the report on the electric railway situation, the City Engineer's department pointed out that the Montreal Tramways Co. would benefit by the carrying out of the work, and therefore should be asked to pay part of the cost. It is suggested that the Board of Railway Commissioners be asked to apportion the cost between the G.T.R., the Montreal Tramways Co., the City of Montreal and the town of Westmount.

Extensions in Kingston.—Press reports, Mar. 14, stated that some difficulty was being experienced in securing a connection between the foot of William St. and the shipbuilding and other industrial concerns, owing to the sharp curves necessary. The plans for the work are being prepared preparatory to negotiations with the City Council.

New Station Buildings at Bridgeburg, Ont.—We are officially advised that the plans for the proposed new passenger station, customs and immigration offices at Bridgeburg, Ont., are not yet sufficiently advanced to permit of a description being given. Press reports state that the buildings are to cost \$75,000, and that work is to be started at once.

Galt and Elmira Branches.—Press reports, Mar. 11, stated that the question of the electrification of the branch running south from Berlin to Galt, and north from Berlin to Elmira, is again under consideration, and that it is probable a start will be made on construction during this year. (Mar., pg. 129.)

Great Northern Railway Lines in Canada.

Vancouver, Victoria and Eastern Ry.—An arrangement has been made with the Kettle Valley Lines and the British Columbia Government, under which the K. V. Line will be built into Princeton, there joining the V. V. and E. Ry. The K. V. Line will then operate over the V. V. and E. Ry. to the point of its junction with the K. V. Line at the starting point of what is known as the joint section, extending down the Coldwater River valley to Hope.

Vancouver Terminals.—A Stewart, Assistant Chief Engineer, G. N. R., reported to Vancouver City Council, Mar. 5, that about 1,750,000 cubic yards of filling was still required to be done on the company's portion of the False Creek flats. The present fill around the site of the proposed station was still 2 ft. lower than the permanent level of the fill. The layout of the tracks had not yet been finally decided.

Work has been started on the reinforced concrete bridges over the railway cut at Victoria road and Broadway East. The first named bridge will be 200 ft. long, and will cost \$35,000; the second will be 288 ft. long and will cost \$70,000. The city has granted permits for their construction to Grant, Smith and Co. (Mar., pg. 129.)

Dominion Financing for Railway Construction.

In connection with the recent issue on the London, Eng., market of a Dominion Government loan for £5,000,000, the Minister of Finance has given out an official statement in which he says this loan and the other Government borrowings during the past six months are for the following special purposes:—(1) To meet sterling and currency indebtedness of \$10,000,000 maturing in October and November last, all of which has been paid off. (2) To pay the special subsidies to the Canadian Northern Ry. under the legislation of last session of Parliament. (3) To purchase 3% bonds of the G.T. Pacific Ry. Co. guaranteed by the Dominion Government, which otherwise would, from time to time, have been sold by the railway company through issues on the London market. The proceeds of these bonds, as purchased by the Government, have been and are being devoted to the construction of the Mountain section of the railway. (4) To advance to the G.T. Pacific Ry. Co. the loan of \$15,000,000, repayment of which is guaranteed by the G.T. Ry. This loan was authorized by the legislation of last session. The G.T.P. Government-guaranteed debentures referred to in (3) above, and the loan made to the G.T.P. Ry. under the guarantee of the G.T. Ry., are of course assets in the treasury of the Dominion.

The proceeds of the present issue of £5,000,000, underwritten in London, will, after the payment of £1,000,000 of treasury bills, which matured in March, be sufficient to meet the balance of expenditure under the headings mentioned above.

Canadian Ticket Agents Association.

At a meeting of the executive committee in Toronto, Mar. 5, G. W. Vaux, General Agent, Passenger Department, Union Pacific Rd., Chicago, on behalf of the Chicago & Northwestern, the Union Pacific, and the San Pedro, Los Angeles and Salt Lake lines, tendered the members a complimentary trip to Denver, Salt Lake City, Los Angeles and San Francisco, the idea being to start from Chicago Oct. 9, to hold the annual meeting in San Francisco, where three days would be spent and a day in each of the other places mentioned, free transportation, sleeping car berths and dining car service to be provided. The invitation was accepted conditionally upon the C.P.R. and G.T.R. providing free transportation to Chicago and return. The special committees appointed to discuss standardization of railways and steamship tariffs met on the same day.

Cash Proceeds of C. P. R. Stock.—Sir Thomas Shaughnessy, president C. P. R., is 225 lbs. of baggage will be checked without \$100 share of the company's outstanding common stock there has been paid into the company's treasury \$112.25 cash. In view of the large discount at which it was necessary to sell the original \$65,000,000 common stock, upwards of 30 years ago, when the railway was in the course of construction, the showing is remarkable and almost unique in the history of the railways in the world.

Filling in a Trestle by Sluicing.—A culvert under a 170 ft. fill was recently completed on the C.P.R., about 30 miles west of Robson, B.C., where a high trestle on the Cascade tunnel grade has been filled in. The crossing is in a narrow canyon, and it was considered cheapest to sluice the fill material from the adjacent hills by the use of hydraulic giants. The culvert, which is about 500 ft. long, was built up of masonry and has an arched roof with a span of about 12 ft.

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
Oct.	2,687,100	1,683,000	1,004,100	298,800
Nov.	2,673,300	1,708,500	964,800	57,000
Dec.	2,256,000	1,632,000	624,000	43,000
Jan.	1,570,900	1,218,000	352,900	82,700
Feb.	1,324,600	1,086,000	238,600	x29,900
	\$16,260,400	\$11,628,200	\$4,632,200	\$640,500
Incr.	\$ 1,108,400	\$ 467,900	\$ 640,500	.....

x Decrease.
Average mileage under operation during above period, 4,509, against 4,297 for same period 1912-13.

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	Increase or Decrease
July	\$11,993,062.27	\$7,876,269.09	\$4,116,793.18	x\$331,383.72
Aug.	11,434,459.58	7,473,320.64	3,961,138.94	x766,786.42
Sept.	12,157,082.17	7,741,508.48	4,415,573.69	165,274.84
Oct.	14,480,216.73	8,877,358.94	5,602,857.79	541,970.60
Nov.	13,407,015.31	8,518,769.25	4,888,246.06	630,107.02
Dec.	11,814,325.67	7,587,503.96	4,226,821.71	x168,897.80
Jan.	7,916,216.25	6,916,042.19	1,000,174.06	x662,199.72
	\$83,202,378.28	\$54,990,767.55	\$28,211,610.73	x\$581,915.20
Incr.	.....	\$ 578,404.72	.....	.....
Decr.	\$ 3,420.48	.....	\$ 581,915.20	.....

x Decrease.
Approximate earnings for Feb., \$7,365,000, against \$9,526,000 for Feb., 1913.
During February the mileage under operation was increased to 11,920.

Grand Trunk Railway Earnings, Etc.

The following figures show the earnings of the G.T.R., C.A.R., G.T.W.R., and D.G.H. & M.R., for Jan., and increases, or decreases from the figures for Jan., 1913:

	1914	1913	Increase	Decrease
G.T.R.	\$5,597,335	\$6,017,499	.....	\$420,165
C.A.R.	225,102	345,239	.....	20,137
G.T.W.R.	1,039,828	1,108,295	.....	68,467
D.G.H. & M.R.	353,693	343,028	\$7,665	.....
Totals	\$7,315,958	\$7,817,061	.....	\$501,108

Grand Trunk Pacific Railway Earnings.

The approximate earnings of the Prairie Section and Lake Superior Branch, 1,104 miles, for Feb., were \$313,492, against \$374,084 for Feb., 1913. The aggregate earnings for two months ended Feb. 28, were \$681,810, against \$751,928 for same period 1913.

Use of Drawing Rooms, Etc.—The Board of Railway Commissioners having ordered suspension of the new regulations as far as concerns traffic between points in Canada, pending a hearing on the subject at Ottawa, which took place Mar. 17, the date for the new regulations becoming effective between points in Canada is postponed until further notice. The new regulations became effective on traffic to, from and between points in the United States on Mar. 15. 300 lbs. and lbs. of baggage will be checked without charge for one person travelling in a drawing room and a compartment, respectively, under these regulations.

Fires Originating Near Railways.—The Board of Railway Commissioners has under consideration the advisability of requesting railway companies to submit monthly, in duplicate, reports on fires originating within 300 ft. of the track and burning over an area of 100 sq. ft. or more outside the right of way. It is reported that the submission of such reports shall be limited to lines or portions of lines to be broadly classified as running through forest sections.

The Algoma Eastern Ry. has been admitted to Eastern Canadian Passenger Association membership.

Supervision of Officials and Employes on C.P.R. Western Lines.

An apparently supplied, or at least inspired, article has been published in some western papers, which mentions the large number of officials and employes on the lines west of Port Arthur, Ont., with some details of the organization, and then says:—

"With a view to bringing the management in as personal touch as possible with all the men employed on this vast transportation system, a new arrangement has been inaugurated by those conducting the company's business. Under this system, the officers will be required to make a report twice a year, in June and December, on the service of every officer and employe under his immediate jurisdiction. Under this report an account will be given of an employe's disposition, attention to business, loyalty, zeal and particularly of the tactful and courteous manner with which he deals with the patrons of the company. Realizing that fairness and courtesy are one of the greatest assets in the success of any company, greater stress will be laid on the degree in which that qualification is possessed. It has been made a rule, however, that should an officer find it necessary to make any adverse comment on the services or qualifications of an employe that employe must be called in, shown the report, and instructed to initial it with any comment he may wish to make. This report will go ultimately to the Vice President. Unfortunately, human nature is not perfect and this means is being adopted to prevent any possibility of a man being 'knocked' without his knowledge; in addition to these reports, a gentleman who is a good judge of human nature, of kindly disposition, whose name has not been divulged to the staff, has been selected who will travel over the road as a passenger, and in that capacity, or as a shipper, or consignee, will come into continual contact with the various employes, and his instructions are to look for the good points in employes and to draw attention to and send in the names of any of the staff whose courtesy, zeal, loyalty, ambition, and knowledge marks them out as above the ordinary, and likely material for advancement."

A Canadian Pacific and Canadian Northern Joint Section in Alberta.

The Alberta Central Ry., a C.P.R. subsidiary, and the Canadian Northern Western Ry., a C.N.R. subsidiary, both of which are building lines west of the Red Deer River to Rocky Mountain House and the Brazeau River coal fields, have agreed that a certain portion of the line is to be jointly owned, and the Dominion Parliament is being asked to confirm this agreement, which is dated June 15, 1913. The lands on which the joint section is to be built extend from the s. e. ¼ of Sec. 22, tp. 29, range 7, west of 6th meridian, to the west limit of sections 18 and 19 in the same tp. and range, and these lands, together with the lines, buildings, etc., to be laid out thereon, are to be known as the joint premises. The C. N. W. Ry. is given joint user of the entire joint premises, with the exception of a spur track to the banks of the North Saskatchewan River; but all maintenance and repairs are to be done by the A. C. Ry. The cost of all works, including a bridge across the North Saskatchewan River, is to be carried to capital account, and the C. N. W. Ry. is to pay interest on 50% of the same at 4½%, and the C. N. W. Ry. will also pay such a proportion of the total of maintenance as is represented by its proportion of the total traffic. The

C. N. W. Ry. proposes to extend its line from the westerly end of the joint premises to the westerly limit of range 19 west of the 5th meridian, and it is understood that this extension, or any portion, may be used by the A. C. Ry. on the same terms and conditions as the joint premises. The agreement provides for arbitration in case of differences as to terms.

Standard Rules on the Intercolonial Railway.

A. C. Barker, Inspector Stations, Trains and Train Dispatching, has issued the following circular:—

The operating rules now in effect on the I.R.C. will be superseded by Standard Code of General Train and Interlocking Rules, at 24 o'clock midnight, May 30. The new rule books are being distributed. Employes concerned not receiving a copy should apply to superior officer for same. The following employes must pass written examination in the new rules before date mentioned above, under supervision of instructor or superior officer:—Conductors, engineers, train dispatchers, brakemen, train baggage men, firemen, yardmasters, yard foremen, switch tenders, agents, operators, section foremen, bridge foremen and signal men. Instructors will hold classes at different points on each district, which employes are requested to attend, and obtain explanation of rules not thoroughly understood.

The following instructors in the rules have been appointed:—District 1—A. Dion, T. T. Marchessault, W. H. Toohy. District 2—J. Davidson, E. Smith, N. Sinclair. District 3—B. S. Ward, B. Ripley, W. B. Johnson. District 4—J. J. MacLeod, R. A. McDonald, A. S. Prowse.

I. R. C.—C. P. R. Traffic Agreement.

The acting Minister of Railways informed the House of Commons, Mar. 11, that under the agreement between the Department of Railways and the C.P.R., covering the transportation of freight and passengers between Halifax and St. John, in connection with the C.P.R. and Allan Line steamships carrying the British mails, special freight trains consist of 500 tons contents east bound, and 400 tons contents west bound; special passenger trains are limited to 12 cars all told, including vans, their size being varied according to weather conditions.

Mail Transportation by Railways.—The Postmaster General has informed Canadian Railway and Marine World that, under the new arrangement with the railways, which has been made effective from Feb. 1, payment is to be made by the car mile, as follows:—Full length postal car, 16c. a car mile; half car, 9c; baggage car service, 4c. The arrangement covers the transportation of mails of all classes, including parcels.

Water for Locomotive Purposes on the Trans Australian Ry. is to be obtained by conveying it in wooden pipes from Kalgoorlie for about 257 miles, service tanks being provided every 50 miles. In addition an underground supply has been located by a bore at 344 miles from Kalgoorlie, and from that point water will be pumped to tanks at other points along the line.

Dominion Railway Subsidy Agreements.—The Dominion Government has entered into agreements under the act granting aid for construction as follows:—Burrard Inlet Tunnel and Bridge Co., Feb. 16, for the construction of a bridge over the second narrows of Burrard Inlet; Kettle Valley Ry., Feb. 18, for the construction of a line from between Merritt and Penticton Wharf, to Midway, 135 miles.

Dominion Government Interior Terminal Elevators.

In the House of Commons recently, the Minister of Trade and Commerce gave the following information as to Government elevators, completed, under construction and under consideration. Applications have been received for the establishment of elevators from Calgary, Lethbridge, Edmonton, Alta.; Prince Albert, Broadview, North Battleford, Melville, Wolseley, Sask.; and Portage la Prairie, Man. It has been decided to build elevators at Moose Jaw and Saskatoon, Sask., and Calgary, Alta., and the requisite sites have been obtained for each place. At Moose Jaw and Saskatoon, the site was acquired from the municipality for the nominal price of \$1 in each case, and for Calgary the site was transferred from the Department of Militia. The elevators at Moose Jaw and Saskatoon are under construction, but no others have been placed under contract. The Moose Jaw elevator is being built by the Barnett-McQueen Co., and will have a working house capacity of 500,000 bush., with storage capacity of 3,000,000 bush. The Saskatoon elevator under construction by the same firm is of the same capacity, and the estimated totals of the contracts is \$2,005,620.

In reply to questions regarding the operating of these and other elevators to be built, and the charges to be made in connection therewith, it was stated that when they are more nearly approaching completion, and when the time comes for transactions with reference to them, all these matters will be taken up by the Board of Grain Commissioners.

Regarding the Government elevator at Fort William, Ont., is reported that the receipts of grain between Oct. 16, 1913, the date on which it was opened for business, and Jan. 31, 1914, were 6,950,206 bush., and the shipments 5,278,145 bush. The gross earnings were \$61,394.56, and the operating expenses \$33,517.73. It has a capacity of 3,250,000 bush., and cost \$1,372,000.23.

Dominion Government Railway to Hudson Bay.

An Order-in-Council was passed, Mar. 2, vesting in the Department of Railways and Canals certain lands for trackage and ballast pits in connection with the railway under construction from Pas to Port Nelson, Man. The lands, 235.70 acres in extent, are situated in tp. 25, range 26 west of the 1st meridian. (Mar., pg. 119.)

Trade with Portugal.—Frederic Nicholls, Consul for Portugal, Toronto, has received the following letter from the Lisbon Commercial Association:—"Being desirous of enlarging our commercial business, especially the foreign one, the directors of the association have approved of the installation of a room for catalogues of the most important commercial houses in the world, in order to have our business men acquainted with prices of all articles in the world's market, and for the above reason we ask you to be kind enough to invite, by the most practical means, the commercial houses of your district that export their products to present their catalogues to the association." Catalogues should be addressed to "Associacao Commercial de Lisboa, Lisbon, Portugal."

During January, 9 employes were killed and 4 were injured in the course of their work on railway construction in the Dominion, and 16 were killed and 89 were injured in general steam railway service.

The Late George Westinghouse.

George Westinghouse, who died of heart disease in New York, Mar. 12, was born at Central Bridge, N. Y., Oct. 6, 1846. His father was an inventor, who, in 1856, removed his family to Schenectady, N. Y., where he established the Schenectady Agricultural Works. The boy attended the public and high schools of the town, spending much of his leisure time, after studies, in his father's machine shop. Before he was 15 he invented and made a rotary engine, and passed at an early age the examination for the position of Assistant Engineer in the U. S. Navy, in which he served from 1863 to 1865.

In 1865 he invented a device for replacing railway cars upon the track, which was made of cast steel, at Troy, N. Y. Going to Troy one day, a delay caused by a collision between two freight trains, suggested to him the idea that a brake under the control of the locomotive driver might have prevented the accident. His first thought was an automatic brake attached to the couplers, which was unsuccessful. This was followed by steam, which proved also to be unsatisfactory, because by the time it reached the brake from the engineer's cab it lost its power. He saw an account of the use of compressed air in digging the Mont Cenis tunnel, and after much study and investigation, the use of compressed air further impressed itself on him. Drawings of the air pump, brake cylinder and valves were made, but considerable time elapsed before a practical trial of the brake was obtained. The first patent was issued April 13, 1869, and the Westinghouse Air Brake Co. was formed on July 20 following. Many changes and improvements were being made in the brake all the while, the business flourished, and the manufacturing works, begun in 1869, were completed in 1870. In 1870 he went abroad to introduce the air brake in England—a difficult problem, as the trains in Europe had hand brakes upon only the brake vans, there being no brakes upon the other vehicles. Not only did this require the spending of seven years in Europe, between 1871 and 1882, but it taxed his inventive ability considerably to meet the new conditions of railway practice. In the meantime, he invented the automatic feature of the brake which overcame the imperfections in the first form, and removed the danger from parting of trains on steep grades. In 1886, he invented the quick action brake, the improvement being made in what is known as the triple valve. By this valve it became practicable to apply all brakes on the train of 50 freight cars in two seconds.

About 1880, he became interested in the operation of railway signals and switches by compressed air, and soon after there was developed and patented the system now manufactured by The Union Switch & Signal Co.

In 1886 the Westinghouse Electric Co. was formed for the manufacture of lamps and electric lighting apparatus, Mr. Westinghouse having become interested in the subject. The business rapidly developed and in 1889 and 1890 this company absorbed the United States Electric Co., and the Consolidated Electric Light Company. In 1891 all these properties were reorganized into the Westinghouse Electric & Manufacturing Co., which owns extensive works at East Pittsburgh, employing over 22,000 people.

In 1895 the Electric Co. outgrew its small quarters and moved to East Pittsburgh and the same year works of the British Westinghouse Co. were established at Manchester.

The question of the steam turbine and its applications was investigated by Mr. West-

inghouse and he secured the patent rights of C. A. Parsons of England in 1897-98. This development of a new prime mover soon led him to consider the use of the turbine as a prime mover for ships. The trouble was the high speed. He then developed and brought out the mechanical reduction gear for reducing the inherently high speed of a turbine to the slow speed of a ship propeller or direct current dynamo. He also occupied himself with the development of an air spring for automobiles and motor trucks.

He rendered an invaluable service to electrical development when, in spite of opposition, ridicule and many efforts to crush his alternating current system, he remained steadfast in his belief that this class of high tension transmission would make distant electrical distribution possible. This system his engineers developed, and in this connection secured Nicola Tesla, in 1887, who invented the alternating current induction motor. A struggle almost identical with that of the earlier fight for alternating current transmission is the recent development of alternating current traction by means of the single phase motor. In spite of the same opposition, Mr. Westinghouse achieved a far step in electric railway practice which the electrical world was quick to follow just as in the case of alternating current transmission.

Owing to his many achievements in mechanics, electricity, steam and gas, his name was known the world over, and he had many honorable distinctions conferred upon him for his achievements and in recognition of the services he rendered the various branches of engineering. His alma mater, Union College, Schenectady, conferred upon him the degree of doctor of philosophy. He was decorated with the order of the Legion of Honor, with the order of the Royal Crown of Italy, with the order of Leopold of Belgium. He was the second recipient of the John Fritz medal. He received the degree of doctor of engineering from the Koenigliche Technische Hochschule of Berlin, Germany. He was an honorary member of the American Society of Mechanical Engineers, of which body he was President in 1910. He was one of the two honorary members of the American Society for the Advancement of Science. He was an honorary member of the National Electric Light Association of America. He was awarded the Scott premium and medal by the Franklin Institute of the State of Pennsylvania. He received the Edison gold medal for meritorious achievements in the alternating current system of electrical distribution. He received the Grashof gold medal from the Society of German Engineers in Germany, which acknowledged him the greatest American engineer.

He was connected with a large number of industries at home and abroad, many of which bore his name. He was President and director of Westinghouse Air Brake Co., Westinghouse Machine Co., Nernst Lamp Company, Union Switch & Signal Co., Canadian Westinghouse Co., Societe Anonyme Westinghouse, Paris., Cooper Hewitt Electric Co., Pittsburgh Meter Co., Societe Italiana Westinghouse, Italy, East Pittsburgh Improvement Co., Westinghouse Brake Co., London, Westinghouse Cooper Hewitt Co., London, Westinghouse Friction Draft Gear Co., Westinghouse Metal Filament Lamp Co., London. He was also Chairman of the Board of Directors of Westinghouse Electric Co., London, and Director Westinghouse Electric & Manufacturing Co., Traction & Power Securities Co., Westinghouse Metallfaden Gluhlampenfab-

rik, Vienna. The Westinghouse companies employ 50,000 men, on whom 150,000 persons are dependent. The total capitalization of all the companies is \$200,000,000. Although actively associated with a large number of industries, he had during the last few years begun to transfer his responsibilities to the shoulders of his trusted lieutenants, the fortunate selection of which had always been one of the leading characteristics of his varied career. His death, therefore, will not cause any material change in the policy or operation of the companies so indelibly linked with his name.

Regulations Respecting the Removal of Regular Station Agents.

Canadian Railway and Marine World for March contained an order passed by the Board of Railway Commissioners, Jan. 31, respecting the removal of regular station agents, the complaints on which it was based having reference to certain specified stations west of Port Arthur, Ont. On Feb. 19 Assistant Chief Commissioner D'Arcy Scott gave the following decision which was concurred in by Commissioners McLean and Goodeve:—

"For some weeks past the Board has received many complaints from places in the Western Provinces where permanent agents had been established by railway companies, that the agent was being removed and the station being turned into a flag station. So numerous were these complaints, that the Board thought it proper to issue General Order 119, requiring railway companies which intend to remove a permanent agent from a station and make the station a flag station, to first notify the local municipality, or board of trade, of its intention to apply to the Board; and, then send in to the Board an application for permission to close the station, with a statement of the grounds upon which action was to be taken. When a railway company opens a station and appoints a permanent agent there, business in that locality is built up on the assumption that the station will continue to be a permanent station. The Board thinks it proper that it should be consulted, and that those representing the public should be heard before such a station is closed by a railway company. The services given by a railway company at a station where there is a regular agent, and at a flag station, are very different; and, it may amount to a great hardship to a community to suddenly have its station closed. The Board has no intention of interfering with a railway company in practising economy by closing a regular station, if the facts of the particular case warrant such action; but, as the closing of a station has such a material effect upon the interests of the public who have been using that station, the Board should have an opportunity of determining in each case upon its own merits whether the railway company would be justified in closing a regular station or not. At the hearing, the point of view of the railway companies was clearly set forth. We realize the necessity for prompt action in all cases where it is reasonable that a company should be permitted to close a regular station. No general rules can be laid down. Each case will have to be dealt with on its merits. The intention of the Board in issuing General Order 119 was that it should apply only to cases where the company desired to close a regular agency station and make that station a flag station. It was not intended to apply to cases where a special agent had been temporarily employed to look after some particular class of business which was of a temporary nature. No order is necessary in this case."

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 Eastern Ry.—A. J. DONEGAN, heretofore Division Superintendent, Algoma Central and Hudson Bay Rd., Hawk Jct., Ont., has been appointed Superintendent, A.E.R., vice P. Robinson, transferred. Office, Sudbury, Ont.

Canada Steamship Lines, Ltd.—J. J. NELLIGAN has been appointed Division Freight Agent, Montreal.

C. W. BATH, heretofore Assistant Ticket Agent, Richelieu and Ontario Navigation Co., Toronto, has been appointed Passenger and Excursion Agent, Canada Steamship Lines, Toronto, vice S. J. Murphy, resigned. He will report to H. D. Paterson, General Agent, Passenger Department, Toronto.

PERCY GRANT has been appointed Division Freight Agent, Hamilton, Ont.

H. B. BROWNELL has been appointed Division Freight Agent, Winnipeg.

F. W. GARDINER has been appointed District Freight Agent, Calgary, Alta.

B. C. TUCKER has been appointed Division Freight Agent, Cleveland, Ohio.

Canadian Car Service Bureau.—J. REILLY, heretofore acting Manager, has been appointed Manager. Office, 401 St. Nicholas Bldg., Montreal.

Canadian Government Railways.—H. H. SCHAEFFER having retired from the service, the position of Division Freight Agent at Moncton, N.B., has been abolished, and agents in New Brunswick, Moncton north and east, report to the General Freight Agent, Moncton.

Canadian Northern Ontario Ry.—H. THOMPSON has been appointed Locomotive Foreman, Parry Sound, vice J. Quinn.

Canadian Northern Ry.—L. C. FRITCH, heretofore Chief Engineer, Chicago Great Western Rd., Chicago, Ill., has been appointed Assistant to the President, C.N.R.

M. A. THOMSON, heretofore Travelling Freight Agent, Hamilton, Ont., has been appointed City Freight Agent, Ottawa.

G. A. KEELER has been appointed acting Manager, Prince Edward Hotel, Brandon, Man., vice E. Hutcheson, Manager, resigned.

F. CLARKE has been appointed Locomotive Foreman, Calgary, Alta.

A. H. SWEETMAN has been appointed Car Foreman, North Battleford, Sask.

Canadian Pacific Railway.—L. C. ORD, heretofore General Car Inspector, has been appointed Assistant Master Car Builder, vice P. A. Crysler. Office, Montreal.

G. W. GEHAN, heretofore storekeeper at Place Viger, Montreal, has been appointed storekeeper at Sortin Yard, Montreal, vice J. McDonald.

W. KENNY has been appointed storekeeper at Place Viger, Montreal, vice G. W. Gehan transferred.

F. W. NICKS has been appointed acting District Master Mechanic, District 2, Manitoba Division, vice P. S. Lindsay, on leave of absence. Office, Winnipeg.

G. T. COLEMAN, heretofore Chief Dispatcher, Moose Jaw, Sask., has been appointed Chief Dispatcher, Winnipeg, vice E. G. Trump, transferred.

E. G. TRUMP, heretofore Chief Dispatcher, Winnipeg, has been appointed Chief Dispatcher, Moose Jaw, Sask., vice G. T. Coleman.

J. GRAHAM has been appointed Assistant Roadmaster, District 2, British Columbia Division, North Bend, vice G. Wharton, transferred.

G. WHARTON, heretofore Assistant Road-

master, District 2, British Columbia, North Bend, has been transferred to Nelson.

C. E. PHELPS, heretofore Soliciting City Passenger Agent, Baltimore and Ohio Rd., Washington, D.C., is reported to have been appointed Southern Travelling Passenger Agent, C.P.R., with office at New York.

Central Vermont Ry.—MARCUS ALEXE, heretofore Soliciting Passenger Agent, Montreal, has been appointed Canadian Freight and Passenger Agent, vice A. C. Stonegrave, deceased, as reported in our last issue. Office, 122 St. James St., Montreal.

Grand Trunk Pacific Ry.—W. E. DUPEROW, heretofore General Agent, Passenger Department, G.T.P.R., G.T.P.R. and G.T.P. Coast Steamship Co., Vancouver, B.C., has been appointed Assistant General Passenger Agent, G.T.P.R. Office, Winnipeg.

C. E. JENNEY, heretofore City Passenger and Ticket Agent, G.T.R., Toronto, has been appointed General Agent Passenger Department, G.T.R., G.T.P.R. and G.T.P. Coast Steamship Co., in charge of territory in British Columbia, Rivers Inlet and South, vice W. E. Duperow, promoted. Office, Vancouver, B.C.

The following station agents have been appointed:—Pope, Man., R. W. Gibson; Unc. Man., C. L. Bennett; Spy Hill, Sask., H. G. Boulger; Young, Sask., H. B. Briggs; Allan, Sask., M. R. Stirling; Bradwell, Sask., P. L. Harper; Asquith, Sask., O. Hawthorn; Juniata, Sask., G. S. Bass; Reford, Sask., T. Hutchings; Tofield, Alta., A. G. Sinclair; Stony Plain, Alta., E. B. Elgood; Dandurand, Alta., H. S. Creelman; Jasper, Alta., H. L. Gurwell; Mirror, Alta., D. W. Mathers; Trochu, Alta., F. C. Taylor; Calgary, Alta., A. B. Dowling; Terrace, B.C., O. E. Nash; Pacific, B.C., W. Norris; New Hazelton, B.C., T. S. Constantine; Prince George, B.C., H. F. Bickford; Wordsworth, B.C., R. A. Pake.

Grand Trunk Ry.—W. S. THOMPSON, heretofore connected with the Montreal press, has been appointed on the General Advertising Agent's staff, for the preparation of publicity articles.

W. J. MOFFATT, heretofore Travelling Passenger Agent, Toronto, has been appointed City Passenger and Ticket Agent there, vice C. E. Jenney, transferred to G. T. Pacific Ry.

S. R. JOYCE, heretofore ticket clerk, Toronto, has been appointed Travelling Passenger Agent there, vice W. J. Moffatt, promoted.

W. F. SHARPE has been appointed Chief Dispatcher, Brantford, Ont., vice E. O. Dunn, transferred.

R. McC. SMITH, heretofore Passenger Agent, has been appointed City Passenger and Ticket Agent at Detroit, Mich., vice C. M. Harwood, resigned.

R. KELLEY, heretofore Trainmaster, District 26, Detroit Division, Battle Creek, Mich., has been appointed Trainmaster, Districts 27 and 28, Detroit Division, vice G. B. Perdue, resigned on account of illness. Office, Durand, Mich.

E. O. DUNN, heretofore Chief Dispatcher at Brantford, Ont., has been appointed Chief Dispatcher at Durand, Mich.

ROY BULLEN, heretofore General Agent, Chicago Great Western Rd., Winnipeg, has been appointed General Agent, Freight Department, G. T. R., Minneapolis, Minn.

F. A. RUTHERFORD, heretofore Chief Dispatcher, London, Ont., has been appointed Trainmaster, District 26, Detroit Division, Battle Creek, Mich., vice R. Kelley, transferred.

The following agents have been appointed:—Britannia Mills, Que., T. A. Leclerc; St. Bazile, Que., H. M. Houde; Aubrey, Que.,

H. D. Reynolds; Glen Huron and Nottawa, Ont., W. Brethauer; Burlington, Ont., W. W. Langford; Winona, Ont., W. W. Weafer; Port Colborne, Ont., O. P. Seeman; Ravensworth, Ont., H. Desarmia.

Great Northern Ry.—L. W. HILL, Chairman of the Board, has been elected President, vice Carl R. Gray, resigned. Office, St. Paul, Minn.

A. R. BROOKS, heretofore agent at Brandon, Man., has been appointed District Freight and Passenger Agent, Montreal, vice W. T. Hetherington, transferred.

W. T. HETHERINGTON, heretofore District Freight and Passenger Agent, Montreal, has been appointed District Freight and Passenger Agent, Winnipeg, vice A. Brostedt, resigned.

Adams Express Co. has been appointed General European Traffic Manager, vice H. G. McMicken, heretofore European Traffic Agent. Office, 25 Cockspur St., London, Eng.

Intercolonial Ry.—W. A. COWAN, A.M. Can. Soc. C.E., heretofore Superintendent, District 1, Atlantic Division, C.P.R., Brownville Jct., Me., has been appointed Resident Engineer, Halifax Ocean Terminals, I.C.R. (See also Canadian Government Railways.)

Manchester Liners, Ltd.—H. D. STOKER, heretofore in the office of the Vice President in charge of Steamship Lines, C.P.R., Montreal, has been appointed Westbound Traffic Agent, Manchester Liners. Office, Montreal.

Moncton and Buctouche Ry.—We are officially advised that no appointment will be made to the Superintendency, left vacant by the recent death of F. N. Hall, the work being undertaken by the General Manager, E. G. EVANS. Office, Moncton, N.B.

New York Central and Hudson River Rd.—IRA H. HUBBEL, heretofore General Freight Agent, has been appointed Assistant Freight Traffic Manager, N.Y.C. & H.R.R., West Shore Rd., and Ottawa and New York Ry., vice H. D. Carter, deceased. Office, New York.

WILLIAM A. NEWMAN, heretofore General Freight Agent, Lake Shore and Michigan Southern Ry., Cleveland, Ohio, has been appointed General Freight Agent, N.Y.C. & H.R.R. and West Shore Rd., vice Ira H. Hubbel, promoted. Office, New York.

Southern New England Rd.—J. M. MORRISON, Engineer and Superintendent of Structures, Central Vermont Ry., has also been appointed Chief Engineer, S.N.E.R., vice H. R. Safford, Chief Engineer, G.T.R., who has resigned from S.N.E.R. service. Office, St. Albans, Vt.

Stopping Trains in their own Length.—A most important development of the air brake was demonstrated in recent experiments on the Pennsylvania Rd., when a 12 car steel train, nearly 1,000 tons in weight, running 60 miles an hour, was stopped within its own length of about 1,000 ft. The new Westinghouse brake may be operated with pneumatic or electric control, and it embodies among other improvements two shoes for each wheel instead of one, as at present. The new apparatus shortens the time of obtaining the maximum brake capacity from 8 seconds in the present system to 3½ seconds. With electric control, the time is shortened to 2¼ seconds. It was shown that a 12 car steel train running 80 miles an hour could be stopped within 2,000 ft.

Canada has not too many transcontinentals. With only 10% of the area of the country under crop, more railways and more wide-spreading railways are the chief means of development, and are a national necessity.—Toronto Globe.

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.

21387. Feb. 16.—Ordering C. N. Ontario Ry. to build a permanent under crossing, not less than 15 ft. wide and 13 ft. high, at west bent of trestle through H. Ray's farm, March Tp.

21388. Feb. 21.—Authorizing C.P.R. to use 9 bridges on its Havelock, St. Thomas, Toronto, Hamilton and London Subdivisions, Ont.

21389. Feb. 21.—Authorizing C. N. Ontario Ry. to build spur for Sun Brick Co., York Tp.; to be completed within six months.

21390. Feb. 21.—Authorizing G.T.R. to use bridge 346, mileage 198.46, Napanee, Ont.

21391. Feb. 23.—Approving detail plans of Edmonton, Dunvegan and British Columbia Ry. bridge to be built across Athabasca River at mileage 131 west of Edmonton.

21392. Feb. 23.—Authorizing Young village, Sask., to build Dublin St. across C.P.R.

21393. Feb. 23.—Amending order 19033, Apr. 11, 1913, re building highway bridge over G.T.R. in Murray Tp., Ont.; and re apportionment of cost between G.T.R. and Campbellford, Lake Ontario and Western Ry. (C.P.R.).

21394. Feb. 23.—Ordering C.P.R. to flag all train movements over crossing of Atwater Ave., Montreal, and to locate highway crossing sign so that good view of it can be had when crossing is being approached in either direction.

21395. Feb. 14.—Approving City of Toronto plan showing bridge to be rebuilt over G.T.R. and C.P.R. at Strachan Ave.

21396. Feb. 24.—Amending order 21290, Jan. 29, re G.T.R. protection of crossing near Hastings Station, Ont.

21397. Feb. 23.—Authorizing G.T.R. to rebuild bridge 63 over Madawaska River, at milepost 171.41, near Arnprior, Ont.; provided pier to be abandoned be lowered to 3 ft. below low water mark.

21398. Feb. 23.—Approving proposed changes in Vancouver, Victoria and Eastern Ry. and Navigation Co.'s main line, part of original section east line section 15, Tp. 16, to west line Tp. 26, B.C.

21399. Feb. 23.—Approving C. N. Alberta Ry. stress sheet and general design of bridge at mileage 209.3, across Stony River, Alta.

21400. Feb. 20.—Authorizing Toronto, Hamilton and Buffalo Ry. to divert two highways between Lot 5, Con. 12, and Lot 5, Con. 13; and Lots 6 and 5, Con. 12; to build a right angle crossing halfway between the two present crossings; and rescinding order 20134, Aug. 16, 1913, in so far as it authorizes highway diversion between Lot 5, Con. 12, and Lot 5, Con. 13, Pelham Tp., Ont.

21401. Feb. 24.—Approving locations of C.P.R. stations at Millicent and Rosemary, Alta.

21402. Feb. 24.—Suspending, pending investigation by Board, increased minima on building papers and pulpwood published in Supplement 40 to C.P.R. tariff C.R.C. No. E. 23543, and Supplement 28 to G.T.R. tariff C.R.C. 2513.

21403. Feb. 24.—Authorizing C.P.R. to build road diversion at grade across its main line, Medicine Hat Subdivision, Alta.

21404, 21405. Feb. 24, 26.—Further extending, to May 31, time within which sidings for Otis-Fensom Elevator Co., Hamilton, Ont., be completed; and to June 30 for completion of those for Godson Contracting Co., in Darlington Tp., Ont.

21406, 21407. Feb. 24.—Authorizing C.P.R. to build spur for International Harvester Co., Lethbridge, Alta.; and extension to siding for C. S. Hyman Co., London, Ont.

21408. Feb. 26.—Authorizing McKim Tp., Ont., to build highway crossing over C.P.R. in Lot 9, Con. 5.

21409. Feb. 26.—Limiting speed of G.T.R. trains over crossing of Long St., Chesley, Ont., to 10 miles an hour.

21410, 21411. Feb. 24.—Authorizing G.T.R. to build extension to siding for British American Oil Co., Toronto; and siding for Stevens Bros. and Holmes, Chaffey Tp., Ont.

21412. Feb. 24.—Authorizing Canadian Northern Ry. to build spur for Alberta Agencies, Edmonton, Alta.

21413. Feb. 27.—Suspending, pending investigation by Board, tariffs of G.T.R., Wabash Rd., Central Vermont Ry., Rutland Rd., Michigan Central Rd., Toronto, Hamilton and Buffalo Ry., C.P.R. and Quebec Central Ry., requiring additional railway tickets for exclusive use of drawingrooms or compartments in sleeping or parlor cars.

21414. Feb. 9.—Approving C.P.R. detail plans of subways to be built on its Forsyth Branch at Desjardins St., Pie IX. Ave., Jeanne D'Arc, D'Orleans, Bourbonniere, Charlemagne, Lasalle and Latourneux Sts., Maisonneuve, Que.

21415. Feb. 23.—Relieving G.T.R. from providing further protection at the crossing of third public road west of Chatham station, Ont.

21416. Feb. 26.—Authorizing Kaministiquia Power Co. to build temporary trestle and sluice way across Canadian Northern Ry., 1,390 ft. west of Kakabeka Falls station, Ont.

21417. Feb. 27.—Approving Edmonton, Dunvegan, and British Columbia Ry. plan for 50 ft. half deck plate girder span of bridge to be built over Athabasca River, mileage 131 west of Edmonton, Alta.

21418. Feb. 14.—Authorizing C.P.R. to build spur on Harbor Quay, Goderich, Ont.

21419. Feb. 24.—Amending order 20817, Nov. 11, 1913, re Campbellford, Lake Ontario and Western Ry. (C.P.R.) undercrossing for A. R. Farewell, Oshawa, Ont.

21420. Feb. 27.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build bridge 88 across Trent River, Trenton, Ont.

21421. Feb. 27.—Authorizing Esquimalt and Nanaimo Ry. to build across Anderson Logging Co.'s line near mileage 33 of E. & N.R. extension from McBride Jct. to Courtenay; crossing to be protected by interlocking plant.

21422. Feb. 26.—Amending order 21137, Dec. 31, 1913, re Toronto Civic Car Line crossing of G.T.R. spur on Danforth Ave.

21423. Feb. 28.—Authorizing C.P.R. to use bridges 15.69 and 103.7.

21424. Feb. 28.—Authorizing C.P.R. to build its Bassano easterly branch at grade across road allowances at mileage 97.8 and 92.8, Alta.

21425, 21426. Feb. 27.—Authorizing C.P.R. to build spurs for J. J. Ferrigo and Calgary Brewing Co., Swift Current, Sask., and for Crown Feed and Produce Co., Calgary, Alta.

21427. Feb. 27.—Rescinding order 20407, Sept. 23, 1913, re Kettle Valley Ry., in so far as it directs a crossing at west boundary of M. W. Smith's farm, Beaverdell, B.C.

21428. Feb. 27.—Amending order 19546, June 10, re Hamilton St. Ry. crossing of Toronto, Hamilton and Buffalo Ry. at Main and Trolley Sts., Hamilton, Ont.

21429. Mar. 2.—Extending to May 31 time within which G.T.R. shall complete siding for Harris Abattoir Co., Hamilton, Ont.

21430. Feb. 24.—Approving Bell Telephone Co. agreement, Feb. 7, with Corporation of Waterloo, Tp., Ont.

21431. Feb. 28.—Ordering G.T.R. to stop train 69 on flag signal at Glanford station, Ont.

21432. Mar. 2.—Amending order 21310, Feb. 4, re C.P.R. ballast pit spur crossing road allowance at La Fleche, Sask.

21433. Mar. 2.—Authorizing C.P.R. to use bridges 90.2, 60.6, 63.3 and 0.3.

21434. Mar. 3.—Rescinding order 21402, re suspension of Supplement 40 to C.P.R. Tariff C.R.C. no. E-2353, and ordering that Supplement 44 to C.P.R. Tariff no. E-2353 be in effect from Feb. 25.

21435. Mar. 3.—Authorizing C.P.R. to build road diversion in Sec. 3, Tp. 23, R. 28, W. 3 M., Sask.; and to build its Swift Current northwesterly branch across same at mileage 101.07.

21436. Mar. 3.—Ordering C.P.R. to maintain station agent at Ralph, Sask.

21437. Mar. 3.—Authorizing C.P.R. to build extension to trackage for Crown Grain Co., Winnipeg.

21438. Mar. 3.—Relieving G.T.R. from providing further protection at crossing of Main St., just east of Thorndale station, Ont.

21439. Mar. 3.—Authorizing Hamilton St. Ry. to cross G.T.R. and Hamilton Radial Ry. at grade on Kenilworth Ave.

21440. Mar. 3.—Ordering American Ex. Co. to establish a 23c. rate from Springfield to Hamilton, Ont., to become effective by April 3.

21441. Mar. 3.—Establishing express collection and delivery limits in Edmonton, Alta.; and rescinding order 20972, Oct. 31, 1913, in same connection.

21442. Mar. 4.—Relieving G.T.R. from providing further protection at Goodwillim's crossing, 134 miles west of Georgetown, Ont.

21443. Mar. 3.—Ordering Kootenay and Alberta Ry. to grade west approach to bridge, in Sec. 7, Tp. 6, R. 1, w. 5 m., Alta., for about 300 ft., and extend guard rail for about 150 ft., to be completed by June 15.

21444. Mar. 4.—Ordering C.P.R., within 60 days, to install improved type of automatic bells at crossing of Kyle and Queen Sts., Port Moody, B.C.; 20% of cost to be paid out of "the railway grade crossing fund."

21445. Mar. 4.—Authorizing Nepean Tp., Ont., to build highway crossing over C.P.R. at Second Ave.

21446. Mar. 5.—Authorizing clearance, as shown on C.P.R. plan, between standard coal sheds and rail of side tracks.

21447. Mar. 6.—Amending order 17264, Aug. 21, 1912, re C.P.R. spur to Sims' ballast pit, Sask.

21448. Mar. 6.—Authorizing C.P.R. to build its Swift Current northeasterly branch across highway, at mileage 98.47, between Secs. 5 and 6-23-27, w. 3 m., Sask.

21449. Mar. 5.—Approving revised location of C.P.R. Bassano easterly branch, from Sec. 17-21-18, easterly to Sec. 21-22-8, w.4 m., Alta., at mileage 0 to 72.07.

21450. Mar. 7.—Authorizing G.T.R. to rebuild bridge 49, mileage 123.75 from Black Rock, over public road between Lots 5 and 6, Con. 1, Fullarton, Tp., Ont.

21451. Mar. 6.—Ordering G.T.Pacific Ry. to ap-

point a regular station agent at Cudworth station, Sask.

21452. Mar. 9.—Authorizing Osborne Rural Municipality, 310, Sask., to open crossing over C.P.R. Pheasant Hills Branch at mileage 260.8.

21453. Mar. 9.—Declaring that land applied for at Tappen, B.C., in Little Shuswap Indian Reserve no. 5, is required by C.P.R. for railway purposes, and is land which, were it the property of a private owner, could be taken without owner's consent.

21454. Mar. 9.—Authorizing C.P.R. to rebuild bridge 37.6 over Saugeen River, Walkerton Subdivision, Ont., and rescinding order 20604, Sept. 25, 1912.

21455. Mar. 9.—Approving location of C.P.R. station at Cadillac, Sask.

21456. Mar. 9.—Authorizing G.T.R. to use 2 bridges, no. 12, mileage 48.98, and no. 13, mileage 49.20, District 30, Quebec.

21457. Mar. 9.—Authorizing C.P.R. to use bridges 24.1, St. Guillaume Subdivision, Que.; 22.5, Newport Subdivision; 32.6, Ottawa Subdivision, and 44.7, Ottawa Subdivision, Ont.

21458. Mar. 9.—Authorizing C.P.R. to build spur for T. W. Murray, Vaughan Tp., Ont.

21459. Mar. 10.—Approving location of C.P.R. station at Shaunavon, Sask.

21460. Mar. 9.—Approving revised location of portion of Kootenay Central Ry. from mileage 91.85 to 94.81, and authorizing crossing of Laurier and Borden Sts., Athalmer, B.C.

21461. Mar. 9.—Ordering C.P.R. forthwith to reopen station at Dunkirk, Sask., and reappoint station agent there.

21462. Mar. 9.—Relieving Pere Marquette Rd. from providing further protection at crossing of public road just west of Renwick station, Ont.

21463. Mar. 10.—Authorizing Vancouver, Victoria and Eastern Ry. and Navigation Co. to build spur for British Columbia Milk Condensing Co. at Guichon, B.C.

21464. Mar. 9.—Authorizing C.P.R. to build its Weyburn-Stirling Branch across highways between mileage 232.523 and 253.34.

21465. Mar. 10.—Approving revision of grades and alignment on C.P.R. Webbwood and Algoma Subdivisions, Lake Superior Division, Ont.

21466. Mar. 9.—Ordering C.P.R., within 90 days, to install improved type of automatic bell at crossing of White Lake Road, Pakenham, Ont., switching movements on sidings to be flagged over crossing by train crew.

21467. Mar. 11.—Authorizing Lake Erie and Northern Ry. to operate for 90 days, for purposes of construction only, across Grand Valley Ry. at station 372.60, near Paris, Ont.

21468. Mar. 12.—Amending order 21345, Feb. 11, re C.P.R. bridge 18.71, over Battle River, Alta.

21469. Mar. 12.—Approving locations of C.P.R. stations at Notukeu and Ponteix, Sask.

21470. Mar. 10.—Extending time for completion of siding for Whiteside and Arnold, Barrie, Ont., for 90 days from date.

21471 to 21473. Mar. 12, 11.—Authorizing G.T.R. to use bridge 168 across Thames River immediately west of London, Ont., bridge across Elgin St., Brantford, Ont., and bridge 30, crossing River St., Paris, Ont.

21474. Mar. 10.—Authorizing Cedar Rapids Mfg. and Power Co. to extend its right of way for transmission line to 125 ft. in St. Polycarpe and St. Ignace du Coteau du Lac parishes, Que.

21475. Mar. 12.—Ordering G.T.R. to discontinue yard limit at Algonquin Park station, Ont., within 60 days; if it desires to discontinue use of locomotive whistle at station it shall, within 20 days, file plans for approval of Board, showing signal system to be established there and instructions as to operating same, either by electricity or by hand.

21476. Mar. 11.—Authorizing G.T.R. to use bridge over viaduct, near Port Hope station, Ont.

21477. Mar. 13.—Authorizing C.P.R. to build its Lacombe-Easterly Branch of Calgary and Edmonton Ry. across highway at mileage 188.26, Sask.

21478. Mar. 12.—Authorizing G.T.R. to build siding for Canadian Clarendon Marble Co., St. Johns, Que.

21479. Mar. 13.—Authorizing C.P.R. to build spur for Canadian General Electric Co., Calgary, Alta.

21480, 21481. Mar. 13.—Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build spur at mileage 1.11 (spur mileage), Trenton, Ont., across C.N. Ontario Ry. at two points.

21482. Mar. 12.—Approving Campbellford, Lake Ontario and Western Ry. (C.P.R.) diversion as built at mileage 91.18 from Glen Tay; and rescinding order 18282, Dec. 11, 1912, in same connection.

21483. Mar. 13.—Approving location of G.T. Pacific Branch Lines Co.'s station at mileage 63, on Moose Jaw Northwest Branch, at Siding 11, in Sec. 26-22-6, w. 3 m., Sask.

21484. Mar. 14.—Authorizing G.T.R. to connect with Dominion Iron and Steel Co.'s siding, Point St. Charles, Montreal.

21485. Mar. 13.—Postponing cancellation of special mileage rates on grain for milling and export, as published in C.P.R. Supplement 3 to C.R.C. no. E-2,715 and G.T.R. Supplement 16 to C.R.C. no. E-2,566; and ordering that special mileage rates, as published in Sec. 3 of C.P.R. Tariff C.R.C. no. E-2,715, and Sec. 4 of G.T.R. Tariff C.R.C. no. E-2,566 be continued for one year from March 20, and granting leave to the companies to apply to Board at end of period for revision of rates.

21486. Mar. 12.—Ordering G.T.R. to install, within 90 days, improved automatic bell at cross-

ing of highway immediately west of Lorne Park station, Ont., 20% of cost of installation to be paid out of railway grade crossing fund.

21487. Mar. 13.—Authorizing C.P.R. to build spur for Adolph Lumber Co. at Baynes Lake, B.C., to install derail 300 ft. from crossing of Great Northern Ry. and connect it with interlocking plant, to be completed within six months.

21488. Mar. 16.—Authorizing C.P.R. to build road diversion under main line in Sec. 5-14-23, at Carmangay, Alta.

21489. Mar. 14.—Authorizing C.P.R. to use bridges 62.8 and 79.1, Windsor Subdivision, Ont.

21490. Mar. 14.—Authorizing G.T.R. to use bridges 144, 90, 40 and 39, District 15, Middle Division, Ont.

21491. Mar. 16.—Approving G.T.R. plans showing location and details of freight shed and platform to be built at Prairie Siding, Ont.

21492. Mar. 16.—Amending order 20940, Dec. 3, 1913, re location of C.P.R. Swift Current North-westerly Branch, Sask.

21493. Mar. 17.—Ordering C.P.R., within 60 days to install improved automatic bell at crossing of County Road no. 14, Hillsburg, Ont., 20% of cost to be paid out of railway grade crossing fund.

21494. Mar. 16.—Authorizing C.P.R. to build spur for W. T. Williams and J. W. Davidson, Medicine Hat, Alta.

21495, 21496. Mar. 17.—Authorizing C.P.R. to build its Bassano Easterly Branch across highway between Secs. 5 and 6, Tp. 23-1, at mileage 112.47; also across highway between Secs. 25 and 26-21-6, w. 4 m., Alta., at mileage 83.6.

21497. Mar. 16.—Authorizing Esquimalt and Nanaimo Ry. to build spur to Newcastle Lumber Mills, at Newcastle, B.C., at mileage 6.64 on Comox Extension.

21498. Mar. 17.—Authorizing C.P.R. to rebuild bridge 109.36, Mountain Subdivision, B.C.

21499. Mar. 17.—Ordering C.P.R., by June 1, to erect shelter at Groverton, Ont., for passenger accommodation.

21500. Mar. 17.—Approving revised location of C.P.R. main line, as built from mileage 24.76, at Savona, to mileage 30, and from mileage 32 to 40.62, at Semlin, B.C.; and authorizing double tracking on same and across 4 highways.

21501. Mar. 16.—Authorizing G.T.R. to build bridge 266, at mileage 48.25, over Credit River, near Inglewood, Ont.

21502. Mar. 16.—Authorizing G.T.R. to build siding in Macauley and Draper Tps., Ont., for I. C. McLeod.

21503. Mar. 16.—Authorizing G.T.R. to use bridge 130, over Nith River, mileage 75.64, near Princeton, Ont.

21504. Mar. 17.—Authorizing G.T.R. to rebuild 9 bridges on District 4, Que.

21505. Mar. 16.—Approving Canadian Northern Ry. revised location through Sec. 19-2-6, and Sec. 24-2-7, w. 2 m., Sask., mileage 0 to 1.43; and authorizing crossing of road between said sections.

21506. Mar. 16.—Approving G.T.R. plans of superstructure of 8 bridges, District 13, Ont.

21507. Mar. 17.—Ordering G.T.R. by June 15 to install gates at St. Clair Ave., Toronto, Ont., to be operated by day and night watchmen; 20% of installing gates to be paid by railway grade crossing fund, remainder, 1-3 by city, and balance by company.

21508. Mar. 14.—Ordering G.T. Pacific Ry. to make certain changes in highway crossings in Tp. 34, R. 1 and 2, w. 3 m., Sask.; to be completed by May 31.

21509. Mar. 16.—Authorizing G.T.R. to build siding for Chalmers Milling Co., west of Dawes Road, Toronto.

21510. Mar. 16.—Approving G.T.R. plan of proposed arrangement for lighting vehicular and pedestrian roadways on Victoria Bridge, Montreal; work to be completed within 3 months.

21511. Mar. 17.—Authorizing Canadian Northern Ry. to build across and divert public road between n.e. ¼ Sec. 33-28-20 and n.e. ¼ Sec. 4-29-20; to divert highway between n.e. ¼ Sec. 32-28-20 and n.w. ¼ Sec. 34-28-20 to new crossing in n.e. ¼ Sec. 33, w. 3 m., at station 5684+20.2.

21512. Mar. 17.—Authorizing Cedar Rapids Mfg. and Power Co., Montreal, to make right of way for transmission line, 125.9 ft. wide, across Lot 338, St. Joseph de Soulanges Parish, Que.

21513. Mar. 16.—Authorizing London and Lake Erie Ry. and Transportation Co. to connect with Michigan Central Rd., at west end of St. Thomas, Ont.

21514. Mar. 17.—Authorizing G.T.R. to rebuild overhead bridge carrying Westminster Road over its line in London Tp., mileage 121.58 from Suspension Bridge, Ont.

21515. Mar. 18.—Approving Marconi Wireless Telegraph Co. of Canada's Tariff C.R.C. 8, covering new rates for cable and weekend letters; same to be filed in form prescribed under order 6679 (general order 32), Mar. 26, 1909.

21516. Mar. 17.—Amending order 21,417, Feb. 27, re Edmonton, Dunvegan and British Columbia Ry. plan for bridge over Athabasca River at mileage 131 west of Edmonton, Alta.

21517. Mar. 18.—Amending order 17,400, Aug. 30, 1912, re Campbellford, Lake Ontario and Western Ry. (C.P.R.) right of way.

21518. Mar. 18.—Ordering C.P.R. by April 1 to restore old clearance by raising underside of top of culvert 11 ins. between mileage 24 and 25, just north of Flower station, Ont.

21519. Mar. 19.—Amending order 21,418, Feb. 14,

re C.P.R. spur at Harbor Quay, Goderich, Ont., 21520. Mar. 16.—Authorizing City of Montreal to build 8 ft. steel water pipe under, across and along G.T.R., Montreal, to be used as emergency supply for city.

21521. Mar. 19.—Authorizing C.N. Ontario Ry. to build trestle across Indian River, Fraser Tp., at mileage 101 from Ottawa.

21522. Mar. 19.—Ordering C.P.R. to stop train 22 on flag, daily except Sunday, at St. Clet, Que.

21523. Mar. 20.—Authorizing C.P.R. to take certain lands in Lot 6, Con. 4, west of Hurontario St., Toronto Tp., for enlarging station yard at Streetsville Jct., Ont.

21524. Feb. 26.—Authorizing G.T.R. to build siding for Terminal Warehouse and Cartage Co., west of Common St., Montreal, and rescinding order 9859, Mar. 9, 1910.

21525, 21526. Mar. 20.—Authorizing G.T.R. to use 16 bridges on District 30, Ont., and bridge on District 16, across Birch Ave., Hamilton, Ont.

21527. Mar. 23.—Amending order 19958, Aug. 8, 1913, re crossing of certain highways in Maisonneuve, Que., by C.P.R. Forsyth St. Branch.

21528. Mar. 20.—Authorizing C.N. Ontario Ry. to take portions of Lots 81 and 82, Ste. Dorothee Parish, Que.

21529. Mar. 21.—Relieving C.P.R. from providing further protection at crossing of Government Road, Mortlach, Sask.

21530. Mar. 23.—Authorizing G.T.R. to build 2 bridges 138, mileage 91.90, near Woodstock, and 7, mileage 6.15, near Weston, Ont.

21531. Mar. 21.—Authorizing C.P.R. to use bridge 2.65 on its Prescott Subdivision, Ont.

21532. Mar. 23.—Amending order 21508, Mar. 14, re G. T. Pacific Ry. crossings of highways in Saskatchewan.

General Order 121 rescinding general order 109, re carriage of trunks containing personal effects by freight, as from March 1.

General Order 122 rescinding general order 116, Dec. 24, 1913, re increased minimum railroad weights on certain grain and root traffic.

General order 123, Mar. 19.—Approving form "Release of Responsibility," no. 981, respecting carriage of clothing, wearing apparel and personal effects, all secondhand, in trunks, securely corded, submitted by Canadian Northern Ry., and ordering that said form be applicable to all railway companies under Board's jurisdiction until ordered otherwise.

Telegraph, Telephone and Cable Matters.

The Timiskaming and Northern Ontario Ry. Commission is reported to have purchased the Elk Lake Telephone and Telegraph line, which was owned by A. J. Reece, Elk Lake, Ont.

The Canadian Northern Telegraph Co. has opened an office at Fairlight, Sask., and has installed telephones at Bayard, Ettington, Gravelbourg, Mazenod, Michellton, Palmer and Spring Valley, Sask.

The Western Union Telegraph Co. has deposited plans for works proposed to be erected on certain land, and land covered by Water in Halifax harbor, N. S., the property being known as the Market wharf.

The Dominion Government has completed the laying of a cable connecting Pender and Saturna Islands, and is also laying cables connecting Halfmoon and Buccaneer bays, across Welcome Pass, and from London Island to Savary Island. A telegraph office has been opened at Britannia Beach on the line connecting Vancouver and Squamish, B. C.

A. B. Smith, Manager of Telegraphs, G. T. R. and G. T. Pacific Ry., is on a trip of inspection through the west to arrange details for the rapid completion of existing telegraph lines, and extensions in connection with the commercial telegraph service. It is anticipated that the telegraph line will be completed between Winnipeg and Prince Rupert shortly, a small gap only having to be filled.

The report with recommendations in the arbitration respecting telegraph operators' wages on the Pere Marquette Rd., issued at Detroit, Mich., Mar. 1, grants to operators in towns with a population of 15,000 or more, who have been receiving \$70 a month, or less, an increase of \$5 a month; to operators in cities with a population of less than 15,000, who have been receiving \$60 a month or less, an increase of \$2.50 a month. Overtime is to be paid at a rate derived by divid-

ing the monthly rate by the monthly hours, with a minimum of 25c. per hour, instead of an all round 25c. an hour as heretofore.

It is announced that the extensions of the C. P. R. telegraph system in British Columbia during this year, will include the continuation of the line along the Esquimalt and Nanaimo Ry., from Nanaimo to Courtenay, connecting Qualicum Beach, Union Bay, Cumberland and Comox, and the erection of an additional wire between Nanaimo and Alberni. Another line will be erected between Golden and Windermere, 95 miles, along the Kootenay Central Ry., and the line in the Okanagan Valley will be rebuilt.

Among the Express Companies.

S. O. Martin has been appointed agent, Canadian Northern Ex. Co., at Ottawa, where an office has recently been opened.

The Dominion Ex. Co. has closed its offices at Bittern Lake, Dauntless, Ensign, Keoma, Mazeppa, Seebe and Spring Coulee, Alta.

The Board of Railway Commissioners has rearranged the express delivery and collection limits for Edmonton, Alta.

F. W. Holland has been appointed General Agent, Canadian Northern Ex. Co., Montreal, vice E. C. Miner, acting General Agent there, who has resigned.

The Canadian Northern Ex. Co. has recently opened offices at Rockville Jct., Caffey's Locks, Cumberland, La Framboise, Ottawa, Richmond, L'Orignal, Orillia, Rockland, Smiths Falls, Perth Road and Portland, Ont.; Rockyford and Calgary, Alta.

The Dominion Express Co.'s Traffic Manager, W. H. Burr, has sent the following circular to agents: "We are going to issue, from time to time, short letters containing information on subjects relating to transportation, and particularly with regard to the service of the express companies, which we think will be of interest to employes, and which may assist them in answering questions, or in discussing such subjects with patrons. We shall be glad to receive suggestions from employes, and will take pleasure in answering personal requests for information desired on any particular point relating to the service. This is not to be a correspondence school, but merely an effort to get into personal touch with those who are interested, to the end that we may be able to place ourselves fairly before the public and be prepared to meet the adverse comments of those who don't know."

The first letter sent out deals with parcel post vs. express service. It says:—

Do not knock the parcels post; it has come to stay; it fills a long felt want to those who are willing to perform the greater part of the service themselves, who are willing to assume all the risks of loss or damage, who do not consider time of very great importance. On the other hand, the express companies are necessary to those who desire the personal service, protection in transit, pick-up and delivery, the saving of time, the prompt payment for goods lost or damaged, the option of prepaying or having the charges collected from the consignee, the collection of the purchase price upon delivery (c.o.d.), the privilege of stopping goods in transit, and the innumerable special services which are performed by express agents and employes. It is a business proposition. Where there is a difference in the charge, the higher charge will not be paid unless it is justified by superior service or advantages. On the other side, we give you the schedules of the parcels post rates, also the charges by express on parcels weighing up to 6 lbs. Make our service worth the price and go after the business.

Electric Railway Department

The Sherbrooke Railway and Power Co.'s Electric Railway System.

The Sherbrooke Railway and Power Co. operates a railway of about 11 miles around Sherbrooke, Que., with a suburban extension to Lennoxville, three miles. It also conducts a power and electric lighting business, in competition with the municipal organization.

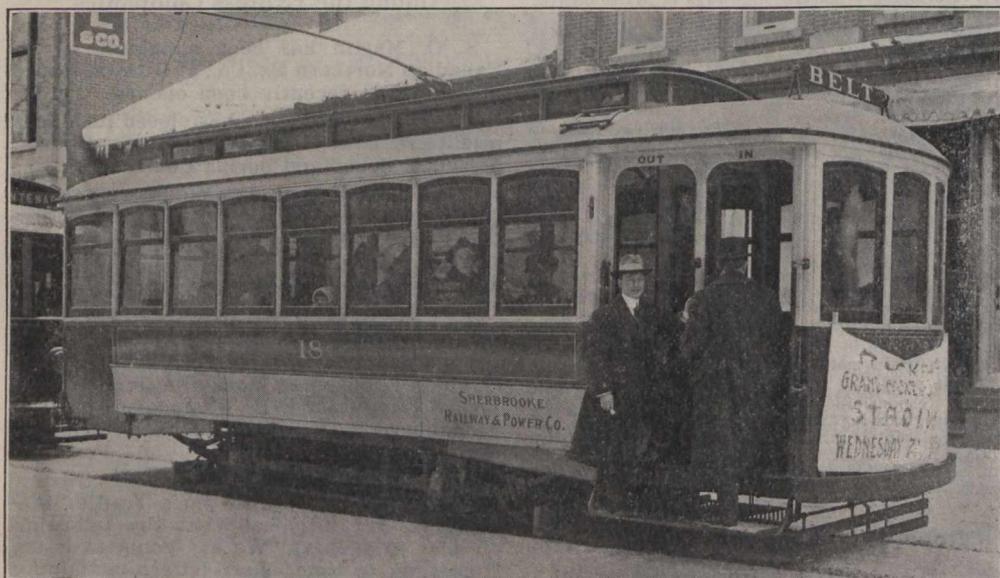
country surrounding the city is very fertile, and supports a prosperous farming community. All these features contribute to the welfare and development of the city. In consequence, the railway policy at the time of the amalgamation was planned with this future prosperity in view. At the

may be counted out, every section of the city is within a short walking distance of a street railway track.

The system consists of five lines, as follows:—Belt, Frontenac, Newington, Park city to the south of the C.P.R. line, which and Lennoxville, all but the latter being exclusively local. The Belt Line operates four cars normally, on a 10 minute headway, the cars running in both directions around the belt. The route followed is along Wellington, Dufferin, Queen, Wolfe, Belvidere, King, Alexander, Aberdeen, Depot, King, and then back along Wellington St. The reverse belt runs in the opposite direction. This is the principal line of the system, embracing the main residential district, and passing through the main business section of the city, which is along Wellington St., north of King St. In addition, this line passes directly in front of the union station, through which pass the trains of the G.T.R., Quebec Central Ry., and Boston and Maine Rd. It is also the line nearest to the C.P.R. station near the back of the city. The starting point, and one of the turnouts for the line, are at the local offices and waiting room on Wellington St.

The Frontenac line operates one car only, and in a sense is a one way belt line, the starting point being the waiting room, following Wellington, Frontenac, Wolfe, Portland, Ontario, Beckett, Dufferin, and then along Wellington St. to the starting point. This line operates on a 20 minute headway.

The Newington line, operating one car, connects the centre of the city with Newington, a small suburb in the southeast section of the city, where the Quebec Central Ry. shops are located. From the corner of Wellington and King Sts. a car leaves every 20 minutes, following King St.



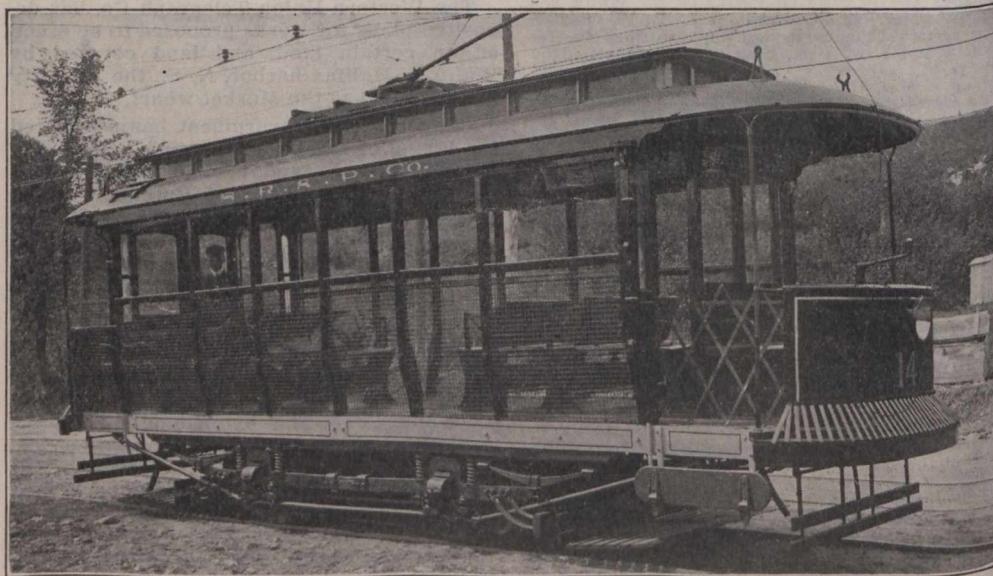
Latest Type of Nearside Pay-as-you-enter Car, Sherbrooke Ry. and Power Co.

The street railway property first operated under the name of the Sherbrooke St. Ry. Co., under a charter granted by the Quebec Legislature in 1895, when the population of Sherbrooke was about 9,000. For some years the railway was operated in a perfunctory manner, and allowed to lapse into a state of decay, largely due to it not being considered a profitable property, and not worth developing. In 1909, when the gross earnings on a small mileage with limited rolling stock were only \$31,222, the Sherbrooke Ry. and Power Co. was incorporated by the Quebec Legislature, to take over the property and franchises of the Sherbrooke St. Ry., as well as certain water power rights held by the British American Land Co., an old English company then being wound up. The resultant combination produced a public utility company with a wide field of activity.

At the time of the combination, Sherbrooke had a population of about 17,000, and in view of the contemplated rapid development of the city, due to the influx of numerous industries, it was proposed to reconstruct practically the whole system, and replace nearly the whole of the rolling stock, bringing the line up to date, as it was felt that by so doing the property would become profitable. This reconstruction has been carried out, with new power plant, road bed, and practically all new car equipment.

Sherbrooke now has a population of over 18,000, which is rapidly increasing as mentioned, due to the rapid influx of new industries, and the growth of existing enterprises. It is the central point of the old United Empire Loyalist settlement called the Eastern Townships, and is one of the very few settlements in Quebec in which the English element predominates. The

time of the amalgamation, a 5 mile extension to Brompton, a city of 12,000 population, and a further 8 mile extension to Windsor Mills, with 4,000 population, were considered, but it was not decided to proceed with these lines, and nothing has been done in this connection.



Open Car Converted for Nearside Prepayment, Sherbrooke Ry. and Power Co.

The extent of the local system is shown in the accompanying plan of the city. The system covers the whole city area most thoroughly, and in a manner that is not excelled in many small railway properties. With the exception of the portion of the is a recent subdivision, and in consequence

across the bridge, and then along Bowen Ave. and Lennoxville St. to the Q.C.R. shops, where the line loops back. A complete round trip is possible in the 20 minutes with a short stop at each end.

The Park line, operating one car, leaves from the same point as the Newington line,

at exactly half time with regard to the Newington car movements. This line follows King St. to Pine St., which it follows to the exhibition grounds, where it loops back, making the round trip in 20 minutes. This is the busiest line of the system during the fair week. Sherbrooke has the distinction of holding the largest fair in Eastern Canada every fall—The Eastern Canada Exhibition, which draws big crowds, taxing the line to its capacity.

The Lennoxville line is the only radial line of the system, and operates two cars on a 15 minute schedule, between Sherbrooke and Lennoxville. Starting from the corner of King and Wellington Sts., the line follows the latter to the road along the east bank of the St. Francis River, parallel to the G.T.R. line, to Lennoxville, where it terminates in the centre of the village. It follows the side of the highway, and maintains a very high schedule speed for the class of traffic handled.

All the lines of the system are single track, with turnouts located at such intervals as to minimize the waiting at meeting points. This is essential, as it will be seen from an examination of the operating times mentioned earlier, that the lines all operate on a pretty quick schedule for a small system.

The layout of the system has been largely dependent on the physical characteristics of the city. The hills on either side of the St. Francis River at this point are quite steep. The streets paralleling the river are comparatively level, but those running at right angles to it are for the most part very steep. Following the courses of the various lines a minimum grade has been obtained in rising from the lower level, in the heart of the business section along the west bank of the river, to the upper residential sections. The heaviest grade is up King St., the second street of the city, and in consequence, it has been considered inadvisable to run the cars straight up this street, the belt line cars making a detour two blocks to the south, thereby obtaining an easier ascent.

The system is laid with 72 lb. rail, 7 in. section, and with the exception of a very small portion the track is in an almost perfect condition. In all there are 11 miles of line. The trolley wire in the city system is 00 grooved copper. On the Lennoxville line an experiment in line material was tried about a year ago, and has given the best of satisfaction. This 3 mile line required trolley wire renewal. It was decided to try a steel wire of similar size to the copper one formerly in use, so 3/8 in. steel wire was obtained for a short section of the line. This was obtained in stock lengths, and welded together at the ends in the shops. This proved quite satisfactory, but it was found that the wire, coming as it did from stock, was rough, and could not be straightened perfectly, and in consequence the wear on the trolley wheel was more than it ought to be. The use of the steel wire was sufficiently satisfactory to warrant the completion of the whole line. Before doing so, an order was placed for smooth, clean wire from the mill in desirable lengths. This wire has proved most satisfactory, and it is claimed that there is practically no wear to the trolley wheels. What wear does occur is due principally, it is claimed, to the first section of rough stock wire. The old copper trolley wire was suspended from the spans, 12 ins. off centre, and connected with the trolley wire at every span by flat steel bars, 16 ins. long, which were forged in the shops in spare moments. The copper trolley, in a single subway through which the line passes, was replaced by a steel bar, 1/2 by 2 ins., which gives good

results. The operation of this section of the line has been most satisfactory, and a new trolley line has been obtained at about one tenth the cost of a new copper one. By the use of the old line as an additional feeder alongside, the resistance

faces are in a theatre building near the north end of Wellington St., with waiting room and operating office on the ground floor, opening to the street, and staff office above. The frame car barns are near the south end of the town on the Lennoxville line, backing on the G.T.R. tracks. They have a capacity for 20 cars, the layout consisting of 5 tracks, each holding 4 cars.

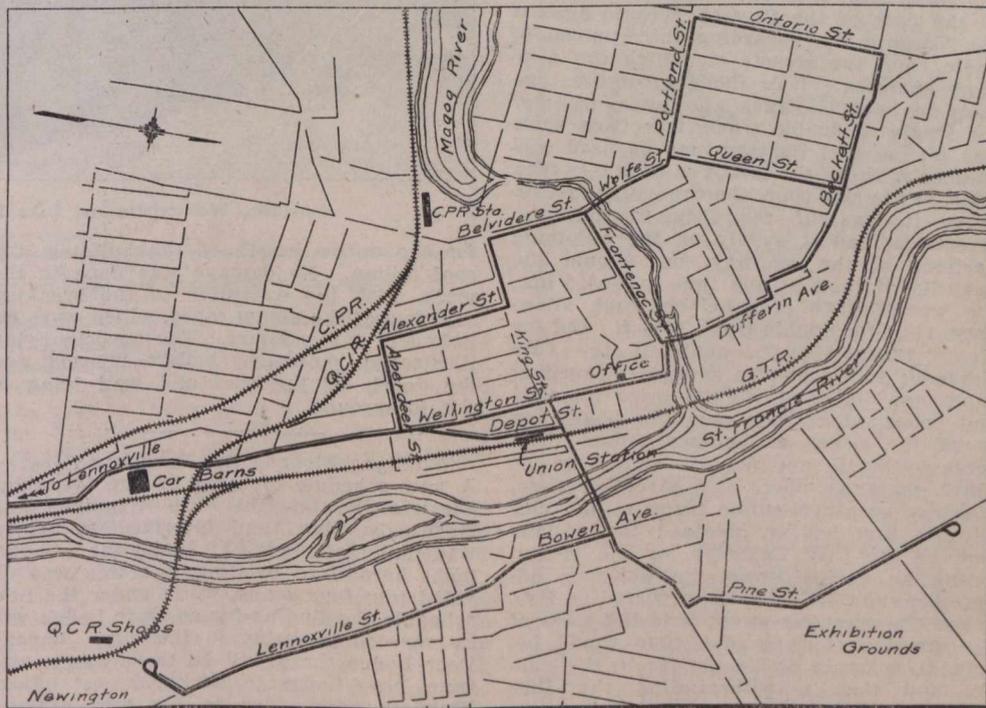
The rolling stock consists of 21 cars, all of which are single truck, with the exception of a double truck sweeper. One of the latest additions to the equipment is shown in an accompanying illustration of one of the new nearside, prepayment cars, which are in almost general use on the system. On a small system, during the major portion of the day, the traffic is very light, and the question of a few men's wages often means the difference between profits and the passing of a dividend. It generally devolves itself into a question of the advisability of decreasing the service, and thereby reducing traffic by causing people to walk, or else putting on an expensive, frequent service to entice traffic. On this system, after considerable study, it was believed that just as good, if not superior, service could be given with a one man car crew. So, in Dec., 1912, most of the cars were changed over from the rear entrance type, that entrance being blocked, and another door added at the front of the car, the front one of which is for entrance, and the other for exit, the entering passengers passing in front of the motorman-conductor, who proceeds without having to await for a signal, as soon as the passengers have entered the car. The Frontenac, Newington and Park lines were all equipped with this service, which proved so satisfactory that last summer the Belt line was also given the same kind of service. It has not been considered advisable to change over the Lennoxville service, as these cars operate on a very fast schedule, and require two men. In order to secure a better class of men for this more responsible single service, the company raised



N. C. Pilcher,
General Manager, Sherbrooke Railway and Power Co.

of the line is, if anything, reduced. On all curves on the city lines, as well as cross-overs, similar steel wire is used.

Power for the railway lines is obtained from two 250 k.v.a. motor generator sets,



The Sherbrooke Ry. and Power Co.'s Lines in Sherbrooke.

receiving a.c. power at 2,000 volts, and delivering from the d.c. end at 550, which is the distribution pressure through the system.

The company's buildings consist of the office building and the car sheds. The of-

ices are in a theatre building near the north end of Wellington St., with waiting room and operating office on the ground floor, opening to the street, and staff office above. The frame car barns are near the south end of the town on the Lennoxville line, backing on the G.T.R. tracks. They have a capacity for 20 cars, the layout consisting of 5 tracks, each holding 4 cars.

The interruption to service is practically negligible.

Most of the cars are of the closed type shown, the older cars being of the same general design as the newer equipment. When the change to the nearside operation was made, it was desired to convert four open cars for this service, and the manner of doing so is shown herewith. These cars may still be used for double end operation. All the cross seats were cut down, so as to form a side aisle, half way on either side. The side steps were removed, and the sides barred with a wire screening made of no. 10 wire, on a 1½ in. mesh, completely closing in the car body. A door was cut in each bulkhead, and at each end a folding gate and step provided, the step being folded up and the gate closed on the rear end of the car, so that the entry and exit of passengers is still under the motorman-conductor's observation as in the closed car. The car bears out the statement of the chairman of the Quebec Utilities Commission, that it is "the safest open car in existence."

Following are some operating statistics for the year ended June 30, 1913:—Operating expenses to gross earnings, 77.22%; car mileage, 448,144; gross earnings per car mile, 10.746c.; operating expenses per car mile, 8.299c.; passengers carried, 1,115,038; transfer passengers carried, 220,809. The heaviest week of the year is at exhibition time, as mentioned. During the last exhibition the railway receipts for the week were \$3,200, with a single day record in the same period of \$1,000. This traffic was handled with 13 cars.

The operating officials are N. C. Pilcher, General Manager, and J. B. Woodyatt, Power Superintendent, to the former of whom we are indebted for the data from which this article has been prepared.

The Toronto Railway and Snow Removal.

Following is a summary of the judgment, delivered Mar. 5, in the York County Court, in the case of the City of Toronto against the Toronto Ry. regarding the removal of snow from the streets on which the company operates:—It is the duty of the company to keep its track allowance, whether for single or double track, free from snow and ice, so that its cars may be used continuously, and if the fall of snow is less than 6 ins. at any one time, the company must remove it, and, if the City Engineer so directs, spread it evenly on the adjoining portions of the roadway, but should the quantity of snow at any time exceed 6 ins., the whole space occupied as track allowance, viz.—for double track 16½ ft., and for single track 8¾ ft., shall, if the City Engineer so directs, be at once cleaned of snow and ice, and the material removed and deposited at such point, or points, on or off the street, as he may order. The company shall not deposit snow, ice or other material upon any street, square, highway or other public place in the city without first having obtained the permission of the City Engineer, or the person acting as such. From the evidence adduced, a snow fall of 6 ins. occurred on Feb. 6, and the company swept it to the sides of the streets, which in due time would become a nuisance and a danger to the public, and that notwithstanding the City Engineer's request to remove it, the company refused to do so. On Feb. 10, 12, 14, 15 and 17, different quantities of snow also fell, which was not removed from the sides of the streets as required, the City being obliged to remove it, and it was therefore declared that it was the duty of the company to have removed the snow as required by the City Engineer.

Explosion in Chatham, Wallaceburg and Lake Erie Railway's Power House.

On Feb. 24, employees of the Chatham Gas Co. proceeded to shut off the gas on the main valve in the building, controlling the gas to the regulating device. In doing so, the valve, of a cast iron plug type, broke off in the centre of the plug, allowing the top portion of the plug to be blown out by the pressure of the gas, which was in the neighborhood of 2 or 3 lbs. per square inch. On account of not having ready access to the valves outside of the building, the gas escaped and filled the boiler room, and ignited, apparently from the boiler furnaces, which are operated by gas, although it was supposed at the time that the men shut off the furnaces. The explosion did not take place until several minutes after the leak occurred, the men remaining in the building apparently trying to stop the leak by some of the methods at hand. During the period which elapsed between the break and the explosion, sufficient gas escaped to fill the room. While the door and ventilators were left shut when the explosion took place, it was sufficient to release the flat slanting roof from the upper wall. The result was that the lowest point in the wall was driven out

The Ontario Hydro-Electric Power Commission and Projected Electric Railways.

The proposition for the building of an electric railway from Toronto, via Markham to Port Perry, Whitby and other points east of Toronto, is being discussed by the municipal councils, through whose territory such a line would pass. The heads of a proposed agreement have been discussed by several of the municipalities interested, and some points upon which there may be differences of opinion have been reserved for full discussion at a general meeting of municipalities, which it is expected to hold in Toronto during April.

In Western Ontario, the points upon which interest is centered are St. Thomas, London and Guelph, each of which cities desires to be a centre from which will radiate a network of electric railways, to be built under the Commission plans. Representative meetings have been held at each of the cities named, and many meetings held in the municipalities surrounding these cities have also been held, favoring the plans. The Commission's engineers have been going over the territory which would be served. This covers practically the whole of the Ontario peninsula, west of a line drawn from Port



Chatham, Wallaceburg and Lake Erie Ry. Power House, After Explosion.

for the entire length of the building, the roof falling. No damage was done to the plant, with the exception of the breaking of a few of the steam pipes, which were repaired in a few hours. The accompanying illustration shows the boilers exposed, and the debris of the roof and wall lying in the foreground.

Winnipeg Electric Ry. Suburban Fares.—

A new schedule of fares on the Winnipeg Electric Ry. line, between Winnipeg and Headingly, Man., and intermediate points, was announced Feb. 17. Under the arrangement heretofore existing, the line was divided into four zones, while under the new schedule the line as far as Deer Lodge will be counted as being in the city. Beyond Deer Lodge there will be three zones, viz., from Deer Lodge to Kirkfield post office; Kirkfield post office to the rifle ranges; and the rifle ranges to Headingly. The fares are 5c. within each zone; and the return fares from the city are:—Kirkfield, 15c.; rifle range, 20c.; Headingly, 30c. The new schedule came in operation Feb. 18.

The G. T. R. ambulance team at Montreal won the Dominion Bridge Co.'s trophy, there, recently.

Burwell to Collingwood.

Hon. Adam Beck, Chairman of the Hydro Electric Power Commission, speaking at Aylmer, Mar. 17, is reported to have said the Commission had 1,200 applications for surveys in connection with electric railways, under the Commission's plan. Only half a dozen of these had been dealt with. Four survey parties were in the field going over suggested routes. The Commission was prepared to give estimates for the building of lines in any direction the people desired, and it would be for the people to decide what lines it would be profitable to build. In the case of guaranteeing the bonds of a company, the ratepayers took all the risks, but if they built the lines themselves, they owned them, and would receive the profits.

Hamilton Incline Ry.—It was reported, Mar. 13, that work on the east end incline railway has been progressing satisfactorily. The concrete piers are reported to be ready for the steel. It is expected that the incline will be ready for operation by April 30.

The G. T. Pacific Telegraph Co. has commenced a commercial telegraph service to Prince George, B. C., its station serving Fort George, and South Fort George.

Electric Railway Projects, Construction, Betterments, Etc.

Cape Breton Electric Co.—We are officially advised that the company has no knowledge of any electric railway being projected in Sydney or vicinity from 15 to 25 miles in length (as recently reported in the daily press) nor of any mining company having such a line under consideration. (Mar., pg. 135.)

Dominion Power and Transmission Co.—It is reported that rapid progress is being made with the building of the new steam power plant in Hamilton, Ont., and that a contract has been let to the Canadian Westinghouse Co., for motors, generators, etc., at a cost of \$360,000. (Mar., pg. 135.)

Edmonton Radial Ry.—We are officially advised that the details of the estimates for work on the radial railway for the current year before the Edmonton, Alta., City Council, are: Permanent track on Portage Ave. from First St. to Norwood Boulevard, \$14,678.10; protection at railway crossings, \$12,270; distribution system negative feeders, \$37,214; work done during 1913 and unprovided for, \$20,216.60; new car barns, unprovided for in 1913, \$66,700; fire protection, \$3,033; sewer, construction \$1,780; tracks laid in barns, \$4,165; total, \$160,056.70.

We are further advised that it has been decided to report adversely on the proposed extension to Forest Heights on the ground that the population was insufficient to warrant service of any kind being given, and the committee further recommends that hereafter no extension be made by the department until the district to be served be sufficiently populated to insure adequate returns on the investment. This recommendation refers to the application for an extension into the Mill Creek and other districts. (Mar., pg. 135.)

Galt, Preston and Hespeler St. Ry.—We are officially advised that the company's franchise in Galt, Ont., does not expire until 1921, and that the press reports that a bylaw granting an extension had been approved by the ratepayers, are without foundation. We are also advised that the company has no power house at Galt, and that the press report that such a power house be extended is therefore without foundation. (Mar., pg. 135.)

Guelph Radial Ry.—We are officially advised that although additional stock has been issued by the company, it is not for the purpose of extending the line, but for the purchase of new cars. A. H. Foster, Guelph, Ont., is Manager. (Mar., pg. 135.)

Hull Electric Ry.—A press report states that the company is considering plans for the extension of the line from Hull to Gatineau Point, Que. G. Gordon Gale, Hull, Que., is General Superintendent. We are officially advised that the proposition is entirely on the part of the Hull City Council, and that the company does not contemplate building the extension at present. (Jan., pg. 38.)

Kingston, Portsmouth and Cataract Electric Ry.—We are officially advised that the company has ordered in the U. S. 130 tons of 90 lb. steel rails, A. S. C. E. section. H. C. Nickle, Kingston, Ont., is General Superintendent. (Mar., pg. 135.)

Lethbridge Municipal Ry.—We are officially advised that it is proposed to build extensions as follows:—East of 2nd Ave. north from 13th St. to 19th St., north on 19th St. from 2nd Ave. to 7th Ave., west on 7th Ave. from 19th St. to 13th St., north on 13th St. to Harcheville, west on 9th Ave. from 13th St. to the C. P. R. coal mines. It

is not expected to make these extensions this year, but it is intended to prepare the plans and estimates in order to have the money in hand for construction in 1915. A. Reid, Lethbridge, Alta., is Commissioner of Public Utilities. (Mar., pg. 135.)

London and Lake Erie Ry. and Navigation Co.—After several conferences between representatives of the company and of the municipal authorities of St. Thomas, Aylmer, Yarmouth and Malahide, it was stated Mar. 5, that the company will build a line from St. Thomas to Aylmer and Sparta, upon the municipalities guaranteeing its bonds for \$20,000 a mile. The municipal representatives subsequently met and arranged that the municipalities will guarantee the bonds in the following proportions:—St. Thomas city, \$100,000; Aylmer village, \$45,000; Yarmouth tp., \$145,000; Malahide tp., \$20,000. It was also agreed that the ratepayers in the four municipalities will vote on the question Mar. 30. Subsequently the matter was discussed by gatherings of ratepayers, at all of which the question of building lines under the Ontario Hydro Electric Commission was raised. As a result of all this W. N. Warburton, Manager, is reported to have said, Mar. 11, that the directors had decided to withdraw the proposition for the present. G. B. Woods, Toronto, Vice President, is also reported to have said, Mar. 11: "We intend to let the matter drop until such time as the people have had an opportunity to obtain an estimate from the Hydro Electric Commission or some other competent engineering authority. If, after the different municipalities have done this and have given the matter careful consideration, and are in a position to make a proposition to us, we will take up the matter with them again." (Mar., pg. 135.)

Montreal and Southern Counties Ry.—The Montreal City Council was informed recently that the Quebec Legislature had refused to sanction an agreement granting the company permission to lay its tracks across McGill St. and on Youville Square. Montreal. (Feb., pg. 87.)

Montreal Tramways Co.—The special committee of the Montreal City Council is studying the company's proposals in connection with the report made by the City Engineer's Department, which was specially submitted to them.

Press reports, Mar. 12, stated that the company's plans for work during the current year provide for the expenditure of about \$2,000,000, to include the purchase of 100 new cars, the construction of two new car barns, and the provision of several new routes, in addition to betterment work on existing lines. (Feb., pg. 87.)

Moose Jaw Electric Ry.—It is expected that as a result of the recent municipal census the company will be asked to extend certain of its lines. The agreement with the company provides for the building of lines according to the density of population. The new line suggested is past Wolfe Ave. on 16th Ave., and on to Laurier Ave., about 0.75 of a mile, with a possibility of extending it so as to complete a belt line. This would give a service to the Hillcrest district. (Dec., 1913, pg. 593.)

Ontario West Shore Ry.—It is said that those in charge of this uncompleted line propose to sell the rails which have been laid or are lying ready for laying.

Ottawa and St. Lawrence Electric Ry.—We are officially advised by M. Malone, Engineer of the company at Ottawa, that a contract has been let to the Ottawa and St. Lawrence Construction Co., of which H.

W. Pearson is Manager, at 201 Union Bank Building, Ottawa, to build 70 miles of line from the Connaught rifle ranges, 15 miles west of Ottawa, through Ottawa, and thence across country to Morrisburg, Ont., on the St. Lawrence River, with a branch line from Metcalfe to Russell, on the Ottawa and New York Ry.; that this line will cross the C.P.R. Montreal-Toronto line at Winchester; that the line will also pass through the following towns and villages, viz.: Britannia, South Gloucester, Greely, Kinmore, Vernon, Ormond, Winchester Springs and Williamsburg; that work will commence about May 1, and that bonds have been floated covering this portion of the line. He also stated that on this first portion, outside of terminals, in three of which there will be a 2.5% gradient, the gradients will not exceed 0.7%, with a maximum curvature of 8 degrees; that there will be 12 bridges varying in length from 30 to 400 ft., and that it is proposed to use Diesel electric cars.

The company's complete project is for the building of about 300 miles of line, the other portions including a line from Brockport, west of Brockville, to the Quebec provincial boundary by way of Cornwall, and another line north from Brockport through Smith's Falls, Perth and Lanark to Arnprior. J. A. Morden & Co., brokers, Toronto, are interested in the project.

Port Arthur Electric Ry.—The Mayor of Port Arthur, Ont., announced, Mar. 7, that the proposed extension of the line will reach Murillo, and pass through the townships of Oliver, McIntyre and Ware. No attempt will be made to extend the line into any district tributary to Fort William. The township councils of Oliver and McIntyre have passed resolutions favoring the construction of the extension. Nothing has been done in the way of locating the line, but it is expected that surveys will be made at an early date. The line will be built in sections, and as soon as the necessary legislative authority is obtained, the money bylaws will be submitted to the ratepayers. (See Port Arthur and Fort William Electric Ry., Jan., pg. 39.)

Prince Albert, Sask.—A Prince Albert press dispatch says:—"The Ottawa St. Ry. interests, which already have a line in operation at Moose Jaw, have offered to build a street car line in Prince Albert this year if a 20 year franchise is granted. The council will consider the matter at once." The Ottawa interests referred to are not connected with the Ottawa Electric Ry., but with the Ottawa Electric Co., the General Superintendent of which, A. A. Dion, is President of the Moose Jaw, Sask., Electric Ry.

Quebec Ry., Light and Power Co.—The Quebec City Council is considering a proposal to ask the company to build an extension of its electric railway in Belvedere Ward. (Feb., pg. 89.)

Sandwich, Windsor and Amherstburg Ry.—The three miles of track which it is proposed to build during the summer are, we are officially advised, practically all renewals on existing lines. Jas. Anderson, Manager, Windsor, Ont. (Jan., pg. 39.)

Sarnia St. Ry.—We are officially advised that it is likely the company will, during the summer, extend its line south on Christine St., to Clifford St., thence along Clifford St. west towards the river, about 0.5 of a mile. The extension would be to take care of new business offering from industrial plants. G. E. Wadland, Sarnia, Ont., is Manager. (Mar., pg. 136.)

Toronto Eastern Ry.—Surveys have been completed, according to local press reports, for an extension of the line from Pickering westerly to Scarboro, where connection will be made with the Canadian Northern On-

tario Ry. The distance of this extension is 15 miles. (Feb., pg. 88.)

Transcona, Man.—The Manitoba Legislature has granted power to the Municipal Council of Transcona, to build an electric railway within its limits, and, to make agreements for connecting the line with the Winnipeg Electric Ry.

Windsor, Ont.—A Windsor press dispatch of Mar. 20 says:—"Mayor Clay announced today that he would take immediate steps to bring about the building of a municipal street railway to compete with the private company." The present service in Windsor is supplied by the Sandwich, Windsor and Amherstburg Ry., which also has interurban lines connecting Windsor with Walkerville, Tecumseh, Sandwich, Amherstburg, and Ojibway. It is controlled by the Detroit United Ry., Detroit, Mich.

Winnipeg Electric Ry.—The City Council is asking the company to submit plans showing the extensions proposed to be made on the various lines in the city. (Mar., pg. 136.)

Electric Railway Finance, Meetings, Etc.

British Columbia Electric Ry. and Allied Companies—Gross earnings for January, \$777,102; operating earnings, maintenance, etc., \$561,146; net income \$215,956, against \$743,271 gross earnings; \$543,803 operating expenses, maintenance, etc.; \$199,468 net income for Jan., 1913. Aggregate gross earnings for 7 months ended Jan. 31, \$5,330,828; net earnings \$1,437,361, against \$4,994,095 aggregate gross earnings, and \$1,451,321 net earnings for same period 1912-13.

Cape Breton Electric Co.—Gross earnings for January, \$29,798.29; operating expenses and taxes, \$18,563.18; net earnings, \$11,235.11; interest charges, \$5,247.37; balance, \$5,987.74; bond sinking and improvement funds, \$1,190; balance for reserves, depreciation, etc., \$4,797.74, against \$31,835.43 gross earnings; \$17,760.49 operating expenses and taxes; \$14,074.94 net earnings; \$4,633.19 interest charges; \$9,441.75, balance; \$1,190 bond sinking and improvement funds; \$8,251.75 balance for reserves, depreciation, etc., for Jan., 1913.

The Guelph Radial Ry. Co.'s annual meeting was held at Guelph, Ont., Mar. 9. Following are the officers for the current year—President, J. W. Lyon; Vice President, W. E. Buckingham; Treasurer, C. E. Howitt; Secretary, T. J. Hannigan; other director, S. Carter. A. H. Foster is Manager.

Mount McKay and Kakabeka Falls Ry.—The Fort William, Ont., City Council passed a resolution Mar. 4 to appoint a commission to report on the value of the company's franchise, power rights, railway and other buildings.

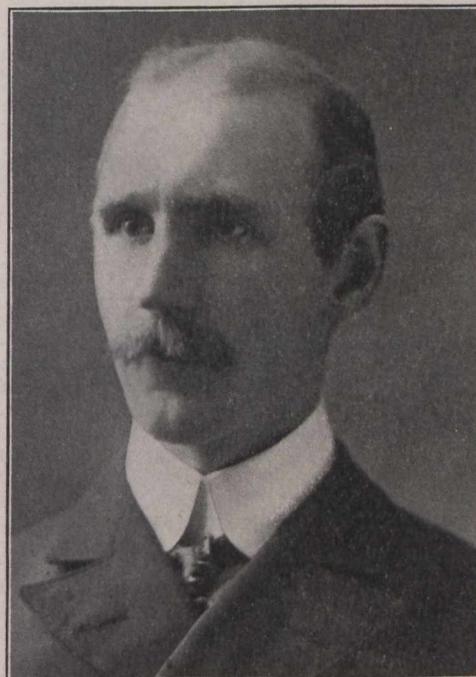
Toronto Civic Car Lines.—A report from the Commissioner of Works to the City Council, Mar. 7, states that the receipts for 1913 were \$59,556.87, and the expenditure \$145,426.11, making a deficit of \$85,569.24, which does not include any allowance for depreciation. The operating charges were \$56,658 and the debt charges \$87,611. The amount mentioned for depreciation is about \$50,000. The question of an increased fare is being discussed but no decision has been arrived at. The present charge is 2c. cash, 1c. for children, and six tickets for 10c.

Toronto Ry., Toronto and York Radial Ry., and Allied Companies.—Gross earnings for January, \$847,945; operating expenses, maintenance, etc., \$440,337; net earnings \$407,608, against \$776,928 gross earnings; \$401,105 operating expenses, maintenance, etc.; \$375,773 net earnings, for Jan., 1913.

The Toronto Ry. earnings for January were \$501,843, and for February, \$461,274.45. The percentage to the city on the February earnings was \$72,057.90.

Toronto Ry. Co.—A London, Eng., cablegram of Mar. 10 said:—"The Morning Post states it understands that arrangements are being made for an issue of £500,000 4½% debenture stock by the Toronto Power Co. The price is stated as 96. This issue, which will be guaranteed unconditionally both as to principal and interest by the Toronto Railway Co., is in addition to debenture stock already issued to the amount of about \$13,900,000. The company's total debenture stock authorization is \$25,000,000, and issues within this total may be made for several purposes, chief of which is the acquirement of outstanding 5% bonds of the Electrical Development Co. of Ontario."

Winnipeg Electric Ry.—Gross earnings for January, \$382,670; operating expenses, \$226,177; net earnings, \$156,493, against



J. H. Larmonth, Superintendent, Edmonton Radial Railway.

\$351,497 gross earnings; \$199,532 operating expenses; \$151,965 net earnings, for Jan., 1913.

Motor Buses for Winnipeg.—The Winnipeg City Council has passed a resolution granting a five years' franchise to the Winnipeg Motor Bus Co., to operate motor bus lines in the city. At the end of five years the city may take over the line at the value of the equipment. Each vehicle is to have accommodation for 25 passengers, and is not to run faster than 10 miles an hour.

Winnipeg River Power Co.—We are officially advised that this company, which is allied with the Winnipeg Electric Ry., has entered into a contract with J. G. White and Co., New York, to make explorations and surveys, and to prepare plans for the development of the water power at the Grand Bonnett Falls of the Winnipeg River. No contract has been let for the construction of the power plant.

Edmonton Radial Ry.—The Edmonton, Alta., City Council has authorized the expenditure of \$160,056 on the street railway system during this year. Of this sum \$90,000 is for work uncompleted in 1913, and for the new car barns, and the balance for track on Portage Ave.; protection at railway crossings, and for the power distribution plant. (Feb., pg. 87.)

Personal Paragraphs.

In connection with the recent resignation of H. Doughty as Superintendent of the Regina Municipal Ry., D. W. HOUSTON has been appointed Acting Superintendent.

J. ANTONISEN, who has resigned his position as Superintendent of the Brandon Municipal Ry., was the recipient, Mar. 6, of a letter signed by all the employes, expressing regret at his leaving.

R. P. LEWIS, who has been appointed street railway traffic inspector by the Winnipeg City Council, at a salary of \$2,500 a year, started upon the duties of his office Mar. 12. Mr. Lewis was a C.P.R. locomotive driver for several years, subsequently moving to Winnipeg, where he took up general office work. After spending some time with the Canadian Northern Ry., in several capacities, he left the service in 1913, and worked for R. M. Fenstel on the preparation of his report on the Winnipeg street railway system.

W. T. WOODROOFE, Superintendent, Edmonton Radial Ry., Edmonton, Alta., has resigned, effective, Apr. 1. He was appointed to that position in June, 1912, after having been in the British Columbia Electric Ry. service at Vancouver, for some time. He is reported to have stated recently that the reason for the resignation was that the Mayor had signed an agreement with the street railwaymen's association, with which, he, as Superintendent, was not in accord. He also stated that he had made no plans for the present, but would probably return to Vancouver.

J. H. LARMONTH, who has been appointed Superintendent, Edmonton Radial Ry., which is owned and operated by the City of Edmonton, Alta., was born in Montreal, May 19, 1872. He graduated from McGill University, Montreal, in 1894, since when his record is as follows:—In erecting shops, G. T. R., Montreal, about a year; in G. T. R. draughting office, Montreal, about 4 months; in Laurie Engine Co.'s draughting office, Montreal, about 2 years; in a chartered accountant's office a little over a year, in order to pick up business ideas; in general construction work in Ottawa about a year and a half; with E. B. Eddy Co., Hull, Que., as constructing engineer on paper and pulp mills, etc. about 2 years; then entered office of C. H. Keefer, consulting engineer, Ottawa, and was sent by him to Peterboro, Ont. as resident engineer on construction of Quaker Oats Co.'s dam and power house; then in Quaker Oats Co.'s mills doing construction work and installing machinery for about 2 years; put in charge of Peterboro Radial Ry. construction in 1904 and managed that line along with electric light and gas plants in Peterboro until the summer of 1910, when the Electric Power Co. was formed, which purchased the Peterboro properties, and he was made General Manager of the Electric Power Co., retaining that position for two years, when he resigned to practice as a consulting engineer, specializing on electric railway, electric light and gas work. Latterly he has also been Secretary-Treasurer of the Canadian Electrical Association.

It was recently reported in a local paper that the London St. Ry. contemplated purchasing 6 additional cars of the type recently added to the system, and of which a full description and illustrations have been given in Canadian Railway and Marine World. We are officially advised that no definite steps have been taken to this end. It is possible that the local reference was a mistaken one, the remarks on which the report was founded being concerned with the 6 cars added last year.

Dominion Power and Transmission Company's Annual Report.

Following are extracts from the report for the calendar year 1913, as presented at the annual meeting recently:—

Business has made its regular growth, as formerly, and but for a general trade depression during the last quarter of the year, the increases shown would have been substantially greater. The company's financial position is a good one.

The board has, after careful consideration, instituted a further feature of conservatism in accounting. The subject of maintenance of the physical integrity of the various properties has been carefully investigated, and the policy adopted of providing throughout the past year and hereafter more liberally for this purpose. Previous to 1913 it had been the practice to charge to operating expenses all sums spent on necessary renewals and maintenance, and the amount so spent in 1910 was \$210,752.99; in 1911, \$224,934.65; in 1912, \$282,443.11. It has been found that in those of the states that have public utilities commissions with power and authority over the public utility corporations operating therein, similar to the power exercised by the Board of Railway Commissioners over Canadian railways, such public utilities commissioners have laid down as a practice to be followed by corporations, similar to ours, that a fund must be provided for renewals and maintenance by charging a substantial percentage of their gross earnings each year for that purpose. Your directors have decided to follow the same practice. For the year 1913, the amount so charged was \$442,676.66, of which \$337,269.37 was actually expended, and the balance of \$105,407.29 remains at the credit of this account, which in the statement is shown under the head of maintenance and renewal account as a special reserve. While this may seem a liberal provision for such purpose, it certainly must be considered to be in the best interest of the owners of the company's securities, as it provides amply for renewals and maintenance, and will keep the company's properties in high physical condition without requiring new capital expenditures for this purpose, a bad practice frequently followed by many other enterprises in our line of business. It should also be mentioned that this provision is made in addition to the provisions of the sinking fund for the bonds; so that we believe our finances are on an absolutely sound, and perhaps an ultra conservative basis, but doubtless the shareholders will heartily approve of this action.

There has been transferred also to the general reserve account \$450,000, bringing that account down with a total of \$1,000,000, and leaving a balance of \$955,861.75 in profit and loss account.

A commencement has been made in the construction of an important addition to the company's power producing capacity by means of a steam supplemental station designed for an ultimate output of some 88,000 h.p. This will be a most beneficial adjunct to our hydraulic system, both by way of material increase of power produced on a financially economic basis and protection against possible interruptions of supply.

During the year a further considerable reconstruction, as well as extension, of the street railway tracks has been carried out; and the work of placing underground our distribution lines in the central part of the city is in progress. Attention should, we think, be directed to the great improvement of the street railway plant during the last four years. Notwithstanding the refusal of the Ontario Railway and Municipal Board

to order extensive changes, the Hamilton Street Ry. Co. has substantially rebuilt its tracks, provided a new equipment of cars, and is extending its track mileage by 50%. Much fresh capital has been needed to do all this, but the board feels sure that the returns will justify its expenditure.

The extension to Galt of our radial system has for some time been under consideration, and it is hoped that during the present year a branch line will be constructed from the Brantford and Hamilton line to that important town, effecting a comparatively direct and short connection between it and Hamilton.

The outlook for the coming year seems favorable, in spite of the general tendency to look forward to a rather unsatisfactory period of general business.

Earnings and Expenditures.	
Gross earnings	\$2,737,806.33
Operating expenses	1,455,992.80
	\$1,281,813.53
Transferred to maintenance and renewal accounts	141,116.50
Bond interest and interest	\$1,140,697.03
	378,171.92
Surplus earnings	\$762,525.11
Profit and Loss Account.	
Balance from 1912	\$1,005,715.14
Surplus earnings, 1913	762,525.11
Dividends declared	\$ 362,378.50
Transferred to reserve accounts	450,000.00
Balance	955,861.75
	\$1,768,240.25
	\$1,768,240.25

Dominion Power and Transmission Co. controls and operates the following properties:—Hamilton Cataract Power, Light and Traction Co., Hamilton Electric Light and Power Co., Hamilton and Dundas St. Ry. Co., Hamilton Radial Electric Ry. Co., Hamilton, Grimsby and Beamsville Electric Ry. Co., Brantford and Hamilton Electric Ry. Co., Hamilton Terminal Co., all with headquarters in Hamilton, Ont.; the Dundas Electric Co., Dundas; the Lincoln Electric Light and Power Co., in St. Catharines; the Welland Electric Co., in Welland, and the Western Counties Electric Co., in Brantford. Separate figures are not given for the different companies operated.

The directors for the current year are:—J. H. Moodie, President; Jas. Dixon, Vice President; Jno. Knox, Treasurer; W. C. Hawkins, Managing Director and Secretary; Sir John Gibson, W. Southam, Lloyd Harris, J. W. Sutherland. The General Manager is E. P. Coleman.

The Grand Valley Railway and Its Subsidiaries.

The necessary formalities for the transfer of the Brantford St. Ry., and the Grand Valley Ry. from Brantford, via Paris, to Galt, Ont., to the Brantford City Council are being gone through. The contract of sale is being finally approved by the various interests, and its sanction by the courts will be asked after the approval of the ratepayers has been obtained. Application is being made to the Ontario Legislature for an act authorizing the city to acquire and operate the lines, and for other necessary powers, so as to cover any complications. The bylaw on which the ratepayers voted Mar. 23, set out that the amount of debt to be created by the purchase is \$270,000, and the citizens will assume a mortgage of \$125,000. The debt created is repayable in 30 years by means of the provision of a sinking fund of \$4,814 annually in addition to the interest amounting to \$12,500.

The Woodstock, Thames Valley and Ingersoll Ry., which extends from Wood-

stock to Ingersoll, Ont., was controlled by the Grand Valley Ry., which is now in liquidation. At a meeting of the bondholders of the W. T. V. and I Ry., held in Toronto recently, it was stated that the G. V. Ry. had no equity in the W. T. V. and I Ry. until the bonds and arrears of interest had been paid off. The arrears of interest on the bonds to date, was stated to be \$20,000. The total issue of bonds outstanding is \$140,000, and the owners of \$96,800 of the issue were present or represented at the meeting. The bondholders are asking that J. G. Wallace, who has had the management of the line for several years, be appointed trustee. The matter is to come before the courts.

Brantford, Ont., ratepayers voted, Mar. 23, by 1,234 majority in favor of the city buying the Brantford St. Ry. and the Grand Valley Ry. from Brantford to Galt, for \$253,000.

Electric Locomotive Performance on Galt, Preston and Hespeler St. Ry.

The G., P. & H.S.R. placed a 50 ton Westinghouse locomotive in service on Nov. 20, 1910, it being described and illustrated in Canadian Railway and Marine World at the time. Since that date it has been in continuous operation, 24 hours every day, except Sundays, averaging about 150 hours a week. This service includes hauling practically every kind of freight in standard steam railway rolling stock, between the C.P.R. at Galt, and Berlin and Waterloo, a distance of from 12 to 14 miles.

Although the haul is not long, there are a number of 2% to 2½% grades from one to two miles long. The maximum number of cars hauled in one train is about 25, the average number being 15, and the tonnage per train is about 200 tons, or on four trips of road per day, 2,000 tons. It is hardly possible to estimate exactly the total mileage, as the greater part of the time, 16 hours a day, the locomotive is in switching service. No record is kept of the tonnage and mileage, but the switching mileage would easily equal half, if not threequarters, of the road service.

The locomotive is equipped with four Westinghouse 308-B-2 commutating-pole, 600-volt railway motors, rated at 120 h.p., and unit switch control. The locomotive is given one half hour inspection every 24 hours, and about five or six every Sunday, when making light repairs, such as applying brake shoes, changing wheels for tire wear and inspection of motors, airbrakes and control equipment. Tires have been turned twice since the locomotive went into service, and the total repair account to July 14, 1913, is given below:—

Air compressor (principally due to armature and field trouble due to low-trolley voltage)	\$ 170.00
Tire turning	45.00
Motor axle bearings	30.00
Unit switch control	50.00
Trolley parts, wheels, harps, poles and bases	110.00
Brake shoes	270.00
Miscellaneous	30.00

Total from Nov. 30, 1910, to July 14, 1913. \$705.00

The total, \$705.00, for repairs on this locomotive, covering a period of over 2½ years, is considered a very good record by the operating company, in view of the large amount of service received.

Nova Scotia Tramways and Power Co.—A bill has been introduced in the Nova Scotia Legislature to incorporate a company with this title to take over the Halifax Electric Tramway Co. and the Nova Scotia Light and Power Co. The provisional directors are E. A. Robert, of Montreal, and other directors of the Halifax Electric Tramway Co.

Electric Railway Notes.

The St. John Ry., St. John N.B., has ordered 12 p.a.y.e. cars, with 20 ft. bodies on 21E trucks, turtle back roofs, and interior finish of cherry, from the Tillsonburg Electric Car Co.

The Peterborough Radial Ry. Co. has a bill before the Ontario Legislature authorizing it to issue bonds, etc., up to \$35,000 for each mile of single track, instead of \$20,000 as previously authorized.

The London, Ont., Board of Control, Mar. 14, recommended the City Council to pass a bylaw for improved street railway service. The schedule submitted by the City Engineer, calls for the operation of 40 cars, instead of 36 as at present, and for the rearrangement of a number of the routes.

The Preston Car and Coach Co. is building two motor busses mounted on Gramm motor trucks, with bodies 15 ft. long by 18 ft. wide, with six standard street car stationary seats, with a seating capacity for 24 passengers, for use by Edmonton, Alta., hotels.

The Saskatoon, Sask., Municipal Ry. was not in operation for a week prior to Feb. 27, owing to a breakdown at the power plant. First one generator gave out and then the second. These give 400 h.p. each. The estimates for the current year provide for the installation of a 600 h.p. generator, in order to provide against such another breakdown.

The six cars which the Niagara, St. Catharines and Toronto Ry. is having built by the Preston Car and Coach Co., of which mention was made in our last issue, will be equipped with four machines each, of the G. E. 204A type, split frame motors, 65 h.p. at 500 volts, 75 h.p. at 600 volts, 2 turn gear pinion, ratio 5423, Sprague electric type M. K. control, all supplied by Canadian General Electric Co.

The Toronto Suburban Ry. has under consideration plans for cars for the line under construction from Lambton to Guelph, Ont., and it is said that about 10 cars, 65ft. long, will be ordered in the near future. They will probably be equipped with four C. G. E. 85 h.p. motors of the latest type, fully ventilated, and the control will be of the multiple unit type to permit of train operation when required. They will be operated on a 600 volt line at approximately half normal speed, and changing from 1,500 to 600 volt trolley, or vice versa, will involve no loss of time in adjustment of control apparatus.

The Guelph Radial Ry. is having two double end, p.a.y.e. steel underframe cars, built by the Preston Car and Coach Co. Following are the chief details,—length overall 45ft. 10 ins.; trucks standard O-50; wheels, 34 ins. rolled steel; motors, Westinghouse 101-B-2; controllers, K-28; air brakes, Westinghouse SM 1; hand brakes, Ackley type; headlights, Crouse Hinds; fenders, Providence type. The cars will be heated with a forced air ventilating system.

The Saskatoon, Sask., and the Lethbridge, Alta., city councils are considering rearrangement of the schedules for running cars on their municipal electric railways, with a view of reducing operating expenses. In Saskatoon it is reported that the present loss on operation is at the rate of \$14,000 a year, and in Lethbridge the saving in operating expenses by the new schedule is estimated at \$3,000 a year. It is said that the rerouting of cars on Winnipeg Electric Ry. will take effect April 16.

The Quebec Public Utilities Commission gave a decision, Mar. 14, on complaint of a

citizen of Longue Pointe Ward against the Montreal Tramways Co., in which the right of a private citizen to lay a complaint and to seek redress was upheld. The application is to direct the company to grant the Longue Pointe citizens the same advantages in fares as those afforded to residents in other parts of the city. The company raised the point that inasmuch as fares and conditions of service were a matter of contract with the municipality, a private citizen could not bring the matter forward. The Commission decided that this matter could be argued when the complaint came up for investigation.

The tentative agreement between the Toronto Ry. Co., and the city, relative to the proposed purchase of the railway by the city, is still in the drafting stages. The clauses relating to the entrance of the radial lines being in the hands of the Works Commissioner and the Engineer of Railways and Bridges, while those relating to the supply of power are being dealt with by the General Manager of the Hydro Electric System. The Mayor recently stated that the power question was one of the vital ones, and it was hoped to have it in such shape that there would be no change in the 3 year contract. When the agreement is completed, it is understood that a vote of the ratepayers will be taken.

St. John Railway Company's Annual Report.

Following are extracts from the reports for the calendar year 1913, presented at the annual meeting in St. John, N.B., recently:—

Your directors wish to congratulate the company on the steady progress that it is making. The statement of the past year's business shows a net profit of \$66,328.85, after providing for interest on the bonds and all other charges. Out of this net amount your directors have paid four quarterly dividends of 1½%, amounting to \$50,609.48, leaving a balance of \$15,719.37, which has been transferred to profit and loss account.

The property has been maintained in a high state of efficiency. A considerable sum has been spent in the upkeep of the tracks, rolling stock, plant and buildings. We have completed an extension of our street railway tracks from the foot of Brussels St. to Kane's Corner, on the Westmorland Road, thence along Douglas St. to the One Mile House, and from there along Rothesay Ave. to Cooper's Corner, 1½ miles.

The new car barn and repair shop on Wentworth St. has been completed, and the street between Queen and St. James Sts. has been paved. The company purchased during the year and put into service eight additional cars. New machinery has been installed in the repair shops, including a hydraulic wheelpress, lathes, pipe cutting machine and hydraulic bender, etc. A new boiler house and stack in connection with the power plant has been erected on Nelson St. New boilers with chain grate stokers are being installed. A 2,000 k.w. steam turbine and generator with condenser and pump, etc., also motor driven exciter and d.c. motor generator set have been added to the power house. The electric light wires and poles have been extended to accommodate the outlying districts. Three thousand feet of gas mains were laid for the purpose of furnishing a sufficient supply of gas for fuel purposes, the charge for which has been reduced to \$1 net per 1,000 cu. ft. During the year there were installed 402 gas stoves and appliances. Extensive improvements were made during the past year to Seaside Park, which is now one of

the best street railway parks in Canada. Six new p-a-y-e cars have been ordered from the Tillsonburg Electric Car Co., delivery to be made on May 1.

The company has continued its liberal policy towards employees in respect of their wages, having increased them during the year. Your directors have much pleasure in making mention of the faithful and efficient service rendered by our officials and employees. It should be noted by the citizens of St. John that our company paid out in wages during last year \$208,186.82. We have in our permanent employ 269 employees. We paid the city last year \$30,905.54 for taxes, water rates and repairs.

In order to cover expenditures on capital account during the past few years your directors applied to the Lieutenant Governor in Council and obtained permission to issue 2,000 shares of new stock at par pro rata to the shareholders.

Your directors regret to have to report the death of James Ross, who was the first President of our company, and continued to hold that office until the time of his death, a period of 19 years. We wish to take this opportunity of paying tribute to the able assistance we at all times received from him.

We have just completed an agreement with the councillors of the Parish of Simonds, which has been approved by the Municipality of the City and County of St. John, for the extension of our tracks from Kane's Corner out Red Head Road as far as the corner of the Old Loch Lomond Road, and from the One Mile House on Rothesay Avenue to Coldbrook. We are paying the municipality for this extension \$400 per year for each mile of single track and \$600 per year per mile of double track. In carrying out our policy of extension your directors were desirous of putting down tracks from Fairville to South Bay Road, and for that purpose entered into negotiations with the Highway Board of the Parish of Lancaster, but were unable to obtain permission from the Board to make this extension.

The directors for the current year are:—H. H. McLean, K.C., M.P., President; F. R. Taylor, Vice President; R. B. Emerson, J. Manchester, W. H. Thorne, J. K. L. Ross. The General Manager is H. M. Hopper.

The Canadian-American Power Corporation has been granted permission by the Public Service Commission of the Second District of the State of New York to do business in the state, but restricting its capital to \$1,250,000 on account of the contract and acquisition of the Niagara Falls Transmission Co. The company desires to acquire a contract with the Electrical Development Co. for furnishing 46,000 electrical h.p. procured in Canada and providing for the sale of this power in the U.S., principally along the Niagara frontier. The proposition at one time was connected with a plan to acquire the Buffalo and Lake Erie Traction Co., and the Buffalo and Rochester trolley systems, and merge the whole, but this was defeated.

Toronto & York Radial Ry. Passengers.—In the table published in our March issue, pg. 135, it was set out that the number of fare passengers carried by the Toronto and York Radial Ry. for the year ended June 30, 1913, was 525,571. We have been advised that the insertion of these figures in the blue book was due to an error in tabulating in the department, and that the number of passengers carried on the T. and Y. R. Ry. was 5,255,706.

The Ontario Railway and Municipal Board is to have attached to its staff a telephone and electrical expert, for whom a salary of \$3,600 has been provided in the Ontario estimates.

Marine Department

The Dominion Canal Statistics for the Season of 1913.

Following are the principal portions of the report on canal statistics for 1913, as issued by the Department of Railways and Canals:—

The volume of traffic through Canadian canals during 1913 aggregated 52,053,913 tons, compared with 47,587,245 in 1912, an increase of 4%. The total traffic for 1913 was distributed among the various canals as follows:—

	Tons.	Increase.	Decrease.
Sault Ste. Marie	42,699,324	3,029,669	
Welland	3,570,714	718,799	
St. Lawrence	4,302,427	825,239	
Chambly	555,602		62,813
St. Peters	71,514		3,295
Murray	180,576	10,495	
Ottawa	365,438		26,912
Rideau	171,223	11,090	
Trent	55,800		21,350
St. Andrews	81,295		14,254
Total	52,053,913	4,595,292	128,624

The foregoing figures do not give the net tonnage. They represent the aggregate of the traffic which passed through all the canals, and it happens that a cargo may pass through two or more canals. From the analysis made, it may be said that the traffic of 1913, after eliminating duplication, involved a net tonnage of 44,901,804, of which 6,654,311 tons were of Canadian origin.

On the basis of gross traffic the following table will show the growth since 1904:—

Year	Tons.
1904	8,256,236
1905	9,371,744
1906	10,523,185
1907	20,543,639
1908	17,502,820
1909	33,720,748
1910	42,990,608
1911	38,030,353
1912	47,587,245
1913	52,053,913

The increase of traffic through Canadian canals for the decade was equal to 530%.

The following table shows upon what canals the growth has taken place during the past five years:—

	1909.	1910.	1911.	1912.	1913.
Sault Ste. Marie	27,861,245	36,395,687	30,951,709	39,669,655	42,699,324
Welland	2,025,951	2,326,290	2,537,629	2,851,915	3,570,714
St. Lawrence	2,410,629	2,760,752	3,105,708	3,477,188	4,302,427
Chambly	752,117	669,299	599,829	618,415	555,602
St. Peters	79,850	85,951	75,298	74,809	71,514
Murray	102,291	177,941	163,457	170,081	180,576
Ottawa	336,939	385,261	320,071	392,350	365,438
Rideau	91,774	134,881	172,227	160,133	171,223
Trent	59,952	46,263	57,290	77,150	55,800
St. Andrews		8,283	47,135	95,549	81,295

The ratio which each of the foregoing classes bore to the total volume during the past four years is as follows:—

	1910.	1911.	1912.	1913.
	%	%	%	%
Agricultural products	10.2	14.2	14.51	16.40
Animal	1.2	.1	.04	.04
Manufactures	5.2	6.2	4.68	3.61
Produce of forests	3.9	4.0	3.43	3.22
Produce of mines	79.5	75.5	77.34	76.73

An overwhelming proportion of the traffic through the canals consists of products of the mine. This significant situation will be dealt with under the next heading. It arises entirely from the use made of Canadian canals by U.S. vessels.

The public service of Canadian canals must be measured in the light of the nationality of the traffic. The canals are entirely free to Canadian and U.S. vessels. Up to 1909 no record was kept of the origin of cargoes, but since that year it has been possible to separate the business of Canada from that of the U.S.

The facts with respect to tonnage of vessels and cargoes during the past six years are as follows:

Year.	Canadian vessels.		U.S. vessels.		Freight tonnage.		Total.
	No.	Tonnage.	No.	Tonnage.	Canadian.	United States.	
1908	29,040	6,780,789	7,489	4,835,320	5,012,147	12,190,673	17,502,820
1909	22,507	7,811,578	9,996	16,459,322	7,378,057	26,342,691	33,720,748
1910	25,337	8,931,790	11,462	21,777,297	7,883,614	35,106,994	42,990,608
1911	25,585	9,172,192	10,370	18,231,622	7,792,907	30,237,446	38,030,353
1912	27,371	10,237,335	11,785	24,636,190	9,376,529	38,210,716	47,587,245
1913	28,654	12,078,041	10,739	24,238,788	11,130,875	40,923,038	52,053,913

Details of traffic, showing tonnage of commodities, will be found in accompanying tables. Comparing 1912 and 1913, following was the tonnage by classes and canals:—

	1912.		1913.		Products of forest.	Products of mines.	Total.
	Tons.	Tons.	Tons.	Tons.			
Sault Ste. Marie	4,530,792	372	5,253,665	198	54,114	34,109,074	39,669,655
Welland	1,205,912	678	1,684,967	361	625,509	792,072	2,851,915
St. Lawrence	1,119,567	9,375	1,545,775	8,269	464,091	578,700	1,305,395
Chambly	19,706	338	13,432	490	425,313	161,458	618,415
St. Peters	15,427	2,996	15,935	2,492	7,583	11,161	37,642
Murray	448	37	568	13	101,511	706	67,379
Ottawa	5,278	2,880	2,331	3,657	226,600	136,634	392,350
Rideau	3,995	3,151	3,437	3,458	18,814	105,531	160,133
Trent	2,514	361	1,840	298	3,459	67,489	3,327
St. Andrews	37	60	377	65	14,153	81,299	95,549
Total	6,903,676	20,188	8,522,327	19,301	2,228,948	1,634,622	36,799,811
Total			8,522,327	19,301	1,881,699	1,678,925	39,951,661

Gathering the foregoing facts with respect to freight tonnage into percentage form, the result is as follows:—

	Canadian %	U. S. %
1908	28.7	71.3
1909	21.8	78.2
1910	18.3	81.7
1911	20.5	79.5
1912	19.7	80.3
1913	21.3	78.7

These totals and percentages relate entirely to freight tonnage which passed through Canadian canals. They do not include the traffic which passed through the U.S. canal at Sault Ste. Marie. At that point vessels passing up and down may take either canal. When they pass through the Canadian canal a record is taken of the origin of the cargo; but when they pass through the U.S. canal no such record is taken. Hence it is always impracticable to ascertain with exactness the volume of traffic which belongs to Canada. Until the U.S. takes cognizance of the origin of cargoes this unsatisfactory situation will continue.

A record is kept at the Canadian canal office at Sault Ste. Marie, and it was found that for 1913 but 6% of all freight tonnage which passed through both canals was carried in Canadian vessels.

The overwhelming proportion of U.S. traffic which passes through the Canadian canals arises very largely at Sault Ste. Marie. In 1913 42,699,324 tons of freight

were transported through the Canadian canal. Of this 4,951,867, or 11.6%, was of Canadian origin. The remainder, equalling 88.4%, was of U.S. origin.

The situation is somewhat improved at the Welland canal. The total freight tonnage which passed up and down at that point in 1913 was 3,570,714 tons, and of this 2,093,406, or 58.7%, belong to Canada. Through the St. Lawrence canals 4,302,427 tons of freight were carried, and of this 2,837,419 tons were of Canadian origin, or 65.9%. There was a marked betterment at the Welland canal in 1913 as compared with 1912, the proportion of distinctly Canadian business having risen from 54 to 59%.

The character of the traffic at Sault Ste. Marie has a great deal to do with the preponderance of U.S. tonnage. Of the 42,699,324 tons of freight which in 1913 passed through the Canadian canal, 32,445,067 tons consisted of ores, chiefly iron. Practically all of this was U.S. business. If ores had been eliminated, the volume of Canadian business through the Canadian canal in 1913 would have been about equal to that of the U.S.

The movement of wheat from the head of Lake Superior eastward has become of increasing importance with the rapid development of the Canadian Northwest. Prior to 1909 the record was not kept in such a way as to separate Canadian from U.S. wheat. Bearing that fact in mind, following is a statement of wheat brought down through the Canadian canal at Sault Ste. Marie:—

1895	4,518,334
1896	19,314,234
1897	17,925,834
1898	9,746,600
1899	12,759,634
1900	9,292,031
1901	9,639,534
1902	27,012,500
1903	32,233,934
1904	29,794,100
1905	25,981,100
1906	34,389,300
1907	49,399,967
1908	58,574,034

1909	*48,047,833
1910	51,774,833
1911	63,641,000
1912	83,743,034
1913	101,066,133

* For the first time represents Canadian wheat only. The figures of preceding years include U.S. wheat which passed through the Canadian canal.

There also was brought down through the U.S. canal at Sault Ste. Marie 40,660,766 bush. of Canadian wheat.

Following is a summary of the facts with respect to Canadian wheat:—

Through Canadian canal	Bush. 101,066,133
Through U.S. canal	40,660,766
Total	141,726,899

As compared with 1912 this total shows an increase for 1913 of 31,884,868 bush.

There was also brought down 1,634,170 barrels of Canadian flour, which, at 4½ bush. to the barrel, would represent 7,578,765 bush. of wheat. This would bring the final total up to 149,305,664 bush. of Canadian wheat. The aggregate on this basis in 1912 was 123,986,931; so that the net increase, counting wheat and flour together, for 1913 was 25,318,733 bush.

A careful analysis has been made of the course which Canadian wheat took in 1913 in its transportation by water. In order to make the statement complete, copies of all ships' reports filed at the office of the U.S. canal at Sault Ste. Marie were procured, and from these the movement of Canadian wheat through that channel was tabulated.

Taking first the facts in relation to Canadian wheat which passed through the Canadian canal, the distribution in 1913 was as follows:—

Port Arthur-Fort William to Montreal..	Bush. 11,233,133
“ “ “ Georgian Bay	21,532,134
“ “ “ Other Canadian ports	25,580,000
“ “ “ Buffalo ..	39,282,500
Duluth to Montreal	437,533
“ “ Georgian Bay	416,067
“ “ Other Canadian ports	281,600
“ “ Buffalo	2,303,166
Total	101,066,133

The volume of Canadian wheat which passed through the U.S. canal at Sault Ste. Marie in 1913 was distributed as follows:—

Port Arthur-Fort William to Montreal..	Bush. 717,300
“ “ “ Georgian Bay	2,916,000
“ “ “ Other Canadian ports	2,465,733
“ “ “ Buffalo ..	28,419,400
Duluth to Montreal	2,798,666
“ “ Georgian Bay	1,189,800
“ “ Other Canadian ports	646,000
“ “ Buffalo	1,507,867
Total	40,660,766

Combining the Canadian wheat which passed through the Canadian canal with the Canadian wheat which passed through the U.S. canal the statement for 1913 is as follows:—

Port Arthur-Fort William to Montreal..	Bush. 11,950,433	% 8.4
Port Arthur-Fort William to Georgian Bay	24,448,134	17.2
Port Arthur-Fort William to other Canadian ports	28,045,733	19.8
Port Arthur-Fort William to Buffalo	67,701,900	47.8
Duluth to Montreal	3,236,199	2.3
“ “ Georgian Bay	1,605,867	1.1
“ “ Other Canadian ports ..	927,600	.7
“ “ Buffalo	3,811,033	2.7
Total	141,726,899	100.0

The “other Canadian ports” referred to in the foregoing statements are ports between Georgian Bay and Lake Ontario. Cargoes consigned to Kingston are counted as being to Montreal, since Kingston is a port of transfer. The destiny of such cargoes is Montreal. 45.4% of Canadian wheat brought down from the Northwest by water in 1913 clung to wholly Canadian channels. In order that a comparison may be made with the facts in preceding years, the fol-

lowing table is brought down to the end of 1913:—

Canadian Wheat.		1909.	1910.	1911.	1912.	1913.
		Bush.	Bush.	Bush.	Bush.	Bush.
Fort William to Montreal	10,517,266	13,185,370	12,761,666	14,929,099	11,950,433	
“ “ Georgian Bay	13,384,400	12,753,200	9,881,234	19,501,168	24,448,134	
“ “ other Canadian ports	10,149,633	9,603,400	11,880,666	20,458,700	28,045,733	
“ “ Buffalo	12,841,334	15,693,363	27,945,600	44,228,266	67,701,900	
Duluth to Montreal	520,000	315,000	.....	283,500	3,236,199
“ “ Buffalo	528,200	224,500	710,334	5,714,367	3,811,033	
“ “ Georgian Bay	28,000	.....	461,500	1,418,767	1,605,867
“ “ other Canadian ports	79,000	.....	.....	230,000	927,600
“ “ unclassified .....	.....	.....	.....	3,078,164	.....
Total	48,047,833	51,774,833	63,641,000	109,842,031	141,726,899	
Through U.S. canal	9,117,328	5,321,446	1,981,481	.....	.....
Grand total	57,165,161	57,096,279	65,622,481	109,842,031	141,726,899	

The following statement of percentages presents the foregoing tables in a convenient form for purposes of comparison:—

Canadian Wheat.		1909.	1910.	1911.	1912.	1913.
		%	%	%	%	%
Fort William to Montreal	21.9	25.5	20.1	13.6	8.4	
“ “ Georgian Bay	27.9	24.6	15.6	17.8	17.2	
“ “ other Canadian ports	21.1	18.5	18.7	18.6	19.8	
“ “ Buffalo	26.7	30.3	43.8	40.2	47.8	
Duluth to Canadian ports	1.3	.6	.7	1.7	4.1	
“ “ American ports	1.1	.5	1.1	5.2	2.7	
“ “ unclassified .....	.....	.....	.....	2.9	.....

The diversion of Canadian wheat to Buffalo-New York, instead of following wholly Canadian channels, is due to several causes. Chief among these is the matter of time. Cargoes are sold for delivery at a foreign port by a specified date, and during the period of pressure in October, November and December, but chiefly in November, the availability of ocean tonnage at New York is a factor rising above freight rates.

Carriers by water are not placed by law on the same reporting basis as are railways. Hence special and extraordinary measures have had to be taken in order to gather facts from which freight rates prevailing on Canadian inland waters might be ascertained. Such steps were taken for the first time in 1912, and were continued in 1913. They have resulted in assembling exceedingly valuable and useful statistical information. That information has been carefully classified and tabulated. With the co-operation of shipowners the system which was inaugurated in 1912 will be continued. It leaves much, however, to be desired. It would, for example, be most instructive also to have definite and authentic reports with respect to the number of vessels operating on inland waters, their tonnage, the capital invested, earnings, operating expenses, tonnage of freight other than that which passes through the canals, employes, salaries and wages bill, accidents, etc. The objects of the special inquiry to which allusion has been made were to show the average rate per ton per mile on inland waters, the average freight charges per ton and per bushel between certain points, and to compare these charges with railway rates. Before steps were taken in this direction in 1912 no information whatever was to be had from any source on these important aspects of transportation.

Having ascertained for 1913 the number of tons carried one mile, and the amount of gross earnings thereon, the following results were reached:—

Canadian traffic:—	Average rate per ton	99.37c.
	Average rate per ton per mile .....	.184c.
U.S. traffic:—	Average rate per ton	55.19c.
	Average rate per ton per mile .....	.074c.

As compared with 1912 the foregoing results show a reduction. Following is a com-

parative summary:—

Average rate per ton	91.04c.	99.37c.
----------------------------	---------	---------

Canadian traffic:—
Average rate per ton per mile

1912.	1913.
.194c.	.184c.
U.S. traffic:—	
Average rate per ton	
56.62c.	55.19c.
Average rate per ton per mile	
.067c.	.074c.

The wide disparity between Canadian and U.S. rates is due wholly to the character of U.S. traffic. Of the 37,747,457 tons of U.S. freight which passed through the Canadian canal in 1913, there were 32,445,067 tons of iron and copper ore and 4,153,301 tons of coal. These two commodities made up 97% of the total U.S. traffic. The ore moved downward and the coal upward. An overwhelming proportion of both the ore and the coal is carried in vessels belonging to the iron and steel industries of Pennsylvania, at rates which can hardly be regarded as commercial. They are uniform year after year—55c. a ton for ore and 33c. for coal. That these rates are not commercial, nor subject to competition, is demonstrated by the fact that in every month of the season of navigation grain and other commodities have been carried over the same route at as high a rate as \$1.17 a ton. In some instances the rate was \$2 and over a ton.

The Canadian rates also exhibit a wide difference as between maximum and minimum. Wheat was moved during 1913 at as low a rate as .067c. per ton per mile, and at as high a rate as .172. Package freight, aggregating a considerable volume, earned as high as .500 per ton per mile.

The facts having been given with regard to the volume of Canadian wheat moved over the various routes in 1913, it will be instructive to observe the rates of freight which applied to this important traffic. A thorough analysis was made of the reports received, and they yielded the following averages:—

Port Arthur-Fort William to Montreal:—	Per ton per mile .....	.142c.
	Per bushel	5.351c.
	Per ton	\$1.78c.
Port Arthur-Fort William to Georgian Bay:—	Per ton per mile .....	.148c.
	Per bushel	2.279c.
	Per ton	76.00c.
Port Arthur-Fort William to other Canadian ports:—	Per ton per mile .....	.104c.
	Per bushel	2.436c.
	Per ton	81.21c.
Port Arthur-Fort William to Buffalo:—	Per ton per mile .....	.103c.
	Per bushel	2.430c.
	Per ton	81.00c.

* A comparison of the foregoing rates for 1913 with the rates for 1912 is as follows:—

	Per ton per mile.	1912. Per bushel.	Per ton.	1913. Per bushel.	Per ton.
Port Arthur-Fort William To Montreal .....	.157	5.774	1.924	5.351	1.780
“ Georgian Bay .....	.163	2.629	.876	2.279	.760
“ other Canadian ports ..	.115	2.384	.795	2.436	.812
“ Buffalo .....	.104	2.863	.793	2.436	.812

A record was also kept of the movement of Canadian wheat over the several routes during each month of the season of navigation and the results ascertained were as follows:—

Port Arthur-Fort William to Montreal:—			
	Per bush.	Per ton.	Per ton per mile.
	Cents.	\$	Cents.
April	6.015	2.04	.165
May	5.525	1.84	.135
June	4.682	1.54	.127
July	4.080	1.60	.130
August	5.440	1.68	.137
September	5.282	1.76	.144
October	6.313	2.10	.171
November	6.341	2.11	.172

Port Arthur-Fort William to Georgian Bay:—			
	Per bush.	Per ton.	Per ton per mile.
	Cents.	Cents.	Cents.
April	2.42	80.63	.157
May	2.16	71.85	.135
June	2.18	73.93	.142
July	1.59	52.73	.092
August	1.43	47.81	.092
September	1.53	51.26	.100
October	2.21	73.95	.146
November	2.46	82.30	.160
December	3.35	\$1.12	.220

Port Arthur-Fort William to other Canadian ports:—			
	Per bush.	Per ton.	Per ton per mile.
	Cents.	Cents.	Cents.
April	2.599	86.63	.127
May	2.200	73.35	.091
June	1.755	58.53	.072
July	2.371	90.36	.122
August	1.928	64.27	.082
September	1.969	65.03	.083
October	2.761	92.23	.166
November	2.780	92.69	.116
December	3.681	\$1.03	.146

Port Arthur-Fort William to Buffalo:—			
	Per bush.	Per ton.	Per ton per mile.
	Cents.	Cents.	Cents.
April	2.739	91.30	.108
May	2.442	81.40	.094
June	1.954	65.13	.076
July	2.289	76.30	.118
August	1.969	65.63	.090
September	1.739	57.97	.066
October	2.876	95.86	.122
November	2.998	99.97	.114
December	3.296	\$1.00	.126

A study of the returns for 1913 showed that the largest volume of wheat was moved through to Montreal during May and June, when the rates were low and there was no apparent pressure for delivery abroad; while the movement to Buffalo was largest in October and November, when dispatch was the prime consideration, and the rates were high.

The all water rate from Port Arthur—Fort William to Montreal in November averaged 6.341c. a bushel, which must be regarded as a fair rate for the vessels. For the same month the average water rate between Port Arthur—Fort William and Buffalo was 3.296c. To this should be added the rail rate between Buffalo and New York, which in November, for export, was 5½c. a bushel. This fact was officially ascertained from the Buffalo Chamber of Commerce. The combined water and rail rate from Port Arthur—Fort William to Buffalo in November was 8.796c., as compared with an average for that month between Port Arthur—Fort William and Montreal of 6.341c. With an advantage of 2.455c. a bushel in favor of the St. Lawrence route, it is still true that more than ten times as many bushels of Canadian wheat went out by way of Buffalo—New York in November than came down to Montreal. Such a situation is obviously created by other considerations than the rates of freight. They will be found in the availability of ocean tonnage at New York, the demand for expedition, and lower ocean freight and insurance rates from New York than from Montreal.

A larger volume of wheat was brought down to Georgian Bay ports in 1913 than in 1912. The average water rate to such ports was 2.279c. a bushel. The rail rate from Georgian Bay to Montreal was 6c. a bushel; but that rate was probably adjusted so as to make the water and rail rate

combined equal to the all water rate. A much larger volume of grain than in preceding years was brought to Port Colborne, passed into the elevator and subsequently carried on to Montreal by water.

Out of the facts which have been presented with respect to freight rates in 1913 on Canadian inland waters, grows quite naturally the suggestion of a comparison with rail rates. It must be said at once that the water rates were considerably lower than the rail rates. It is easily possible with the information in hand which has been gathered during the past years to put certain water rates side by side with rail rates; but such a measurement could not be made with satisfactory accuracy until carriers by water are placed on the same statistical footing as that now occupied by the railways. There are large and important factors lacking from the data which has been made available with regard to the operations of certain carriers by water on the inland waters of Canada. When all the factors are known it will then be practicable to make an exact comparison. The statistical facts dealt with in this report are satisfactory as far as they go; but in a matter of this nature absolutely complete and comprehensive reports are required before conclusions may be drawn which are sound from every point of view. It is believed that the whole statistical situation with regard to carriers by water will be changed during the current year.

Within the limited scope of canal statistics certain facts are definitely known. The rates of freight on a very large proportion of all the cargoes of Canadian origin moved through the canals have been ascertained. From that basic information the average rate per ton per mile has been calculated. The omissions from the account relate to cargoes which did not pass through the canals, and there are good reasons for asserting that such cargoes bore a somewhat higher freight rate than those which applied to the trade of the Great Lakes in particular. The latter is a more or less specialized business, in which competition is active.

It has been shown that the average rate per ton per mile on canal traffic in 1913 was .184c. The corresponding average rate for all the railways of Canada in 1913 was .758c. This comparison is most favorable to carriers by water, but it must not be forgotten that the Government makes a substantial contribution toward freight rates by water. The canals have not only been constructed by the Government, but the Government also maintains and operates them. It is therefore obviously reasonable to ask what the freight rate by water would have been in 1913 if carriers had been obliged to meet the interest on the cost of canals as well as the cost of maintenance. The facts are at hand. The capital cost of Canadian canals to March 30, 1913, was \$105,656,037. Interest at 3½% on this sum would amount to \$3,697,612. The cost of maintenance for the fiscal year 1913 was \$1,603,080. These two sums combined give a total of \$5,301,041. The Canadian tonnage in 1913 was 6,654,311; so the Government contribution was equal to 78.85c. a ton. Assuming that all this Canadian tonnage was carried at the same freight rates as the tonnage dealt with in the calculations preceding, it will be seen that 78.85c. was the precise equivalent to .146 per ton per mile. Put into tabular form the account would stand as follows:—

	Per ton.	Per ton per mile.
	Cents.	Cents.
Actual freight rate	99.37	.184
Government contribution	79.66	.147
Total	\$1.79.03	.331

The rail rate on wheat from Fort William

to Montreal is 12c. a bushel, or \$4 a ton. This is equal to .402 per ton per mile; so that the difference in favor of waterborne wheat in 1913 was .071 per ton per mile. Put in another way, if shippers had been obliged to meet the amount involved in the public's contribution to the water rate, the freight cost to Montreal in 1913 would have been 8c. a bushel instead of 5.351c. It should be added that the cost and maintenance of the canals is not the only Government contribution to the water rate. If the cost and maintenance of harbors, lighting, dredging, etc., had been taken into account there would have been a considerable addition. As it was, however, the rate by water was very much lower than the rate by rail.

The insurance rates which prevailed during 1913 on the St. Lawrence and Great Lakes route were as follows:—4¾% from the head of navigation to the eastern end of Lake Erie, an additional 1% to Ogdensburg, and a further 1% to Montreal. This would make the total 6¾% from Port Arthur—Fort William to Montreal, or 2% more than to Buffalo. This difference must be taken into account in comparing freight rates as between Buffalo and Montreal. In December an extension was allowed for the first five days at an additional 1%.

The St. Lawrence River Route.

During a discussion in the House of Commons, Feb. 20, on the Marine Department's estimates for the current year, the Minister of Trade and Commerce stated in regard to insurance rates, that while the Government is in sympathy with any movement to secure lower insurance rates on the St. Lawrence, the representations made to Lloyd's had not accomplished much. The shipping firms of the Dominion have been assured by the Government that if they would do their share in organizing a new plan of insurance the Government will assist, but no practical step has been taken in this direction.

The Minister of Marine stated that the commission consisting of Dean Haskell, V. W. Forneret and W. Stewart, which investigated water levels, etc., during 1913, had found that further investigation would be necessary this season before a report could be presented. Nothing, however, had been learned that would cause the Government to abandon the plan of deepening the channel to 35 ft., and the work would be carried on during the season. Up to March, 1913, over \$15,000,000 had been spent on the St. Lawrence route, of which \$9,000,000 was for dredging. The north channel is now being dredged, and when this is completed, the last impediment to navigation between Montreal and Quebec would be removed. Provision will be made in the supplementary estimates for the building of an additional dredge for this work, but, he stated, it was doubtful if it could be built in Canada. In connection with the ice breaker which is to be built for the St. Lawrence, and which it was decided to have built in Canada, a contract had not been awarded, as no satisfactory tenders were received, the prices being considered too high. The vessel is to be 275 ft. long, about 50 ft. broad and 27 ft. draught, while the horsepower will be between 8,000 and 10,000. It is intended to have it superior to the well known Russian ice breakers, and with this in view conferences have been had with the Russian naval authorities. Winter navigation on the St. Lawrence, he continued, is now beyond the experimental stage, especially with vessels built for such service, and the only question that remains is whether it would be commercially profitable to build such vessels.

Another Steel Car Ferry for the Ontario Car Ferry Company.

An all steel car ferry, Ontario No. 2, a sister ship to Ontario No. 1, being operated between Cobourg, Ont., and Charlotte, N. Y., by the Ontario Car Ferry Co., has been ordered from Polson Iron Works, Ltd., Toronto. The Ontario Car Ferry Co., Ltd., is a combination of G. T. R. and Buffalo, Rochester and Pittsburg Ry. interests, formed some years ago to handle the coal traffic originating on the latter company's lines, destined to points in Eastern Ontario, on G. T. R. lines, the object being to eliminate the long haul around the west end of Lake Ontario. The business handled over by car ferry has increased so greatly that a second vessel is required. It will be in most particulars almost identical with the first ferry on the line, Ontario No. 1, which was described in Canadian Railway and Marine World, May, 1907. Following are some of the principal particulars:

It is to be a twin screw car ferry of the shelter deck type, with four tracks for cars on the main deck. The main deck is to be of steel throughout, without wood covering; the shelter deck is to be of steel laid flush, with a steel deck house running throughout its greatest length and containing accommodation for passengers, officers and crew. It will have a wooden pilot house and bridge on top of the deck house forward, and a pilot house at the after end of the deck house. It will be divided into six transverse watertight bulkheads, extending from the keel to the main deck, with a longitudinal bulkhead along the centre line, in three deep water ballast tanks. There will be three water tanks 13 ft. deep, two of which will be forward of the boiler room, and one aft of the engine room, steel lower deck, to be laid throughout forward and after holds and both peaks, forming the tops of the deep water ballast tanks. There will be two shaft alleys, one on each side from the engine room, extending into the stuffing box bulkhead. The boiler room will contain four single ended Scotch marine boilers placed amidships, with one firehold athwartships and one wing coal bunker on each side of the boiler room. The hull is to be bossed out on each side to enclose the propeller shafts. There will be two steel pole spars, without masts or sails.

The ferry will have a capacity for 28 standard coal cars of 68 tons gross weight each, and 200 tons of fuel in the bunkers. The draught of the vessel will not exceed 16 1/4 ft. when fully loaded. It is to have a normal working speed of 13 miles an hour, to be maintained in open water, but will be capable of making 15 miles an hour to meet emergency conditions.

Length overall	318 ft.
Length, between perpendiculars	307 1/2 ft.
Beam, moulded	54 ft.
Beam, on main deck	56 ft.
Depth at centre, main deck to promenade deck ..	17 ft.
Depth at side, main deck to promenade deck ..	17 ft.
Draught of water with 28 loaded freight cars and 200 tons of bunker coal, not over	16 1/4 ft.
Camber of main and promenade decks	9 ins.
Depth to promenade deck	20 1/2 ft.
Rise of floor	2 ft.

The ferry is to be built on the transfer system, with solid plate floors and bulb angle frames. The steel plating will not be reduced forward, and will be extra heavy for working in ice. It is to be built to pass the inspection of the Great Lakes Register, and to receive the highest rating in the latter.

Plates and shapes will be of mild open hearth steel; stem, stern frame and rudder, of hammered scrap iron; and the spectacle frame, of cast steel in two parts. The frames from the after peak bulkhead to the stern post are to be 8 by 3 1/2 in. by 19.17 lb. bulb

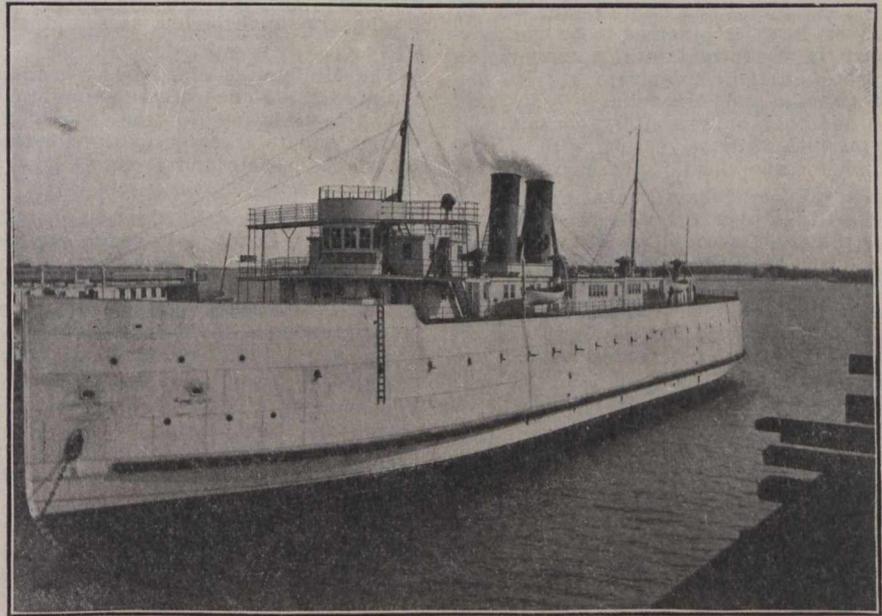
angles, spaced 24 ins. apart; from the collision to after peak bulkhead, 10 by 3 1/2 in. by 25.9 lb. bulb angles, 24 ins. apart; and forward of the collision bulkhead, they are to be of the same section as in the after peak, but spaced 18 ins. apart on the water line. All frames are to extend to the main deck in one length. The frames above the main deck will be of 8 by 3 1/2 in. by 19.17 lb. bulb angles, spaced 36 ins. throughout.

The bulkhead frames will be 5 by 5 in. by 16.2 lb. angles, double rivetted on both flanges, while the frames in the centre will be 6 by 3 1/2 in. by 11.7 lb. angles. Where floor plates are to be fitted, they will be connected to the shell plating by 4 by 3 1/2 in. by 11.9 lb. angles. The frames below the main deck in the way of the bossing are to be of 4 by 3 1/2 in. by 11.9 lb. angles and 15 lb. plate, with 3 by 3 in. by 7.2 lb. reverse bars. The reverse frames will be of 3 by 3 in. by 7.2 lb. angles, with double reverse frames to be fitted on all floors in the engine space.

The floors in the engine and boiler space are to be 33 in. by 20 lb., and 17 1/2 lb. elsewhere. At the end of the vessel, they are to be 17 1/2 lb., but increased in depth wherever necessary to suit the shape of the vessel.

The bilge keel will be a 13 in. 27.95 lb. bulb angle, fitted between double 6 by 3 1/2 in. by 12 lb. angles, and carried amidships for 110 ft. The main deck stringer will be a 30 lb. plate, 66 ins. wide for two thirds the length, tapering at the ends to 36 in. by 22 1/2 lb., and connected to the shell by 4 by 4 in. by 14.3 lb. angles. The hold stringer will be double 6 by 3 1/2 in. by 15.32 lb. bulb angles with 17 1/2 lb. plate fitted intercostally and connected to the shell by 3 1/2 by 3 1/2 in. by 9.8 lb. angles. The lower deck stringers will be 17 1/2 in. plates, 48 ins. wide for three quarters the length, reduced to 36 in. by 15 lb., connected to the shell and frame with 3 1/2 by 3 1/2 in. angles. The upper hold stringers will be 17 1/2 in. plate, 39 ins. wide for three quarters the length, reducing to 30 ins. by 15 lb., and connected by 3 1/2 by 3 1/2 in. by 9.8 lb. angles. The promenade deck stringers will be 17 1/2 in. plate 72 ins. wide for two thirds the length, reducing to 42 in. 15 lb. and connected by 3 1/2 by 3 1/2 in. by 11.1 lb. gunwale angles. The web plate will be 17 1/2 lb. plate.

The deck plating for the main deck will be 17 1/2 lb. plate; windlass deck, 12 1/2 lb., with 20 lb. under the windlass; lower deck, 12 1/2 lb.; and promenade deck, 10.2 lb. The



Ontario Car Ferry No. 1.

The floors are to be connected to the centre keelson by double 3 1/2 by 3 1/2 in. by 8 1/2 lb. angles.

The centre keelson will be 45 ins. deep, of 25 lb. plate throughout, with double 5 by 4 in. by 14.5 lb. angles top and bottom. The side keelson will be of several kinds. The first, of double bulb angles, 6 by 3 1/2 in. by 15.32 lb., on top of floor, with 17 1/2 lb. plate filler intercostally between the floors, and connected to the floors and shell by 3 1/2 by 3 1/2 in. by 9.8 lb. angle clips. The second, of single 10 by 3 1/2 in. by 25.9 lb. bulb angles, with 17 1/2 lb. plates fitted intercostally. The third, of double 6 by 3 1/2 in. by 15.32 lb. bulb angles, rivetted back to back, and connected to reverse bars with two 3/4 in. rivets. Extra keelsons will be fitted forward, one in each strake of shell plating. There will also be additional keelsons under the engine space.

The keel plates will be 48 ins. wide, of 32 1/2 lb. plate, reduced fore and aft to 30 lb. The hull plating will be in five courses, 25 1/2 lb. plate reduced fore and aft to 21.5 lb.; three courses, 30.6 lb., reducing to 25 1/2 lb., fore and aft; one course 12 1/2 lb. plate, increasing to 15 lb. at the forward end; and two courses, respectively 12 1/2 and 15 lb.

deck beams for the main deck will be 13 by 4 in. by 32 lb. channels; windlass deck, 10 in. by 20 lb.; lower deck, 10 by 3 in. by 22.49 lb. bulb angles; and promenade deck, 8 by 3 in. by 18.4 lb. bulb angles. The six transverse bulkheads will be watertight, with the collision bulkhead 32 ft. abaft the stem.

There will be two 12 by 16 by 18 in. horizontal or vertical duplex piston type ballast pumps, connected so as to individually fill or empty the ballast tanks; one 12 in. centrifugal pump, directed connected to an engine in the engine room, and so arranged as to act as an air pump in emergencies; a fire pump; 6 by 5 by 7 in. duplex bilge pump; 6 by 5 by 7 in. sanitary pump; 4 1/2 by 4 by 5 in. fresh water pump; and a 4 1/2 by 4 by 5 in. cooler pump.

There will be an electric lighting plant, consisting of one 15 k. w. and one 20 k. w. generator. There will be a 16 in. search light. There will also be a 2 ton ice machine, working on the carbonic anhydride principal.

The accommodation on the main deck will be for 6 coal passers, and 6 firemen on the port side, and 2 oilers, 2 watchmen, 4 deck hands and 2 water tenders on the starboard

side, all forward. The promenade deck will have accommodation for the vessel's officers, and in addition, 32 staterooms, as well as passenger saloons, dining room, etc.

There will be two triple expansion, 20½ by 33 by 54 by 36 in. jet condensing engines, operating normally at about 110 revolutions per minute. They will turn outwards.

The boilers will be four in number, 14 ft. diameter, and 12 ft. long, of the Scotch type, fitted for Howden's forced draught, and carrying 180 lbs. Each boiler will contain three 42 in. corrugated steel furnaces, 42 in. diameter.

Atlantic and Pacific Ocean Marine.

The Canadian Northern Steamships will continue to make Montreal the summer headquarters of the Royal Line during the forthcoming season, and will not run to Quebec only, as it has been reported.

It is reported from the Pacific coast that the Union Steamship Co. of New Zealand, which is now operating the mail steamship service between Canada and Australasia, is about to inaugurate a freight steamship service also, and is at present investigating the requirements of such a service.

The Merchants Trust and Trading Co., of Vancouver, B. C., is reported to be the moving spirit in the formation of a company to inaugurate another steamship service between Canada and Australia. It is said that a monthly or bimonthly service will be given with 13 knot vessels, with accommodation for one class of passengers.

The Royal Mail Steam Packet Co. has arranged to take over the s. s. Mandingo, to replace the s. s. Cobequid, which was wrecked in the Bay of Fundy recently, and operate her on the West Indies route. The Mandingo was formerly owned by the Elder Dempster Co., and was built for its West African service. The two companies named are closely allied.

H. B. Stoker, formerly in the C. P. R. Steamship Department, has been appointed Westbound Traffic Agent, Manchester Liners, Ltd., with office at Montreal. The company operates a line of steamships between Manchester, Eng., and Montreal, on the summer route, and St. John and Halifax in the winter. Furness, Withy and Co. are the General Agents.

Capt. F. Carey of the C.P.R. s.s. Tyrolean has retired from active service after over 50 years marine experience. He entered C.P.R. service when the C.P.R. acquired the old Beaver Line, and eventually was placed in command of the Empress of Ireland for her first few trips, after which he was transferred, at his own request, to one of the more southerly routes.

The Royal Mail Steam Packet Co.'s s. s. Cobequid which was recently wrecked in the Bay of Fundy, will probably be declared a total loss. She was insured on a value of £30,000, but the underwriters are only liable for the excess of £10,000 for particular average claims. She was built in 1893 for the Union-Castle Line, and was formerly known as Goth.

Maritime Provinces and Newfoundland.

The Crystal Stream Steamship Co.'s steamboats D. J. Purdy and Majestic have both had their boilers and machinery overhauled.

The Cape Breton Electric Co.'s new steamboat Electronic will be placed in service on the company's ferry route during the summer.

The Maritime and Newfoundland Steamship Co. is reported to have placed an

order at Paisley, Scotland, for the construction of a steel screw driven steamship.

The Majestic Steamship Co.'s s. s. Champlain has been extensively overhauled during the winter, at Meteghan, N. S., and the hull has been practically rebuilt.

The Dominion Government has awarded a contract for the construction of a breakwater at Little Sands, P. E. I., to Phillips, Mutch and McLean, Charlottetown.

Furness Withy and Co. are considering tenders for the construction of a pile wharf and steel freight shed, and for moving the existing freight shed and building extensions to it, and for other work, at St. John's, Nfld.

It is reported that the St. John River Steamship Co.'s steamboat Elaine is about to be sold, and that she will be operated during the forthcoming season on the main river route by an independent company.

The steamboat Maggie Miller which runs on the ferry service on the Kennebecasis River, between Millidgeville and Bayswater, N. B., was practically rebuilt during the winter in readiness for the season's service.

The Victoria Steamship Co.'s s. s. Victoria has been thoroughly overhauled during the winter, and has had her furnaces so arranged that she will use wood as fuel during the forthcoming season, instead of coal.

The Minister of Marine has introduced a bill into the House of Commons, to repeal the acts relating to the North Sydney harbor and to transfer to the Government, the rights, assets and property now vested in the Harbor Commissioners there.

The C. P. R. s. s. St. George, operating on the Bay of Fundy service, is having new turbines installed at New York. The turbines were built at Birkenhead, Eng., and the work is being carried out under the superintendence of the builders.

The steamboats Malcolm Cann and Robert G. Cann, owned by Hugh Cann and Son, Ltd., Yarmouth, N. S., will be operated as follows, during the forthcoming season,—the first, between Guysboro and Mulgrave, daily, and the second, between Canso and Mulgrave, daily except Sunday.

The acting Minister of Railways stated in the House of Commons, Mar. 4, in answer to questions, that the amount of the contract for the construction of the Halifax ocean terminal docks, which was awarded to Foley Bros., Welch, Stewart and Fauquier, is \$5,208,745, based on schedule prices. The amount deposited by the contractors as security for carrying out the work is \$200,000.

Representations have been made to the Dominion Government for the removal of the tax of 1c. a ton on all vessels of over 100 tons capacity, entering the harbor at North Sydney, N. S., as it is claimed that many of the larger vessels which might otherwise utilize the port, avoid it on that account. For entering Sydney harbor, vessel owners pay a nominal fee twice a year.

The New Brunswick courts have recently declined to dismiss the application for a winding up order for the May Queen Steamship Co., Ltd., Gagetown, N. B., but allowed time for any shareholder to offer evidence to determine whether there should be an appeal against it. The winding up order had been asked for on account of the impairment of the company's capital to the extent of 25%. The company owns the s. s. May Queen, which was built at Carleton, N.B., in 1869, and which is a paddle wheel vessel driven by an engine of 60 n. h. p. Her dimensions are, length 160 ft., breadth 24.7 ft., depth 8.4 ft.; tonnage 539 gross, 340 register.

Province of Quebec Marine.

J. C. Sullivan, Harbor Master at Quebec for the past 16 years, died there, Mar. 23.

It was reported from the Montreal Harbor Commissioners' office, Mar. 18, that probably the ice would move out of the river by about Apr. 15.

The Dominion Public Works Department has awarded a contract for the construction of a wharf at Thurso, Que., to Belanger Bros., Papineauville, Que.

Polson Iron Works, Toronto, launched the first of the large dump scows, which it is building for the Quebec Harbor Commission, Mar. 4. In order to carry out the launching, the ice in the dock had to be dynamited.

The varying reports as to the future of the shipbuilding plant at Levis, owned by G. D. Davie and Sons, have been set at rest by the announcement of G. D. Davie, that he is incorporating a company with the title of The Davie Company, Limited, to take over the business, he remaining, as heretofore, in control.

Canada Steamship Lines, Ltd., has entered a tender for a mail service, which the Dominion Government intends to inaugurate along the north shore of the lower St. Lawrence, between Quebec and Seven Islands. If the matter can be arranged with the company, it may run the Northern Navigation Co.'s s. s. Saronic on the route.

The Department of Marine has issued a list of buoys to be placed, shortly after the reopening of navigation, in the steamship west channel of the St. Lawrence River, known as the Repentigny channel, and which is 300 ft. wide, 15 ft. deep at extreme low water of 1897, between Lavalrie and Ile Deslauriers.

The Dominion Public Works Department during 1913 did considerable dredging in front of Bureau Quay, Three Rivers, giving a 30 ft. waterway at all points up to 30 ft. or less of the quay front, except at a point 400 ft. below the upper end, where there is a 28 ft. spot 100 ft. outside the quay, surrounded by a patch about 100 by 300 ft. having less than 30 ft. of water. A shelter basin 300 ft. square has been dredged to 14 ft. below lowest low water from the St. Lawrence River into the west mouth of the St. Maurice River.

Ontario and the Great Lakes.

The head office of the Farrar Transportation Co., operating the steamships Collingwood and Meaford on the Great Lakes, has been moved from Collingwood to Toronto.

Robert Bruce, of Ottawa, has been appointed Superintending Engineer of the Ottawa River Works, for the Department of Public Works, succeeding the late George Brophy.

J. Wiggins, who died at Toronto, Mar. 4, aged 90, was in his early days engaged in Great Lakes navigation, before sailing vessels were displaced by steamboats, and for 20 years owned the Erie Stewart.

Press reports say that the combined ports of Port Arthur and Fort William, with shipments of 203,328,129 bush. of grain in the navigation season of 1913, lead all ports on this continent in grain shipments.

A deputation from Bruce County waited on the Ministers of Public Works and Marine, Mar. 19, to lay before them a scheme for the construction of a port of refuge for lakes, at Inverhuron, on Lake Huron.

The report of G. H. Ferguson, a member of the Ontario Legislature, on a number of allegations in connection with the expendi-

ure of public money on the Trent Canal, was laid on the table of the House of Commons, Mar. 9.

The Department of Railways and Canals has awarded the contract for subaqueous work on section 3 of the Rice Lake Division of the Trent Canal, to Robertson and Co., Cornwall, Ont. The amount of the contract approximates \$100,000.

The Ontario Car Ferry Co., which operates between Cobourg, Ont., and Charlotte, N. Y., has applied to the U. S. Interstate Commerce Commission, under the Panama Canal law, for permission to retain, after July 1, its water line holdings in the U. S.

The Whitby Town Council is being asked to consider a scheme for the establishment of a ferry steamboat service between Whitby and Olcott, N. Y. The project would involve the expenditure of about \$1,500,000, it is reported, and is in the hands of a U. S. syndicate.

Capt. William McIlwain, who has been connected with marine business for the greater portion of his life, both on the Atlantic Ocean and the Great Lakes, died at St. Catharines, Mar. 2, aged 87. He was, for about 25 years, Examiner of Masters and Mates for the Dominion Government.

The Minister of Public Works, in response to a deputation respecting the proposed harbor improvements at Goderich, promised, Mar. 12, that the matter would be considered at an early date, but could not promise that provision would be made in the supplementary estimates for carrying out the work.

A press dispatch from Port Arthur recently stated that the large freight steamship under construction there for Canada Steamship Lines, Ltd., and of which a full description was given in our last issue, is to be named W. Grant Morden, and that the launching would probably take place Apr. 4.

It was announced in Ottawa recently that the commission to enquire into the commercial possibilities of the project to build a canal between the Georgian Bay and the St. Lawrence River will be appointed shortly. Among those who have been mentioned as members are, W. Sanford Evans, Winnipeg; F. S. Meighen and E. Gohier, Montreal.

Canada Steamship Lines, Ltd., has established a series of lectures in various parts adjacent to the Great Lakes, for the benefit of its navigation employes, with Capt. G. D. Frewer as Instructor. All those engaged in the navigation and handling of the company's vessels necessarily attend the course and pass an examination, which, it is said, makes for a standard considerably higher than that required by the Government examinations.

The U. S. Lake Survey reports the levels of the Great Lakes in feet above tidewater for February, as follows:—Superior, 602.10; Michigan and Huron, 580.06; Erie, 571.73; Ontario, 245.87. Compared with the average February levels for the past ten years, Superior was 0.38 ft. above; Michigan and Huron, 0.01 ft. below; Erie, 0.08 ft. above, and Ontario, 0.19 ft. above. It was anticipated that during March, Superior would fall 0.1 ft.; that Michigan and Huron, and Erie would rise 0.1 ft., and Ontario 0.2 ft.

A report from Windsor states that a steamboat company is in process of organization to operate a passenger and freight service between Sarnia, Wallaceburg, Windsor and intermediate points, and possibly calling at Detroit, Mich. It is said that the capital will be \$50,000, and that a vessel with capacity for about 1,000 passengers will be placed in service by May 1. Among those interested in the project are said to be H. B. Smith, D. A. Gordon, M. P., and T. B. Dunbar, of Wallaceburg.

The Algoma Central Steamship Co., a subsidiary of the Lake Superior Corporation and allied with the Algoma Central and Hudson Bay Ry., and the Algoma Eastern Ry., has purchased the s. s. J. A. McKee from the Western Steamship Co., Toronto. This vessel is on the British register, and was built at Newcastle on Tyne, Eng., in 1908. She is screw driven with engine of 204 n. h. p., and her dimensions are as follows:—Length 248 ft., breadth 43.1 ft., depth 22.5 ft., tonnage, 2,158 gross, 1,375 register.

Representatives from Leamington and Pelee Island waited on the Minister of Public Works, Mar. 3, to ask for an appropriation of \$75,000 for the construction of a breakwater at Leamington, so as to provide proper protection there with a view to securing safe and constant steamboat communication with Pelee Island. The Minister promised that if an amount was not included in the supplementary estimates during the current session, it would certainly be placed in the estimates for next session.

The Keystone Transportation Co., Montreal, is having built at Londonderry, Ireland, the s. s. Keynor of full canal size, 256 ft. long, 42½ ft. beam, 20 ft. deep, to Lloyds highest class for lake and gulf trading, and especially strengthened for canal work. The engines will have the following dimensions: Cylinders, 16 by 26 by 44 ins.; stroke, 36 in.; boilers, 11½ ft. diameter, 10½ ft. mean length, fitted with forced draught on the Howden system. Capt. James Martin of Kingston will have command, with John Robertson as engineer.

Press reports from Cleveland, Ohio, state that James Playfair, formerly Vice President and Managing Director, Richelieu and Ontario Navigation Co., has purchased the steamships Griffin, La Salle and Wawatam, from the Pittsburgh Steamship Co. These vessels were built at Cleveland, in 1891, 1890 and 1890, respectively, their dimensions being, length 266 ft., breadth 38 ft., depth 23 ft.; tonnage, Griffin, 1879 gross, 1526 register; La Salle, 1935 gross, 1536 register; Wawatam, 1879 gross, 1526 register. They are steel vessels, each equipped with triple expansion engines with cylinders 17, 29 and 47 ins. diam., by 36 ins. stroke. It is also reported that Mr. Playfair is also negotiating for other vessels. Other press reports state that H. W. Richardson, of Kingston, is associated with him in these transactions, and that they have also purchased the steamships Minnekahta and Minnetonka from the Chicago and Duluth Transportation Co. It is also stated that the foregoing vessels will be operated in the Great Lakes trade, in conjunction with the steamships Glenmavis, Glenfoyle and Calgary, and the motor vessel Toiler. The Glenmavis and Glenfoyle are sister vessels built on the arch principle, which was fully described and illustrated in Canadian Railway and Marine World for Sept., 1913. The Toiler was the first vessel to be equipped with internal combustion engine for the lakes service, and these vessels, with the Calgary, are registered under the name of James Richardson and Sons, Ltd., Kingston.

Manitoba, Saskatchewan and Alberta.

C. A. Dunning, a member of the Saskatchewan Grain Commission, and Manager of the Co-operative Elevator Co., is advocating the construction of an inland waterway system, to enable large vessels to convey grain from the Prairie Provinces to the ocean, thus obviating the numerous transfers of cargo.

The channel at the mouth of the Red River, Lake Winnipeg, known as the new channel, is cut through the northeast ex-

treme of the delta between the middle and east mouths of the river to the lake shore, and extends between pilework breakwaters into deep water of the lake. Range lights have been established to mark the axis of the portion extending into the lake, and the old range lights at the mouth of the Red River have been discontinued, but the light-houses have been left standing so that in the event of the new channel filling up, the old one could again be used and the old lights put into operation temporarily.

British Columbia and Pacific Coast Marine.

The contract for the extensive harbor improvements at Victoria has been awarded to Grant Smith and Co. and Macdonnell, at prices approximating \$2,244,745.

B. W. Greer, Vancouver, has been appointed agent for British Columbia, for the Maple Leaf Line, running vessels between New York and Vancouver, with steel and other cargo.

The two steamships which are under construction at Dumbarton, Scotland, for the C. P. R. British Columbia Coast service, will probably be launched in June or July. It is reported that they will be named Princess Margaret and Princess Melita.

Press reports from Vancouver state that the British Columbia Government has decided to order a ferry steamboat, at a cost of about \$25,000, for service across the Fraser River at Ladner, and that tenders will be invited early in April.

We are officially advised that no action is being taken on the tenders recently received for the construction of a 15 in. hydraulic, self propelling steel suction dredge, for use in the Arrow Lakes and adjoining waters, in British Columbia.

The Provincial Government snag boat, recently built at Coquitlam, was towed down the river recently, to New Westminster, where she will have the machinery from the dismantled snag boat installed. The new vessel is named Samson, as was the old one.

Davis and Leslie, consulting engineers, Vancouver, are reported to have been appointed as harbor engineers by the North Fraser Harbor Commissioners, for the laying out of the North Arm of the Fraser River. The firm act as representatives of the English firm of Sir Douglas Fox and Partners.

The dock recently completed at Vancouver for Balfour, Guthrie and Co., consists of two piers, each 450 ft. long and 127 ft. wide. On the piers are warehouses, each 400 by 100 ft., supported on trusses, with no pillars to obstruct the free handling of freight. Railway siding facilities are also provided.

The Public Works Department has dredged a channel 1,700 ft. long by 75 ft. wide and 14 ft. deep, through a sandbar in Cloud Bay on the northwest shore of Lake Superior, to give access to Cloud River which runs into the bay. The north edge of the cut will, on the reopening of navigation, be marked by two red spar buoys, one at each extremity.

It was announced in the House of Commons, Mar. 10, that authority had been given by order in council for the purchase of a site for the proposed Government dry dock at Esquimalt, and that the Public Works Department is negotiating for the acquisition of a frontage of 2,703 ft. at Langs Cove, the estimated cost being \$334,595.

The Union Steamship Co. is said to have recently renewed its insurance on nine vessels of its fleet, the values ranging from

\$20,000 to \$150,000. On the Chelohsin Camosun, Cowichan, Cheakamus and Venture, 189 shillings% is paid; on the Cassiar, 210 shillings, and on the Capilano, Comox and Coquitlam, 231 shillings. This is an increase of 21 shillings% over the amounts paid in 1913.

In order to permit of repairs to the revolving machinery, the exhibition of the flashing white light at Race Rocks in the Juan de Fuca Strait, on the south coast of Vancouver Island, will be discontinued for about three weeks from May 1. While these repairs are under way, a temporary occulting white light will be shown from a lens lantern, placed on the top of the tower, lighted by acetylene.

A collision between the G. T. Pacific Coast Steamship Co.'s s. s. Prince John and the Dominion Government fisheries protection vessel Newington, off Queen Charlotte Sound, was reported, Mar. 3. The Newington was reported to have been considerably damaged above the waterline. She proceeded under her own steam to Esquimalt where she was docked for examination and repairs.

A deputation of the North Vancouver Council appeared before the municipal committee of the Legislature, recently, to ask that in the new Municipal Act, power be allowed the municipality to operate the ferry service between Vancouver and North Vancouver. The service between these points is now operated by a private company, the capital stock of which is practically all owned by the municipality. The proposal was not entertained, and the deputation was advised that the council should proceed with such a matter by the promotion of a private bill.

The Vancouver Shipmasters' Association recently adopted a resolution calling the attention of the Minister of Marine to the coasting trade so far as it affects the Pacific coast, claiming that at present the coastwise trade on the eastern seaboard has been cornered by aliens, chiefly Norwegians, and that probably on the opening of the Panama Canal, they would endeavor to do the same on the western seaboard. It also asks that no further orders in council, governing the participation in the coasting trade by foreigners, be renewed, or passed, and that a commission be appointed to investigate the whole matter.

The cases against a number of steamship companies, including the C. P. R. and the White Pass and Yukon Route, brought by the U. S. Attorney, alleging discrimination against the Humboldt Steamship Co., in monopolizing wharfage facilities at Skagway, Alaska, and making lower through rates than could be made by other lines, has been compromised by the companies charged pleading guilty, and submitting to fines of various amounts, the White Pass and Yukon Route's amount being \$2,000 and the C. P. R.'s \$500. In addition to the companies being charged, a number of employes of the companies were charged, but later dismissed from the case.

The Island Transfer and Trading Co., Victoria, the incorporation of which has already been mentioned, is taking over the East Coast Trading and Transport Co., and will run a steamboat service between Victoria and the Gulf Islands, chiefly in the general food supply business. The company has purchased the small steamboat Imperieuse, which was built at Victoria in 1910. She is screw driven by engine of 3 n.h.p., and is of the following dimensions,—length 38 ft., breadth 10.9 ft., depth 4.8 ft.; tonnage, 14 gross, 8 register. The steam tugboat Burin is also being operated by the company, and an option to purchase it has been obtained. The Burin was built at

Vancouver in 1910, and is screw driven by engine of 4 n.h.p. Her dimensions are,—length 55 ft., breadth 16.8 ft., depth 7.2 ft.; tonnage, 45 gross, 30 register. Following are the officers and directors,—Managing Director, A. C. C. Smith; Secretary, R. Wilmot; other directors, W. W. Foster, M.L.A.; B. Boggs, W. Blakemore and J. J. White.

The Shipping Federation of Canada's officers for the current year are.—President, A. A. Allan; Treasurer, J. R. Binning; Executive, J. Thom, chairman, A. A. Allan, J. R. Binning, D. W. Campbell, A. W. Mackenzie, W. R. Eakin and R. W. Reford.

Panama Canal Tolls.—In dealing with remarks recently made in the U. S. Senate, respecting the British protest against the exemption provision in favor of U. S. steamship owners using the Panama Canal, Sir Thomas Shaughnessy, President, C. P. R., is reported to have stated that the C. P. R., neither directly nor indirectly protested to the British Government, or any other government, against the Panama Canal tolls, and that the C. P. R. was quite unconcerned as to any decision the U. S. Government came to in the matter.

Victoria, B.C., Breakwater.—The breakwater being constructed by the Dominion Government at Ogden Point, near Victoria, B.C., has reached a stage where operations on parts of the substructure will have to await weather conditions such that divers can assist in the placing of the granite blocks which are to form the foundation for the concrete. In the three weeks in December, during which it was possible to carry on the work, 32,459 tons of rock were dumped, and for the first 900 ft. of its length the substructure has been brought up to a depth of about 20 ft. below low water mark. This work is under the direction of J. S. MacLachlan, District Engineer for the Public Works Department, and the contract is held by the Sir John Jackson Co., Ltd., of London, Eng.

Tides and Currents in the Gulf of St. Lawrence.—The Department of Naval Service has issued a report by Dr. W. Bell Dawson, on the currents in the Gulf, from investigation during 1894-5 and 6, 1906, 1908, 1911 and 1912. During these seasons the work was divided into sections and considerable surveys done in each, the vessel employed being anchored in positions carefully selected for the purpose. The observations of the currents were obtained by current meters registering electrically on board, the speed being measured at the standard depth of 18 ft. in all cases, and a continuous record of the tide was obtained simultaneously for comparison with the currents. The information is divided into two parts, viz., the description of currents on the surface as a mariner may expect to find them in each locality; and the general circulation of the water in the Gulf, and the characteristics of its water in regard to temperature, density, etc.

Canadian Notices to Mariners.

The Department of Marine has issued the following:—

- 66. Feb. 27. Quebec, River St. Lawrence, Lavaltrie to Ile Deslauriers, buoys established to mark Repentigny Channel.
- 67. Feb. 27. Quebec, River St. Lawrence, Lavaltrie to Repentigny, range lights established to mark Repentigny Channel.
- 68. Feb. 27. Quebec, River St. Lawrence, Ile a la Bagne, light discontinued.
- 69. Mar. 2. British Columbia, Vancouver Island, Victoria harbor, Hospital rock, buoy to be moved as work of widening harbor progresses.
- 70. Mar. 2. British Columbia, Vancouver Island, south coast, Juan de Fuca Strait, Race Rocks, temporary light.
- 71. Mar. 3. New Brunswick, south coast, Bay of Fundy, Cape Spencer, intended change in character of light.
- 72. Mar. 3. Nova Scotia, Bay of Fundy, Lurcher Shoal, position of lightship.
- 73. Mar. 3. Quebec, River St. Lawrence, Barrett ledges, changes in buoyage.
- 74. Mar. 3. Quebec, River St. Lawrence, Marmen rock, Demers rock, change in position and character of buoys.
- 75. Mar. 3. Quebec, River St. Lawrence, Montreal harbor, Ile Ronde, front range light to be improved.
- 76. Mar. 3. England, south coast, Plymouth Sound, light buoys established.
- 77. Mar. 5. Nova Scotia, Bay of Fundy, Long Island, Petit Passage, Boars Head, fog alarm established.
- 78. Mar. 5. Quebec, River St. Lawrence below Quebec, Traverse of St. Roch, change in characteristic of gas buoy lights.
- 79. Mar. 6. Ontario, Bay of Quinte, Pictou, dredging.
- 80. Mar. 6. Ontario, Bay of Quinte, Nigger Narrows, dredging.
- 81. Mar. 6. Ontario, Lake Huron, Loyal Island, intended change in character of light.
- 82. Mar. 11. New Brunswick, Bay of Fundy, Machias Seal Island, change in fog alarm, new fog alarm building.
- 83. Mar. 11. New Brunswick, St. Croix River, St. Stephen, dredging.
- 84. Mar. 11. Nova Scotia, Bay of Fundy, Brier Island, permanent light.
- 85. Mar. 11. Nova Scotia, Bay of Fundy, Lurcher Shoal lightship, wireless telegraph, additional information.
- 86. Mar. 11. Quebec, Gulf of St. Lawrence, Seven Islands Bay, names of lights.
- 87. Mar. 11. Newfoundland, south coast, Placentia Bay, off eastern entrance to Burin harbor, Iron Island, light discontinued.

Montreal Warehousing Co.—The annual meeting was held at Montreal, Mar. 4. Following are the officers and directors for the current year:—President, E. J. Chamberlin; Vice President, H. G. Kelley; other directors, W. Wainwright, M. M. Reynolds and J. E. Dalrymple; Manager and Secretary, G. H. Hanna.

Lake Grain Shipments in 1913.

The following table shows the bushels of grain shipped from Fort William and Port Arthur during 1913, the amounts in Canadian and U. S. bottoms, respectively, and the quantity sent by each route. The total amount of grain of all kinds shipped from the dual ports in 1913 was 203,328,129 bush., compared with 135,545,946 busa. in 1912.

	Wheat.	Oats.	Barley.	Flax.	Rye.	Mixed.
To Canadian ports in Canadian vessels	61,547,467	25,726,810	6,546,400	8,534,626	3,029	126,158
To Canadian ports in U.S. vessels	2,060,560	.....	67,663	366,227	.....	.....
Total to Canadian ports	63,608,027	25,726,810	6,614,063	8,900,853	3,029	126,158
To U.S. ports in U.S. vessels	67,301,363	14,412,154	4,446,578	10,364,492	.....	.....
To U.S. ports in Canadian vessels	1,087,939	607,671	78,703	50,289	.....	.....
Total to U.S. ports	68,389,302	15,019,825	4,525,281	10,414,781	.....	.....
Grand total	131,997,329	40,746,635	11,139,344	19,315,634	3,029	126,158

Coast, Lake and River Officers for 1914.

The following appointments, made by the principal navigation companies, engaged in Canadian navigation, for their various steam vessels and tugs, for this year, have been reported to Canadian Railway and Marine World, by the managements. The first column gives the names of the vessels, the second, those of the captains, and the third those of the chief engineers:—

ALGOMA CENTRAL STEAMSHIP CO., SAULT STE. MARIE, ONT.
Agawa J. A. Brown J. L. Smith
J. A. McKee R. G. Bassett A. M. MacInnes
J. Frater Taylor R. H. Boyle L. B. Cronk
Paliki H. C. Wingrove John Knight
Thomas J. Drummond A. McIntyre W. T. Rennie
W. C. Franz W. C. Jordan G. Sylvester
BAY OF FUNDY AND MINAS BASIN STEAMSHIP CO., LTD., MARGARETVILLE, N.S.
Brunswick H. W. Moore G. Snow
Margaretvillie S. Baker L. Harris
Ruby L. C. D. Baker A. B. Dorman
BURNHAM MORRILL AND CO., HALIFAX, N.S.
Mary Jane H. Hingley John Palmer
Robie M. R. A. Hines John McCarvel
CALVIN CO., LIMITED, GARDEN ISLAND, ONT.
Frontenac C. E. Phelix F. Campeau
India C. Beupre F. Brian
Johnston J. W. Phelix C. Lalonde
Parthia J. Dix G. Sauve
Simla C. E. Coons D. Simons
CANADA ATLANTIC AND PLANT LINE STEAMSHIP CO., LIMITED, HALIFAX, N.S.
A. W. Perry H. Doyle R. Mackay
Evangeline A. Ellis James Smith
Halifax F. H. Hawes John Dobbie
CANADA ATLANTIC TRANSIT CO., LIMITED, MONTREAL.
Arthur Orr John Simons D. E. Mance
George N. Orr H. Jaenke J. B. Wellman
Kearsarge A. W. Baxter A. P. Williams
Newona W. J. Moles W. Paus
CANADA STEAMSHIP LINES, LTD., TORONTO.
Cayuga C. J. Smith A. Mains
Chicora T. Allen N. Griffin
Chippewa W. Malcolm H. Parker
City of Hamilton J. L. Baxter E. Hamelin
City of Ottawa W. G. Cox S. Murray
Corona B. A. Bongard A. J. Woodward
Geronia J. Heffernon J. Kane
Kingston E. A. Booth W. Chipman
Macassa James Henderson E. A. Prince
Modjeska P. Walsh J. A. Findley
Rochester W. Owens A. Cummings
Toronto H. LaRush D. A. Leslie
Turbinia B. W. Bongard W. Noonan
CANADIAN NORTH WEST STEAMSHIP CO., LIMITED, TORONTO.
Atikokan W. J. Brown C. Arnberg
George A. Graham A. A. Hudson J. H. Louden
Needing P. McIntyre R. R. Foote
Paipooenge J. N. Foote H. H. Moore
CANADIAN PACIFIC CAR AND PASSENGER TRANSFER CO., PRESCOTT, ONT.
Charles Lyon W. Henry L. Black
CANADIAN PACIFIC RY. BAY OF FUNDY SERVICE, YARMOUTH, N.S.
St. George M. Cardiff J. T. Kelly
Yarmouth A. MacDonald J. M. Pendrigh
CANADIAN PACIFIC RY. BRITISH COLUMBIA LAKE AND RIVER SERVICE, NELSON, B.C.
Aberdeen J. B. Weeks W. Sutherland
Bonnington G. Robertson T. F. McKechnie
Castlegar M. P. Reid J. P. Sutherland
Hosmer F. L. Orr A. McLeod
Kaleden F. Broughton J. McRae
Kokanee L. McKinnon J. G. Cameron
Kootenay G. Robertson N. Hawthorn
Kuskanook F. L. Orr J. Donaldson
Minto A. Forslund J. Fyfe
Moyie W. Wright D. McLeod
Naramata M. P. Reid J. Sutherland
Nasookin W. Seaman D. H. Biggam
Nelson W. Wright
Okanagan G. L. Estabrooks W. Jacobs
Proctor J. Fitzsimmons P. H. Pearce
Rossland J. Fitzsimmons J. Fyfe
Sandon G. Graham C. E. McKenzie
Sicamous G. L. Estabrooks W. Jacobs
Slocan W. Kirby J. Russell
Valhalla J. Ferguson T. C. l'Anson
Whatshan J. Dougal W. Edwards
Ymir F. Swanson W. Kelly
York A. McDonald W. Liver
CANADIAN PACIFIC RY. DETROIT RIVER CAR FERRY SERVICE, WINDSOR, ONT.
Michigan R. Brown F. Merrill
Ontario J. Carney A. McDonald
CANADIAN PACIFIC RY. UPPER LAKES SERVICE, PORT McNICOLL, ONT.
Alberta F. J. Davis C. Butterworth
Assiniboia Jas. McCannel A. Cameron
Athabasca J. B. Currie W. Lockerbie
Keewatin M. McPhee W. Lewis
Manitoba J. McIntyre R. Sinclair
HUGH CANN & SONS, LIMITED, YARMOUTH, N.S.
Bruce Cann I. A. Banks H. Doane
Hugh D. E. B. Nickerson R. M. Gammon

John L. Cann A. L. MacKinnon John Nixon
LaTour F. E. Smith C. Weddleton
Malcolm Cann J. R. Durkee D. E. Read
Robert G. Cann W. E. Morris J. L. Cann
Wanda F. L. Nickerson H. L. Goodwin.
CANADIAN TOWING AND WRECKING CO., LTD., PORT ARTHUR, ONT.
Barnes S. Corson L. Caley
Home Rule John Scott W. Floona
J. T. Horne G. Scagel H. Cross
James Whalen A. Morrison A. Vigars
Minnie W. R. Nuttall John Currie
Orcadian G. Buell A. Murray
Roi Tan W. Garrick C. Kennedy
Salvor E. J. Cadott P. Holland
Sarnia G. Stitt L. Williams
Superior A. Fader W. Farnell
Viper A. Trembley John Farquharson
CAPE BRETON ELECTRIC CO., LIMITED, SYDNEY, N.S.
Hygeia A. McLeod R. Dickson
Pawnee J. Brown A. Campbell
Peerless I. H. Lewis J. B. Weeks
CENTRAL CANADA COAL CO., LIMITED, BROCKVILLE, ONT.
Samuel Marshall C. A. Mahoney J. R. Ferguson
CHARLOTTETOWN STEAM NAVIGATION CO., LIMITED, CHARLOTTETOWN, P.E.I.
Empress A. Cameron J. A. Rowe
Northumberland A. McLeod C. Cuming
COAST STEAMSHIP CO., LIMITED, VANCOUVER, B.C.
British Columbia G. Foellmer J. Ellison
Celtic J. Finlay A. C. Ritchie
Clansman M. F. MacDonald H. Nissen
Fingal R. W. H. Lloyd H. Spencer
CRYSTAL STREAM STEAMSHIP CO., LIMITED, ST. JOHN, N.B.
D. J. Purdy F. Maby — McVicar
Majestic B. Dykman G. Blewitt
DARTMOUTH FERRY COMMISSION, DARTMOUTH, N.S.
Chebucto John Hare J. Ross
Dartmouth W. Jennex C. Shortt
Halifax C. A. Ozon A. McLeod
(Extra Officers) N. W. Allen C. Pearce
DOMINION TRANSPORTATION CO., LIMITED, SAULT STE. MARIE, MICH.
Caribou A. A. Batten James Nicoll
Manitou N. McCoy James McDonald
EASTERN MANITOULIN ROYAL MAIL STEAMSHIP LINE, LITTLE CURRENT, ONT.
Amigo C. L. D. Sims — Mikon
Bon Ami E. Mackie R. A. Johnston
John Haggart ————— John Needle
EASTERN TRANSPORTATION CO., LIMITED, BATHURST, N.B.
Nyanza A. Hains L. Sprague
FARRAR TRANSPORTATION CO., LIMITED, COLLINGWOOD, ONT.
Collingwood F. Scott D. McLeod
Meaford W. A. Richmond E. W. Maloney
FOLEY, WELCH & STEWART, VANCOUVER, B.C.
Conveyor John Shannon A. Forbes
Operator C. Myers D. Martin
FORWARDERS, LIMITED, KINGSTON, ONT.
Port Colborne W. E. Steeves John McMillan
W. H. Dwyer J. P. McLeod J. Silverthorne
GASPE AND BAY CHALEUR STEAMSHIP LINE, QUEBEC, QUE.
Gaspesian P. Blouin J. Bolduc
GASPE STEAMSHIP CO., LTD., QUEBEC, QUE.
Lady of Gaspe James Boucher H. Mercier
GRAND MANAN STEAMSHIP CO., LIMITED, GRAND MANAN N.B.
Grand Manan J. A. Ingersoll J. C. McGray
GREAT LAKES AND ST. LAWRENCE TRANSPORTATION CO., CHICAGO, ILL.
A. D. Davidson C. Babb B. Hammond
A. M. Marshall T. B. Greenway O. T. Biddle
George C. Howe F. Hoffman J. R. Jones
H. G. Dalton F. C. Hector C. Crampton
J. S. Keefe D. Barry G. Squier
John Crerar C. Bennett W. Vollmer
John Lambert W. Rinn J. Gallardo
Robert Wallace J. A. Connelly Ole Larsen
S. N. Parent F. H. Johnson R. S. Mott
HALIFAX AND CANSO STEAMSHIP CO., LIMITED, HALIFAX, N.S.
Scotia James Schmeiser J. G. Clark
F. E. HALL AND CO., MONTREAL.
Byron Whitaker E. Tremblay A. Theriault
Carleton E. Groulx E. Scott
Clyde W. H. Ransom M. J. McFaul
Compton B. Bowen L. Smith
Robert R. Rhodes W. C. McLaren F. A. Collier
Sindbad J. C. McCarty J. A. Miller
HAMELIN AND BRUNELLE, CHAMPLAIN, QUE.
Jessie Bain E. Brunelle H. Hamelin
W. HANNA & CO., PORT CARLING, ONT.
Mink W. H. McCulley —————
Numinko J. J. McCulley S. W. Lambert
HOME STEAMSHIP CO., SYDNEY, N.S.
Eskasoni E. W. Hickey C. Dobbie
KEENAN TOWING CO., LIMITED, OWEN SOUND, ONT.
Keenan J. H. Rutherford W. Owens
KEYSTONE TRANSPORTATION CO., LIMITED, MONTREAL
Keybell J. J. Murray E. W. Sparling
Keynor Jas. Martin John Robertson
Keyport G. Bunting R. J. Muchmore
Keyvive John Mullen James Boak
Keywest ————— W. H. Jennison
KILKEEL, C. LIMITED, TORONTO
Kilkeel J. T. Elworthy

LEMCKE TUG CO., LIMITED, LIONSHEAD, ONT.
Henry Pedwell D. W. Spence Jas. McGill
MAGDALEN ISLAND STEAMSHIP CO., PICTOU, N.S.
Lady Sybil F. Ferguson H. Webster
MAGNETAWAN RIVER AND LAKE STEAMBOAT CO., BURKS FALLS, ONT.
Armour J. Mostner F. Dunn
Gemada W. W. Kennedy E. Goldthorpe
Gravenhurst S. Carswell M. Pritchard
Thessa W. Keitch C. Rooflack
Waiuta P. Lawson T. McPherson
MERCHANTS TRANSPORTATION CO., SYDNEY, N.S.
Weymouth W. E. LeBlanc Joseph McDonald
MARITIME STEAMSHIP CO., LIMITED, BLACKS HARBOR, N.B.
Connors Bros. E. H. Warnock G. Cowie
MATHEWS STEAMSHIP CO., TORONTO
Easton D. N. Laroche J. T. Myler
Edmonton H. Maitland J. G. Fisher
Masaba J. A. Smith W. Whipps
Yorkton J. Cavanaugh D. McKenzie
NIAGARA, ST. CATHARINES AND TORONTO NAVIGATION CO., LIMITED, ST. CATHARINES, ONT.
Dalhousie City J. W. Maddick J. H. Brown
Garden City G. Blanchard H. R. Welch
NIPISSING-PONTIAC STEAMBOAT CO., LISKEARD, ONT.
Aileen J. J. Ladouceur Chas. Wood
NORTHERN NAVIGATION CO., LIMITED, SARNIA, ONT.
City of Midland J. D. Montgomery John Osborne
Germanic F. G. Males S. Burgen
Hamonic A. L. Campbell Jas. Wilson
Huronic A. M. Wright John Smith
Ionic O. Wing A. E. Crosthwaite
Noric R. D. Foote S. Brisbin
NORTH SHORE STEAMSHIP CO., SYDNEY, N.S.
Aspy D. M. MacDonald J. S. Jackson
NORTH VANCOUVER FERRY CO., NORTH VANCOUVER, B.C.
Ferry No. 1 W. Fatke L. H. Clark
Ferry No. 2 R. Spicer D. Becker
Ferry No. 3 W. J. Spracklin J. W. Whitworth
NOVA SCOTIA STEEL AND COAL CO., LIMITED, NEW GLASGOW, N.S.
Wasis John Ritcey A. D. Cameron
ONTARIO CAR FERRY CO., LIMITED, MONTREAL.
Ontario No. 1 F. D. Forrest J. A. Nicoll
OTTAWA RIVER NAVIGATION CO., MONTREAL.
Duchess of York E. P. Shepherd F. Piche
Empress A. Blondin A. L. deMartigny
OTTAWA TRANSPORTATION CO., LIMITED, OTTAWA, ONT.
Dolphin Z. Lavigne D. Mornaville
Florence E. Lefebvre P. Torttier
G. A. Harris F. Pilon A. Madore
Glen Allan A. Clark G. Beaudet
Hall J. B. Barclay W. Drury
Ottawan A. Malette H. Lavigne
Sir Hector W. Mainville N. Belanger
PORT COLBORNE AND ST. LAWRENCE NAVIGATION CO., LIMITED, TORONTO.
Algonquin R. F. Johnson H. W. Fletcher
PRESCOTT AND OGDENSBURG CAR FERRY CO., LIMITED, PRESCOTT, ONT.
Miss Vandenberg A. Black W. J. Jenks
S. Delamey
PROGRESSIVE STEAMBOAT CO., LIMITED, VANCOUVER, B.C.
Harry S. H. Grauer A. Toren
Progressive L. Hagen G. Dixon
Pronative J. B. Johnson O. Mathiesen
Senator J. Walters C. Mowat
QUEBEC TRANSPORTATION AND FORWARDING CO., LIMITED, QUEBEC, QUE.
Florence V. Gendron O. Croteau
J. A. Hackett J. Thibault A. Legendre
M. A. Hackett M. Allison J. Blanchet
REVELSTOKE NAVIGATION CO., LIMITED, REVELSTOKE, B.C.
Revelstoke A. Forslund H. Colbeck
RICHMOND STEAMSHIP CO., SYDNEY, N.S.
Richmond W. H. Micheau R. Morrison
RIDEAU LAKES NAVIGATION CO., KINGSTON, ONT.
Rideau King Mm. Scott D. G. Donovan
Rideau Queen Ed. Fleming Thos. Hazlitt
ST LAWRENCE AND CHICAGO STEAM NAVIGATION CO., LIMITED, TORONTO.
E. B. Osler P. J. Shaw W. Robertson
G. R. Crowe C. E. Robinson W. Reid
Iroquois J. H. Hudson J. E. Readman
W. D. Matthews S. Hill W. Harwood
SEVERN RIVER AND LAKE COUCHICUNG NAVIGATION CO., LIMITED, ORILLIA, ONT.
Soncie T. W. Wood T. Marshall
SPARROW LAKE STEAMER LINE, SPARROW LAKE, ONT.
Glympe A. Stanton G. Stanton
Lakefield F. Stanton A. Lee
UNION STEAMSHIP CO., LIMITED, VANCOUVER, B.C.
Camosun A. E. Dickeson J. Brown
Capilano S. Nelson A. Johnstone
Cassiar G. Gaisford C. B. Smith
Cheakamus J. Cockle R. Wilson
Chelohsin J. F. Edwards H. Stacey
Comox J. Brown J. McKiernan
Coquitlam N. Gray J. D. McPhee
Cowichan C. Moody G. Whalen
Venture J. Park J. E. Noel
VALLEY STEAMSHIP CO., LIMITED, ANNAPOLIS ROYAL, N.S.
Granville C. W. Collins James McCullough
VICTORIA NAVIGATION CO., LIMITED, OTTAWA, ONT.
Victoria F. Elliott P. Belanger
VICTORIA STEAMSHIP CO., LIMITED, BADDECK, N.S.
Blue Hill D. Macrae J. H. Jones
WESTERN NAVIGATION CO., LIMITED, FORT WILLIAM, ONT.
Kaministiquia E. L. Stephens H. Young

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.

The Titanium Alloy Manufacturing Co., Niagara Falls, N.Y., has issued in sheet form 24 comparative sulphur prints, being a summary of prints shown in bulletins 1 to 5.

Canadian General Electric Co., Toronto, has issued the following bulletins:—A, 4190, Motor generator sets; A. 4185, Single phase motors; A. 4188, small direct current motors-motors.

Flannery Bolt Co., Pittsburgh, Pa., in "Staybolts, a Monthly Digest" for February, deals principally with the Tate flexible radial staybolts, recommending the sleeves LK and KK for button head type of crown stay.

Westinghouse Church Kerr & Co., 37 Wall St., New York, N.Y., have established a laboratory for testing concrete aggregates, waterproofing materials and for investigating paints and preservative coatings for steel and concrete.

Canadian Westinghouse Co., Ltd., Hamilton, Ont., has the following booklets, etc.:—Westinghouse Portable Meters for Alternating and Direct Current, circular 1104-9-13; Westinghouse Electric Fans, 1914; Westinghouse Ozonizer Sales Helps, the Electric Breakfast Set, Westinghouse Electric Curling Iron.

The Hart-Otis Car Co., Ltd., Montreal, has issued pamphlet 18, "The Yost Draft Gear," which it claims to be a friction gear of five times the capacity of the G Spring gear, at the same cost. The gear is fully illustrated and described under the headings of operation, compression, recoil, construction, strength, adaptability, service and efficiency.

Locomotive Superheater Co., 30 Church St., New York, N.Y., has issued a booklet on the use of highly superheated steam in marine practice, describing and illustrating the Schmidt fire tube superheater as installed in internally fired marine boilers, and giving a list of 881 vessels so equipped, the total horse power of their engines being 1,043,230, and the average h.p. per vessel 1,185.

Gold Car Heating and Lighting Co., 17 Battery Place, New York, N.Y., has issued a booklet, Gold's Electric Thermostatic Control of Steam Heating, which it describes as an economical method of controlling the steam, maintaining an equable temperature in every car throughout the train, lessening the parts and weight of the steam heating system, and cutting down the steam consumption in yards, at terminals, and in service.

Canadian Machinery Corporation, Galt, Ont., has issued a number of sheets 11 by 8½ in. for its loose leaf binder describing and illustrating No. 303, heavy moulder, 504 tenover single or double head, 76 in. portable radial girder drill, 36 in. heavy duty vertical drilling machine, 42 in. heavy car wheel lathe, 60 in. by 60 in. forge planer; extra heavy driving wheel lathe, heavy gate shear with turntable, 50 in. rotary planing machine, horizontal punches, all geared head lathe, and heavy duty double axle lathe.

Northern Engineering Works, Detroit, Mich., has issued its crane catalogue 26, illustrating electric traveling cranes, hand

power cranes, electric and pneumatic hoists, also overhead track systems, bucket handling cranes and railway cranes. This catalogue is condensed, but contains references to various bulletins which more fully explain the numerous designs.

The company's Canadian works are the Northern Crane Works, Ltd., Walkerville, Ont., from which point Canadian trade is supplied.

Northern Electric Co., Ltd., which was incorporated recently under the Dominion Companies Act, with office in Montreal, has taken over the business of Imperial Wire & Cable Co., Ltd., and the Northern Electric & Manufacturing Co., Ltd., and will continue to operate without change in management. The officers of the new company are:—E. F. Sise, President; Paul H. Sise, Vice President and General Manager; Clement Saye, Secretary, and G. W. Jones, Treasurer. The Northern Electric & Manufacturing Co.'s present factory will continue to be used as a factory and engineering office for telephone apparatus, and the new works being built on St. Patrick St. will be devoted principally to wire and cable products, it being the intention to sell the Imperial Wire & Cable Co.'s present buildings on St. James and Guy Streets. The general offices will be in the new building on St. Patrick St., and the staffs of the two old companies will be amalgamated there as soon as the building is finished, which will probably be in August.

Mechanical Engineering Co., Ltd., 129 Mill St., Montreal, has issued the following announcement:—"We desire to inform you that Frank Ditchfield, formerly General Superintendent of the Canadian Car & Foundry Co., Ltd., has become associated with us, and will direct the affairs of our consulting engineering department. Mr. Ditchfield was with the Pressed Steel Car Co., Pittsburgh, Pa., for eight years, successively, as Engineer of Construction, Assistant Chief Engineer, and General Superintendent, coming to Montreal in 1907 in the same capacity with the Dominion Car & Foundry Co., and after the formation of the Canadian Car & Foundry Co., was General Superintendent of its plants until 1911, when its business demanded large extensions at its Montreal and Amherst plants, as well as the erection of its new plant at Fort William, all of which work was designed and carried out by Mr. Ditchfield. Francis A. Jacobs will continue in charge of our furnace and general mechanical departments, and his wide practical experience as mechanical engineer in railroad and industrial shops, and as combustion expert pertaining to the use of gas, oil or direct coal fuel, will be at the service of our clients. So that in soliciting your patronage as mechanical and consulting engineers, we feel confident that we can satisfactorily handle such business as you may place in our care."

The Interurban Co. is applying to the Dominion Parliament for an act authorizing it to change its name to the Interurban Telephone Co., and to give it power to build, acquire and operate telephone and telegraph lines, railways and tramways outside the Dominion of Canada. This is the company which reports said might conceal electric railway plans inimical to the interests of the City of Toronto. The company's solicitors have informed the City Council that the company is a subsidiary of the Rio de Janeiro Tramway, Light and Power Co., and has "no connection whatever with any past, present or contemplated undertaking in Canada."

During January one employe was killed and three injured in the course of their employment in electric railway service in Canada.

Transportation Conventions in 1914.

April 21.—American Association of Freight Agents, Houston, Tex.

May —.—Association of Railway Claim Agents, St. Paul, Minn.

May 5-8.—Air Brake Association, Detroit, Mich.

May 13.—Freight Claim Association, Galveston, Texas.

May 18-20.—Railway Storekeepers' Association, Washington, D.C.

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 21-22.—American Association of Railroad Superintendents, St. Louis, Mo.

May 26-29.—Master Boiler Makers' Association, Philadelphia, Pa.

May 28.—Association of American Railway Accounting Officers, Atlantic City, N.J.

June 10-12.—Master Car Builders' Association, Atlantic City, N.J.

June 15-17.—American Railway Master Mechanics' Association, Atlantic City, N.J.

June 16.—Train Despatchers' Association of America, Jacksonville, Fla.

June 16-19.—American Society of Mechanical Engineers, St. Paul and Minneapolis, Minn.

June 24.—Association of American Railway Accounting Officers, Minneapolis, Minn.

June 30-July 4.—American Society for Testing Materials, Atlantic City, N.J.

July 14-17.—International Railway General Foremen's Association, Chicago, Ill.

July 20-22.—American Railway Tool Foremen's Association, Chicago, Ill.

Aug. 18.—International Railroad Blacksmiths' Association, Lima, Ohio.

Sept. 1-4.—American Boiler Manufacturers' Association, New York.

Sept. 8-10.—Roadmasters and Maintenance of Way Association, Chicago, Ill.

Sept. 8-11.—Master Car and Locomotive Painters' Association of the United States and Canada, Reading, Mass.

Oct. 20-22.—American Railway Bridge and Building Association, Los Angeles, Cal.

Nov. 17-19.—Maintenance of Way and Master Painters' Association of the United States and Canada, Detroit, Mich.

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., 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, 45 John St., Halifax, N.S.

Western Canada Railway Club, W. H. Rosevear, 25½ Princess St., Winnipeg. Meetings at Winnipeg 2nd Monday each month, except June, July and August.

Western Canada Railway Club, W. H. Rosevear, 25½ Princess St., Winnipeg. Meetings at Winnipeg 2nd Monday each month, except June, July and August.

Western Canada Railway Club, W. H. Rosevear, 25½ Princess St., Winnipeg. Meetings at Winnipeg 2nd Monday each month, except June, July and August.

Western Canada Railway Club, W. H. Rosevear, 25½ Princess St., Winnipeg. Meetings at Winnipeg 2nd Monday each month, except June, July and August.

Western Canada Railway Club, W. H. Rosevear, 25½ Princess St., Winnipeg. Meetings at Winnipeg 2nd Monday each month, except June, July and August.

Western Canada Railway Club, W. H. Rosevear, 25½ Princess St., Winnipeg. Meetings at Winnipeg 2nd Monday each month, except June, July and August.

Western Canada Railway Club, W. H. Rosevear, 25½ Princess St., Winnipeg. Meetings at Winnipeg 2nd Monday each month, except June, July and August.

Western Canada Railway Club, W. H. Rosevear, 25½ Princess St., Winnipeg. Meetings at Winnipeg 2nd Monday each month, except June, July and August.

Western Canada Railway Club, W. H. Rosevear, 25½ Princess St., Winnipeg. Meetings at Winnipeg 2nd Monday each month, except June, July and August.

Western Canada Railway Club, W. H. Rosevear, 25½ Princess St., Winnipeg. Meetings at Winnipeg 2nd Monday each month, except June, July and August.

Western Canada Railway Club, W. H. Rosevear, 25½ Princess St., Winnipeg. Meetings at Winnipeg 2nd Monday each month, except June, July and August.

Western Canada Railway Club, W. H. Rosevear, 25½ Princess St., Winnipeg. Meetings at Winnipeg 2nd Monday each month, except June, July and August.

Western Canada Railway Club, W. H. Rosevear, 25½ Princess St., Winnipeg. Meetings at Winnipeg 2nd Monday each month, except June, July and August.

A conference of the secretaries of the 14 branches of the Y.M.C.A., connected with the G.T.R., was held at Montreal, recently. Among the special subjects discussed was the "Safety First" movement, which was introduced by G. Bradshaw, Safety Engineer, G.T.R.

Iceland is, it is said, to have its first railway, some 60 miles, built.