

Canadian Railway and Marine World

May, 1916.

Methods Adopted in the Construction of Rogers Pass Tunnel.

By J. G. Sullivan, M. Can. Soc. C. E., Chief Engineer, Western Lines, Canadian Pacific Ry.

The Rogers Pass tunnel is in the Selkirk Mountains of British Columbia. It is double tracked, five miles long, and as shown on figs. 1 and 2, lowers the summit of the former line by 552 ft. It also

so rapidly that it was evident that if the rate of increase continued, the road would have to be double tracked. A very prominent consulting engineer, who reported favorably on the proposal to con-

three times as fast as any long tunnel had been driven on this continent, and he had, in a superficial way, an idea of the methods employed. In a circular letter sent to contractors April 8, 1913, the fol-

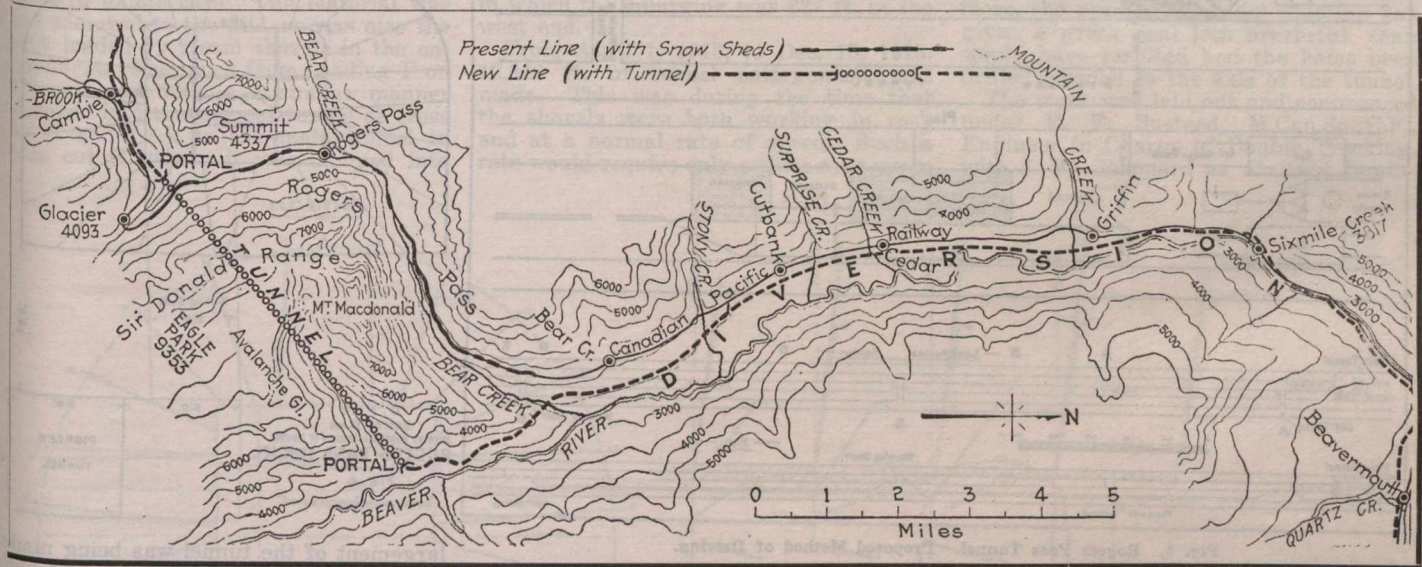


Fig. 1. Rogers Pass Tunnel. Map of Old and New Lines.

shortens the line by 4.3 miles, eliminates some 2,300 or 2,400 degrees of curvature and avoids the expense and danger of maintaining and operating 4.5 miles of snow sheds.

struct the tunnel, made a further suggestion that it might be necessary to double track the present line over the mountain and gauntlet the heavy bridges in order to handle the traffic during the

lowing statement appeared:—"The necessity for this tunnel is so great and the expenditure so large that it would be worth considerable money to this company to have the tunnel completed as

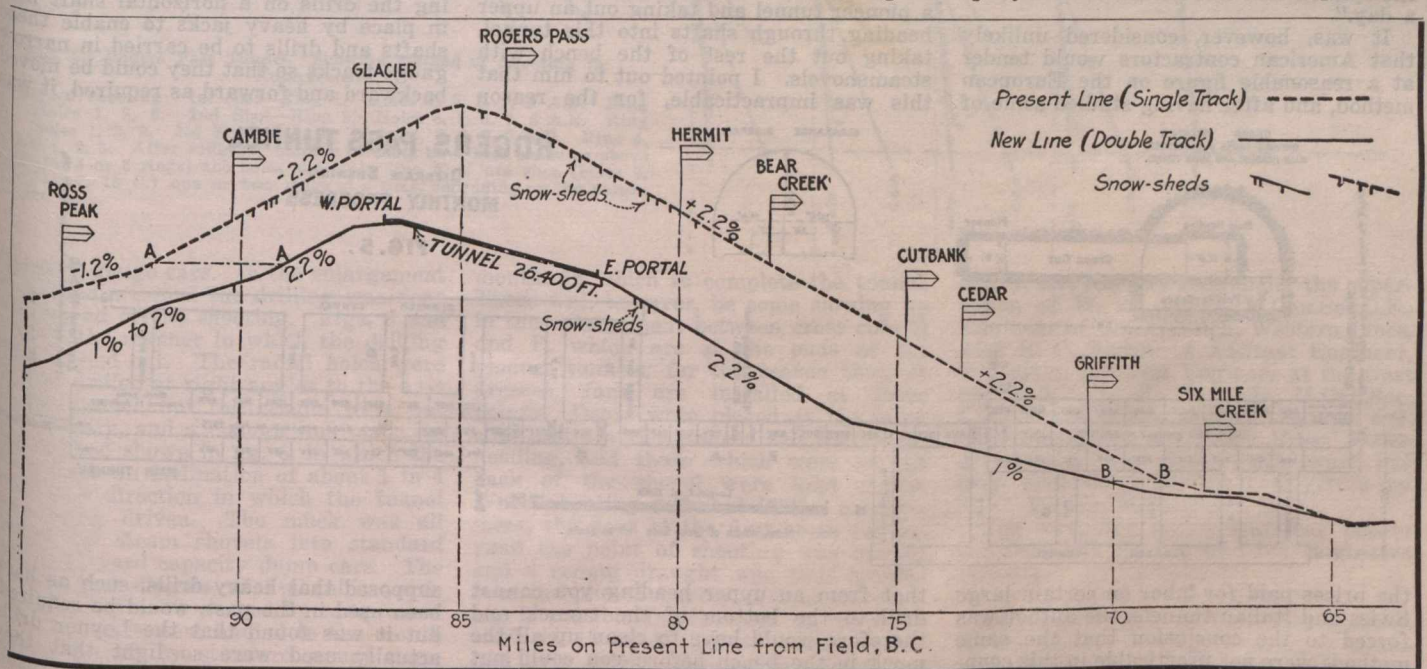


Fig. 2. Rogers Pass Tunnel. Profile of Old and New Lines.

In order that the plan adopted in the construction of this tunnel may be properly understood and appreciated, it is perhaps advisable to go somewhat into the history of the case. During the period from 1910 to 1913, C.P.R. traffic increased

period of construction. It can be readily understood, therefore, that the length of time required to complete the work became a matter of anxiety to the company. The author was aware that tunnels in Europe had been driven at a rate two or

soon as possible. Therefore, everything else being equal, the party who will guarantee completion in the shortest time will be the one who will receive the work. I would be glad if you would give us prices on the European method of tunnelling,

which is to drive a very small heading and take out the bench working from several headings into this small drift. Tunnels in Europe have been driven by this method at two or three times the speed that any tunnel was ever driven in the United States or Canada, and I would like to be able to place before the management figures for doing this work according to this method. I would be glad if you would state in your proposal the amount per day that you would be willing

have been driven through the Alps. I have given the matter considerable study since and have come to the conclusion that the European method of driving a small lower heading and stoping out the remainder of the tunnel would be too expensive on this side on account of the difference in the cost of labor. I have been thinking out and studying methods that would tend to expedite this work. I first thought of driving a heading in the centre of the tunnel, about 9 ft. x 12 ft.,

have the proper credit for first suggesting a pioneer tunnel."

The sheets 1 and 2 referred to in this report are the accompanying figs. 3 and 4. These figures will serve to illustrate the methods which were adopted for the construction of the tunnel. A pioneer tunnel was driven entirely outside the regular section of the tunnel, and a centre heading was driven along the centre of the main tunnel. The functions of the pioneer tunnel were to provide a means of transporting the material from the heading to a point back of where the en-

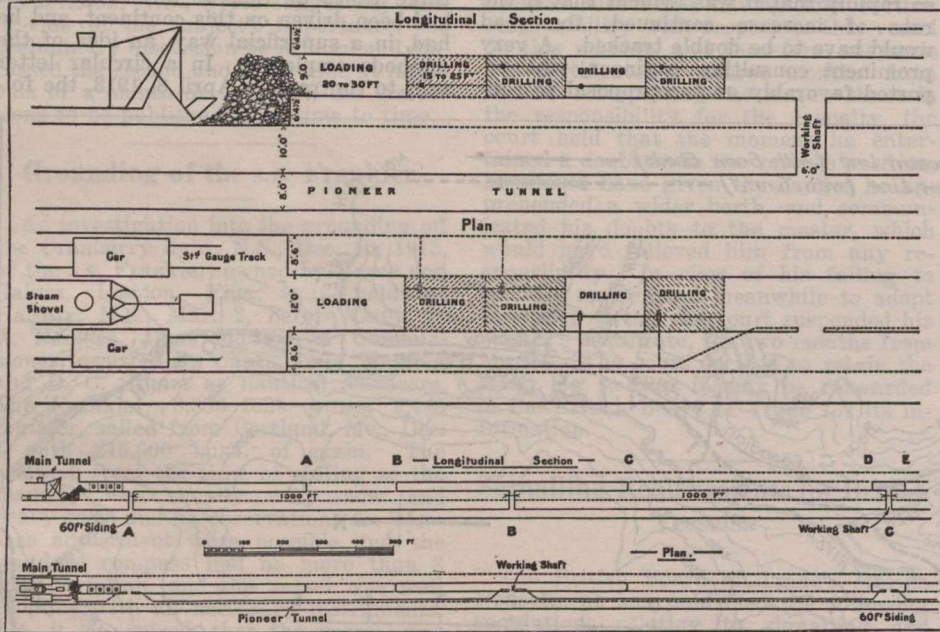


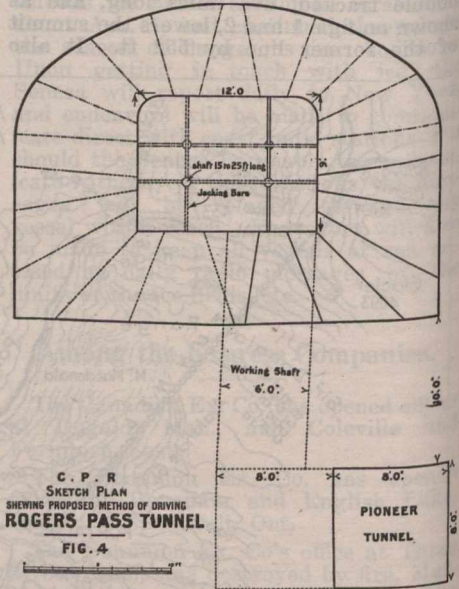
Fig. 3. Rogers Pass Tunnel. Proposed Method of Driving.

to have inserted in a contract to be paid as a bonus for time saved over the agreed time, the same amount to be exacted as a penalty for the time lost, being the time between the fixed day of completion and the actual date of completion. We are of the opinion that this should be about \$750 a day."

It was, however, considered unlikely that American contractors would tender at a reasonable figure on the European method, and after having studied some of

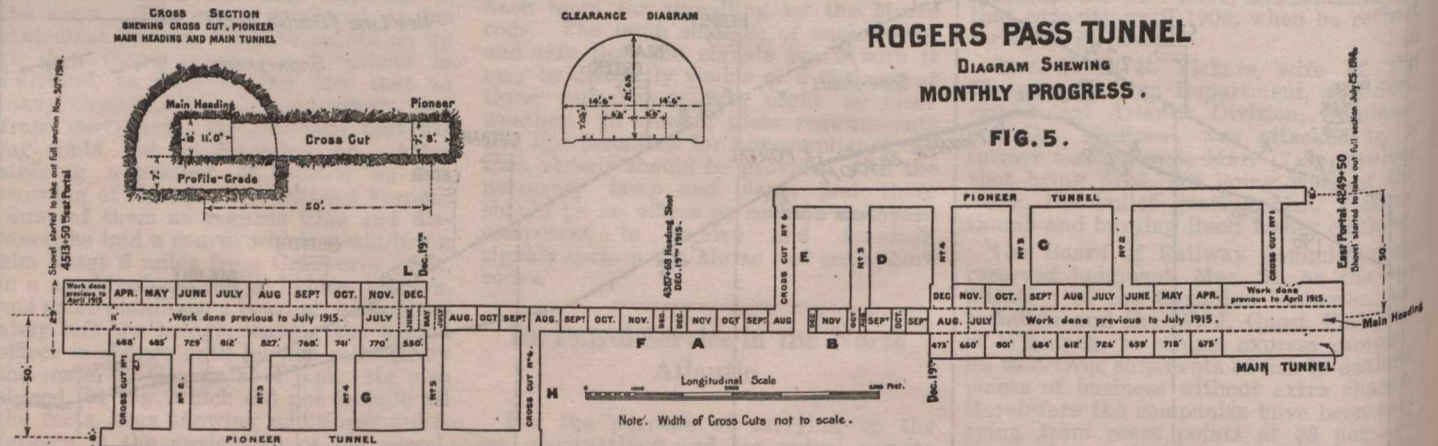
as is shown on sheet 1, and keeping this heading close to the bench, carrying the air pipes over the muck in front of the steam shovels. I pointed out to him that I believe that this method in rock that will stand, is better than an upper heading. A. C. Dennis, however, suggested driving a pioneer tunnel and taking out an upper heading through shafts into this tunnel, taking out the rest of the bench with steamshovels. I pointed out to him that this was impracticable, for the reason

largement of the tunnel was being made, and to provide for the carrying of high pressure air pipes, water pipes, ventilating suction pipes, etc. In other words, to provide a means whereby the "shooting" at any one point in the tunnel would not interfere with operations at other points. In regard to the idea of carrying the drills on a horizontal shaft held in place by heavy jacks to enable these shafts and drills to be carried in narrow gauge tracks so that they could be moved backward and forward as required, it was



C. P. R. SKETCH PLAN SHOWING PROPOSED METHOD OF DRIVING ROGERS PASS TUNNEL.

FIG. 4.



ROGERS PASS TUNNEL

DIAGRAM SHOWING MONTHLY PROGRESS.

FIG. 5.

the prices paid for labor on certain large Swiss and Italian tunnels, the author was forced to the conclusion that the same methods were not practicable in this country, where labor is so expensive. On Mar. 13, 1913, he reported his ideas on the subject to the company in the following terms:—"Referring to the progress that we hope to make in the driving of Rogers Pass tunnel. I advised you in my report of Oct. 22 regarding the relative speeds of driving tunnels on the American continent compared with those that have

that from an upper heading you cannot drill to the bottom of the tunnel, and therefore would have to clean up all the muck in the bench before you could put in a round of breast holes to break more rock. I have now made plans showing a combination of my ideas and Mr. Dennis', which I think is well worth studying. The plan is to drive a small working pioneer tunnel, 8 x 8 ft. underneath the main tunnel. I am sending you this for your information, and further, if this method should be adopted, that Mr. Dennis may

supposed that heavy drills, such as have been used in the past, would be required, but it was found that the Leyner drills actually used were so light that they could be operated by one man. The result has been that all drilling in the enlargement has been done from vertical shafts as shown in figs. 6 and 7.

Fig. 5 is a progress diagram, and shows the condition of the work to Dec. 19, 1915. The pioneer tunnel at the east end was located 50 ft. to the north of the centre line of the main tunnel. The mode of

operation was as follows: drilling in the small headings was done in the usual manner, using in general Leyner drills, making an advance of 6 or 7 ft. for each round of holes. The muck was shovelled by hand from steel plates into "half yard" cars and hauled back, either by a mule or small compressed air locomotive. The latter was used entirely when the haul had reached a considerable distance. The muck from the headings A and B on the progress diagram was carried out through the cross cuts E and D respectively into the pioneer tunnel, where it was carried back to cross cut C, and then out on a trestle over the standard gauge tracks through the main tunnel, and dumped into standard gauge cars. The material was then removed to the fills, as was also the muck loaded by steam shovels in the enlargement. The muck from heading F on the west end was in a similar manner conveyed into the pioneer tunnel at cross cut H and back to the main tunnel in cross cut G, where it was dumped into

which would require immediate timbering. As there was some 1,660 ft. of such ground, the time limit of the contract was extended into June, 1917.

The work completed up to Dec. 19, 1915, was as follows:—19,610 ft. of pioneer tunnel, 24,612 ft. of centre heading, 1,660 ft. of earth tunnel, and 14,342 ft. of tunnel enlargement in rock. At the same date there remained to be driven:—288 ft. of centre heading, 10,398 ft. of tunnel enlargement. The best progress made in driving the pioneer tunnel heading was in Jan., 1915, when 932 ft. in the west heading were completed. The best record for a week in the enlargement was 267 ft., and for a month was for Aug., 1915, in which the enlarging was 827 ft. in the west end.

From April 1, 1915, to Dec. 15, 1915, 12,346 ft. of tunnel enlargement was made. This was during the time that the shovels were both working in rock and at a normal rate of speed. Such a rate would require only a little over seven

up the muck, thus making an advance of from 30 to 35 ft. The shooting was usually continued until the tunnel became so full of muck that no more could be done. The largest amount shot at one time was 84 ft. in 11 hours, which was the record for Nov. 20, 1915.

All expectations as to speed in the execution of the work have been more than realized. For rock tunnelling where the rock is of sufficient hardness to stand until the mucking has been completed, the method described can be most successfully worked, and a speed of three miles a year can be easily made at a much less cost than tunnels driven at the same speed by the European method. Furthermore, the practice of radial shooting has given a great deal less overbreak than would have resulted had the holes been drilled parallel to the axis of the tunnel.

The work was laid out and commenced under F. F. Busted, M.Can.Soc.C.E., Engineer in Charge of Double Tracking, with J. W. Sheppard as Assitant Engin-

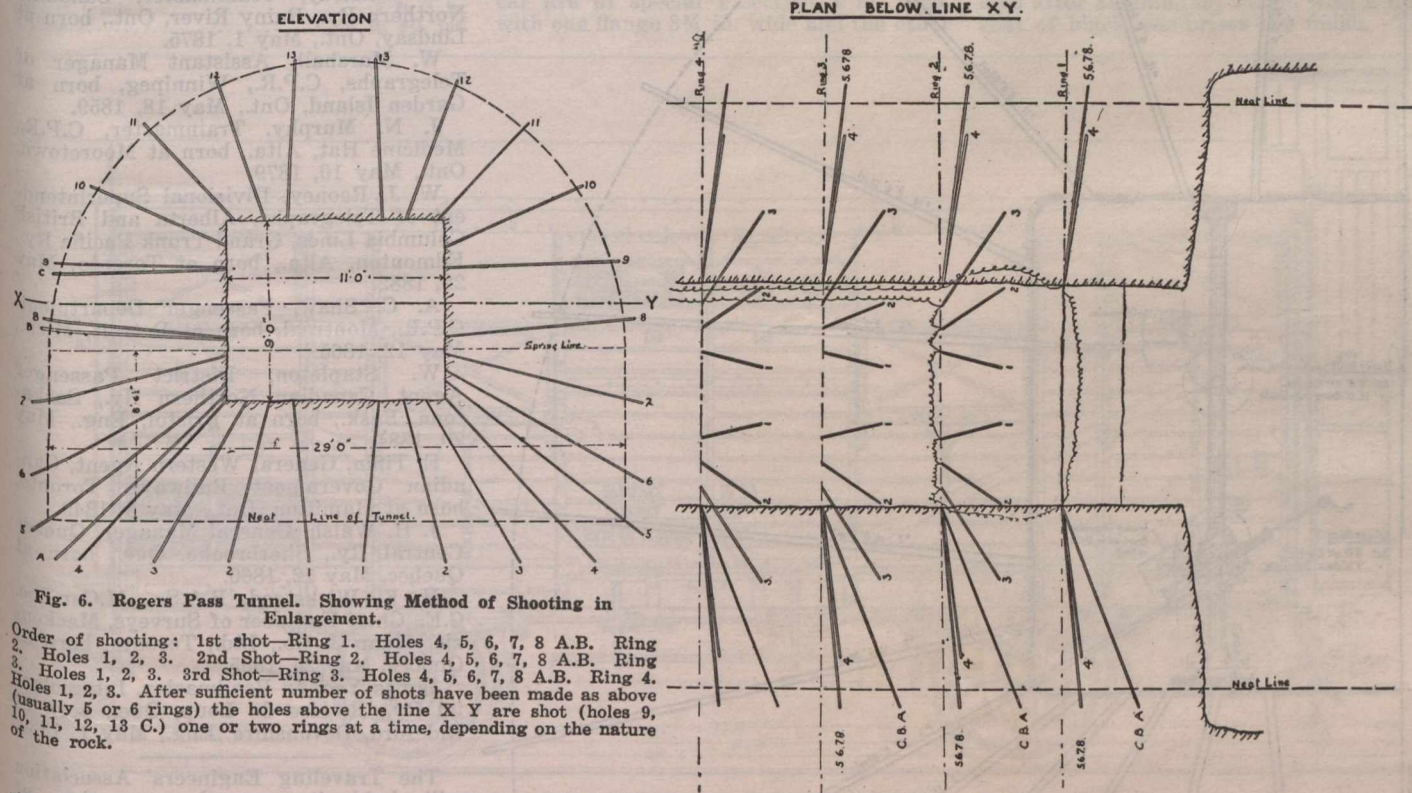


Fig. 6. Rogers Pass Tunnel. Showing Method of Shooting in Enlargement.

Order of shooting: 1st shot—Ring 1. Holes 4, 5, 6, 7, 8 A.B. Ring 2. Holes 1, 2, 3. 2nd Shot—Ring 2. Holes 4, 5, 6, 7, 8 A.B. Ring 3. Holes 1, 2, 3. 3rd Shot—Ring 3. Holes 4, 5, 6, 7, 8 A.B. Ring 4. Holes 1, 2, 3. After sufficient number of shots have been made as above (usually 5 or 6 rings) the holes above the line X Y are shot (holes 9, 10, 11, 12, 13 C.) one or two rings at a time, depending on the nature of the rock.

standard gauge cars. In the enlargement of the main tunnel the drilling was done well ahead of the shooting. Figs. 6 and 7 show the manner in which the drilling was carried out. The radial holes were at first drilled at right angles to the axis of the tunnel, but the results were not satisfactory, and a change was made, to the method shown in fig. 6, in which the holes have an inclination of about 1 in 4 from the direction in which the tunnel was being driven. The muck was all loaded by steam shovels into standard gauge 12 yard capacity dump cars. The shovels had dippers of 1½ cubic yards capacity and were worked by compressed air. The cars were hauled to the mouth of the tunnel by standard gauge compressed air locomotives and taken from there to the dumps by standard steam locomotives.

The contract for this work was let on July 1, 1913. The limit of time for completion was 3½ years, which would end on Jan. 1, 1917. There was an allowance in extension of time of one day for every ten feet of soft ground encountered,

months in which to complete the tunnel. There will, however, be some slowing up in the enlargement between cross cuts H and F, which are at the ends of the pioneer tunnels, for the reason that, at present, fans are installed at these points. Doors were placed at the cross cuts between the pioneer and the centre heading, and those which were at the back of the shovel were kept closed. When shooting occurred in the enlargement, the door at the first cross cut beyond the point of shooting was opened and a strong draught was thus created over the pile of freshly shot muck, making it possible for the men to return to work in 10 or 15 minutes after a shot had been fired. The methods employed in shooting in the enlargement were as follows:—One round of holes was shot at a time, the holes in the bottom of the tunnel being shot in advance of the holes on the sides or on top (see fig. 6). In some cases the top holes were not shot until all the bottom holes were finished. Usually 6 or 7 rounds of holes were shot before the steam shovel began to take

eer. It has recently been under the supervision of W. A. James, M.Can.Soc.C.E., Engineer of Construction, Western Lines, with H. C. Barber as Assitant Engineer, T. Martin, Resident Engineer at the west end and J. R. C. Macredie, M.Can.Soc.C.E., Resident Engineer at the east end. The contractors are Foley Bros., Welch & Stewart. The construction work has been supervised for the contractors by A. C. Dennis, M.Can.Soc.C.E.

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

Canadian Society of Civil Engineers.—

At the regular monthly meeting in Montreal, April 13, John Murphy, chairman of the Ottawa Branch, gave an informal talk, illustrated by views, describing his trip over the Panama Canal, and referring particularly to the difficulties of earth slides in the Culebra Cut. Lt.-Col. F. A. Snyder described an original diagram for making military scales for interpolation of contours and reduction and enlargement of maps.

Birthdays of Transportation Men in May.

Many happy returns of the day to:—
 Jas. Bain, General Superintendent, Halifax & South Western Ry., Bridgewater, N.S., born at Pictou, N.S., May 24, 1860.

W. R. Baker, Secretary, and Assistant to President, C.P.R., Montreal, born at York, Eng., May 25, 1852.

B. T. Chappell, Superintendent, Pacific Division, Canadian Northern Ry., Vancouver, B.C., born at Charlottetown, P.E.I., May 1, 1878.

W. G. Connolly, City Passenger and Ticket Agent, C.P.R., Vancouver, B.C., born at McAdam Jct., N.B., May 28, 1889.

M. Donaldson, M.Can.Soc.C.E., Vice

M. A. Fullington, A.M.Can.Soc.C.E., Superintendent, District 3, Eastern Division, C.P.R., Montreal, born at Johnson, Vt., May 12, 1880.

Edward Garrett, Superintendent, Park and River Division, International Ry., Niagara Falls, Ont., born at Cataract, Ont., May 24, 1868.

G. E. Graham, General Manager, Dominion Atlantic Ry., Kentville, N.S., born May, 1870.

J. Graham, Roadmaster, C.P.R., Nelson, B.C., born in Ontario, May 22, 1870.

G. H. Hedge, General Master Mechanic, Western Lines, Canadian Northern Ry., Winnipeg, born at Neath, Wales, May 26, 1865.

W. T. Huggan, Divisional Accountant and District Passenger Agent, Prince Edward Island Ry., Charlottetown, P.E.I., born at Halifax, N.S., May 24, 1851.

J. Irwin, Superintendent, Toronto District, Ontario Division, Canadian Northern Ry., born at Clinton, Ont., May 28, 1866.

S. McElroy, Trainmaster, Canadian Northern Ry., Rainy River, Ont., born at Lindsay, Ont., May 1, 1875.

W. Marshall, Assistant Manager of Telegraphs, C.P.R., Winnipeg, born at Garden Island, Ont., May 18, 1859.

J. N. Murphy, Trainmaster, C.P.R., Medicine Hat, Alta., born at Mooretown, Ont., May 10, 1879.

W. J. Rooney, Divisional Superintendent of Telegraphs, Alberta and British Columbia Lines, Grand Trunk Pacific Ry., Edmonton, Alta., born at Toronto, May 22, 1882.

A. C. Shaw, Passenger Department, C.P.R., Montreal, born at Detroit, Mich., May 12, 1865.

W. Stapleton, District Passenger Agent, Canadian Northern Ry., Saskatoon, Sask., born at Bristol, Eng., May 20, 1884.

E. Tiffin, General Western Agent, Canadian Government Railways, Toronto, born at Hamilton, Ont., May 5, 1849.

J. H. Walsh, General Manager, Quebec Central Ry., Sherbrooke, Que., born at Quebec, May 12, 1860.

H. K. Wicksteed, B.A.Sc., M.Can.Soc.C.E., Chief Engineer of Surveys, Mackenzie, Mann & Co., Ltd., Toronto, born at Quebec, May 25, 1855.

James Yeo, ex-Roadmaster, Intercolonial Ry., Riviere du Loup, Que., born at Bideford, Devonshire, Eng., May 1, 1830.

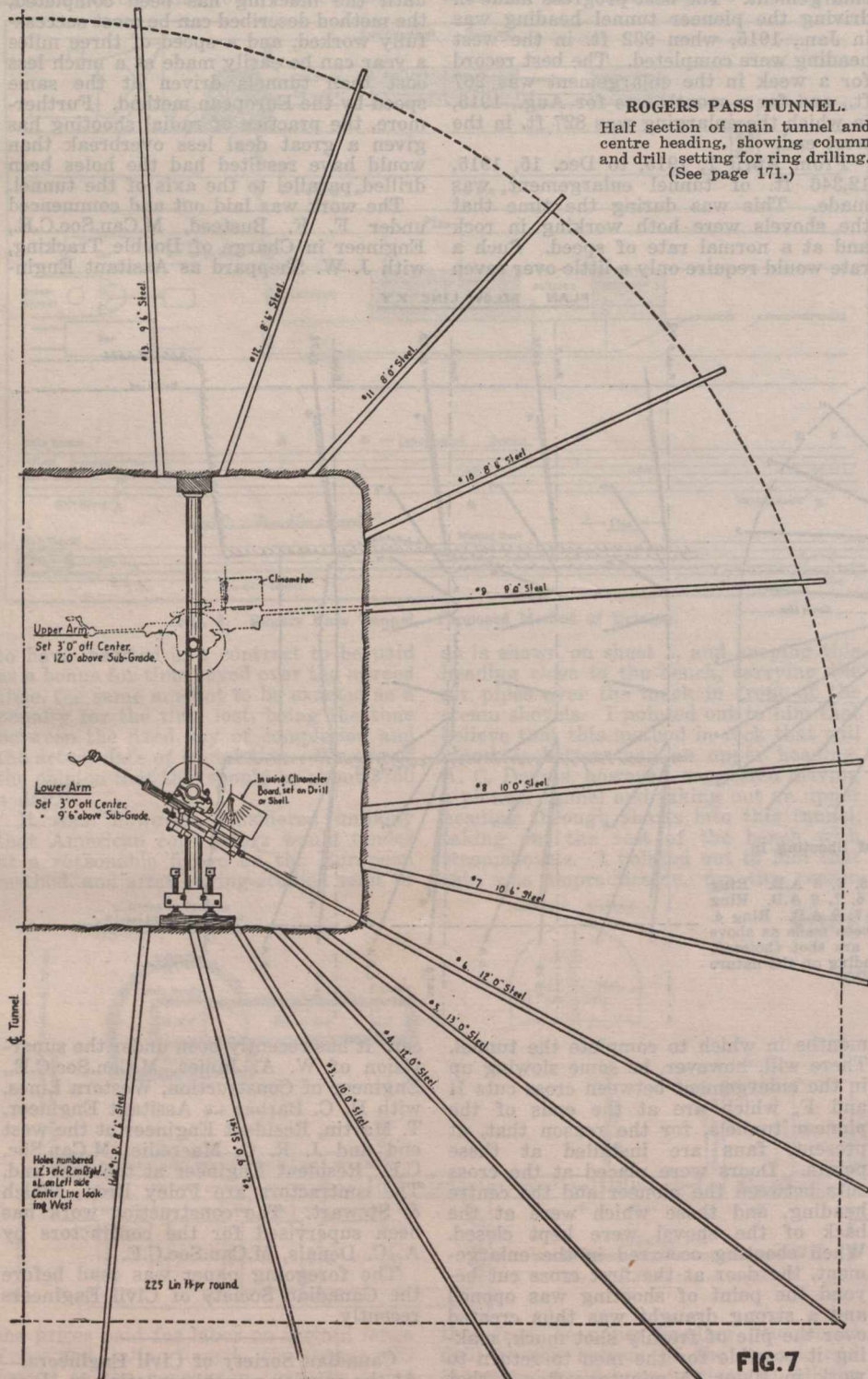


FIG. 7

B. A. Bourgeois, Assistant to Comptroller, and Treasurer, Canadian Government Railways, Moncton, N.B., born there May 24, 1869.

G. S. Cantlie, ex-General Superintendent, Car Service, C.P.R., Montreal, now in military service with Canadian Overseas Forces, born at Montreal, May 2, 1867.

President and General Manager, Grand Trunk Pacific Ry., Winnipeg, born near Edinburgh, Scotland, May 1, 1851.

A. E. Duff, ex-District Passenger Agent, G.T.R., Toronto, now of Winnipeg, born at Sherbrooke, Que., May 1, 1872.

G. C. Dunn, Division Engineer, Grand Trunk Pacific Ry., Winnipeg, born at Quebec, May 13, 1862.

The Traveling Engineers' Association will hold its annual convention at Chicago, Ill., Sept 5 to 8, when discussions will take place on the following subjects: the effect of mechanical firing and lubricating of locomotives on the cost of operation; advantages of superheater brick arches and other modern appliances on large locomotives especially those of the Mallet type; prevention of dense black smoke and its relation to the cost of fuel and locomotive repairs; make up and handling of modern freight trains on level and steep grades to avoid damage to draft rigging; and assignment of power from standpoints of efficient service and economy in fuel and maintenance. W. O. Thompson, N.Y.C.R. Carshops, East Buffalo, N.Y., is Secretary.

British Railway War Traffic.—Fifteen thousand special trains have been run over the London & South Western Ry. during the past year in connection with movements of troops. This was independent of the large number of trains for soldiers on leave, many trains run in connection with troop movements, and 2,500 ambulance trains.

Freight Cars for Paris, Lyons and Mediterranean Railway.

The Paris, Lyons & Mediterranean Ry. operates more than 6,000 miles of line, extending from Paris through Lyons, Marseilles and Monte Carlo to Ventimille on the Italian border, with a branch line running east from Macon to the Swiss frontier, making a direct route to Geneva. The National Steel Car Co., Ltd., Hamilton, Ont., has an order for 4,000 cars for this line and which represent a standard design of car as employed in the past for general freight traffic, yet being of a type especially adapted for military purposes, having a registered capacity of either 40 men or 18 horses in this service. The cars are of 20 tons capacity, weighing approximately 25,000 lbs. when empty, with the following general dimensions:

Length over buffers.....	28 ft. 6 ins.
Length over end sills.....	23 ft. 10 ins.
Length inside.....	23 ft. 7½ ins.
Width over side sheathing.....	8 ft. 9½ ins.
Width inside.....	8 ft. 7 ins.
Height over body roof.....	12 ft. 2 ins.
Height inside.....	8 ft. 1 in.
Gauge.....	4 ft. 8½ ins.

pulling strains. A centre draw hook is connected up to the ends of the combination draft and buffing springs through suitable castings. The whole of the underframe is covered with flooring 1 9/16 in. thick by approximately 8½ in. width of face.

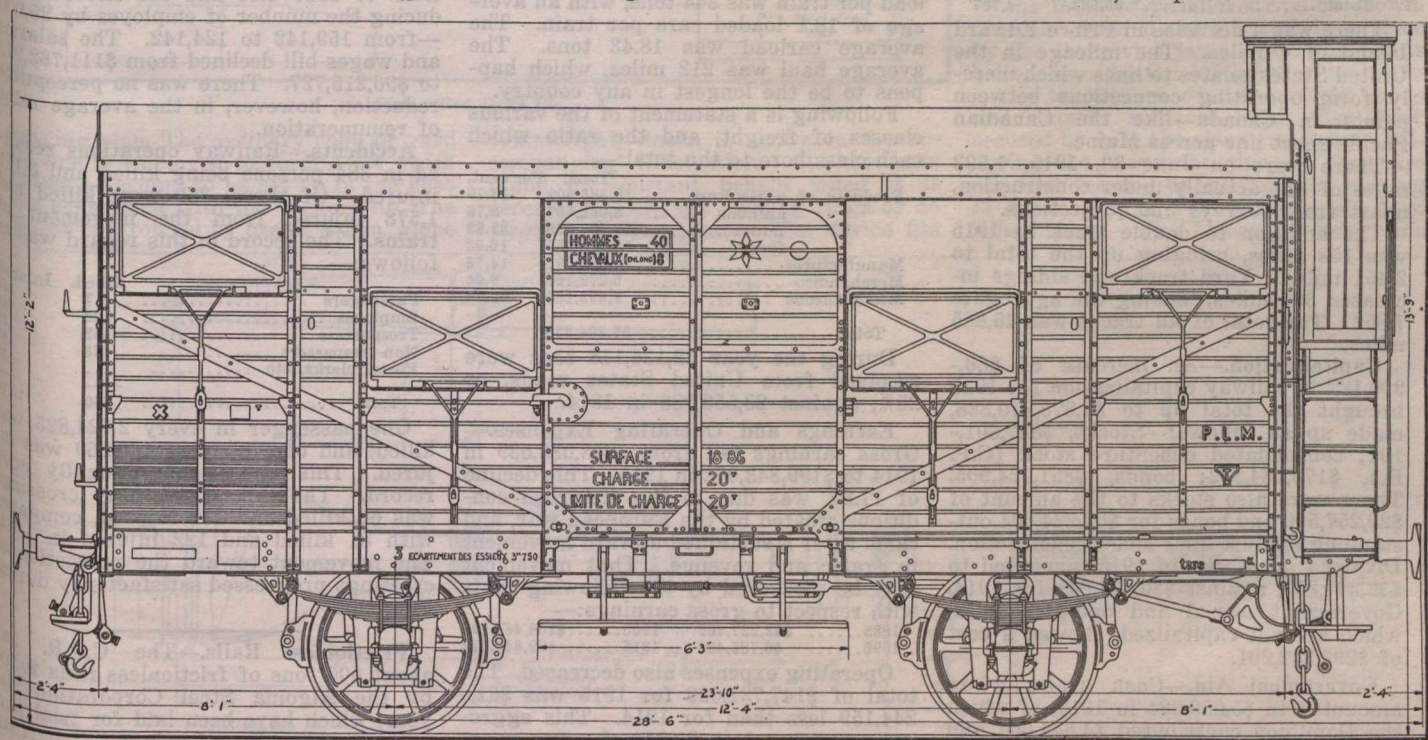
The superstructure embodies the use of six side post tees, 4 x 4 x 5/16 in., to 3/8 in., each side and two door post angles 3 x 3 x 3/8 in. The lower ends of these posts are rivetted to steel strap brackets projecting from the pedestal sills.

The upper ends are tied by side plate of 2½ x 1¾ x 5/16 in. angle, which is reinforced above the door opening by a plate 6 in. wide and 5/16 in. thick. The side posts are also tied by a diagonal steel strap brace 3 in. wide x 5/16 in. thick, extending below the shutter openings from the side post at end to the door post. The two end posts at each end of car are of special I section 4 in. high, with one flange 3¾ in. wide and the other

ing 4 in. beyond the side sheathing.

The brake equipment is hand operated and of high capacity screw actuated type, on account of the fact that in train operation employes are only stationed on a few cars, which have to do all the braking for the train. A cabin, projecting 18 in. above the body roof and approximately 27½ in. beyond the end sheathing is located at one end of the car to receive the brake wheel, same being connected up to a shaft through gearing and delivering a braking force equivalent to 163% of the loaded weight of car. Steps are provided leading up to a door on each side. Windows are located on all four sides. There are two hinged seats inside, fitted with counter weights to keep them in a upright position when not in use.

All structural steel parts receive one coat of red lead on contact surfaces when assembling and one general coat of red lead after assembling, which, with a final coat of black, comprises the finish. The



Paris, Lyons & Mediterranean Railway Freight Car.

The general construction throughout is the usual composite type employed on the European continent and embodies the use of 4 wheels forming a rigid wheel base of 12 1-3 ft. The underframe is composed of a set of strong side sills and end sills, being firmly connected at the corners, forming a stiff panel frame, which sustains the lading and buffing shocks as a unit. The end sills and pedestal sills are of 10 in. rolled steel channels weighing 21.8 lbs. a foot; the four pedestal cross ties are only 7 in. deep, weighing 12.25 lbs. a foot. A single centre sill extends from crosstie to crosstie and is continued to the end sill by two pairs of 2 3/8 x 2 3/8 x 5/16 in. rolled steel angles, to which the draft rigging is connected. The upper pair of angles are rivetted in place, while the lower pair are bolted, in order to be removable to allow for the proper replacement of the semi-elliptic draft springs, which travel between the upper and lower pairs of angles, allowing the springs to function as a buffing element as well as taking

flange 1¾ in. wide, all being tied at the top by a rolled steel end plate 2½ x 1¾ x 5/16 in., also by two diagonal steel strap braces 3 in. wide x 5/16 in. thick, the ends of which are connected to the end side post, through the angles, which are rivetted to the back of same, extending from top of end sill to end plate. There are 6 steel carlines of angle section, to which wood furrings are bolted. These are supplemented by 9 wooden carlines and covered with a layer of white pine boards, over which is spread a layer of canvas. The sides and ends are sheathed with yellow pine and the flooring throughout is oak for half the cars and yellow pine for the remainder. Four shutter openings are provided in each side of the car, size 3½ ft. x 21 in. high. The side doors are designed to roll on trucks of angle iron section, whereas the shutters slide up and down between guides on the side posts. The shutter and door openings are protected at the top by a 3/32 in. pressed steel plate running the full length of side and project-

brake and running gear and all detachable metallic parts receive two coats of black paint. The entire surface of woodwork, inside and outside, receives one coat of red oxide of iron before assembling, another coat of same after assembling and final finishing coat of red, all lettering and stencilling being in white. Roof canvas is soaked in linseed oil, then applied to roof, and when dry it receives two coats of black paint.

A Maine Railway Story.—One of Canadian Railway and Marine World's esteemed subscribers, a well known railway civil engineer, has sent in the following story which he heard in Maine recently. When a certain railway was about to build a branch line to the north part of the state, it solicited bonuses from farmers along the line in the shape of right of way. One enthusiastic farmer said that he would either grade a mile of the line or give \$1,000. The railway accepted the money.

Railway Statistics for Year Ended June 30, 1915.

The following summary of Canadian railway statistics for the year ended June 30, 1915, has been prepared by the Comptroller of Railway Statistics, J. L. Payne:

Mileage.—An addition of 4,787 miles was made for the year. This brought the total up to 35,582 miles. By 10 year periods, railway mileage has grown as follows:—

1865	2,240	1895	15,977
1875	4,804	1905	20,487
1885	10,773	1915	35,582

By provinces, the railway mileage for 1915, with the increases for the year, is shown in the following statement:—

	Miles.	Increase.
Nova Scotia	1,367	2
Prince Edward Island.....	275	..
New Brunswick	1,962	123
Quebec	4,677	634
Ontario	10,703	1,448
Manitoba	4,898	422
Saskatchewan	5,327	238
Alberta	3,174	629
British Columbia	3,000	1,122
Yukon	102	..
In the United States.....	398	173
Total	35,582	4,787

There was a decrease in Prince Edward Island of 4 miles. The mileage in the United States relates to lines which merely form operating connections between points in Canada—like the Canadian Pacific short line across Maine.

There were on June 30, 1915, 1,593 miles of line actually under construction, apart from surveys and projections.

The addition to double track in 1915 was 158 miles, bringing up the total to 2,451 miles. Yard track and sidings increased 335 miles, making the aggregate 7,852. The total of all tracks was 45,885 miles.

Capitalization.—An increase of \$66,990,127 in railway capitalization for 1915 brought the total up to \$1,875,810,888, made up as follows:—Stocks, \$847,801,101; consolidated debenture stock (C.P.R.), \$176,284,882; bonds, \$851,724,905. There were also stocks to the amount of \$29,257,500 and bonds for \$52,224,004 outstanding against lines under construction. Dividend on stocks in 1915 amounted to \$32,341,337, against \$30,434,601 for 1914. Government owned and operated lines, which are not capitalized, showed a cost of \$293,542,201.

Government Aid.—Cash subsidies amounted to \$5,059,284 in 1915, of which the Dominion contributed \$4,644,664 and the provinces \$414,620. The whole account for aid in cash, constructed lines, loans, etc., stood as follows on June 30:—

By the Dominion.....	\$ 183,479,193
By the provinces.....	87,437,895
By municipalities	17,914,836
Total	\$ 288,831,924

Land grants by the Dominion and Provinces totalled 43,929,312 acres up to June 30. Guarantees have been authorized as follows:—

Dominion	\$ 188,965,063
Manitoba	25,221,580
Alberta	59,410,450
Saskatchewan	41,625,000
Ontario	7,860,000
British Columbia	80,332,072
New Brunswick	6,063,000
Quebec	392,000
Total	\$ 409,869,165

Under these authorizations, bonds for \$350,622,918 had actually been executed on June 30.

Public Service.—There were 46,322,035 passengers carried in 1915, and 87,204,838 tons of freight. As compared with the preceding year, there was a decrease of 380,245 in the number of passengers, and 14,189,151 in the tons of freight. The

history of freight traffic growth is shown in the following statement:—

1885.....	14,659,271	1905.....	50,893,957
1895.....	21,524,421	1915.....	87,204,838

Per mile of line there were 1,299 passengers carried in 1915, or 217 less than for 1914. Average receipts per passenger per mile were 2.021c—an advance of 0.014 over 1914. The average receipts per passenger from the sale of tickets were \$1.083, which fell short of the record for 1914 by 0.245c. The average number of passengers per train declined from 59 to 50; but the average number of passengers per car remained at 14. The average journey was 54 miles, or 12 miles lower than the figures for 1914.

The average receipts per ton of freight were \$1.520, against \$1.614 for the preceding year; the average receipts per ton per mile were 0.751 cent, or $\frac{3}{4}$ c, against 0.742 for 1914. Each mile of line yielded an average of 2,451 tons of freight traffic, 842 tons less than for 1914. The average load per train was 344 tons, with an average of 18.1 loaded cars per train. The average carload was 18.43 tons. The average haul was 212 miles, which happens to be the longest in any country.

Following is a statement of the various classes of freight, and the ratio which each class bore to the total:—

	Tons.	Per cent.
Products of agriculture....	16,385,909	18.79
“ animals	3,356,657	3.75
“ mines	33,127,535	37.89
“ forest	13,976,555	16.03
Manufactures	12,586,393	14.76
Merchandise	5,272,163	6.04
Miscellaneous	2,393,123	2.74
Total	87,204,838	

During the year 22,134,118 tons were received from United States roads, or 25%, against 23,553,833 in 1914.

Earnings and Operating Expenses.—Gross earnings fell from \$243,083,539 in 1914 to \$199,843,072 in 1915. This decline of 17.8% was due to the disturbed conditions created by the European war, and came after a sustained upward movement in traffic and revenue. That movement may be measured by the following facts with respect to gross earnings:—

1885.....	\$32,227,469	1905.....	\$106,467,198
1895.....	46,785,486	1915.....	199,843,072

Operating expenses also decreased. The total of \$147,731,099 for 1915 was \$31,244,159 less than for 1914. This aggregate was equal to 73.9% of gross earnings. The difference between gross earnings and operating expenses—which is popularly, but erroneously, regarded as net earnings—was \$52,111,973, as compared with \$64,108,280 in the year preceding.

Gross earnings in 1914 and 1915 were realized from the following sources:—

	1914.	1915.
Passengers	\$ 62,012,296	\$ 50,173,267
Mails	2,500,176	3,026,773
Express	6,444,214	6,059,385
Baggage, parlor cars, etc.	1,607,517	1,440,509
Freight	165,753,731	132,543,984
Station and train privileges	1,044,737	936,268
Telegraphs, rents, etc.	3,720,868	3,718,366
Total	\$243,083,539	\$199,843,072

Railways had further gross earnings from outside operations, amounting in 1915 to \$20,332,306, which, after deducting operating cost, were reduced to \$6,273,794. There were still other sources of income, and these in 1915 produced a net of \$14,111,483. The final gross corporate income was \$72,497,250, as against \$82,134,694 in 1914. Gross earnings per mile of line in 1915 averaged \$5,616.41—

a decrease of \$2,277.19 for the year. The large addition to operating mileage in 1915—and new mileage is invariably low in earning power—had the effect of diluting many averages. Operating expenses were equal to \$4,151.57 per mile of line, compared with \$5,811.83 in 1914. Notwithstanding the heavy loss of gross earnings during the year, the returns show that Canadian railways made normal expenditures for the maintenance of roadbed and equipment.

Equipment.—Although there were additions to motive power and to cars in passenger service during 1915, there was an actual decrease of 2,500 in the number of cars available for freight service. It would seem that railways, after several years of unprecedented expansion in equipment, took advantage of the conditions prevailing in 1915 to cut out of commission a considerable number of old and much worn units.

Employees.—The extraordinary conditions of 1915 also had the effect of reducing the number of employes by 35,000—from 159,142 to 124,142. The salaries and wages bill declined from \$111,762,972 to \$90,215,727. There was no perceptible reduction, however, in the average rates of remuneration.

Accidents.—Railway operations resulted in 384 persons being killed and 3,161 injured. Of these, 360 were killed and 1,578 injured from the movement of trains. The record in this regard was as follows:—

	Killed.	Injured.
Passengers	17	304
Employes	102	946
Trespassers	168	147
Non-trespassers	73	167
Postal clerks, etc. ....	..	14
Total	360	1,578

One passenger in every 2,724,825 was killed, and one in every 140,369 was injured. This was an exceptionally good record. The toll at highway crossings was 66 killed and 112 injured, compared with 81 killed and 122 injured in 1914. The movement toward the protection of crossings progressed satisfactorily during the year.

Frictionless Rails.—The C.P.R. had about 500 tons of frictionless rails rolled by the Algoma Steel Corporation last year, which have been laid for trial purposes at a number of points, but particularly on the hill west of Galt, Ont.

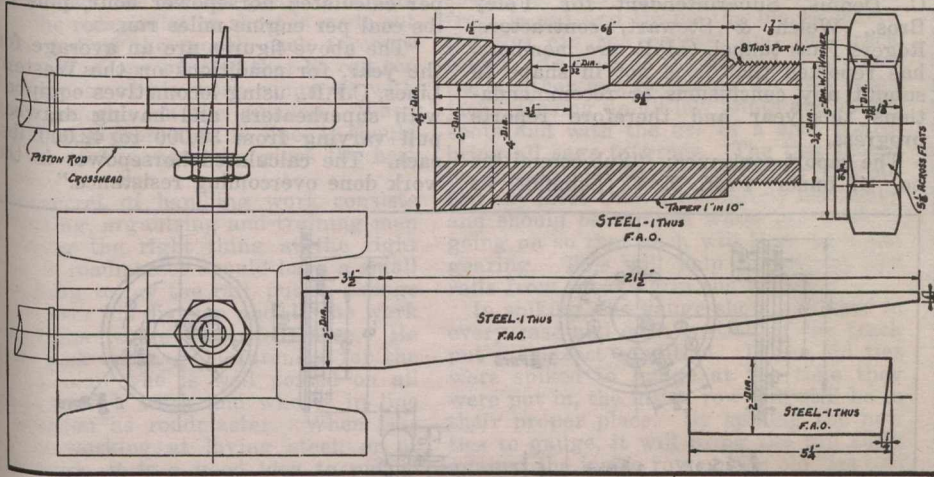
Restaurant Cars.—The Pennsylvania Rd. has discontinued the use of the name “dining car.” All its cars formerly called “dining cars” are now known as “restaurant cars.” In announcing the change, the Pennsylvania management states that the term “dining car” is a misnomer, as the word “dining” properly applies to a place to eat dinner. As breakfast and luncheon, as well as dinner, are served in the so-called “dining car,” it is actually a “restaurant car” and the Pennsylvania has taken the initiative on this continent in abolishing the misnomer and in giving its proper title.

Delaware, Lackawanna & Western Rd. Connection.—In the discussion on the extension of the charters for railways in the Niagara Peninsula of Ontario, controlled by Canadian Northern interests, the rumor has been revived that when the C.N.R. builds to the Niagara frontier it will connect with the D.L. & W. and thus secure direct connection with New York. The D.L. & W. mileage from Buffalo to New York is 411 miles.

Railway Mechanical Methods and Devices.

Vacuum Cleaner on Canadian Northern.

A useful and inexpensive type of portable vacuum cleaner as used by the Canadian Northern Ry. is shown in the accom-



Piston Rod Drift Pin.

Piston Rod Drift Pin on Grand Trunk Pacific.

A practical type of shop kink for removing piston rods from crossheads, as used in the Grand Trunk Pacific shops at

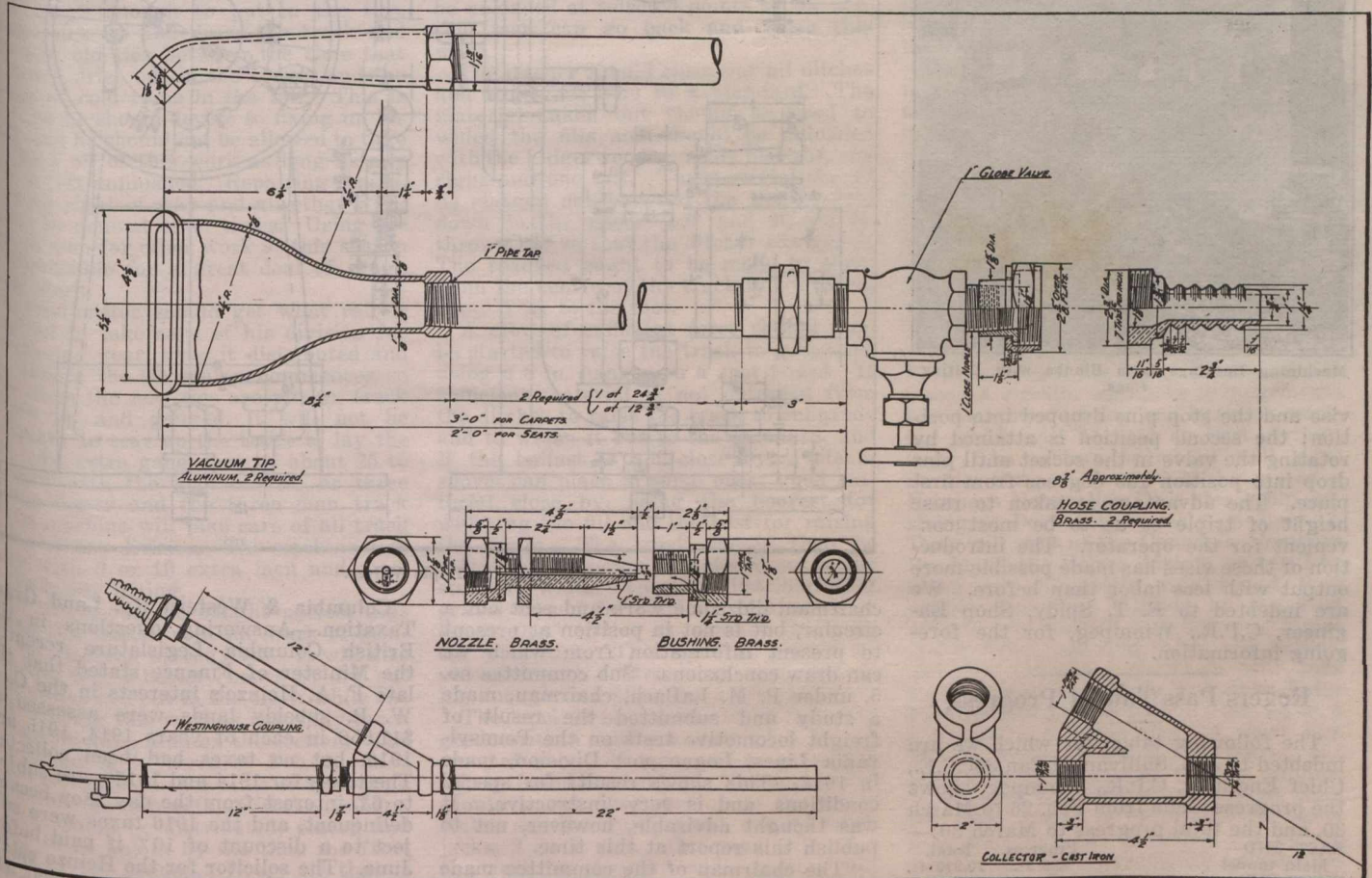
thereby avoiding any damage to the motion work, and is bevelled to receive the sloping face of the wedge, which is inserted through the hollow shank of the wrist pin opening sleeve. The material used throughout is of common stock as regularly carried at the shops. We are indebted to W. W. Yeager, Locomotive Foreman G.T.P. at Biggar, Sask., for the foregoing information.

Machining Bushings in Grand Trunk Shops.

Bushings are machined in the G.T.R. shops, at Stratford, Ont., at one setting of the blank in the vertical boring mill. The method of operation is shown in the accompanying illustration. The bushing blank pattern is made about 1 in. longer at the lower end than the finished blank requires, and has four projecting pronged feet on which the blank sits and is bolted to the table or parallel strips as shown. It is first centred and held lightly in place by the three vise jaws, after which it is bolted down by the lug bolts. The heavy cut is then taken over the whole inside and outside surfaces, with the blank secured by both the vises and bolts. Following the heavy cut, the vise jaws are released, leaving to the lugs the holding of the blank, the final finishing cut then being taken. The object of doing this

panying plan. The ordinary shop or yard air line is employed to form a jet which causes a vacuum to be set up in the hose line connecting with the vacuum tip. The air jet is throttled by use of a 1 in. globe

Wainwright, Sask., is shown in the accompanying illustration. It has been found of constant benefit when it is necessary to change packing rings or do other work on pistons. The device fits



Portable Vacuum Cleaner.

valve, located so as to be convenient of operation. Two lengths of cleaning outfits are employed, one for use of seats, etc., and the other for cleaning carpets and floors. The apparatus shown has already given more than two years satisfactory service.

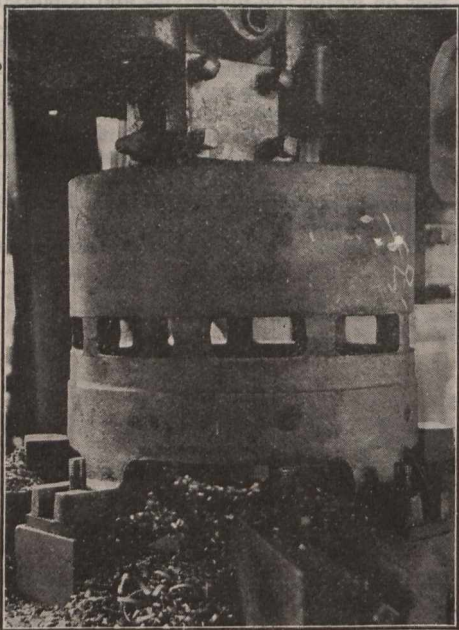
the standard crosshead and is provided with a hollow tapered steel sleeve, which is fastened through the wrist pin opening in the crosshead by a 3 1/4 in. hexagon nut and plate washer. The sleeve is recessed to hold a 2 in. diameter driving block in line with the piston rod to be removed,

is to eliminate the springing strains set up in the blank by the compression caused by the vise jaws. A cutting off tool finally removes the bushing to the desired length, leaving about 1/2 in. of waste stock attached to the bolting lugs. The same system of lugged blanks is

employed for piston rings, the blank for the first cut being held both by the vises and bolts, and for the final cut, by the bolts alone. The rings are then severed by the cutting off tool. Bushings of different sizes are all handled in the same way.

Vise for Triple Valves, Canadian Pacific Railway.

J. Anthony, Air Brake Inspector, C.P.R., Winnipeg, has designed a vise for repairing and cleaning triple valves. Before it was used, it was customary to use an ordinary bench vise for the work. Owing to the irregular shape of the triple valve, it is only possible to grip it in a vise in certain positions; these are not the most advantageous for the work, and the new vise overcomes this difficulty. The arrangement consists of a special disc suited for each type of triple valve to which the triple is attached through the bolt holes in the flange by cotters. The disc is placed in the stand position of the



Machining Bushings from Blanks with Bolting Lugs.

vise and the stop pins dropped into position; the second position is attained by rotating the valve in the socket until pins drop into position 180 degrees from first place. The advantage is taken to raise height of triple so as to be most convenient for the operator. The introduction of these vises has made possible more output with less labor than before. We are indebted to E. T. Spidy, Shop Engineer, C.P.R., Winnipeg, for the foregoing information.

Rogers Pass Tunnel Progress.

The following table, for which we are indebted to J. G. Sullivan, M.Can.Soc.C.E., Chief Engineer, C.P.R., Winnipeg, shows the progress made from Feb. 26 to March 30, and the total progress to March 30:—

	Progress.	Total.
EAST END—		
Main tunnel	828 ft.	10,979 ft.
WEST END—		
Main tunnel	1,006 ft.	12,258 ft.

Canadian Railway Club.—At the monthly meeting in Montreal April 11, S. J. Sarjant, M.I.C.E., ex-Locomotive Superintendent, Great Indian Peninsula Ry., read a paper on the railways of India, which was illustrated by stereoptican views.

Report on Economics of Railway Location.

The American Railway Engineering Association's committee on economics of railway location, of which J. G. Sullivan, Chief Engineer, Western Lines, C.P.R., is chairman, and of which A. S. Going, Engineer of Construction, G.T.R., and A. C. Dennis, Superintendent for Foley Bros., Welch & Stewart, contractors, Rogers Pass tunnel, C.P.R. are members, has reported that it is not in shape to submit any conclusions or recommendations this year and therefore reports progress.

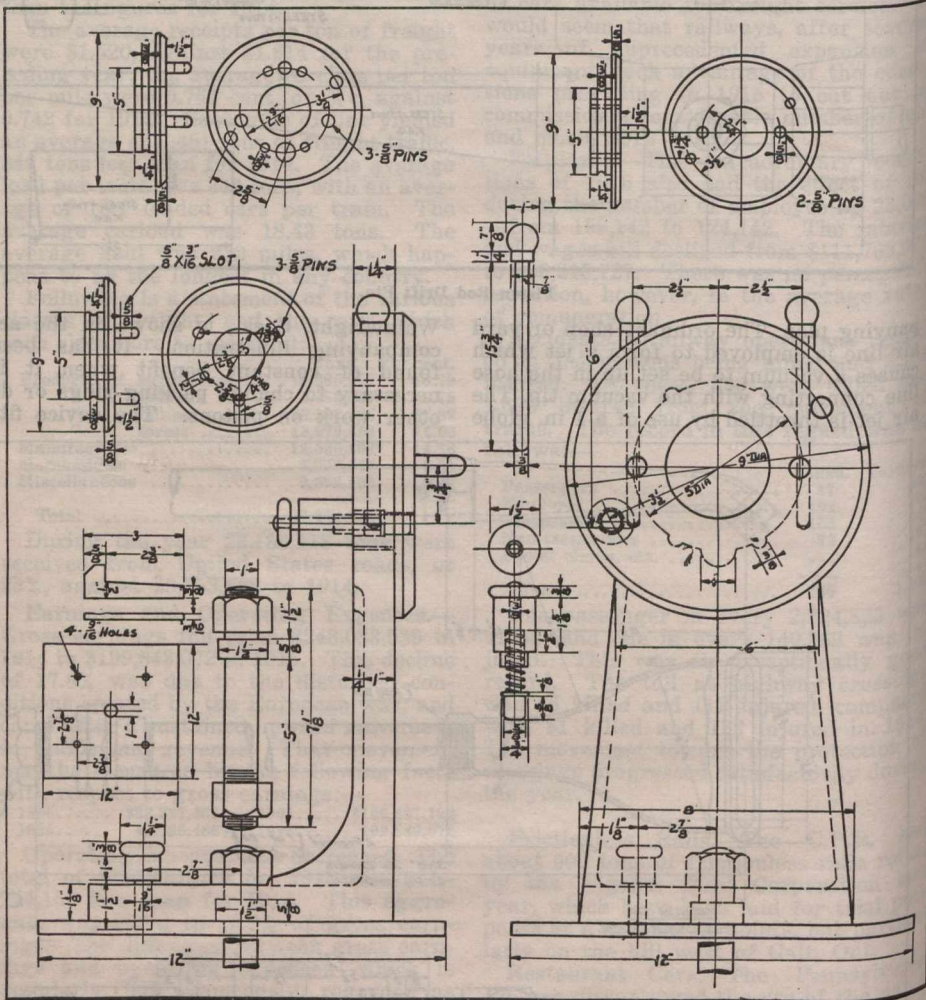
The report continues: "Sub-committee no. 4, under Prof. E. C. Schmidt, as

the amount of work done and the other varying with the locomotive miles run. As a result of these studies, the following formulae have been adopted for Western Lines.

"Single-Track Operation.—Fairly busy lines, 3.5 lbs. coal per calculated horsepower hour, plus 70 lbs. coal per engine miles run.

"Double-Track Operation.—3 lbs. coal per calculated horsepower hour, plus 60 lbs coal per engine miles run.

"The above figures are an average for the year, for conditions on the Western Lines, C.P.R., using locomotives equipped with superheaters, and having drawbar pull varying from 36,000 to 42,000 lbs. each. The calculated horsepower is the work done overcoming resistance."



Vise for Triple Valves.

chairman, did some work and sent out a circular, but is not in position at present to present information from which we can draw conclusions. Sub committee no. 5, under P. M. LaBach, chairman, made a study and submitted the result of freight locomotive tests on the Pennsylvania Lines, Logansport Division, made in 1912. This shows results for special conditions and is very instructive. It was thought advisable, however, not to publish this report at this time.

"The chairman of the committee made a careful study of the statistics of coal consumption in freight services on the Western Lines of the Canadian Pacific for the past eight years. These studies have convinced him that instead of attempting to base coal consumption directly on the amount of work done, that it is better to divide the coal into two factors, one varying directly with

Columbia & Western Ry. Land Grant Taxation.—Answering questions in the British Columbia Legislature recently, the Minister of Finance stated that the late F. A. Heinze's interests in the C. & W. R. subsidy lands were assessed at \$11,556 in each of years 1914, 1915 and 1916, but no taxes had been collected. The taxes for 1914 and 1915 were subject to 6% interest from the day they became delinquent, and the 1916 taxes were subject to a discount of 10% if paid before June. The solicitor for the Heinze estate had informed the Government that the taxes would be paid before the Government took any steps to advertise the lands for sale. The subsidy lands of the railway, now in the C.P.R.'s control, had been assessed at \$43,094.45 for 1912, but no taxes had been collected.

The G.T.R. handled 1,376,189 car loads of freight during 1915.

Spring and Summer Track Work.

By William Downey, Roadmaster, Minneapolis St. Paul and Sault Ste. Marie Ry.

All work should be authorized and mapped out before the spring work starts and estimates prepared of the cost. Every foreman should be given a certain allowance to spend on his section as should also the extra gang foreman. When the recapitulation sheet is made out at the end of the month each foreman should get a copy of it so that he can see how the cost of his work compares with other foremen's on the division. When there is any promotion in line, it should be given to the man who gives the best service.

The secret of handling work consists in selecting, organizing and training men and doing the right thing at the right time. A roadmaster should have a small extra gang to lay the rail, put in sidings and go over his division and do the work on sections where labor is scarce. He should pick out a good foreman for the gang, a man who is well posted on all kinds of track work and who is in line for position as roadmaster. When this crew is working at laying steel, or at other work, it is a good idea to put in two or three section forces with them. The roadmaster should be on the work as much as possible and give the foreman the benefit of his experience. He in time would train the section foremen and their men to carry out his instructions.

A section foreman should be allowed a force large enough to put in the ties, gauge, pick up and dress the track and burn the old ties between the time that the track dries out in the spring and the season of cold rains in the fall. This is the time he should devote to fixing up his track and he should not be allowed to take his force off of this work as long as any of it is left unfinished. Repairing fences, cleaning right of way and all other work should be done at other times. Using the section men for other work at this season is responsible for a great deal of rough track work.

A roadmaster should get what rail is required to take care of his division for the coming year, have it distributed and laid before the tie season commences so that when the new ties are put in, track picked up and gauged, it will not be necessary to tear up the track to lay the rail. An extra gang crew of about 25 to 30 men with the help of two or three section crews and the three man track laying machine will take care of all track laying on any division. The machine does away with 9 or 10 extra men and most of the heavy lifting.

All ties should be bought peeled, thus saving the section men the work of peeling and cleaning up the bark. It will also give the ties a better chance to dry out before they are put in the track while the cost of doing this work is naturally much less at the mills than on the section. The ties should be delivered by Feb. 1, which would force the lumber mills to turn them out before the sap gets up in the timber.

Ties should be distributed, placed and ready to be put in by the time the frost is out of the ground. Every tie that is to be removed from the track should be tested. This can be done by using a good lining bar and block, placing bar under the end of the tie, using it as a lever, or by using a pick under the end of the tie. Ties which raise the track by applying this leverage under them without breaking and have a good tie on each side of them, should be left in the track for an-

other year. When there are several poor ties at one place which are serviceable for but another year, some good ones should be put in so that all the ties do not give out at the same time. The foreman should go over his track as soon as the frost is out and tie up the places where the ties are the poorest and the track rough. As soon as the ground is dry and the weather hot, he should use two track jacks, picking up all low joints and rough spots and with the use of a spot board, bring all sags to grade. The ties should be slipped in without disturbing the old bed any more than is absolutely necessary and should be tamped while the work is going on so that each will have an equal gearing. This will help to prevent the rails from breaking in the winter.

In spiking, the gauge should be used in every case and each portion of the track put in perfect condition. If the old ties were spiked to gauge at the time they were put in, the inside row will still be in their proper place. By spiking the new ties to gauge, it will bring the rail tight against the inside row on the old ties and all that is necessary to be done is to pull those on the outside that are spread, plug the holes and drive them back in the same place. You will then have your track in gauge without any extra labor. If there is any place where gravel is needed to dress it up to standard, it should be unloaded at selected points so the section men can go back and finish this work.

The ditcher should clean out all ditches and widen all cuts to a standard. The material taken out should be used to widen the fills and should be unloaded with the Lidgerwood and side ploughs, one right and one left. The material should be cleaned out between the ties in cuts down to the under side and should be thrown out so that the ditcher can get it. The roadbed ought to be made to slope from the centre of the track to the ditch, about 1 in. to the foot.

A crew of sufficient force should then be started to raise the track to subgrade, using a 6 in. hanger on a spot board. If sufficient material is not obtained from the ditches to raise the track to subgrade and to widen it out to the standard, and if the ballast is not close by, a steam shovel can place in some other good material close by, using the poorest for widening the fill and the best for raising the track. The track should then be raised to subgrade and widened out to the standard width. Then the distribution of gravel should be started, working from the farthest end so as to make the longest haul first. This material should be unloaded with centre dump cars, unloading enough in a place for a 6 in. raise.

The track is now ready to be raised to grade with a uniform raise of 6 in. A crew of about 30 men and a water boy will be found economical. The spot board should be set upon the top of the grade stakes and the track raised, using 6 track jacks, 3 on a side. One man will raise the track for the crew while another will go ahead and dig the jack holes. Joint tampers can be dispensed with but let the track rest on the jacks until tamped. One man will carry the level board and space the ties. He will be followed by 24 tampers with 3 men to fill in the centres. Whatever ballast is required to fill it out to standard should be unloaded from flat cars with the Lidgerwood and side plough,

keeping the shaper set behind the plough so as to get the right amount of ballast unloaded. The best time to do this is when the surfacing gang is working between switches or in yards. While they are working on main line at these places the unloading crew can go by them on the passing tracks or sidings and when working on the sidings they can go by on the main line without causing any delay to themselves or the surfacing gang. By this method, the material can be unloaded in proper place and the dump line be kept as straight as the rail without any push car work or other expense in moving material. The section men should keep after their track, picking up low places and rough spots, until it is thoroughly settled in perfect grade and surface and then dress it down to a standard. Tracks should not be dressed and surplus gravel removed until it is thoroughly settled and up to grade and surface. If work is handled in this way, whenever you decide to put in rock ballast, or something better than what you have been using, you do not have to make any changes in your roadbed or waste any of the material and labor that you have been using.

Places in the track which heave a great deal each winter should be marked and during the summer holes should be bored from 3 to 4 ft. deep or below the frost line, and filled with cinders. They should be drilled at the end of the ties and between them if there is much heaving. When the ground freezes the following winter and expands, much of the movement will be towards the holes filled with cinders, as they are not packed tightly, instead of forcing upwards and raising the track.

On roads that are not troubled with much snow and frost, it should be so arranged that all double tracks, passing tracks, house tracks and yards be laid in the winter, all ties loaded and distributed, engine wood unloaded and ice houses filled. This work could be taken care of by the section men thus keeping a regular force busy during the entire year. None of the men would have to be laid off in the fall and the trouble with green men in the spring would be overcome.

Canadian Ticket Agents' Association.—E. de la Hooke, Secretary-Treasurer, has issued a circular outlining arrangements for the annual outing and business meeting which will be held at Port Arthur, Ont. The eastern members will leave Sarnia, Ont., on June 10 at 4 p.m., on a Northern Navigation Co.'s steamship, arriving at Port Arthur early on June 12. They will stay at the Canadian Northern Ry. hotel, the Prince Arthur, and will be given an automobile ride round Port Arthur and Fort William by the Port Arthur City Council and Board of Trade and a steamboat trip round the harbor, and the Canadian Northern will take them by special train to Kakabeka Falls. Port Arthur will be left on June 14 at 8 a.m. by C.P.R. steamship. A short stop will be made at Sault Ste. Marie, and Port McNicoll should be reached on June 16 about 8 a.m., whence a special train will take them to Toronto. Members preferring to make the whole trip by rail may do so. The transportation companies will provide free passage on both trains and steamships, the only charges being for meals and berths. On sleeping car berths there will be a reduction of 50%.

The G.T.R. has supplied, at the request of the British military authorities, a series of motion pictures of Canadian scenery and industries, for use in France and Belgium, at the military rest camps.

Canadian Northern Railway Construction, Betterments, Etc.

Canadian Northern Ontario Ry.—The agreement, dated Oct. 1, 1915, entered into between the company and the C.P.R., respecting lines in North Toronto, and the use of the station being erected on Yonge St., has been ratified by the Dominion Parliament.

The Dominion Parliament has ratified an agreement between the Canadian Northern Ontario Ry and the Canadian Northern Ry. on the one hand, and the C.P.R. on the other, respecting the construction, maintenance and operation of a joint section, to connect the C.N.O.R. east of Current River, Ont., with the C.P.R., the operation of trains over the C.P.R. for about two miles, and a connection with the C.N.R. at Arthur St., Port Arthur, Ont. The agreement is to run for 20 years, and at the end of that time may be renewed for a term of 999 years in all from Oct. 1, 1915. The rental to be paid for existing properties of the C.P.R. is \$312 a month for land, \$73 a month for a specified piece of land on which tracks are to be built, and \$220 a month for existing improvements; for further improvements, a rental at the rate of 4½% on half the ascertained value of the land and the cost of improvements, payable monthly. The cost of putting in connections and crossover is to be borne by the C.N.O.Ry. and the C.N.R., the work being done by the C.P.R. One half of the cost of maintenance and operation of the joint lines is to be borne by the C.N. companies, together with the entire cost of the maintenance of crossover and connections, and the special interlocking apparatus and other protection appliances.

A press report states that the company proposes to start at once to extend the C.N.O.R. from the present terminus at Current River, to Stephen St., Port Arthur, which work includes a bridge over the Current River. In the agreement above referred to, there is a section providing that within 10 years the C.N.O.R. may withdraw in respect such piece of line as will make the eastern terminus of the joint lines at Stephen St. This report would indicate that the C.N.O.R. is about to build its own line within that area.

Canadian Northern Ry.—The Dominion Parliament has extended the time within which the company may build the projected line from near Grosse Isle on the Oak Point branch, northerly and westerly to Grand Rapids, with a branch to Sturgeon Bay, Man.

The company is applying to the Brandon, Man., City Council for permission to close a number of streets in the south end of the city.

The Minister of Railways for Saskatchewan, is reported to have said on April 10 that he was about to take up with the company the question of the work to be done in the province on the lines for which guaranteed bonds had been issued.

A press report states that the Premier of Saskatchewan has been informed by M. H. MacLeod, General Manager and Chief Engineer, Western Lines, that it is expected to lay 35 miles of steel on the extension of the Macrorie Branch westerly from Eston, this year.

Canadian Northern Pacific Ry.—Replying to questions in the British Columbia Legislature recently, the Minister of Finance stated that the province guaranteed the company's bonds for \$21,000,000. Of these guaranteed bonds, \$18,286,573 had been sold, realizing \$17,310,037.40,

which amount had been paid out to the company as the work progressed.

Vancouver Terminals.—The general plan for the station to be erected on the False Creek property, east of Main St., was tentatively approved by the Vancouver City Council's bridges and railway committee, April 4. Detail plans and estimates are being worked out. The City Engineer estimates that the station building will cost about \$1,050,000. The company was not required by its agreement with the city to submit plans for approval. It is expected a contract will be let for the foundation work within a few weeks. Referring to the plans, the Vancouver Province says:—

"The drawings presented show a structure of classical Doric design, 321 x 120 ft., of modern fireproof construction. Twelve Corinthian columns stand at intervals across the entire front. The centre portion of the proposed structure reaches to a height of 100 ft. from the ground, the tower proper being 96 ft. high. The ends of the building stand 64 ft. high, and the portions between the centre and the ends, 60 ft. high. These sections are three stories in height, and the ends and the centre portion are four stories high. The building is designed for white or grey stone. Many modern features are embodied in the interior design. A large main entrance is provided in the central portion through which a passage runs into a very wide lobby leading into the general waiting room, 150 x 50 ft. wide. In this are the ticket offices, etc. Adjacent to the ticket offices is the baggage room and on the opposite side of the building, with means of access from the waiting rooms, are the lunch and dining rooms. There are numerous lobbies off the waiting room are numerous lobbies off the waiting room. A barber shop is provided, a men's waiting room and a women's waiting room and retiring room; a government mail room and the dining and sleeping car department; C. N. Ex. Co. and commercial telegraphs. The upper stories are devoted to traffic offices. A passageway leads from the waiting room to the train tracks at the back of the station. Here a large covered concourse is provided, 50 ft. wide and covered platforms from 1,200 to 1,500 ft. long. Provision is made for 16 tracks. The basement is to be utilized for storage purposes, etc. The floors throughout are of terrazzi and marble; the stairways are marble and the finish throughout is in natural wood."

Reply to a question in the Legislature as to the station building and terminals, the Minister of Railways said, April 8:—"The work has been proceeded with slowly, evidently from a desire to modify and revise the proposed works. This is a matter that is receiving very careful consideration before a final decision is arrived at. It appears probable that the work will not be further delayed. The filling in of the land surrounding the station at Vancouver will be started immediately, and as soon as the plans and specifications are completed, tenders will be called for at once, and it is hoped that the excavation and basement will be put in within six weeks."

Replying to questions in the Legislature, the Minister of Finance said recently that the proceeds of the \$8,614,000 of C.N.P.R. terminal bonds issued amounted to \$7,954,814.43, of which there had been expended to Dec. 31, 1915, at Port Mann,

\$360,331.60; New Westminster, \$1,376,361.15; Vancouver, \$330,249.80; Steveston, \$344,541.11; Patricia Bay, \$37,430.76; total, \$2,448,914.42. The government held drawbacks of \$37,436.74 on these accounts, making the amount at the credit of the account, \$5,543,336.75.

Lines on Victoria Island.—The Minister of Finance informed the B.C. Legislature recently that up to Feb. 10, the company had paid \$4,100,105 to contractors on the line from Victoria to Port Alberni, 136.50 miles. About 65% of the work had been completed and the government had paid out of the proceeds of the guaranteed bond issue, \$2,879,259, or 58%. An expenditure of \$861,294 will be required to complete the grading and bridging, and a total of \$1,380,662 to complete the line ready for operation as far as already graded. About six miles of grading is required to be done at the Victoria end. (April, pg. 145.)

Canadian Government Railways Rolling Stock.

The acting Minister of Railways, in discussing Departmental estimates for 1916-17 in the House of Commons recently, in referring to the condition of the rolling stock, said: "The sums which had been transferred to the three renewal accounts, viz.: \$600,000 to the renewal of equipment account, \$400,000 to the rail renewal account, and \$100,000 fire renewal account, will be used entirely for the providing of new equipment. At no time in the history of the Government Railways has new equipment been needed more than at the present time, owing to the fact that we have taken over 2,000 miles of railway on which there was very little, if any, equipment. During the past year new rolling stock has been delivered as follows:—

10 passenger locomotives and 15 consolidated locomotives, Canadian Locomotive Co.
250 steel gondola cars, Eastern Car Co.
250 flat cars, Nova Scotia Car Co.
6 first class steel cars, Canadian Car & Foundry Co.
6 baggage and postal cars, being built in Montreal shops are about 55 per cent. completed.
2 wrecking cranes and one steam shovel delivered.

The following amounts were set aside for renewal of equipment account: 1912-13, \$777,863.74; 1913-14, \$179,362.78; 1914-15, \$36,465.08; 1915-16, \$900,000. The following work had been done so far as repairs are concerned:—

	1913-14	1914-15	Increase	Decrease
Locomotives	173	392	119	
Freight cars	19,208	14,065		5,143
Passenger cars	472	505	33	

To organize the initial service on the National Transcontinental, there were transferred from the Intercolonial, 98 locomotives, 33 passenger cars and 1,000 freight cars. "We were able to transfer locomotives from the Intercolonial," said the acting Minister, "for the reason that during the dull times last winter we repaired all our Intercolonial locomotives and were able at the opening of the National Transcontinental to utilize 95% of our power on the two railways. Ordinarily, 20% of the locomotives of a railway are out of commission for repairs or other causes. These locomotives, with the assistance of 13 rented from the G.T. Pacific, have enabled us to handle the grain situation as well as we have. In addition to this equipment loaned, much of which will be absorbed permanently by the National Transcontinental, we purchased 1,000 steel frame box cars, at a cost of \$1,095,000, which were delivered in September.

Traffic Orders by Board of Railway Commissioners.

Interchange Facilities at Moose Jaw.

24797. Mar. 16. Re application of Board of Trade of Moose Jaw, Sask., for an order directing the Grand Trunk Pacific Branch Lines Co. and the C.P.R. to install interchange tracks for inter-switching purposes at Moose Jaw, it is ordered that the G.T.P. Branch Lines Co. be directed to construct interchange tracks between its spur to the Government Elevator and the C.P.R. Outlook Branch at Moose Jaw, that detail plans showing the proposed interchange tracks be filed for the approval of an engineer of the Board within 30 days from date, the work to be completed by June 1, 1916; and that the question of the cost of constructing and maintaining the tracks be reserved to be disposed of at the next sittings of the Board in Moose Jaw.

Nanaimo Not Terminal Freight Rate Point.

24808 Mar. 18, the complaint of Nanaimo, B.C., Board of Trade against the proposed C.P.R. new tariff eliminating Nanaimo as a terminal freight rate point. It is ordered that the complaint be, and it is hereby, dismissed.

The Chief Railway Commissioner, Sir Henry Drayton gave the following judgment. Nanaimo for many years has had the benefit of coast terminal rates. This benefit has been taken from it. As the lower rate was of course entirely out of line and lower than rates fixed as reasonable for the service, the difficulty of ordering the company to restore the old rate was obvious. On the other hand, there is no doubt that more or less inconvenience and sometimes real hardship results from changes in rates; and judgment was reserved, so that the matter could be looked into with a view of ascertaining whether or not the Board could consistently order a restitution of the rate. I am unable to find any ground on which such an order could be based. The principle that a railway may meet water competition or not just as it pleases is of general acceptance and so well known that it need not be emphasized. If the railway does not choose to meet the water competition, the Board's whole right to interfere with the rate is confined to a case where the rate as charged is unreasonable for the service rendered. It is impossible to say such is here the fact. It appears that the C.P.R. for years maintained its car ferry at Ladysmith, giving Nanaimo terminal coast rates involving a rail movement from Ladysmith to Nanaimo of 14 miles without charge. The Ladysmith facility was not owned by the company, and in view of the transfer charges which were being exacted, the C.P.R. now runs its car ferry to Esquimalt. The rail haul from Esquimalt to Nanaimo is 69 miles. The result is that to give Nanaimo the benefit to the terminal rate, the Board must say that the C.P.R. shall carry Nanaimo shipments 69 miles for nothing. Of course, if the railway company was performing a similar service for nothing for a similar or considerable distance, the Board could order that Nanaimo should get the benefit of this 69 mile haul for nothing, on the ground of discrimination. Such is not the case, the only points enjoying terminal rates being Esquimalt and Victoria, and as Esquimalt, of course, adjoins Victoria, there is no discrimination; and no order can be made.

Specifications for Cheese Boxes.

24837. Mar. 28. Re order 24188, Sept. 18, 1915, approving Supplement 5 to Canadian Freight Classification 16, to become effective not later than Nov. 1, 1915, with the exception of the item on pg. 9 giving specifications for cheese boxes, which was to become effective not later than Dec. 1, 1915: It is ordered that the effective date of the said item be finally extended until Aug. 1, 1916. No further suspension will be permitted.

Minimum Weight for Lumber.

24840. Mar. 29. Re application of R. H. Alexander, Secretary-Treasurer, British Columbia Lumber & Shingle Manufacturers, Ltd., of Vancouver, B.C., and the Riverside Lumber Co., Ltd., and A. B. Cushing Lumber Company, Ltd., both of Calgary, Alta., for an order postponing the effective date of the increased minimum weight for fir, spruce, hemlock, and common cedar lumber, when loaded in cars under 36 ft. in length, from 30,000 to 35,000 lbs. per car, which, as appearing in C.P.R. Supplement 59 to its Tariff, C. R. C. W. 1806, was, on the application of the said Alexander, suspended until further order by order 24550, Dec. 13, 1915: It appearing that the said minimum weight has been republished by the C.P.R. in its Supplement 68 to Tariff C. R. C. W. 1806, so as to give the notice required by the Railway Act, and has been continued in Supplement 69 to the said tariff: It is ordered that the effective date of the said increased minimum weight be postponed until further order.

Interswitching at Chatham, Ont.

24868. April 5.—The complaint of N. H. Taylor and Canada Flour Mills Co. of Chatham, Ont., against the interswitching charge of 2c per 100 lbs. on grain, ex-lakes, milled in transit at Chatham: Upon hearing the complaint at Toronto, Feb. 22, the complainants and the C.P.R. being represented; upon the report of the Chief Traffic Officer of the Board, it is ordered that the complaint be dismissed.

Question of Rights at False Creek, Vancouver.—Champion & White are owners of a wharf on False Creek, Vancouver, where the Canadian Northern Pacific Ry. and the Great Northern Ry. are carrying out large reclamation works, under an agreement with the city. Part of this work consists of a seawall which is in course of erection by the Canadian Northern. An interim injunction to prohibit the building of the seawall was dissolved, some time ago, on the ground that it did not interfere with the carrying on of complainants' business, but in the action on the main question, Champion & White, who hold title under an old Crown grant, claim that they have riparian rights on the south side of their wharf, which they will be entirely cut off from by the seawall. This, the trial judge held to be the case, and an injunction was granted against the city. It is expected that while there will be an appeal, a settlement will be reached, under which the work will proceed on the understanding that arbitrated damages will be paid if the city is ultimately found to be liable.

British Soldiers and Railway Equipment Repair.—The British military authorities have released a number of soldiers to repair locomotives and cars, owing to the great number out of service for necessary repairs, which had caused congestion of traffic.

Railway Finance, Meetings, Etc.

Algoma Eastern Ry.—There have been deposited with the Secretary of State at Ottawa, and with the Provincial Secretary at Toronto, duplicates of contract and mortgage dated April 1, entered into between the company and the Algoma Rolling Stock Co., evidencing a sale of rolling stock, the mortgage securing the payment for the same being made to the National Trust Co.

Canadian Northern Ry.—A recent press report states that the company has secured \$2,500,000 in New York to retire a loan about to mature in London, Eng.

Diamond Coal Co.—Under an order of the Supreme Court of Alberta, this company's property was offered for sale by auction at Lethbridge, Alta., April 27, under proceedings instituted by the Trusts and Guarantee Co. The property offered includes the collieries opened, the coal lands, the mining plant, together with the rails, mining cars and electric hauling motor used in the collieries.

The Diamond Ry. & Coal Co. built a line in 1909 from Kipp, six miles west of Lethbridge, on the C.P.R., to Diamond City, where the Diamond Coal Co.'s first collieries were situated. In 1910, a number of sidings and spurs were built connecting up other collieries with the line. This railway does not appear to be included in the schedule of the property ordered to be sold.

Grand Trunk Ry.—The annual meeting was held in London, Eng., Apr. 18, when the report was presented and adopted. In reply to questions from shareholders as to the Dominion Government's intentions regarding the Grand Trunk Pacific Ry., the Chairman, A. W. Smithers, stated that he had put the company's case fully before the ministers when in Ottawa recently, and their reply was being awaited.

Minneapolis, St. Paul & Sault Ste. Marie Ry.—It was stated in New York, April 8, that \$6,000,000 of the company's bonds which were being transferred were part of a consignment of bonds mobilized by the British Government in Great Britain and sent over to the U. S. in connection with Imperial financial plans.

Morrissey, Fernie & Michel Ry.—The report for 1915, presented at the annual meeting at Toronto, Apr. 14, showed a profit from the year's operations, of \$17,932.83, which, with the balance brought forward from 1914, makes a credit to profit and loss, of \$61,419.88. The directors for the current year are, Elias Rogers, President and Treasurer; E. C. Whitney, Vice President; H. B. McGiverin, C. A. Thompson and W. H. Robinson. R. M. Young is Secretary.

Temiscouata Ry.—Earnings for January, \$17,123; operating expenses, \$14,635; net earnings, \$2,488. The net earnings for Jan., 1915, were \$2,969.

Treated Ties Save Growing Trees.—Of the 3,000,000 cross-ties used every year by the Chicago, Burlington & Quincy Rd. for replacement purposes, over 70% are treated with a preservative. According to the Superintendent of the company's wood preserving plant, the millions of treated ties in their tracks now last from 12 to 20 years, whereas untreated they last an average of eight years. In each of the 20 divisions of the Burlington system there are tracks for experimental purposes containing 26,000 treated ties of different species, which are all carefully inspected at least once a year for the actual results of treatment as shown by the service test.

Canadian Built Freight Cars for French State Railways.

The accompanying illustration shows the sample car built by the Eastern Car Co., New Glasgow, N.S., on an order for 1,000 4 wheel freight cars for the French State Railways, the contract for which was given in June, 1915, its execution having been held up owing to impossibility of getting material. It is however hoped to make shipments shortly. These cars are of material to C.P.R. specifications, with the exception of the screw coupling, drawbar hook and all springs, which are to a modified French specification suitable for American practice, especially regarding tests. All rolled shapes of American standard are inter-

Length over end sills.....23 ft. 11 $\frac{3}{8}$ ins.
 Length inside.....21 ft. 7 $\frac{1}{8}$ ins.
 Width inside.....8 ft. 2 $\frac{7}{16}$ ins.
 Height from top of rail to top of cabin 11 ft. 4 $\frac{1}{2}$ ins.

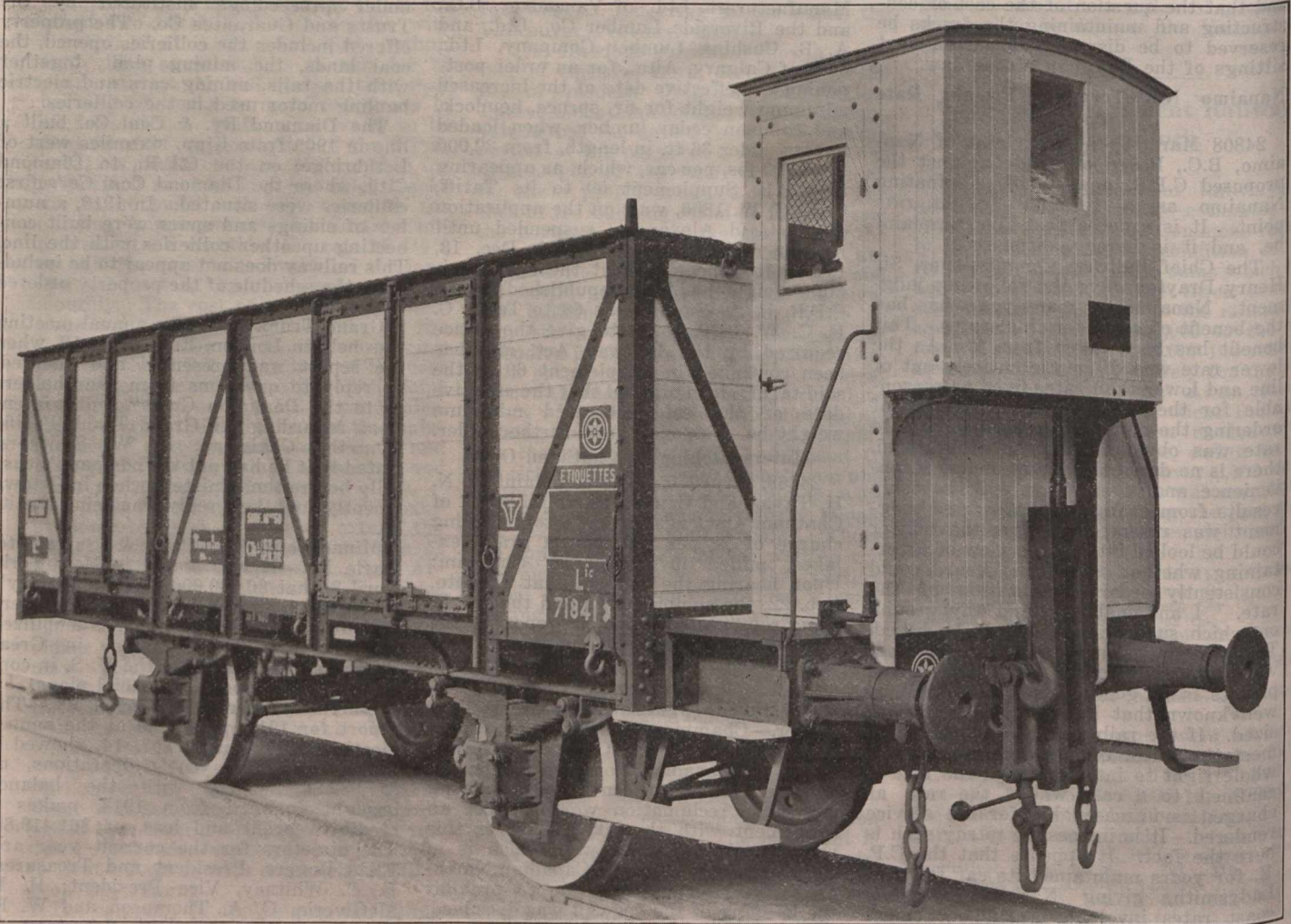
Canadian Government Railways Mileage, Operation, Etc.

The acting Minister of Railways, in discussing the Department estimates for the current financial year in the House of Commons recently, said: The mileage of railways operated by the Government is as follows:—

Intercolonial Ry.	1,457
Prince Edward Island Ry.	272
National Transcontinental Ry., Moncton to Winnipeg	1,804
Lake Superior Branch, G.T.P.R.	188
New Brunswick & Prince Edward Island Ry.	36

traction, stronger bridges, and other facilities, if we could get an increased share of freight business, we could handle it successfully and make a much better showing. We have been able to get that extra business, and have been able to handle it with a very slight increase of cost in operation. To put it in concrete form, our gross earnings at the end of Dec. 1915, were increased by \$1,191,000, while the increase in working expenses was only \$43,000. Having given particulars of items in which economy had been made, the acting Minister gave the following statement of the operations of the I.R.C. for the year ended Mar. 31, the figures for Jan., Feb. and March being estimated:—

Actual earnings to Dec. 31, 1915...\$10,613,264.99
 Estimated for Jan., Feb. and Mar.,



Canadian Built Freight Car for French State Railways.

changeable with the French as far as possible, and the side end stakes and floor stringers are of French section. The siding, ending and sheathing for cabin is of yellow pine, and the floor and cabin framing of oak. The buffers are of cast steel, and the brake of the usual clamp type with counterweights operated from the cabin. Brakeshoes are of cast iron with trussed type brake beam; journal boxes of malleable iron with drop forged wedges, lead lined bearings and special oil lubricator. The wheels are of solid forged steel, interchangeable with the French wheels of spoked type, and are on French type axle with journals 140 by 250 m.m. Following are the chief dimensions:—

Length over buffers.....27 ft. 8 $\frac{3}{8}$ ins.
 Wheel base.....11 ft. 9 $\frac{1}{8}$ ins.
 Width over side steps.....10 ft. $\frac{3}{8}$ ins.

International Ry.	112
Dartmouth to Deans Branch.....	67
Quebec & St. John Valley Ry.	124

Total 4,057

“The operation of these lines is under the direction of one General Manager, with two general superintendents, one for the Intercolonial and its branches, and the other in charge of the National Transcontinental and the G.T.P.R. Lake Superior Branch. During the present year the Intercolonial has received its share of the increased business enjoyed by railways generally, so much so that the result has been that the current year will be the best in the history of the road. The Minister of Railways has always been of the impression, and I concur with him, that, with the staff at present operating the road, and its good roadbed, increased

1916.	3,800,000.00
Total	\$14,413,264.99
Actual expenses to Dec. 31, 1915.....	\$ 8,896,754.84
Estimated expenses for Jan., Feb. and Mar., 1916	3,360,000.00
Transferred during year to renewal of equipment account.....	600,000.00
Rail renewal account.....	400,000.00
Fire renewal account.....	100,000.00
Total	\$13,356,754.84

Showing a surplus of.....\$ 1,056,510.15

Following are the traffic statistics:—

Tons (revenue) and passengers moved.

	Passengers Number.	Freight Tons.
1913-14	3,983,511	5,287,740
1914-15	3,613,371	4,539,002
Decrease	370,140	758,738

Tons (revenue) and passengers moved one ton mile:

	Passengers Number.	Freight Tons.
1914-15	176,189,749	1,189,017,914
1913-14	159,843,276	970,895,253
Increase	16,346,473	218,622,661
	Passengers Number.	Freight Tons.
1914-15	3,234,202	5,893,003
1913-14	2,355,268	4,869,879
Increase	878,934	1,023,124

In regard to the Prince Edward Island Ry., the acting Minister said: "Up to Nov. 30, 1915, we have succeeded in reducing the operating expenses nearly \$34,200. The earnings, however, were \$8,700 less than for the same period last year. The deficit on this road this year as compared with the same period last year, has been reduced \$25,500, and unless winter conditions are severe the same relation should continue until the end of the year. Last year the deficit in the operation of this road was \$182,731.53."

Referring to the operation of the National Transcontinental Ry., the acting Minister stated that a service was placed in operation on the line from Superior Jct. to Quebec, June 1, the G.T.P.R. Lake Superior branch having been leased from that company May 15. The G.T.P.R. operated the line from Winnipeg to Superior Jct., and the Lake Superior branch as agents of the Government until July 1, when the Department took over the entire operation of the lines, the G.T.P.R. employes being retained. The terminals at Transcona were made joint terminals between the National Transcontinental and the G.T.P.R. and the latter company's locomotives are repaired in the Transcona shops at cost, plus 10%. A daily through westbound freight service between Cochrane and Winnipeg was started in August, which gives an average of 15 paying loads a day. A daily passenger service is given between Quebec and La Tuque and between Levis and Monk. Bi-weekly mixed trains are run between La Tuque and Cochrane, and tri-weekly mixed trains between Moncton and Chaudiere, and as many freight trains are run as the traffic requires. From early in September to the end of the season of navigation, 26,173 cars of grain were delivered at Fort William, which is about two and one-half times that handled last year under G.T.P.R. operation. To relieve the grain blockade at Fort William and take advantage of elevator space at Quebec and Montreal, an emergency freight rate which would compare favorably with lake and rail rate was put into effect, under which the National Transcontinental undertakes to handle grain from Armstrong (the geographical position of which corresponds with Fort William) to Quebec and Montreal at 6c a bushel. A considerable amount of traffic is being arranged for in this way. To relieve the Fort William situation further, grain is now being hauled from Fort William to Atlantic ports, which requires a back haul to Superior Jct., and in this way 50 cars of grain a day are being moved.

The N.T.R. gross earnings to Dec. 1, were \$2,962,113.40, and the operating expenses \$1,975,994.36, to which must be added the rental of the Lake Superior branch for seven months, \$350,000, showing a deficit of \$30,000 to that date. The reports received since indicate that the traffic handled during December gave a small surplus. For the remaining three months of the fiscal year to Mar. 31, deficits are to be expected.

James A. Allan, formerly a director of the Allan Line Steamship Co., at Glasgow, Scotland, died there Apr. 17.

Railway Land Grants Extended by Quebec Legislature.

The Quebec Legislature has extended for four years the time for earning lands granted in aid of railway construction as follows:

Argenteuil Ry.—2,000 acres a mile for line from the Grenville Canal in Grenville Tsp., in the direction of Arundle, 15 miles. (June, 1912, pg. 299.)

Canada & Gulf Terminal Ry.—3,000 acres a mile for line from Matane to Gaspé Basin, 190 miles. (Dec., 1914, pg. 545.)

Canadian Pacific Ry.—2,000 acres a mile for line from Waltham station to Creuse River or Ferguson Point, 20 miles.

Caughnawaga to Dundee, Que.—2,000 acres a mile for line from Caughnawaga, Que., near Adirondack Jct., on the New York Central Rd., to St. Jean, and on to Dundee, Huntingdon County, 60 miles.

Chaudiere Jct. to Sherbrooke, etc.—2,000 acres a mile for line from Chaudiere Jct. to Sherbrooke, 120 miles, with a branch from St. Agathe to Lyster, 10 miles, and another branch from St. Agathe to Black Lake, 30 miles. (May, 1912, pg. 238.)

Grand Lake & Bell River Ry.—2,000 acres a mile for line from National Transcontinental Ry. at Bell River to Twenty-one Mile Bay on Grand Lake, Pontiac County. (Nov., 1912, pg. 557.)

Great Northern Ry.—2,000 acres a mile for line from St. Sauveur to St. Jerome, 15 miles; and to the C.N.Q.Ry. 3,000 acres a mile for 16 miles of line in Montcalm County; 2,000 acres a mile for 65 miles from near Montreal to a junction with the C.N.Q.Ry. near Grenville; 2,000 acres a mile for 82 miles from Quebec to Garneau Jct., with a five mile branch to the Quebec bridge, and a 7½ mile line from Limoilou to the Montmorency River.

Ha Ha Bay Ry.—2,000 acres a mile for line north of Chicoutimi, 4 miles, and a 12 mile line through Laterriere towards Lake Kenogami. (See Roberval-Saguenay Ry., April, pg. 139.)

Indian River Ry.—3,000 acres a mile for line from north end of Lake Megantic to the International Boundary, 19 miles. (May, 1912, pg. 238.)

Interprovincial & James Bay Ry.—4,000 acres a mile for line from the present C.P.R. terminus at Gordon Creek to Ville Marie, 50 miles.

James Bay & Eastern Ry.—4,000 acres a mile for line from Roberval westerly towards James Bay, 30 miles.

Joliette & Lake Manuan Ry.—4,000 acres a mile for a line from Joliette in the direction of Lake Manuan, 60 miles. (Feb., pg. 49.)

Kamouraska & L'Islet Ry.—2,000 acres a mile for line from River Ouelle wharf on the St. Lawrence River to the National Transcontinental Ry. at St. Perpetue, 25 miles.

Little Nation Ry.—3,000 acres a mile for line from Chenerville to Lake Nominig near the C.P.R., 30 miles. (July, 1913, pg. 331.)

Metabetchouan Ry.—1,000 acres a mile for line from Lake Audette to St. Andre, on the Metabetchouan River, 13 miles.

Napierville Jct. Ry.—2,000 acres a mile for line from St. Constant to the International Boundary, 27.25 miles. (See Delaware & Hudson Co., Jan., pg. 11.)

North Ry.—2,000 acres a mile for line

from Montreal to the National Transcontinental Ry., 837 miles west of Moncton, N.B., 200 miles; and 5,000 acres a mile for line in extension of the above to the mouth of the Nottaway River, on James Bay, 300 miles. (May, 1915, pg. 171.)

North Shore Power, Ry. & Navigation Co.—3,000 acres a mile for line from Seven Islands Bay to Clarke City on St. Marys River, 15 miles.

Northern Colonization Ry.—3,000 acres a mile for line from Mount Laurier, 100 miles, in the direction of Lac des Turge.

Orford Mountain Ry.—2,000 acres a mile for line from Bolton via Mansonville to the International Boundary, 10.66 miles; from Windsor Mills to Brampton Falls, 8 miles; and from the Melbourne railway crossing into the Village of Melbourne, 3.50 miles.

Quebec & Lake St. John Ry.—3,000 acres a mile for line from Valcartier to St. Catharines; from Valcartier towards Gosford, 4.50 miles; and a 12 mile extension of a branch line to Valcartier.

Quebec & Saguenay Ry.—3,000 acres a mile for a line from St. Joachim to Nairn Falls, 63 miles, and thence to Ha Ha Bay, 72 miles. (Nov., pg. 422.)

Quebec Central Ry.—3,000 acres a mile for a line from mileage 30 beyond St. George to mileage 31.34, and 2,000 acres a mile for a further distance of 25 miles easterly. (April, pg. 139.)

Quebec Eastern Ry.—2,000 acres a mile for a line from Chaudiere Jct. to Levis, 120 miles; from Ste. Agathe to Lyster, 10 miles, and from Ste. Agathe to Black Lake, 30 miles. (May, 1913, pg. 220.)

Quebec, Montreal & Southern Ry.—2,000 acres a mile for a line from Ste. Philomene towards Levis, 52.66 miles, and from Becancourt to the St. Lawrence River, 3.37 miles. (See Delaware & Hudson Co., Jan., pg. 11.)

Roberval-Saguenay Ry.—3,000 acres a mile for a line from the junction at Jonquieres Jct., of the Ha Ha Bay Ry. and the Quebec & Lake St. John Ry., crossing the Saguenay River, and extending to the north of Lake Mistassini, 80 miles. (April, pg. 129.)

Richmond, Magog & Stanstead Ry.—2,000 acres a mile for line from Richmond, passing through Magog, to Stanstead, 55 miles, with a branch from Cherry River to Waterloo, 20 miles.

Richmond to Drummondville.—2,000 acres a mile for line from Richmond or Melbourne to Drummondville, 27 miles.

St. Charles & Huron River Ry.—2,000 acres a mile for line from Lorette on the Quebec & Lake St. John Ry. to Stoneham, 7.5 miles.

St. Leonard to Duddeswell.—2,000 acres a mile for line from St. Leonard, on the Intercolonial Ry., to a junction with the Quebec Central Ry. and the Maine Central Rd. in Duddeswell Tsp.

Accidents to G.T.R. Employes.—H. G. Kelley, Vice President, G.T.R., has issued a message to employes as follows: "There has been a gratifying reduction in the number of employes injured. This improvement, it is believed, is due largely to the exercise of care and diligence, which is expected as a matter of course from railway men. The management, however, takes this opportunity to express grateful appreciation to officers and employes whose fidelity to duty has made this announcement possible."

Railway Development, Projected Lines, Surveys, Construction Betterments, Etc.

Atlin Ry.—The Dominion Parliament has extended for two years the time within which the company may start the construction of its projected railway from Atlin, or the southern end of Atlin Lake, southerly to where the Falcon River intersects the International Boundary, B.C. (Mar., pg. 106.)

Burrard Inlet Tunnel & Bridge Co.—The Dominion Parliament has extended for two years the time within which the company may build its proposed bridge and tunnel at Burrard Inlet, Vancouver, B.C., and the connecting railways. (Feb., pg. 49.)

Canadian Pacific Ry.—It is said that the construction of stock yards at Saskatoon, Sask., will be started at an early date.

A press report states that a six stall addition to the locomotive house at Weyburn, Sask., is to be erected at an early date. The new ice house at Weyburn is reported to be partially completed.

Grant Hall, Vice President and General Manager, Western Lines, is reported to have informed a deputation from the district to be served by the proposed Retlaw-Suffield line, that it is expected to have an appropriation for its construction in the estimates for 1917. (April, pg. 138.)

Canton & Grand Lake Ry.—The New Brunswick Legislature is being asked to give authority to build a railway from Canton, on the National Transcontinental Ry., to Flower Cove on the St. John River, to open up a new coal mining area. (April, pg. 139.)

Edmonton, Dunvegan & British Columbia Ry.—Tracklaying on the Grand Prairie Branch, extending from Spirit River to Grand Prairie, 60 miles, was completed Mar. 29, when there was a popular celebration at the track end. W. R. Smith, General Manager and Chief Engineer, is reported to have stated that ballasting would be rushed to completion, and that two trains a week in each direction, would be operated between McLennan and Grand Prairie City, at as early a date as possible. (Mar., pg. 106.)

Edmonton & South Western Ry.—The Dominion Parliament has incorporated a company with this title to build a railway from Edmonton, southwesterly to the Blue Rapids on the Saskatchewan River, 70 miles. This railway is projected in connection with a power development company, which secured an understanding with the Edmonton City Council respecting a contract. The bylaw authorizing the council to enter into a contract with the company was approved by the ratepayers in 1915, and was after considerable discussion finally passed by the council, and steps were taken to have it ratified by the Legislature. Subsequently the council rescinded the bylaw, and notified the Alberta Legislature that it was no longer a party to the bill for the ratification of the bylaw. The resulting tangle has not been straightened out. (See Hydro Electric Power Projects at Edmonton, April, pg. 155.)

Farnham & Granby Ry.—The Dominion Parliament has extended for two years the time within which the company may build its projected railway from Farnham, on the C.P.R., to Granby, and thence to Windsor Mills or Montreal, Que. C. L. Hervey, M.Can.Soc.C.E., Montreal, is one of the provisional directors. (Nov., 1915, pg. 437.)

Grand Trunk Ry.—Preparatory work is

being done at Bathurst St., Toronto, for the erection of a new bridge across the railway tracks.

The company proposes to build a new station at Ferguson Ave., Hamilton, Ont., at an estimated cost of \$8,000. (April, pg. 138.)

Grand Trunk Pacific Ry.—The Board of Railway Commissioners has ordered the company to build an interchange track between its spur to the Government elevator, and the G.T.R. Outlook Branch at Moose Jaw, Sask., by June 1. The cost of building and maintaining the track is to be apportioned by the commissioners at the next sitting in Moose Jaw. (Mar., pg. 106.)

Great Northern Ry.—A press report states that it is proposed to start construction at an early date on a line 14 miles long to connect the present Cloverdale-Abbotsford line with the Canadian Northern Pacific Ry. at Sam's Landing, B.C.

The building line for the station building on the False Creek site, 375 ft. east of Main St., has been finally approved by the Vancouver City Council. The question of the cost of the station building, which has been raised by the B.C. Government, the Council decided, was not one with which it had to do. A contract for the erection of the station is reported to have been let to Grant, Smith & McDonnell, who will start work at once. F. L. Townley, Vancouver, is the architect in charge. The plans provide for a structure of two units, a main building with terminal facilities on the main floor, and office accommodation above, and an L wing containing the baggage, mail and express offices and rooms. The building will be of brick with terra cotta trimmings. The main structure will be 235 x 60 ft., and the L will be 130 x 42½ ft. There will be a glass covered concourse leading to 11 sets of tracks, and in the centre of the main building will be a domed waiting room which will reach up above the roof of the two storied wings. The open space to Main St., 375 ft., will be laid out in grass and shrubberies.

Application is being made to the Board of Railway Commissioners for approval of an agreement dated Nov. 6, 1915, whereby the Victoria, Vancouver & Eastern Ry. & Navigation Co. grants the Canadian Northern Pacific Ry. joint and equal use in common, of the main and passenger tracks (subject to certain reservations), and the train, standing and industrial spurs, from the north approach of the Fraser River bridge at New Westminster, to the junction of the two companies' tracks at the east boundary of the C.N.P.R. property at False Creek, Vancouver, subject to all exceptions and upon terms set out in the agreement. (Mar., pg. 107.)

Hudson Bay, Peace River & Pacific Ry.—A press report states that it is proposed to start some construction on this projected railway from Winnipeg along the east shore of Lake Winnipeg, at an early date, but it is not stated where work will be started. Some time ago the company asked the Transcona City Council for concessions in that city for terminal purposes, but the project was not favorably entertained, and nothing has transpired since as to the company's proposal for terminals. Although it is reported that the New York syndicate interested "has a backing of \$200,000,000," it is not thought likely that anything will

be done in the way of construction at present at least. The route and other plans have not yet been approved by the Minister of Railways and the Board of Railway Commissioners. (May, 1915, pg. 171.)

Intercolonial Ry.—We are officially advised that the plans for the new station at Levis, Que., are being revised, and that no work will be undertaken in connection with the project until the revision is approved.

Joliette & Lake Manuan Colonization Ry.—The Dominion Parliament has extended for two years the time for the construction of this projected railway from Joliette northerly to Lake Manuan and the National Transcontinental Ry., and from Joliette southerly to Montreal. (Feb., pg. 49.)

Kettle Valley Lines.—The Dominion Parliament has extended for two years the time for the construction of a number of branch lines, and has confirmed an agreement made with the Vancouver, Victoria & Eastern Ry. and Navigation Co., respecting joint sections of railway. Under the terms of the agreement dated July 19, 1914, the latter company has constructed a railway from the headblock of the east switch of the K.V. lines at Princeton to the headblock of the west switch of the K.V. lines at Otter Summit, and the agreement provides for the use of the same by the K.V. Lines, on payment of 5% on the ascertained cost of construction. The agreement provides what each company may do on the joint section, and is to run for 999 years. It is endorsed for the K.V. Lines by the C.P.R., and for the V.V. & E. Ry. and N. Co., by the Great Northern Ry., U. S. (Feb., pg. 49.)

Lake Huron & Northern Ontario Ry.—There was a discussion in the Ontario Legislature April 7, on a motion not to renew or extend the time within which the company might earn the right to purchase land estimated at 1,230,000 acres, as provided in the statutes of 1913, chap. 134. It was explained that under the provisions of the act the company had a certain time within which to extend its railway from the present terminus at Rock Lake, to the National Transcontinental Ry., and that in order to earn the right to take up the land, a certain number of settlers had to be brought into the area, a certain sum expended upon development and other conditions fulfilled before any areas of land were sold, and before a price was fixed. The government was not, it was stated, taking any risk in the matter. The time limit fixed would expire within a few months, and there need be no worry about extensions of it. The motion was thereupon withdrawn. (April, pg. 138.)

Michigan Central Rd.—A press report states that the company proposes to expend about \$250,000 upon a new locomotive house, etc., at Montrose, Ont., during this current year. (Sept., 1915, pg. 310.)

National Transcontinental Ry.—The car shops at Quebec have been completed, and are reported to be ready for the installation of the machinery. The electric power plant is to be operated by steam, and the plant for this purpose is being installed. It is expected that the shops will be used at first for repair work only. (April, pg. 138.)

Ontario Niagara Connecting Bridge Co.—The Dominion Parliament has incorporated a company with this title to build

a bridge across the Niagara River, with connecting railways, in connection with a company incorporated for a similar purpose in New York State. It is said that this company is being promoted by Canadian Northern Ry. interests to connect up the Toronto, Niagara & Western Ry. or the Niagara, St. Catharines & Toronto Ry., or both of them, with the railways in the U. S. (April, pg. 139.)

Pacific Great Eastern Ry.—The Minister of Railways for British Columbia answered a large number of questions relating to the cost of building this railway, in the Legislature April 4. The really important fact stated was that it was estimated that the total cost of completing the line from the Second Narrows of Burrard Inlet to Prince George, 479.6 miles, would be \$11,463,730.11. (April, pg. 138.)

Pacific, Peace River & Athabaska Ry.—Negotiations are reported to have been carried on since early in March between C. A. Law, Vancouver, representing the promoters of the P., P. R. & A. Ry. to obtain a government guarantee of bonds for \$35,000 a mile from the British Columbia Government for building a railway from Prince George into the Peace River country, as a part of its railway. The projected line from Prince George would connect with the projected main line at Kitimat Arm on the Pacific Ocean, at Hudsons Hope on the Peace River, and would be 150 miles long. (May, 1915, pg. 171.)

Peace River Tramway & Navigation Co.—The Dominion Parliament has extended for two years the time within which the company may build its projected railways to connect up certain stretches of navigation on the Peace River, Alta. This is one of the projects which are being worked out in Alberta and Northern British Columbia, in which Baron Rhondda (D. A. Thomas), of Cardiff, Wales, is interested. (April, pg. 138.)

Prince Edward Island Car Ferries.—Work in connection with the car ferry terminals at Carleton Point, P.E.I., has been opened up for the season. There are reported to be seven concrete cribs yet to be placed on the pier to form the berth for the vessel, together with considerable other work. The work is expected to be completed by Dec. 1. There is about half a mile of the branch railway yet to be built to connect the terminals with the island railway system. The main part of the branch line was graded and two miles of track laid to Carleton Point in 1914. (April, pg. 139.)

Quebec & Saguenay Ry.—The Premier stated in the House of Commons, April 4, that representations had been made to the Government from time to time with regard to the desirability of completing this railway, because a very large part of the expenditure which would make it serviceable had already been made. There was no announcement, however, to be made at present, and no decision had been reached by the Government with regard to it. (Nov. 1915, pg. 422.)

St. John & Quebec Ry.—A delegation representing the New Brunswick Government waited on the acting Minister of Railways at Ottawa, April 5 in connection with the construction of this railway. The point at issue is the route to be followed from St. John to Gagetown. As originally planned, the route would carry the line across the St. John and Kennebecas Rivers, by two bridges which it is estimated would cost about \$3,000,000. These bridges were to have been built by the Dominion, and leased to the railway company. Recent surveys show that,

owing to the nature of the river bottom, it would be a difficult matter to erect the bridges, and it is recommended that their construction be abandoned, and a new route laid out along the west bank of the St. John River, via Westfield, thus giving the line temporary entry into St. John over the C.P.R. The negotiations between the two governments are progressing. (April, pg. 139.)

Canadian Government Railways Officials, Salaries, Etc.

In reply to questions in the Senate recently, respecting the position and salaries of certain Canadian Government Railways officials, Senator Lougheed said: "F. P. Gutelius is Manager of the Canadian Government Railways, in which the Eastern Division of the National Transcontinental Ry. is included. His salary is \$20,000 a year.

"W. H. Ferguson, M.D., is Chief Medical Officer. The position is a new one, rendered necessary by the enlargement of the Government Railways system, by the taking over for operation of the National Transcontinental Ry., the Grand Trunk Pacific Ry.'s Lake Superior Branch, the International Ry. of New Brunswick, the New Brunswick & Prince Edward Island Ry., the St. John & Quebec Ry., the Dartmouth to Deans branch, in addition to the Intercolonial Ry. and the Prince Edward Island Ry. His salary as Chief Medical Officer of the Employes' Relief and Insurance Association is \$500; as Chief Medical Officer of the Provident Fund, \$1,000; as Chief Medical Officer of the C.G.R., \$1,000, total \$2,500. Dr. Ferguson has supervision of all medical work on the Ry.'s, personally looks after work on the railways, personally looks after all serious damage claims for alleged injuries and passes on all claims on the Insurance Association or Provident Fund."

Demurrage Charges on Privately Owned Cars on Private Sidings.

The Assistant Chief Railway Commissioner, D'Arcy Scott, has given the following judgment:—The Board have been asked to give a ruling on the application of Car Service Rule 12 to the following facts: The Nichols Chemical Co., Ltd., of Toronto, owns a number of private cars specially constructed for the transportation of acids. The railway companies pay $\frac{1}{4}$ c a mile hauled to the owners of such private cars for the use of the cars. It was contended by the company that the tank cars used for the transportation of acids are different from any other class of cars in that the unloading connections often become corroded and buyers are unable to unload without the assistance of the shippers. The consignees have sometimes to send to the Chemical Co. for men to repair the outlet pipes, they being afraid to allow their own men to make the necessary repairs on account of the nature of the material. The Chemical Co. is, therefore, agreeable to leave its cars with consignees till they can be conveniently unloaded. The cars are unloaded on the private sidings of the consignees. It was contended by the Chemical Co. that its cars were leased to its consignees till released by the consignee after being unloaded, but I have been unable to get evidence in substantiation of that statement. Where delays over the free time have occurred in unloading, the railway companies have charged the consignee demurrage.

Canadian Car Service Rule 12 is as follows:—"When both cars and tracks are owned by the same private party, no car service tolls shall be charged." These cars are not owned by the consignee and therefore are not exempt under this rule from the usual demurrage charges. The object of the car service rules is not to secure additional revenue for the railways so much as to bring about the prompt release of cars so that they may be available for other shipments. This applies to privately owned cars as well as cars owned by railway companies.

If the contention of the Chemical Co. that more free time is required for the unloading of these cars because of the liability of the outlet pipe to corrode is to be pressed, then its application should be to amend the Car Service Rule accordingly. I think on the present application the parties might be informed that Rule 12 does not exempt the consignees of the Chemical Co. from the payment of demurrage.

Cost and Speed of Constructing Rogers Pass Tunnel.

By J. G. Sullivan, Chief Engineer, Western Lines,
Canadian Pacific Ry.

Since writing the paper (printed on pgs. 169 to 171 of this issue), I have been asked by several persons to give the figures showing the cost of driving this tunnel on the method adopted. The work has proceeded far enough now that we can state with safety that the cost of driving this tunnel through rock, including in this price the cost of driving 19,610 lin. ft. of pioneer tunnel, 12 cross cuts, each 40 ft. long, installation of plant, including freight on it, the proportionate cost of building 5 miles of railway tracks, and other overhead charges, plus 10% on all expenditures, will amount to a little less than \$5 a cubic yard for tunnel excavation in the tunnel proper. This is just about half the amount bid by contractors who proposed to use the European method, and who required a time limit of from 42 to 48 months.

The progress of the work up till Apr. 15 is as follows: The drilling for the enlargement has all been completed during the past week. The plan was to continue the pioneer tunnels until such time that the work required to remove the centre heading between the last two cross cuts, and to drill for the enlargement between these cross cuts, would be completed before the steam shovels had the enlargement completed up to the last cross cut, for the reason that after the steam shovel passed the last cross cut, drilling could not be done for the enlargement without carrying air pipes over the muck pile in front of the shovels. This work was carried out on schedule time, with only 10 or 15 days to spare.

On April 15 the enlargement from the west end had reached a point 150 ft. east of cross cut no. 6. The shovel doing the enlargement from the east end had reached a point 130 ft. east of cross cut no. 6 from the east pioneer, leaving 4,604 ft. to be completed between shovels at this date. During March, 1916, the steam shovels on the west end advanced 1,050 ft., or at the rate of over 2.3 miles a year, in a single heading.

The Eastern Canadian Passenger Association's territory has been changed to embrace territory in Canada east of and including Armstrong, Port Arthur and Sault Ste. Marie, Ont., and the St. Clair and Detroit Rivers.

Freight and Passenger Traffic Notes.

The C.P.R. put into effect April 4, reduced fares for farm laborers from Pacific Coast points to the prairie provinces.

The Grand Trunk Pacific Ry. has arranged with the Saskatoon Taxicab Co., Ltd., to operate a passenger transfer between South Saskatoon station and the hotels in Saskatoon.

It is reported that a daily train service will be put on the Canadian Northern Ry., between Vancouver and Edmonton, June 1, replacing the present tri-weekly service; and that an extra train to take care of the increasing local traffic will be put on between Vancouver and Hope, B.C.

The Kent Northern Ry., which has hitherto operated its trains daily, Sundays excepted, between Kent Jct. on the Intercolonial Ry. and Richibucto, N.B., has put in force a new schedule, giving a service on Mondays, Wednesdays, Fridays and Saturdays only.

The Canadian Northern Ry. has been ordered by the Board of Railway Commissioners, to furnish a tri-weekly train and mail service on its Winnipegosis Branch from June 1 to Sept. 15, when the company may, if it so desires, reduce the service to a semi weekly one.

The Quebec Central Ry. has extended its Chaudiere subdivision from St. Camille, the former terminus, to Daaquam, 10 miles, and to English Lake, 19 miles. There are three trains a day from Valley Jct., the connection with the main line, to St. Camille, and an accommodation train from St. Camille to English Lake, on Tuesdays, Thursdays and Saturdays.

The C.P.R. has issued new rate cards showing increases made in fares to single trip rates on its steamship from Seattle, Wash., Victoria and Vancouver, B.C., to Alaskan points. The rates are increased \$2 on the first class rates to Ketchikan and \$3 to Juneau, Wrangel and Skagway, and \$2 on second class fares to Skagway and Juneau, and \$1 to Wrangel and Ketchikan.

C. H. Nicholson, Manager Grand Trunk Pacific Steamships, is reported to have said that an official courier will be attached to each of the company's steamships running to Alaska, after June 1. The couriers will be thoroughly acquainted with Alaska and the Yukon, and their special duty will be to entertain, and give information to travellers going into the country.

The Chicago, Milwaukee & Pacific Ry., through its connection with the Bellingham Bay & Northern Ry., reaches the International Boundary at Sumas, Wash., where a connection has been made with the British Columbia Electric Ry. An arrangement has been made with the B.C. Government by which the C.M. & St.P.R. cars run over the Fraser River bridge at New Westminster. The B.C.E.R. is handling the traffic for the C.M. & St.P.R. into New Westminster and Vancouver.

The C.P.R. announces that a daily train service will be inaugurated, via the Kettle Valley Lines, between Vancouver and Nelson, June 3. This is possible owing to the completion of the K.V.R. Coquehalla Valley section, extending from Hope to Otter Summit. A train will leave Vancouver every evening, reaching Nelson on the following evening, and a train will leave Nelson every morning, reaching Vancouver on the following morning. It takes practically two days to make this trip at present via the Arrowhead and Slocan Lakes.

Canadian Government Railways Construction and Betterments.

Speaking of capital expenditure on permanent betterments and on new works for the development of service on the Intercolonial and Prince Edward Island Railways, the acting Minister of Railways said in the House of Commons recently: "There was in last year's estimates a vote of \$9,290,650 for capital expenditure. The estimated expenditure under this head is expected to be about \$7,100,000. One of the most important and necessary works undertaken has been the strengthening of bridges to allow the use of the heavier power rendered necessary by modern railway practice. This work will, it is expected, be completed during the fiscal year ending Mar. 31, 1917. Additional facilities for the economical handling of business have been provided at 27 points. About 5 miles of double tracking between Chaudiere Jct. and St. Romuald have been completed. Diversions of the line between Nelson and Derby Jct., as well as a diversion between North Sydney and Leitches Creek (4.3 miles), have been completed. Pier 2 at Halifax is completed and in use. The subway at Moncton is practically completed. The car ferry Scotia, 2 has been delivered and is in use, and the Bathurst spur line has been completed. The Levis coaling plant has been completed, and is in operation.

"When improvement of the terminals at Halifax and St. John was first considered by the Minister with a view to the necessity of providing for the future increase in the business of the Government Railways, we all agreed that it was necessary that some provision should be made to properly take care of the increasing development of the Dominion, and this is more than ever true now that we have the National Transcontinental under Government control, and my own opinion is that the necessity for this terminal work is much greater than ever before, and the work of providing the required accommodation is being pressed as fast as possible. The situation so far as Halifax is concerned is as follows: Sections 1 and 2 of the railway from Rockingham to Jubilee House, His Majesty's lumber yard and Reid Rock in Halifax Harbor, are under construction for a total distance of 7½ miles. Work to the value of \$1,574,834.71 has been done. Good progress is being made on the first unit of docks, and 6,500 ft. of quay walls have been dredged and filled. Also substructures for buildings, sewers, etc., have been completed. Work to the value of \$1,349,119.64 has been done, and the work is about 30% completed. The unit should be finished by Nov. 1, 1917. The expenditure in connection with the Cook Construction Co. and Wheaton Bros. contracts has been \$1,574,834.71, and in connection with Foley Bros., Welch, Stewart and Fauquier's contract, \$1,349,119.64. On the opposite side of the harbor at Halifax, from the town of Dartmouth, we have completed the construction of a railway locally known as the Dartmouth to Deans branch and which at present extends to Upper Musquodoboit, 67 miles. The contract for this work was let to M. P. & J. T. Davis in Feb. of 1912, and was completed in January last. There still remains a number of station buildings to be erected, tenders for which are being called for by the department. A triweekly service has been installed by the Intercolonial Ry. since Jan. 1, 1916.

The total expenditure to Jan. 3, 1916, was \$2,189,485.81. This has been on construction and chargeable to capital account. The work being done at St. John is being carried on by the Public Works Department.

"The work connected with the provision of a car ferry service to Prince Edward Island has not made such progress as was desired and expected. The New Brunswick & Prince Edward Island Ry. has been acquired and is being put into shape to form an adequate link between the main line of the Intercolonial and the ferry landing, at the P.E.I. Ry. The contract with Armstrong, Whitworth Co. was satisfactorily completed, and the car ferry Prince Edward Island was delivered during the summer notwithstanding war conditions. The situation has not been as satisfactory with respect to the terminal works. At the outset a season was lost at Carleton Point through the default of those to whom the contract for this terminal was at first awarded. Further serious delays have resulted from the stormy weather and exposed conditions under which the work has necessarily had to be carried on. With the advance of the breakwater these conditions improve. At Cape Tormentine the principal work remaining to be done is the completion of the breakwater, the dredging, and the placing of riprap on exposed faces of the pier head. At Carleton Point several more cribs are necessary to complete the car ferry landing, some dredging has to be done, and further work done on the breakwater and rock approach pier. The contract for the steel transfer bridges, to connect the car ferry's deck with the pier, has been let, and works are ready for their reception. The total estimated cost of the car ferry and terminals is \$2,850,000, of which \$1,975,000 has been expended."

National Transcontinental Ry. Operation.—The Premier stated in the House of Commons, Mar. 31, that the operation of the National Transcontinental Ry. from Moncton to Winnipeg, by the government could not be a permanent arrangement until the government had entered into an agreement to take over the road and to relieve the Grand Trunk Pacific Ry. from its operation. No such agreement had been made, and the government had no power to make one without the authority of Parliament.

Canadian Society of Civil Engineers.—At the regular monthly meeting in Montreal, April 13, John Murphy, chairman of the Ottawa Branch, gave an informal talk, illustrated by views, describing his trip over the Panama Canal, and referring particularly to the difficulties of earth slides in the Culebra Cut. Lt.-Col. F. A. Snyder described an original diagram for making military scales for interpolation of contours and reduction and enlargement of maps.

Canadian Railway Club.—At the monthly meeting in Montreal April 11, S. J. Sarjant, M.I.C.E., ex-Locomotive Superintendent, Great Indian Peninsula Ry., read a paper on the railways of India, which was illustrated by stereopticon views.

The C.P.R. has put in operation a rule to compel passengers to show their tickets on boarding trains at all terminal points on its western lines.

Railway Rolling Stock Notes.

The Canadian Pacific is going to purchase 26 steel ore cars, 2 scale test cars and 2 ditchers.

The Canadian Northern has received 5 mail cars, nos. 4000 to 4004, from Preston Car & Coach Co.

The Canadian Government Railways has been voted \$1,100,000 to expend on rolling stock during this fiscal year.

The Canadian Cement Co. has received 12 narrow gauge charging cars and 30 narrow gauge ingot cars from Canadian Car & Foundry Co.

Canadian Government Railways have received one consolidation freight locomotive for the Intercolonial Division, from Canadian Allis-Chalmers, Ltd.

The Canadian Pacific is building the following rolling stock at its Angus shops, Montreal: 12 steel mail cars, 4 steel baggage cars, 1 steel dining car, 1 steel mail and express car, 100 passenger refrigerator cars, 302 freight refrigerator cars, 1,399 box cars, 28 stock cars, 180 automobile cars, 1 auto furniture car, 3 furniture cars, 20 steel coal cars.

The Canadian Pacific has given orders for the conversion of cars at its Angus shops, Montreal, as follows: 4 sleeping cars to cafe parlor cars, 8 sleeping cars to parlor cars, 4 parlor cars to smoking cars, 6 first or second class cars to baggage and smoking cars. Four cafe parlor cars, 8 parlor cars and 48 sleeping cars, heretofore gas lighted, are to be electric lighted. Twelve combination cars are to be electric lighted.

The acting Minister of Railways stated in the House of Commons, April 5, that the Canadian Government Railways leased locomotives recently as follows:— From the C.P.R., at \$13.50 a day; from

Canada Iron Foundries, Ltd., and the Bangor & Aroostook Rd., at \$15 a day. These locomotives have an effective tractive capacity of 27,000 lbs. for C.P.R. locomotives, 37,000 for Canada Iron Foundries locomotives, and 23,152 for Bangor & Aroostook Rd. locomotives.

Canadian Car & Foundry Co. has received an order from the French State Railways, for 1,000 high sided gondola cars, type L.F.C., to be fitted with brakeman's cab and hand screw brake gear. Following are the chief details:

Length of underframe.....23 ft. 11 1/2 ins.
Length inside box.....21 ft. 7 1/2 ins.
Width inside.....8 ft. 2 3/4 ins.
Depth inside.....4 ft. 9 ins.
Car type.....Steel underframe and wood siding
Wheels, no. and details.....4 with cast steel centres and tires, 41 1/2 ins. diar.
Axles.....6 1/2 ins. diar.
Journals.....5 1/2 by 9 13/16 ins.

The Algoma Eastern Ry. has ordered 2 consolidation locomotives from Canadian Locomotive Co. Following are the chief details:—

Weight on drivers.....175,400 lbs.
Weight, total.....200,400 lbs.
Wheel base, rigid.....15 ft. 10 ins.
Wheel base, engine, total.....24 ft. 4 1/2 ins.
Wheel base engine and tender.....53 ft. 6 1/4 ins.
Heating surface, firebox.....161 sq. ft.
Heating surface, tubes.....2,078 sq. ft.
Heating surface, total.....2,239 sq. ft.
Driving wheels, diar.....56 ins.
Driving wheels, centres.....Cast steel
Driving journals, diar. and length.....9 and 9 1/4 by 12 ins.

Cylinders, diar. and stroke.....22 by 28 ins.
Boiler, type.....Radial stayed
Boiler pressure.....200 lbs.
Tubes, no. and diar.....206-2 ins.; 28-5 1/2 ins.
Tubes, length.....14 ft. 2 1/2 ins.
Air brakes.....Westinghouse American E.T.6 Superheater.....Locomotive Superheater Co., Type A
Weight of tender loaded.....126,500 lbs.
Tank type.....Water bottom
Tank capacity.....5,000 imp. gals.
Coal capacity.....10 tons
Truck type.....Equalizer
Truck wheels, diar.....34 ins.
Truck wheels, type.....Steel tired, cast steel centres
Truck journals.....5 1/2 by 10 ins.
Brake beam.....M.C.B. steel

Canadian Northern Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, for Western Lines, compared with those of 1914-15, from July 1, 1915:

	Gross Earnings	Expenses	Net Earnings	Increase or Decrease
July	\$1,206,100	\$921,200	\$285,100	x\$145,400
Aug.	1,192,800	954,000	238,800	x5,900
Sept.	2,014,500	1,358,000	661,600	1,900
	\$4,413,600	\$3,227,000	\$1,186,600	x\$79,300
Decr.	\$658,300	\$579,000	\$79,300	.....

Mileage in operation at Sept. 30, 1915, 4,965, against 4,670 at Sept. 30, 1914.

Commencing with October, the figures show the earnings of the entire system, both eastern and western lines.

	Gross Earnings	Expenses	Net Earnings	Increase
Oct.	\$3,678,500	\$2,421,500	\$1,257,000	\$537,800
Nov.	3,535,200	2,323,800	1,211,400	618,400
Dec.	3,435,600	2,233,500	1,202,100	768,900
Jan.	2,086,800	1,831,400	255,400	88,100
Feb.	2,089,200	1,959,800	129,400	x193,500
	\$14,825,300	\$10,770,000	\$4,055,300	\$1,841,200
Inc.	\$5,189,300	\$3,348,100	\$1,841,200	.....

February was the worst month in the company's history for operating its business, continuous snow storms and low temperature extending over the entire system caused inconceivable difficulties in maintaining a partial service at very excessive cost.

Approximate earnings for March, \$2,517,000, against \$1,898,500 for March, 1915, and for two weeks ended Apr. 14, \$1,340,900, against \$910,700 for same period 1915.

Canadian Pacific Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, compared with those of 1914-15, from July 1, 1915:

	Gross Earnings	Expenses	Net Earnings	Increase
July	\$7,895,375.47	\$5,094,972.35	\$2,800,403.12	\$978,042.71
Aug.	8,801,451.52	5,359,136.80	3,442,314.72	79,157.02
Sept.	10,273,165.45	5,527,864.81	4,475,300.64	378,252.25
Oct.	13,433,206.88	6,863,780.29	6,579,426.59	3,258,105.79
Nov.	13,351,283.51	6,996,870.48	6,354,413.03	3,710,340.86
Dec.	12,705,673.45	7,003,351.97	5,702,321.48	3,502,797.67
Jan.	8,588,826.04	6,498,417.81	2,090,408.23	954,174.93
Feb.	8,795,830.30	6,501,487.56	2,294,342.74	315,328.12

\$83,854,820.18 \$49,845,882.07 \$34,008,938.11 \$11,216,113.93
Inc. \$15,071,989.17 \$3,855,875.24 \$11,216,113.93

Approximate earnings for March, \$10,228,000, against \$7,700,000 for March, 1915, and for three weeks ended Apr. 21, \$7,402,000, against \$5,090,000 for same period 1915.

Grand Trunk Railway Earnings.

Following are the earnings and expenses for the G.T.R., including the Canada Atlantic Ry., the G.T.W.R. and the D.G.H. & M.R., for February, compared with those for February, 1915.

	1916.	1915.
Earnings	\$3,094,000	\$2,624,400
Expenses	2,546,600	2,210,100
Net earnings	\$ 547,600	\$ 414,300
Grand Trunk Western Railway.		
Earnings	\$ 693,450	\$ 521,900
Expenses	594,450	559,400
Net earnings	\$ 99,000	\$ 37,500
Detroit, Grand Haven & Milwaukee Ry.		
Earnings	\$ 245,300	\$ 178,600
Expenses	246,800	212,800
Deficit	\$ 1,500	\$ 34,200

TRAFFIC RECEIPTS OF THE SYSTEM.

	1916	1915	Increase
G.T.R.	\$9,990,685	\$8,581,996	\$1,408,689
G.T.W.R.	2,094,681	1,665,394	429,287
D.G.H.&M.R.	722,893	560,021	162,872
	\$12,808,209	\$10,757,411	\$2,050,728

Approximate earnings for March, \$4,509,223, against \$4,014,204 for March, 1915, and for two weeks ended Apr. 14, \$2,179,991, against \$1,072,978 for same period 1915.

Grand Trunk Pacific Railway Earnings.

The approximate earnings of the Prairie Section, 916 miles, for March were \$461,107, against \$291,177 for March, 1915. Aggregate for three months ended Mar. 31, \$1,053,069, against \$713,401 for same period 1915.

Grain in Store at Terminal Elevators, Interior Terminal Elevators and at Public Elevators in the East.

Week ending April 14, 1916.	Wheat bushels.	Oats bushels.	Barley bushels.	Flax bushels.	Totals bushels.
Fort William—					
C.P.R.	6,075,129	1,301,626	506,983		7,883,738
Consolidated Elevator Co.	1,277,172	310,422	40,607	108,967	1,737,168
Empire Elevator Co.	1,859,885	649,545	148,350	216,537	2,874,317
Ogilvie Flour Mills Co.	1,411,896	151,449	73,030		1,636,375
Western Terminal Elevator Co.	1,553,281	276,251	45,781	140,778	2,016,091
G. T. Pacific	3,718,017	1,803,509	188,168	122,445	5,832,139
Grain Growers' Grain Co.	1,607,483	480,392	184,271		2,272,146
Fort William Elevator Co.	1,061,270	258,904	55,881	26,020	1,402,075
Eastern Terminal Elevator Co.	1,442,588	478,430	59,312		1,980,330
Port Arthur—					
Port Arthur Elevator Co.	5,415,631	2,638,952	489,477	108,762	8,652,822
D. Horn & Co.	227,759	190,129	27,006	185,842	630,736
Dominion Government Elevator	1,916,878	1,009,900	127,372	93,018	3,147,168
Grain afloat.	2,447,386	974,311			3,421,697
Total Terminal Elevators	30,014,375	10,523,820	1,946,238	1,002,369	43,486,802
Calgary Dom. Govt. Elev.	769,085	591,972	14,624	2,509	1,378,190
Saskatoon Dom. Govt. Elev.	1,514,476	848,020	55,237	146,484	2,564,217
Moose Jaw Dom. Govt. Elev.	2,616,037	517,742	22,771	62,879	3,219,429
Total Interior Terminal Elevators	4,899,598	1,957,734	92,632	211,872	7,161,836
Depot Harbor					
Midland—					
Aberdeen Elevator Co.	5,500	124,250			129,750
Midland Elevator Co.		115,870			115,870
Tiffin, G.T.P.	31,679	862,755	189		894,623
Port McNicoll	826,390	3,926			830,316
Collingwood					
Goderich Elevator & Transit Co.	60,208	15,910			76,118
Kingston—					
Montreal Transportation Co.					
Commercial Elevator Co.					
Port Colborne	9,369	170,764		8,000	188,133
Prescott					
Montreal—					
Harbor Commissioners No. 1		663,831	37,795		1,338,977
Harbor Commissioners No. 2	632,351	540,486	1,391		724,655
Montreal Warehousing Co.	182,778	57,958	5,720		335,160
Quebec Harbor Commissioners	271,482	32,211	41,456		771,226
West St. John, N.B.	697,559				
Halifax, N.S.					
Total Public Elevators	2,717,316	2,587,961	86,551	8,000	5,399,828
Total Quantity in Store	37,631,289	15,069,515	2,125,421	1,222,241	56,048,466

x Corn

Mainly About Railway People Throughout Canada.

Francis J. Hunter, Montreal, has been elected a director of the Reid Newfoundland Co.

Dr. C. M. Sanford, for many years local surgeon for the G.T.R., at Brighton, Ont., died there, Apr. 17.

J. J. Hill of the Great Northern Ry., St. Paul, Minn., telegraphed \$5,000 to the Winnipeg Patriotic Fund recently.

F. C. Salter, European Traffic Manager, G.T.R., London, Eng., spent April at Falmouth, Eng., recuperating after two operations.

Mrs. E. Tiffin, wife of the General Western Agent, Canadian Government Railways, Toronto, has left to spend some time at the Pacific coast.

J. W. Leonard, General Manager, Toronto Terminals Ry. Co., has removed from Montreal and taken a house on Roxborough St. East, Toronto.

J. M. Gibbon, General Publicity Agent, C.P.R., Montreal, has been appointed chairman of the Audit Bureau of Circulations' Canadian Advisory Board.

J. G. Sullivan, M.Can.Soc.C.E., Chief Engineer, Western Lines, C.P.R., Winnipeg, has been elected First Vice President of the American Railway Engineering Association for 1916-17.

Lieut. Wm. Blythe Hanna, 92nd Battalion, 48th Highlander, C.E.F., only son of D. B. Hanna, Third Vice President, Canadian Northern Ry., was married in Toronto, April 21, to Miss M. O. Powis.

F. H. Phippen, K.C., General Counsel, Canadian Northern Ry., returned to Toronto early in April, from Mexico, where he went in connection with some of the enterprises Sir Wm. Mackenzie is interested in.

W. E. Rispin, ticket agent, G.T.R., Chatham, Ont., was advised by cablegram recently that his son-in-law, Major Templeton, of the 48th British Columbia Battalion, had been wounded while on service overseas.

R. J. Mackenzie, of Winnipeg, son of Sir Wm. Mackenzie, President, Canadian Northern Ry., has given the use of Deer Lodge Hotel and grounds, near Winnipeg, for a military convalescent home, rent free, for a term of years.

Capt. C. S. L. Hertzberg, of the Canadian Engineers, C.E.F., son of A. L. Hertzberg, M.Can.Soc.C.E., Division Engineer, C.P.R., Toronto, was invested with the Military Cross by the King at Buckingham Palace, April 16.

Sir Thos. Tait, President, Fredericton & Grand Lake Coal & Ry. Co., was operated on in Montreal, April 8, for a gathering between his left eye and ear. On April 20 he was reported to be convalescing satisfactorily at the Ritz Carlton Hotel, Montreal.

S. J. Montgomery, who has resigned the position of City Passenger Agent, Canadian Northern Ry., Ottawa, has been appointed Manager for Ottawa and district, of the Manufacturers Life Insurance Co.

Walter Maughan, Assistant General Passenger Agent C.P.R., Montreal, has been appointed an honorary lieutenant-colonel in the Canadian Militia, in recognition of services in connection with the movement of troops for overseas service.

The Hon. Frank Cochrane, M.P., Minister of Railways, and Mrs. and Miss Cochrane, who have had an apartment in Washington for several weeks, were to go on to Atlantic City at Easter and are

expected to return to Canada early in May.

W. A. Griffith, formerly secretary to Manager, Natural Resources Department, C.P.R., Calgary, Alta., has been appointed Traffic Assistant, Gold Coast Government Ry., Secondee, West Africa, the appointment being practically for war purposes.

Lieut. Angus R. Sinclair, of the 92nd Highlanders, C.E.F., youngest son of Angus Sinclair, railway contractor, Toronto, while at the front early in April, was slightly wounded in the arm and knee by shrapnel and was taken to Le Toquet Hospital.

B. R. Hepburn, M.P. for Prince Edward, Ont., and formerly President, Ontario & Quebec Steamship Co., who is going overseas as Major of the Forestry Battalion, C.E.F., was entertained at a public dinner at Picton, Ont., recently and given an address and a wrist watch.



G. C. Briggs
Supervisor of Buildings, Eastern Lines, Canadian Northern Railway.

The engagement is announced of **G. A. Suckling**, son of **H. E. Suckling**, Treasurer, C.P.R., Montreal, to Miss **A. M. Angstrom**, daughter of **A. Angstrom**, Naval Architect, Canadian Northern Ry., Toronto. The wedding will take place early in May.

Mrs. W. B. Howard, wife of the District Passenger Agent, C.P.R., Toronto, died at St. John, N.B., Apr. 20. She had been ill for some time, and when Mr. Howard removed from St. John to Toronto a few months ago, she was unable to accompany him, but her death was not expected.

W. E. Mann, a civil engineer, who died at Edmonton, Alta., Mar. 30, from injuries received by falling down an elevator shaft at the Alberta Hotel on the previous evening, was formerly in Grand Trunk Pacific Ry. service as Branch Lines Engineer at Winnipeg, and Division Engineer, Edmonton, Alta.

George Blackbird, who died at the Royal Victoria Hospital, Montreal, March 30, aged 67, was in the G.T.R. service for many years, during which, among other positions, he was Locomotive Foreman at Allandale, Ont., Montreal and Richmond, Que. Since retiring a year or two ago he lived in Montreal. He was buried in Toronto.

William E. Germain, whose appointment as agent, G.T.R., Sarnia, Ont., was announced in our last issue, was born at Gananoque, Ont., Oct. 18, 1870, and entered G.T.R. service in 1888, since when he has been, to 1891, ticket clerk, Petrolia, Ont.; 1891 to 1893, operator, Watford, Ont.; 1897 to March 1916, agent, Alvinston, Ont.

David C. Paisley, who was appointed General Yardmaster, C.P.R., Windsor, Ont., recently, was born at Toronto, Feb. 16, 1881, and entered railway service in 1900, since when he has been, to 1906, switch tender, trainman and yardman, G.T.R.; Aug. 26, 1906, to Sept. 24, 1910, brakeman, C.P.R., London, Ont.; Sept. 24, 1910 to Dec. 20, 1915, conductor, C.P.R., London, Ont.

John Donald McMillan, who has been appointed acting Superintendent, Belleville Division, Ontario Lines, G.T.R., Belleville, was born in Eldon Tp., Ont., Apr. 5, 1858, and entered railway service in March 1876, since when he has been, to Aug. 1878, brakeman, Toronto & Nipissing Ry., Uxbridge and Sutton, Ont.; 1878 to 1910, conductor and rule instructor, G.T.R., Toronto and Belleville, Ont.; 1910 to Apr. 1, 1916, Trainmaster, Lindsay, Ont.

E. J. Wearing, whose appointment as General Agent, G.T.R., Central Vermont Ry. and Canadian Express Co., Liverpool, Eng., was mentioned in a previous issue, was born at Birkenhead, Eng., Nov. 12, 1872, entered G.T.R. service, Jan. 1, 1888, and has since served in all departments of the company's office at Liverpool. He visited Canada from Sept. to Nov., 1911, covering the chief points from Montreal to Prince Rupert, Vancouver and Victoria, in order to become personally acquainted with the handling of freight, passenger and express traffic.

J. L. Reycraft, Solicitor, Manitoba and Saskatchewan Divisions, C.P.R., was born in Orford Tp., Kent County, Ont., June 20, 1868, and was educated at Ridgetown Collegiate Institute and Osgoode Hall Law School, Toronto. He served his articles in Chatham, Ont., and was admitted to the bar in 1896, and practised in Ridgetown until Mar. 1913, when he was appointed Solicitor, Manitoba Division, C.P.R. In July, 1915, he was also appointed Solicitor for the Saskatchewan Division and now has charge of the company's legal business from Port Arthur, Ont., to the western boundary of the Saskatchewan Division.

Baron Shaughnessy's second son, **Capt. Hon. A. T. Shaughnessy**, was killed in action in France, about Apr. 2. He was born at Montreal Oct. 18, 1887, and after completing his education at McGill University, was for some little time in the C.P.R. Traffic Department, leaving there to join the brokerage firm of C. Meredith & Co. He joined the Victoria Rifles in Montreal in 1910, and enlisted for overseas service with the 60th Battalion in June, 1915, and was in command of Company A. He was married in 1912 and is survived by his widow and two children. About ten years ago he travelled round

the world, by the C.P.R., using only that company's steamships and railways. A requiem mass was held at St. Patrick's Church, Montreal, Apr. 19, attended by members of the family, representatives of the Dominion and British Governments, and of all the transportation interests in the city.

G. I. Evans, who has resigned as District Master Mechanic, Districts 3 and 4, Ontario Division, C.P.R., Toronto, has been appointed General Manager, Imperial Iron & Steel Works, Collingwood, Ont. He was born at Montreal in May, 1880, and entered C.P.R. service in Apr., 1900, since when he has been, to Mar., 1906, draughtsman; Mar., 1906, to July, 1910, Chief Draughtsman; July, 1910, to Aug., 1912, Mechanical Engineer; Aug., 1912, to May, 1915, Superintendent, Angus Locomotive Shops, all at Montreal; May, 1915, to Mar., 1916, District Master Mechanic, Districts 3 and 4, Ontario Division, Toronto.

Andrew Duncan Davidson, Land Commissioner, Canadian Northern Ry., Toronto, died at Rochester, Minn., Apr. 22, of acute stomach trouble and frequent hemorrhages. He was born at Glencoe, Ont., May 18, 1853, and entered land business in Minnesota, where he also engaged in banking, and was eventually appointed a Colonel by the State Governor for services in the settlement of Minnesota and Dakota. On his return to Canada in 1905, he was appointed Land Commissioner, Canadian Northern Ry., and has been closely associated with many of the Mackenzie and Mann interests. D. B. Hanna, Third Vice President, C.N.R., attended the funeral at Duluth, Minn.

X. H. Cornell, who has been appointed General Superintendent, Chicago and Alton Rd., Bloomington, Ill., was from 1900 to Dec. 1910, in G.T.R. service at Durand, Mich., first as Chief Dispatcher, then as Trainmaster, and from 1904, as Master of Transportation. From Dec. 1910, to Apr. 1912, he was Inspector of Transportation, Chicago and Alton Rd., and Toledo, St. Louis and Western Rd., Chicago, Ill., and from Apr. to Oct. 1912, was Superintendent of Transportation, same roads. From Oct. 1912, to June 1914, he was Superintendent of Transportation, Pere Marquette Rd., Detroit, Mich., returning to the Chicago and Alton Rd. as Master of Transportation, which position he occupied until his present appointment.

Lewis Ketcham Sillcox, whose appointment as Mechanical Engineer, Illinois Central Rd., Chicago, Ill., was announced in our last issue, was born at Germantown, Pa., Apr. 30 1886, and educated at Trinity School, New York, and at the Institute of Mechanical and Electrical Engineering, Brussels, Belgium. From 1903 to 1906, he was an apprentice, New York, New Haven & Hartford Rd., High Bridge, N.Y.; 1907 to 1909, machinist and assistant superintendent in charge of foundries and machine shops, McSherry Mfg. Co., Middletown, Ohio; 1912 to Apr. 1, 1916, Shop Engineer, Canadian Car & Foundry Co., Montreal, and latterly Mechanical Engineer, Canadian Northern Ry., Toronto.

Charles Ketchum Howard, whose appointment as Commercial Agent, Canadian Government Railways, Boston, Mass., was announced in our last issue, was born at St. Andrews, N.B., Aug. 28, 1877, and entered railway service in Apr. 1893, since when he has been, to 1900, operator and agent, at various points, Atlantic Division, C.P.R.; 1900 to 1901, agent, C.P.R., Brownville Jct., Me.; 1901

to 1906, agent, C.P.R., McAdam Jct., N. B.; 1906 to 1910, agent, C.P.R., Fredericton, N.B.; 1910 to 1911, Superintendent, Aroostook Valley Rd., Presque Isle, Me.; 1911 to 1912, Travelling Freight Agent, C.P.R., St. John, N.B.; 1912 to 1915, Right of Way Agent, St. John and Quebec Ry., Fredericton, N.B.; 1915 to Mar. 1916, agent, Canadian Government Railways, Woodstock, N.B.

W. G. Manders, whose appointment as General Freight Agent, Western Lines, Canadian Northern Ry., Winnipeg, was announced in our last issue, was born at Owen Sound, Ont., July 24, 1876, and entered railway service in Apr. 1897, since when he has been to Feb. 1901, clerk and stenographer, Local Freight Office, C.P.R., Owen Sound, Ont.; Feb. to July 1901, chief clerk, Local Freight Office, C.P.R., Fernie, B.C.; July 1901 to Dec. 31, 1903, clerk, General Freight Office, Canadian Northern Ry., Winnipeg; Jan. 1, 1904, to Jan. 1, 1907, chief clerk in charge of loss and damage and overcharge freight claims, General Freight Office,



E. J. Wearing
General Agent, Grand Trunk Railway System,
Liverpool, England.

C.N.R., Winnipeg; Jan. 1, 1907, to May 1, 1909, chief clerk, Freight Traffic Department, C.N.R., Winnipeg; May 1, 1909, to Feb. 29, 1916, Assistant General Freight Agent, C.N.R., Winnipeg.

David H. Williams, who was appointed Assistant to General Manager, Canadian Government Railways, Moncton, N.B., recently, was born at Toronto, June 22, 1879, and entered railway service, Aug. 1, 1896, since when he has been to June 1, 1901, clerk, and chief clerk to Superintendent, C.P.R., Toronto; June 1, 1901, to Dec., 1902, clerk to General Superintendent, C.P.R., North Bay, Ont.; July, 1903, to Jan., 1905, chief clerk to Superintendent, C.P.R., White River, Ont.; Jan., 1905, to June, 1912, chief clerk to General Superintendent, C.P.R., North Bay, Ont.; June to Dec., 1912, Traffic Manager, Canada Cement Co., Montreal; Dec., 1912, to June, 1913, Superintendent, National Transcontinental Ry., Cochrane, Ont.; June, 1913, to Jan., 1916, chief clerk to

General Manager, Canadian Government Railways, Moncton, N.B.

C. A. Cotterell, who has been appointed Superintendent, District 2, Alberta Division, C.P.R., Lethbridge, was born at Enden, Eng., Jan. 18, 1877. He entered C.P.R. service as a messenger boy at Montreal in June 1888, and in Feb. 1894 was appointed an operator on the Farnham Subdivision, south of Montreal, and until 1898 occupied various positions as operator, relieving agent and station agent on the Eastern Lines, after which he was transferred to the Crownsnest Subdivision and acted as agent at various points and as dispatcher at Cranbrook, B.C. until 1901, when he was transferred to Fort William, Ont., as dispatcher, and subsequently served in that capacity at various points on the Western Lines, and as Chief Dispatcher at Fort William, Ont., Regina and Saskatoon, Sask., and Revelstoke, B.C.; as Trainmaster at Revelstoke, B.C.; Terminal Trainmaster, Vancouver, B.C.; acting Superintendent at Revelstoke, Nelson and Vancouver, B. C., until Sept. 1, 1913, when he was appointed Superintendent, District 2, British Columbia Division, Vancouver, which position he held to Apr. 1, the date of his present appointment.

Dominion Aid Toward Railway Construction.

A series of questions as to grants in aid of the Canadian Pacific, Canadian Northern and Grand Trunk Railways were answered in the House of Commons, recently, by Mr. Blondin. The answers given contained the following facts:—

Canadian Pacific Ry.—Total money paid out by way of subsidy, \$30,369,374.70. Land granted, main line, 18,206,986 acres; Souris Branch, 1,408,704 acres; Pipestone extension, 200,320 acres; total, 19,816,010 acres. Total amount of guaranteed issues, \$3,093,700. This obligation was assumed direct by the Government in Dec., 1906.

Canadian Northern Ry.—Total money paid out by way of subsidy, \$26,155,360.65. Total area of land granted by way of subsidy, 3,422,528 acres. Bond guarantees: Principal and interest of £1,923,287 of 3% 50 year bonds, authorized 1903; principal and interest of £1,622,586 19s 9d of 3½% 50 year debenture stock, authorized 1908; guarantee of securities to an amount not exceeding \$45,000,000 at 4%, of which amount \$3,500,000 have been sold, the remainder being pledged for the purposes set out in the Act, authorized 1914; principal and interest of £7,493,935 12s 4d of 3½% 50 year debenture stock of the C. N. Ontario Ry., authorized 1911; principal and interest of £647,260 5s 6d 3½% 50 year debenture stock of the C. N. Alberta Ry., authorized 1910; principal and interest of £733,561 12s 6d 3½% 50 year debenture stock, N. C. Alberta Ry., authorized 1912.

Grand Trunk Ry.—Subsidy for Victoria Jubilee Bridge, Montreal, \$500,000. No grants of land were voted to the company, neither were there any guarantees of bonds or other issues of securities by the Dominion Government for the G.T.R.

We are officially advised that the rolling stock used on the Intercolonial Ry. and the National Transcontinental Ry. is all being lettered Canadian Government Railways, Intercolonial Division, or Transcontinental Division, as the case may be. The rolling stock on the Prince Edward Island Ry. remains as heretofore, for the present.

Flagging Rules for Impassable Track.

The Board of Railway Commissioners has passed general order 161, prescribing the following regulations for the uniform maintenance of way flagging rules for impassable track:—

1. When the track is found to be impassable due to any obstruction or defect, or before undertaking any work which will render it impassable, trackmen, bridgemen, or other employes of the company shall protect the same as follows:—

2. On all mountain subdivisions, by day, place a red flag supported on two staffs, with flag drawn out between them, at right angles to the track and 5 ft. above rail level; and in addition, by night, a red light on the same side of the track as the engineer of an approaching train, at a point 600 ft., in both directions, from the defective or working points, with two torpedoes placed on the rail, opposite each other, so as to cause but one explosion, 150 ft. in advance of the red signal. Such red signal shall be changed to green and the torpedoes removed as soon as the work will permit; and the said green signal shall be displayed until other protection signals are withdrawn; and send out a flagman in each direction with stop signals at least 1500 ft. in daytime, if there is no down grade towards the obstruction within one mile, and there is a clear view of 6000 ft. from an approaching train; 3600 ft. at other times and places, if there is no down grade towards the obstruction within one mile; 5400 ft. if there is a down grade towards the obstruction within one mile. The flagman must, after going the required distance from the obstruction to ensure full protection, take up a position where there will be an unobstructed view of him from an approaching train of, if possible, 1500 ft., first placing two torpedoes on the rail (not more than 200 nor less than 100 ft. apart), on the same side as the engineer of an approaching train, 300 ft. beyond such position. The flagman must display a red flag by day and a red light by night, and remain in such position until recalled or relieved.

3. On all main lines and on the portions of branch lines over which main line traffic is handled, send out a flagman in each direction with stop signals at least 1500 ft. in daytime, if there is no down grade towards the obstruction within one mile, and there is a clear view of 6000 ft. from an approaching train; 3600 ft. at other times and places, if there is no down grade towards the obstruction within one mile; 5400 ft. if there is a down grade towards the obstruction within one mile. The flagman must, after going the required distance from the obstruction to ensure full protection, take up a position where there will be an unobstructed view of him from approaching train of, if possible, 1500 ft., first placing two torpedoes on the rail (not more than 200 nor less than 100 ft. apart), on the same side as the engineer of an approaching train, 300 ft. beyond such position. The flagman must display a red flag by day and a red light by night, and remain in such position until recalled or relieved.

4. On all other branch lines (a) a flagman must be sent out in each direction, who shall place a red flag supported on two staffs, with flag drawn out between them, at right angles to the track and 5 ft. above rail level; and in addition a red light by night, on the same side of the track as the engineer of an approaching train, at a point 600 ft. from the defective

or working point, with two torpedoes placed on the rail opposite each other, so as to cause but one explosion, 150 ft. in advance of the red signal. Such red signal shall be changed to green and the torpedoes removed as soon as the work will permit, and the said green signal shall be displayed until other protection signals are withdrawn; and provide further protection as follows: (b) By day, place a flag supported on two staffs, with flag drawn out between them, at right angles to the track and 5 ft. above rail level; and in addition a red light by night, on the same side of the track as the engineer of an approaching train, so that it will be clearly in his view at least 3600 ft. from the defective or working point, if there is no down grade towards the obstruction; 5400 ft. if there is a down grade within one mile of the obstruction, or as much further as may be necessary to ensure full protection. (c) Place two torpedoes (not more than 200 ft. nor less than 100 ft. apart) on the rail on the same side as the engineer of an approaching train, 300 ft. in advance of the red signal.

5. Trains stopped by flagman, as per rule 2, shall be governed by his instructions and proceed to the working point signal and there be governed by signal or instructions of the foreman in charge, unless in the meantime stop signal has been removed and proceed signal displayed.

6. Trains stopped by flagman, as per rule 3, shall be governed by his instructions and proceed to the working point signal, and there be governed by signal or instructions of the foreman in charge.

7. Train stopped by flagman, as per rule 4, shall replace the torpedoes exploded and proceed to the working point signal, and from there shall be governed by the signal or instructions of the foreman in charge, unless in the meantime stop signal has been taken down and proceed signal displayed.

8. In the event of a train order protection being provided, yellow flags by day and, in addition, yellow lights by night may be used as markers without torpedoes on the rail, placed 3600 ft. from the defective or working point, and in addition red signals, in both directions, 600 ft. from the defective or working point.

9. When weather or other conditions obscure day signals, night signals must be used in addition.

The foregoing rules are to be printed in the railway companies' working timetables for the guidance of enginemen and trainmen.

Canadian Freight Association, Eastern Lines.

The annual meeting of the association was held at Montreal, Apr. 13, when the standing committees were elected for the current year, as follows:—Advisory—G. H. Shaw, C. E. Dewey, H. E. Macdonell and J. H. Meglemry; Executive—H. E. Macdonell, F. F. Backus, G. Tombs and H. C. Martin; Classification—H. E. Macdonell, G. Tombs, F. J. Watson, E. N. Todd, L. Macdonald, A. O. Secord, G. T. Pettigrew, M. H. Brown, R. E. Perry and James Edward; Freight Inspection—R. W. Long, F. A. Shaw, M. H. Brown, R. W. Youngs, R. J. S. Weatherston, Jas. Edward, G. H. Clark, W. B. Bamford, W. S. Elliott and G. C. Martin.

Proposed Removal of Car Building Plant.

Representatives of the Russian Government have secured an option on the Canadian Car & Foundry Co.'s plant at Fort William, Ont., for a sum in the neighborhood of \$2,500,000, the intention being, if a purchase is effected, to remove it to Russia. The purchase would include the entire plant, buildings and machinery, and everything used in the construction, particularly the steel work, with the exception of the concrete, brick and hollow tile work, together with the machinery, which would be removed to Russia and re-erected there. Russia is very short of railway rolling stock and to partly supply the deficiency has, since war began, ordered 20,000 freight cars in the United States and 2,000 in Canada, delivery of which is being made in knock down form at Vladivostok, where it is to be erected. The Russian Government wants shops there for erection purposes and also for building further rolling stock, and as the Fort William plant is considered the last word in car works construction, it is believed the purchase would be an advantageous one for the Russian Government, and would enable it to obtain the necessary structural steel, etc., much more quickly than from any other source.

The Fort William plant has a capacity of from 50 to 60 cars a day, but has not been operated owing to war conditions. W. W. Butler, Vice President, and K. W. Blackwell, another of the Canadian Car & Foundry Co.'s directors, met the Fort William City Council on April 19 in regard to the matter, when the councillors put themselves on record as being opposed to the plant's removal, although the company is willing to undertake to re-erect it after the war's conclusion.

The Dominion has already assisted Russia by letting it have two icebreaking steamships, and a Fort William icebreaking tug, the J. T. Horne, was sent to Archangel last year. The transfer of the Fort William car building plant would be in line with the policy in regard to icebreaking steamships and would undoubtedly be of great assistance to our Russian allies. It is hoped that Fort William's objections will be got over. If they are not, there is of course the possibility of the plant being commandeered by Government action.

Grain Inspection at Western Points.

The following figures issued by the Department of Trade and Commerce, show the number of cars of grain inspected at Winnipeg and other points on the Western Division for railways, for March, and for seven months ended Mar. 31, with a comparison of the number of cars inspected for seven months ended Mar. 31, 1915.

	March	Seven months* to Mar. 31, 1916	Seven months to Mar. 31, 1915
C.P.R.	10,784	126,854	48,966.9
C.P.R. Calgary	1,600	4,885	5,195
C.N.R.	7,112	65,807	32,279
G.N.R. Duluth	1,081	4,177	1,262
G.T.P.R.	5,220	31,691	12,870
Totals	22,797	232,434	100,572

The United States Lake Survey reports the levels of the Great Lakes in feet above tidewater for February, as follows: Superior, 602.44; Michigan and Huron, 579.57; Erie, 571.99; Ontario, 245.41. Compared with the average February levels for the past ten years, Superior was 0.70 ft. above; Michigan and Huron, 0.53 ft. below; Erie, 0.31 ft. above, and Ontario, 0.31 ft. below.

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The Immensity of the Transporta- tion Interests.

Sir Henry L. Drayton, K.C., Chief Rail-
way Commissioner for Canada, in giving
judgment in March, 1916, on the question
of freight rates on tank and still struc-
tural material from Sarnia to Regina,
said: "There is, of course, another public
interest to be considered, that is, the
transportation interest, possibly repre-
senting, next to the great agricultural
industry of the country, the largest public
interest."

Algoma Central and Hudson Bay Railway Settlement.

A special general meeting of share-
holders at Sault Ste. Marie, Ont., on Mar.
28 ratified a scheme of arrangement be-
tween the company and its creditors,
approved all the steps taken to put the
scheme into effect, and took the necessary
steps to complete and carry out the ar-
rangement.

The company has been in the hands of
receivers for some time pending the ar-
rangement of its finances. This was
finally agreed to and was approved by
the Exchequer Court Feb. 28. The ar-
rangement affects the A.C. & H.B. Ry.
and the Algoma Central Terminals,
Limited, and covers the adjustment of
relations between these two companies;
"the modification and compromise of the
rights of the holders of the bonds of the
companies in respect of the mortgages
respectively securing the same and the
rights of each class of bondholders in
respect of the other for reducing the
existing preference shares of the railway
company from \$5,000,000 to \$2,000,000,
and creating and issuing a new class of
preference shares to the amount of \$3,-
000,000, having rights similar to the pre-
sent issue, and for the formation of a
bondholders' committee and the transfer
to it of the common stock of the said
companies and vesting in it certain rights
and power." This arrangement was ap-
proved by the Dominion Parliament Mar.
14.

In connection with the carrying out of
the arrangement, a meeting of the holders
of the railway company's 5% first mort-
gage 50 year gold bonds was called, to be
held in London, Eng., Mar. 24. Resolu-
tions were submitted to sanction the
scheme of arrangement and readjust-
ment; for the formation of a bondholders'
committee; for the payment of moneys
held by the terminals receiver and the
Supreme Court Accountant to the bond-
holders' committee under conditions set
forth in the agreement; for the payment
of interest on the railway bonds from
June 1, 1914, and interest and sinking
fund on the terminals bonds only if the
joint net earnings permit; for the pre-
servation of the guarantee of the Lake
Superior Corporation endorsed on the
railway bonds, such guarantee not to be
enforced by any single bondholder so long
as the bondholders' committee exists; for
reducing certain preference shares now
outstanding of the value of \$5,000,000 by
60%, and creating a new class of prefer-
ence shares to be distributed three-fourths
to the railway bondholders and one-fourth
to the Terminal Co. bondholders pari
passu; for the exercising of voting pow-
ers of the railway; for the conversion of
the second mortgage bonds of the com-
pany into income bonds; for the modifi-
cation of the lease of the terminals to
the railway company for the operation of
the railways and terminals companies by

two boards of directors and a General
Manager; for the payment of unsecured
creditors, and other necessary detail pur-
poses.

The Dominion Parliament has con-
firmed the agreement between the A.C. &
H.B. Ry., the Algoma Central Terminals,
Limited, and the shareholders and bond-
holders of the company respectively, and
giving power to the companies to carry
out all the terms of the agreements. The
proclamation of the Governor General in
Council, which may be issued upon evi-
dence being produced satisfactory to the
Minister of Railways that he scheme of
arrangement has been properly approved
by the shareholders of the several com-
panies. The scheme of arrangement is
fully set forth in the schedule of the act.

Tests of British Columbia Ties in England.

Canadian Railway and Marine World
for March contained the results of tests
of Douglas fir and red cedar ties from
British Columbia made by the Great
Eastern Ry. of England. We now have
a report on the use of British Columbia
Douglas fir ties on the Great Western Ry.
of England, which is also very satisfac-
tory. The tests on these two great Eng-
lish railways are especially important as
convincing testimony of the work of Brit-
ish Columbia ties for South African,
Indian and Chinese railways, which are
practically controlled by English engi-
neers. The Great Western report follows:

Date placed—May 1, 1898.
Date reported—Sept. 26, 1914.
Time of service—Still in line.
Distance—Down Main Line, 78 m. 8 c. and 78 m.
31 c.
Number of ties—616.
Subgrade soil—Marl and gravel, embankment.
Kind of ballast—Crushed.
Drainage—Good.
Whether ties have been used with spikes or
soleplates for flat bottom rail road; or with chairs
for bull headed rail road—Chairs for bull headed
road.
Rail—92 lbs. per yard, bull headed.
Ties per mile of track—2,142.
Average curve and maximum curve—On curve
of 200 chains radius.
Average grade and maximum grade—1 in 1,660,
falling.
Traffic, tons per annum—Approximately 15,000,-
000.
Kind of wood—Douglas fir.
Size—9 ft. x 10 in. x 5 in.
Class—Highest.
Sawn or hewn—Sawn.
Kind of treatment—Creosoted.
Absorption of preservative per cubic foot—0.8 of
a gallon.
Seasoning—Only kept in stock 9 weeks before
being creosoted as they were dry when received.
Condition of ties at last inspection—Very good,
considering they had actually been in line 16 years
and 5 months.
Number removed—On account of decay, 23; me-
chanical wear, nil; other causes, nil; total number
removed, 23.
Average life—Still in line, present life 17½ years.

Press reports emanating from Mont-
real state that Canada Steamship Lines
Ltd. is purchasing all the steamships,
suitable for freight purposes, which are
offering, that several vessels which have
been running out of Ogdensburg, N.Y.,
have been acquired, and that several
vessels which were not in use last year
for passenger purposes, are being fitted
up for business this season.

George Bury, Vice President, C.P.R., is
reported to have stated at Vancouver
recently that the company had placed
orders in British Columbia for about
10,000,000 ft. of lumber, the principal por-
tion of which is to be used in building
freight cars at Angus Shops, Montreal.

The Canadian Locomotive Co. has ship-
ped 7 decapod locomotives, similar to
those illustrated and described in Cana-
dian Railway and Marine World for Janu-
ary, to the Russian Government.

Lacombe & Blindman Valley Electric
Ry.—We are officially advised that the
company has no definite plans as to fur-
ther construction this year.
Saskatoon Municipal Ry.—Revenue for
March, \$17,690.02; operating and over-
head charges, \$15,177.55; profit, \$2,512.47.
Passengers carried, 344,933, against 237,-
787 for Mar. 1915.

Transportation Appointments Throughout Canada.

The information under this head, which is gathered almost entirely from official sources, is compiled with the greatest care, so as to ensure absolute accuracy. Anyone who may notice any error in our announcements will confer a favor by advising us.

Algoma Central and Hudson Bay Ry.—T. F. RAHILLY, heretofore Travelling Auditor, has been appointed acting Trainmaster, vice W. M. Hugill, enlisted for active service. Office, Sault Ste. Marie, Ont.

Canada Steamship Lines, Ltd.—See under separate heading in Marine Department, pg. 204.

Canadian Northern Ry.—The Engineering Department, Eastern Lines, has been organized as follows:—Chief Engineer, A. F. STEWART; Assistant Engineer, R. A. BALDWIN; Assistant Engineer, E. W. OLIVER; Bridge Engineer, W. P. CHAPMAN; Supervisor of Buildings, G. C. BRIGGS; Chief Draughtsman, W. H. ARMS. The Chief Engineer has charge of all engineering matters, the prescribing of standards and will be in direct charge of new work or special assignments of work not otherwise delegated to the Division officers. All maintenance of way work, including ordinary maintenance of way and structures, continues to be handled under the jurisdiction of the division officers as heretofore. Offices, Toronto.

L. W. BULLER, heretofore agent, has been appointed General Agent, Ottawa, with jurisdiction over the Ottawa Terminal. His duties include those previously carried out by G. A. Hoag, as Assistant Superintendent.

I. G. REECE, heretofore Travelling Passenger Agent, Toronto, has been appointed City Passenger Agent, Ottawa, vice S. J. Montgomery, resigned to enter private business.

G. A. HOAG, heretofore Assistant Superintendent, Ottawa, has been appointed Assistant Superintendent, Toronto District, Ontario Division, vice W. J. Curle, whose appointment as General Superintendent, Chatham, Wallaceburg & Lake Erie Ry., was announced in our last issue. Office, Trenton, instead of Rosedale, Toronto, where the Assistant Superintendent's office was previously located.

H. D. CAMERON, heretofore chief draughtsman, Winnipeg, has been appointed Mechanical Engineer, Toronto, vice L. K. Silcox, whose resignation to enter Illinois Central Rd. service was announced in our last issue.

W. H. LONG, heretofore Car Foreman, Trenton, Ont., has been appointed General Car Foreman, Ontario Division. Office, Toronto.

R. C. GADSBY, heretofore Soliciting Passenger Agent, Toronto, has been appointed Travelling Passenger Agent there, vice I. G. Reece, promoted.

H. J. LeCLAIR, heretofore City Ticket Agent, Toronto, has been appointed Soliciting Passenger Agent there, vice R. C. Gadsby, promoted.

F. G. WARD has been appointed City Ticket Agent, Toronto, vice H. J. LeClair, promoted.

F. L. WILLIS has been appointed Night Locomotive Foreman at Dauphin, Man.

Canadian Pacific Ry.—R. E. HALL, heretofore Storekeeper, North Bay, Ont., has been appointed Storekeeper, Angus Shops, Montreal.

R. V. NICHOLSON, heretofore Bridge and Building Master, Schreiber, Ont., has been appointed Bridge and Building Mas-

ter, Ottawa, Ont., vice F. O'Hara, deceased.

T. H. HAMILTON, heretofore locomotive driver, West Toronto, has been appointed District Master Mechanic, Districts 1, 3 and 4, Ontario Division, vice G. I. Evans, on leave of absence. Office, Toronto.

J. JARRETT, heretofore Storekeeper, Chapleau, Ont., has been appointed Storekeeper, North Bay, Ont., vice R. E. Hall, transferred.

S. A. POTTLE has been appointed Storekeeper, Chapleau, Ont., vice J. Jarrett, transferred.

N. BERGER has been appointed Roadmaster with territory from White River to Schreiber, Ont. Office, Schreiber, Ont.

J. COUGHLIN has been appointed Roadmaster with territory from Schreiber to Port Arthur, Ont. Office, Schreiber, Ont.

R. A. McPHERSON has been appointed Locomotive Foreman, Ignace, Ont., vice A. J. Pentland, transferred.

J. A. MacARTHUR has been appointed Superintendent, District 1, Manitoba Division, vice A. Halkett, transferred. Office, Kenora, Ont.

F. SADLIER, heretofore Shop Foreman, Revelstoke, B.C., has been appointed District Master Mechanic, Fort William, Ont., vice G. Twist, transferred.

A. J. PENTLAND, heretofore Locomotive Foreman, Ignace, Ont., has been appointed Locomotive Foreman, Souris, Man., vice H. J. Reed, transferred.

G. TWIST, heretofore District Master Mechanic, Fort William, Ont., has been appointed District Master Mechanic, Winnipeg, vice A. Brown, transferred.

J. D. MUIR, heretofore Locomotive Foreman, Medicine Hat, Alta., has been appointed Locomotive Foreman, Winnipeg, vice G. Pratt, transferred.

H. B. JACKSON, heretofore Manager, Empress Hotel, Victoria, B.C., has been appointed Manager, Royal Alexandra Hotel, Winnipeg, vice J. J. McGuire, who has left the service.

G. C. GIBSON, heretofore Locomotive Foreman, Strathcona, Alta., has been appointed Locomotive Foreman, Saskatoon, Sask., vice C. A. Perry, transferred.

A. HALKETT, heretofore Superintendent, District 1, Manitoba Division, Kenora, Ont., has been appointed Superintendent, District 2, Saskatchewan Division, vice H. H. Boyd, transferred. Office, Moose Jaw.

W. J. RENIX, heretofore District Master Mechanic, District 1, British Columbia Division, Revelstoke, has been appointed District Master Mechanic, Moose Jaw, Sask.

G. PRATT, heretofore Locomotive Foreman, Winnipeg, has been appointed Locomotive Foreman, Strathcona, Alta., vice G. C. Gibson, transferred.

C. A. COTTERELL, heretofore Superintendent, District 2, British Columbia Division, Vancouver, has been appointed Superintendent, District 2, Alberta Division, vice F. Walker, who is on leave owing to illness. Office, Lethbridge.

C. A. PERRY, heretofore Locomotive Foreman, Saskatoon, Sask., has been appointed Locomotive Foreman, Medicine Hat, Alta., vice J. D. Muir, transferred.

JAMES McGOWN, Jr., heretofore machinist, has been appointed Locomotive Foreman, Rogers Pass, B.C., vice J. W. Jackson, transferred.

J. A. REID, heretofore Locomotive Foreman, Souris, Man., has been appointed Locomotive Foreman, Cranbrook, B.C.,

vice D. G. MacDonald, who, at his own request, has resumed work at the bench, at Lethbridge, Alta.

A. BROWN, heretofore District Master Mechanic, Winnipeg, has been appointed District Master Mechanic, District 1, British Columbia Division, Revelstoke, vice W. J. Renix, transferred.

W. J. BARBER, heretofore acting Locomotive Foreman, North Bend, B.C., has been appointed Locomotive Foreman, Revelstoke, B.C., vice F. D. Warner, transferred.

R. QUINN, heretofore in Winnipeg shops, has been appointed Shop Foreman, Revelstoke, B.C., vice F. W. Sadlier, transferred.

F. D. WARNER, heretofore Locomotive Foreman, Revelstoke, B.C., has been appointed Locomotive Foreman, Nelson, B.C., vice W. Pitts, superannuated.

J. W. JACKSON, heretofore Locomotive Foreman, Rogers Pass, B.C., has been appointed Locomotive Foreman, Kamloops, B.C., vice John Macrae, acting Locomotive Foreman, transferred.

JOHN MACRAE, heretofore acting Locomotive Foreman, Kamloops, B.C., has resumed his former position as Locomotive Foreman, North Bend, B.C.

C. HOOD, heretofore Trainmaster, Grand Forks, B.C., has had his headquarters transferred to Nelson, B.C.

J. HOLLONQUIST, heretofore Roadmaster, Moose Jaw, Sask., has been appointed Roadmaster, with territory from North Bend to mileage 110, Cascade Subdivision, B.C., vice J. Esslemont, deceased. Headquarters, Mission, B.C.

H. H. BOYD, heretofore Superintendent, District 2, Saskatchewan Division, Moose Jaw, has been appointed Superintendent, District 2, British Columbia Division, vice C. A. Cotterell, transferred. Office, Vancouver.

W. H. DEACON has been appointed Travelling Passenger Agent, Vancouver, B.C., vice F. H. Daly.

A. BENAGLIA has been appointed acting Manager, Empress Hotel, Victoria, B.C., vice H. B. Jackson, transferred.

C. E. PHELPS, heretofore Travelling Passenger Agent, New York, has been appointed City Passenger Agent, Washington, D.C. Office, 1419 New York Ave.

A. G. BROOKER has been appointed Travelling Passenger Agent, New York, vice C. E. Phelps, promoted. Office, 1231, Broadway.

G. J. WEIDMAN, heretofore City Passenger Agent, Washington, D.C., has been appointed City Passenger Agent, Cleveland, Ohio.

H. M. BEYERS has been appointed City Passenger Agent, Spokane, Wash.

D. C. O'KEEFE has been appointed City Passenger Agent, Tacoma, Wash., vice C. H. Naylor.

Grand Trunk Ry.—R. E. ORR, heretofore dispatcher, Belleville, Ont., has been appointed acting Trainmaster, Districts 8, 9 and 10, Belleville Division, vice J. D. McMillan, assigned to other duties. Office, Lindsay, Ont.

J. D. McMILLAN, heretofore Trainmaster, Lindsay, Ont., has been appointed acting Superintendent, Belleville Division, comprising Districts 5, 6, 7, 8, 9 and 10, Ontario Lines, vice H. F. Coyle, on leave of absence on account of illness. Office, Belleville.

J. S. CARRUTHERS has been appointed City Passenger Agent, Prescott, Ont., during the absence of P. B. Whiteley, who has enlisted for overseas military service.

J. R. MELVILLE, heretofore chief

clerk to Vice President Dalrymple, Montreal, has been appointed General Agent, Passenger Department, Toronto. This is a new position.

R. E. NEWCOMER, heretofore in office of General Manager, Wabash Ry., has been appointed Trainmaster, Districts 17, 18, 19 and 24, London Division, G.T.R., vice W. J. Durkin, who has resigned and at his own request been assigned to train service. Office, London, Ont.

The following station agents have been appointed:—Millbrook, Ont., P. Stinson; Seagrave, Ont., A. J. Dance; Madawaska, Ont., F. D. O'Connor; Pottersburg, Ont., outside agency, J. M. Duncan.

Grand Trunk Pacific Ry.—C. N. McMATH has been appointed Car Inspector, Transcona, Man., vice N. C. Hopper, who has enlisted for overseas military service.

S. M. GREENE, heretofore City Passenger and Ticket Agent, Saskatoon, Sask., has been appointed City Passenger and Ticket Agent, Regina, Sask., vice G. Powell, promoted.

J. J. RALEIGH, heretofore Mixed Train Agent, Smithers, B.C., has been appointed Agent, Ketchikan, Alaska.

J. D. McAULEY, heretofore Chief Clerk to Commercial Agent, Regina, Sask., has been appointed Travelling Freight and Passenger Agent, Juneau, Alaska.

GORDON POWELL, heretofore City Passenger and Ticket Agent, Regina, Sask., has been appointed Freight and Passenger Agent, Skagway, Alaska.

The following station agents have been appointed:—Central Butte, Sask., A. Jackson; Gilroy, Sask., W. G. Stimpson.

Great Northern Ry.—G. H. SMITTON, Assistant General Freight Agent, Portland, Ore., is reported to have been appointed Assistant Traffic Manager, St. Paul, Minn., vice H. A. Jackson, transferred to Great Northern Pacific Steamship Co.'s service.

H. H. BROWN, heretofore Assistant General Freight Agent, St. Paul, Minn., has been appointed General Freight Agent there. This is a new position.

F. H. PARKER, heretofore Assistant Comptroller, St. Paul, Minn., has been appointed Assistant General Freight Agent, St. Paul, Minn., vice H. H. Brown, promoted.

P. B. BEIDELMAN, heretofore General Agent, Refrigerator Service, has been appointed Assistant General Freight Agent, St. Paul, Minn., vice W. J. Power, resigned.

H. COSTIGAN is reported to have been appointed General Agent, Freight Department, Seattle, Wash., vice R. K. Pretty, transferred.

R. K. PRETTY, General Agent, Freight Department, Seattle, Wash., is reported to have been appointed Assistant General Freight Agent, Portland, Ore., vice G. H. Smitton, promoted.

Great Northern Pacific Steamship Co.—H. A. JACKSON, heretofore Assistant Traffic Manager, Great Northern Ry., St. Paul, Minn., has been appointed General Traffic Manager, G.N.P.S.Co., vice C. E. Stone. Office, San Francisco, Cal.

Illinois Central Rd.—G. B. WYLLIE, heretofore Travelling Passenger Agent, Buffalo, N.Y., has been appointed Travelling Passenger Agent, Chicago, Ill.

Minneapolis, St. Paul & Sault Ste. Marie Ry.—C. E. PHELPS has been appointed City Passenger Agent, Washington, D.C., vice G. J. Weidman.

New York Central Rd.—G. H. CLARK, Division Freight Agent, has had his jurisdiction extended to include stations on the extension from Cornwall to Ottawa, Ont. Office, Ottawa.

Northern Navigation Co.—C. LEIDICH has been appointed District Passenger Agent, 69 Fort St. West, Detroit, Mich.

A. RAY LAWRENCE has been appointed District Passenger Agent, 733 Euclid Ave., Cleveland, Ohio.

Lake and Rail Rate Cancellations Forbidden.

The Interstate Commerce Commission has given the following decision:—Tariffs of the Grand Trunk, designated as Supplement 16 to I. C. C. 1535, Supplement 10 to I. C. C. 2110, and I. C. C. 2297, filed to become effective Sept. 15, 1915, proposed to cancel the joint class and commodity rates on traffic from Duluth, Minn., and other ports at the head of Lake Superior to points in eastern trunk line territory, published in connection with the Port Huron & Duluth Steamship Co., which operates a line of boats between Port Huron, Mich., and Duluth, Minn. By tariff of the Chicago, St. Paul, Minneapolis & Omaha Ry., designated as Supplement 23 to I. C. C. 3868, filed to become effective Oct. 8, 1915, cancellation was proposed of joint rail-lake-and-rail commodity rates published in connection with the same boat line from Minneapolis, Minn., and other points to eastern trunk line territory. By orders of the commission the tariffs were suspended until July 13, 1916, pending investigation. Cancellation of the joint rates would leave in effect combination rates only, with the result that through freight charges via the Port Huron & Duluth Steamship Co.'s line would be materially increased. The evidence shows that the tariffs filed by the G.T.R., are the result of a dispute with the rail lines east of Buffalo over the divisions of the joint rates claimed by such rail lines. The Chicago, St. Paul, Minneapolis & Omaha did not appear at the hearing, and no evidence was offered in support of its tariff.

The Port Huron & Duluth Steamship Co. is a common carrier, entirely independent of railway ownership. At Duluth it connects with rail lines which serve Minneapolis and other interior points. At Port Huron traffic is interchanged with the G.T.R., whose lines connect at Buffalo with the eastern trunk lines. Through routes and joint rates via these lines, excepting the Pennsylvania east of Buffalo, have been in effect for many years; the freight tonnage over the water line during the season of navigation is considerable, and there is public demand for the continuance of such through routes and joint rates.

The question of through routes and joint rates in connection with the Pennsylvania east of Buffalo was before the commission in a recent case, and we held that such routes and rates should be established and maintained for two years, and that the rates should not exceed as maxima the joint rates in effect via other rail-and-lake and rail-lake-and-rail routes. Port Huron & Duluth Steamship Co. v P. R. R. Co., 35 I. C. C., 475. Portions of the evidence in that case were introduction and filed in this proceeding. On the record we have no doubt that the public interests will be best served by a continuance of through routes and joint rates, and we find nothing in the evidence to justify the cancellations proposed. The mere fact of disagreement between the carriers as to divisions does not prove that the joint rates are unreasonable, or that the routes over which they are applied should be abandoned. We hold that the proposed cancellations have not been

justified and that the suspended tariffs should be cancelled and that the through routes and joint rates applicable thereto should be maintained. It will be so ordered. The carriers should make further endeavor to agree upon the divisions of such joint rates, and if they cannot so agree they should present the question of divisions to the Commission in a supplementary proceeding.

H. C. Martin, General Freight Agent, G.T.R., represented that company at the hearing.

Reid Newfoundland Co's Railway Operations.

The operations of the Reid Newfoundland Co.'s railways for the year ended June 30, 1915, show the following results:

	Earnings.	
	1914-1915.	1913-1914.
Passenger traffic	\$301,401.04	\$354,657.56
Freight traffic	382,510.00	311,175.61
Mails	53,370.21	50,865.06
Other sources	54,305.50	63,549.12
	\$691,586.75	\$782,247.35

	Operating Expenses.	
	1915.	1914.
Maintenance of lines, build- ings, etc.	\$174,253.29	\$161,796.53
Operation and repairs of locomotives	283,465.93	321,932.77
Repairs of cars.....	66,843.41	75,210.70
General	375,475.63	430,275.28
	\$900,038.26	\$989,215.28

	Operating Results for Five Years.		
	Earnings.	Expenses.	Deficit.
1911	\$626,303.56	\$663,771.29	\$ 37,467.73
1912	633,797.91	766,920.49	123,122.68
1913	740,231.88	875,862.08	135,630.20
1914	782,247.35	989,215.28	200,967.93
1915	691,586.75	900,038.26	208,451.51

	Freight Carried.	
	1914-1915	1913-1914
	lbs.	lbs.
Flour	50,581,800	34,506,760
Live stock	2,700,000	2,956,610
Lumber	60,555,890	52,431,470
Fish	9,266,610	13,071,660
Manufactured goods.....	3,113,710	3,181,120
Other articles	212,194,030	256,534,850
Totals	338,412,040	362,682,470

Quebec Bridge Construction Progress.

During the discussion of the estimates in the House of Commons recently, the acting Minister of Railways said: The car ferry Leonard is in service between Quebec and Levis and handling very satisfactorily the National Transcontinental and Intercolonial business. The car ferry was rendered necessary owing to the delay involved in this project by the collapse of the first Quebec bridge. Work is now progressing rapidly on the construction of the second bridge. On the north shore the entire cantilever arm has been completed, thus practically completing all the steel work on that side. On the south side the steel work has been completed up to and including the main post over the main pier. This year the south cantilever arm will be erected, and the work of erecting the suspended span will be commenced early in the spring at Sillery Cove and will be completed by the time the cantilever arm is ready to receive it. It will then be floated into place and suspended from the two ends of the cantilever arms. Thus, it is expected that all the main members of the bridge will be erected this year, and the connection from shore to shore made, though it will take another year to finish riveting and painting and to clean up the work. The expenditure on the bridge to date amounts to \$18,257,621, of which \$10,473,346 has been on the new bridge. The total cost of completing the bridge, taking the old bridge and the new bridge together, is estimated at \$27,000,000.

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 the paper have a continuous record of the Board's proceedings. No other paper has done this.

The dates of orders, immediately following the numbers, are those on which they were drawn.

General order 162, Mar. 30.—Approving conditions on telegraph forms used by telegraph companies on which messages to be transmitted are to be written.

General order 163, Mar. 31.—Ordering that terms of judgment, re telegraph companies' tariffs of tolls, Mar. 28, delivered by Commissioner McLean and concurred in by the other Commissioners, which is made part of this order and the tariff changes therein directed to be made, be complied with and become effective not later than July 1.

24814. Mar. 16. Authorizing C.P.R. to build road diversion at mileage 27.5 from Golden, B.C.

24815. Mar. 17. Approving G.T.R. detail plans showing substructure of Bathurst St. bridge, Toronto.

24816. Mar. 17. Authorizing Canadian Northern Ontario Ry. to build across certain highways in York Tp., mileage 0 to 14.9, northerly from new Union Station site, Toronto.

24817. Mar. 18. Amending order 24651, Jan. 13, re protection of C.P.R. crossing near Binscarth, Man.

24818. Mar. 20. Relieving G.T.R. from providing further protection at Wilson's public crossing, Iroquois, Ont.

24819. Mar. 20. Authorizing Canadian Northern Ry. to build across and divert road in s.w. ¼ Sec. 3-28-10, w. 3 m., Sask.

24820. Mar. 20. Approving Canadian Northern Ontario Ry. location of temporary main line passenger station in Parry Sound.

24821. Mar. 20. Authorizing Canadian Northern Ry. to build and divert east and west road allowance between n.w. ¼ Sec. 33-39 and s.w. ¼ Sec. 4-40-9, w. 3 m., Sask.

24822. Mar. 18. Authorizing Ancaster Tp., Ont., to build highway crossing over Toronto, Hamilton & Buffalo Ry on Leland St. West, Hamilton.

24823. Mar. 20. Approving agreement between Bell Telephone Co. and Addison Rural Independent Telephone Co., March 1.

24824. Mar. 21. Authorizing Grand Trunk Pacific Ry. to operate branch line required under order 24080, Aug. 13, 1915, to connect with Board of Grain Commissioners' elevator at Moose Jaw, Sask.

24825. Mar. 10. Authorizing G.T.R. to operate over tracks to be built by C.P.R. on Lots 22 and 23, Con. 1, Chatham, Ont., for Dominion Sugar Co., crossing to be protected by interlocking plant to be provided and operated by C.P.R., at cost of G.T.R.

24826. Mar. 22. Authorizing C.P.R. to build across First Ave., Shaunavon, Sask.

24827. Mar. 23. Ordering Canadian Northern Ry. to keep station waiting room at Tiny, Sask., heated, clean and lighted for accommodation of passengers on arrival and departure of trains, and to take care of freight and express matter.

24828. Mar. 23. Amending order 24698, Jan. 31, re C.P.R. spur for Ford Motor Co. at Winnipeg.

24829. Mar. 22. Authorizing C.P.R. to build diversion, in lieu of road allowance between Secs. 22 and 27-13-11, w. 4 m., Alta.

24830. Mar. 24. Dismissing applications of Ivey & Co., Port Dover, Ont., for order directing G.T.R. to build siding at Port Dover, without prejudice to an application under Sec. 226 of Railway Act.

24831. Mar. 23. Approving G.T.R. plans showing temporary repairs to Bonaventure station, Montreal.

24832. Mar. 27. Authorizing Grand Trunk Pacific Branch Lines Co. to build highway over Battleford Branch in n.e. ¼ Sec. 4-43-16, w. 3 m., in rural municipality 438, West Saskatchewan District, Sask.

24833. Mar. 27. Approving New York Central Rd. bylaw passed March 15, and rescinding order 23265, Feb. 9, 1915.

24834. Mar. 25. Authorizing Canadian Northern Ry. to cross and divert special road in s.e. ¼ Sec. 33-27-10, w. 3 m., Sask.

24835. Mar. 27. Ordering Canadian Northern Ry. to appoint station agent by May 1, at Excel, Alta.

24836. Mar. 27. Ordering Grand Trunk Pacific Ry. to appoint station agent by May 1 at Smiley, Sask.

24837. Mar. 28.—Extending, finally, to Aug. 1, the effective date of item on page 9 of Supplement 5 to Canadian Freight Classification 16, giving specifications of cheese boxes for carriage as freight.

24838. Mar. 28.—Authorizing Toronto & Hamilton Highway Commission to build temporary industrial railway along right of way and tracks of Hamilton Radial Electric Ry. in Oakville, Ont., rights so granted not to extend beyond Sept. 1.

24839. Mar. 28.—Relieving Canadian Northern

Ry. from providing further protection at highway just east of Kamsack yards, Sask.

24840. Mar. 29.—Postponing, until further order, effective date of increased minimum weight for fir, spruce, hemlock and common cedar lumber, when loaded in cars under 36 ft. long, from 30,000 to 35,000 lbs. per car, as appearing in C.P.R. Supplement 59 to C. R. C. no. W. 1806.

24841. Mar. 30.—Ordering Canadian Northern Ry. to fence both sides of its right of way, from mileage 387.2 to 2 miles east of Bedford, Man., running easterly to Sandilands, mileage 381.7, by May 15.

24842. Mar. 30.—Authorizing Canadian Northern Quebec Ry. to build across public road between Lots 41 and 42, R. 7, Ponsby Tp.

24843. Mar. 30.—Authorizing Canadian Northern Ontario Ry. to build spur on parts of lots 13 and 14, Con. 5, Field Tp., Ont.

24844. Mar. 30.—Authorizing Canadian Northern Quebec Ry. to build across public road in lot 36, R. 1, Arundel Tp.

24845. Apr. 1.—Approving Vancouver, Victoria & Eastern Ry. & Navigation Co. (G.N.R.) plan of location for station and facilities in Vancouver, B.C.

24846. Mar. 31.—Authorizing British Columbia Government to build highway over Grand Trunk Pacific Ry. at Newlands station.

24847. Mar. 30.—Ordering Canadian Northern Ry. to furnish tri-weekly train and mail service on its Winnipegosis Branch, from June 1 to Sept. 15, when it may reduce service to semi-weekly.

24848. Apr. 3.—Authorizing Quebec, Montreal & Southern Ry., until further order, to remove station agent at St. Robert, Que.; caretaker to be appointed for accommodation of passengers and to care for freight and express matter.

24849. Apr. 3.—Authorizing Canadian Northern Quebec Ry. to build across and divert certain highways in Amherst Tp.

24850. Apr. 1.—Relieving Grand Trunk Pacific Branch Lines Co. from erecting fences, gates and cattle guards on its Regina-Boundary Branch, on east side of station grounds at Huntoon, Sask.

24851. Apr. 3.—Authorizing G.T.R. to build siding for Canada Forge Co., Welland, Ont.

24852. Apr. 3.—Authorizing C.P.R. to build diversion in lieu of road allowance at mileage 129.91, Hardisty Subdivision, Alta.

24853. Apr. 3.—Authorizing C.P.R. to build spur for Martinon Lumber Co. at mileage 65.67, Shore Line Subdivision, N.B.

24854. Apr. 4.—Authorizing Canadian Northern Quebec Ry. to build across public road in Lot. 40, R. 7, Ponsby Tp.

24855. Apr. 4.—Authorizing C.P.R. to build across and divert highways at mileage 371.38; 375.73; 363.84; 420.65, and 421.41, on its Pheasant Hills Branch, Sask.

24856. Apr. 4.—Amending order 24029, July 28, 1915, re G.T.R. crossing at Barton St. and Ferguson Ave., Hamilton, Ont.

24857. Apr. 4.—Dismissing complaint of Hunting-Merrit Lumber Co., Vancouver, B.C., against refusal of British Columbia Electric Ry. to handle cars destined or to for furtherance via Great Northern or Northern Pacific Rys. and rate on lumber and shingles of 1c per 100 lbs. over Vancouver rates which complainants have to pay on shipments from Eburne to points in Canada and United States.

24858. Mar. 29.—Authorizing Canadian Northern Ontario Ry. to build across highways, mileage 44.78 to 47.81, Scott Tp.

24859. Apr. 4.—Approving London Railway Commission's bylaw authorizing J. E. Richards, Manager and Treasurer, London & Port Stanley Ry., to prepare and issue tariffs of tolls.

24860. Apr. 1.—Ordering G.T.R. to open railway crossing as a continuance of Pitt St., Glen Robertson, Ont.

24861. Apr. 5.—Ordering G.T.R. forthwith to desist from charging any toll other than that prescribed under order 4988, on traffic from and to interchange with Canadian Northern Ry., as authorized by order 24416, Nov. 5, 1915, near Ottawa, Ont.

24862. Apr. 4.—Approving agreement between Bell Telephone Co. and La Cie. de Telephone St. Ours, March 27.

24863. Apr. 4.—Relieving C.P.R. from providing further protection at Hawkesbury Road, near Vankleek Hill Station, Ont.

24864. Apr. 4.—Authorizing C.P.R. to use bridge at Ninth Ave., Broadview, Sask.

24865. Apr. 4.—Approving agreement between Bell Telephone Co. and Malahide & Bayham Telephone Association, March 27.

24866. Apr. 5.—Approving plans of signalling for Montreal & Southern Counties Ry. across Victoria Jubilee Bridge, Montreal.

24867. Apr. 4.—Ordering Canadian Northern Ry. to put in cattle pass when it fills trestle at mileage 757.7, on e. ½, sec. 27, tsp. 52, range 15 w. 4th meridian.

24868. Apr. 5.—Dismissing complaints of T. H. Taylor and Canada Flour Mills Co., Chatham, Ont., against interswitching charge of 2c per 100 lbs. on grain, ex-lake, milled in transit at Chatham.

24869. Apr. 5.—Ordering Vancouver, Victoria

& Eastern Ry. and Navigation Co. (G.N.R.) to protect tracks between Ocean Park and White Rock, B.C., from May 15 to Nov. 15 each year, one watchman to patrol track between mileposts 123 and 127 from 7 p.m. to 7 a.m., and from Nov. 15 to May 15 each year, two watchmen to patrol track from 7 p.m. to 7 a.m., one from milepost 123 to 125, and other from 125 to 127; speed of all trains and locomotives not to exceed 10 miles an hour between mileposts 123 and 127 throughout year; and rescinding orders 17959, Nov. 5, 1912, and 23885, June 21, 1915.

24870. Apr. 6.—Ordering G.T.R., within 60 days, to install bell at Talbot Road, just east of Courtland Station, Ont., 20 per cent. of cost to be paid out of railway grade crossing fund.

24871. Apr. 6.—Authorizing Grand Trunk Pacific Ry. to build highway over its main line and siding between lots 361 and 369, R. 5, Coast District, B.C.

24872. Apr. 6.—Amending order 24825, March 10, re G.T.R. operation over Dominion Sugar Co.'s spur at Chatham, Ont.

24873. Apr. 7.—Ordering C.P.R. to inaugurate on or about June 1, daily, except Sunday, service between Empress and Swift Current, Sask.

24874. Apr. 6.—Relieving C.P.R. from providing further protection at Third St., London Tp., Ont.

24875. Apr. 8.—Ordering Grand Trunk Pacific Ry. to appoint caretaker at Cando Station, Sask.

24876. Apr. 7.—Authorizing City of Windsor, Ont., to build overhead crossing at Wyandotte St.

24877. Apr. 8.—Authorizing G.T.R., Toronto, Hamilton & Buffalo Ry. and Hamilton St. Ry. to operate over crossing at Burlington St., Hamilton, Ont., and authorizing G.T.R. and T.H. & B.R. to operate trains over same without stopping; speed not to exceed 10 miles an hour.

24878. Apr. 10.—Amending order 24856, Apr. 4, re G.T.R. crossing at Barton St. and Ferguson Ave., Hamilton, Ont.

24879. Apr. 10.—Extending for one year from date, time within which City of Regina, Sask., shall build bridge across C.P.R., on Hamilton St.

24880. Apr. 8.—Ordering Canadian Northern Ry. to appoint caretaker at Fairmount Station, Sask.

24881. Apr. 10.—Ordering Great Northern Ry. to erect fences along right of way on property of J. Rinn, Elm Creek, Man., on west side of railway for 1,287 ft., on east side for 2,850 ft., to install gates through station grounds at Magnus, Man., and cattle guards at crossing of Government road allowance, by May 31.

24882. Apr. 8.—Ordering G.T.R. to place day watchman at highway crossing east of Coteau, Que., mileage 37.58, between 7 a.m. and 7 p.m.; wages to be paid 75 per cent. by G.T.R. and balance by Soulanges County, Que.

24883. Apr. 8.—Relieving Grand Trunk Pacific Branch Lines Co. from erecting fences, gates and cattleguards on its Tofield-Calgary Branch, mileage 0 to 201, Alta.

24884. Apr. 11.—Authorizing Essex Terminal Ry. to build spur across Mercer St. and Hanna Ave., Windsor, Ont.

24885. Apr. 11.—Approving plan and specifications of Turvey drain, to be constructed under G.T.R. in Morris Tp. about 32.62 miles west of Palmerston, Ont.

24886. Apr. 11.—Dismissing application of Brotherhood of Locomotive Firemen and Engineers for order directing railway companies to erect railway crossing sign posts (mile whistle boards) at railway crossings, at grade.

24887. Apr. 11.—Approving Toronto, Hamilton & Buffalo Ry. form of release and power of attorney 147, to be signed by persons who desire, for special reasons, to travel in cars which are not intended to carry passengers.

24888. Apr. 11.—Authorizing Canadian Northern Ontario Ry. to connect its Montreal-Ottawa line with G.T.R. near Ottawa.

24889. Apr. 11.—Relieving C.P.R. from providing further protection at highway at mileage 8.4 from Place Viger, 1½ miles east of Jacques-Cartier Jct., St. Laurent, known as Cremazie Road, Montreal.

24890. Apr. 11.—Relieving C.P.R. from providing further protection at highway first west of Herbert station, Sask.

24891. Apr. 11.—Authorizing Canadian Northern Ry. to build connecting track with G.T.R. across public road in Lot. 11, Gloucester Tp., Ont.; protection at crossing reserved for further consideration.

24892. Apr. 11.—Dismissing C.P.R. application for order amending general order 65, Nov. 9, 1910, as amended by general order 68, Feb. 6, 1911, re clearances.

T.H. & B.R. Wages.—Arbitration proceedings in connection with the demand for increased wages by mechanics employed on the Toronto, Hamilton & Buffalo Ry., were opened at Hamilton, Ont., April 10, before the arbitrators, Judge Snider, G. S. Kerr, K.C., and Jas. Simpson.

Electric Railway Department

Recent Developments in Electric Railway Car Equipment.

By W. G. Gordon, Transportation Engineer, Canadian General Electric Co., Ltd.

(Continued from last issue.)

Control.—Modern methods of control, including both hand control and multiple unit control, also show great advances of recent years. The number of operations that a car controller must perform daily is remarkable, and the work that is accomplished with the platform controller is still more remarkable. In city streets the controller is kept in almost constant movement, making and breaking large currents, and doing its required work indefinitely, requiring very little attention, and receiving considerable abuse. A big advance in the design of the platform type of controller was made in applying individual magnetic blowouts to each finger, and also in rearranging the internal connections so as to secure the minimum potential between adjacent contacts. With the individual blowouts, the burning of the arc chutes has been practically eliminated; and the platform controller as it stands today is absolutely safe, reliable and dependable. Where field control is desired with this type of controller it is secured by the use of extra fingers in the controller. This form of control is built to handle a total motor equipment of 360 h.p. at 600 volts; although, for various reasons, with equipments of this capacity and even considerably smaller, it may be advisable to use multiple unit control either for single car or train operation. The hand operated platform type of controller has been built and operated up to 1,500 volts, successful operation being secured by increased creepage, insulation, and current rupturing capacity. This is the highest voltage at which this type of controller has so far been called on to operate.

Multiple unit control generally replaces hand control with platform type of controller, for a total horsepower of equipment between 200 and 300 h.p., depending largely on local conditions of car layout, space available for location of controller, and desirability of securing train operation with two or more cars. Very decided advances have been made in simplifying the apparatus comprising a multiple unit equipment of recent years, especially from the point of view of mounting the apparatus under the car body and wiring up between the contactors (whether electrically or pneumatically operated), reverser, rheostats and motors. Whether the multiple unit control should be non-automatic or automatic depends, for any given service, on the conditions and requirements. Automatic control is recommended where several motor cars are operated in a train and where it is desirable to prevent high current peaks. It secures a minimum slipping of the wheels with high acceleration. An interesting application of automatic control is used by one of the large railway companies in the United States. The passenger load is a higher percentage than usual of the total loaded weight of car, so the setting of the current relay is varied automatically corresponding with the varying compression of the truck springs.

For interurban work there promises to be a big development throughout Canada in the use of high voltage direct current, with multiple unit operation. 600 volts,

1,500 volts, 2,400 volts and 3,000 volts form a natural progression; and in laying out new work it is a simple matter, and involves a very small relative increase in cost, to make provision in the line construction and power supply for going up to the next highest voltage step when future conditions will warrant the change. With regard to supply for auxiliary circuits, when operating on 1,500 volts or higher, for control, lights, heaters (if electric heaters are used) and pump motor, various combinations are used, depending largely on local conditions. The most common method of obtaining low voltage current for the control circuit is by the use of either a motor generator set or a dynamotor. The dynamotor is smaller, lighter, and cheaper than the motor generator, and is quite generally used up to and including 1,500 volts; its operation having proved entirely satisfactory and its maintenance cost almost negligible. In this connection I might mention with regard to the motor equipments which I referred to as showing such small brush wear after years of service, that the dynamotors in operation with those equipments were also running with the original brushes.

The most satisfactory arrangement for the air compressor is to provide it with a high voltage motor. It is found that a 1,500 volt motor of this size can be built with excellent characteristics. Another arrangement for use on 2,400 volts consists in having two 1,200 volt motors, one on each side of the compressor; and for 3,000 volt operation the use of two 1,500 volt motors.

With regard to electric car heaters, the design of 1,500 volt heaters was not a serious matter, the chief precaution being to provide against foreign objects coming in contact with the live parts, and at the same time not to restrict free air circulation. 2,400 and 3,000 volt individual heaters are in successful operation for locomotive cabs; but for cars operating at these voltages, the plan adopted is to mount the heater under the car. A fan blows air over the heated coils and the hot air is distributed evenly through ducts along both sides of the car.

With regard to car lighting, in many cases the amount of current required for this purpose is small enough to make it desirable to supply the lights from the dynamotor. It was found unsafe to connect lights across 1,500 volts using the standard 600 volt sockets, as the leading in wires are close enough together to hold the arc in case of a filament breaking. A new socket has been produced, similar to that used for series street lighting, and twelve 125 volt lamps can be used in series on 1,500 volts. The receptacle for the socket covers the lamp base and all the live parts and is thoroughly grounded, thus affording very thorough protection.

The luminous arc type of headlight has been very successful and is very economical in maintenance. This type of headlight, with parabolic metal reflector, throws a wide beam of light; and, with a semaphore lens, throws a concentrated beam for a great distance ahead. This latter type is largely used on high speed roads. Dimming can be arranged for,

either by reversing the polarity of the arc or, with incandescent lamps. A smaller headlight of the same type throwing a concentrated beam for 600 to 800 ft. is excellently adapted for city and suburban work. Some roads consider the results obtained with high efficiency metal filament lamps with concentrated filament used with parabolic reflector warrant for providing a special low voltage supply of from 6 to 30 volts for the headlights.

In the case of combined 600 and 1,500 volt operation, which is a condition sometimes met with, a protective device is necessary to prevent the higher voltage from ever being maintained on the low voltage circuits. A protective relay is used for this purpose which is connected so that the low voltage circuits are instantly opened in case the higher voltage is impressed on them. These circuits cannot be restored till the proper steps have been taken and the higher voltage removed from the relay. When going from 1,500 volt to 600 volt operation, provision must be made to supply the lower voltage to the auxiliary circuits, and also to disconnect the dynamotor. This is done by means of a two position selector relay. In the down or normal position the 1,500 volt trolley is connected to the dynamotor, and the low voltage tap on the dynamotor is connected to the auxiliary circuits. When going from 1,200 to 600 volts the motorman closes a switch energizing the relay coil, thus disconnecting the dynamotor from the trolley and transferring the auxiliary circuits from the low voltage tap on the dynamotor directly to the 600 volt trolley. The protective relay prevents damage in case the motorman throws the switch energizing this relay while still on 1,500 volt trolley or neglects to throw the switch when going from 600 volt to 1,500 volt trolley.

Generally, in city running, on 600 volts with 1,500 volt equipment, it is satisfactory to operate at less than half speed; however, in some cases where there is a lot of suburban running on 600 volts, it is desirable to run at a higher speed. To do this it is necessary to parallel the motors, which are run two in series on 1,500 volts, and also to change the rheostat connections to provide sufficient current for the motors during accelerating on the lower voltage. Both of these operations are performed on a commutating switch. This switch has two positions, one for 600 volts and another for 1,500 volts, in which the motors and various rheostat sections are connected in parallel and series respectively. The proper connections of the auxiliary circuits to the low voltage tap of the dynamotor when running on 1,500 volts, or to trolley when on 600 volts, are also made on the commutating switch. The commutating cylinder may be thrown by a handle connected directly to the cylinder, or from the cab by means of an air valve and pneumatic cylinders connected to the switch, when it is mounted under the car body.

Several years experience has shown that the operating expenses of high voltage control apparatus are exceptionally low, in many cases less than with 600 volt

operation, this being largely due to the smaller currents handled. In connection with control, I may refer to the advance made from a maintenance point in the present type of rheostat, where a broken grid can be easily and quickly replaced without having to take down and dismantle the rheostat.

Modern car wiring has also been put on a sound basis to insure long life and protection to the wiring with practically no maintenance cost. If special protection by lightning arresters for car service is desired in localities with severe lightning conditions, the direct current aluminum type of arrester should be used. This type will solve any problem in direct current electric railway protection. They, however, require proper inspection. Their maintenance, therefore, is considerably higher than the magnetic blow-out type of arrester. The question of the use of the aluminum type for car work depends then on the amount of protection desired; and whether the absolute assurance of this protection warrants the additional maintenance charges which their use entails.

The best types of arresters, however, are placed at a very great disadvantage if the car wiring is so laid out that electro magnetic induction from lightning can take place. To avoid this, do not place any wire that carries lightning current near and parallel to, for any considerable length, any of the wiring where damage can be done by an induced charge. A second point to note is that the wiring may be such that electrostatic induction will shunt the choke coil and render it useless. To avoid this, never bring wires connected to the opposite terminals of a lightning choke coil within one foot of each other. By observing these instructions, electrostatic induction in car wiring will be avoided and the arresters given a proper show to arrest.

Current Collectors.—The use of a wheel collector is almost universal throughout Canada, and is an important maintenance item. The trolley wheels most largely in use today range from 2½ to 5 ins. diameter at the tread, with overall diameters of from 4 to 7 ins. The larger size wheels are used for the higher speeds and the smaller for city service, though the tendency is towards the use of the larger wheel for all classes of service. The great majority of wheels are of alloy, hardness and conductivity being obtained by a mixture of over 90% copper with a small amount of tin and zinc. The claim of long life has been made for the use of the iron trolley wheel. This is true, but they cause excessive wear on the wire, as the contact surfaces become pitted and covered with fine points from the arcing. These points are chilled by the air to a cutting hardness, conditions much exaggerated during rain and sleet storms. The principal trouble with a wheel collector is to get satisfactory lubrication and to carry the current from the wheel to the harp. The ordinary method of lubrication is the use of graphite paste pressed into spiral grooves in a brass bushing, although grease and oil are also used in a number of ways. The general tendency seems to be toward the use of a pin from ¾ to 1 in. in diameter as against the smaller sizes. With a wheel collector, the limitation in current carrying capacity is due to the difficulty in collecting current from the moving faces of the trolley wheel. Side springs and washers are generally used for this purpose; but in addition to the difficulty of getting sufficient contact area, friction is a serious matter, and in order to prevent

slipping between the wheel and wire the spring pressure must be kept very low. The use of ball and roller bearings to give greater sensitiveness to the trolley base has been a decided advance, and the use of a number of tension springs instead of one for holding the pole up, is also of benefit in this regard. The best pressure to use against the wire depends on local conditions. For service not over 30 m. p.h. with accelerating current of from 200 to 300 amperes, 20 to 30 lbs. is used. For heavier service the pressure may be as high as 40 lbs. for the best results.

A large amount of work has been expended in experimenting on pantographs, with both rollers and pans as the collecting devices. The first cost of a pantograph is considerably higher than the standard form of trolley base with pole, harp and wheel, but it possesses a number of important advantages over the standard trolley. It requires no attention either during running over special work or in reversing, and can be raised and lowered by air operation, controlled from a grounded valve, by the motorman. All these features are of value in the operation of two or more motor cars together, the latter feature especially in high voltage operation. The London & Port Stanley Ry. is operating very successfully with slider type pantographs on locomotives and motor cars.

The catenary type of line construction presents no difficulties over the usual overhead construction; and, on account of the greater pole spacing possible with its use, can meet the latter on a cost comparison on almost equal terms, while having very distinct advantages even with wheel operation for high speed service. As the catenary overhead construction suitable for wheel operation does not differ materially from that required for pantograph operation, in construction suitable for the former, providing certain standard line fixtures suitable for pantograph operation are included, a change can readily and economically be made at any later date to the latter.

Windsor, Essex and Lake Shore Rapid Ry. Appointments.

A. Eastman, Vice President and General Manager, has issued a circular making the following appointments, consequent on the accidental death of W. W. Chisholm, Electrical Engineer. The appointments follow the rule adopted some time ago by the company, of advancing officers and employes. A. BALTZER, heretofore Master Mechanic, has been appointed Electrical Engineer, in charge of power house and rolling stock; G. R. MCKENZIE, heretofore second engineer, has been appointed first engineer, power house; W. L. McLARTY, heretofore third engineer, has been appointed second engineer, power house; W. BOWLES has been appointed third engineer, power house; E. BUTLER has been appointed Shop Foreman, Kingsville shops; C. PETERSON, heretofore line foreman, has been appointed Superintendent of Line Department, reporting to Superintendent O. P. Cooper.

Following are the commissioners and officials responsible for the operation of the Port Arthur Civic Ry., Port Arthur, Ont.: Commissioners, W. P. Cooke, Chairman; G. H. Rapsey, I. L. Matthews, A. E. Wideman, and the Mayor, D. J. Cowan, ex officio; acting Secretary, G. H. Rapsey; General Manager (Operation), M. M. Inglis; Master Mechanic, F. Philp; Roadmaster, James Dillon.

Toronto Suburban Railway Office Building.

The Toronto Suburban Ry. is about to erect an office building at 938 Keele St., Toronto, on the west side of the street a few doors north of Dundas Street. The front of the building will make an angle with the sides, giving a length on one side of 109¼ ft. over all and on the other side 100 ft. The width will be 28 ft. There will be basement, ground floor, and one upstairs floor. The basement will contain boiler and coal rooms aggregating 30 ft. and a fireproof vault 4½ x 7 ft. inside dimensions. The rest of the basement will be used for stores. The ground floor will contain a waiting room 56 x 25½ ft. inside dimensions, out of which space a ticket office 16 x 16 ft. will be taken. The back of the building will be an express room 35 x 25½ ft. Between the waiting and express rooms will be the stairs leading to the upper floor, a vault 7 x 4½ ft. and women's lavatory. The upstairs will have offices over the waiting room, and conductors' and motormen's room over the express room, the sizes corresponding to the lower rooms in each case. The office space will be divided by light frame and glass partitions into offices for the officials, with a general office and space for the public immediately at the entrance from the stairs. There will be employes' lavatories on this floor.

The foundation walls will be of concrete 18 in. thick and the main building walls will be brick 13½ in. thick. About the centre of the building there will be a cross wall of concrete in the basement and brick above carried to the roof. The basement floor will be 2 in. of cinders and 4 in. of concrete, finished with ½ in. dressing of rich mortar. Upper floors will be of ¾ in. birch, dressed, matched and scraped. Lavatory floors will be of composition. The building will have a store front of plate glass windows and double door, the whole having a span of about 24 ft. The wall above this span will be carried on two 15 in. I beams which will rest upon columns composed of 5 in. I beams with standard cap and base. The roof will be of ¾ t. & g. lumber, covered with tar, felt and gravel on asbestos. The waiting rooms and offices will have lath and plaster walls and will be finished in hardwood throughout. Hot water heating will be used. The building was designed by Geo. C. Briggs, Architect, under the direction of H. T. Hazen, M. Can.Soc.C.E., Chief Engineer.

The Sherbrooke Street Railway may be taken over by the municipal authorities if negotiations now pending result successfully. An offer is said to have been made by the Sherbrooke Railway & Power Co. to sell the system to the City of Sherbrooke, Que., for \$250,000. As an alternative proposition the company offers to lease the road to the city for 25 years at a semi-annual rental of \$9,000. At the end of this period the system would become the city's property.

Automobiles and Electric Car Traffic.—The Ontario Legislature has passed an amendment to the Ontario Motor Act, which prevents automobiles from creeping up to the rear of standing electric cars and thus blocking the exit for passengers. It is provided that motorists must not approach nearer than 6 ft. to any standing car, while passengers are being discharged or taken on. This applies to suburban as well as city cars, and all vehicular traffic.

Hydro Electric Railway Projects in Ontario.

In the Hydro Electric Power Commission of Ontario's report for the year ended Oct. 31, 1915, the various proposals received by the Commission for the construction of radial electric railways under the Hydro Electric Railway Act of 1914, are dealt with. During the year requests for reports and estimates on proposed lines were received, and Canadian Railway and Marine World has already covered these in detail in previous issues. From the passing of the act, applications have been received from 158 townships, 47 villages, 46 towns, 15 cities, 8 police villages, and 7 miscellaneous committees, boards of trade, etc. Two engineering parties have been maintained in the field constantly, making preliminary surveys and gathering traffic statistics for the preparation of cost of construction and equipment, probable revenue, etc. Preliminary surveys have been made, and estimates submitted for the construction of approximately 2,000 miles of line, a considerable portion of which is in the nature of alternative routes. The preparation of standard specifications for roadbed, commenced in 1913, was continued and this data is now available for use in the construction of any of the lines with which it is decided to proceed, so that tenders may be called for with as little delay as possible. In reaching the decision of a standard roadbed construction, the standards of prominent roads in Canada and the United States, and the recommendations of the various railway societies, were carefully studied. Following is the list of the various surveys, with mileage, made by the Commission, to Oct. 31, 1915:—

	Miles.
Toronto northeasterly	295.00
Kingston-Cornwall	115.00
Barrie-C.P.R.	8.20
Huron County	222.20
Guelph-Georgian Bay east line.....	226.62
London-Lambton County	126.78
London-Stratford	52.27
Guelph-Hespeler	10.00
Berlin-Woodstock	31.00
Guelph-Hamilton	35.00
London-Port Stanley	24.05
St. Marys-Exeter	19.84
St. Thomas-Aylmer	11.30
London-Aylmer	18.50
Hamilton-Galt	35.00
Lyons-Tillsonburg	17.00
Guelph-Orangeville	33.00
Aylmer-Port Burwell	15.00
Drumbo-Linwood	31.20
Tillsonburg-Woodstock	23.00
Hamilton-St. Catharines	32.10
Hamilton-Welland	40.00
St. Catharines-Queenston	8.10
Dunnville-Beamsville	24.00
Welland-Port Colborne	7.10
Port Colborne-Bridgeburg	20.00
Port Credit-Hamilton	28.00
Port Colborne-Dunnville	22.50
Listowel-Fullarton	31.74
Dresden-Strathroy	37.90
Arkona-Grand Bend	37.90
Wingham-Chesley	43.50
Flesherton-Collingwood	32.64
Guelph-Port Credit	19.40
Toronto-Port Credit	8.00
Guelph-Berlin	31.50
Berlin-Stratford	66.50
St. Catharines-Pelham Tp.	11.00
Welland-St. Catharines	10.00
Newmarket-Barrie	37.00
Barrie-Midhurst	6.00
Chelsea-Green Spur, London.....	2.50
Collingwood-Midhurst	26.00
Ottawa-Morrisburg	51.80
Penetanguishene-Midhurst	52.50
Dunnville-Simcoe	32.00
Baysville District	73.40
Hamilton-Port Dover	36.00
Total	2,164.14

In the Toronto northeastern district, 11 municipalities have sent signed copies of an agreement with the Commission to provide for the construction and operation of approximately 80 miles of line. On the request of the municipalities inter-

ested in the Ontario West Shore Ry., the Commission has prepared estimates of the cost of completing the construction of the line and of operating it by electric or gasoline power.

A report has also been prepared and submitted to the municipalities in the Aylmer district, for the construction and operation of a line from Westminster Jct., on the London & Port Stanley Ry., through Belmont to Aylmer, with connection to Springfield, Brownsville and Tillsonburg.

The year's work also covered the completion of the work undertaken for the London Railway Commission in the electrification of the London & Port Stanley Ry., which was opened for traffic, July 1, 1915.

Before specifications and plans could be prepared for rolling stock, equipment and sub stations, it was necessary to select a system of electrification. During the past ten years there has been considerable discussion between the most prominent engineers in Canada and the United States on this subject and opinions have been divided between the 1,500 volt direct current system and the high tension single phase alternating current system. However, during the past five years there has been a distinct movement in favor of the first mentioned system for purely interurban railways, the chief reason being that the equipment is lighter, cheaper and more standard, as well as being cheaper to maintain and capable of being operated over existing 600 volt city lines. The chief advantage of the single phase system is that the sub stations may be placed at greater intervals and the overhead system can be designed much cheaper. The Commission decided that the proposed Ontario system should be constructed on the 1,500 and 3,000 volt direct current system.

The centre entrance type of car has been in use on some of the prominent lines in the United States in recent years, chiefly for the reason that it gives greater seating capacity for the same length of car, and is also a more pleasant car to ride in, due to a better separation of the smoking, baggage and main passenger compartments. After consultation with the more prominent car manufacturing companies, it was decided that the centre entrance type of car was impracticable for the proposed Ontario lines, chiefly from the standpoint of safety. A properly designed steel car, provided with a vestibule, has been demonstrated as being the safest type of car to ride in, inasmuch as the vestibule can be designed to collapse when in collision so that the main framing of the car itself will be able to withstand the strain in a satisfactory manner. Specifications have therefore been prepared for a modern 60 ft., three compartment steel car.

Statement in the Legislature.

The Attorney General of Ontario stated in the Legislature, April 5, that no municipal corporation had been authorized by the Lieutenant Governor in Council to enter into agreements with the Hydro Electric Power Commission of Ontario for the construction, equipment and operation of electric railways to be operated by electric power or energy supplied by the Commission under the provisions of the Hydro Electric Railway Act of 1914, sec. 4, other than those mentioned in the Hydro Electric Railway Act, 1915. No agreement had been entered into for the purchase of any existing electric or street

railway or any part of any such railway, to form part of the line to be constructed and operated by the commission. Secs. 1, 2 and 3 of the act of 1915 became operative on the day of assent, April 8, 1915, but sections 4, 5 and 6 will not become operative until they are proclaimed by the Lieutenant Governor in Council.

The first three sections of the act of 1915 deal with what agreements for the building on lines may contain and the power of the municipalities to pass by-laws, to levy rates and to issue debentures, and gave power to purchase existing lines. The other sections of the act, which are not yet in operation, provide as follows: Sec. 4 confirms the contract entered into between the commission and the municipal corporations of Scarborough, Markham, Pickering, Whitby Beach, Whitby, Markham Town, Stouffville and Port Perry, subject to certain amendments set out in the sections. Sec. 5 provides for the execution of separate copies of the contract by each municipality; and Sec. 6 confirms the several by-laws passed approving of the agreement.

Edmonton Municipal Railway Operating Results.

The audited report for the year ended Dec. 31, 1915, presented to the Edmonton, Alta., City Commissioners, Mar. 31, showed total receipts of \$520,322.38, with expenditure as follows: Transportation expenses, \$294,534.91; maintenance, \$11,374.53; equipment, \$33,996.53; general, \$30,362.20; interest and redemption charges, \$259,836; depreciation, \$25,551.05; altogether showing a deficit of \$135,758.71. At Dec. 31, 1914, the total deficiency was \$630,955.19, and this has been increased during the year to \$644,431.52. From this amount has to be taken \$198,585.20, the readjustment of the depreciation reserve as recommended by the investigation committee and approved by the council. The total capital expenditure up to Dec. 31, 1915, was \$3,089,612.00.

The total number of passengers carried in 1915 was 10,658,219, against 14,081,564 in 1914. The average number carried per day in 1915 was 25,200, against 38,579. Passengers paid an average fare of 4.9, against 4.6. The difference in the fare was due to the reduction in price from 6 to 5 for 25c. Car miles run were 2,014,262 against 2,093,373.

The traffic manager has prepared a chart showing the number of passengers carried each month. The traffic dropped considerably until September, when a re-routing of the cars was instituted and the soldiers returned to the city. In December, 48,996 more passengers were carried than in Dec. 1914, and the expenses were reduced from 25.8c per car mile to 19.8c. The running expenses for 1915 were 12.3c per car mile, exclusive of power charges, against 16.6 per car mile in 1914.

Deficit for Jan. 1916, \$9,587.34; deficit for Feb. 1916, \$5,743.45.

Soldiers Not to Obstruct Street Railway Traffic.—Brigadier General Logie has issued the following order in Toronto: "It has been brought to attention that troops on the march, and small squads and bands for recruiting purposes, are interfering with street car traffic in the city. Officers commanding units will be held personally responsible that proper march discipline is preserved in the streets and no interference with the street railway company is permitted."

The Moncton Tramways, Electricity & Gas Co. is adding two p.a.y.e. one man cars to its equipment.

Handwritten notes and signatures at the bottom of the page, including "Receipts for the year ended Dec. 31, 1915" and "Total 2,164.14".

Toronto Suburban Railway's Car Barn Etc. at Lambton.

The Toronto Suburban Ry., in anticipation of the completion of its extension to Guelph, Ont., has built a car barn on the property between Dundas St. and the C.P.R. Toronto-Windsor line, at the top of the hill east of the Humber River and at the junction of the new Lambton-Guelph line with the old West Toronto-Lambton line. The buildings are as follows:—

Inspection shop.....	63 ft. 3 in. x 151 ft. 0 in.
Repair shop.....	61 ft. 1 in. x 83 ft. 7½ in.
Machine shop.....	40 ft. 10 in. x 66 ft. 7½ in.
Paint shop.....	19 ft. 6 in. x 66 ft. 7½ in.
Blacksmith shop.....	28 ft. 0 in. x 30 ft. 0 in.
Boiler room.....	30 ft. 0 in. x 33 ft. 0 in.
Coal store.....	30 ft. 0 in. x 29 ft. 1 in.
Men's lavatory.....	30 ft. 1 in. x 11 ft. 0 in.

floor is of concrete, 4 in. thick; 1, 2 and 4 mixture, with 1 in. fine finish and 3 in. mesh. Six gauge expanded metal, resting on 7 in. I's at 15 lb. at 8½ centres. These 7 in. I beams rest on and are bolted with angles to the 10 in. I beams and at external walls, and anchored to foundation wall at piers with ¾ in. diameter w.i. hook bolts, 4¾ x 6 x 6 in. w.i. plate to outside. The whole of the space under the repair shop is excavated for a depth of about 4 ft. and has a 4 in. concrete floor on 4 in. of gravel, laid with fall to sub pit of ½ in. to the foot. Below the tracks, on this floor, rails 2½ ft. gauge are laid on solid concrete beds. On these

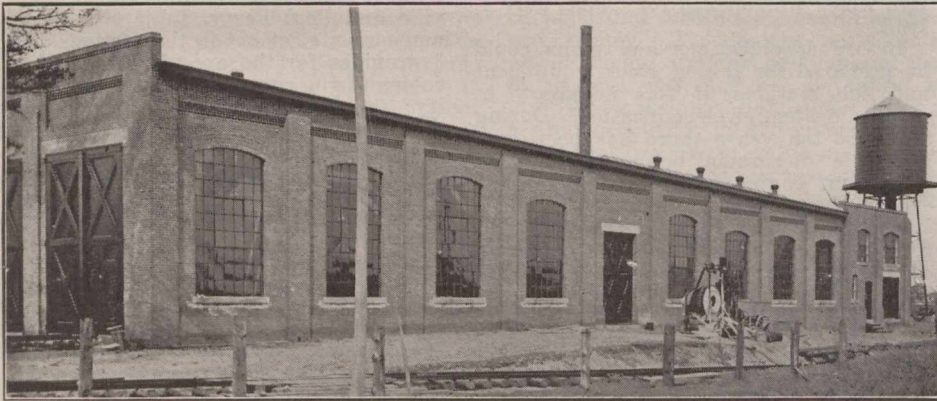
set at any desired height. Twelve standard skylights 8 x 17 ft. are framed in roof.

The machine shop is to be equipped with: 100 ton capacity wheel press; two in one lathe for axle, wheel and small work; spindle lathe; combination radial drill; air trip hammer; wheel grinder; shaper; slotting machine; babbitting furnace; soldering iron furnace; forge; air compressor; 2 pit jacks; 2 cranes; travelling crane; benches, vises, machinist's and blacksmith's tools; full set wood working tools and machines. Two skylights, 8 x 68 ft., run longitudinally in centre of each span and provide excellent lighting to every portion of the shop.

In the paint shop, in addition to the windows, a skylight, 8 x 68 ft., is placed over tracks giving sufficient light for every purpose. The blacksmith shop also contains a standard ventilated skylight 8 x 11 ft. The men's lavatory is provided with 6 water closets, wash basin and urinal troughs and 6 lockers. There is a large ventilated top light.

The boiler room contains a 75 h.p. locomotive type boiler. There is a skylight 8 x 11 ft. The coal storage is very conveniently located, and is so arranged that the coal will be brought direct in cars over the company's own tracks and shovelled through a high doorway level with the coal car, thus necessitating a minimum of handling. The coal space is well placed in relation to boiler. The chimney rests on a solid concrete foundation and the brick work, 7 ft. square, is carried 15 ft. above grade. The steel stack, 36 in. diameter, is 65 ft. above grade.

At the southeast corner of the building entrance is provided to the administrative offices on the first floor. They are placed over the store and lavatory and consist of five offices; public waiting space, separated from the larger office by counter, with office lavatory and private lavatory. The rooms are 9 ft. high and are finished with ¾ in. birch floors and the walls and partitions are plastered.



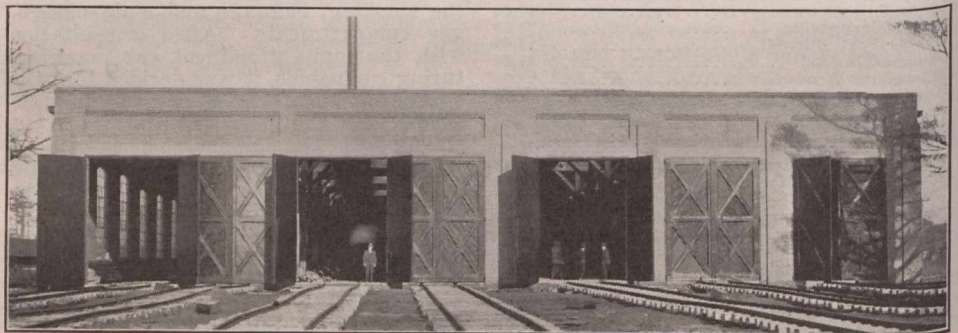
Lambton Car Barn, etc., Toronto Suburban Ry., South Elevation.

The track shown in the foreground is the main line, which joins the old line on Dundas St., immediately to the right of the view.

The administrative offices are on the first floor over the store and lavatory. The walls throughout are of good hard burned brick with massive buttresses to the outside. Toronto pressed brick is used for facing. The different shops, etc., are separated by brick walls, with substantial pilasters, and intercommunicating large sliding doors are provided between each. Excellent lighting is provided by large windows 8½ ft. wide and averaging about 13 ft. in height, and by ample roof lights to every portion. The roof is of mill construction, covered with asbestos and tarred and gravelled. One row of posts runs longitudinally down the centre of the inspection shop spaced at 17 ft. centres, and two rows similarly in the repair shop; one of these continuing through the machine shop. These rest on tapered concrete pedestals. The posts are 12 x 12 in., 22 ft. long, and have 6 x 8 in. braces with 10 x 12 in. corbel heads, the latter bolted to posts with ¾ x 24 in. drift bolts. These take the main 12 x 12 in. roof beams, the ends of which at brick walls are spiked to 3 x 8 in. wood plates bolted down to walls. Into these main beams are framed, with duplex hangers, the 6 x 8 in. transverse beams which carry the 2 x 8 in. dressed roof planking. Large skylights are framed in roof. The floors generally are of concrete, except in the inspection shop, which has a 4 in. cinder floor on sand. The administrative offices have wood floors. The average height of the shops is about 21 ft.

The repair shop has three tracks; 4¼ in. x 60 lb. rails A.S.C.E. section are used, supported on 10 in. I's at 25 lb. resting on 4½ in. steam pipe columns, set on concrete bases 24 x 24 x 9 in. These columns have companion flange cap and base. The 10 in. I's are secured to the companion cap flanges by four ¾ in. bolts and the column bases are anchored to the concrete bases with two ½ in. pins 4 in. long. The

a hand truck can be operated, on which a hydraulic jack will be mounted for dropping car parts. With the open construction employed this jack can be moved from point to point as required. The sub pit provided is 58 ft. long, 11 in. wide and 10¾ in. deep at highest point, laid with falls to 4 in. diameter in centre of pit, and carries away surface water, oil, waste, etc. Concrete steps lead from tracks at both ends down to the lower floor. Six standard ventilated skylights, two 8 x 17 ft. and four 10 x 17 ft., glazed



Lambton Car Barn, etc., Toronto Suburban Ry., Front or West Elevation.

with wired rolled plate glass, set on 4 in. solid wood curbs, are placed in roof.

The inspection shop contains 4 tracks, each of which will accommodate 2 cars. The rails rest on tapered concrete piers placed 4 ft. centres. The floor is hollowed out around these piers below the general floor level, thus permitting the workmen to make minor repairs. To further facilitate in the light repair work, cleaning and painting of the cars, movable iron brackets can be attached to the structural wood posts, on which plank scaffolding can be placed. The posts are bored at intervals to receive the ends of these brackets, so that the scaffolding can be

A low pressure vacuum steam heating system has been installed. By means of a pressure reducing valve sufficient live steam is admitted automatically to effectively heat the buildings. The radiation amounts to 4,500 sq. ft., with the mains and returns included as radiation, and the following temperatures are provided for: Offices, 75° Fahr.; store, 60°; blacksmith shop, 50°; paint shop, 65°; machine shop, 60°; repair shop, 50°; inspection shop, 50°. These temperatures are guaranteed at 5° below zero, at 2 lbs. pressure, and at 15° below zero at 5 lbs. pressure.

A wood tank of 10,000 gall. capacity is placed outside the southeast corner of the

building, supported on steel framework, set on tapered concrete bases. The water supply is obtained from two wells sunk nearby and is pumped to the tank by means of a small electrically operated pump.

The building cost about \$25,000, inclusive of heating and lighting, but not including water tank. It was designed and its erection carried out under the superintendence of Geo. C. Briggs, architect under the general direction of H. T. Hazen, M.Can.Soc.C.E., Chief Engineer.

St. John Railway Co's Annual Report and Meeting.

Following are extracts from the report for the calendar year 1915, presented at the annual meeting in St. John, N.B., recently: The earnings for the year, after

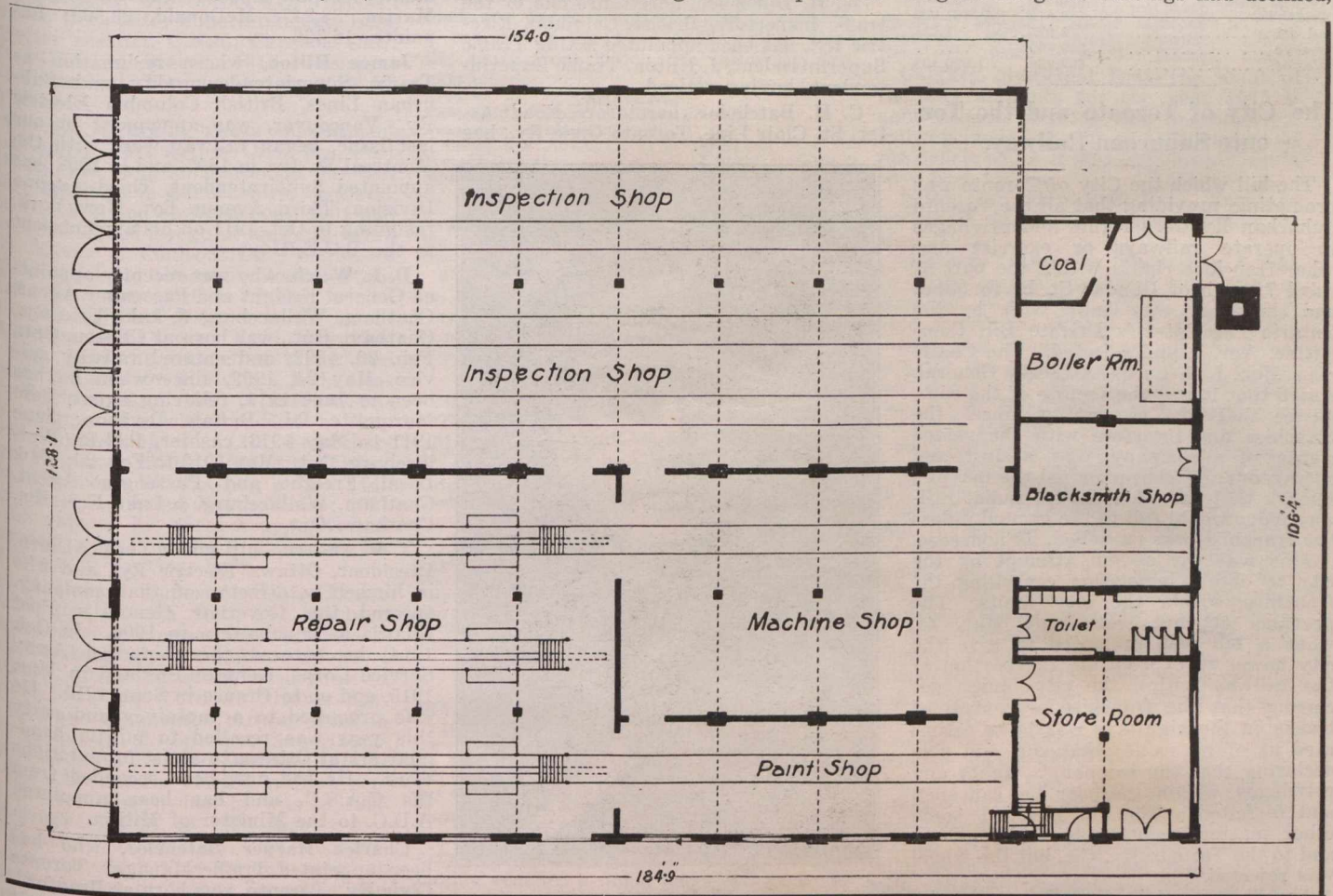
first submitted the legal points to the judgment of the court before taking the law in its own hands.

During the year we completed the Glen Falls extension to the Manor House, and commenced operating it on May 24, 1915. Crouchville extension was completed and operation commenced on Aug. 19, 1915. These extensions are operated at a heavy loss. The completion of the new bridge over the falls enabled us to connect up the east and west sides of our railway system, and a through service was inaugurated on Jan. 1 last. The cost of this work was upwards of \$50,000. A considerable sum was expended in the upkeep of the property, which is in a high state of efficiency. The curves at the foot of King, Prince William and Dock Streets were relaid, and the sharp curves eliminated. This work will remove a serious source of danger in the operation

Dominion Power and Transmission Co's Annual Report.

Following are extracts from the report for the calendar year 1915:

The directors have considerable satisfaction in laying before the shareholders the report on the business of the past year. While the statement shows no marked change over the previous year, the general course of the business must be regarded in estimating its significance. The depression and unfavorable conditions of 1914 continued during the first six months and onward through Aug., 1915, and until that month the decline in our earnings continued. The falling off was somewhat emphasized during June, July and August, by the operations of the so called jitney system. At the end of August the gross earnings had declined,



Lambton Car Barn, Toronto Suburban Ry., General Plan View.

providing for the interest on the bonds and all other charges, were \$71,066.89, out of which your directors declared and paid four quarterly dividends of 1½% each, amounting to \$60,000, leaving a balance of \$11,066.89, which has been transferred to profit and loss account.

The company's street railway earnings were seriously affected by the action of the City's Department of Public Works in tearing up our rails on Union and Main Streets, and filling in the track section with concrete, also removing our rails on Princess St. This stopped the circulation of our cars, made it necessary to transfer at points where our tracks had been torn up, and seriously inconvenienced the travelling public. The legal points involved were submitted to the Supreme Court of New Brunswick, and judgment was given in our favor. It would have been better if the city had

of that section of the railway. We were delayed for over eight months in carrying out this work by the action of the city authorities, which greatly increased the cost.

Electric Railway Statistical Statement.

	1914.	1915.
Gross earnings	\$242,859 83	\$242,217 31
Operating expenses	257,282 64	250,714 34
Expenses per cent. of earnings	105.94	103.51
Deficit	14,422 81	8,497 03
Passengers carried.....	5,576,455	5,541,417
Car earnings per pass.gr.	4.35c.	4.37c.
Transfers	2,036,363	2,241,562
Total passengers carried..	7,612,818	7,782,979
Car earnings per passenger total carried.....	3.19c.	3.11c.
Number of miles of track	21½	25

The directors for the current year are: Col. Hugh 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 and Secretary is H. M. Hopper.

as compared with the same period of 1914, by \$128,437.88. During the remainder of the year the falling off was reversed, the larger part of the recovery taking place in November and December, indicating that a decided improvement may be expected in 1916. The policy of setting apart from gross earnings 20% thereof for maintenance and renewal has been continued. After having provided \$384,771.38 for bond interest, \$386,613.25 for dividends, and \$109,640.38 of unexpended maintenance and renewal reserve, there stood at the credit of profit and loss \$1,139,259.49, from which account \$500,000 has been transferred to the regular reserve account, which now stands at \$1,500,000, leaving still at the credit of profit and loss \$639,259.49. Under the business and money conditions which have been prevailing, it was decided to suspend proceeding with the steam station

construction, but it is intended to proceed to completion as soon as the weather permits satisfactory building work. Operation for the past year has been smooth and uneventful, and the directors look forward to the coming year with confidence and satisfaction. Eighty three employes have joined the military forces of the Empire, being contributed from all parts of the staff. The profit and loss accounts for 1915 and 1914 compare as follows, the cents being omitted:—

	1915.	1914.
Gross earnings	\$2,353,956	\$2,395,967
Operating expenses	1,352,001	1,390,846
Net	1,001,955	1,005,020
Transfer to maintenance and renewal account ..	109,640	101,023
Balance	892,314	904,096
Bond interest & interest	384,771	377,105
Surplus earnings	507,543	526,991
Previous balance	1,020,405	955,861
Dividends	386,613	461,932
Bad debts	2,075	1,055
Reserve	500,000	.....
Balance	639,259	1,020,405

The City of Toronto and the Toronto Suburban Railway.

The bill which the City of Toronto was promoting, providing that all the Toronto Suburban Ry Co.'s rights and privileges to operate railways or exercise any other franchise rights within the part of ward 7 south of Dundas St. be forfeited and cancelled, was dealt with by the Ontario Legislature's Private Bill Committee, Apr. 5, and rejected. The Chairman, Hon. I. B. Lucas, Attorney General, stated that it was the feeling of the committee that the request to cancel the franchise and interfere with the vested rights of a company was absurd and outrageous. He characterized the mayor's remark that the whole hydro radial railway plans would fall to the ground unless the franchise was cancelled, as nonsense.

This was the second attempt by the city to obtain legislation cancelling the franchise within the city limits. The previous attempt was made Mar. 23, when a bill was promoted to give the city power to expropriate the portion of the railway within the city limits, declaring that the franchise or control of tracks on the highways was to be estimated as of no value whatever, and also declaring that the company's rights and privileges within the city be cancelled and forfeited. The bill included some other matters relating to the company and to the Toronto Ry. Co., but the whole was rejected.

The Toronto Suburban Ry., under its agreement with York Tp., dated Sept. 4, 1899, has the exclusive right to build and operate a single and double track railway on Davenport Road from the northern limits of the city to the east limit of the town of Toronto Junction, and in the part of Bathurst St., between Davenport Road and the northern limits of the City of Toronto. The franchise is for 30 years and expires Sept. 4, 1929, and on the expiration of the 30 years the company is entitled to a renewal for a further 20 years upon such terms as may be agreed upon between the company and the township, and so on at the end of each 20 year period. The township at the end of any of these periods, may take over the railway at a valuation by agreement or arbitration. Since this agreement was entered into, the town of Toronto Junction, and other outlying portions over which the company has rights, have been incorporated in the city of Toronto, and disputes have been of constant occurrence.

Mainly About Electric Railway People.

Robt. W. Moore, heretofore Master Mechanic, Moose Jaw Electric Ry., Moose Jaw, Sask., has been appointed Assistant Superintendent.

Hugh Logan, who has been connected with the British Columbia Electric Ry's office staff, has been granted leave of absence to enlist for overseas service.

J. E. Hutcheson, General Manager, Montreal Tramways Co., returned to Montreal early in April, after spending about a month at St. Augustine, Florida.

Bion J. Arnold, of Chicago, has been appointed on the United States Naval Consulting Board, to represent the American Society of Aeronautic Engineers.

W. H. Dinsmore, heretofore one of the traffic inspectors, British Columbia Electric Ry., has been appointed acting Traffic Superintendent, J. Hilton, Traffic Superintendent, having retired.

C. H. Batchelor, heretofore Roadmaster, St. Clair Line, Toronto Civic Ry., has

of Ontario pays the following yearly salaries, as announced in the Ontario Legislature recently: **F. A. Gaby**, Chief Engineer, \$10,000; **W. W. Pope**, Secretary, \$4,000; **W. S. Andrews**, Auditor, \$3,000.

G. W. Lang, whose portrait was published in our last issue, and who was mentioned as Claims Agent, Ottawa Electric Ry., is, as we previously announced, also acting Superintendent during the absence on military service of **F. D. Burpee**.

Duncan McDonald, who has been one of the city controllers of Montreal for the past year or two, was defeated for the mayoralty Apr. 3 by Mayor Mederic Martin. Alderman Lapointe, another candidate, lost his deposit. The votes were: Martin, 33,247; McDonald, 23,300; Lapointe, 16,566.

James Hilton, whose resignation as Traffic Superintendent, City and Suburban Lines, British Columbia Electric Ry., Vancouver, was announced in our last issue, began railway work with the Montreal St. Ry. in 1897, and in 1908 was appointed Superintendent, Third Avenue Division, Third Avenue Ry., New York, resigning in Oct. 1911 on his appointment to the B.C.E.R.

D. L. Welch, who was recently appointed General Freight and Passenger Agent, Chatham, Wallaceburg & Lake Erie Ry., Chatham, Ont., was born at Clinton, Ont., Feb. 29, 1892, and entered railway service, May 24, 1909, since when he has been to June 1911, relieving agent, Pere Marquette Rd., Buffalo Division; June 1911 to May 1913, cashier, P.M.R., Wallaceburg, Ont.; May 1913 to Feb. 20, 1916, Local Freight and Passenger Agent, Chatham, Wallaceburg & Lake Erie Ry., Chatham, Ont.

T. F. Ahearn, only son of Thos. Ahearn, President, Ottawa Electric Ry., and who is himself a director of that company, entered the Governor General's Foot Guards as a subaltern in 1906. In Oct. 1914, he entered the Canadian Army Service Corps, went to England in Mar. 1915, and on to France in Sept. 1915. He was promoted to a captaincy and early this year was recalled to militia headquarters at Ottawa to assist in munitions work. He has now been seconded from the C.A.S.C. and has been appointed A.D.C. to the Minister of Militia.

Charles Harper Batchelor, who has been appointed Traffic Manager, Toronto Civic Ry., Toronto, was born at Bradford, Eng., May 18, 1885, and entered electric railway service in Aug., 1907. He has been, from Apr. 9, 1909, to Apr. 1, 1913, conductor and motor man, Bradford City Tramways, and also motor man on the rail-less electric car system, Bradford, Eng.; Apr. 20 to June 1, 1913, motor man, Toronto Ry., Toronto; June 6 to Aug. 22, controller man, Toronto & York Radial Ry., Toronto; Aug. 22, 1913, to Mar. 21, 1916, Roadmaster, Toronto Civic Ry., Toronto.

James J. Callahan, Manager of Operation, London & Port Stanley Ry., London, Ont., resigned Apr. 8. He was appointed to that position in July 1915, on the completion of the electrification of the line. He was born at New Glasgow, Que., Feb. 25, 1875, and entered electric railway service, Apr. 27, 1897, since when he has been, to 1901, motorman, Montreal Park & Island Ry., Montreal; 1901 to 1908, Inspector and Chief Instructor, Montreal St. Ry., Montreal; 1908 to 1909, Chief



F. D. Burpee
Superintendent, Ottawa Electric Railway.

been appointed Traffic Manager, succeeding **J. Metcalf**, who has enlisted in the Canadian Expeditionary Forces.

Hiram Williams, Assistant Comptroller, British Columbia Electric Ry., has resigned and left Vancouver for England. No other appointment to the position will be made for the present at least.

J. L. Perron, K.C., of Montreal, who is the Montreal Tramways Co.'s solicitor, and who has represented Vercheres in the Quebec Legislative Assembly for some years, has been appointed to the Quebec Legislative Council.

Moses Switzer has been appointed examiner of motormen for the Toronto Civic Ry., and his appointment has been confirmed in pursuance of the provisions of the Ontario Railway Act, by the Ontario Railway and Municipal Board.

The Hydro Electric Power Commission

Inspector, New York and Queens County Ry., Long Island, New York; 1909 to July 1915, Superintendent of Transportation, Montreal & Southern Counties Ry., Montreal.

W. J. Curle, whose appointment as General Superintendent, Chatham, Wallaceburg & Lake Erie Ry., Chatham, Ont., was announced in our last issue, entered railway service with the G.T.R. at Brockville, Ont., about 34 years ago, and about two years later transferred to the C.P.R., being successively, car checker, telegraph operator, night agent, outside agent, and General Yardmaster at Carleton Place, Ont. He was appointed Superintendent, Brockville, Westport & Northwestern Ry., Brockville, Ont., in Aug., 1904, and subsequently also General Freight and Passenger Agent, and from July, 1914, to Aug., 1915, was Superintendent, Toronto Division, Canadian Northern Ry., Toronto; Aug. to Oct., 1915, Superintendent, Lake Superior District, C.N.R., Capreol, Ont.; Oct., 1915, to March, 1916, Assistant Superintendent, Toronto District, C.N.R., Toronto.

Malcolm M. Inglis, whose appointment as Manager, Port Arthur Civic Ry., Port Arthur, Ont., was announced in our last issue, was born in Lanarkshire, Scotland, Oct. 10, 1884, and between Sept. 1901 and Nov. 1908 served a regular apprenticeship with Mavor & Coulson, Ltd., engineers and electricians, Glasgow, Scotland towards the latter portion of that period acting as assistant designer in the machinery department there. From Nov. 1908 to Aug. 1909, he was chief tester and erector for Johnson & Phillips, Ltd., London, England; Aug. 1900 to 1910, assistant designer of machinery, British Electrical Engineering Co., Ltd., Loughborough, England; 1910 to 1911, Chief Electrical Engineer, W. Y. Craig & Co., Ltd., Brynkinalt Collieries, North Wales; 1911 to the date of his present appointment, Electrical and Consulting Engineer for the Town of Yorkton, Sask.

F. D. Burpee, Superintendent, Ottawa Electric Ry., Ottawa, Ont., who has been granted leave of absence for military service, has been given command of no. 1 company, 207th Battalion, with rank of captain. He was born at Ottawa Apr. 25, 1876 and commenced railway work in 1891 under H. B. Spencer, Superintendent, District 4, Eastern Division, C.P.R., Ottawa. He entered electric railway service in 1893, since when he was to 1896 stenographer; 1896 to 1898 cashier and paymaster; 1908 to Aug. 1912, accountant, during which time he also acted as assistant to the Secretary-Treasurer and Superintendent. He was appointed Superintendent in Aug. 1912, when J. E. Hutcheson resigned to enter Montreal Tramways Co's service. In 1894 he enlisted in the Ottawa & Carleton Rifles and was afterwards in the O.A.A.C.Co. of the 43rd Regiment, which he rejoined last year. He has taken an active part in athletics, particularly canoeing and swimming.

In connection with the death of W. W. Chisholm, Electrical Engineer, Windsor, Essex and Lake Shore Rapid Ry., Kingsville, Ont., mentioned in our last issue, we have been advised that so far as can be ascertained, the accident happened as follows: Owing to the heavy snow storm the cars were blocked at a cut near Leamington, and Mr. Chisholm with some employees, was endeavoring to get the cars moving. One truck of a passenger car was off the track. The car had been moved a few inches by use of the truck, and before making another move, he

went between the car and a locomotive to straighten out a drawhead. He laid his hand on the drawhead of the passenger car and gradually collapsed, one of the employes noticing a slight puff of smoke from the hand that was resting on the drawhead. He was wearing rubber boots, and after a careful investigation, the opinion was arrived at that one hand came in contact with the rail when the other was touching the drawhead, that the car must have been entirely insulated from the rail by snow and ice and that his body formed a circuit between the car and the ground.

Brantford Municipal Railway Report.

The Brantford, Ont., Municipal Ry. Commissioners, C. H. Hartman, F. J. Colbeck and W. R. Turnbull, have presented a report for the six months ended Dec. 31, 1915, from which the following are extracts:—

EARNINGS.	
Passenger earnings, city lines	\$25,839.29
Passenger earnings, Grand Valley line	24,492.10
Freight earnings	1,704.91
Miscellaneous earnings	1,356.67
	\$53,392.97
EXPENDITURE.	
Power	\$ 8,943.53
Maintenance	14,735.22
Operating wages and expenses and miscellaneous expenses	16,803.33
	40,482.08
Gross surplus	12,910.89
Bond and debenture interest	\$ 8,658.00
Sinking fund	2,600.00
	11,258.00

Net surplus \$ 1,652.89
The deficit for the 6 months to June 30, 1915, was \$3,202.45, leaving a net deficit for the year of \$1,549.56.

ASSETS.	
Original property and betterments	\$453,206.29
Cash, stores, etc.	31,200.47
	\$484,406.76

LIABILITIES.	
Capital and bonds	\$395,000.00
City current account	39,121.27
City deferred account	32,397.47
Mortgage	1,500.00
Contingent	9,752.65
Presently payable	8,184.93
	\$485,956.32

Deficit for year ended Dec. 31, 1915....\$ 1,549.56

In Dec., 1915, there was a net surplus of \$1,039.19, and in Jan., 1916, of \$1,695.23, so that the 1915 deficit was wiped out by the Jan., 1916, surplus. The commissioners say: "The statements for January and February show clearly that the property is now on a sound basis, earnings having reached a much more satisfactory level and operating expenses having been very materially reduced. We are now in a position to say with perfect confidence that the days of operation of the property at a loss are past and from this time forward the junior member of the public utilities of the city will take its place among the others as a profitable and wise investment on the part of the citizens." The operating ratios were as follows: August, 89.1%; September, 91.1%; October, 86.3%; November, 86.3%; December, 68.3%; January, 59.9%. Following are particulars of passenger traffic:—

	City lines.	Grand Valley.
Car mileage	161,242.01	86,609.5
Passengers carried	554,927	128,898
Passenger earnings	\$26,176.79	\$24,548.20
Passenger earnings per car mile	16.2c.	28.3c.

L. G. Ireland is manager.

The Winnipeg City Council has consolidated the jitney traffic bylaw, making it more concise. No change has been made in the license fee of \$20.

Electric Railway Finance, Meetings, Etc.

Brantford Municipal Ry.—Earnings for three months ended Mar. 31, \$25,716.59; operating expenses, \$17,356.87; net revenue, \$8,359.72. Fixed charges were \$6,141 for the three months, leaving a balance of \$2,218.72. In accordance with the arrangement with the city council, there is \$1,500 available for application on the 1916 instalment of city deferred account, and \$718.72 for the reduction of city current account.

British Columbia Electric Ry., and allied companies:—

	July 1, 1915 to July 1, 1914 to			
	Jan. 1916	Jan. 1915	Jan. 31, 1916	Jan. 31, 1915
Gross earnings	\$591,949	\$640,495	\$3,832,095	\$4,639,394
Expenses	477,927	497,170	3,363,249	3,571,730
Net earnings	114,022	143,325	468,866	1,067,660

	July 1, 1915 to July 1, 1915 to			
	Feb. 1916	Feb. 1915	Feb. 29, 1916	Feb. 28, 1915
Gross	\$572,935	\$558,512	\$4,405,030	\$5,197,906
Expenses	476,413	469,187	3,839,742	4,040,925
Net	99,522	99,325	565,388	1,156,981

Calgary Municipal Ry.—The audit of the city accounts for the year 1915 is announced as showing that the municipal railway made a profit of \$391 instead of the deficit which it was anticipated would have been shown.

Lethbridge Municipal Ry.—Earnings for March, \$4,429.05, against \$3,494.37 for Mar., 1915.

Moncton Tramways, Electricity & Gas Co.—The annual meeting was held at Moncton, N.B., April 12, E. B. Reesor, Vice President, Pittsburg, Pa., in the chair. The following were elected directors for the current year: T. N. Barnsdall, R. Law, Jr., E. B. Reesor, T. O. Sullivan, F. W. Sumner, J. A. L. Henderson and E. O. Bartlett.

Port Arthur Civic Ry.—Passengers carried in March, 164,483, against 142,982 in February and 152,754 in January.

Saskatoon Municipal Ry.—Total revenue for February, \$16,215.26; operating expenses, \$10,337.06; balance, \$5,878.20; capital charges, \$4,575; net profit, \$1,303.20; total miles run, 61,004; total passengers, 314,660; receipts per car mile, 26.581c; operating expenses per car mile, 16.945c; capital charges per car mile, 7.500c; total kw.h., 157,090; k.w.h. per car mile, 2.575; average passengers per car mile, 5.158.

Saskatoon Municipal Ry.—Total revenue for March, \$17,690.02; operating expenses, \$11,396.46; balance, \$6,293.56; capital charges, \$3,781.09; net profit, \$2,512.47; miles run, 62,085; passengers carried, 344,953; traffic receipts per car mile, 28.493c; operating expenses per car mile, 18.356c; capital charges per car mile, 6.090c; total k.w.h. 169,090; k.w.h. per car mile, 2.723; average passengers per car mile, 5.556.

Sherbrooke Ry. & Power Co.—A press report states that negotiations are being carried on for the sale to the City of Sherbrooke of the railway part of the company's undertaking.

St. Thomas Electric Ry.—A proposal was submitted to the St. Thomas, Ont., City Council, April 12, by the London & Lake Erie Ry. & Transportation Co., for the operation of the lines within the city now being operated by a committee of the council. The suggestion is to make a contract for one year, its continuance is to depend upon the results obtained. The matter is under consideration.

Toronto Ry.:—

	1916		1915	
	amount	percentage	amount	percentage
Jan.	\$473,784	\$68,847	\$471,226	\$70,486
Feb.	470,764	70,614	440,313	66,047
Mar.	518,555	97,237	488,468	93,141
	\$1,463,103	\$236,698	\$1,400,007	\$229,647

Toronto Ry., Toronto & York Radial Ry., and allied companies:—

	Jan. 1916	Jan. 1915
Gross earnings.....	\$906,350	\$843,351
Expenses.....	471,493	440,500
Net earnings.....	434,857	402,851

	Jan. 1 to Feb. 29, 1916	Jan. 1 to Feb. 28, 1915
Gross.....	\$1,752,606	\$1,610,677
Expenses.....	931,032	852,333
Net.....	821,574	758,344

Winnipeg Electric Ry.:—

	Jan. 1916	Jan. 1915
Gross earnings.....	\$297,560	\$350,682
Expenses.....	189,085	204,206
Net earnings.....	108,475	136,476

	Jan. 1 to Feb. 29, 1916	Jan. 1 to Feb. 28, 1915
Gross.....	\$590,810	\$665,340
Expenses.....	374,085	408,771
Net.....	216,725	256,569

Manitoba Taxation of Electric Railways.

The act amending the Corporations Taxation Act, passed by the Manitoba Legislature recently, increases the taxation to be levied upon electric railways. The act provided in sec. 3, par. 1, that "Every street railway company in Manitoba and every company working or operating a railway or part thereof entirely or partly by electricity in the province for the carrying of passengers, shall pay a tax of \$500" a year for 20 miles or less and \$10 a mile for every mile in excess, single track, one mile of double track to count as two miles; switches, sidings, tracks into car sheds, Y's and portions of track not in general use to be exempt.

The new act repeals the foregoing paragraph and substitutes the following: "Every street railway company in Manitoba, and every person or corporation other than a municipality working or operating a railway or part thereof, entirely or partly by electricity, in the Province of Manitoba, for carrying passengers shall pay a tax of: \$30 per mile, if the mileage does not exceed 15 miles; \$40 per mile, if the mileage exceeds 15 miles but does not exceed 30 miles; \$50 per mile, if the mileage exceeds 30 miles but does not exceed 50 miles; \$60 per mile, if the mileage exceeds 50 miles. In all cases the mileage shall be computed on the single track, each mile of double track being counted as two miles of single track; switches or sidings, tracks into car sheds, Y's and portions of track not in general use shall be excluded from the computation of mileage."

It was stated by the Provincial Treasurer when the measure was before the Legislature, that the new tax is on the same level as that levied on similar companies in Saskatchewan and Alberta, and he also intimated that there would likely be a further increase after the war. It was stated in the discussion that the Winnipeg Electric Ry., which is the only railway in the province that will be affected, will have to pay an increased tax of \$6,737.13 a year.

Tax on Railway Tickets in England.—

The British Government has withdrawn the tax on railway tickets. It was stated in the House of Commons recently that the expense and trouble required to collect the tax so depleted the £3,000,000 which it was expected to gain, that it had been decided not to persist in the collection.

W. Menard, a telegraph operator at Richmond, Que., has been held to be criminally responsible for the death of W. Gagnon, locomotive fireman, in a train wreck on the G.T.R., near Richmond, Feb. 28.

Electric Railway Projects, Construction, Betterments Etc.

Brantford Municipal Ry.—The Dominion Parliament has authorized the City of Brantford to maintain and manage the Grand Valley Ry. as fully and effectually as the G.V.R. Co. might do, and to extend the existing railway from Brantford to Cainsville, Ont. The city council is to be subject to any bylaws made between the company and any municipality, and shall pay taxes in such municipalities to the same extent as the company would have been liable for. As far as the Parliament's power extends, the control of the railway is vested in the Brantford Municipal Railway Commission.

The Calgary Municipal Ry. contemplates building two miles of temporary track to the Sarcee Military Camp. Materials are on hand. Track will be laid to within 440 yards of the camp. The estimated cost is \$6,000 to \$6,800, which it is proposed to pay out of revenue, and the material, so far as it is available, will be used elsewhere when the camp is removed. (Sept. 1915, pg. 359.)

Hamilton & Brantford Ry.—A new shelter has been erected at the Murray St. crossing, Brantford, Ont.

We are officially advised that the question of physical connection with the Lake Erie & Northern Ry. in Brantford, and the construction of a joint station there is being arranged for. (See Lake Erie & Northern Ry.)

Lake Erie & Northern Ry.—A press report states that it is expected that the section of this railway between Brantford and Port Dover, Ont., will be opened for traffic, May 15. This will give a through line operated by electricity, Galt to Port Dover, 50.3 miles.

A contract has been let to Schultz Bros. Co. for the erection of a station building at the south end of Lorne Bridge, Brantford, which will be used jointly with the Hamilton & Brantford Ry. The estimated cost is about \$40,000. The agreement for the building and use of this station has not yet been formally approved by the H. & B. Ry., the Brantford City Council and the Board of Railway Commissioners. (April, pg. 156.)

Morrisburg & Ottawa Electric Ry.—J. A. Kilt, President, informed the Ontario Legislature's Railway Committee, Mar. 31, that it is proposed to spend \$30,000 on surveys and other work connected with the railway during this year, and he asked for an assurance that the bonding power would be increased to \$40,000 a mile. The committee did not feel that it was justified in acceding to this request, and the matter stood over for consideration by the Legislature. (April, pg. 115.)

Nelson Street Railway.—A press report states that H. P. Thomas has been retained by the Nelson, B.C., City Council to prepare plans and estimate cost of extending the municipal railway along Baker St. from Josephine to Cedar Sts. and on Vernon St. from Cedar to Josephine Sts. F. C. Ingram is Superintendent and Chief Engineer.

Niagara, St. Catharines & Toronto Ry.—The station at Standard, Ont., was destroyed by fire April 2. A press report states that a larger and up to date station is to be built at once in its place. (Jan., pg. 30.)

Ottawa Electric Ry.—We are officially advised that the City Council has decided

to lay a new asphalt pavement on Rideau St., between Sussex and Waller Sts. The company has on hand the 108 and 115 lb. T rails required, and expects to proceed with track laying some time in May. (Oct., 1915, pg. 318.)

Port Arthur Civic Ry. will renew about half a mile of track from Argyle St. to Arthur St. this year.

St. John Ry.—Residents of the parish of Simonds are asking the New Brunswick Legislature to compel the company to carry out an agreement made in 1914 for the extension of the company's railway into that area. An agreement between the parties is expected to be reached as to when the work will be undertaken. (April, pg. 156.)

Winnipeg Electric Ry.—The question of the extension of the Academy St. line, to the Midland Ry. of Manitoba, and of the Talbot Ave. line from Roland to Cameron Sts., is under discussion. Both matters are being considered by committees of the Winnipeg City Council. (April, pg. 156.)

Nipissing Central Railway Report.

The Nipissing Central Ry., 12.64 miles, is owned by the Province of Ontario, and is operated by the Timiskaming & Northern Ontario Ry. Commission. The report for the year ended Oct. 31, 1915, gives the following statistics:—

Revenue from transportation.....	\$105,458.49
Other revenue.....	1,252.13
Total operating revenue.....	\$106,710.62
Maintenance of way and structures.....	\$12,809.80
Maintenance of equipment.....	6,840.72
Traffic expenses.....	474.39
Transportation expenses.....	45,689.44
General and miscellaneous.....	8,737.11
Total operating expenses.....	74,551.46
Net operating revenue.....	\$ 32,159.16
Other income.....	268.00
Total income.....	\$ 32,377.16
Rent for lease of road.....	\$ 7,254.98
Taxes.....	27.19
	7,282.17
Net result.....	\$125,094.99
PROFIT AND LOSS ACCOUNT.	
Balance from 1913-14.....	\$ 27,397.97
Net revenue from operation.....	25,492.96
	\$ 52,492.96
Townsite balance.....	\$ 2,382.03
Interest on advance from T. & N.O.R.....	23,233.90
Paid Treasurer of Ontario.....	25,000.00
	50,615.93
Balance carried forward.....	\$ 1,877.03
ASSETS.	
Cost of road.....	\$298,815.70
Cost of equipment.....	74,290.88
Townsite property.....	244,197.76
Working assets.....	62,591.23
Deferred debit items.....	48.20
Franchise.....	141,383.82
	\$821,327.18
LIABILITIES.	
Capital stock.....	\$530,000.00
Advance from T. & N.O.Ry.....	229,194.16
Working liabilities.....	60,255.99
Profit and loss balance.....	1,877.03
	\$821,327.18

The statistics of operation for the year are as follows:—

Passenger car hours.....	27,326
Passenger car miles.....	280,157
Passengers carried.....	1,367,902
Average daily receipts.....	\$288.92
Average receipts per car hour.....	\$3.36
Average receipts per car mile.....	476
Freight car hours.....	2,077
Freight car miles, loaded.....	1,861
Freight car miles, empty.....	\$16.87
Average receipts per freight car hour.....	\$1.25
Average receipts per freight car mile.....	

Electric Railway Notes.

The Windsor, Essex & Lake Shore Rapid Ry. is going to do some paving in Leamington and Windsor, Ont.

The London St. Ry. is considering the question of double tracking about 2,000 ft. beyond the Exhibition Ground on Dundas Street East.

The Windsor, Essex & Lake Shore Rapid Ry. is in the market for some 80 lb. steel T rails, angle bars, tie plates, track bolts, and cedar and oak ties.

The Winnipeg Electric Ry. has agreed to put on a service of two cars across the Arlington St. bridge, as required by the Manitoba Public Utilities Commission.

The Brandon, Man., Municipal Ry. started operating cars on its electric railway April 12, after having been out of operation, owing to snow and ice, since Jan. 25.

The Port Arthur Civic Ry. has altered one of its cars so as to be operated by one man, and it is proposed to put two such cars in operation on the north belt and one on the south belt line.

The St. Thomas Ont., City Council has raised the wages of the conductors and motormen on the municipal railway from 22 to 25c an hour after six months service. New men are to be started at 22c.

A new traffic bylaw went into force in Vancouver, B.C., April 3, the principal feature of which is that pedestrians are forbidden to cross the streets within certain bounds, in the centre of the city, except at intersections.

The Toronto Civic Ry. employes decided Apr. 11, not to ask for an increase in wages for the present, as according to a resolution passed by them they realize that any increase would mean increased taxation on the ratepayers.

The Saskatoon, Sask., City Council is being asked by Roman Catholic residents to start the Sunday car service on the municipal railway half an hour earlier so as to enable them to use the cars to attend 9 o'clock mass. The question of the cost of the additional service is under consideration.

The Port Arthur, Ont., Public Utilities Commission has been considering a proposal to sell street railway tickets at 7 for 25 cents, and to collect 2 tickets for the run between Port Arthur and Fort William. The Fort William authorities decided April 1, that they would not agree to the proposition.

The Montreal City Council has sent on to the Department of Railways for transmission to the Board of Railway Commissioners, plans for the proposed subway under the Lachine Canal at Wellington St. The estimated cost of the work is \$1,250,000, part of which will be borne by the Montreal Tramways Co., and the Dominion Government.

The Board of Railway Commissioners has authorized the London & Lake Erie Ry. & Transportation Co. to sell through passenger tickets from points on its line to points on, or via, the Michigan Central Rd., and the latter is required to honor such tickets, subject to the condition that prompt accounting therefor be made by the issuing company.

The Sandwich, Windsor & Amherstburg Ry. has ordered 2 single truck, double end, p.a.y.e., city cars, from Preston Car & Coach Co. They will have bodies 21 ft. long, mounted on 21E trucks with 8 ft. wheel base, and will be equip-

ped with 2 Canadian Westinghouse motors, 2 trolleys, electric heating system, push buttons and leather upholstered seats.

The Brantford Municipal Ry. Commission approved April 5, a new wage schedule for conductors and motormen, to date from April 1, as follows: First month, 16c an hour; first year, 18½c an hour; second year, 20c; third year and thereafter, 21c, which gives a 5% increase all round. It was also decided to permit the use of stools for motormen if sanctioned by the Ontario Railway and Municipal Board.

The Quebec Ry., Light and Power Co. is building at its Ste. Anne de Beauport shops, 4 double truck, p.a.y.e. city cars, similar to its class 600 cars now in use. Following are the chief details:—

Seating capacity	40
Bolster centres, length.....	18 ft.
Length over body.....	29 ft. 8 ins.
Length over all.....	40 ft.
Width over all.....	8 ft.
Body, material.....	wood and steel
Interior trim.....	Canadian red birch, stained mahogany
Headlining	Agasote
Roof.....	arch type

The Court of Review at Montreal, in dealing with a claim against the Hull Electric Co., recently, found that the company was guilty of negligence if it did not provide such guards for the front wheels of its cars as would prevent persons who fall on the track from being run over, and that the necessity of providing a "cow catcher" on its cars when operating in rural districts, did not relieve it from providing protection by means of a fender when the cars were being operated on city streets.

The Three Rivers Traction Co., Three Rivers, Que., has ordered three cars from the Ottawa Car Manufacturing Co., for delivery by July 1. Two of them will be single truck, single end, one man, near side, and one will be single end, double truck type, and generally similar to those previously supplied, which were described and illustrated in Canadian Railway and Marine World for Dec. 1915. The bodies will be mounted on radiax trucks and equipped with Westinghouse 101-B-2 motors, straight air brakes, life guards, scrapers, Coleman stationary fare boxes, ventilators, folding doors and steps, and heated with cross seat heaters, 10 per car. The dimensions will be:—

Length of body.....	21 ft.
Length of front vestibule.....	6 ft. 2 ins.
Length of rear vestibule.....	4 ft.
Length over all.....	32 ft. 2 ins.
Width over all.....	8 ft. 6 ins.

British Columbia Accident Case.—In Sept., 1914, some cars belonging to the British Columbia Electric Ry. were standing on a siding on Main St., Vancouver, ready for unloading, when they were liberated by some mischievous boys, with the result that two persons were killed and several injured. Actions were brought against the B.C.E.Ry., and the Dominion Creosoting Co., to which the cars were consigned to recover damages, and in two of the three cases decided, the juries found both companies liable. Other cases were held over pending an appeal. Judgment on the appeal case was delivered April 12, and placed the entire responsibility for the accident on the B.C.E.Ry. An appeal will be made to the Imperial Privy Council by the B.C.E.Ry., but the Court of Appeal declined to allow all the cases to be consolidated for the purposes of the appeal.

Regina Municipal Railway Earnings, Etc.

Following are statistics for February, compared with those for Feb., 1915.

	Feb. 1916.	Feb. 1915.
Total revenue	\$17,166.79	\$14,418.62
Expenses	17,216.17	14,346.13
Capital charges	6,963.80	9,137.58
Adjustment charges .....	.....	.....
Operating deficit	49.38	72.49
Total deficit	9,113.18	9,065.09
Expenses per car mile without power	17.90c.	14.53c.
Expenses per car mile with power	24.01	19.42
Platform wages per car hour	77.19c.	72.56c.
Passengers carried.....	380,265	289,421
Expenses, less capital charges, percentage .....	.....	100.29
Expenses with capital charges, percentage .....	.....	152.51

British Columbia Hours of Labor.—British Columbia Electric Ry. employes have been asking the Provincial Government to pass an act to give them one day off work in every seven days. Several conferences have taken place between the company, the employes and the Government. A statement was made by the Premier in April, to the effect that the Government had come to the conclusion that the men, who number about 1,300 in the three cities, were entitled to one day in seven, or at least one day in eight, which some of the men suggested would satisfy them for the present. The government preferred not to bring down any drastic legislation on the subject, especially as the company had agreed to bring forward a new schedule which would provide for one day in seven or eight. The government would, however, bring in an amendment to the Railway Act giving the Lieutenant Governor in Council power to provide for such a regulation, but there was no intention to enforce it against the company if the latter carried out the compromise now arranged which is satisfactory to the men and which the company agrees to put into effect.

Port Arthur-Fort William Traffic.—In connection with the proposal to give 7 tickets for 25c, and using 2 tickets for the trip between Port Arthur and Fort William, Ont., a report prepared for consideration by the Port Arthur Public Utilities Commission respecting traffic for 1915, shows that 2,096,830 fares were paid, and 407,719 transfers issued. The traffic was distributed as follows: Main line, 66.25%; Arthur St. line, 11.95%; north belt line, 13.45%; south belt line, 8.35%. Of the traffic on the main line, 46.3% travelled on the interurban line. The proposed change would mean a reduction of revenue on the cars of the fast traffic, which would have to be made up by increased traffic, and the question is whether there would be such an increase mainly within the city, to justify the reduction.

Johnson St. Bridge, Victoria, B.C.—The Premier of British Columbia informed the Victoria city bridge committee, recently, that the government was prepared to give an additional \$25,000 towards the building of this proposed bridge, making its contribution \$200,000, and to secure from the British Columbia Electric Ry., either by negotiation or legislation, a contribution of \$50,000. The Canadian Northern Pacific Ry. is contributing \$25,000, but it is not said whether the Esquimalt and Nanaimo Ry. is making a contribution or not. The B. C. Electric Ry. says it will be time enough to discuss the amount of its contribution towards the cost of the bridge, when, if ever, it would be determined to use it, and that the cost of rearranging its tracks so as to run over the proposed bridge would be an expensive matter.

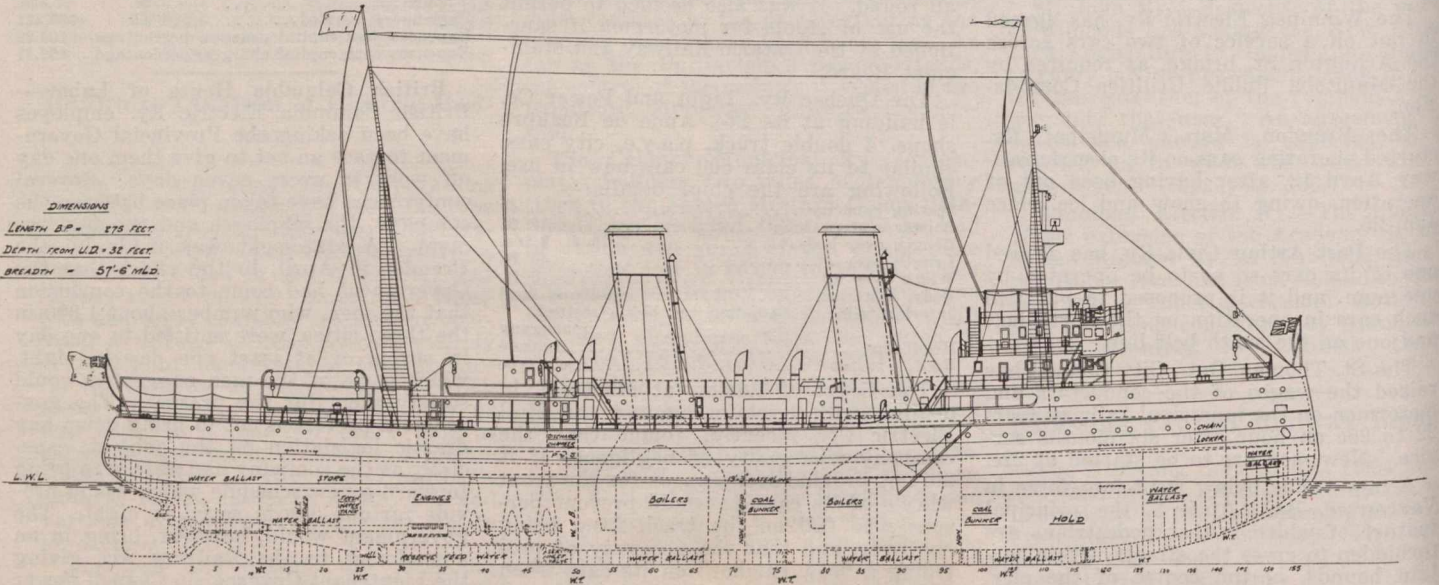
Marine Department

Icebreaking Steamship for the St. Lawrence River.

The Dominion Government icebreaking steamship, which will, it is expected, be launched at Maisonneuve, Montreal, shortly, was ordered early in 1914, from Canadian Vickers Ltd., the contract price being \$998,593, and delivery was required by the autumn of 1915. A considerable

i.h.p. 8,000; speed 15 to 16 knots an hour. She is of the twin screw type designed to work through the ordinary sheet ice formed in the river, from 12 to 30 ins. thick, and packed ice formed in certain parts of the river, particularly at Cap Rouge, will with the displacement and

in conjunction with the double bottom, which extends the full length of the vessel, a double skin extending from the engine and boiler room bulkhead right forward. Access from below to these watertight compartments is provided for by watertight doors. Large trimming



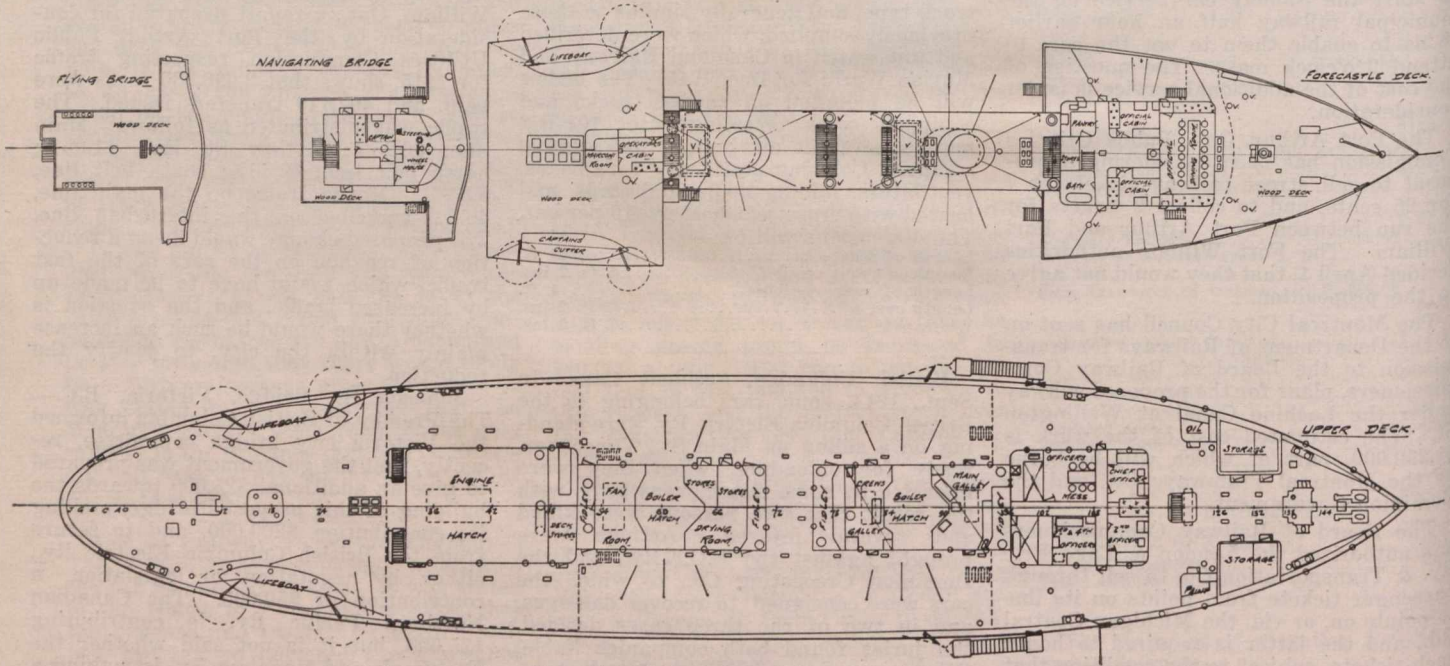
Icebreaking Steamship for St. Lawrence River.

amount of work was done on the hull during the following months of the year, but when war broke out in August, it was found necessary to suspend all outside work, in order to deal with more pressing requirements. Since work on the icebreaker was resumed, very quick progress has been made.

power developed, be successfully coped with. She is of massive construction, built to Lloyd's requirements for class 100 A1. The stem a massive steel casting, is raked aft, and the stern, which is of the cruiser type, will allow of easy propulsion and steering when going astern amongst ice. The watertight sub-

tanks are placed forward and aft, connected with special pumping arrangements, so that the vessel may be trimmed quickly.

The framing amidships and approaching the ends forward and aft, is of heavy channel section 12 ins. deep, spaced 18 ins., and at the extreme ends of the ves-



Icebreaking Steamship. General Arrangement of Upper and Forecastle Decks.

The vessel was designed as an icebreaker only, the intention being that she will lay up during the summer. The principal dimensions are: length over all 292 ft., breadth moulded 57½ ft., depth moulded 32 ft., draught mean 19¼ ft.; sheer forward 4½ ft., sheer aft 2 ft.;

division is very complete, there being seven main transverse watertight bulkheads extending to the upper deck. The side bunker walls are also watertight to the upper deck, and an inner skin is provided between the fore peak and the forward bunker, the bulkheads thus forming,

sel the spacing is reduced to 15 ins. The complete framing is bound in every way practicable in order to form a complete structure, in itself independent of the outer plating. At the icebreaking water line, and running fore and aft for the complete length of the vessel, a special

ice belt is fitted, 10 ft. deep, 1½ in. thick at the stem and 1 in. at the stern. Forward in the bows and from the bottom of the ice belt to the keel plate, the plating is for a considerable distance aft 1½ in. and 1 in. thick respectively.

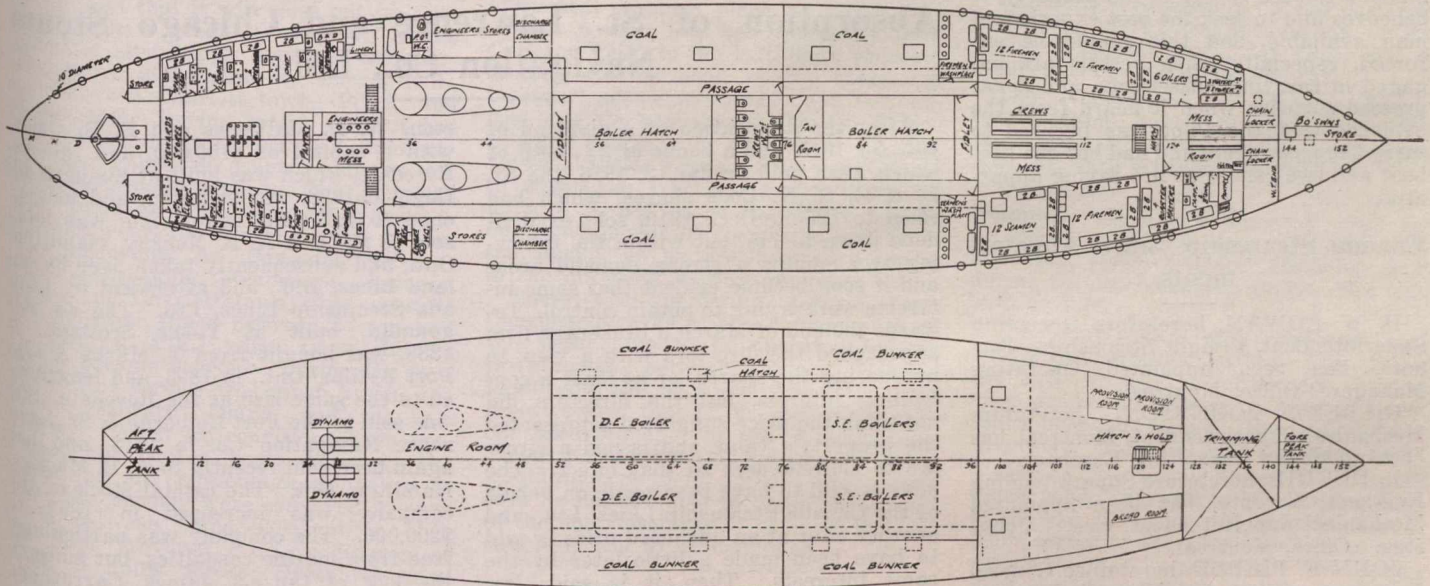
The main propelling machinery consists

The lifesaving appliances are in accordance with the latest rules of the Canadian Steamboat Inspection Act, and include four lifeboats and one cutter.

The deck machinery consists of powerful steam steering gear aft, controlled from the bridge by telemotor, and fitted

Loss of the s.s. Pilot Investigated.

An investigation was held at Quebec, recently, by Capt L. A. Demers, Dominion Wreck Commissioner, assister by Capt. C. Koenig and L. R. Demers, as nautical assessors, into the causes of the loss of the

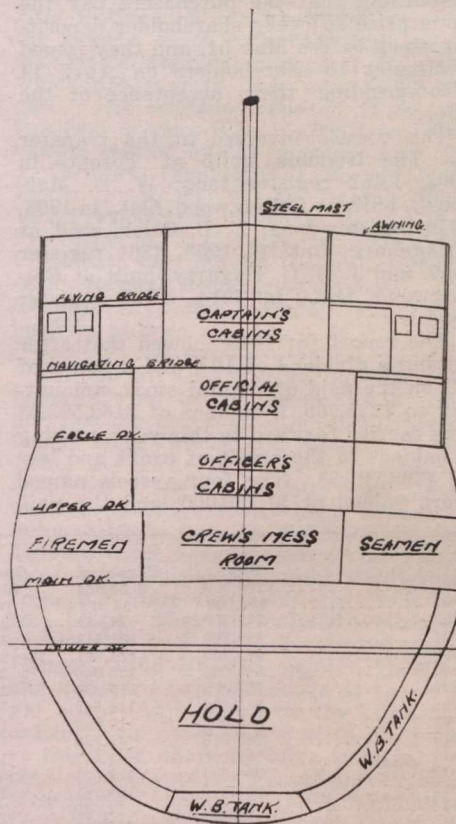


Icebreaking Steamship. Main and Lower Decks.

of twin screw, triple expansion, surface condensing engines, with cylinders 28, 46 and 75 in. diam., by 48 in. stroke, capable of developing 8,000 collective i.h.p., when running at 100 r.p.m. The shafting is made stronger than actual requirements, to withstand the shock, should the propellers strike solid ice, and the propellers themselves are especially strong, being of nickel steel. Independent air, feed and bilge pumps of extra large capacity are provided and the engine room auxiliary equipment is very complete. Steam is supplied to all machinery by two double ended and four single ended boilers of the return tubular type, having a grate area of about 560 sq. ft., and delivering steam at 180 lb. pressure, working under forced draught. All the boilers will supply steam to the main engines, and connections for the auxiliary steam main are also led from three of the single ended boilers. Ash ejectors and steam ash hoists are provided in the various stokeholds.

Accommodation on the main deck is provided for the engineers and stewards, etc., while forward on the same deck are the quarters for the crew and petty officers. On the upper deck at the forward end of the casing are the officers' quarters and mess room. The two galleys are located on this deck in the casing, and communicate with all messing quarters by dumb waiters. In the forecabin are two houses for cold storage with cook's day stores alongside. The official accommodation is located on the forecabin deck, and consists of two official cabins, pantry, bath and w.c., and combined dining saloon and chart room. The wireless telegraph cabin and operator's room are on the boat deck aft, and the captain's cabin and wheel house are on the navigating bridge. Complete hot and cold fresh water, sanitary and steam heating systems are fitted throughout the vessel, and also electric light. A searchlight of 25,000 candle power is also provided and fitted on the fore side of the foremast. Electric current is supplied by two direct current compound dynamos direct driven by high speed enclosed compound engines.

with hand gear at the engine, a windlass, two capstans and boat and coal hoists. Special arrangements have been made for coaling and mooring equipment.



Icebreaking Steamship. Section in Way of Deck Houses, Frame III, looking forward.

Universal Transportation Co., Ltd., has been incorporated under the Dominion Companies Act with \$100,000 authorized capital and office at Toronto, to own and operate steam and other vessels, docks, wharves and other transportation facilities, and to carry on a general transportation business for passengers and merchandise.

Quebec & Levis Ferry Co.'s s.s. Pilot, Jan. 18, on Red Island in the River St. Lawrence, when en route from Riviere du Loup to Saguenay. The master, A. Deschenes, gave evidence that his log was lost and that he encountered much ice, but that the weather was clear. After steering a tortuous course to avoid ice floes, he met with a large field of ice extending some 200 to 300 ft. on his port side, and he chose what appeared to be the narrowest part to enter with the idea of breaking a passage. The ice appeared to be about an inch above the surface, thus indicating a depth of about 11 ins. He entered at full speed to two-thirds of the vessel's length when she stopped. He then tried to work out of the ice, but without success, the vessel being wedged in. In the meantime the tide was ebbing at about 6 miles an hour, and he realized that the vessel was being brought on to Red Island, and when she grounded there, a boat was lowered and all hands landed, as nothing could be done to save the vessel after she grounded.

The court finds that the master showed lack of judgment in entering the ice floe where he did and failing to take into consideration the strength of the ebb and his distance from Red Island, and it cannot conceive why the vessel could not extricate herself from the ice if the conditions were as stated. While the court only charges the master with an error of judgment, it deprecates the system whereby a man holding a minor inland water certificate only, is entrusted with such a responsible position to navigate the St. Lawrence during the winter, a post which requires knowledge acquired by experience only, and it claims that his experience was not sufficient for the position and had there been loss of life, its remarks would have been more severe. The master cannot be held at fault if the owner chooses to engage him, but the master, A. Deschenes, was reprimanded and cautioned to exercise better judgment in future, and the court considers it would have been preferable for him to have waited a more fitting opportunity to enter the ice, and that the mate had not suffi-

cient experience to assist the master. The court also remarked that the qualifications of the master, in virtue of his certificate, may be sufficient for ordinary circumstances, but absolutely insufficient, owing to his lack of experience, in such a trade, and therefore, if the owner is anxious for the safety of his property, it behooves him to seek the best experienced man available, and this should be enforced, especially when vessels are engaged in carrying passengers, and it expressed surprise when it heard from the evidence that the Pilot was licensed to carry 390 passengers and had but one lifeboat and two canoes as life saving apparatus.

Canada Steamship Lines Appointments.

H. W. COWAN, heretofore Operating Superintendent, Freight Steamships, Toronto, has been appointed Operating Manager. Office, Montreal.

GILBERT JOHNSTON, heretofore Mechanical Superintendent, Montreal, has been appointed Consulting Engineer.

R. DUGUID, heretofore Superintending Engineer, Toronto, has been appointed Mechanical Superintendent, vice G. Johnston. Office, Montreal.

JOHN F. PIERCE, heretofore General Passenger Agent and General Baggage Agent, has been appointed Assistant Passenger Traffic Manager. The position of General Passenger Agent has been temporarily abolished. Office, Montreal.

C. C. BONTER, heretofore Special Agent, Montreal, has been appointed General Baggage Agent. Office, Montreal.

W. J. KING has been appointed Division Freight Agent, Montreal, vice J. J. Nelligan, who has joined the Canadian Expeditionary Forces.

D. OLIVIER, heretofore ticket agent, Montreal, has been appointed City Passenger Agent, in charge of the ticket office and excursion business and about Montreal.

D. M. CRITES has been appointed Soliciting Freight Agent, Montreal.

JOHN V. FOY, heretofore General Agent, Buffalo, N.Y., has been appointed Assistant General Passenger Agent. Office, Toronto.

F. J. GRAHAM, who has been in the service for some time in different capacities, including purser and dock ticket agent, has been appointed City Passenger Agent, Toronto, in charge of city and dock offices.

A. A. AULD has been appointed Superintendent of Terminals, with jurisdiction over Toronto, Niagara on the Lake, Queenston, Lewiston and Charlotte terminals, for both passenger and freight steamships. He will have charge of the physical operation of the docks and steamships at these points, and agents will work under his jurisdiction in respect of the handling of freight to and from the steamships, and also any changes in passenger schedule. Captains and engineers will report immediately on arrival any necessary repairs to their vessels to him, and he will consult with the Mechanical Department. He will also be responsible through the Passenger Department for the sailing time of vessels, change of schedule and all orders to captains and engineers affecting this. Office, Toronto.

C. E. CROFT, heretofore General Agent, Toronto, has been appointed Chief of Commissary Department. Office, Toronto.

A. E. RANKIN, heretofore Soliciting Freight Agent, Toronto, has been ap-

pointed Soliciting Freight Agent, Hamilton, Ont., succeeding W. J. Robinson, promoted.

S. J. MURPHY has been appointed Travelling Passenger Agent, Niagara Falls, N.Y., the same position as he had

last navigation season.

W. J. ROBINSON, heretofore Soliciting Agent, Hamilton, Ont., has been appointed District Freight Agent, Windsor, Ont.

BROCK BATTEN has been appointed Westbound Freight Agent, Fort William.

Absorption of St. Lawrence and Chicago Steam Navigation Co., Ltd.

After the declaration of a dividend of 10% for 1915, and a bonus of 2%, both of which were paid on Jan. 2, 1916, the St. L. & C. S. N. Co.'s shares, which had risen to 125 in Dec., 1915, sold ex dividend down to 115, but within the following two months a strong demand arose and it soon became evident that some interests were trying to obtain control. Towards the end of March a brokerage firm approached the directors with a view to purchasing the shares, or at least a controlling interest, but the directors did not think the price suggested represented the property's value and issued a circular to shareholders to that effect. The offer is said to have been made on behalf of the Canada Steamship Lines, Ltd., and another offer at an advanced price is said to have been made a little later by the same interests. Then, it is said, Jas. Playfair, of Midland, Ont., and associates made a higher offer, which was followed by a still higher one of \$185 a share by the Canada Steamship Lines interests, which a majority of the directors decided to accept for their individual holdings, stipulating that the purchasers pay the same price to every shareholder depositing stock before May 31, and they issued a circular to shareholders on April 14 recommending their acceptance of the offer.

The vessels involved in the transfer are The Iroquois, built at Toronto in 1902, 1,452 register tons; W. D. Matthews, built at Collingwood, Ont., in 1908, 2450 register tons; E. B. Osler, built at Bridgeburg, Ont., in 1908, 4361 register tons, and J. H. G. Hagarty, built at Collingwood, Ont., in 1914, 5,704 register tons.

The report for 1915 showed that after paying a dividend of 10% and a bonus of 2% on the paid up capital stock, amounting to \$115,968, a balance of \$162,522.33 was carried forward to this year, making a balance to the credit of profit and loss of \$393,791.88. The four vessels named were valued at \$1,120,000, and the paid

ston, W. D. Matthews and E. B. Osler, with a capital of \$100,000, and the s.s. Rosedale, which was built at Sunderland, Eng., in 1888, was acquired, and lengthened to full canal size. She was later sold to R. O. & A. B. Mackay, Hamilton, Ont., and subsequently taken over by Inland Lines, Ltd., and afterward by Canada Steamship Lines, Ltd. The s.s. Algonquin, built at Yoker, Scotland, in 1888, was bought from T. Marks & Co., Port Arthur, Ont., in 1893, and lengthened to the same size as the Rosedale. She was sold to the Port Colborne & St. Lawrence Navigation Co. in 1913, and has again been sold recently to A. B. Mackay, Hamilton, Ont. The capital stock of the company was increased in 1893 to \$200,000. The company was particularly free from marine casualties, but suffered the loss of the s.s. James Carruthers, with officers and crew, in the great storm on the lakes in Nov., 1913. This vessel was for a time the largest carrier on the Great Lakes, and was built at Collingwood in 1913, with a register tonnage of 5,606.

The shareholders in the company number 230, which for the capital involved shows a very fair distribution of the stock. Some of the shares are held in Great Britain. The directors are: W. D. Matthews, President; J. H. G. Hagarty, Vice President; A. A. Wright, Managing Director; Sir Edmund B. Osler, C. S. Gzowski, G. R. Crowe, Jas. Carruthers, S. Crangle

At \$185 a share for the stock the buyers are paying \$1,787,840 for the St. Lawrence property, which, taking into account cash and other assets, amounts to something like \$47 a ton for the four boats. It was stated some time ago that the Canada Steamship Lines had collected insurance under its war risks at the rate of \$68 a ton for every boat lost, and that the sales of boats had been at equally remunerative rates.

The following table shows the company's record from 1901:

	Stock.	Earnings.	Charges.	Balance.	Per cent. on Stock.	Dividend.	Surplus.
1901	\$200,000	\$ 53,654	\$12,380	\$ 41,274	20.63	15	\$ 62,753
1902	350,000	55,312	14,152	41,160	11.76	26 2-3	18,918
1903	563,300	78,888	20,234	58,654	11.05	10	24,640
1904	563,300	81,613	31,945	49,668	8.81	8	29,235
1905	563,300	134,891	27,749	107,142	19.02	10	80,067
1906	563,300	125,050	32,780	92,270	16.38	10	115,996
1907	751,000	113,928	30,770	83,158	11.15	10	101,965
1908	855,700	116,549	56,234	60,315	7.04	7	102,353
1909	860,000	112,930	13,507	99,423	11.56	8	132,007
1910	860,000	42,830	13,994	136,042	15.81	3	136,042
1911	860,000	62,677	14,233	48,444	5.63	5	141,476
1912	860,000	134,031	35,000	99,031	11.51	8	158,645
1913	900,875	150,161	19,357	130,804	14.52	8	222,150
1914	966,400	54,639	20,768	33,871	3.5	3	231,169
1915	966,400	301,690	23,099	278,600	28.82	12	393,791

up capital stock is \$966,400 (nominal \$1,000,000). For some time past the company largely carried its own insurance risk, the insurance fund showing a credit balance at Dec. 31, 1916, of \$135,689.67. The steamship earnings for the year were \$301,690.25.

The company was incorporated in 1890 by S. Crangle, Sir Casimir Gzowski, G. Hagarty, J. H. G. Hagarty, F. W. King-

Yarrows Ltd., Esquimalt, have an order for the construction of a steel, shallow draught river steamboat for India. The contract was originally placed with the parent concern in Scotland, and transferred to Esquimalt, owing to rush of business. The machinery will be supplied from Glasgow, and the whole will be knocked down and shipped to India, where it will be reconstructed.

Steamship Service Between Prince Edward Island and the Mainland.

The Charlottetown Steam Navigation Co. Ltd. advises us that it has decided not to resume its service between Prince Edward Island and the mainland in the spring, and that it will close out its business. For a great many years it has operated steamships between Summerside, P.E.I. and Pointe du Chene, N.B., and between Charlottetown, P.E.I. and Pictou, N.S. During recent years it has run the s.s. Empress between Summerside and Pointe du Chene, and the s.s. Northumberland between Charlottetown and Pictou as long as weather permitted each year, the winter service having been performed by Dominion Government icebreaking steamships between Pictou and Charlottetown when possible and at other times between Pictou and Georgetown, P.E.I. when Charlottetown harbor became blocked. During the past winter this service was given by the s.s. Prince Edward Island and the s.s. Stanley. When ice conditions have prevented the winter boats running, the mails and any passengers compelled to make the journey were conveyed in open boats between Cape Tormentine, N.B. and Cape Traverse, P.E.I., a distance of about 9 miles across Northumberland Strait, and which was the only route available until icebreaking vessels were provided.

In 1864 the Prince Edward Island Steam Navigation Co. was formed to operate between Charlottetown, P.E.I., and Pictou, N.S.; between Summerside and Georgetown, P.E.I., and Port Hawkesbury, N.S.; and between Summerside and Pointe du Chene and Chatham, N.B. The services were performed by the s.s. St. Lawrence and s.s. Princess of Wales. In 1891 the Charlottetown Steam Navigation Co., Ltd., was incorporated under the Dominion law and took over the old company's affairs, the change being one of name only. In 1891 the s.s. Princess of Wales was broken up, the steel s.s. Northumberland taking her place. The steel s.s. Princess took her place. The latter vessel was sold in 1906 to the Marine and Fisheries Department, her place being taken by the steel s.s. Empress. The present directors of the Charlottetown S. N. Co. are: W. W. Owen, President, A. E. Ings and John Richards.

The Charlottetown Steam Navigation Co. has sold its s.s. Northumberland to the Dominion Trade and Commerce Department, and has about completed arrangements for selling the s.s. Empress, but the name of the latter's purchaser is not yet available. It is said to be the Trade and Commerce Department's intention to run the Northumberland this year between Summerside and Pointe du Chene and to carry on the service between Charlottetown and Pictou with the C.G.S. Stanley, owned by the Marine and Fisheries Department, but a later report says the Stanley is not suitable for the service, having been specially built for icebreaking. The s.s. Princess, which was formerly run by the Charlottetown Steam Navigation Co. on that route, and which was sold to the Marine and Fisheries Department in 1906, is stated in another report as likely to be put on the Charlottetown-Pictou run again this year. It is not expected that the car ferry terminals at Carleton Point and Cape Tormentine will be ready in time to permit of their use by the s.s. Prince Edward Island until early in December next.

On July 31, 1914, the Dominion Government acquired the New Brunswick and Prince Edward Island Ry., from Sackville to Cape Tormentine, and had the car ferry s.s. Prince Edward Island built to run between Cape Tormentine and Carleton Point, P.E.I., near the old open boat landing place at Cape Traverse. A spur line has been built from Carleton Point to the P.E.I.Ry's Emerald Branch and as soon as the steamship terminals are completed at Cape Tormentine and Carleton Point the s.s. Prince Edward Island will commence running between those points. The intention is to widen the P.E.I.Ry. gauge from 3½ ft. to 4 ft. 8½ in. so that there will be no transshipment of freight to and from the Island, as is now necessary owing to the different railway gauges.

There are conflicting reports from Charlottetown as to the management of the steamships to be operated by the Government between Prince Edward Island and the mainland this year. One report stated that G. W. Wakeford, who has been Manager of the Charlottetown Steam Navigation Co. for several years, would manage them, while a later report says he has declined to do so on account of the non suitability of some of the vessels proposed to be employed.

Great Lakes Transit Co. Organized.

The Great Lakes Transit Corporation, organized with a capital of \$20,000,000 by W. J. Connors, of Buffalo, N.Y., has taken possession of the vessels purchased from the New York Central, Pennsylvania, Erie, Rutland and other railways. Among the vessels, which have been engaged in lake traffic, are three passenger steamers, which are said to have cost \$1,000,000 each. The combined capacity of the entire fleet is more than 150,000 tons. The officers elected by the company are: W. J. Connors, Chairman of Board; J. C. Evans, President; M. M. Marcus, First Vice President; H. S. Noble, Second Vice President; W. J. Connors, Jr., Third Vice President; Levi Mayer, General Counsel; R. M. Russell, Secretary-Treasurer. Mr. Connors says the company will begin business at once.

Caution at Rifle Ranges on Lake Ontario.—Owing to the resumption of rifle practice in connection with military training at Long Branch and Niagara on the Lake, the areas likely to be struck by spent or ricochet bullets have been marked as follows:—At Long Branch, 6 miles westerly from the lighthouse at the Toronto west entrance, seven spar buoys have been placed extending southward from the shore for 2,500 yds. from the stop butts. They are painted white and surmounted by a red sign with the words Danger, Rifle Ranges, painted thereon, and mark the extreme limits of the danger zone. At Niagara on the Lake, the danger zone comprises a strip of water at the south shore of Lake Ontario, extending westward for 1½ miles from Fort Massasauga, and 1½ miles northward from the shore. No attempt should be made to cross that area as long as the red flag is hoisted on the rifle ranges at Massasauga and Chataqua. Any vessel having to pass close to the danger area is cautioned to blow her whistle when at least three miles out so that firing can be stopped until she has passed out of the danger area.

An order in council has been issued approving the regulations and rates to be charged on the ferry between Brockville and Morristown.

Atlantic and Pacific Ocean Marine.

The Donaldson Line s.s. Kastalia, at one time well known in the Canadian trade, has been sold to an English firm for approximately \$90,000.

The Cunard Steamship Co. has declared a dividend of 10% less income tax, on its ordinary capital stock, for 1915, and a bonus of 10% free of income tax.

The Norwegian s.s. Thomas Krag, bound from South Shields, Eng. for Baltimore, Md., was towed to Halifax, Mar. 31, with a broken crank shaft.

Manchester Liners s.s. Manchester Engineer, which was reported sunk by a German submarine, was well known in Montreal, which was her Canadian port during the St. Lawrence season. She was built in 1902.

The Norwegian ship Svaland was towed into Halifax harbor, Apr. 1, by the U.S. revenue cutter Seneca, having been dismasted during a severe storm south of Sable Island. She sailed from Liverpool, Eng., Feb. 29, for New York.

Canada Steamship Lines s.s. Turret Court, when en route to Manchester Eng. at the end of March, put in at St. John's, Nfld., owing to some damage having been sustained to her machinery. The repairs were carried out there, and she proceeded on her voyage.

The British s.s. Potomac, which stranded near the entrance to Halifax harbor recently, was libelled in the Halifax Admiralty Court, Apr. 3, by the Halifax Dry Dock Co. for \$22,000 for temporary repairs made before she sailed for New York.

Reports from Liverpool, Eng., to the effect that the C.P.R. is building three steamships at Hong Kong, China, are denied by the company's officials, who state that they have no knowledge of facilities at that port for shipbuilding on a large scale. It is surmised that the report has arisen from the fact that C.P.R. vessels have been repaired there recently.

Maritime Provinces and Newfoundland.

The West Coast Trading and Steamship Co., St. Georges, Nfld., is reported to have purchased the steam yacht Narwhal, of New London, Conn., for \$25,000, for mail service on St. Georges Bay.

Two Government wharves have been built in Shediac Harbor, N.B., one, 700 ft. long, extending out to low water mark, from the northwest extreme of Shediac Island, and the other at Grandigue, 410 ft. long, towards the north tangent of Shediac Island.

The schooner N. W. White, which wintered in Montreal, and was purchased recently by Eastern Canada Fisheries, Ltd., is reported to have been chartered for a cargo of lumber for Great Britain, at 360s. a standard. The rate before the war was 33s. 6d. a standard.

A. B. Mackay of Hamilton, formerly of R. O. & A. B. Mackay, steamship owners, and who has latterly been dealing in steam and other vessels, has placed an order in Digby, N.S., for the construction of a four masted wooden sailing vessel for the South American trade.

The Shepody Navigation Co., Ltd., Moncton, N.B., is offering its s.s. Wilfred C. for sale. She has been engaged for the last few years in passenger and

freight towage service on the Petitcodiac River. She was built at Yarmouth, N.S., in 1897, and is screw driven by engine of 16 n.h.p. Her dimensions are, length 80 ft., breadth 18.5 ft., depth 8 ft.; tonnage 99 gross, 48 register.

The Marine Department announces that lightship 15, stationed at the Sambro outer bank, at the entrance to Halifax Harbor, will be removed from her station about June 1, for necessary repairs. During her absence, the station will be marked by a combined gas and whistling buoy, painted black, showing an occulting white light, and a submarine bell buoy, painted black, moored 300 yds. northward of the gas and whistling buoy.

The Marine Department advises the old wooden light ship no. 1, at Barrington Bay, on the southwest coast of Nova Scotia, has been replaced by lightship no. 17. The vessel is a wooden schooner with two masts, the hull painted red, and with a red ball on the main mast. The illuminating apparatus is dioptric, consisting of two lights on the fore mast, a white light 35 ft. above water level, and red light 20 ft. below the white light, visible 11 and 6 miles respectively from all points of approach.

The Public Works Department received tenders to Apr. 26, for the purchase of the s.s. Mulgrave and a barge, formerly utilized in transferring passengers and freight at the Strait of Canso, between Mulgrave and Point Tupper, N.S. The Mulgrave was built at New Glasgow, N.S., in 1893, and is of steel, and is screw driven by engine of 75 n.h.p. Her dimensions are, length 114.8 ft., breadth 31 ft., depth 16.4 ft.; tonnage, 485 gross, 330 register. The barge is 140 ft. long, 31 ft. broad and the hold is 6 ft. deep, and about 195 tons.

Province of Quebec Marine.

The s.s. Westmount, formerly owned by the Montreal Transportation Co., has had her name changed to Wethersfield.

Canada Steamship Lines s.s. Laurentian sailed from Quebec, Apr. 15, for Natashquan and Anticosti, being the first steamship to sail out of Quebec this year.

The Public Works Department has completed the dredging of a basin on the east side of the Government wharf at Murray Bay, to 15 ft. below low water level.

The Quebec Harbor Commissioners received tenders to Apr. 15, for the construction of a freight shed and grain loading galleries on the northern extension of the Princess Louise embankment.

The Montreal Board of Control has recommended that the contract for the operation of a ferry service between Montreal and St. Helens Island, be awarded to Canada Steamship Lines, Ltd., for one year for \$22,180, and if the council possesses the necessary power, to extend the contract to five years at \$19,950 a year.

The operation of the ferry between Riviere Ouelle and Ste. Irene and Murray Bay, came before the Senate recently, when Senator Loughheed stated that the cost of the service from July 1, 1913, to Mar. 1, 1916, was \$143,836.08, and that several complaints as to the service during the winter had been received. In the winter of 1913-14, the vessel was withdrawn from service Dec. 27, resuming Mar. 20; in 1914-15, she missed 30 regular trips, and in 1915-16, she missed 47 regular trips.

Steamer Howard W., Ltd., Steamer Stuart W., Ltd., and Steamer Richard W., Ltd., have been incorporated under the Quebec Companies Act, each with authorized capital of \$10,000, and offices at Quebec, Que., to own and operate steam and other vessels, docks, wharves and other facilities, to dock and repair vessels, operate salvage and wrecking plants, act as stevedores and general merchants. L. C. Webster, H. Aird, Montreal, and W. Q. Stobo, H. C. Thorn and C. St. J. Griffis, Quebec, are the incorporators in each case.

Ontario and the Great Lakes.

The Welland Canal was officially opened for traffic, Apr. 22, at 8 a.m.

The Public Works Department will receive tenders to May 2, for dredging to be done at Port Hope.

The Western Navigation Co.'s s.s. Kaministiquia, reported sold recently, has had her name changed to Westoil.

Canada Steamship Lines' s.s. Rosedale has been generally rebuilt for ocean service, at Port Arthur, at a cost of approximately \$50,000.

Hamilton press reports state that Canada Steamship Lines is making arrangements for taking over the Hamilton Ferry Co's business.

The C.P.R. opened its service on the Great Lakes, Apr. 24, and will give five sailings each week during the summer from Port McNicoll.

The s.s. Quinte Queen, which was offered for sale by auction at Ottawa, Mar. 28, as mentioned in our last issue, was not sold, owing to lack of bids.

The Farrar Transportation Co.'s s.s. Collingwood ran aground above Whitefish Point, Apr. 24, in ice, during a fog, and was released by dredging, Apr. 25.

The Reid Wrecking Co., Sarnia, is reported to have sold the s.s. Magnetic to Cleveland, Ohio, parties, and to be negotiating for the sale of the s.s. Wyoming.

The Great Lakes Transportation Co.'s s.s. Glenlyon was the first steamship to pass through the Sault Canals, down-bound, locking during the afternoon of Apr. 23.

Work in connection with the raising of the Cadillac Steamship Co.'s s.s. Western Star, which foundered near Sarnia, last autumn, has been suspended for a time owing to the collapse of the cofferdam which had been built around it. The loss is estimated at \$32,000.

Canada Steamship Lines s.s. Rochester, which last year was chartered to a company operating out of Chicago, will this year be operated by the Northern Navigation Co., which is subsidiary to Canada Steamship Lines Ltd., in place of the s.s. Majestic, destroyed by fire recently.

The Buffalo Creek Rd., a switching road of 34.95 miles, in Buffalo, N.Y., is reported to have awarded a contract to the Great Lakes Dredge and Dock Co., there, for a new dock to be built on the canal, to be of reinforced concrete on pile foundation, about 800 ft. long and 30 ft. wide.

The Interstate Commerce Commission decided, Apr. 6, to reconsider its demand of the G.T.R. application under the Panama Canal Act, to retain control of the Canada Atlantic Transit Co., operating steamships between Georgian Bay ports in Canada, and Chicago, Ill., and Milwaukee, Wis.

A press report from Cleveland, Ohio, states that 26 steamships have been ordered there for delivery during 1916 and 1917. Of these, 9 are intended for the lake trade and the remainder for ocean service. The 17 ocean vessels, it is stated, will be delivered this year, with 6 of the lake vessels.

The Niagara, St. Catharines and Toronto Navigation Co's s.s. Dalhousie City was the first steamship to enter Toronto harbor from an outside port this year, arriving there Apr. 1. Capt. Maddick was presented with a silk hat by the harbor master. This is the third successive year that the Dalhousie City has opened the season at Toronto.

The United States Lake Survey reports the levels of the Great Lakes in feet above tidewater for March as follows:—Superior, 602.17; Michigan and Huron, 579.48; Erie, 571.74; Ontario, 245.46. Compared with the average March levels for the past ten years, Superior was 0.60 ft. above; Michigan and Huron, 0.57 ft. below; Erie, 0.07 ft. above, and Ontario, 0.43 ft. below.

The Public Works Department has dredged a channel 150 ft. wide leading to the Government wharf at Bruce Mines, to a depth of 16 ft. below zero of the gauge, which is 580 ft. above mean sea level at New York. At the wharf, a turning basin has been dredged to the same depth, for 150 ft. east and 200 ft. west of the middle of the wharf, and for 190 ft. behind the outer point of the wharf.

Canada Steamship Lines, Ltd., has deposited with the Minister of Public Works, the plans of a proposed wharf to be built in the St. Lawrence River at the foot of Wolfe Island. As announced in our last issue, it is the company's intention to build a wharf at Port Metcalfe, at the foot of Wolfe Island, for the transfer of passengers for Clayton and other Thousand Island points from the steamships Toronto and Kingston.

The s.s. Cabotia, formerly owned by the Cabotia Steamship Co., Montreal was offered for sale at Toronto, by public auction recently. She was built at Gibraltar, Mich., in 1880, and was formerly known as Hiawatha. She is of wood with diagonal strapping on frames, with steel boiler house, and equipped with fore and aft compound engines with cylinders 21 and 50 ins. diam., by 46 ins. stroke, 700 i.h.p. at 85 r.p.m., and supplied with steam by a Scotch boiler 12 x 12½ ft. at 125 lbs. Her dimensions are: length 234 ft., breadth 36 ft., depth 30 ft.; tonnage 1,530 gross, 932 register.

An examination of the dredged channel at Owen Sound, by the Public Works Department recently, shows that there is a least depth of 20 ft. in the channel from the outside bay to a point 200 ft. inside the back range lighthouse, with the exception of an area 100 ft. wide on the east side extending from 550 ft. outside to 350 ft. inside the front range lighthouse, where depths of 19 ft. and less are found. From a point 200 ft. inside the back range lighthouse to the outer end several spots with a less depth than 20 ft. and a least depth of 17.7 ft.

Two steel freight steamships are under construction by the Western Dry Dock & Ship Building Co., at Port Arthur, for delivery during the current year. Their dimensions are, length over all, 261 ft., length between perpendiculars 251 ft., beam 43½ ft., depth 28 ft. 2 ins. Each vessel will be equipped with triple expansion engines with cylinders 20, 33 and 54 ins. diam. by 40 ins. stroke, supplied with

steam by two Scotch boilers 14½ ft. diam. by 11 ft. long at 190 lbs. They are being built to Lloyd's inspection for ocean service, and will each have a carrying capacity of 3,000 gross tons.

The s.s. Frontier, formerly Argyle, and at one time owned by the People's Steamboat Co., Toronto, is to be sold unless claims against her for repairs, etc., are met, according to the decision of the Admiralty Court, held at Chatham, Ont. Among the numerous claims is one of the Customs Department for duty on repairs made to her last year at Detroit, Mich. The vessel has had an unsuccessful and varied career. She was built at Picton, Ont., in 1876, and rebuilt in 1899. The hull is of oak, and her dimensions are: length 185 ft. 1 in., breadth 26 ft., depth 9 ft. 7 ins.; tonnage, 700 gross, 374 register.

A Montreal press dispatch stated recently that in anticipation of a shortage of vessels in the lake trade this year, Canada Steamship Lines, Ltd., was reported to have bought up every freighter it was possible to acquire suitable for lake service, and that several vessels hitherto plying out of Ogdensburg had been taken over together with several vessels which were not in service last year. We are officially advised that Canada Steamship Lines, Ltd., has purchased the s.s. Moreland, which was wrecked on Lake Superior two or three years ago, and which is now being repaired at Superior, Wis.

The Toronto Harbor Commission contemplates continuing reclamation work along the waterfront, between the Humber River and Bathurst St., and on Toronto Island. The harbor head walls are also under contemplation, from Bathurst St. east, for which work tenders are being asked. In addition to this, reclamation work will be proceeded with in the industrial district and inner harbor, and the Cherry St. bridge. The total cost of the work west of Bathurst St. and at Toronto Island, which it is expected will be commenced this year, approximates \$500,000, while the other work mentioned will be about \$700,000.

The George Hall Coal Co., Ogdensburg, N.Y., has sold its s.s. Henry B. Hall to A. H. Lonov, Montreal. She was built at Detroit, Mich. in 1881, and is of oak construction with diagonal strapping on frames, with bow sheathed for ice, and was practically rebuilt in 1906, when she received her present name, having formerly been known as Iron Duke. She is equipped with compound engines with cylinders 23½ and 48 ins. diam., by 36 ins. stroke, 415 i.h.p. at 82 r.p.m., and supplied with steam by a Scotch boiler 13 ft. 4 ins. diam. by 11 ft. 7 ins. long, at 150 lbs. Her dimensions are, length 213 ft., breadth 35 ft., depth 19 ft.; tonnage, 1,151 gross, 962 register.

The s.s. T. J. Waffle, formerly owned by T. J. and W. J. Waffle, Kingston, Ont., was offered for sale, by auction, Apr. 12, at Kingston, by order of the Exchequer Court of Canada, Toronto Admiralty District. She is of oak construction and was built at Westport, Ont. in 1914. She is equipped with a high pressure engine with cylinder 12 ins. diam. by 14 ins. stroke, built at Kingston in 1879 and remodelled in 1914, and supplied with steam by a boiler of the firebox type, 4 ft. 8 ins. diam. by 8 ft. long, at 150 lbs. Her dimensions are, length 105 ft., breadth 22 ft. 5 ins., depth 8 ft.; tonnage, 202 gross, 104 register. The vessel was purchased by Capt. A. Foster, Smiths Falls, Ont., for \$8,500.

The Great Lakes Transit Co. has been organized in New York, with a capital of \$20,000,000, to control 85% of the passenger, packet freight and grain steamships operating on the Great Lakes under the U.S. flag. The fleet will comprise 35 steamships with a freight capacity of 150,000 tons, these being the vessels of 6 railway companies compelled to relinquish their connection with the operation of steamships under a section of the Panama Canal act. The vessels include those controlled by the Pennsylvania, New York Central, Erie, Delaware & Lackawanna and Rutland Rds. J. C. Evans, heretofore Vice President and General Manager, Anchor Line, has been appointed President of the new Company, with office at Buffalo, N.Y.

The s.s. Sarnor, latterly owned by H. M. Norris, Montreal, and which has been the arrow signal which was used last year with claims aggregating \$21,000 against her, was sold by order of the Admiralty Court, Apr. 1, to A. B. Mackay, Hamilton, and P. C. Bonham, Toronto, for \$6,700, the completion of the sale being subject to the consent of the Admiralty Court. The Sarnor was built at West Bay City, Mich., in 1888, and rebuilt in 1901, and was formerly known as Britannic. The hull is of oak with diagonal strapping on the frames, and with the bow sheathed for ice, steel arches and steel boiler house. The propelling machinery consists of fore and aft compound engines with cylinders 24 and 48 ins. diam. by 40 ins. stroke, 495 i.h.p. at 82 r.p.m., and is supplied with steam by a boiler of the firebox type, 10½ by 15½ ft. at 115 lbs. Her dimensions are: length 219 ft., breadth 36 ft., depth 20 ft.; tonnage 1,319 gross, 1,152 register. She was used in the coal trade between Lake Erie ports and Montreal.

The officer in charge of the operation of the canals and locks at Sault Ste. Marie, Mich., announces that to replace the arrow signal which was used last year to designate the lock to be taken by upbound vessels in passing through the Sault Canals, there has been installed on the top of the watchman's shelter near the end of the centre pier, a signal composed of two inclined arms which diverge upward in the form of a broad V. The arms each carry four white lights, spaced in line equidistantly, and are lighted either on the arm to the north or the south to signal that the lock on the side so indicated is to be taken by an upbound vessel. In order that downbound vessels may know before coming within calling distance of the west centre pier whether there is sufficient water to enable them to take the Poe lock, the draft of the Poe lock will be displayed at the watch station at the west end of the west centre pier, in a manner similar to that at Brush Point, and will be properly lighted so that it may be read at night.

British Columbia and Pacific Coast.

The British Columbia Express Co., will not, we are advised, operate any steamboats during this year.

The Public Works Department received tenders recently for the construction of a wooden freight shed on the Government wharf at Vancouver.

The West Vancouver ferries' total receipts for March were \$1,573.10, and the deficit \$197.01. They are being taken over by the council for operation on May 1.

The C.P.R. s.s. Princess Victoria was taken out of service early in April for her

annual overhaul, being replaced on the Seattle run by the Princess Alice, and on the Vancouver run by the Princess Adelaide.

The Marine Department has given notice that the change in the color of gas beacon lights and gas buoy lights, from occulting red to occulting white, in British Columbia waters, will be made as occasion offers, about May 1.

The Marine Department has discontinued the use of dolphins to mark the channel at the entrance to the north arm of the Fraser River, as the building of a jetty on the south side has made them unnecessary.

The C.P.R. sailings to Alaska will commence with the s.s. Princess Alice, June 9, and she will make eight trips during the summer. The s.s. Princess Charlotte will make three trips in July, and the s.s. Princess Sophia, two in each month, June, July and August.

The West Vancouver Ferry Co. will probably increase its ferry service May 1, operating three vessels, the Doncella, Sonrisa and West Vancouver No. 5. The last mentioned has been operating under charter on a passenger service between Vancouver and Port Moody.

The British Columbia Premier stated in the Legislature, Apr. 3, that the Agent General of the Province in London, Eng., was doing excellent work in connection with the releasing of interned German vessels, with the view of utilizing them in the Pacific coast lumber trade.

The wharf at Blubber Bay, Texada Island, has been extended to 260 ft. long, and has an elevated car track on it near to its eastern extremity. A berth has been dredged giving depths from 25 to 20 ft. along the north face, and from 20 to 15 ft. along the northwest face.

The Dominion Government lighthouse and buoy tender Quadra, which was sunk at Gallows Point, near Nanaimo, Feb. 26, in collision with the C.P.R. s.s. Charmer, is reported sold as she lies, partially submerged at low tide, to Capt. A. R. Bissett, Vancouver. It is stated that she will be raised and repaired if possible.

The C.P.R. commenced its summer service to the west coast of Vancouver Island, Apr. 1, when the s.s. Tees sailed from Victoria for Clayoquot and way ports. The summer schedule provides for similar trips on the 1st and 15th of each month, and to Holberg and way ports on the 7th and 20th of each month, making four trips each month.

Repairs on the Union Steamship Co's s.s. Camosun were expected to be completed by the end of April. The contract was placed with Yarrows Ltd., Esquimalt, the price being stated as \$18,669. The contract covered the renewal of 19 plates, 8 plates to be taken out and faired, repairing 3 tank top plates, repairing the stokehold bulkhead, renewing the keel for about 60 ft., new propeller and tail shaft and overhauling the engines. The Camosun stranded on a reef off Digby Island, Mar. 7, and was released about 10 days later.

The Grand Trunk Pacific Coast Steamship Co.'s summer schedule goes into effect, from Seattle, Wash., June 12, and from Prince Rupert, June 17. The steamships Prince George and Chelohsin, the latter owned by the Union Steamship Co. of British Columbia, will be operated between Seattle, Victoria, Vancouver and Prince Rupert, and the s.s. Prince Rupert from Seattle to Skagway, Alaska, calling at principal ports each way. The first vessel for the season left Prince Rupert

for Skagway, Mar. 30, and will continue until Sept. 25 from Seattle and Sept. 27 from Prince Rupert.

Port Moody, B.C., ratepayers, on Apr. 8, by a vote of 115 to 15, endorsed the agreement between the city and Boyds, Limited, which has been formed to carry on a general shipbuilding and repairing business. It was announced that construction would be proceeded with immediately, and by about the middle of July, it is expected that the plant will be sufficiently advanced to enable the first keel to be laid, and four months thereafter, it is anticipated that the first launch will take place. The site of the plant is on

the water front between Kyle and Queen Sts., about 400 by 1,100 ft. Foundations are to be laid for three launching slips, and vessels of approximately 2,000 tons will be built, each with capacity for 1,500,000 ft. of lumber. The slips will be built so as to provide for the building of steel vessels up to 10,000 tons. Two marine railways are also to be included in the plant, one of 1,000 tons capacity and the other of 3,000 tons. The active management is in the hands of Capt. H. Mowatt, formerly Marine Superintendent, C.P.R., Liverpool, England, who has superintended the construction of several of the largest of the C.P.R. steamships.

Mainly About Marine People.

J. W. Norcross, Vice President and Managing Director, Canada Steamship Lines, Ltd., has been elected a director of Canadian Vickers, Ltd., Montreal.

John Hannan, head of the Ogdensburg Coal & Towing Co., and President, St. Lawrence Realty Co., Montreal, died at Ogdensburg, N.Y., Apr. 9, after a long illness.

Lt.-Col. G. P. Murphy, of the Canadian Army Service Corps, and Vice President, Ottawa Transportation Co., who has been in England for some time is on the staff of Major General Carson, C.B., the Minister of Militia's representative in London.

Gilbert Johnston, who has been appointed Consulting Engineer, Canada Steamship Lines, Ltd., Montreal, was appointed Mechanical Superintendent, Richelieu & Ontario Navigation Co., in Sept. 1894, and continued in that capacity under the various changes made in the company, until his present appointment.

Capt. J. Freeman, who died at Victoria, B.C., Apr. 2, aged 81, had been master of various vessels on the Atlantic and Pacific Oceans for many years, having received his first command in 1856. For the past 15 years he was port captain for R. Dunsmuir & Sons, but owing to failing health, his duties had been purely nominal for the last three years.

Capt. McNeill, of the Canadian Pacific Ocean Services s.s. Lake Manitoba, committed suicide at Plymouth, England, by shooting, Apr. 7. He had been in C.P.R. service from the time when the company took over the Beaver Line, prior to which he was with Elder, Dempster & Co., who controlled the Beaver Line. He was about 45 years old.

Lieutenant **J. M. Hazen**, son of **Hon. J. D. Hazen**, Minister of Marine, has died of wounds received in action. He graduated from the Royal Military College, Kingston, Ont., since the commencement of the war, and received a commission as Lieutenant in the 25th Battery of Artillery, C.F.A.

Claude Cameron Bonter, who has been appointed General Baggage Agent, Canada Steamship Lines, Ltd., Montreal, was born at Toronto, Nov. 13, 1884, and entered navigation service in 1905, since when he has been, to 1910, baggage agent, Richelieu & Ontario Navigation Co., Toronto; 1911 to 1912, Assistant Baggage and Claims Agent, same company, Montreal; 1913 to 1915, Special Agent, Passenger Traffic Department, Canada Steamship Lines, Ltd., Montreal.

A. Ray Lawrence, who has been appointed District Passenger Agent, Northern Navigation Co., Cleveland, Ohio, is a member of the firm of Akers, Folkman & Lawrence, General Steamship and Pas-

senger Agents, and has been connected with the transportation business since 1902. He began as messenger, Cleveland, Cincinnati, Chicago & St. Louis Ry., Cleveland, remaining in that company's service until 1905, when he was appointed assistant ticket agent, New York, Chicago & St. Louis Rd., and later joined Akers & Folkman, general transportation agents, becoming a partner in 1914.

Engineer-Commander J. Carmichael, R.N.R., who was personally decorated by the King, with the D.S.O., recently, for special services in mine laying operations, was in C.P.R. service from 1911, when he went from Liverpool to Vancouver, to occupy a shore position in the British Columbia Coast Service. At the outbreak of war he was in Scotland superintending the construction of two vessels for the C.P.R., the Princess Irene and Princess Margaret, both of which were requisitioned by the Admiralty as soon as completed. He was on the Princess Irene for some time and was transferred to the Princess Margaret just prior to the sinking of the former.

Capt. W. F. Butler, who was drowned following the torpedoing of the s.s. Port Dalhousie in British waters, as announced in our last issue, lived in Halifax, N.S., and was connected with deep sea navigation for many years. He was for some time serving with Pickford and Black, and was chief officer of the s.s. Beta, and later, master of the s.s. Fastnet, sailing her from Halifax to British Columbia via the Straits of Magellan. On returning to Halifax, he was appointed master of the s.s. Oruro, and on leaving Pickford and Black's service, had command of the Arctic schooner Burleigh, the schooner Adventure, the s.s. Sable I, and later took the s.s. Wasis to England where she was sold.

H. A. Jackson, who has been appointed General Traffic Manager, Great Northern Pacific Steamship Co., San Francisco, Ca., was born at Toronto, Jan. 6, 1869, and educated at Upper Canada College. He entered railway service in 1894 as Travelling Freight Agent, G.N.R., Duluth, Minn., and was from July 12 to Dec. 1, 1896, Contracting Freight Agent, same road, Spokane, Wash.; Dec. 1, 1896, to Aug. 21, 1898, Travelling Freight Agent, same road, Spokane, Wash.; Aug. 21, 1898, to June 13, 1899, General Agent, same road, Spokane, Wash.; June 13, 1899, to Oct. 1, 1905, Commercial Agent, same road, and General Freight and Passenger Agent, Spokane Falls & Northern Ry., Spokane, Wash.; Oct. 1, 1905, to Aug., 1909, Assistant General Freight and Passenger Agent, G.N.R., St. Helena, Mont.; Aug., 1909, to Apr., 1911, in a similar position, Portland, Ore.; Apr.,

1911, to Mar., 1916, Assistant Traffic Manager, same road, St. Paul, Minn.

P. D. Sutherland, whose appointment as General Agent, Passenger Department, Canadian Pacific Ocean Services, Ltd., Hong Kong, China, was announced in a previous issue, was born at Toronto, Nov. 2, 1879, and entered C.P.R. service in the General Freight Department, under his father, J. N. Sutherland, subsequently transferring to the Passenger Department at St. John, N.B., where he spent four years in the City Ticket Office, and the West. St. John Atlantic Terminal, and was then transferred to Toronto as chief clerk in City Passenger and Ticket Agent's office, and in 1906 was transferred to Hong Kong as Passenger Agent, C.P.R. Pacific Ocean Service. His territory now covers Hong Kong, South China, Phillipine Islands, Straits Settlements and India.

C. E. Croft, whose appointment as Chief of the Commissary Department, Canada Steamship Lines, Ltd., Toronto, was announced in our last issue, was born at Cobourg, Ont., Aug. 26, 1904, and entered steamship service in Apr. 1904, since when he has been, to 1907, stenographer, Passenger Department, Richelieu & Ontario Navigation Co., Montreal; 1907 to 1911, secretary to Traffic Manager, same company, Montreal; 1911 to 1913, chief clerk, Traffic Department, Montreal; 1913 to 1914, chief clerk to Manager, Eastern Lines, same company, Montreal; 1914 to 1915, chief clerk to Operating Superintendent, Canada Steamship Lines, Ltd., Montreal; 1915 to March 1916, General Agent, same company, Toronto.

Requisitioning of Vessels by the Admiralty.—The Minister of Trade and Commerce has issued a circular stating that there is a general impression that vessels carrying Canadian grain from Canadian ports are more likely to be requisitioned by the Admiralty than are those carrying Canadian grain from U.S. ports. He points out that British vessels sailing from U.S. ports are in exactly the same position regarding their requisition as those sailing from Canadian ports. He also states that so far as can be seen at present, no necessity will arise during the current season for the Dominion Government to commandeer grain for war purposes, as the desired reserve for immediate use was secured by its action last November.

Enemy Subjects on Vessels at Canadian Lake Ports.—On a report emanating from Cleveland, Ohio, to the effect that the Dominion Government had decided to remove sailors of enemy nations from all vessels touching at Canadian lake ports, it was announced in Ottawa, Apr. 21, that the Government did not contemplate examining vessels touching at Canadian lake ports, and removing sailors of belligerent nations.

The Dominion Government Dredge, Port Nelson, which was built at Polson Iron Works, Toronto, and taken to Port Nelson, Hudson Bay, in 1913, has, according to a statement in the House of Commons, by the acting Minister of Railways and Canals, cost to date, \$363,518. Since being sent north, the dredge was working for nine weeks during the summer of 1915.

North American Shipping Co. Ltd. has been incorporated under the Dominion Companies Act, with \$48,000 authorized capital and office at Winnipeg, to own and operate steam and other vessels, docks, wharves and other shipping facilities, and to act as general carriers.

Stranding of the s.s. Potomac.

An investigation was held, recently, at Halifax, N.S., into the causes of the stranding of the Anglo-American Oil Co's s.s. Potomac, near Holy Stone rock, south of Sandwich Point, at the entrance to Halifax harbor, Feb. 19. Capt. L. A. Demers, Dominion Wreck Commissioner, conducted the enquiry, assisted by Capt. John Fleming and D. C. Stuart, as nautical assessors. The Potomac is 3,868 tons gross, 2,471 tons register. She sailed from Middlesbrough, Eng., Jan. 29, for Galveston, via Norfolk. On the voyage out, boisterous weather with head wind was encountered, and there was considerable fog in the neighborhood of Halifax harbor, where she grounded, remaining fast until Feb. 23.

Following is a summary of the judgment: The court cannot come to any other conclusion than that the master allowed but one thought to occupy his mind, viz., that of bringing his vessel to port as quickly as possible, owing to shortage of fuel, and ignoring prudence, by proceeding without a pilot, on the distance obtained from Chebucto by sound only, and by being too positive of the correctness of a compass which had scarcely been checked during the outward voyage. Being a stranger in the vicinity, he showed lack of judgment in attempting to make a strange port under such adverse conditions as existed. The fact that, through stress of weather, his coal ran short, causes the court to deal leniently with him, by severely censuring him for his temerity and lack of prudence and judgment.

The court's attention was called to the system of having sailing vessels instead of steamboats to convey pilots to and from vessels, and while admitting that criticism is justified, points out that in cases where a vessel chooses to keep going instead of laying to, the adoption of steamboats would be of little use. The evidence does not show that the vessel's officers failed in their duties, and they are exonerated. The logs and deviation book were all kept with a degree of care and precision. The court deprecates the placing of boys, with practically no sea experience, on the lookout, as they are incapable of realizing the importance of their duties, but understanding the difficulties of masters in finding crews, owing to war conditions, refrains from further criticism of the master's actions on this head.

Certificated Officers on Motor Vessels.

The bill before the House of Commons regarding the necessity of certificated officers for the navigation of vessels driven by internal combustion engines, of which mention was made in our last issue, amends sec. 629 of the Canada Shipping Act, and a new section, 640a is added regarding certificates and classification of engines on such vessels. Sec. 629 provides that no person shall act in the double capacity of engineer and master on any steamboat, and no person shall, except when the boiler is fired from the engine room, act as engineer and fireman on any steamboat having an engine of over 7 n.h.p. and required by law to carry a certificated engineer. This is amended by the addition of a sub-section reading as follows: "Subject to such regulations as may be made by the Minister this section shall not apply to any passenger ship not exceeding 65 ft. reg-

istered length propelled by an internal combustion engine or by a steam engine with a flash boiler, or by electricity."

Sec. 640a, which is added, is as follows: "The Minister may issue certificates authorizing persons found qualified by the Chairman of the Board of Steamboat Inspection to take charge of the machinery of vessels propelled by internal combustion engines only, and may prescribe by regulations, a classification for such certificates, the qualifications necessary for obtaining the several classes respectively, the limits and authority of the power conferred by the several classes of certificates and the fees payable for such certificates, and may also provide for the examination of those desiring to obtain certificates. 2, The provisions of sec. 628 shall apply to the certificates granted under this section."

Sec. 628 provides for the suspension and cancellation of certificates.

The Quadra-Charmer Collision.

Following is a summary of the judgment on the causes of the collision between the Dominion Government s.s. Quadra and the C.P.R. s.s. Charmer, near the entrance to Nanaimo harbor, B.C., Feb. 26, when the former was sunk. The enquiry was held by Capt. J. D. Macpherson, Wreck Commissioner for British Columbia, assisted by Capt. Ridley and Gardner as nautical assessors. The court decided that the whole blame for the collision was due to E. LeBlanc, master of the Quadra, the mishap taking place in broad daylight with a smooth sea and fine clear weather. The Quadra had the Charmer broad on her own starboard and was therefore the giving way ship, but no action was taken until too attempting to cross the Charmer's bow, late. The master disobeyed article 22 by with the inevitable result. Further, article 25 requires all vessels in narrow channels to keep on their own starboard side of the channel, but the Quadra was so far on the port side that the evidence of her own crew placed her about 40 ft. off the black buoy which marks the port side of the entrance to Nanaimo harbor. Much evidence, most of which was unreliable and conflicting, was given to the effect that the Quadra gave two short blasts of her whistle on seeing the Charmer. Granted that such whistles were given, such a signal was in violation of article 28 which indicates other signals. The one mentioned if given indicated that the Quadra was directing her course to port, which she never did, and had she done so the court's opinion was that such a movement was neither authorized nor required by the regulations under the circumstances existing.

The court decided not to deal with the master's certificate, but severely reprimanded him, being influenced by the facts that there was no loss of life, that although the collision was caused by the most flagrant breaches of the regulations, it was, in the court's opinion, not due to ignorance nor to carelessness, but rather to the stupid assumption which is far too prevalent in British Columbia, that by being the first to blow a signal whistle gives that vessel the right to choose on which side she will pass an approaching vessel; and that the loss of his vessel as affecting his previous excellent record is in itself a severe punishment. In reprimanding him, the court warned him as well as others handling vessels in British Columbia waters, that until any duly authorized rules appear, the present international rules must be implicitly

obeyed and that in future any breach of them will be severely dealt with. No blame was attached to any other members of the Quadra's crew. Regarding the Charmer, the court found it difficult to see how any blame could be imputed to its officers or crew. It was the duty of the Charmer's master to carry out the one rule which applied to him under the conditions then existing, viz., to keep her course and speed. This he undoubtedly did, and furthermore when he found that a collision was unavoidable, he took the best action possible to avert it. The master of the Charmer, C. Campbell, and the officers and crew were therefore absolved from all blame for the casualty. Capt. Gardner dissented from the judgment as given, giving as his reasons that the Charmer had left her berth on the outward trip at full speed, which is dangerous and should be condemned; that there was some excitement on board the Charmer, caused by nearly swamping a motor launch in passing her in contravention of the regulations governing such cases, this excitement causing a lack of proper vigilance and causing the approach and the signals of the Quadra to be overlooked; that the signals of the Quadra were properly given, and while they are not international signals are the outcome of a custom and long usage and recognized by local masters. He also stated that the master of the Quadra could not be absolved for being on the wrong side of the channel, by being there he was contributing to the initial cause of the accident and merited the censure which a departure from the rules deserves. It was announced after the judgment had been delivered, that the master of the Quadra would appeal to the Minister of Marine against the judgment, as in his counsel's opinion the finding was opposed to the trend of the evidence.

Licensing of Canadian Vessels for Foreign Business.

Following on the British regulations of Nov. 10, 1915, prohibiting British vessels of 500 tons and upward from engaging on voyages to foreign ports without licenses, the Dominion Government has issued instructions on similar lines, as follows: All Canadian registered vessels whose gross tonnage exceeds 500 tons, are from Apr. 1, prohibited from proceeding on any voyages, excepting those from a port in Canada to another port in Canada, or from a port in Canada to a port in the United States, and vice versa, unless a license to do so has been granted to, or in favor of, the owners or charters of such steamships. The Minister of Marine is authorized to appoint a committee with power to grant the licenses required, which may be general in reference to classes of ships or their voyages, or special. The Minister is authorized from time to time, to add to the committee and to substitute as members, others, to replace such as may die, resign or become incapable of acting. It is also ordered that all steamships failing or refusing to obtain a license as provided, shall be subject to forfeiture.

Tonnage on Canadian Register.—The Minister of Marine in replying to a question in the House of Commons recently, stated that the tonnage on the Canadian register for the decennial periods from 1875, was as follows: 1875, 1,205,565; 1885, 1,231,856; 1895, 825,776; 1905, 669,825; 1915, 929,891.

Investigation of the Fire on the s.s. Matatua.

An enquiry was held at St. John, N.B., concluding Apr. 4, into the origin of a fire aboard the s.s. Matatua, Mar. 12 and 13, while lying at her dock there, where by the master, Capt. Gilman, lost his life. Capt. L. A. Demers, Dominion Wreck Commissioner, presided, assisted by Capt. A. J. Mulcahy and D. Kenny, as nautical assessors. The vessel is owned by Shaw, Savill & Albion Co., London, Eng., and was loading miscellaneous cargo for Australia and New Zealand, including 3,000 to 4,000 drums of calcium carbide, which was stowed in every hold.

The first officer stated that an alarm of fire was conveyed to him at 12.10 a.m. on Mar. 12, and immediate instructions were given to combat it. The ship's hose was not used, as the water service pipe on deck was under repair, but the crew helped the crew of the Sin Mac, the tug and fireboat, which was fast alongside the Matatua, and hose was playing on the fire by the time the local brigade arrived. He caused the hatches to be battened down and directed the use of carbon dioxide into hold 3. Notices prohibiting smoking were exhibited at various points and were visible to all, and there were two watchmen, one at the gangway and the other the ship's watchman, who were instructed to perform the usual duties and also to see that no one smoked in the hold. He stated that though he was not familiar with local climatic conditions, precautions were taken to prevent the service pipe from freezing, but without avail, and it was being repaired for the second time. Regarding the explosions, he stated that a few minutes after the first one he spoke to the captain as to the dangers, and had hardly left the bridge when the second one took place, causing a general outburst of flame and eventually causing the captain's death.

D. Gallagher, an employe of the Marine Department, gave evidence on the effects and dangers of calcium carbide, and on precautions in handling it, and termed the gas generated as very penetrating and that it would explode of its own heat. A representative of the Canadian Carbide Co. also spoke as to the method of packing and handling carbide, and stated that he considered carbide was not an explosive.

After considering the evidence, and after having visited the vessel, the court criticized the second officer for not being on deck at 12 midnight, when his watch commenced, instead of being in his room, and also on the manner and matter of his evidence, but it was informed later that at the time he was not in his ordinary senses, but was in an abnormal condition, and had this been known at the outset, the taking of any evidence from him would have been deferred. The court failed to find that anyone had been smoking in hold 2, specially mentioned. Regarding the origin of the fire, the court found that there were several possibilities, but no certainty, and therefore declared that the origin was unknown and remains a mystery. In referring to the second explosion, the evidence showed that apparently the fire had been put out late on the first day, and the second explosion occurred early on the second day, enveloping the vessel in flame and cutting off the captain's quarters with remarkable suddenness. The opinion of the court as to the second outbreak is that the explosion was caused through the accumulation of acetylene in a restricted space, generated by the immersion of the carbide in

water, and that the igniting of the gas took the merest fraction of a second, as it cannot conceive that any fire remained from the first outbreak after the immersion of the hold. The court criticizes the lack of foresight in the stowing of such a cargo, quoted a British Board of Trade regulation respecting the carriage of carbide, and stated that in face of such a regulation it cannot for a moment condone the method adopted on the Matatua. The court was however unanimous in exonerating the officers of the vessel from any blame for the casualty, but advised a stricter supervision at all times, while cargoes are being taken in, and more especially during war times. It also recommended that if the service pipe be out of repair, means be immediately adopted to replace temporarily the defective service, as at no time should a vessel be left without proper fire equipment. In reiterating that the origin of the fire is unknown, the court stated that it may have been caused by spontaneous combustion, the dropping of a cigarette stub or the hot ashes of a pipe, either accidentally, carelessly or maliciously, but there are no signs visible, nor is there any evidence even to suspect the employment of chemicals or bombs. The death of the master was accidental and no blame was attached to anyone for the loss of life.

The Longshoremen's Agreement at Montreal.

The longshoremen attached to the port of Montreal have entered into an agreement with the shipowners trading to the port, for two years from Mar. 15, providing for an increase of 5c an hour day and night on general cargo, and 5c an hour increase to coal shovellers on general cargo vessels. The rates heretofore in force were 35c an hour for day and 40c an hour for night work on general cargo, and 40c an hour for coal shovellers day and night. All other conditions remain as heretofore. This is the first time the longshoremen at Montreal have had increases since 1908.

During the negotiations, the most friendly spirit existed between all parties, and it was through this good will that a speedy and satisfactory arrangement was concluded. The steamship lines which are parties to the agreement are:—Allan Line, Black Diamond Line, Cairn Line, Canadian Northern Steamships, Ltd., Canadian Pacific Ocean Services, Ltd., Crown Line, Cunard Line, Direct Line, Donaldson Line, Furness Line, Head Line, Leyland Line, Manchester Liners, Ltd., New Zealand Shipping Co., Ltd., South African Line, Thompson Line and White Star-Dominion Line.

Vessel Losses during the War.—Merchant vessel losses from the commencement of the war to Mar. 23, are reported as totalling 726 with an aggregate tonnage of 1,987,375. Of these, 627 vessels of 1,914,375 tons are steamships, and 99 vessels of 73,000 tons are sailing ships. The losses of the allied powers were 481 steamships of 1,621,000 tons, and 57 sailing vessels of 47,000 tons; while neutral nations lost 146 steamships of 293,375 tons, and 42 sailing vessels of 26,000 tons. The chief losses were naturally British, these comprising 379 steamships of 1,320,000 tons, and 31 sailing vessels of 19,000 tons. In addition to the foregoing, the allies lost 776 trawlers, and neutral powers 196. The British loss is under 4% in numbers and slightly over 6% in tonnage, of the total register.

Coast, Lake and River Steamship Officers for 1916.

The following appointments made by navigation companies engaged in Canadian navigation for their various steamships and tugs, have been reported to Canadian Railway and Marine World, in addition to those published in our last issue. The names in the first column are those of the vessels; those in the second column, of the captains, and those in the third column, of the chief engineers.

CANADIAN GOVERNMENT RAILWAYS, MONCTON, N. B.		
Leonard	O. Dubois	O. T. Williams
Prince Edward Island	J. J. Merchison	R. L. Main
Scotia No. 1	R. L. Maguire	W. J. Johnson
Scotia No. 2	R. Keating	W. Anderson
CHARLOTTETOWN STEAM NAVIGATION CO. LTD. CHARLOTTETOWN, P.E.I.		
Empress	A. Cameron	J. A. Rowe
Northumberland	A. W. McLeod	C. Cumming
This company is discontinuing business, and has sold the s.s. Northumberland to the Dominion Government.		
CHATHAM NAVIGATION CO. LTD., CHATHAM, ONT.		
Ossifrage	T. J. Stockwell	G. Peel
DETROIT AND WALLACEBURG STEAMSHIP LINE, DETROIT, MICH.		
Olcott	T. Moore	L. Miller
DOMINION TRANSPORTATION CO., CHICAGO, ILL.		
Caribou	A. A. Batten	Jas. Nicoll
Manitou	N. J. McCoy	C. Kenny
MIRAMICHI STEAM NAVIGATION CO. LTD., CHATHAM, N. B.		
Alexandra	Jas. Nowlan	W. S. Stewart
Miramichi	J. P. Bullick	N. Smith
Sybella H.	H. Copp	A. McIntyre
MONTREAL TRANSPORTATION CO. LTD., MONTREAL		
Advance	J. V. Norris	M. J. Sherman
Bartlett	A. Lepine Jr.	J. P. Lappin
D. G. Thomson		G. Henderson
Emerson	W. J. Murphy	J. G. Lamoureux
Glenmont	W. H. Norcott	D. Cameron
H. F. Bronson	L. Mallan	
India	J. Reoch	F. H. Brian
Kinmount	W. F. Young	R. G. Gibson
M. P. Hall	T. Lesprie	H. Paus
Mary	H. Desgrosseillier	
Rosemount	L. G. Dixon	M. Dickson
Simla	C. E. Coons	D. S. Symons
Stormount	W. H. Blackler	R. Downie
Windsor	J. Doyle	A. Dunn
MERCHANTS TRANSPORTATION CO. LTD., SYDNEY, N. S.		
Weymouth	W. E. Leblanc	P. Schrupp
NORTH SHORE STEAMSHIP CO. LTD., SYDNEY N.S.		
Aspy	D. McDonald	S. O. White
PEACE RIVER NAVIGATION CO. LTD., EDMONTON, ALTA.		
Northland Call	J. Willisroft	A. Grant
PROGRESSIVE STEAMBOAT CO. LTD., VANCOUVER, B.C.		
Harry S.	J. R. Grauer	G. Dennis
Maagen	A. O. Clampitte	O. Sherbruge
Progressive	T. T. Edwards	G. Dixon
Pronative	A. Lewis	O. Mathieson
Senator	H. Grauer	A. Toren
REID NEWFOUNDLAND CO.-ST. JOHN'S Nfld.		
Argyle	G. O'Reilly	T. Moysk
Clyde	J. Kne	J. Pollock
Dundee	D. Blandford	H. Crawford
Ethie	N. Day	P. Burton
Glencoe	A. Blandford	F. C. Barnes
Home	S. Harbin	J. Cunningham
Kyle	L. Stevenson	J. MacFarlane
Meigle	J. Goobie	John MacFarlane
Sagona	B. Taverner	J. Buckingham
RICHMOND STEAMSHIP CO. LTD., SYDNEY, N.S.		
Richmond	W. H. Micheau	R. G. Morrison
ROSS NAVIGATION CO. LTD., PAS. MAN.		
Brisbin	H. L. Weber	B. M. Olde
Minasin	H. H. Ross	T. Paquette
JOHN WALTER, EDMONTON, ALTA.		
City of Edmonton	P. Christianson	
WEST VANCOUVER FERRY CO. VANCOUVER, B.C.		
Doncella	J. Watson	R. W. Pyne
Sonrisa	D. Smith	H. L. Thompson

Quebec Pilots and Apprentices.—A bill has been introduced in the House of Commons, amending the Canada Shipping Act as regards pilots and pilot apprentices in the Quebec Pilotage District, and providing that the number of pilots for that district shall not exceed 125, and that when the apprenticeship period of a pilot has been interrupted by sickness or other legitimate cause, he may be allowed to serve an additional period equal to the time lost, and if found otherwise qualified and entitled to a license, he may be granted such license after he has completed a full service period of seven years including the additional period.

Stranding of the s.s. Sarah Radcliffe.

An investigation into the stranding of the s.s. Sarah Radcliffe, owned by Evans-Thomas Radcliffe Co., Cardiff, Wales, and under charter to the Admiralty, on Georges Island, in Halifax Harbor, Mar. 23, was held at Halifax, Apr. 1, by Capt. L. A. Demers, Dominion Wreck Commissioner, assisted by Capt. John Fleming and D. C. Stuart as nautical assessors. Following is a summary of the judgment: The court finds that the master and officers of the vessel are not to blame for the predicament in which the vessel was placed owing to dragging at her anchor, and attributes the stranding to an act of God. All directions given by the pilot were followed when first the vessel anchored, and again under the same pilot's direction, when the vessel was ordered to shift her berth, and at that time there were no indications of a change of weather. When the vessel began to drift, the essential duties of the master and officers were carried out. The vessel came off without much delay and with but little damage. The attention of the first and second officers was called to the fact that they had not taken bearings of objects which were then visible, to fix the exact position of their anchoring ground, and cautioning them that entries should have been made in the scrap log, and log of bearings, soundings, etc., and also of the precautionary measures taken for the safety of the vessel.

The Dominion Marine Association and the United States Seaman's Act.

In the U.S. Seamen's Act, now in force on the Great Lakes, a number of new regulations are provided, some of which affect Canadian vessels trading with U.S. ports. The sections of the act which affect Canadian vessel owners, are 4, 11, 13 and 16. The first amends a previous section and provides for the payment of seamen, on demand, of half of the wages earned, at any port where cargoes are taken on and delivered, the demand not to be made for five days after the commencement of a trip nor oftener than once in five days. This section is particularly made applicable to seamen on foreign vessels in U.S. harbors, and U.S. courts are to be open for its enforcement. Sec. 11 amends sections respecting advances of wages to seamen, and allotments of pay to dependents.

Sec. 13 provides, among other things, that no vessel of 100 tons or upwards shall depart from any U.S. port, unless she has on board a crew not less than 75% of which, in each department, are able to understand any order given by officers of the vessel, nor unless certain proportions of the crew, exclusive of licensed officers and apprentices, are of a rating not less than able seaman; and also provides for the issue of certificates by U.S. authorities. The Dominion Marine Association has taken this matter up with the U.S. Government, Francis King, M.A., Counsel for the Association, visiting Washington early in March, and it has been arranged that certificates of competent authorities in Canada will be accepted in the U.S. as proof that the holders comply with the provisions of sec. 13. The Dominion Department of Marine has prepared forms of certificate as required, and these are now in the hands of all collectors of customs. It has also issued a circular of instructions to col-

lectors, owners and masters, indicating exactly what is required.

Section 14 refers to steamboat inspection and particularly to life saving appliances, and does not affect Canadian vessels, as the reciprocal arrangement between the Dominion and the U.S. with regard to the inspection of steamboats, instead of being in the form of a treaty capable of abrogation by the President of the U.S., is embodied in an Act of Congress, which has not been repealed.

Masters of lake vessels having occasion to enter U.S. ports are now providing their deck crews with proper certificates, as far as possible. This requirement extends, for this year, to 40% of the deck crew, excluding the certificated officers. On an ordinary lake freighter, this means 40% of the deck hands, watchmen and wheelmen, and sometimes the second mate, as he does not require to be certificated. This means that about four men must be qualified under the statute, and arrangements are being made accordingly.

New Books, Etc.

Any of the books mentioned may be obtained through Canadian Railway and Marine World at the published price.

CANADA IN FLANDERS, by Sir Max Aitken, M.P. Cloth, 5 x 7½, 247 pages, with maps. Hodder & Stoughton, Toronto, 25c.

This is vol. 1 of the Official Story of the Canadian Expeditionary Force. Its 10 chapters deal with mobilization, warfare, Neuve Chapelle, Ypres, a wave of battle, Festubert, Givenchy, Princess Patricia's Light Infantry, the Prime Minister, the Canadian Corps. The six appendices contain the King's message to the Canadians, Canadians in dispatches, the Prime Minister and the war, Lieut.-Gen. Alderson, commanding the Canadian Corps, honors and rewards granted, statement of casualties.

COAL, ITS ECONOMICAL AND SMOKELESS COMBUSTION, by J. F. Cosgrove. Cloth, 5½ x 8½ ins., 273 pages, 32 tables, 33 illustrations. Technical Book Publishing Co., Philadelphia, Pa. \$3.

The 21 chapters deal with the following subjects: Classification of coals; characteristics of coal; coal classed according to use; composition of coal; effect of size of coal; clinkering of coal ash; prevention of clinker; geological history of coal; the coal fields of America; analysis of coal; the purchasing of coal; theory of combustion; combustion of coal; temperature of combustion; determining heat value of coal; burning bituminous coal; smoke and its prevention; burning coal smokelessly; draught regulation; hand fired furnaces; stoker furnaces.

STUDIES IN THE COST OF URBAN TRANSPORTATION SERVICE, by F. D. Doolittle, Director, Bureau of Fare Research, American Electric Railway Association. Cloth, 6 x 9 ins., 467 pages, 58 plans and charts. American Electric Railway Association, 8 West 40th Street, New York, N.Y.

This work, which includes among other things the results of a number of special investigations made by the Bureau, consists of 29 chapters dealing with the following subjects; Creating the street railway; the street railway as a going concern; elements of cost; the anatomy of the five cent fare; tendency of operating costs; utility capital and its replacement; actual returns in the traction business;

units of comparison; elements of service; traffic characteristics, the traffic survey; traffic observations; the application of traffic data; prescribed standards of service; psychological aspects of street railway service; special problems; the paying haul; cost of extending fare limits and lines; cost of service and the zone system of fares; cost of complying with standards of service; cost of extending the transfer privilege; cost of competing forms of transportation; effect of rate of fare on riding habit; the problem of rapid transit; regulation and the cost of service; the Cleveland experiments; events preceding the Taylor ordinance; the Taylor ordinance and defects in its operation as disclosed at arbitration; efforts since arbitration to reduce cost of operation to permit continuance of low fares; service rendered under ordinance regulation; actual cost of service under ordinance regulation; the Milwaukee experiment; events preceding the Railroad Commission of Wisconsin decisions of Aug. 23, 1912; the decision of Aug. 23, 1912 and its rescission, Jan 30, 1915; cost of service and decisions on line extensions; zone system transfers and service requirements; appeal of Nov. 6, 1915.

Board of Railway Commissioners' Judgment re Telegraph Tolls.

The Board of Railway Commissioners issued general order 163, Mar. 31, re applications of the telegraph companies for approval of their tariffs of tolls within the territory west of Sudbury, Ont., and between points east thereof and west thereof in both directions, and of the applications of the Winnipeg Board of Trade and the Winnipeg Grain Exchange, that the tolls into and out of Winnipeg be not approved. Upon hearing the matter at various sittings in the presence of representatives of the various telegraph companies, the Dominion Government, the Winnipeg Grain Exchange, the Boards of Trade of Winnipeg, Brandon, Regina, Vancouver, Victoria, Nelson, Saskatoon, Edmonton, Toronto and Montreal, the Associated Board of Trade of Western Canada and the Canadian Manufacturers Association, judgment was delivered, Mar. 28, by Commissioner McLean and concurred in by the other commissioners, and this judgment is made a part of the order and the tariff changes therein directed to be made are to become effective by July 1.

For the purposes of operation, the C.P.R. has divided the territory between the Atlantic and Pacific Oceans, which it covers, into districts as follows: (a) New Brunswick and Nova Scotia. 1—Quebec and Ontario, east of and including Windsor and Sudbury; 2—Ontario, west of Sudbury to and including Nipigon; 3—Sault Ste Marie Branch; 4—Ontario, west of Nipigon; 5—Manitoba; 6—Saskatchewan east; 7—Saskatchewan west; 8—Alberta, main line and branches south; 9—British Columbia, main line east of and including Kamloops and Okanagan branch; 10—British Columbia, all lines and west of Kamloops; 11—Alberta, north of main line; 12—Manitoba, for United States rates only; 13—British Columbia, Kootenay east of and including Kootenay Landing; 14—British Columbia, Kootenay west of Kootenay Landing.

In a portion of the territory east of the Great Lakes in which the Great North Western Telegraph Co.'s lines are located, there is an identity of districts. In the territory from the head of the Great

