

Canadian Railway and Marine World

February, 1915.

Some Maximums and Minimums in Train Operation.

By Alfred Price, Assistant General Manager, Eastern Lines, Canadian Pacific Railway.

It has become a trite saying that a railway company has nothing to sell except transportation, but in order to sell its sole commodity, it must have an ample supply available at all times, and to do so must buy a variety of materials. During the past ten years every item it uses in construction and in the operation and maintenance of its property has increased in price. For example: steel rails, telegraph poles, car sills and lumber have increased by amounts varying from 29% to 54%, while the wages of its enginemen, trainmen, yardmen, telegraphers and maintenance of way employes have increased from 19% to 79%, an increase in all its purchases, including labor, of approximately 35%.

If a commercial institution had to face the problems of securing sufficient additional revenue to offset such tremendously heavy increases in the cost of its raw material and its labor, it would adopt the simple, and natural expediency of increasing the price of its product, so that the consumer would ultimately pay the piper. But although a railway is a business conducted under much the same conditions as a manufactory, having many similar problems and difficulties, it does not enjoy the privilege of increasing its rates. In proof of this statement the following table, showing the earnings on all Canadian railways during the past seven years, is submitted. The units are, one passenger carried one mile—the passenger mile; and one ton carried one mile—the ton mile:

Year	Passenger mile cents	Ton mile cents
1907	1.911	.815
1908	1.920	.723
1909	1.921	.727
1910	1.866	.739
1911	1.944	.777
1912	1.943	.757
1913	1.973	.758

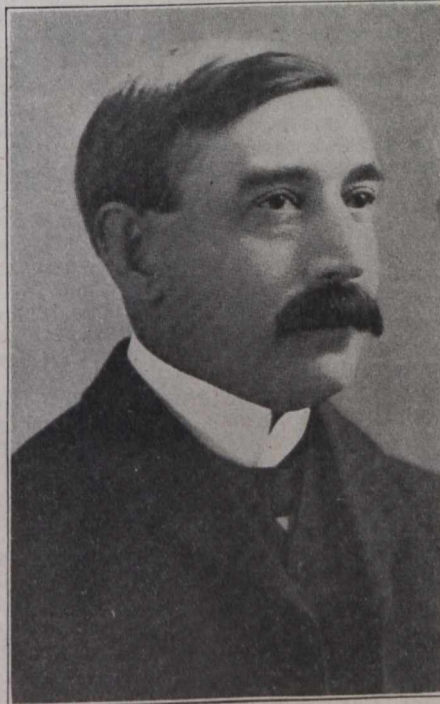
Since 1907, therefore, the earnings per passenger per 100 miles shows an increase of 6c., and per ton of freight per 100 miles a decrease of 5½c. But the ton mile units for 1914 were 23 billions, and the passenger mile units only 3 billions, so that the figures actually represent a very serious decrease in earnings. To be more specific, had the passenger mile and ton mile earnings of 1907 been applied to the 1913 traffic, the railways would have shown an increase in their net earnings of over \$11,000,000.

But, compared to a commercial enterprise, the railway has other handicaps; it cannot, like a manufactory, for instance, close down its plant in dull times and wait until there is a demand for its product, nor can it warehouse its product, holding for higher prices. The public demands that an ample supply of transportation be kept on hand at all times whether required or not; that the railway company be prepared to take care of the peak load whenever an unusual demand occurs, and that the service be efficient. It may, or may not, be reasonable to expect the railway company to do this. In view of these constantly increasing cost of materials the railway has to buy, and the increasing cost of every-

thing it has to sell, it is absolutely necessary that the strictest economy, consistent with efficiency, be practiced, and that intelligent, scientific methods of operation be adopted.

Unfortunately, the existing lines and facilities are not likely to be taxed to handle the traffic for some time to come. It would be folly, therefore, to advocate the lowering of transportation costs by reducing grades, eliminating curves, or building better operating facilities. Instead, it is desired to suggest that, under existing conditions, there are opportunities to reduce the operating expenses, for it will be freely admitted that there is a wide field for economy on Canadian railways without any impairment of efficiency.

The operating official naturally desires to provide a service as satisfactory as can be



Alfred Price,
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reasonably expected by the public, and at the minimum cost. Efficiency and economy might well be adopted as his slogan, the maximum efficiency at the minimum cost. If he can handle the freight without damaging, or losing it, he will take a long step towards efficiency, and, at the same time, will accomplish something worth while under the head of economy. Last year the freight loss and damage account of Canadian railways amounted to over \$2,000,000, the double the amount paid out in 1911. The shipper wants the goods delivered to the consignee intact, and would gladly waive the \$2,000,000 he now receives to have this done. This sum, therefore, may be regarded as a penalty imposed upon the railway for nonfulfilment of an obligation or con-

tract. The railways are almost entirely responsible for this loss. The waste can be stopped by the adoption of up to date methods and insistence upon the exercise of greater care on the part of agents, billers, checkers, porters and trainmen.

For clearing wrecks and satisfying claimants on account of injuries Canadian railways paid out last year over \$1,500,000. There were no less than 710 people killed by the movement of trains, besides 2,966 injured. It is quite true that almost half of those killed were trespassers, and we are likely to continue to have a harvest of deaths from this cause every year until there is a law making trespassing a criminal offense, and a severe penalty is imposed for a violation. Most of the other fatalities and injuries might have been avoided by the exercise of ordinary care. What is needed more than anything else is increased safety in railway operation. One dislikes to speak of the loss in dollars and cents in the face of the awful loss of life and limb as a result of these accidents. The figures quoted tell their own pitiful tale in terms needing no emphasis. The safety first campaign is doing a grand work, and is entitled to the sympathy and active help of every railway officer and employe.

The largest single operating item is the fuel bill. It amounted to \$28,000,000 last year on Canadian railways. For every locomotive mile run there was consumed 113 lbs. of coal for which was paid 17¼c. It is conceded that in order to secure the maximum tonnage with the minimum consumption everybody having to do with the running of trains must co-operate. The fireman alone might save a considerable sum of money. He now puts 11 scoopfuls of coal into the firebox per mile run. If he could manage to get it down to 10 the net earnings of the railways would increase by \$2,500,000. The question is, "Would he do it if it was his own coal?" But it must not be left to the fireman alone. Coal can be saved by the locomotive man, the locomotive foreman and his staff, the yardmaster and his staff, train despatchers, operators, trainmen, and, in fact, by everyone from the superintendent to the callboy.

It does not pay to run trains at high speeds, for aside from the greater liability to accident, and the relatively greater amount of damage and loss when an accident occurs, the service is expensive. Because of keen competition in certain territories, it would appear to be necessary to schedule some fast passenger trains, but when and where possible the actual running speed should not exceed from 45 to 50 miles an hour.

Last year the average number of passengers per train on Canadian railways was only 62, and the average number of cars was 5.6. The minimum tonnage per passenger train mile should be handled. On the other hand, and for obvious reasons in freight service, the maximum tonnage per train mile should be handled, and all way freights should be scheduled slow enough to enable locomotives to pull their full tonnage under normal weather conditions. It is significant that the Interstate Commerce

Commission has advised the American railroads to lengthen the time of their fast freight train schedules in order to enable them to lessen their operating expenses.

There is an economical load for a locomotive. What that load is can be determined only by experience and by a series of tests. The maximum tonnage may not be an economical load, especially on what is known as a low grade line. A locomotive given the maximum tonnage which it is capable of hauling on a line with grades of 4-10% of 1%, or less, would run into overtime, the fuel consumption would be excessive and it would probably be found that the last straw, speaking metaphorically, had broken the back of the locomotive camel. On the other hand, to underload locomotives in through freight service in both directions is an inexcusable waste.

When, by tests made with a dynamometer car, it has been determined what tonnage a locomotive of a certain tractive power is capable of hauling economically over the maximum grades on a subdivision, operating officials should insist upon locomotives being so loaded, at least in one direction, and under normal weather conditions. Low temperature, a heavy fall of snow, a greasy rail, or any atmospheric condition that will retard the movement of a train will warrant running with a reduced tonnage, so as to permit reasonably good time being made from the initial to the objective terminal. It does not pay to haul maximum tonnage at the expense of excessive fuel consumption and overtime.

Theoretically, locomotives should be given their full tonnage rating in both directions, but in practice it is found that this cannot be done, as usually there is a preponderance of traffic one way, and locomotives must run in the opposite direction with reduced tonnage in order to keep the freight moving. However, under the circumstances, if locomotives haul the maximum load in one direction, the results should be satisfactory.

It might be well to demonstrate the effect of running trains with greatly reduced tonnage. The following statement makes a comparison of actual results on a certain subdivision, the period A and B representing two summer months. During B the gross tonnage handled one mile was 87,008,449, and items indicated by X in A are based on this ton mileage:

Item	Period A	Period B
Average weight of train per mile	1,737 tons	2,133 tons
Train miles	50,136 x	40,876
Pounds coal used per train mile	129	128
Pounds coal per thousand tons hauled one mile	75	61
Cost	\$22,893.55x	\$18,637.98
Saving		\$ 4,255.57

The saving on this 125 mile subdivision was not due to any change in the physical characteristics of the road nor to the use of more powerful locomotive, but merely to a better loading of trains, and during the month the saving amounted to \$4,255.57.

It will be observed that, although the average weight of train per mile during period B was 396 tons more than during A, the amount of coal consumed per train mile was approximately the same. This will not always follow, but the statement demonstrates clearly that if a locomotive is not overloaded, it will burn almost as much coal per mile when hauling 75% or 80% of its full tonnage as when it is loaded to its capacity. The same is true of wages and other engine and train supplies.

It is surprising the effect upon almost every operating item a small increase in the average load per loaded car would have. During 1913 the average weight of contents in loaded cars on all Canadian railways was 19 tons—a very small load when it is considered that the average carrying capacity

was 32.14 tons. An increase in the average contents would result in a decrease in the number of cars required to carry the same volume of traffic, and fewer cars would lessen the cost of locomotives, train, yard and round-house service, as well as some other incidental expenses.

There is now a campaign on to increase the average weight of contents of loaded cars on the Eastern lines of the C.P.R. in 1915, the increase aimed at being 3 tons a car. Based upon the traffic handled in 1913, when the average weight of the contents of loaded cars was 20.15 tons, it is estimated that the increased average load would represent a saving in three items alone of not less than \$800,000, as follows:

In locomotive and round house expenses	\$ 99,608.50
In car repairs	282,367.65
In ton mileage	427,502.60
Total	\$809,478.75

The question might well be asked: Is it possible to secure the additional tonnage? It cannot be done without the hearty and intelligent co-operation of the officers of the railway company and its employes, with the shippers and consignees; but there are many ways in which to increase the average load: only a few need, however be mentioned:

Select cars of large capacity for heavy freight. For 100,000 bush. of wheat, if 80,000 lb capacity cars were used, the cars would be loaded up to 88,000 lbs., and the whole shipment would be carried in 68 cars. To make the shipment in 60,000 lb capacity cars the cars would carry only 66,000 lbs. each and 91 cars would be used. In the former case the average weight of contents would be 44 tons. and in the latter only 33 tons. By using large cars the figures would be: Contents, 3,000 tons; tare, 1,274 tons; total, 4,274 tons. By using small cars the figures would be: Contents, 3,000 tons; tare, 1,558 tons; total, 4,558 tons. Therefore, under the second proposition, in addition to supplying grain door, switching, inspecting and hauling 23 extra cars, the locomotives would have to haul 284 additional tons of dead weight from the point of shipment to destination and back again.

Select smaller capacity cars for light and bulky freight. As the smaller capacity cars are approximately the same dimensions as the larger, and weigh 2 tons less, they are just as suitable for hay, furniture, oats, etc., and for such commodities it is profitable to use them.

Consignees who need but one car of freight at a time usually order the minimum car load, as per the freight classification. If the matter was properly represented to them, they might be induced to order in larger units.

When a shipper holds an order for several car loads of freight for the same consignee and destination, it should not be a difficult matter to persuade him to load the full order in the minimum number of cars.

Shippers and consignees who have suffered through car shortages in the past can be shown that the simplest way to prevent a recurrence of such a condition is by loading all cars to their full capacity. Not only will this plan avoid car shortages for a number of years to come, but it will prevent the congesting of terminals, which has also been the cause of a great deal of trouble to shippers and consignees in past years.

Another way to secure the maximum freight tonnage to the minimum tare and in the minimum number of cars is by avoiding the unnecessary movement of empty cars.

When the settlement for the use of foreign cars was on a mileage instead of a per diem basis, the principle that empties should be run in only one direction, and that op-

posite to the direction of the preponderance of traffic, was pretty generally adhered to. A cross movement of empties was then looked upon as exceedingly bad transportation. Since the change in the system, the penalty for holding foreign cars has been so heavy (at present 45c. per day) that under most circumstances it pays to send foreign cars home empty, even when to do so they must travel in the direction of traffic.

The necessity of moving foreign empties homeward promptly has, probably, had a tendency to weaken the hold which the transportation officer a few years ago had upon the principle of moving empties in one direction only. The principle, however, is as sound today as ever it was, but it is conceded that, under the changed conditions, it must often be departed from.

The direction in which empties should move is naturally that opposite to the movement of the preponderance of traffic. The cost in that direction is comparatively small, because the locomotives returning for loads are light enough to handle them and no additional locomotive mileage is necessary. When, however, empties are moved in the same direction as the balance of traffic, additional locomotive mileage is involved—but not only so, for the empties are being sent out of a territory where they are in demand, and for every such movement, an empty must be hauled in the opposite direction to take its place, except for cars of special classes and for which there is no suitable commodity.

A conservative estimate of the cost of hauling empty cars is 1½c. per car mile. If, therefore, an empty suitable for traffic is sent in the direction of the balance of tonnage, a distance of 300 miles, the total additional mileage involved is 600 miles at a cost of \$9—a sum well worth trying to save.

During last year 24% of the car mileage on Canadian railways was empty. If by some means this percentage could be reduced to say 20% it would represent a large increase in the net earnings of our railways.

Reported Settlement of Detroit River Tunnel, Michigan Central Railroad.

A rumor came to our attention recently that the M. C. R. tunnel under the Detroit River was showing evidences of settlement. This tunnel is a structure of concrete of rectangular cross section and was built by floating successive steel caissons into position and filling in around them with concrete deposited under water. There would seem to be no reason why a tunnel of this type should be more liable to settlement than a circular tube tunnel, such as that under the St. Clair River, which is driven through clay very similar to that in which the Detroit tunnel lies.

We find upon inquiry that some settlement did take place during the construction of the Detroit tunnel before it was opened to traffic, and was found to be due to an enormous additional load upon the under side of the tunnel and thereby placed small amount of leakage coming through the floor of the tunnel. This had the effect of relieving the hydrostatic pressure on the foundation soil underlying the tunnel. Measures were at once taken to stop the leakage through the tunnel floor, and when this was done the settlement stopped. There has been no ascertainable settlement since the tunnel was opened to the operation and the small amount of water which had entered into the tunnel is steadily being probably to the gradual closing of the pores in the concrete. *Engineering News.*

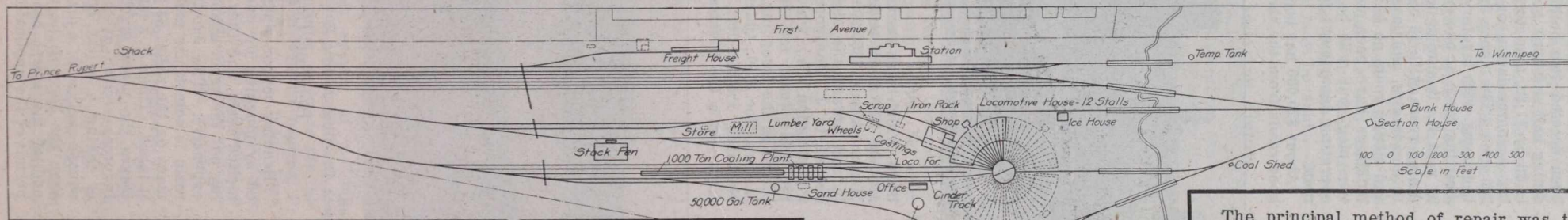
Divisional Facilities on the Grand Trunk Pacific Railway.

The accompanying plan shows the G.T.P.R. divisional yards at McBride, B.C., which are typical of the facilities which are being provided at other points along the portion of the line now under construction. These facilities are being constructed at Prince George, Endako, Smithers and Pacific, and

be a station, 165 x 48 ft., with a long platform. There will be a freight house, 80 x 40 ft., with a platform 185 ft. long. Opposite the freight house there will be a 120 x 60 ft. stock pen. In addition, the plans call for a trainmen's house, sectionmen's house, bunk house, coal bins, and other

Fire Hill—Ruby	4.00	
Navilus—Port Arthur	7.90	179.30
Manitoba Division:—		
Port Arthur—Molson	386.06	
Winnipeg terminals	9.20	
Winnipeg—Virden	180.60	
Whitewood—Broadview	14.60	590.46
Saskatchewan Division:—		
Broadview—Grenfell	16.00	
Indian Head—Swift Current	194.20	210.20
Alberta Division:—		
Swift Current—Java	6.00	
Calgary terminals	6.20	12.20

as to render the rails useless by spiralling. In the hasty repair of bridges, the engineers were materially assisted by the small flow of water in the dry season, and in consequence it was possible frequently to throw across shorter bridges at a lower level than the permanent structure, on a low level deviation, the permanent line taking the higher level on account of the high water in the rainy season.



Grand Trunk Pacific Railway Divisional Yards at McBride, B.C. Typical of the Several Divisional Points on the Line.

are duplicates of the McBride layout, with the exception of at the last two points, where the locomotive houses will be curtailed in so far as the extent of the machine shop is concerned, and the boiler capacity will be reduced. The McBride installation is complete, and the others are under way.

In the McBride layout the terminal plans call for a 12 stall locomotive house, with a machine shop to the rear. The locomotive house will be heated by hot air, from a fan house midway in the outer wall. As contemplated, the final capacity of the locomotive houses will be 48 stalls, in four 12 stall sections, each section with its own heating fan arrangement. In the McBride installation there is a 1,000 ton coaling plant, which it is the intention to eventually replace with an oil fuel station. The other four points are being equipped with oil fuel stations, each of which will contain a 350,000 imperial gallon storage tank, with provision for extension to include two other similar tanks. There will also be a service tank, under which will be located pumps, which will take the oil directly from a sump into which the tank cars drain, and deliver it either to the service tank or the storage tank. These tanks will be provided with heating coils, measuring apparatus, etc., supplied with steam from the locomotive house boilers. Each of the five points will have a 100,000 gallon steel water tank, and a 50,000 gallon steel service tank.

The initial layouts in these yards will only have repair tracks near the locomotive house for car repairs, but it is the intention in the future to add a planing mill and store, and storage bins for repair parts, etc., as well as additional shop buildings as shown.

Opposite the locomotive house there will

minor facilities such as are required at these points.

We are indebted to H. A. Woods, M. Can. Soc. C.E., Assistant Chief Engineer, Grand Trunk Pacific Ry., for the information on which this article is based.

Canadian Pacific Railway Double Track and Alternative Routes.

The C.P.R. has in operation 1,445.35 miles of double track line, and it has also in operation 525.20 miles of track which give alternative routes to the previously existing lines. The following table shows the location and mileage of the sections of double tracked lines:—

	Miles.	Miles.
Eastern Division:—		
Montreal (Windsor St.)—Smiths Falls Yard	129.18	
Montreal West—Brigham Jct.	44.72	
Montreal West—Mile End	7.19	
Montreal (Place Viger) — Ste. Therese	20.11	
Montreal Terminals (additional mileage)	0.71	201.91
Ontario Division:—		
Smiths Falls—Glen Tay	14.87	
Junction of Lake Ontario Shore Line (near Agincourt)—Toronto	13.40	
Toronto—Guelph Jct.	39.20	
Toronto (Bathurst St. Jct.—Hamilton)	39.07	
North Toronto line	3.97	
London terminals	1.41	
Windsor terminals	0.36	112.28
Lake Superior Division:—		
Romford Jct.—Sudbury	6.80	
Azilda—Geneva	30.00	
Roberts—Woman River	25.90	
Nemegos—Esher	25.50	
Healy—Bolkow	19.10	
Depew—King	27.10	
Heron Bay—Peninsula	8.40	
Selim—Pays Plat	13.60	
Cavers—Gurney	11.00	

British Columbia Division:—		
Hopgood—Kamloops	25.50	
Revelstoke—Taft	24.40	
Kamloops—Tranquille	8.00	
Ruby Creek—Vancouver	81.10	139.00
		1,445.35

Following are the location and mileage of the alternative routes:—

	Miles.
Ontario Division:—	
Glen Tay and mileage 87.4 Peterboro Subdivision	181.10
Manitoba Division:—	
Molson and Winnipeg terminals	36.70
Virden and McAuley	36.60
Alberta Division:—	
Java and Bassano	229.80
Gleichen and Shepard	41.00
	525.20

Repairing Bridges in the South African War.

A. F. Stewart, M. Can. Soc. C.E., Chief Engineer, Mackenzie, Mann & Co., Ltd., Toronto, gave an address on this subject recently to the Canadian Society of Civil Engineers, Toronto branch, of which he is Chairman. Some of the points brought out, demonstrating the resourcefulness of the engineers conducting the repairs, would prove of great value to construction men.

The Boers had four methods of interrupting communication on the railways with the object of impeding the British advance: Blowing up bridges, blowing up the rail joints on a section of line, blowing up trains, and turning over sections of line, so

The principal method of repair was the employment of short Bates link trusses, up to lengths of 25 ft., spanning between cross-tie piers or trestle bents. The link trusses were provided from the military base in quantities, for repair purposes, and would fit into a great many places. The ties used were standard for the South African Railways, of Jarrah wood or teak, with 5 by 10 in. section, accurately sawn, so that when built up in bird cage form they made a solid pier. Most of the temporary piers were thoroughly bedded on the ground level, the soil being hard, but in some instances, where trouble was anticipated from washouts concrete foundations were placed, to which the ties were anchored. Where the pier height was great, triple cribs of ties were in some instances used, the three cribs being tied together, at about every fifteenth course, with cross rails.

The Railways and City Smoke Bylaws.—Judgment was delivered recently in Toronto, on a motion on behalf of the C.P.R. to quash a conviction for allowing smoke to issue from its locomotive house there, contrary to the city bylaw. In giving his judgment, the judge said:—"If the railway is subject to the operation of the bylaw in question, the magistrate could convict on the evidence before him, but I am of the opinion that the railway in its operation is not subject to the municipal bylaw, but is subject to the Dominion Railway Board's regulations. The conviction will therefore be quashed without costs and with protection to the magistrate."

Assuming fuel oil and coal to cost the same on the B.T.U. basis, there is said to be a saving in favor of the former of about 25% due to the lesser volume of air required, which, in the case of coal, carries a large amount of heat out of the stack with it.

Mountain Type Locomotives, Canadian Pacific Railway.

The C.P.R. has built recently at its Angus shops, Montreal, 2 Mountain type locomotives, the first to be used in Canada. This type was first introduced on the Chesapeake and Ohio Ry. in 1911, and as it was especially designed for high speed passenger service over mountainous divisions, the name now used naturally followed. In detail design these new C.P.R. locomotives follow C.P.R. standard practice as far as possible, and the cylinders, pistons, piston rods, piston valves, cylinder heads, steam chest covers, boxes, axles, and other details are interchangeable with the more recent

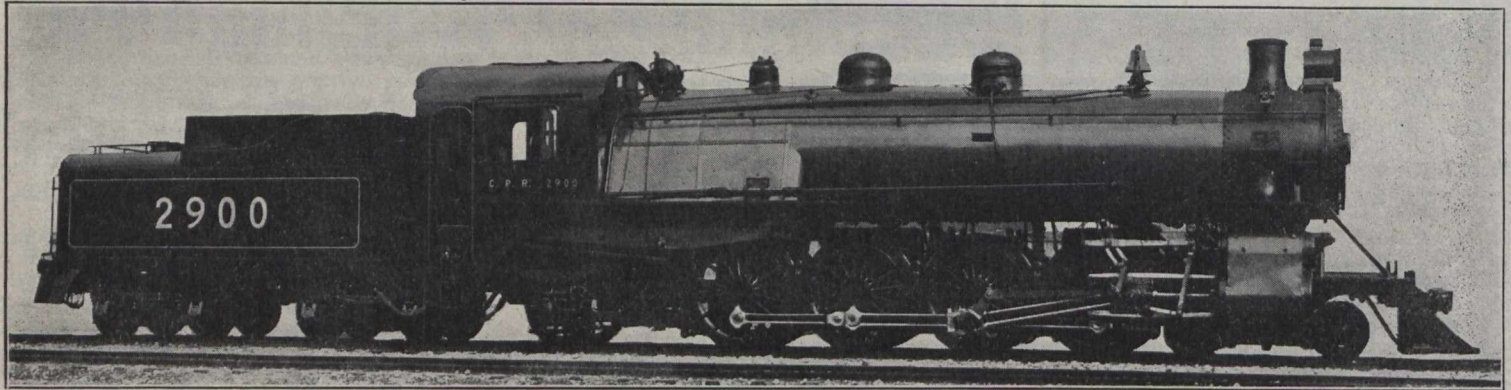
Railway and Marine World, June, 1912, and have the latest design of screw reverse gear.

Canadian Northern Railway Terminals at Port Mann.

Canadian Railway and Marine World for March, 1914, contained a description and plans of the terminal facilities planned by the C.N.R. at Port Mann, B.C., part of which were then under way. While the scheme as outlined there provided for an extensive terminal, sufficient to meet all requirements of the line for some years to come, the intention was to merely build a portion of the facilities, adding thereto according to a prearranged scheme as required.

South of the locomotive house there have been erected two buildings for the men, a dining hall and bunk house. The dining hall is 86 by 31 ft., two stories high, with a seating accommodation on the lower floor for 200 men. The upper floor is laid out for 13 bedrooms, with lavatory accommodation, and a sitting room at one end. The bunk house, 92 x 31 ft., is similar in construction to the dining room, with 13 bed rooms upstairs and 13 downstairs, and lavatory accommodation and sitting room on both floors. These two buildings have been used by the construction men, but will be turned over to the operating department for the shop and road men.

About \$20,000 has been spent in laying out good roads from the shop site to Bon Accord



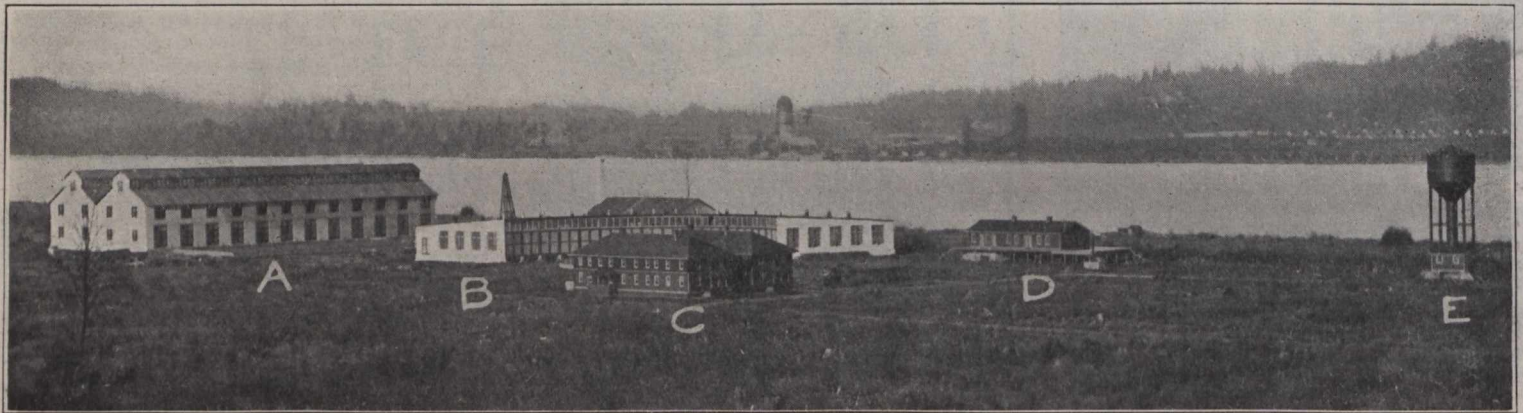
Mountain Type Locomotive, Canadian Pacific Railway.

consolidations and the mikados, classes P1 and N1, over 200 of each of which are in service: Following are the principal dimensions:

Type	4-8-2
Sub class	H1a
Boiler pressure	200 lbs.
Firebox width, inside	88 7/8 ins.
Firebox length, inside	161 1/2 ins.
Tubes, number and outside diameter	210—2 1/4 ins.
Flues, number and outside diameter	30—5 1/4 ins.

A 10 stall section of the proposed 43 stall locomotive house has been completed, and is in use, and for it certain facilities, such as coaling plant, ash pits, etc., have been built, including an 80,000 gal. steel tank. The locomotive house stores building has also been completed. This consists of a single story and basement structure, 83 1/2 x 30 ft., with an 8 ft. platform along three sides, with a platform 30 ft. long along the fourth side for outside storage. This is

Road, which runs through what will eventually be the main business section of Port Mann. About \$350,000 has been expended in and around the shop area. We are indebted to J. Montgomery, of the Imperial Construction Co., which had the contract for this work, for the information contained in the foregoing, and to T. H. White, M. Can. Soc. C.E., Chief Engineer, Canadian Northern Pacific Ry., for the photograph from which the illustration was made.



Canadian Northern Railway Terminals at Port Mann.

A.—12 stall locomotive machine shop; B.—10 stall locomotive house; C.—dining hall and bunk house; D.—store house; E.—80,000 gal. steel tank.

Length over tube sheets	20 ft. 8 1/2 ins.
Superheater, type	Vaughan-Horsey
Superheater tubes, number and outside diameter	120—1 1/4 ins.
Superheater tubes, average length	19 ft. 4 1/2 ins.
Superheating surface	760 sq. ft.
Firebox heating surface	299 sq. ft.
Tube heating surface	3,414 sq. ft.
Equivalent heating surface	4,853 sq. ft.
Grate area	59.6 sq. ft.
Cylinders	23 1/2 by 32 ins.

One of the main features of the design is the style of firebox adopted, which is 13 ft. 5 3/8 ins. long by 7 ft. 6 7/8 ins. wide, fitted with a Gaines combustion chamber and arch, and having a 59.6 sq. ft. grate area. The locomotives are equipped with the Vaughan-Horsey superheater, and the vestibule cab, which was described in Canadian

served by a spur track from the main line, which also serves the boiler house addition to the locomotive house, over which coal is supplied.

A section of the locomotive repair shop, 277 1/2 x 145 ft. has been completed, to the southern end of which a future addition will be made, increasing the size to 600 x 145 ft. when required. This shop is of a mill design, consisting of two bays, with a central row of cast iron columns, and a low gallery along one side of one of the bays, about half the width of the bay. This shop is due west of the locomotive house, and separated from it by a track storage space and 80 ft. transfer table, which is completed to serve the 12 shop tracks.

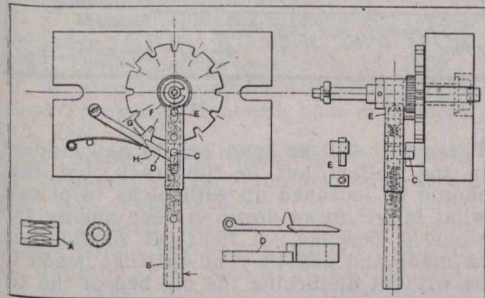
Bending Copper Pipes.

Bending copper pipes, as ordinarily effected by plugging up one end, filling it with melted resin, and then, after bending, melting out the resin again, is troublesome and expensive. The substitution of sand for resin is sometimes practised as an improvement on the resin, as regards the time that it takes. There is a much better way, which leaves the pipes much more truly circular in cross section at the bends. It consists of taking a spiral of wire, preferably of square section, of a diameter slightly greater than the bore of the pipe to be bent. One end of the spiral has a squared shank to permit of the application of an ordinary car-

penter's brace. By means of the latter, the spiral is inserted inside the pipe completely, by turning the brace in the direction of the spiral, so as to slightly diminish the diameter of the spiral; on the discontinuance of the turning the spiral springs to the full inside diameter of the pipe. The pipe may then be bent as though it were a lead rod, after which, by reversing the rotation of the brace, the spiral may be withdrawn from the tube. Curves of any degree of complication may thus be made without any flattening at the bends; the only limit of sharpness of curvature is that imposed by the quality of the metal being bent. Curves in all three planes may be made.—Shop Kinks, by R. Grimshaw.

Quick Shifting Indexing Fixture.

The accompanying illustration shows a quick shifting indexing fixture, which is used on a milling machine for milling ratchet teeth of the form shown at A in the illustration. The blank is held on the fixture by means of a screw and slotted washer, the arrangement of which is clearly shown in the side view. The operation is as follows: The handle B is moved in the direction of the arrow, causing the pin C at the end of the oblong slot in the handle to force the pawl D out of its slot in the dial. As soon as the pawl is out of the slot, the V shaped pin E, which is kept engaged with the ratchet F by a spring, will cause the shaft to which the dial is keyed to revolve. When the pin C has reached the point G, it will release the pawl, which is then thrown back into contact with the dial by a spring. As the dial continues to revolve,



Quick Shifting Indexing Fixture.

the pawl will drop into the next slot and locate the work for milling the next tooth.

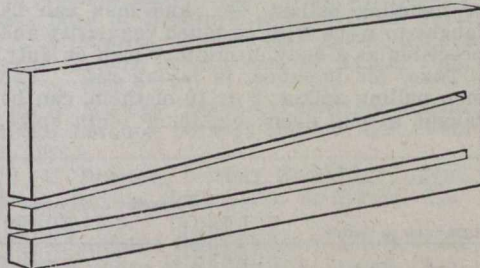
In returning the handle, the pin C will travel on the opposite side of the pawl, and when left in the curve H the spring behind the pin will hold the pawl D securely in the slot in the dial. The spring behind pin B is made just stiff enough to keep the pin from slipping when the pawl is out of a slot in the dial. The teeth in the ratchet F were cut with an ordinary thread cutter. This fixture is used on a hand miller, and the teeth in the blank are cut with an ordinary angular cutter. This system of shifting could easily be applied to a horizontal attachment, and by substituting a centre for the stud and inserting a ball thrust bearing, it could be used instead of an index head where quick shifting is desirable. For those classes of work for which it is adapted, a fixture of this kind enables a very satisfactory rate of production to be attained.—Machinery, New York.

Block Signaling on the Intercolonial Ry.—

The block signaling system, which is being installed on the I.R.C., has been completed between Nelson Jct. and Newcastle, N.B., and was placed in operation Jan. 10. The system is already in operation between Halifax and Windsor Jct., St. John and Hampton, and Moncton and Painses Jct.

Milling Out Keys.

About as cheap a way of making keys in quantity, or even when only a few are needed, is to mill them out of a slab, as shown herewith, by means of a cutter, which is practically a thick saw. This insures that the sides, which are at an angle to each other, and which do the work and hence require to be true and well finished, have a perfect surface and regular taper, the lat-

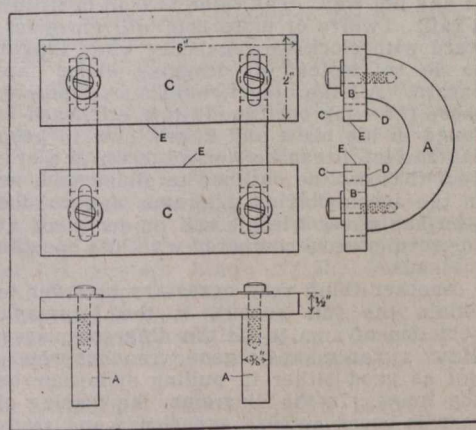


Milling Keys from a Slab.

ter being of whatever degree it is required, which is readily determined by the graduated table of the machine. From one slab, either planed off or milled on the two parallel sides, there may be milled a number of keys, cutting them alternately head and tail, so that the width is properly arranged for, the whole stock may be used up. The accompanying illustration shows a key partially milled out of a slab.—Shop Kinks, by R. Grimshaw.

Accurate Tapered Plug Gauges.

An accurate tapered plug gauge that has been found of value in grinding work especially, is illustrated herewith. It is made quite heavy to withstand the severe usage it would meet with in the hands of the tool boy, etc. The two yokes A were rough turned from machine steel forgings, and the surfaces B were then ground on a surface grinder to insure having them parallel. The pieces C



Gauge for Measuring Tapered Work.

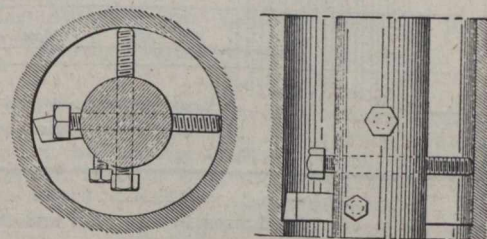
were made of tool steel, hardened, with the surfaces D ground, and the surfaces E ground and lapped. The slots were made 1-16 in. larger than the screws, in order to provide for the required amount of adjustment.

This tool was used for gauging the tapered plugs while grinding, the method of setting forth the proper taper in inches per foot being as follows: A block, made of machine steel, with two holes of accurate diameter and spacing between centres, was used. Assuming that a plug is required with a taper of 1 1/4 in. per ft. and 1 in. diam. at the large end, it would be necessary to use accurate 11-16 and 1-in. plug gauges in connection with this block. As the centre distance of the holes in the block is exactly 3

ins. it will be evident that the difference in diameter of the plugs should be 5-16 in. to correspond to a taper of 1 1/4 in. per ft. In setting the gauge shown all that is necessary is to insert the standard plugs in the block, and then set the parallels to engage the protruding ends of the plugs. In case other tapers than 1 1/4 in. per ft. are required, it would be necessary to make extra plugs with shanks to fit the holes in the block, and with the protruding ends of the proper diameters to correspond with the required taper.—Machinery, New York.

Tool for Drilling Long Deep Holes.

For drilling long deep holes that do not go clear through the pieces so as to permit the use of a boring bar, a tool having right back of it a set crew that can be set out so as to bear against the side opposite the cutting

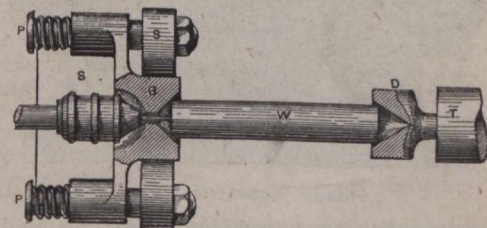


Tool for Drilling Long Deep Holes.

so as to touch the opposite side of the bore, and with a similar set screw midway between the tool and the first mentioned set screw, bearing against the bore hole circumference at a midway point, has been found very effective. Such a tool is shown in the accompanying illustration. One set screw is directly opposite the tool, and the other one midway. The opposite set screw prevents the tool from backing away from the work, and the midway one prevents the tool from springing away from a central position. If the job be such as to permit the hole being bored vertically, there will be no trouble about getting out the borings or having them crowd under either of the set screws, but if the job must be placed horizontally, the tool must be rigged so that one of the screws shall be on top, and the other on the side.—Shop Kinks, by R. Grimshaw.

Centre Drilling Device.

A centre drilling device for small work, and which is of novel design, is shown in the accompanying illustration, which is a plan view. A frame S is bolted to the lathe shears, close to the headstock, directly be-



Centre Drilling Device.

neath the centre drill. This frame carries two pin bolts P, which act as guides for a carriage G, which is normally kept to the right by the coil springs on the pin bolts P. The rear of the carriage G is recessed for drill chuck clearance, with a central hole through which the centre drill passes. The front of the carriage is recessed with a tapered recess, of such a size as to take the largest bars to be centred. The recesses on either side and the drill hole are concentric, and in line with the lathe centres. The

tailstock spindle T carries a centre D of similar design to the tapered recess on the front side of the carriage. When not in use the drill is back in the drill clearance hole. The work W to be centred is placed between the tapered recesses, and by working the tailstock spindle forward, the work is forced on the drill, which drills a centre hole, truly concentric with the work.—Shop Kinks, by R. Grimshaw.

Handy Eccentric Vise.

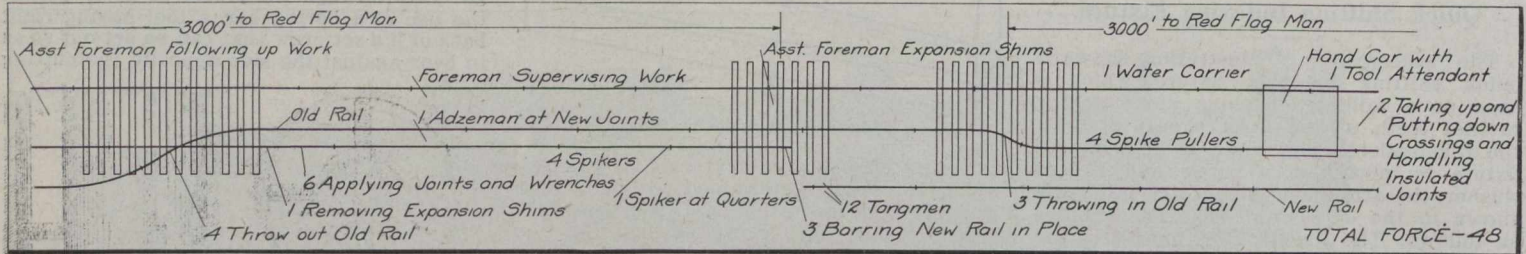
A handy eccentric vise for holding narrow flanged pieces that are to be faced on two sides, is shown in the accompanying illus-

System in Railway Track Work.

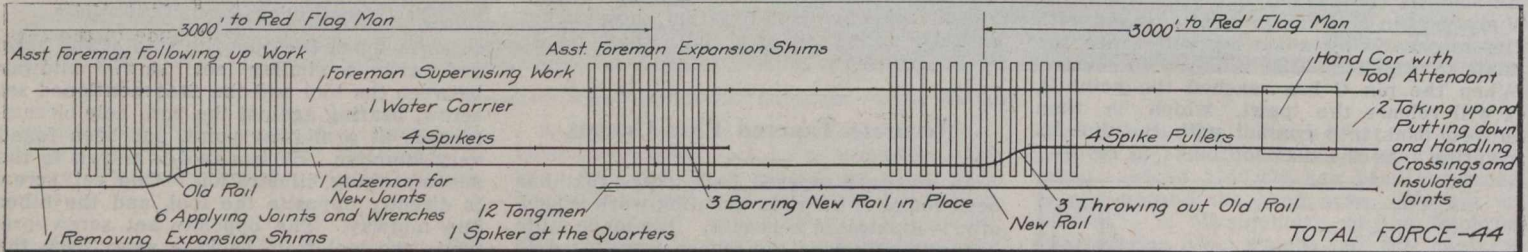
By A. M. Clough, Supervisor, New York Central and Hudson River Railroad.

It is just as essential to have proper organization of men in doing track work as it is in many of the departments of an army. The fact that a body of men when dressed alike and when moving in harmony give an added effect to their movement can be worked in several instances in laying rail, or handling ballast, etc., and men can be taught to work with as much regularity and precision as a body of military men on duty. Take, for instance, in laying rail: The men pulling spikes, 8 or 10 of them, can be taught to pull every eighth or tenth spike,

troublesome and harder to handle than poor cinder or gravel ballasted track. Weeds will grow and it is impossible to cut them, moisture will cause ties to decay and track to heave in winter and instead of having a clean, bright looking track it will look worse than poor cinder or gravel ballast. A light lift, of from 1½ to 2 ins., should be made if possible, but before anything else is done the stone and dirt from between the ties, for their full length, should be removed to nearly the depth of the tie. This should be put outside on the shoulder.

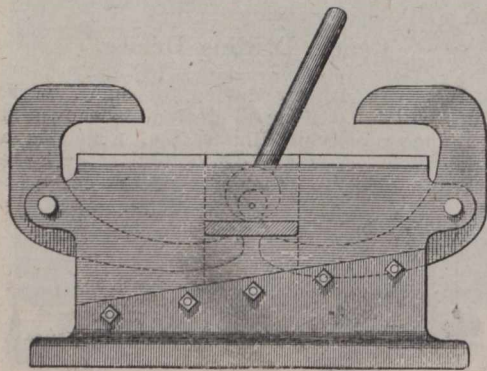


Efficiency methods. Rail laying from the inside. The figures in this plan and the one below relate to the number of men, thus:—"6 applying joints and wrenches."



Efficiency methods. Rail laying from the outside.

tration. The pieces for which the vise was originally made were narrow arched members, with flanges at either end, on which the clamping jaws set, the far and near sides of which were to be finished. It was a job that would ordinarily be done on a milling machine, but as all the milling machines were in use the vise was clamped to the



Handy Eccentric Vise.

carriage of a lathe, and side cutters mounted on an arbor between lathe centres, with the vise containing the work fed across the carriage. It could be used in a variety of ways, and for flanged pipe work, should be most useful in the lathe, planer, boring mill or milling machine. With the clamping eccentrics a positive grip on the flanges of the pieces to be held can be secured. The base of the vise is made in two parts, with the mating surfaces on an incline, to allow for vertical adjustment of the work with regard to the tool.—Shop Kinks, by R. Grimshaw.

each pulling their own without the confusion of a poorly organized gang that goes at it haphazard and moves past each other in any old way. The same is true in lifting a rail. Twelve or more men will move forward with clocklike regularity when taught to do so, instead of dragging along haphazard. All the others, wrenchers, spikers, those throwing out the old rail, etc., each is found in his place and knows how to keep it. In fact, it can be worked down to a system that can be outlined or illustrated, as in the accompanying diagrams, and anyone who has never tried it will be surprised at the results when compared with less specific methods.

Another thing very necessary in order to obtain the full benefit, is the foreman's selection of men to fill the different places. Many a man makes a good wrencher who is not as good either in pulling spikes or on the tongs. In the diagrams, the placing of men is based on long experience and study and will not cost anything to be tried by those who heretofore have not worked to a set system.

Cleaning Stone Ballast and Keeping it Clean.—This plan should interest every trackman who has charge of stone ballasted track and instead of making it a secondary consideration, sometimes considered a waste of money, it should be considered paramount. Whenever a foot of track is to be repaired, where dirty stone ballast exists, the dirty stone should be removed and when replaced it should be put back with the ballast forks or be cleaned with some other devices made for the purpose.

Stone ballasted track, if permitted to get foul with sparks, cinders or other foreign matter, will become in a short time more

There will still be some sparks and cinders in the ballast left in the track, but this should be loosened up with picks to permit what is left to go down as deep among the stone as possible. A light lift should then be made and any tie renewed that needs to be without disturbing the old bed of the tie taken out. Then tamp up the track with clean stone forked in from the shoulder, loosen up the shoulder with picks and fork over the stone, shovelling out the dirt. Make the shoulder standard with what has been shovelled out and if there is any stone needed to finish the standard dressing, this should be unloaded in the centre of the track from ballast cars. Then you will have track that will look like new ballasted track and will ride smooth and elastic. It will also be good for two years under the heaviest kind of traffic and longer where it is lighter.

When simply cleaning the stone, screens can be used that will throw the stone back where it was shovelled out from, but where track is being given a light lift and ties renewed it is necessary to put the stone outside and then it can be forked back in more economically and just as cleanly as screening it.—Maintenance of Way Bulletin.

Railway Rates in Australia. It is stated that on the New South Wales Government Railway an increase has been made recently in passenger fares ranging from 6% on through fares to 14, 25 and 50% on different kinds and classes or reduced excursion fares. An increase of 10% has been made in freight rates also. The advances are for the purpose of enabling the railways to meet the very considerable increase in operating expenses.

Birthdays of Transportation Men in February.

Many happy returns of the day to:—

B. H. Bennett, General Agent, Chicago and North Western Ry., Toronto, born at Cobourg, Ont., Feb. 6, 1858.

F. L. C. Bond, Division Engineer, Eastern Lines, G.T.R., Montreal, born there Feb. 21, 1877.

C. H. Booth, ex-Local Freight Agent, Midland Ry., of Manitoba, Winnipeg, born at Banff, Scotland, Feb. 16, 1882.

T. Britt, General Fuel Agent, C.P.R., Montreal, born there Feb. 3, 1871.

G. E. Bunting, General Western Freight Agent, Allan Line Steamships, and Manager, Allan and Co., Chicago, Ill., born at Toronto, Feb. 8, 1873.

H. R. Charlton, General Advertising Agent, G.T.R. and G.T.P.R., Montreal, born at St. Johns, Que., Feb. 9, 1866.

R. Colclough, Superintendent, Intercolonial Ry., Levis, Que., born at Bic, Que., Feb. 24, 1871.

F. W. Cooper, A.M. Can. Soc. C.E., Division Engineer, C.P.R., Montreal, born at London, Ont., Feb. 16, 1880.

R. Crawford, Northwest Agent, Northern Navigation Co., Winnipeg, Man., born at Kingston, Ont., Feb. 21, 1870.

A. J. Donegan, Superintendent, Algoma Eastern Ry., Sudbury, Ont., born at Perth, Ont., Feb. 17, 1872.

R. W. Drew, Division Freight Agent, Saskatchewan Division, C.P.R., Regina, born at Kingston, Ont., Feb. 17, 1874.

E. A. Evans, M. Can. Soc. C.E., ex-General Manager and Chief Engineer, Quebec Ry., Light and Power Co., Quebec, born at Kensington, London, England, Feb. 26, 1855.

L. O. Genest, General Storekeeper, Western Lines, C.P.R., Winnipeg, born at St. Henri, Levis County, Que., Feb. 16, 1856.

J. H. Guess, General Purchasing Agent, Grand Trunk Ry., Montreal, born at Raleigh, N.C., Feb. 5, 1878.

J. C. Holden, A.M. Can. Soc. C.E., Division Engineer, C.P.R., Winnipeg, born at St. John, N.B., Feb., 1876.

T. C. Hudson, Division Master Mechanic, Quebec Grand Division, Canadian Northern Ry., Joliette, Que., born at Brockville, Ont., Feb. 20, 1873.

H. Hulatt, Commercial and Traffic Superintendent, G.T. Pacific Ry. Telegraphs, Winnipeg, born in London, Eng., Feb. 15, 1883.

C. Gardiner Johnson, Lloyds' Agent for British Columbia, Vancouver, B.C., born at Dunblane, Scotland, Feb. 8, 1857.

F. C. Johnson, Night Locomotive Foreman, C.P.R., North Transcona, Man., born at Montreal, Feb. 26, 1885.

R. S. Logan, Vice President G.T.R., Montreal, born at St. Louis, Mo., Feb. 13, 1864.

John McCraw, General Agent, Central Vermont Ry., New London, Conn., born at Craigvale, Ont., Feb. 6, 1868.

G. L. McCrea, Local Freight Agent, C.P.R., Vancouver, B.C., born at Springtown, Ont., Feb. 9, 1876.

D. McDonald, District Passenger Agent, Canadian Government Railways, Montreal, born at Ste. Hyacinthe, Que., Feb. 28, 1862.

T. McNabb, ex-Master Mechanic, Alberta Ry. and Irrigation Co., now of Turin, Alta., born in Scotland, Feb. 16, 1849.

J. K. McNeillie, Superintendent, District 3, Eastern Division, C.P.R., Montreal, born at Toronto, Feb. 23, 1874.

D. C. Macdonald, Assistant General Claims Agent, C.P.R., Winnipeg, born at Elmsdale, N.S., Feb. 9, 1874.

D. MacPherson, M. Can. Soc. C.E., ex-Assistant to Chairman, National Transcontinental Ry. Commission, Ottawa, born at Bath, Ont., Feb. 2, 1858.

C. S. Maharg, Superintendent, District 3, Manitoba Division, C.P.R., Brandon, born in Dufferin County, Ont., Feb. 4, 1867.

V. J. Melsted, Engineer of Water Service, Western Lines, C.P.R., Winnipeg, born at Gardar, N.D., Feb. 20, 1887.

G. A. Montgomery, General Superintendent, Algoma Central and Hudson Bay Ry., and Algoma Eastern Ry., Sault Ste. Marie, Ont., born at Bradford, Ont., Feb. 11, 1871.

A. Z. Mullins, Commercial Agent, G.T.R., Grand Rapids, Mich., born at Appin, Ont., Feb. 14, 1862.

M. G. Murphy, District Passenger Agent, C.P.R., Toronto, born at Halifax, N.S., Feb. 26, 1878.

J. E. Proctor, District Passenger Agent, C.P.R., Regina, Sask., born at Sarnia, Ont., Feb. 17, 1878.

C. T. Radalls, Car Foreman, C.P.R., London, Ont., born at St. Heliers, Jersey, Channel Islands, Feb. 8, 1864.

J. E. Robitaille, Treasurer, Roberval-Saguenay Ry., Chicoutimi, Que., born at Quebec, Feb. 17, 1870.

A. E. Rosevear, General Freight Agent, G.T. Pacific Ry. and G.T. Pacific Coast Steamship Co., Winnipeg, born at Montreal, Feb. 20, 1863.

H. H. Schaefer, ex-Division Freight Agent, Intercolonial Ry., Moncton, N.B., born at Cologne, Germany, Feb. 10, 1848.

J. G. Scott, ex-General Manager, Quebec and Lake St. John Ry., Quebec, born there Feb. 13, 1847.

J. J. Scully, General Superintendent, Lake Superior Division, C.P.R., North Bay, Ont., born at Montreal, Feb. 3, 1872.

G. Spencer, Assistant Chief Operating Officer, Board of Railway Commissioners, Winnipeg, born in London, Eng., Feb. 21, 1865.

R. H. Sperling, Assistant to Chairman of the Board, British Columbia Electric Ry., London, Eng., born there, Feb. 9, 1876.

H. E. Suckling, Treasurer, C.P.R., Montreal, born at Gibraltar, Feb. 27, 1851.

Hugh Sutherland, Executive Agent, Canadian Northern Ry., Winnipeg, Man., born at New London, P.E.I., Feb. 22, 1845.

Sir Wm. C. VanHorne, K.C.M.G., Director, C.P.R., and President, Cuba Co., Montreal, born in Will County, Ill., Feb. 3, 1843.

F. L. Wanklyn, M. Can. Soc. C.E., General Executive Assistant, C.P.R., Montreal, born at Buenos Ayres, Feb. 25, 1860.

J. R. Watson, Assistant Superintendent, Sleeping, Dining and Parlor Cars and News Service, Eastern Lines, C.P.R., Montreal, born at Morpeth, Eng., Feb. 8, 1873.

John L. Weller, M. Can. Soc. C.E., Engineer in charge Welland Ship Canal, St. Catharines, Ont., born at Cobourg, Ont., Feb. 13, 1862.

A. Williams, Superintendent, District 2, Atlantic Division, C.P.R., Woodstock, N.B., born at Mono Road, Ont., Feb. 22, 1872.

Disinfectant System for Trains and Lake Steamships.

A system of sewage disinfection for Great Lakes steamships as well as for trains has, according to a Detroit, Mich., press report, been worked out by Sanitary Engineer L. C. Frank, of the U. S. Public Health Service, and it is expected that the Treasury Department at Washington will issue regulations based on the plan devised. The action follows the U. S. Government's enquiry into the outbreaks of typhoid in 1913 among persons who had been fellow tourists on certain Great Lake steamships.

Prof. E. B. Phelps has suggested that steam might be used to disinfect the sewage from steamships and railway cars before it is discharged and a device has been designed to perform this function automatically. This device may be used wherever it is desired, to heat to 100 degrees centigrade and discharge automatically any liquid which is received intermittently or continuously. The device will apply in particular to the disinfection of sewage or lavatory waste from steamships or from steam, electric or gasoline trains.

Preliminary studies of the cost of operation indicate that with steam as heating agent, the disinfection of one closet would cost about 7½c. per 1,000 flushes. Therefore, if each steamer closet discharges on the average 50 times every day, the cost of disinfection a day per closet on steamships will be 5c.

Expenditures on Grade Crossings by Board of Railway Commissioners.

Following is a statement of amounts paid by railway companies, municipalities and out of the Railway Grade Crossing Fund to April 1, 1914, in connection with orders by the Board of Railway Commissioners:

Fiscal Year	Railway Companies	Municipalities	Grade Crossing Fund
1909-10 ...	\$ 30,242.91	\$ 7,703.76	\$ 70.00
1910-11 ...	196,733.50	23,433.99	6,909.18
1911-12 ...	155,866.45	34,537.20	12,630.68
1912-13 ...	15,395.69	2,691.51	26,152.24
1913-14 ...	4,694.88	906.33	41,877.93
Totals ..	\$402,933.43	\$69,272.79	\$87,640.03

This includes all payments to date, with the exception of the St. Lawrence Boulevard Subway, St. Louis, Que. (order 8839), which provides for \$5,000 from the Railway Grand Crossing Fund, \$15,000 to be paid by the Montreal St. Ry. and the balance by the C.P.R. and the municipality, as agreed upon between themselves.

General Clauses for Contract Specifications.

The Canadian Society of Civil Engineers' Committee on this subject, of which H. Holgate, Montreal, is chairman, presented a report at the annual meeting in Montreal in January, from which the following are extracts:—

"We have compiled the accompanying form of general clauses from various sources, and have revised, altered and added to them as we thought necessary. We have arranged them in a manner which, we hope, will be satisfactory, and have endeavored to cover the necessities of various classes of work. By the use of this or a similar form of general conditions, the form of contract and of the specification can be very much abbreviated, as many of these clauses would of necessity be incorporated in either the contract or specification, and by its use the standardization of forms of contract would be advanced.

"Though perhaps somewhat beyond the question that we have been asked to report on, we would recommend that all contracts should embrace in one document:— The agreement or contract itself; the tender or a certified copy of it; the specification; the general clauses; the signed drawings as tendered on; any modified drawings agreed to prior to signing of contract. Preferably these should be printed documents.

"In case of the adoption of a form of general conditions we would suggest that the Society have it printed and sold to the membership at a moderate charge."

Orders by Board of Railway Commissioners for Canada.

Beginning with June, 1904, Canadian Railway and Marine World has published in each issue summaries of orders passed by the Board of Railway Commissioners, so that subscribers who have filed our paper have a continuous record of the Board's proceedings. No other paper has done this.

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

23004. Dec. 19.—Authorizing Erie & Ontario Ry. (T.H. & B. Ry.) to open for traffic line from Smithville to Dunnville, Ont., and to operate over grade crossings of M.C.R. near Attercliffe, and G.T.R. near Diltz and at Dunnville, subject to certain conditions.

23005. Dec. 15.—Amending order 22961, Nov. 30, 1914, re G.T.R. deviation near Welland, Ont.

23006. Dec. 3.—Amending order 20677, Oct. 24, 1913, re provision of cattle pass by C.N. Ontario Ry. for W. R. Kirk, Foresters Falls, Ont.

23007. Dec. 18.—Dismissing Toronto Board of Trade's application for an order including school crayons in stationery list of Canadian Freight Classification.

23008. Dec. 11.—Approving agreement between Bell Telephone Co. and Brussels Village, Ont., Dec. 1.

23009. Dec. 19.—Extending to Nov. 30, 1915, time within which Canadian Northern Ry. shall equip its cabooses with air brakes, subject to condition that cabooses already so equipped shall be kept in service as much as possible.

23010. Dec. 18.—Authorizing C.P.R. to use bridge 0.7 across Wellington St., Sherbrooke, Que.

23011. Dec. 17.—Approving agreement between Bell Telephone Co. and Princeton & Drumbo Telephone Co., Dec. 4.

23012. Dec. 17.—Approving location of G.T.R. new station at Inglewood Jct., Ont.

23013. Dec. 18.—Authorizing Saskatchewan Highway Commissioners to build road over Canadian Northern Ry. right of way in n.e. ¼ Sec. 33-43-16, W. 3 M. After crossing has been built, C.N.R. is authorized to close portion of original road allowance north of n.w. ¼ Sec. 33, within its right of way.

23014. Dec. 12.—Relieving C.P.R. from speed limitation of 10 miles an hour over crossing of 8th St. East, Calgary, Alta.

23015. Dec. 17.—Authorizing Cedar Rapids Mfg. & Power Co., Montreal, to take additional 25 ft. across portion of Lot 123, North River, Delisle, St. Ignace du Coteau du Lac Parish, Que.

23016. Dec. 14.—Authorizing Vancouver, Victoria and Eastern Ry. and Navigation Co. (G.N.R.) to erect station at New Westminster, B.C., within 60 days.

23017. Dec. 11.—Authorizing C.P.R. to build spur for City of Swift Current, Sask.

23018. Dec. 21.—Amending order 22871, Nov. 16, re G.T. Pacific Ry. fencing between Irma and Kinsella, Man., by substituting Alta. for Man.

23019. Dec. 18.—Recommending to Governor in Council for sanction the General Train and Interlocking Rules of Quebec, Montreal & Southern Ry., approved by its bylaw 26.

23020. Dec. 22.—Suspending Supplement 1 to C.P.R. Competitive, Proportional and Joint Freight Tariff, C.R.C. no. E-2847, to become effective Jan. 4, 1915, pending hearing of applications at sittings of Board at Ottawa, Jan. 5; also suspending Supplement 16 to G.T.R. Special, Local, Joint and Proportional Tariff, C.R.C. no. E-2588, to become effective Jan. 4, 1915, increasing its rates on same commodity from same territory to same point, via Sherbrooke, and Boston & Maine Rd.

23021. Dec. 19.—Dismissing Fort William Board of Trade's application for order directing C.P.R. to provide local freight sheds, separate from wharf sheds.

23022. Dec. 23.—Establishing express collection and delivery limits in Cobalt, Ont.

23023, 23024. Dec. 18, 21.—Authorizing the Hydro Electric Power Commission of Ontario to erect wires across C.P.R. at Kenzie St., Woodbridge, and across G.T.R., at Lot 118, Thorold Tp., Ont.

23025. Dec. 23.—Authorizing C.P.R. to open for traffic portion of Kootenay Central Ry. from Fort Steele to Edgewater, mileage 23.06 to 59 south from Golden, B.C.

23026. Dec. 22.—Approving C.P.R. clearances at siding at coal and wood warehouse, Sudbury, Ont.

23027. Dec. 23.—Authorizing C.N. Ontario Ry. to operate over crossing of C.P.R. Stobie Branch in Lot 4, Con. 5, McKim Tp., upon its putting interlocking plant into operation; after interlocking plant is in use C.P.R. is authorized to operate over crossing at speed not exceeding 15 miles an hour, without first stopping trains; and rescinding order 22927, Dec. 1, 1914.

23028. Dec. 22.—Authorizing G.T. Pacific Ry. and Fort William Electric Ry., pending instal-

lation of half interlocking plant, to operate over crossing on Empire Ave., at Sprague St., Fort William, Ont., half interlocking plant to be completed by May 31, 1915.

23029. Dec. 23.—Certifying correction in G.T. Pacific Branch Lines Co.'s plans by endorsing thereon affidavit of J. E. Gray, Winnipeg, Dominion Land Surveyor.

23030. Dec. 22.—Ordering G.T.R. to install gates at crossing of Gage Ave., Hamilton, Ont., to be operated by day and night watchmen appointed by company; 20% cost of gates to be paid out of railway grade crossing fund; wages of watchmen, half by City of Hamilton.

23031, 23032. Dec. 22.—Authorizing Hydro Electric Power Commission of Ontario to erect wires across G.T.R. near Strathroy Station, and in Stayner, Ont.

23033. Dec. 23.—Authorizing C.N. Ontario Ry. to cross and divert public road between Lots 10 and 11, Pembroke Tp., and cross and divert highway in half Lot 10, carrying highway under tracks by subway.

23034. Dec. 21.—Dismissing application of farmers and citizens of Ensign, Alta., for order directing C.P.R. to continue station agent there, and ordering C.P.R. to have station building at Ensign heated before arrival and departure of passenger trains during cold weather.

23035. Dec. 22.—Authorizing British Columbia Public Works Department to build level highway crossing over Great Northern Ry. near White Rock station.

23036. Dec. 19.—Authorizing City of Toronto to waterproof superstructure of subway at Keele St., under C.P.R., company to maintain it in that condition in future.

23037. Dec. 23.—Certifying correction in G.T. Pacific Branch Lines Co.'s plan, showing location of Biggar-Calgary Branch from mileage 77.13 to 104.06, Saskatoon District, Sask., by endorsing thereon affidavit of J. E. Gray, Winnipeg, Dominion Land Surveyor.

23038. Dec. 23.—Ordering Esquimalt and Nanaimo Ry., within 60 days, to install bell at crossing of Victoria and Campbell River trunk road; to ring only when trains approach from south; 20% of cost to be paid out of railway grade crossing fund, and rescinding order 22817, Nov. 4.

23039. Dec. 23.—Recommending to Governor in Council for sanction, lease of Southampton Ry. to C.P.R., Nov. 14.

23040. Dec. 23.—Ordering Bay of Quinte Ry. to remove any station or buildings from J. James' land, Elzevir Tp., Ont., and not to re-erect any buildings thereon; that railway shall, upon it being shown by him that he is about to operate his mining property, within 3 months of such proof, build subway under its tracks sufficient for purpose of carrying on the mining business; also that J. James shall be at liberty to erect aerial trams across B. of Q.R. for the conveyance of material.

23041. Dec. 24.—Authorizing Kettle Valley Ry. to build bridges 32.65, 32.55 and 36.3 across Coquihalla River, B.C.

23042. Dec. 24.—Approving Canadian Northern Ry. plan showing its combined standard station and section house.

23043. Dec. 24.—Approving location of Erie & Ontario Ry. (T.H. & B.R.) through Moulton and Sherbrooke Tps., Ont., between Dunnville and Port Maitland, mileage 14.61 to 19.19.

23044. Dec. 24.—Authorizing Canadian Northern Ry. to build across and divert road in south half Sec. 18-29-27, W. 3 M., Sask., subject to condition that land necessary for diversion be secured by C.N.R. in name of Province of Saskatchewan.

23045. Dec. 24.—Ordering that 20% of cost of installing gates at crossing of first highway east of Clarkson Station, Ont., by G.T.R., be paid out of railway grade crossing fund; remainder:—25% by Toronto Tp. and 75% by G.T.R.; cost of maintenance:—75% by G.T.R. and 25% by Toronto Tp., the 25% to cover expense of watchmen employed at crossing since erection of gates.

23046. Dec. 23.—Appointing Judge Winchester, of York County, as arbitrator to adjust claims for damages occasioned by construction of subways in Toronto, authorized under orders 16842 and 16846.

23047. Dec. 22.—Ordering Great Northern Ry., within 60 days, to install improved type of automatic bell at crossing of Front St., near intersection of Columbia St., New Westminster, B.C.; 20% of cost to be paid out of railway grade crossing fund.

23048. Dec. 24.—Approving location of G.T. Pacific Ry. station at Hutton, B.C., mileage 1220.6 west of Winnipeg.

23049. Dec. 24.—Authorizing Toronto Hydro Electric System to erect wires across C.P.R. and G.T.R. at Ruskin Ave., Toronto.

23050. Dec. 10.—Authorizing Canadian Northern Ry. to carry traffic over its line between Grand Marais and Birds Hill, Man., 50 miles, until July 15, 1915.

23051. Dec. 23.—Authorizing Vancouver, Vic-

toria and Eastern Ry. and Navigation Co. (G. N.R.) to build spur for McLellan Lumber Co., Gulchon, B.C.

23052. Dec. 28.—Approving location of Canadian Northern Ry. third class station at Turtleford, Sask.

23053. Dec. 26.—Authorizing City of Toronto to repair sidewalks on bridge at Moore Ave., and rescinding order 22304, July 31.

23054. Dec. 28.—Extending to Feb. 28, 1915, time within which C.P.R. shall build transfer track at Coldwater, Ont.

23055. Dec. 28.—Authorizing C.P.R. to build road diversion in Sec. 13-6-8, W. 4 M., at mileage 71.16 of Weyburn-Stirling Branch.

23056. Dec. 28.—Authorizing C.P.R. to close station at Three Valley, B.C.

23057. Dec. 28.—Authorizing Canadian Northern Ry. to open for traffic its line from junction with Battle River Subdivision north of Camrose to junction with C.N. Western Ry. near Strathcona, Alta., 46 miles; speed of trains limited to 25 miles an hour.

23058. Dec. 28.—Extending to July 1, 1915, time within which Canadian Northern Ry. shall complete alterations and additions to its station building at Alsask, Sask.

23059. Dec. 29.—Amending order 22721, Oct. 16, re opening of double track for traffic on its White River Subdivision, Ont.

23060. Dec. 23.—Approving location and details of G.T. Pacific Ry. station at Ribstone, Alta.

23061. Dec. 11.—Dismissing application of Town of Courtenay, B.C., for order directing Esquimalt & Nanaimo Ry. to permit B.C. Government to make road from freight shed northwesterly to Lake Trail, approximately 900 ft. to obviate haul now necessary between the trail and freight shed of approximately 5,700 ft.

23062. Dec. 29.—Authorizing Kettle Valley Ry. to connect with Vancouver, Victoria & Eastern Ry. (G.N.R.) at Hope, B.C.

23063. Dec. 24.—Authorizing G.T.R. to cross Toronto, Grey & Bruce Ry. (C.P.R.) at grade with its spur for Elias Rogers Co., south of St. Clair Ave., Toronto, crossing to be protected by interlocking plant.

23064. Dec. 29.—Authorizing Ingersoll, Ont., Electric Power and Light Commission to erect wires across C.P.R. on Wonham St., between Charles and Hamilton Sts., Ingersoll, Ont.

23065. Dec. 29.—Authorizing C.P.R. to open for traffic additional track and diversions at various points on its Lake Superior Division, Ont.

23066. Dec. 29.—Extending to Apr. 30, 1915, time within which C.P.R. shall complete spurs in York Tp. on land owned by Canadian Kodak Co.

23067. Dec. 29.—Authorizing G.T.R. to rebuild bridge 317, near Weyvale, Ont.

23068. Dec. 31.—Approving location of Erie & Ont. Ry. (T.H. & B. Ry.) station at Diltz Jct., Ont.

23069. Dec. 30.—Authorizing C.P.R. to build spur for Austin & Nicholson, Tp. 37, Sudbury District, Ont.

23070. Dec. 29.—Approving C.P.R. clearance between northerly track of its team yard and three poles on south side St. Ambrose St., Montreal, owned by Montreal Light, Heat and Power Co.

23071. Dec. 3.—Authorizing Sandwich, Windsor & Amherstburg Ry. to connect track leading to car barn to Michigan Central Rd. team tracks, Windsor, Ont.

23072. Dec. 29.—Authorizing Canadian Northern Ry. to discontinue station agent at Lorette, Man., company to appoint caretaker to keep waiting room cleaned and heated for arrival and departure of passenger trains, to see that i.c.l. freight is properly housed and freight shed locked, and freight delivered to consignees.

23073. Dec. 30.—Authorizing Canadian Northern Ry. to build transfer track between its Strathcona-Edmonton branch (formerly Edmonton, Yukon & Pacific Ry.); and to build across Nineteenth Ave. South and cross and divert Bay Lakes Trail, Edmonton, Alta.

23074. Dec. 31.—Rescinding order 17840, in so far as it relates to Vancouver, Victoria & Eastern Ry. overhead crossings at Pender, Keefer, and Harris Sts., Vancouver, B.C.; and reserving leave to any party to make new application; V. & E. Ry. & Nav. Co. to erect crossing signs and flag all trains over crossings.

23075. Dec. 31.—Approving C.P.R. overhead clearances at Victoria and McKay Ave. bridges, Edmonton, Alta.

23076. Dec. 31.—Dismissing application of S. S. Hamilton Co., Moose Jaw, Sask., for order directing Canadian Northern Ry. and C.P.R. to build transfer track at Hawick, Alta.; or, in the alternative, for order directing the issue of joint freight tariff on coal between Drumheller and Moose Jaw, via Calgary, Alta.

23077. Jan. 2.—Recommending to Governor in Council for approval New York Central & Hudson River Rd. rules 11, 27, 466, 484, and 507, as modified.

23078. Dec. 31.—Amending order 18580, Jan. 24, 1913, re Canadian Northern Ry. crossing of Water Ave., Winnipeg.

23079. Jan. 4.—Extending to March 31 time within which C.P.R. shall install bell at highway

between lots 5 and 6, mileage 12.61, Toronto Tp., Ont.

23080. Dec. 30. — Authorizing Hydro-Electric Power Commission of Ontario to erect wires across G.T.R., near Paris station, Ont.

23081. Jan. 2. — Ordering G.T.R. to change time of train 191 to leave Stratford at 7.50 a.m. and arrive at Palmerston at 9.15, timing it at Listowel at 8.45 a.m. or 8.48 a.m., if desired, to meet opposing train at latter time.

23082. Dec. 31.—Authorizing City of Regina, Sask., to build overhead bridge across C.P.R. on Hamilton St., Regina.

23083. Jan. 2.—Authorizing C.P.R. to take for highway, certain lands adjoining southern limit of main line right of way in s.w. quarter section 32-16-24, w. 2 m., Sask., containing by admeasurement 4.06 acres, more or less.

23084. Dec. 30.—Ordering that Canadian Northern Ry. crossing by Suburban Rapid Transit Co. on Portage Ave., Winnipeg, Man., be protected by a half-interlocking plant with derails; plans to be submitted for approval of board's engineer by Feb. 1; work to be completed by June 15; cost of installing to be paid, 50% by C.N.R., 25% by Winnipeg Electric Ry., and 25% by Suburban Rapid Transit Co.; maintenance and operation to be paid, 40% by C.N.R., 30% by Winnipeg Electric Ry., and 30% by Suburban Rapid Transit Co.; watchman employed in the meantime to be paid, 40% by C.N.R., 30% by Winnipeg Electric Ry., and 30% by Suburban Rapid Transit Co.

23085. Dec. 18. — Dismissing application of municipality of Brokenshell 68, Sask., for order directing Canadian Northern Ry., to build bridge over creek at mileage 5.2, Moose Jaw Subdivision, and authorizing C.N.R. to cross and divert north and south road between sections 10 and 11, Tp. 7, R. 18, w. 2 m., Sask.; work to be completed by May 1, 1915.

23086. Jan. 2.—Authorizing C.P.R. to remove regular station agent at Ivry, Que., for winter months; company to provide reliable man to keep station heated and to look after baggage and express.

23087. Jan. 5.—Authorizing British Columbia Public Works Department to build level crossing over C.P.R., Arrow Lake branch, at corner of section 10-23-2, w. 6 m.

23088. Jan. 4.—Relieving Michigan Central Rd. from providing watchmen or other protection at crossing of second public highway west of Tillsonburg station, Ont.

23089. Jan. 5.—Authorizing G.T.R. to build siding for Rathbone & Lovering, York Tp., Ont.

23090. Jan. 7.—Ordering G.T. Pacific Ry. forthwith to establish a semi-weekly train service, in each direction, on its Regina-Moose Jaw and Northwesterly branch, install a Y at Gilroy, Sask., to permit turning locomotives, and to provide box car stations at Central Butte, Gilroy, and Lawson; work to be completed by May 1.

23091. Jan. 7.—Authorizing C.P.R. to build siding for American Tar Products Co., La Salle, Que.

23092. Jan. 8.—Approving Edmonton, Dunvegan & British Columbia Ry. location through Tp. 78, R. 3 and 6, w. 6 m., Alta., mileage 331.89 to 360.47.

23093. Jan. 8.—Authorizing C.P.R. to build road diversion in s.w. quarter section 20-35-21, w. 3 m., Sask., and build its Kerrobert northeasterly branch across same at grade at mileage 9.55.

23094. Jan. 8.—Authorizing C.P.R. to build highway diversion across its main line in Shawanaga Indian Reserve, Shawanaga Tp., Parry Sound District, Ont.

23095. Jan. 8.—Authorizing Canadian Northern Ry. to build spur for Sterling Coal Co., Ltd. in s. w. quarter section 9-29-20, w. 4 m., Alta.

23096. Jan. 7.—Authorizing C.P.R. to discontinue services of agent at Meadows station, Man., company to keep building cleaned and heated and have package freight and express matter properly housed.

23097. Jan. 8.—Approving C.P.R. clearance at bridge 112.6, carrying Sandwich St., Windsor, Ont., across its tracks.

23098. Jan. 9.—Rescinding order 13963, June 15, 1911, in so far as it authorizes C.P.R. to build its Kipp to Aldersyde branch across road allowances at mileage 41.47, 57.03, and 83.51, and authorizing it to build across diversion of road allowances at mileage 41.47, 57.03, and 83.51.

23099. Jan. 7.—Rescinding order 22646, Oct. 1, 1914, re stopping of C.P.R. train 211 at Highlands, Que.

23100 to 23104. Jan. 9. — Authorizing Hydro-Electric Power Commission of Ontario to erect wires across G.T.R. at five points in Simcoe, Ont.

23105. Jan. 8.—Authorizing Edmonton, Dunvegan & British Columbia Ry. Co. to cross and divert 30 highways in Alberta, mileage 331 to 360.

23106. Jan. 9.—Ordering that while Intercolonial Ry. is operating its eastbound train known as Ocean Limited, Quebec Oriental Ry. shall hold its eastbound train daily, except Sunday, at Matane for connection, from May 1 until Nov. 1, and on Saturdays only from Nov. 1 until May 1 each year: time tables so arranged to be filed with board by April 1.

23107 and 23108. Jan. 8.—Approving location of Erie & Ontario Ry. (T.H. & B. Ry.) stations at Vaughan, mileage 5.17, and at Port Davidson, mileage 7.68, Ont.

23109. Jan. 11.—Authorizing Erie & Ontario Ry. (T.H. & B. Ry.) to open for traffic its branch lines to freight and passenger stations at Dunnville, Ont.

23110. Jan. 11.—Approving revised location of portion of C.P.R. Weyburn-Stirling branch line, from section 13-6-9, easterly to section 12-6-7, w. 4 m., mileage 64.34 to 77.84, Alberta.

23111. Jan. 11.—Authorizing G.T.R. and Campbellford, Lake Ontario & Western Ry. (C.P.R.) to operate over crossings at mileage 119.90, 119.91, and 120.02, Cobourg, Ont., until June 1, all trains to be stopped before crossing and to be flagged over, pending installation of interlocking plants.

23112. Jan. 11.—Authorizing C.P.R. to build road diversion in section 34-16-11, w. 3 m., Sask.; and build additional track, Swift Current subdivision, across same, at mileage 92.17.

23113. Jan. 11.—Authorizing C.P.R. to open for traffic portion of double track, mileage 0 to 0.5, Thompson Subdivision, B.C.

23114. Jan. 11.—Amending order 22293, July 17, 1914, re C.P.R. farm crossings in Bolton Tp., Que.

23115. Jan. 11.—Ordering G.T.R. to protect crossing of Bridge St., Meaford, Ont., by watchman during switching operations, and arrival and departure of passenger trains.

23116. Jan. 9.—Approving agreement of Bell Telephone Co. with Central Dufferin Telephone Association, Dec. 21, 1914.

23117. Jan. 11.—Authorizing Bow Valley rural municipality 219, Alta., to build 3 highway crossings over C.P.R.

23118. Jan. 12.—Relieving Canadian Northern Ry. and G.T. Pacific Ry. from maintaining night signalman at crossing at Dana, Sask.

23119. Jan. 12.—Relieving C.P.R. and G.T. Pacific Branch Lines Co. from maintaining night signalman at crossing at Alix, Alta.

23120. Jan. 12.—Relieving Canadian Northern Ry. and C.P.R. from maintaining night signalman at crossing at Stettler, Alta.

23121. Jan. 12.—Relieving C.P.R. and G.T. Pacific Branch Lines Co. from maintaining night signalman at crossing at Frobisher, Sask.

23122, 23123. Jan. 12.—Relieving C.P.R. and Canadian Northern Ry. from maintaining night signalmen at crossings at Bienfait and Carlyle, Sask.

23124. Jan. 12.—Relieving C.N.R. and Great Northern Ry. from maintaining night signalman at crossing at Roland, Man.

23125, 23126. Jan. 12.—Relieving C.P.R. and Canadian Northern Ry. from maintaining night signalmen at crossing at Midale, Sask., and Hartney, Man.

23127. Jan. 12.—Relieving C.P.R. and G.T. Pacific Branch Lines Co. from maintaining night signalman at crossing at Griffin, Sask.

23128 to 23131. Jan. 12.—Relieving Canadian Northern Ry. and C.P.R. from maintaining night signalmen at crossings at Forward, Sask., Carberry and Findlay, Man., and Conquest, Sask.

23132. Jan. 12.—Relieving G.T. Pacific Branch Lines Co. and C.P.R. from maintaining night signalman at crossing at Yorkton, Sask.

23133. Jan. 12.—Relieving Canadian Northern Ry. and G.T. Pacific Ry. from maintaining night signalman at crossing at Empire Ave., Fort William, Ont.

23134. Jan. 13.—Relieving G.T.R. from providing further protection at Marsh Winery crossing, about 3 miles west of Niagara Falls, Ont.

23135. Jan. 13.—Approving location of Canadian Northern Ry. third class station at Wisetown, Sask.

23136. Jan. 13.—Ordering that Canadian Northern Ry. diversion, authorized by order 19631, June 18, 1913, near Victoria Bridge, Calgary, Alta., be completed by March 1.

23137, 23138. Jan. 11, 13.—Approving Bell Telephone Co. agreements with Canadian Telephone Co., Dec. 28, 1914, and with Dover Tp., Ont., Dec. 24, 1914.

23139. Jan. 12.—Authorizing G.T.R. to open for traffic portion of deviated line through Grantham Tp., Town of Thorold, and Thorold Tp., Ont., and temporary cross over to connection with present line at bridge 11, Welland Canal.

23140. Jan. 12.—Approving deviation of Dominion Atlantic Ry. main line from near Chestnut St., Windsor, to north side of Avon River, N.S., 3,250 ft.

23141. Jan. 13.—Authorizing West Kildonan municipality, Man., to build highway over C.P.R. Selkirk Branch at Enniskillen Ave.; and dismissing similar application respecting Kenilworth Ave.

23142. Jan. 12.—Rescinding order 22505, Sept. 5, 1914, authorizing C. N. Ontario Ry. to build spur for Hawkins Bros., Parry Sound.

23143. Jan. 14.—Relieving Canadian Northern Ry. and Midland Ry. of Manitoba (G.N.R.) from maintaining night signalman at crossing at Carman, Man.

23144. Jan. 14.—Relieving Brandon, Saskatchewan & Hudson Bay Ry. (G.N.R.) and Canadian Northern Ry. from maintaining night signalman at crossing in Sec. 31-1-18, w.p.m. Man.

23145 to 23148. Jan. 14.—Relieving C.P.R. and Canadian Northern Ry. from maintaining

night signalmen at crossings at Rosetown, Sask.; Brookdale, Man.; in Sec. 35-24-27, and in s.e. and s.w. ¼ Sec. 28-25-24, w. 4 m., Alta.

23149. Jan. 14.—Relieving G. T. Pacific Ry. and Canadian Northern Ry. from maintaining 23150. Jan. 12.—Authorizing C.P.R. to build spur for Georgetown Collieries Ltd., Cammore, Alta.

23151. Jan. 14.—Relieving C.P.R. and Canadian Northern Ry. from maintaining night signalman at crossing at Petrel, Man. signalman at crossing at Morris, Man.

23152. Jan. 14.—Relieving C.P.R. and Canadian Northern Ry. from maintaining night signalman at crossing at Holmfild, Man.

23153. Jan. 13. — Dismissing application of Central Convention of Farmers' Institutes of British Columbia for order granting privilege of shipping mixed carloads of flour and feed (in sacks) and baled hay and straw at carload rates.

23154. Jan. 15.—Relieving C.P.R. and Canadian Northern Ry. from maintaining night signalman at crossing at Maryfield, Sask.

23155 to 23157. Jan. 15.—Relieving G.T. Pacific Ry. and Canadian Northern Ry. from maintaining night signalmen at crossings at St. Boniface, Man.; Leaman, Alta.; and Harte, Man.

23158, 23159. Jan. 15.—Relieving G.T. Pacific Branch Lines Co. and C.P.R. from maintaining night signalmen at crossings at Druid and Oban, Sask.

23160. Jan. 15.—Relieving C.P.R. and G.T. Pacific Ry. from maintaining night signalman at crossing at Reford, Sask.

23161. Jan. 15.—Relieving Canadian Northern Ry. and G. T. Pacific Ry. from maintaining night signalman at crossing at Ryley, Alta.

23162. Jan. 15. — Relieving G.T. Pacific Ry. and C.P.R. from maintaining night signalman at crossing at Deer, Man.

23163. Jan. 15. — Relieving G.T.R. Branch Lines Co. and Canadian Northern Ry. from maintaining night signalman at crossing at Lampman, Sask.

23164. Jan. 15.—Relieving G.T. Pacific Branch Lines Co. and C.P.R. from maintaining night signalman at crossing at Neeley, Sask.

23165. Jan. 15.—Relieving Canadian Northern Ry. and Great Northern Ry. from maintaining night signalman at crossing at Minto, Man.

23166. Jan. 15.—Approving Michigan Central Rd. plan of 6th-7th side road drain across Cons. 2 to 8, Brooke Tp., Ont.

23167. Jan. 15.—Ordering that \$5,000 towards cost of building bridge from Coutts St., produced, north from Baroness Road, across C.P.R. yards, Lethbridge, Alta., be paid out of railway grade crossing fund, and be divided equally between C.P.R. and city.

23168. Jan. 15.—Authorizing G.T.R. to build siding and spur for Campbell Flour Mills Co., West Toronto, Ont., and approving clearances.

23169. Jan. 16.—Approving C.N. Ontario Ry. location through Trenton, Ont.: the rearrangement of Central Ontario Ry. tracks to permit of location between mileage 145 and 145.94 from Ottawa; and crossing of Joseph, King, and Dundas Sts.; and location along Division St.; and authorizing crossing of Joseph, King, and Dundas Sts.

General order 133. Dec. 19.—Suspending proposed cancellation, on Jan. 1, 1915, of arrangements whereby mixed carloads of foreign and native liquors and mixed carloads of groceries, classified 5th class in straight carloads and dried fruits, classified 4th class in straight carloads, are carried at their respective carload rates between points west of and including Port Arthur, and thereto from eastern shipping points.

Rogers Pass Tunnel Suit.—The hearing of the action of McIlwee and Sons, against Foley, Welch and Stewart for damages consequent on the cancellation of a sub-contract on the C.P.R. Rogers Pass tunnel contract, was begun in Vancouver, Jan. 5. The case was expected to last a considerable time.

The paper by Alfred Price, Assistant General Manager, Eastern Lines, C.P.R., on Some Maximums and Minimums in Train Operation, on the first two pages of this issue, was read before the Canadian Railway Club in Montreal, which should have been stated on one of those pages.

Western Canada Ry. Club.—An address was given to the members at Winnipeg, Jan. 11, by A. Calder, formerly of the C.P.R. Passenger Department there, in which he gave many details of early railway history in the West.

C.P.R. Hotels during the year ended June 30, 1914, served 2,901,598 meals to guests and employes, an average of 7,650 a day, showing that 2,973 persons were supplied with three meals a day.

A Problem in Economics of Mountain Railway Location at Rogers Pass, B.C.

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

The data to be taken into account is as follows: Present location, total distance 23.1 miles, revised location 18.68 miles, as shown in fig. 1; grades are as shown in fig. 2, and consist, on the present location of 16.65 miles up hill for westbound traffic on maximum grade of 2.2%, 6.45 miles down grade same maximum with a total rise of 1,726 ft. and a drop of 692.1 ft. with 1,860 degrees of curvature on the up hill and 1,288 degrees on the down hill portion of the line. The revised location consists of 16.77 miles up hill with about 5 miles of 2.2% pusher grade, the balance 1% and a down hill run of 1.91 miles with a maximum 2.2% grade; a total rise of 1,178.2 ft. and a drop of 144.3 ft., with 635 degrees of curvature on the up hill grade and 66 degrees on the down hill. The average traffic for 1912 and 1913, which is made the basis of calculations, was 1,342½ passenger trains in each direction; the average weight of the passenger trains, exclusive of locomotives, was 443 tons; 980 of the passenger trains required pusher locomotives; the weight of the passenger and pusher locomotives for passenger trains was

Resistance to overcome, on present line.	
Actual rise, 692.1 ft.	692.1 ft.
Curve resistance, 1,288° × .04 ft.	51.5 ft.
Friction resistance, 6.45 mls. × 15 ft.	96.7 ft.
Total	840.3 ft.
Resistance to overcome, tunnel line.	
Actual rise, 144.3 ft.	144.3 ft.
Curve resistance, 66° × .04 ft.	2.6 ft.
Friction resistance, 1.91 mls. × 15 ft.	28.6 ft.
Total	175.5 ft.
Difference	664.8 ft.
3,281,890 tons × 664.8 ft. equals 2,181,800,472 foot tons.	
Westbound tonnage per year, including weight of locomotives, 3,191,488 tons.	
Resistance to overcome, present line.	
Actual rise, 1,726 ft.	1,726.0 ft.
Curve resistance, 1,860° × .04 ft.	74.4 ft.
Friction resistance, 16.65 mls. × 15 ft.	249.7 ft.
Total	2,050.1 ft.
Resistance to overcome, tunnel line.	
Actual rise, 1,178.2 ft.	1,178.2 ft.
Curve resistance, 635° × .04 ft.	25.4 ft.

70,681.0 pusher engine miles.	
Amount saved—27,236.0 train miles; 54,913.7 pusher engine miles.	
27,236 train miles at 22 cts.	\$ 5,991 92
54,913.7 pusher miles at 25 cts.	13,728 40
NOTE.—25 cents to cover engine crew wages, cost of repairs to pusher locomotives and extra cost of maintenance account of running pushers.	
Extra cost of maintenance of way:	
4.42 miles at \$200, plus 27,236 train miles at 20 cts.	6,331 20
Extra cost, maintenance of way, account of extra number of degrees of curvature, assuming that 400° of curvature per mile would increase rate at 20 cts. per train mile for maintenance by 30%.	
6,162 trains × 2,447° × 1-40 cts.	3,769 60
Special maintenance, account 4½ miles snow sheds	85,000 00
Extra cost, maintenance of equipment, 27,236 train miles at 21 cts.	5,719 56
Extra cost, maintenance of equipment, account of extra number of degrees of curvature, assuming that 400° of curvature per mile would increase rate of 21 cts. per train mile by 40%.	
6,162 trains × 2,447° × 21-1,000 cts. ...	3,166 47
Total annual saving in cost of operation	
	\$170,635 61

The rate at which traffic has been increasing would indicate that shortly after the work of constructing the tunnel was completed the traffic would have doubled. In this case, if no further economics were made in methods of operating this section

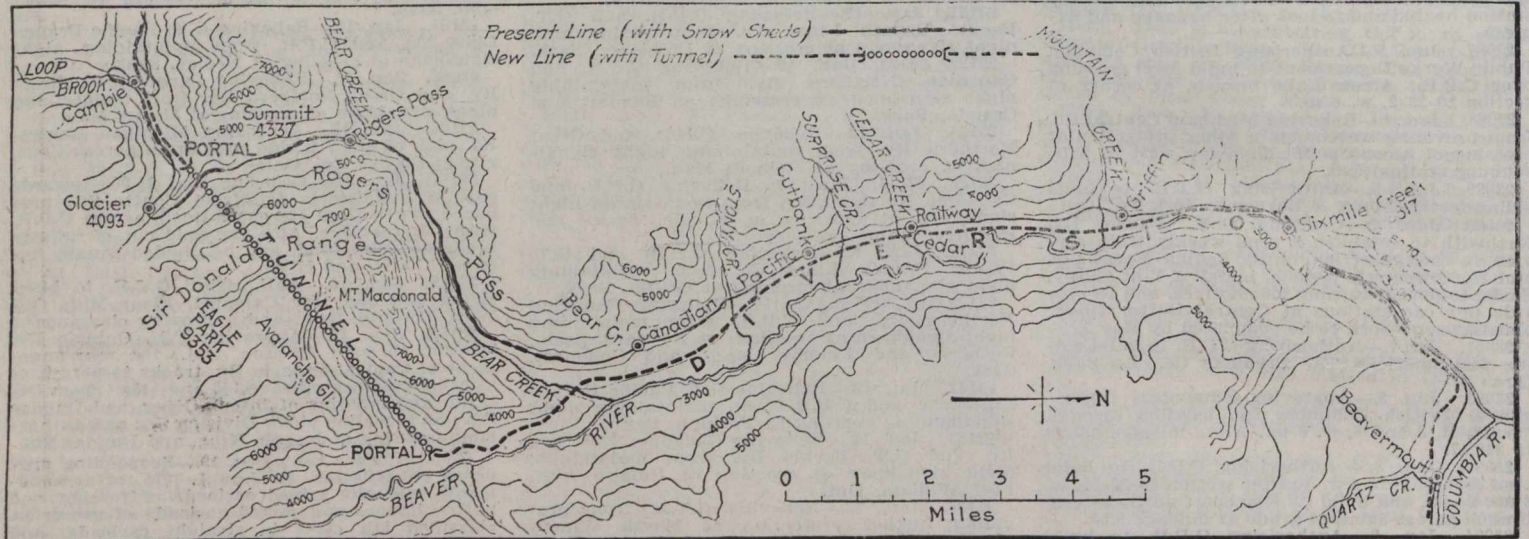


Fig. 1.—Rogers Pass Tunnel. Map of Old and New Lines.

175 tons each; there were 1,738½ freight trains in each direction per year; the average weight of the freight trains eastbound, exclusive of locomotives, was 950 tons; the average weight of freight trains westbound was 898 tons; all freight trains had to be pushed in both directions; weight of freight locomotives and pushers, 181 tons each. The tonnage eastbound and westbound was as follows:

EASTBOUND.	
	Tons.
1,342½ trains @ 443 tons each	594,727.5
2,322 locomotives @ 175 tons each ..	406,350.0
1,738½ freight trains @ 950 tons each ..	1,651,575.0
3,477 locomotives @ 181 tons each ..	629,237.0
Total	3,281,889.5
WESTBOUND.	
	Tons.
1,342½ trains @ 443 tons each	594,727.5
2,322 locomotives @ 175 tons each ..	406,350.0
1,738½ freight trains @ 898 tons each ..	1,561,173.0
3,477 locomotives @ 181 tons each ..	629,237.0
Total	3,191,487.5

Comparison of Comparable Factors affecting the Cost of operating over Rogers Pass, via Present Line and via Tunnel Line, now under construction, Average Traffic for 1912 and 1913.

Eastbound tonnage per year, including weight of locomotives, 3,281,890 tons.

Friction resistance, 16.77 mls. × 15 ft.	251.5 ft.
Total	1,455.1 ft.
Difference	595.0 ft.
3,191,488 tons × 595 ft. equals 1,898,935,360 foot tons.	
Total work done extra ... 2,181,800,472 foot tons	
1,898,935,360 foot tons.	
Total	4,630,735,832 foot tons
1,000 foot tons equals approximately 1 horse power hour. Assuming that 5 pounds of coal is consumed in doing one horse power hour's work and that coal on locomotive costs \$4.60 per ton, the saving in fuel will amount to:—	
4,080,736 × 5 lbs. × \$4.60	
2,000 lbs (one ton) =	\$46,928 46

EXTRA WAGES, TRAIN AND ENGINE CREWS.	
Present Line.	
6,162 trains for 23.1 miles.	
5,437 pusher engines for 23.1 miles.	
142,342.2 train miles.	
125,594.7 pusher engine miles.	
Tunnel Line.	
6,162 trains for 18.68 miles.	
5,437 pusher engines for 13 miles.	
115,106.2 train miles.	

of track, the annual saving on account of operating over tunnel line would be:—
 \$85,635.61 × 2 plus \$85,000.00 = \$356,271.22

In arriving at the above figures no account is taken of whether line was single or double track, and for comparative figures it was assumed that methods of operation would be the same. Now, as a matter of fact, the present single track line with double the present traffic would make the business too congested for economical single track operation. Therefore, it was apparent that it was time to study the question of double tracking the present line or seeking a new line for double track. It was decided to double track on the five mile tunnel location as shown in fig. 1, with grades as shown in fig. 2. Now to operate successfully a five mile tunnel we will require the installation of an electric plant and the purchase of electric locomotives. All the details of the proposed electrification have not been worked out, but even if they were, the reader is not interested in the details of cost. He can see at once that the problem was to find out if the cost of operating and maintaining the tunnel line, taking into account the extra costs of operating on account of having a short section

of electric operation and extra cost of maintaining tracks in the tunnel, plus the interest on the cost of building the new double track line, including the cost of electrifying the tunnel, would be less than the cost of operating and maintaining a double track line on the present location plus the interest on the cost of building the second track. The figures would not have been very decisive one way or the other were it not for the fact that there is now 4½ miles of wooden snow sheds on the present location which will be all done away with on the new location. The maintenance and renewals of these sheds cost between \$85,000 and \$100,000 a year. To maintain and renew a double track wooden shed would probably cost at least 50% more than the above, so that with a saving of about \$125,000 a year in maintenance and renewals of snow sheds and a calculated saving in operation and maintenance of \$171,271.22 on a traffic that surely will be reached in the near future, there was no doubt as to the proper course to pursue.

As to the details of figuring economics of railway location, the writer is well aware

speed between 7 and 35 miles an hour:—
 $R = 2.2 T + 121.6 C$
 R = total resistance on level tangent.
 T = total weight cars and contents in tons.
 C = total number of cars in train.

This amounts to 4 lbs. per ton to 8 lbs. per ton, depending on whether cars are fully loaded or empty. This is equivalent to a rise of from 10 ft. to 20 ft. per mile. For mixed traffic a conservative estimate is train resistance equals rise of 15 ft. per mile.

It may appear that the rate of 25c. per actual pusher mile covering the cost of repairs and engine crew wages and extra cost of maintenance is too high, but as a matter of fact it is very conservative for the repairs, maintenance and renewals of the locomotives alone will run somewhere between 7c. and 10c. per mile, and we have had cases where the locomotive crew wages alone averaged 25c per mile for the actual mileage run, on account of delays to the pusher.

The foregoing was contributed by Mr. Sullivan to the Cornell Civil Engineer, pub-

Traffic Orders by the Board of Railway Commissioners.

C.P.R. Joint Tariff on Grain.

22989. Dec. 17.—Re Supplement 2 to C.P.R. Joint Tariff on Grain and other Commodities, C.R.C. no. W. 1890, published to become effective Jan. 1, 1915. Upon reading the application of the Taylor Milling & Elevator Co. and the Ellison Milling & Elevator Co., of Lethbridge, Alta., protesting against the proposed cancellation of the joint through rates prescribed by the order 20462, Oct. 2, 1913. It is ordered that that supplement be suspended pending the hearing and determination of the matter by the Board.

Rates on School Crayons.

23007. Dec. 18. Re application of Toronto Board of Trade for an order including school crayons in the stationery list of the Canadian Freight Classification, it is ordered that the application be dismissed.

Rates on Pulpwood to Mechanicville, N.Y.

23020. Dec. 22.—Re Supplement 1 to C.P.R. Competitive Proportional, and Joint

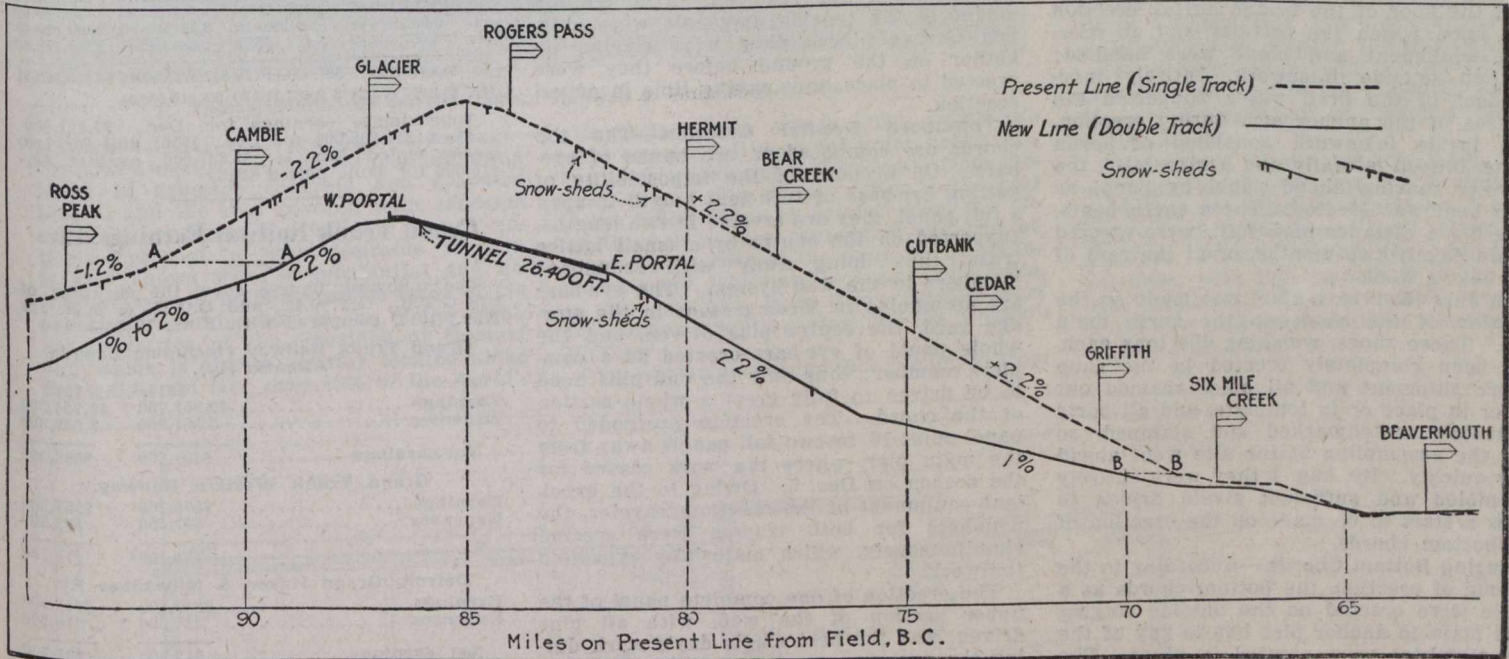


Fig. 2.—Rogers Pass Tunnel. Profile of Old and New Lines.

that it is impossible to devise any method that will show absolutely that saving in cost of operating one line over another, but he believes that the method herein followed, namely, that of comparing cost of fuel on the basis of work done rather than on a train mile or any other unit is much more logical and will give more reliable results than other methods that have been followed. The train mile is possibly the best unit for comparison in cost of wages and for cost of maintenance of equipment. In figuring maintenance of way a fixed sum should be taken, plus a rate per daily train rather than a fixed rate alone per train mile, for the reason that a certain amount of expense must be incurred regardless of whether trains are run or not. The fixed sum of \$200 a mile taken in this problem is probably about one half the actual sum that would be assumed if the entire cost of maintenance was to be included in this fixed sum per mile plus the rate per train mile for the reason that cost of maintenance of terminals and other items are not affected by the details of location between fixed terminals.

Frictional resistance, normal conditions, warm weather, modern freight equipment,

lished by the Association of Civil Engineers of Cornell University, Ithaca, New York, of which Mr. Sullivan is a graduate. Other articles on this tunnel have been published in Canadian Railway and Marine World, as follows:—April, Oct. and Nov., 1913; Jan., June, Oct. and Dec., 1914, and Jan., 1915.

Grand Trunk Railway Secured Notes.—

The G.T.R. issued in London, Eng., in December, a prospectus of £1,000,000 three year 5½% secured notes dated Jan. 15, 1915, due Jan. 14, 1918, the issued price being £98 10s. The notes are secured by deposit with the trustee of £1,430,000 G.T.R. perpetual 4% consolidated debenture stock. The proceeds are to be applied to the company's general purposes. The prospectus stated that the net revenue for 1913 showed a surplus after providing for fixed charges of £975,000. The complete figures for 1914 were not available, but although the amount must be reduced owing to the depression of trade, the outbreak of war and the increase in net revenue charges, the net revenue available would cover the interest on the issue many times over. We are officially advised that the issue was fully subscribed.

Freight Tariff on pulpwood, C.R.C. no. E-2847, published to become effective Jan. 4, 1915, in connection with Boston & Maine Rd. Upon reading the application of Auger & Son and the d'Auteuil Lumber Co., both of the City of Quebec, protesting against the proposed increases in the joint through rates on pulpwood, in carloads, from C.P.R. stations south of the River St. Lawrence and east of Montreal to Mechanicville, over the C.P.R. and the Boston & Maine Rd. It is ordered that the said supplement be suspended pending the hearing of the said application at the sittings to be held at Ottawa on Jan. 5, 1915. And it is also ordered that Supplement 16 to G.T.R. Special, Local, Joint, and Proportional Tariff, C.R.C. no. E-2588, published to become effective Jan. 4, 1915, increasing its rates on the same commodity from the same territory to the same points, via Sherbrooke, Quebec, and the Boston & Maine Rd., be suspended pending the hearing aforesaid.

A decided shop economy results from the use of the outside locomotive gear, as repairs to it can be more readily handled in the locomotive house shop.

Progress of Work on the Quebec Bridge During the First Erection Season.

By H. P. Borden, Assistant to Chief Engineer.

During the past season substantial progress has been made toward the erection of the new Quebec Bridge. In spite of the fact that the actual start on the work of erecting the main trusses of the anchor arm was not made until the middle of July, 1914, over 80% of the north anchor arm, amounting to some 15,000 tons, has been entirely erected, and for the most part riveted. During the winter of 1913-1914, the traveler for this work was erected on the north shore, just clear of the abutment. On May 18, 1914, the traveler was completed and moved out over the approach span, which had been put in place the season before.

Falswork.—From a position over the north anchor pier a start was then made on the erection of the steel falswork extending between this pier and the north main pier. The erection of two systems of falswork was required at this point: (1) An inside falswork, which was required to support the floor of the bridge during erection and upon which the traveler and all erection equipment and plant were handled; (2) an outside falswork, entirely independent of the first, which supported the trusses of the anchor arm during erection. The inside falswork consisted of seven bents, braced laterally and horizontally, the traveler moving ahead panel by panel as each bent was erected. These seven bents, covering a distance of 500 ft., were erected in practically two months, or at the rate of one bent a week.

On July 15, 1914, a start was made on the erection of the shoes on the north main pier. These shoes, weighing 400 tons each, had been completely erected in the shop before shipment and all holes reamed out either in place or to template, and all parts accurately matchmarked and stamped, so that the assembling at the site went ahead very quickly. By Aug. 1 they were entirely assembled and sufficient rivets driven to allow a start to be made on the erection of the bottom chords.

Placing Bottom Chords.—According to the scheme of erection, the bottom chords as a whole were erected on the outside staging from main to anchor pier before any of the web members were erected in place. The average main panel length being 86 ft., it was necessary to erect the lower chord members in four pieces for each panel, there being a transverse as well as a longitudinal field splice (both vertical). A full panel of bottom chord near the shoe weighs approximately 400 tons per truss. By Sept. 28 these chords were erected, connected up with the bottom lateral system, and the web splices riveted. The traveler moved back toward the anchor pier as the work progressed.

Erecting Web Members.—When the traveler had finished the erection of the bottom chord, it was again moved forward to the main pier and the erection of the lower half of the web members (up to the point where the diagonals and the verticals intersect) was started. These diagonals, also on account of their weight, had to be erected in four pieces between main panel points, having a vertical as well as a longitudinal field splice. As their ends are pin-connected, the erection of this portion of the web system proceeded rapidly. Each diagonal was accurately trued up and all the rivets in the vertical web splices were driven for the connection before it was connected to the vertical. No difficulty whatever was met with in the erection of these members.

The lower half of this web system was fully erected back to the north anchor pier by Nov. 9, 1914. The anchorage bars were then put in place in the anchor pier and connected up to the eye-bar heads, which had been left extending above the masonry at the foot of the well. These bars were carried up and connected to the top of the end compression diagonal, which is held in position by a special steel strut resting on the anchor pier until such time as it receives stress from the weight of the cantilever arm.

The start on the upper portion of the web system, including the top-chord eye-bars, was made on Nov. 12, the traveler moving forward panel by panel toward the main pier as the work progressed. This work went ahead even faster than the lower half of the web system, as the compression verticals were shipped in one length, and very little riveting was required. Although the longer of the tension diagonals were shipped in two pieces, they were riveted together on the ground before they were erected in place, thus saving time in actual erection.

Top-Chord Eye-Bar Erection.—The top chords are composed of two banks of eye-bars. On account of the impossibility of getting eye-bars of sufficient length to span a full panel, they are erected in two lengths, supported on the centre by a small lattice truss, thus doing away with redundant members in the web system. The eye-bars are assembled in these trusses in the storage yard, the centre pins driven, and the whole panel of eye-bars erected as a complete member; thus only the end pins need to be driven to fully erect a whole section of the chord. The erection proceeded to panel point 10, or two full panels away from the main pier, where the work ceased for the season on Dec. 5. Owing to the excellent equipment of the erection traveler, the members for both trusses were erected simultaneously, which materially expedited the work.

The erection of one complete panel of the upper section of the web, with all pins driven, was the best single day's work during the season.

The St. Lawrence Bridge Co., of Montreal is the contractor for this work. Phelps Johnson is President; G. H. Duggan, Chief Engineer; George F. Porter, Engineer of Construction; W. B. Fortune, Superintendent of Erection; S. P. Mitchell, Consulting Engineer of Erection.—Engineering News.

At the annual meeting recently of the Dominion Bridge Co., which is largely interested in the St. Lawrence Bridge Co., it was stated that 42% of the steel of the Quebec Bridge had been fabricated and 18% erected. It is anticipated that the work will be finished on time and within the original cost estimates.

Railway Financial Issues in England in 1914.—During 1914, Canadian railways placed loans on the London market aggregating £11,545,000, as follows.—Canadian Northern Ry., 4% guaranteed debenture stock £3,000,000 at 94; Canadian Northern Western Ry., 4½% Alberta guaranteed first mortgage debenture stock, £1,320,000 at 93; Central Ry. of Canada first mortgage 5% bonds, £1,225,000 at 90; Grand Trunk Ry. perpetual 4% consolidated debenture stock, £1,500,000 at 90, and three year 5½% secured notes, £1,000,000 at 98½; Pacific Great Eastern Ry. first mortgage 4½% guaranteed debenture stock, £1,500,000 at 95.

Canadian Northern Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, compared with those for 1913-14, from July 1, 1914:

	Gross Earnings	Expenses	Net Earnings	Increase or Decrease
July	\$1,594,800	\$1,168,800	\$430,500	x \$83,800
Aug.	1,367,700	1,123,000	244,700	x 163,900
Sept.	2,109,900	1,519,000	590,700	65,800
Oct.	1,895,300	1,332,100	563,200	x440,900
Nov.	1,670,200	1,123,100	547,100	x417,700
Dec.	1,329,100	908,000	423,100	200,900
	\$9,966,500	\$7,167,200	\$2,799,300	x\$1,241,400
Decr.	\$3,398,400	\$2,157,000	\$1,241,400	.....

x Decrease.
Approximate earnings for three weeks ended Jan. 21, \$656,600, against \$1,040,700 for same period 1913.

Canadian Pacific Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, compared with those of 1913-14, from July 1, 1914:

	Gross Earnings	Expenses	Net Earnings	Decrease
July	\$10,481,971.72	\$6,703,525.89	\$3,778,445.83	\$388,347.35
Aug.	8,917,764.83	6,554,606.68	3,373,157.70	597,981.54
Sept.	10,754,139.67	6,387,091.28	4,367,048.39	48,530.30
Oct.	9,282,923.49	5,961,600.13	3,321,323.36	2,281,529.43
Nov.	8,057,353.89	5,413,186.72	2,644,072.17	2,244,173.89

\$48,494,163.15 \$31,020,110.70 \$17,474,052.45 \$5,510,562.51
Dec. \$14,977,673.21 \$9,467,110.70 \$5,510,562.51

Approximate earnings for Dec., \$7,321,000 against \$11,695,000 for Dec., 1913; and for two weeks ended Jan. 14, \$2,637,000, against \$3,413,000 for same period 1913.

Grand Trunk Railway Earnings, Etc.

The following figures show the earnings of the G.T.R., G.T.W.R., and D.G.H. & M.R. for Nov., 1914, compared with Nov., 1913:—

	1914.	1913.
Grand Trunk Railway (Including Canada Atlantic Ry.)		
Earnings	\$2,953,700	\$3,724,300
Expenses	2,551,900	3,028,300
Net earnings	\$401,800	\$696,000
Grand Trunk Western Railway.		
Earnings	\$576,200	\$557,200
Expenses	607,300	502,500
	\$31,100*	\$74,700
Detroit, Grand Haven & Milwaukee Ry.		
Earnings	\$240,400	\$241,300
Expenses	227,600	210,200
Net earnings	\$12,800	\$31,700
	*Deficit.	

TRAFFIC RECEIPTS OF THE SYSTEM.

Aggregate traffic receipts from July 1 to Dec. 31, 1914:—

	1914	1913	Incr.	Decr.
G.T.R.	\$21,387,342	\$24,374,136	.....	\$2,986,294
G.T.W.R.	3,752,189	3,717,877	\$34,312	.....
D.G.H. & M.R. ...	1,389,801	1,347,427	42,374	.....
Totals	\$26,529,332	\$29,439,440	.....	\$2,909,608

Approximate earnings for Dec., \$4,087,967, against \$4,761,352 Dec., 1913; and for two weeks ended Jan. 14, \$1,523,267, against \$1,607,187 for same period 1914.

Grand Trunk Pacific Railway Earnings.

The approximate earnings of the Prairie Section and Lake Superior Branch, 1,104 miles, for December were \$317,894, against \$554,926 for Dec., 1913. Aggregate earnings for six months ended Dec. 31, \$3,076,890, against \$4,293,114 for the same period 1913.

C.P.R.'s Algonquin Hotel.—It is expected that the reconstructed Algonquin Hotel, St. Andrews, N. B., will be ready for occupation June 15. It will contain 220 bedrooms, many with private baths attached. The dining room will be 112x41½ ft.; the general lounge 89½x21½ ft.; and the drawing room 38½x37 ft., with an extension of 21x17½ ft. There will be large verandahs.

Typical Station on the Quebec Central Railway.

The Quebec Central Ry. has developed a very neat, attractive, and substantial type of standard station, which will be built at the more important points along the line as required. One of the buildings as completed is shown in the accompanying illustration of the station at East Angus, while another is shown in the plan of a station completed recently at Tring Jct. The feature of especial value in connection with these

ing position on the other side of the offices, the general waiting room, 24 ft. square, is located. Adjoining the latter is the baggage room, 16 by 24 ft.

The ticket office has a ticket wicket into both waiting rooms, the wicket being made of ornamental iron, with a balanced sash. It is entered from the general waiting room through a small lobby for trainmen, from which there are small ornamental iron

corner to that in the women's waiting room, there is another lavatory.

The baggage room at the end of the building has no connection from the main part of the building, and is entered by a double door, 6 ft. 8 ins. wide, leading out on the train platform. The two waiting rooms and the baggage room have an 8 by 12 in. beam extending over top.

The covered platform at the opposite end of the building is carried on two concrete piers, reinforced with rails, located 22 ft. back from the building wall.

The floor lining in all the rooms is 7/8 in. spruce, with a surfacing of clear birch in all but the baggage room, which has a no. 1 birch floor. The general waiting room, women's waiting room, offices and lavatories have ornamental metal ceilings, and the ceiling of the covered section of the end of the station is of 7/8 in. tongued and grooved no. 1 spruce sheathing, 2 1/2 ins. wide, a similar treatment being given to the underside of the overhanging roof all around the building. The baggage room has a similar ceiling. The partition walls are made up of a framing of 2 by 6 in. scantlings at 16 in. centres, while the exterior walls are furred with 2 by 1 1/4 in. spruce at 16 in. centres. All the rooms are wainscotted to a height of 4 1/2 ft. Above this, there are applied two coats of asbestic plaster, the second coat of asbestic lime putty with plaster of paris, trowelled to a perfectly smooth surface. There is a single coat of plaster behind the wainscoting.

The outside doors and all sashes are of no. 1 kiln dried pine, and all the frames to the doors and windows are of no. 1 pine or spruce. All the windows have storm sashes attached inside, where the sashes are balanced, with the lower half of the storm sash balanced. All the outside woodwork is painted with three coats of a bottle green lead and oil paint.

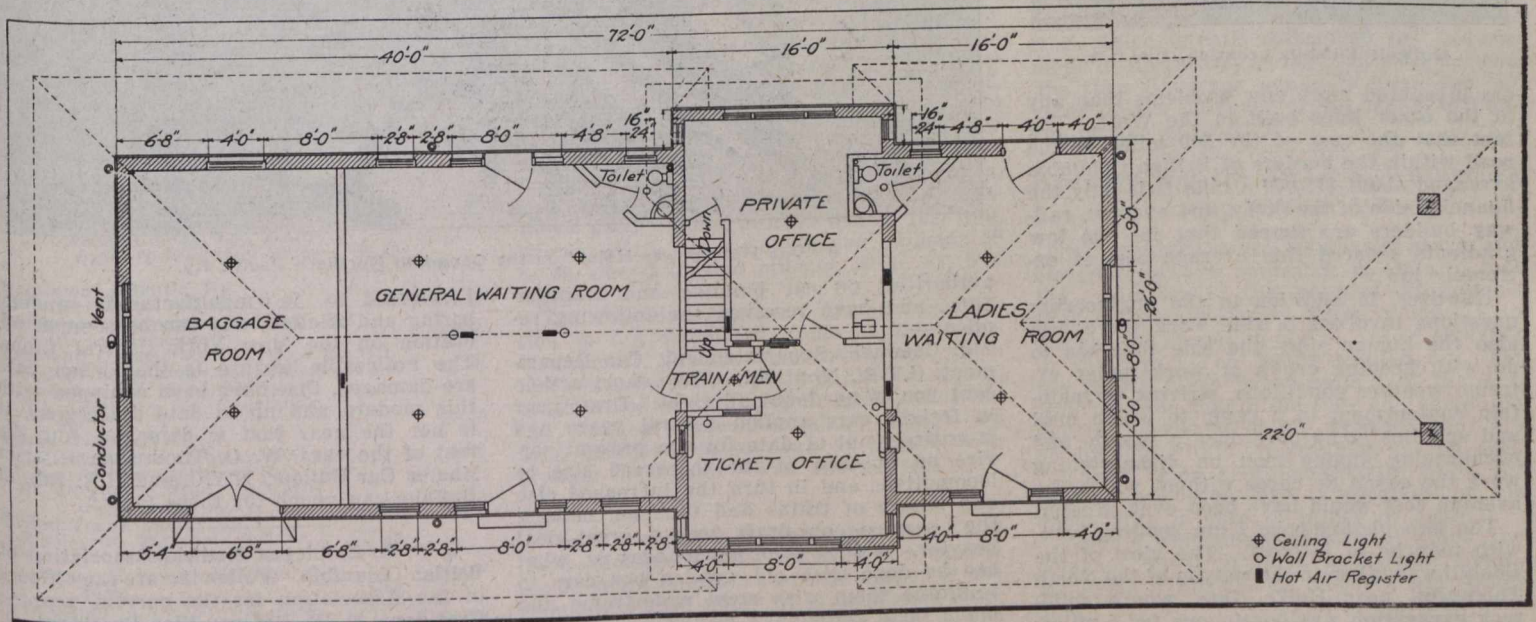


Typical Station on Quebec Central Railway at East Angus, Que.

stations is that they are built almost entirely of asbestos, the foundations and walls being of asbestos concrete and asbestos blocks, and the roof covered with asbestos shingles, rendering the building almost entirely fireproof, a very desirable feature. It also shows what a substantial and attractive type of building can be made of the asbestos mineral, which is one of the greatest industries of the Province of Quebec, and which is almost entirely located along the Q.C.R. In fact, over 85% of the world's

wickets into both offices. The trainmen's room has a small desk for order books, etc. The stair to the upper floor leads from this small room. The private office to the rear of the ticket office, is entered from the latter through a door connecting the two offices. One corner of the room is cut off for the chimney, while at the rear of the room, on the same side, there is a projection from the women's waiting room for the women's lavatory.

The women's waiting room is entered from



Typical Station on Quebec Central Railway at Tring Junction, Que.

production originates on, or is shipped over that line.

The building is symmetrically arranged about the central offices, when the covered platform at one end is included. The building proper is 72 by 26 ft., with projecting wings at the centre giving a width of 32 ft. opposite the offices. The ticket office, 14 ft. square, occupies the front half of the office section, behind which is the private office, 14 by 16 ft. On one side is the ladies' waiting room, 15 by 24 ft., while in a correspond-

ing position on the other side of the offices, the general waiting room, 24 ft. square, is located. From this room, there is a door leading into a small lavatory, which is located in the back corner, adjoining the private office, into which the lavatory projects.

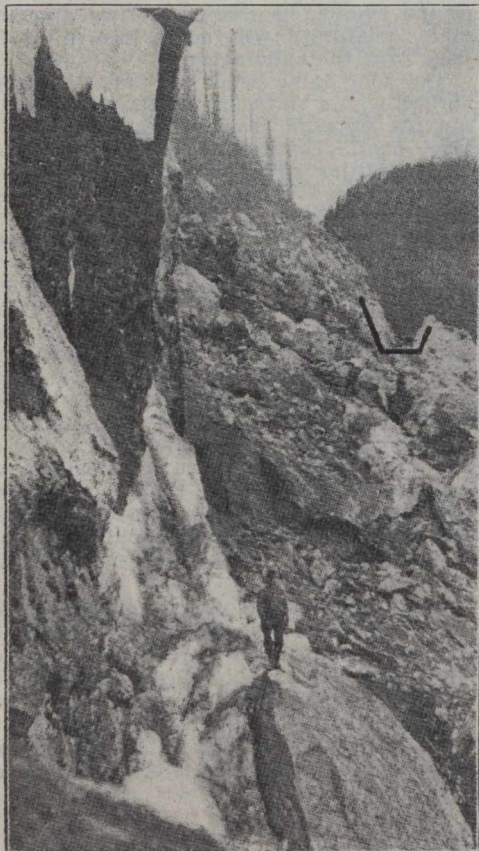
The general waiting room also has two entering doors, in the front and rear. In the centre line of the room, there are two hard pine columns, all the other rooms being clear, the upper floors being carried on the room walls. In the corresponding

Electric lighting is employed, either in ceiling lights, or wall brackets, all controlled from wall switches, conveniently located beside doors. The heating is by hot air, the ducts passing up in the walls, with wall registers, with the exception of the general waiting room, which has two registers of similar type in the centre of the room. The furnace is in the basement.

We are indebted to J. H. Walsh, General Manager, Q.C.R., for the data from which this article has been prepared.

Difficulties of Railway Contractors in British Columbia. Discussion of the Draft Gear Problem.

The troubles of the railway contractor are ever legion and as varied as they are numerous, yet I believe the construction of the Canadian Northern Pacific Ry. through the canyons on the Fraser and Thompson Riv-



Difficult Sidehill Location, C.N.P.R.

ers presented more new problems than any of the other lines built in the West. The fact that the cost of the 500 miles of the road within the borders of British Columbia averaged about \$75,000 a mile tells only the financial side of the story, and even so, railway builders are agreed that for the low gradients secured this average cost is extremely low.

However, in addition to the engineering questions involved in this work there was also the human side—the side that has to do with keeping crews at work under extreme weather conditions, striving to maintain contentment in a camp to which mail and supplies come only once a month, and encouraging among men on disheartening work the esprit de corps without which the average cost would have been even greater.

The two photographs I am sending herewith may be of interest. The view of the sidehill was taken in the canyon of the North Thompson near Hell's Gate, where solid-rock excavation was continuous for 5 miles. The cut under construction is marked in the background, while the foreground gives a good idea of the character of the country to be traversed. The final location surveys, made along the face of ice covered cliffs of this sort, can be imagined better than described, yet the fatality was surprisingly low.

The other photograph shows a horse being hauled back to the grade by 26 men, after it had fallen some 30 ft. without injury.—K. T. Roberts, Victoria, B. C., in Engineering Record.

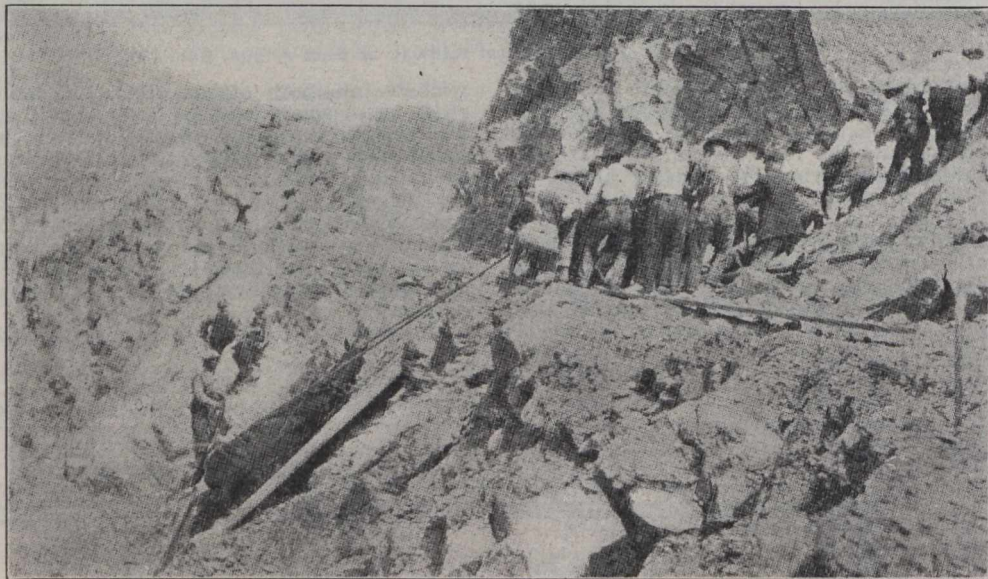
A Montreal subscriber to Canadian Railway and Marine World wrote recently as follows:—"The draft gear problem is certainly the most important item in considering railway freight. The annual cost of repairs to cars that are damaged through draft gear failure, and loss and damage claims resulting from this cause far exceeds all other repairs made to freight car equipment. The draft gear equipment in most of the old cars used in service today is inadequate to withstand the shock incident to the heavy power that is being universally used, and there is only one thing to do, viz., do away with the old and put on the new up to date modern equipment. Draft gear today is manufactured tandem, spring, and friction, and any of these is away ahead of even the most modern car construction. Short draft gear is used today on railways on, say, seven out of ten cars, and it appears that the only reasonable way would be to make as few repairs on these cars as possible and to retire them from service as speedily as economic conditions permit."

We sent a copy of the above to several

arms riveted to same, or steel draft arms so arranged that the plate extends upwards and bolted to the side of the sills, in addition to the regular draft timber bolts now in use in wood under frame cars, and it is very essential that the plate of the draft arm extend back beyond the bolster. There are several types of steel draft arms being used by the different railways, designed to suit their equipment. Repairs to cars through draft sills and gear failure is the largest item we have today in freight car repairs."

W. S. Atwood, Chief Engineer, Canadian Car and Foundry Co., Montreal.—"I believe the writer of this paragraph is quite correct in his statement, in that the draft gear problem is one of the most important items in railway freight car construction, and I believe that his points are well taken, except that I do not quite understand his meaning of the sentence reading 'Draft gear today is manufactured tandem, spring and friction, and any of these is away ahead of even the most modern car construction.'"

Canadian Railway and Marine World sent a copy of Mr. Atwood's letter, as published above, to the subscriber in Montreal who brought up the question, and who has written in reply as follows:—"The gear which



A "One Horsepower Hoist" on the Canadian Northern Pacific Ry.

authorities on car building and maintenance, and have received the following replies:—

J. Coleman, Superintendent, Car Department, G.T.R., Montreal.—"The short article sent you is no doubt all right. Draft gear in freight cars applied several years ago is entirely out of date for the present service on account of the increased size of locomotives and in turn the increased size and length of trains and tonnage, making the service on draft gear a great deal heavier. A serious problem today is, what can be done with old wooden box cars to reinforce them with steel underframe and make them sufficiently strong?"

G. E. Smart, Master Car Builder, Canadian Government Railways, Moncton, N. B.—"The draft gear equipment is not the real source of trouble on freight car equipment at present, it is the wood underframe cars, with the short draft timbers, that are failing under the heavy service of today. These cars, in most cases, are equipped with tandem draft gear, and in some cases the friction draft gear that your correspondent refers to, but it is the short draft timber bolted to the wood sills that is causing the trouble. The remedy for this is to apply steel centre sills, with steel draft

I referred to is manufactured tandem, spring and friction, and can be seen in operation on the New York Central Lines. The noticeable feature is that when cars are damaged, that have been equipped with this modern and up to date draft gear, it is not the gear that is damaged, but the rest of the car. W. O. Thompson, District Master Car Builder, N.Y.C. and H.R. Rd., at Buffalo, can vouch for these facts."

C. P. R. Employes Medical Association of British Columbia.—Following are the officers of the Association for the current year:—President, F. W. Peters; Vice President, G. R. Thomas; Secretary-Treasurer, A. M. Innes; other members of board of management, C. A. Cotterell, W. O. Miller, W. P. Martin, Dr. A. P. Proctor, A. S. Emms, R. B. Urquhart, A. E. Shaw, T. L. Bloomer, O. L. McCrea, F. B. McCharles, A. Robb, R. Winterholder, J. H. Taylor, W. E. Kingston. Of these the following have been elected the Executive Committee:—F. W. Peters, Dr. Proctor, A. L. McCrea, W. Robb, W. G. Kingston. The board has decided to provide free medical attendance for the families of all employes who have enlisted in the military service of Canada for the war.

Steam Railway Track Laid in 1914.

Following the usual annual custom of many years, circulars were sent in December by Canadian Railway and Marine World to all railways in Canada asking information as to new track built in 1914. From the replies received and estimates made a table was given in our January issue showing 2,088.09, a figure which did not agree with the total in the table. The errors have been adjusted, and with revised official information, except in three instances, the table shows that 2,041.31 miles of new single track were laid in 1914, as follows:

	Miles.	Miles.
Alberta and Great Waterways Ry.		
Carbondale to Lac La Biche	114.00	
Canadian Northern Ontario Ry.		
Between Montreal and Grenville	39.00	
Between Ottawa and Capreol	130.00	169.00
Canadian Northern Ry.		
Birds Hill to Pt. Grand		
Marias, Man.	50.77	
Chatfield, Man., northerly	27.08	
Laird, Sask., northerly	8.67	
C. N. A. Ry., Yellowhead easterly	2.48	
C. N. Western, Stolberg-Brazeau	17.44	106.44
Canadian Northern Pacific Ry.		
Yellowhead Pass westerly	94.40	
Waterfall to Spatum	43.00	
Kamloops W. to Upper Black Canyon	52.00	
Irvine to near Goose Creek ..	44.00	233.40
Canadian Pacific Ry.		
Quebec—		
Forsyth St. branch, Montreal	0.64	
Interprovincial and James Bay Ry., mileage 7.5 to 9.87 Kewaw north	2.37	
Ontario—		
Trenton freight spur	1.11	
Manitoba—		
Gimli to Riverton	26.30	
Saskatchewan—		
Weyburn-Lethbridge line ..	37.00	
Moose Jaw South West line ..	22.40	
Kerrobot to Sask. boundary	50.00	
Alberta—		
Monitor to Alberta-Sask. boundary	22.00	
Empress to Westerham	18.00	
Empress to Bassano	113.30	
Suffield S. W., m. 57 to 84 ..	27.00	
Coronation to Lorraine	18.70	
Gleichen to Shepard	12.50	
Alberta Central Ry. between Red Deer and m. 64.50 ..	32.00	
British Columbia—		
Kootenay Central Ry., Edgewater to Kootenay River ..	68.30	506.62
Dominion Atlantic Ry.		
Centerville to Weston, N.S. ...	14.80	
Edmonton, Dunvegan and B.C. Ry.		
Smith to McLennan	131.00	
Erie and Ontario Ry. (T., H. & B. R.)		
Smithville to Dunville, Ont. ...	14.90	
Esquimalt and Nanaimo Ry.		
Big Qualicum to Courtenay, B.C.	28.70	
Essex Terminal Ry.		
Extension to Ojibway, Ont. ...	1.00	
Glengary and Stormont Ry.		
St. Polycarpe, Que., to Cornwall, Ont.	28.00	
Grand Trunk Pacific Ry.		
Shelley to Tintagel, B.C. ...	157.30	
Talmage to Weyburn, Sask. ...	14.50	
Central Butte to Riverhurst, Sask.	17.60	
Rossman to Carruthers, Sask. ...	15.80	205.20
Hudson Bay Ry. (Dominion Government)		
Mileage 86 to 197	111.00	
Intercolonial Ry.		
Dartmouth Branch Line	33.00	
* Kettle Valley Lines.		
Extensions	60.00	
Lake Erie and Northern Ry.		
Brantford to Galt, Ont.	22.00	
Waterford towards Simcoe ..	8.00	30.00
* Pacific Great Eastern Ry.		
Mileage 13.50 from Squamish, B.C., to m. 120	106.00	
* Prince Edward Island Ry.		
Carleton Point spur	2.50	
Quebec Central Ry.		
Extension east of St. Camille, Que.	5.00	
Roberval-Saguena Ry.		
Extension St. Alexis branch ..	0.50	

St. John and Quebec Ry.	
Fredericton to Woodstock, N.B.	24.98
Fredericton to Gagetown ...	3.51
Woodstock to Centreville ...	1.50
	29.99

Vancouver, Victoria and Eastern Ry.	
Coalmount to Brooks, B.C. ...	25.56

Winnipeg Water District.	
St. Boniface to Shoal Lake, Man.	85.00

Total	2,041.31
*Estimated.	

Of the total mileage laid in 1914 the Canadian Northern Ry. lines laid 508.84 miles; the Canadian Pacific Ry., 506.62, and the Grand Trunk Pacific Ry., 205.20 miles, or a total of 1,222.66 against 2,710.51 miles in 1913 and 1,864.07 miles in 1912.

Divided by provinces the track laid in 1913 and 1914 compares as follows:

	1914.	1913.
British Columbia	679.26	655.32
Alberta	513.12	511.51
Manitoba	300.15	221.88
Saskatchewan	215.97	765.49
Ontario	200.01	840.57
Quebec	52.51	103.26
Nova Scotia	47.80	12.80
New Brunswick	29.99	107.84
Prince Edward Island	2.50	.....
	2,041.31	3,218.67

Following are the figures showing new single track laid from 1906:

	Miles.
1906	1,204.06
1907	1,469.65
1908	1,505.95
1909	1,588.47
1910	1,869.24
1911	1,851.98
1912	2,179.09
1913	3,218.67
1914	2,041.31

The C.P.R. built during 1914, on the Lake Superior Division, 21 miles of double track diversion to replace an approximately equal mileage of old second track. This is located as follows:—Cartier Subdivision, mileage 101 to 107, six miles; Schrieber Subdivision, mileage 3 to 7, four miles; mileage 9 to 11, two miles; mileage 21 to 22, one mile; Nipigon Subdivision, mileage 14 to 22, eight miles; total, 21 miles. New second track was laid as follows:—Cartier Subdivision, mileage 95.5 to 100, 4.5 miles, and mileage 110 to 113, three miles; Chapeau Subdivisions, mileage 125 to 129, four miles; White River Subdivision, mileage 29 to 30, one mile, and mileage 33 to 38, five miles.

The Canadian Northern Ry. has, in addition to the completed grade on the transcontinental line to Vancouver, on which track is expected to be laid in about a month, 155.25 miles of grading practically ready for the track on Vancouver Island, in addition to a considerable mileage of branch mile grading in Saskatchewan and Alberta.

The Lancashire & Yorkshire Ry. Chief Goods Manager's staff has made it a custom for 20 years to hold an annual dinner at the company's head office at Manchester, Eng., but this year, on account of the war, it was not thought desirable to do so. Instead, the staff entertained about 150 Belgian refugees to a dinner and concert, the guests being called for, and taken home by motor cars. The invitations were printed in English, Flemish and French, and the chief speech of the evening was translated into the two latter languages.

The Intercolonial Ry. Ticket Office at St. John, N.B., has been removed from its old quarters at the foot of King St. to the offices formerly held by the C.P.R. in the Royal Hotel, at the corner of King and Germain Sts.

The Late Thomas C. Keefer.

The death occurred at Ottawa, Jan. 7, of T. C. Keefer, the father of the engineering profession in Canada. He was born at Thorold, Ont., Nov. 4, 1821, and was educated at St. Catharines, Ont., Upper Canada College, Toronto, and McGill University, Montreal. He commenced his engineering career on the Erie and Welland canals in 1838, and continued as an engineer on that work until 1845. From 1845 to 1848, he was Chief Engineer of the work in connection with the improvement of navigation on the Ottawa River, and later was engaged in survey work for the navigation of the rapids on the St. Lawrence River. In 1850 he was sent by the Canadian Government to assist a U. S. representative to report on Canadian trade with the U. S., and he also assisted in preparing a second report on the same subject. In 1851 he was engaged on preliminary surveys for the G. T. R. between Montreal and Toronto, and for a railway bridge over the St. Lawrence River at Montreal. In 1853 he was appointed Engineer for the Montreal Harbor Commissioners, and later constructed water works for Montreal, Hamilton and Ottawa, and was for some time Chief Engineer of various railways in Upper and Lower Canada, since amalgamated with the larger systems. He was also appointed a member of the International Commission of Waterways. He was made an honorary member of the Canadian Society of Civil Engineers in 1903, and was one of its founders and its first President. He was also a member of the American Society of Civil Engineers, Institute of Civil Engineers (England), and the Royal Society of Canada. He was created a Companion of the Order of St. Michael and St. George in 1878, and was also made a member of the Legion of Honor, of France, in the same year.

He produced a number of works, treating of transportation in the Dominion, issuing his Philosophy of Railways in 1849, which, it is stated, greatly influenced the Government in its railway policy. In 1850 he won the then Governor General's prize for an essay on the influence of the canals of Canada on her agriculture.

Railways and the Ontario Workmen's Compensation Act.

Representatives of a number of steam and electric railways operating in Ontario met the members of the Ontario Workmen's Compensation Board in Toronto, Jan. 15, to discuss the operation of the Act as applying to railways. The Board pointed out that the railways are in schedule 1 of the Act, which means that while they are under the general provisions of the measure, they are not brought within the grouping system, each company being held individually liable for the compensation due a workman or his dependents in case of injury or death.

When a workman is injured or killed, the company must at once notify the Board, supplying a physician's report and other data. The Board passes upon the case, fixes the compensation due the workman and notifies the company. A cheque for the amount fixed must then be forwarded to the Board, which places it upon record and sends it on to the workman.

In every respect the employe of a railway is given the same protection and compensation that the worker under the general scheme receives, the only difference being that he gets his compensation from his employer instead of from a general fund.

The Canadian Northern Ry. was reported Jan. 9, to have sold \$2,000,000 of equipment trust notes in New York.

Railway Development.

Projected Lines, Surveys, Construction, Betterments, Etc.

Alaska.—A proposition has been submitted to the United States Government for the sale to it of the Copper River and Northwestern Ry., with a view of its inclusion in the projected Government system of railways in Alaska. The Government's engineering commission is making a valuation of the Alaska Northern Ry., and will make a valuation of the C. R. and N. W. Ry. later. The Government project looks to the building of a railway from the Pacific Coast through the centre of the Territory to the Yukon River, at the boundary of British Columbia. (Sept., 1914, pg. 418.)

Alberta and Great Waterways Ry.—Press reports stated that grading had been completed Dec. 20, from Carbondale, the junction with the Edmonton, Dunvegan and British Columbia Ry. to mileage 137, about 23 miles beyond the Hudson's Bay reserve at Lac La Biche, and that tracklaying had practically reached the lake. The right of way beyond mileage 137 is being cleared, and grading will be proceeded with during the summer. Location surveys are practically completed to Clearwater River, mileage 310, about seven miles above Fort McMurray. It is expected to have track laid to that point this year. (Jan., pg. 10.)

Athabasca, Grand Prairie and Peace River Ry.—The Dominion Parliament is being asked to authorize the building of the following lines:—From Brule Lake, Alberta, on the Grand Trunk Pacific Ry. main line north easterly to Grand Prairie, thence north westerly to a junction with the Pacific Great Eastern Ry., at the boundary between Alberta and British Columbia; from Grand Prairie northerly to the Peace River at the point where the Pacific, Peace River and Athabasca Ry. proposes to cross. The length of the two lines is approximately 400 miles. Pringle, Thomson, Burgess and Cote, Ottawa, solicitors for applicants. (See Athabasca and Grand Prairie Ry., Nov., 1914, pg. 500.)

British Columbia and White River Ry.—Application is being made to the Dominion Parliament for an extension of time for the construction of the projected railway from Bear Creek, at the mouth of the Chilkat River, B.C., to the White River, and then on to the boundary between Yukon and Alaska. C. M. Marpole, G. E. Wilson, G. E. MacDonald, A. McDonnell, Jas. Ironside, are the provisional directors. The company was incorporated in 1911. Barnard, McKeown and Choquette, Montreal, solicitors for applicants. (July, 1911, pg. 645.)

Brule, Grand Prairie and Peace River Ry.—The Dominion Parliament is being asked to incorporate a company with this title to build a railway from Brule Lake, Alberta, on the G.T. Pacific Ry. and the Canadian Northern Ry., to Grand Prairie, thence to the boundary between Alberta and British Columbia, there connecting with the Pacific Great Eastern Ry.; also a line from Grand Prairie to the crossing of the Montagneuse River by the Pacific, Peace River and Athabasca Ry., and on to the Peace River at Dunvegan; in all about 400 miles. Pringle, Thomson, Burgess and Cote, Ottawa, solicitors for applicants.

Burrard Inlet Tunnel and Bridge Co.—The British Columbia Government informed the company, Dec. 23, 1914, that it was not prepared to endorse either of the three plans under consideration for the projected bridge across the Second Narrows of Burrard Inlet, Vancouver. The directors held a meeting, Dec. 24, when it was decided to

ask Vancouver City to raise its contribution to the total amount to be contributed by the municipalities on the opposite side of the Inlet, and to ask the Provincial Government to guarantee a sufficient amount of the company's bonds to permit the letting of a contract for the substructure, pending the settlement of the question of superstructure plans. A large section of the directors favor the Canadian Bridge Co.'s design, but the Vancouver city directors desire to have the superstructure manufactured in Vancouver and erected by a Vancouver contractor. Further consideration of the question was postponed. (Jan., pg. 10.)

Calgary and Fernie Ry.—The Dominion Parliament is being asked to extend the time for the building of this projected railway from Calgary, Alberta, to Fernie, B.C. Hough, Campbell and Ferguson, Winnipeg, Man., solicitors for applicants. (Aug., 1914, pg. 371.)

Canadian Western Ry.—The Dominion Parliament is being asked to extend the time for the building of this projected railway from the International Boundary through Pincher Creek and Cowley, and along the Old Man River, to the Livingstone Mountains, thence to Calgary, Alta., with a branch from the Livingstone Mountains to Michel, B.C. The company was incorporated in 1909, the provisional directors being J. S. Hough, L. L. Metcalfe, A. S. Kildall, H. J. Box, and O. L. Boynton, Winnipeg. Hough, Campbell and Ferguson, Winnipeg, are solicitors for the applicants.

The Cape Breton Coal, Iron and Ry. Co. closed down its coal mine at Broughton, N.S., Jan. 17. The mine was only reopened a year ago, after having been idle for several years. The company owns a railway from the colliery to a junction with the Sydney and Louisburg Ry., 3 miles, and in 1913 graded a 3 mile extension to Mira, on which track has not been laid. The President is H. Mayhew, Chester, Eng., and the only Canadian director is W. Hanson, Montreal. (Dec., 1913, pg. 573.)

Central Canada Ry.—Press reports state that tracklaying has been started at McLennan, Alta., on the Edmonton, Dunvegan and British Columbia Ry., on the 28 miles of grading completed on this line. On the completion of this tracklaying supplies will be got in for the grading of the 22 miles between track end and Peace River Crossing. The construction on the first 8 miles of this will be average, but heavy on the other 14. The route follows the valley of the Heart River, which drops 700 ft. to the Peace River, in the 22 miles. The stream is not a large one, but is subject to high floods, and it has been found impossible to arrange a grade on a side hill cut. In order to establish a satisfactory roadbed the stream will, it is said, be crossed 58 times in 18 miles. The ruling gradient is 1.3%. The grading and track laying on the 22 miles is estimated at \$87,000 a mile, and the cost of the steel for the bridges \$750,000. The bridge required for the crossing of the Peace River will be 1,800 ft. long, 80 ft. above low water, with a 2,500 ft. trestle approach on the east side. This bridge is estimated to cost \$800,000. Beyond the river prairie country stretches for over 200 miles, through which it is proposed ultimately to extend the railway. (Dec., 1914, pg. 544.)

Dominion Atlantic Ry.—The Board of Railway Commissioners has approved plans for the deviation of the main line in Windsor, N. S., for 3,250 ft. (Sept., 1914, pg. 418.)

Dominion Government Railway to Hudson Bay.—J. D. McArthur, the contractor for building this railway, and — MacLachlan, his engineer, arrived in Ottawa, Jan. 12, from Pas, Man. Mr. McArthur is reported as stating that when he left, track had been laid to mileage 200 from Pas, and that in all 300 miles of grading had been completed. The grading would, he expected, be completed right through to Hudson Bay, by the end of this year, and the track laid by the summer of 1916. (Jan., 1914, pg. 10.)

Edmonton, Dunvegan and British Columbia Ry.—Application is being made to the Dominion Parliament for an extension of time for the building of the line now under construction from Edmonton to Dunvegan, and the Alberta-British Columbia boundary. Tracklaying has been completed to McLennan, mileage 245 from Edmonton, where a divisional point is to be laid out, and where the Central Canada Ry. branches off. Grading is reported finished from McLennan to the east bank of the Smoky River, and it is expected to have track laid to that point early in March. Subcontracts are reported let for grading from the west bank of Smoky River to Spirit River, mileage 360. It is expected to have this grading done during the summer and the track laid by the end of the year. (Jan., pg. 10.)

The Erie and Ontario Ry. from Smithville to Dunnville, Ont., 14.9 miles, was officially opened for traffic, Dec. 23, when a special Toronto, Hamilton and Buffalo Ry. train was run over it from Hamilton. The official party was entertained at luncheon at Dunnville, by the Mayor, and J. N. Beckley, President T. H. and B. Ry., in speaking referred to the negotiations which led to his company undertaking six months ago to build the road. The promise to have the line in operation by Jan. 1, had been kept, and it was now the duty of the Dunnville people to keep the promise made to supply traffic. The line would be carried through to Port Maitland, and as the traffic warranted it, docks would be built there, and additional facilities for traffic provided along the line. Three trains a day each way are being run.

The Board of Railway Commissioners has approved of location plans of the line from Dunnville to Port Maitland, 4.58 miles. It is expected that this will be built during the summer. (Jan., pg. 10)

Intercolonial Ry.—We are officially advised that no track has been laid on the piece of line being built to the new ocean terminals at Halifax, N.S.

In connection with the Dartmouth branch line, under construction into the Musquodoboit district we are advised that it starts at the terminus of the branch line running from Windsor Jct., through Dartmouth to Woodside. Track had been laid for 33 miles at Dec. 31, 1914, and it is expected that the track laying gang would reach about mileage 53, or three miles beyond Elderbank by Jan. 30. A train service is being operated on the line by the sub-contractors, Cavicchi and Pagano. W. A. Hendry, Dartmouth, is engineer in charge of construction for the Railways and Canals Department. (Jan., pg. 10.)

Kettle Valley Lines.—Application is being made to the Dominion Parliament by the Kettle Valley Ry., for an extension of time for building the following lines:—From Summer Creek or One Mile Creek to Copper Mountain and Voigt Mining Camps; from Vernon via Kelowna to Penticton; branch to Otter Summit; from Tulameen for 50 miles up the Tulameen River valley; from Penticton to Osoyoos Lake; from Summer Creek to Alliston or Princeton, thence to Granite Creek coal areas; from Grand Forks for 50 miles up the North Fork of the Kettle River; from Midway to Hedley; from

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Penticton to Nicola. Parliament is also asked to ratify an agreement entered into with the Vancouver, Victoria and Eastern Ry. and Navigation Co. respecting the joint section of the main line between Princeton and Otter Summit, B.C.

The Board of Railway Commissioners has authorized the company to connect its tracks with those of the Vancouver, Victoria and Eastern Ry., at Hope, B.C.

The Kettle Valley Ry. has entered into a contract with the Dominion Government, under the act granting aid in the construction of railways, for the building of a railway bridge, under subsidy, over the Fraser River, at or near Hope, B.C. (Dec., 1914, pg. 544.)

Lake Erie and Northern Ry.—W. P. Kellett, Chief Engineer, is reported to have said that nothing has been settled as to the opening of the section of the line between Brantford and Galt, Ont., and that it certainly will not be opened Feb. 1. Press reports, Jan. 12, stated that work on the construction of the line in Brantford and in the direction of Port Dover was to be proceeded with at once. This includes a bridge in Brantford and another in Simcoe. (Dec., 1914, pg. 544.)

Northern Pacific and British Columbia Ry.—Seattle, Wash., and Vancouver, B.C., press reports state that the application being made to the Dominion Parliament for the incorporation of a company with this title is on behalf of the Northern Pacific Ry. The N. P. R.'s line to Huntingdon has been extensively improved in preparation for the company's direct traffic entrance into Vancouver. Grades and embankments have been improved, new bridges have been built, and heavier steel laid. An order for new rolling stock has been placed for delivery early this year. Entrance to Vancouver will be obtained over the Vancouver, Victoria and Eastern Ry. to the False Creek terminals which are being laid out by the Great Northern Ry. for joint use with the N.P.R. At present the N.P.R. has a traffic agreement with the C.P.R., which is nearing expiration. (Dec., 1914, pg. 544.)

Pacific Great Eastern Ry.—A train service is being operated from Squamish, B.C., to the head of Anderson's Lake, 89 miles, about 33 miles from Lillooet. It is expected that it will be possible to operate trains into Lillooet, by Mar. 1.

F. C. Gamble, Chief Engineer of the Provincial Department of Railways, returned to Vancouver, Jan. 9, after making a trip of inspection over the line to the track end. (Jan., pg. 10.)

St. John and Quebec Ry.—We are officially advised that the Intercolonial Ry. is operating its trains over the section of the St. J. and Q. R. from Fredericton to Centreville, N.B., 88.2 miles. A mixed train is run daily, except Sundays, leaving Centreville 6.15 a.m., arriving at Fredericton, 11.10 a.m., and returning leaves Fredericton at 4.30 p.m., reaching Centreville, 9.30 p.m. The line is also completed and ready for operation from Fredericton, southerly to Gagetown, 33 miles. Negotiations are in progress for the taking over of this section by the Intercolonial Ry. for operation. The entire line in New Brunswick is to be operated by the Intercolonial, under an agreement. (Dec., 1914, pg. 544.)

Southern Central Pacific Ry.—The Dominion Parliament is being asked to extend the time for the building of this projected railway from Vancouver via Kootenay Pass and the Old Man River and on to Hudson Bay at least 100 miles north of Fort Churchill, with branch lines from the Blindman River, Sask., via Dunvegan to the Pacific coast at Gardner's canal, and from the Elk River, B.C., to the Intercolonial boundary at Milk River. The following were named provisional directors in an amending act of 1913: G. F. McDonnell, A. E. Honeywell, W. N. Graham, J. C. Dingman, K. P. Young, Ottawa. McDonnell and Honeywell, Ottawa, are solicitors for the applicants. (May, 1913, pg. 220.)

Toronto, Hamilton and Buffalo Ry.—The Hamilton, Ont., City Council, Jan. 4, authorized City Engineer Macallum to attend a conference at Ottawa, Jan. 11, when the

question of the depression of the T. H. and B. Ry. tracks was to be discussed with the Chief Engineer of the Board of Railway Commissioners. W. F. Tye, Toronto, is consulting engineer for the city council in connection with the matter. (June, 1914, pg. 267.)

Van Buren Bridge Co.—The Dominion Parliament is being asked to authorize the company to subject its property and assets constructed or acquired in Canada to the lien or charge of a mortgage dated Sept. 1, 1914, to secure its bonds to the amount of \$250,000; to confirm and declare valid such mortgage to the United States Mortgage and Trust Co., and to authorize the registration of the mortgage in Canada. The company is building a railway and general traffic bridge between St. Leonards, N.B., and Van Buren, Maine. The bridge was originally projected to be built by the International Ry. of New Brunswick, which is now part of the Intercolonial Ry. system. (Oct., 1914, pg. 468.)

Vancouver Terminal Ry.—The Dominion Parliament is being asked to incorporate a company with this title to construct and lay out railway and terminal works, tunnels, and transfer and connecting tracks and other railways in Vancouver, New Westminster, and at the mouth of the Fraser River, B.C. J. B. Noble, Vancouver, B.C., solicitor for applicants. Parliament was asked to incorporate a similar company in 1914, under the title of the Vancouver Ry. and Ocean Terminal Co., but the bill was withdrawn, April 30. (June, 1914, pg. 268.)

Winnipeg, Man.—The Commissioners of the Greater Winnipeg Water District at a meeting Jan. 15, were authorized to advertise for from 8,000 to 12,000 tons of coal for use on its railway. It was reported that track laying on the 85 miles was completed Dec. 10, and that practically the whole of the ballasting has been completed. The contract for digging a navigable channel from Indian Bay to Snowshoe Bay, was let to C. J. Anderson, Kenora, Ont., at an estimated cost of \$12,765. (Jan., pg. 11.)



Concrete Decoration on the Canadian Pacific Railway, near Hamilton, Ont.

With the object of creating something in Canada corresponding to the famous Whiteleaf Cross in Buckinghamshire, Eng., W. Murphy, section foreman on the C.P.R. spur line at Hamilton, Ont., has built the concrete decoration illustrated above, on the side of a hill on the right of way, a quarter of a mile from Grant Jet., Hamilton, representing among other things the C.P.R. beaver trade mark, the representation of the animal measuring 7 ft. in length.

Mainly About Railway People.

W. D. Reid, President, Reid Newfoundland Co., St. John's, Nfld., was in Montreal for the Christmas holidays.

Henry and C. J. Goldmark have opened an office as consulting engineers at 103 Park Ave., New York, N.Y.

D. B. Hanna, Third Vice President, Canadian Northern Ry., Toronto, has been appointed an honorary colonel.

F. P. Gutelius, M.Can.Soc.C.E., General Manager, Canadian Government Railways, Moncton, N.B., has returned from a short holiday at Pinehurst, N.C.

Miss **Kathleen Dunsmuir**, daughter of **James Dunsmuir**, director, C. P. R., left Canada for England recently to train as a nurse preparatory to acting at the front.

Sir Robt. Turnbull, M. V. O., formerly General Manager, London & North Western Ry., (England) has been elected a director of the company.

J. Madill, City Passenger Agent, Canadian Northern Ry., Edmonton, Alta., is in the east on two months leave of absence, for reasons of health.

J. Stewart, of Foley Welch and Stewart, railway contractors, returned to Canada at the end of December, after spending some time in Great Britain.

J. R. W. Ambrose, M. Can. Soc. C.E., Chief Engineer, Toronto Terminal Co., Toronto, has been elected Chairman of the Toronto Branch of the Canadian Society of Civil Engineers.

Sir Wm. Mackenzie's son-in-law, **Count Jacques de Lesseps**, is on active service in the French army's aviation corps. The Countess and her children are in Paris with the Count and Countess Paul de Lesseps.

D. Pottinger, I. S. O., ex Assistant Chairman, Canadian Government Railways Managing Board, and Mrs. Pottinger, returned from England recently, and are spending the winter at Ottawa.

Nicholas Bawlf, who died at Winnipeg at the end of December, was connected with a number of grain elevator companies in the west, and was President of the Winnipeg Grain Exchange in 1890.

G. McLaren Brown, European Manager, C. P. R., and **F. C. Salter**, European Traffic Manager, G. T. R., London, Eng., have been elected directors of the recently inaugurated Institute of Industry and Commerce.

R. F. Cobbe, who was mentioned recently for gallant work in dispatch riding in France, is a nephew of **F. W. Peters**, General Superintendent, British Columbia Division, C. P. R., Vancouver.

E. C. Meyers, a former Secretary of the Kettle River Valley Ry. Co., committed suicide by shooting, in the C. P. R. station at Penticton, B. C., Jan. 4. He was under remand on a charge of shooting, and was to come up for trial Jan. 13.

D. McNicoll, Director, C. P. R., who, since his retirement from the Vice Presidency of the company, is learning golf at Hot Springs, Va., was presented by Vice President Odgen with a set of golf clubs, before leaving Montreal.

E. A. Humphrey, heretofore Assistant Electrical Engineer, Great Northern Ry., St. Paul, Minn., has been appointed Electrical Engineer, succeeding **C. L. Daugherty**, who has gone to the St. Petersburg, (Fla.) Light & Power Co.

Sidney P. Howard, formerly General Freight Agent, C. P. R., Montreal, has been awarded \$80,000 damages against **John Findlay**, his former partner in the real estate

firm of Findlay and Howard, who terminated the partnership suddenly.

Frederic Nicholls, President, Canadian General Electric Co., Vice President, Toronto Railway, and director, Canadian Northern Ry., has been elected a director of the Confederation Life Association, to succeed the late **Sir Wm. Whyte**.

R. Marpole, General Executive Assistant, C.P.R., Vancouver, B. C., has, as reported in a press cablegram from London, sent, at his own expense, 20 fully equipped recruits for the Welsh army corps which is being raised in Wales.

A. A. Heard, heretofore General Passenger Agent, Delaware and Hudson Co., Albany, N.Y., who resigned recently, has been appointed Sales Agent for the Saratoga Springs State Waters, which are owned and controlled by New York State.

A. W. Wheatley, General Manager, Canadian Locomotive Co., left Kingston, Ont.,



C. E. Stockdill, Assistant Vice President and General Manager, Western Lines, Canadian Pacific Railway.

Jan. 19, for Russia, in the hope of securing orders for locomotives and shrapnel shells for the Russian Government. It is expected that he will be away about four months.

Mrs. H. E. Whittenberger, wife of the General Superintendent, Ontario Lines, G. T. R., Toronto, shipped a consignment of clothing recently for Canadian soldiers at the front and for Belgian refugees, the same having been contributed by wives of G. T. R. officials at Toronto and Barrie.

Lieutenant-Colonel G. S. Cantlie, General Superintendent of Car Service, C. P. R., Montreal, has been granted extended leave of absence, in connection with his military duties concerning the third contingent of the Canadian expeditionary force, now recruiting.

Westrop Armstrong, formerly of Mackenzie, Mann & Co.'s engineering staff, and latterly on the Toronto, Hamilton & Buffalo Ry.'s engineering staff for the construction of the Erie and Ontario Ry., has been

appointed Engineer of Bridges for the Toronto-Hamilton Highway Commission.

R. H. Aishton, heretofore Vice President, (operation) Chicago and North Western Ry., has been appointed by the President of the United States to fill the vacancy in the Federal Industrial Relations Commission, caused by the appointment of **F. A. Delano**, of Chicago, to the Federal Reserve Board.

Lt.-Col. H. S. Greenwood, formerly Assistant Chief Engineer, Mackenzie, Mann & Co., Toronto, is now attached to the Royal Engineers in England with the rank of major. His son, **Lt. Eric Greenwood**, who is also in the Royal Engineers, was wounded recently while at the front, and has had a leg amputated.

James Man on, who was Assistant to the Vice President, C. P. R., Winnipeg, with the late **Sir William Whyte**, as well as **George Bury**, was entertained to dinner at Winnipeg, towards the end of December, by the local staff, on leaving for Montreal, where he accompanied Vice President **Bury**, to act in a similar capacity.

Archibald McDonald, the last of the chief factors of the Hudson Bay Co., who died at Fort Qu'Appelle, Sask., Jan. 6, aged 79, started business life as a booking clerk on the old Edinburgh, Perth and Dundee Ry., in Scotland, and left there in 1854 to enter the H. B. C. service, from which he retired in 1913.

F. M. Lawledge, a divisional engineer on the Dominion Government railway to Hudson Bay, who went to England in Aug. 1914, on leave, being due to return in November, is reported to be missing. He appears to have registered at one of the Canadian newspaper offices in London, but has not been heard of since, nor was he known at the address given by him when registering.

D'Alton C. Coleman, Assistant General Manager, Western Lines, C. P. R., was entertained to a dinner at the Hotel Palliser, Calgary, Alta., at the end of December, by a few friends, on leaving Calgary, where he had been General Superintendent, Alberta Division, C. P. R., to assume his new duties at Winnipeg. He was presented with a cigarette case, and with a jewel box for Mrs. Coleman.

Abraham T. Hardin, who has been appointed Vice President, New York Central Rd., in charge of the Operating Department, New York, is a graduate in civil engineering of the University of South Carolina, and commenced his railway career as a telegraph operator on the Richmond and Danville Rd., becoming an agent and stenographer with that company. After graduation he spent four years with the Southern Ry., and in 1898 was appointed Supervisor and Division Engineer, Eastern Division, New York Central and Hudson River Rd.

Col. Herbert C. Nanton, R. E., who has latterly occupied the position of Deputy Director General of Military Works at Simla, India, has been attached to the headquarters of the British Expeditionary Forces in France as Colonel and temporary Brigadier-General. He is a brother of **A. M. Nanton**, director, C. P. R., Winnipeg, and was born at Toronto in 1863. He graduated from the Royal Military College, Kingston, Ont., in 1883, and saw service in the Northwest Rebellion in 1885, the Lushai Expedition in 1888-89, the Chitral Expedition in 1895, and in the South African war 1899-1901, when he took part in the relief of Kimberley and was mentioned in dispatches. He married a daughter of the late **Sir Henri Joli de Lotbiniere**, of Quebec.

Edward J. Guthrie, who has been appointed Superintendent, Southern Division, Central Vermont Ry., and Central Vermont Transportation Co., New London, Conn., was

born at Erie, Ont., Mar. 1, 1866, and entered railway service, Oct. 1, 1889, as switchman, G. T. R., remaining in that position for a year and a half. He was afterward telegraph operator for nine years, agent G.T.R. at various points for nine and a half years, and in 1907 was appointed Freight Agent, Central Vermont Ry., at St. Albans, Vt. Later in the same year he was transferred to Palmer, Mass., and subsequently to Brattleboro, Vt. He was afterward appointed General Agent, C. V. R., at New London, Conn., and four months later was transferred to New York as Agent of pier 29, East River.

William Allan Mather, whose appointment as Superintendent, District 1, Alberta Division, C.P.R., Medicine Hat, was announced in our last issue, was born at Oshawa, Ont., Sept., 1885; graduated B.Sc., McGill University, 1908, and entered C.P.R. service in May, 1903, since when his railway record has been:—May to Aug., 1903, axeman, Rush Lake, Ont.; Apr. to Aug., 1905, tapeman, Deception, Ont.; Apr. to Aug., 1906, rodman, Deception, Ont.; Apr. 21 to Dec. 19, 1908, instrumentman, Deception, Ont.; Apr. 1 to Oct. 1, 1909, instrumentman, Kenora, Ont., Oct. 1, 1909, to Jan. 1, 1910, transitman, Laggan, B.C.; Mar. 15, 1910, to Mar. 1, 1912, Resident Engineer, Winnipeg and Portage la Prairie, Man.; Mar. 1, 1912, to Jan. 1, 1913, acting Superintendent, Kenora, Ont.; Jan. 1, 1913, to Jan. 1, 1915, Superintendent, District 1, Manitoba Division, Kenora, Ont.

J. A. DeWolfe, whose appointment as chief clerk to Vice President and General Manager, Western Lines, C. P. R., Winnipeg, was announced in our last issue, was born at Woodstock, Ont., Aug. 31, 1884, and entered railway service, July 10, 1899, since when he has been, to Apr. 16, 1900, stenographer to Locomotive Foreman, G. T. R., London, Ont.; Apr. 17, 1900 to May 12, 1903, not in railway service; May 13, to June 23, 1903, clerk to Car Foreman, C. P. R., Toronto; June 23, 1903, to May 22, 1905, clerk in offices of Trainmaster and of Superintendent, C. P. R., London, Ont., and Toronto; May 22, 1905, to May 7, 1907, clerk to Manager of Construction, C. P. R., Toronto; May 7, 1907, to June 21, 1909, secretary to General Manager, C. P. R., Montreal; June 23 to Aug. 24, 1909, assistant chief clerk, Second Vice President's office, C. P. R., Winnipeg; Aug. 24, 1909, to Dec. 31, 1914, chief clerk, Engineering Department, Western Lines, C. P. R., Winnipeg.

James Neil Murphy, whose appointment as Trainmaster, District 1, Alberta Division, Medicine Hat, was announced in our last issue, was born at Mooretown, Ont., May 10, 1879, and entered railway service in July, 1897, since when he has been, to June, 1898, operator, Manitoba and Northwestern Ry., Winnipeg; June 20, to Sept. 3, 1898, operator, C.P.R., Winnipeg; Sept. 3, 1898, to Dec. 15, 1899, ticket clerk, C.P.R., Brandon, Man.; Dec. 15, 1899, to Mar. 11, 1900, operator, Columbia and Western Ry., Smelter Jct., B.C.; Mar. 11 to Oct. 15, 1900, Division Engineer's clerk, C.P.R., Smelter Jct., B.C.; Oct. 15, 1900, to Feb. 2, 1901, storekeeper, Trail Smelter, Trail, B.C.; Feb. 2, 1901, to May 1, 1902, Division Engineer's clerk, C.P.R., Trail, B.C.; May 1, 1902, to Jan. 7, 1905, accountant, Construction Department, C.P.R., Winnipeg; Jan. 7 to May 21, 1905, clerk, C.P.R., Kenora, Ont.; May 21 to July 19, 1905, dispatcher, C.P.R., Lip-ton, Sask.; July 19 to Oct. 11, 1905, clerk, C.P.R., Kenora, Ont.; Oct. 11, 1905, to Feb. 1, 1909, chief clerk, C.P.R., Kenora, Ont.; Apr. 7, 1909, to Apr. 27, 1910, instrumentman, C.P.R., Alberta Division; Apr. 27, 1910, to Sept. 16, 1914, Resident Engineer, C.P.R., Alberta Division; Sept. 16 to Dec. 31, 1914, Trainmaster, C.P.R., Souris, Man.

Sir Herbert S. Holt, who was created a

knight bachelor, Jan. 1, was born in Dublin, Ireland in 1856, and was educated as a civil engineer. He came to Canada in early life and engaged in railway construction, being associated at various times with the late James Ross, Sir William Mackenzie and Sir Donald Mann. From 1875 to 1883 he was, successively, engineer, Credit Valley Ry., Victoria and Lake Simcoe Jct. Rys., Ontario and Quebec Ry., and other lines in Ontario, now incorporated in the C. P. R.; Engineer and Superintendent of Construction, Prairie and Mountain Divisions, C. P. R. He also carried out, in association with the other railway builders named, a number of contracts for the construction of C. P. R. lines in Quebec, Maine and in the Rocky Mountains, and also on the Qu'Appelle Long Lake and Saskatchewan Rd. and Calgary and Edmonton Ry. Since 1892 he has devoted his time to financial matters, and in addition to being President of the Royal Bank, is, or has been, connected with the Montreal Light, Heat and Power Co., Canadian General Electric Co., C. P. R., Ogilvie Flour Mills Co., Canadian Car and Foundry Co., London St.



J. M. Cameron,
Assistant General Superintendent, British Columbia Division, Canadian Pacific Railway.

Ry., Detroit United Ry., Toledo Rys. and Light Co., Monterey Ry. and Light Co., Canadian Construction Co., Montreal Park and Island Ry., and many other concerns. He is a member of the Canadian Society of Civil Engineers, and of the American Society of Civil Engineers.

John Murray Cameron, whose appointment as Assistant General Superintendent, British Columbia Division, C. P. R., Vancouver, was announced in our last issue, was born at Lochaber, N. S., Dec. 18, 1867, and entered railway service, July 1883, since when he has been, to Dec. 1883, laborer, C. P. R., Moose Jaw, Sask.; Dec. 1883, to Apr. 1884, wiper, C. P. R., Moose Jaw, Sask.; Apr. 1884 to Apr. 1885, bridge and building laborer, Western Division, C. P. R.; Apr. 1885 to Feb. 1886, pump man, Western Division, C. P. R.; Feb. 1886, to Oct. 1888, brakeman and train baggage man, C.P.R., Medicine Hat, Alta.; Nov. 1888 to June 1889, brakeman and conductor, Northern Pacific Ry., Tacoma, Wash.; June 1889 to Dec. 1890, brakeman and conductor, Oregon and Washington Territory Rd., Walla Walla, Wash.; Dec. 1890 to

July 1892, conductor, Columbia and Puget Sound Rd., Seattle, Wash.; July 1892 to June 1893, brakeman and conductor on construction, Great Northern Ry., Seattle and Spokane, Wash.; June 1893 to Oct. 1895, conductor, G. N. R., Great Falls, Mont.; Oct. 1895 to Sept., 1899, conductor, Kaslo and Slocan Ry. (G. N. R.), Kaslo, B. C.; Sept., 1899 to May 1900, conductor and construction trainmaster, G. N. R., Bonners Ferry, Idaho; May 1900 to Aug. 1907, brakeman and conductor, C. P. R., Nelson, B. C.; Aug. 1907 to Oct. 1909, Trainmaster, C. P. R., Nelson, B. C.; Oct. 1909 to June 1910, Trainmaster, C. P. R., Vancouver, B. C.; June to Dec. 1910, Superintendent, C. P. R., Moose Jaw, Sask.; Jan. 1911 to Dec. 1914, Superintendent, C. P. R., Medicine Hat, Alta.

Progress of Rogers Pass Tunnel Construction.

Canadian Railway and Marine World for January gave particulars of a new American hard rock tunnelling record of 817 ft. in one month at the C.P.R. tunnel in the Selkirk Mountains at Glacier, B.C. The previous American record was 810 ft. in 31 working days in the Canadian Northern Ry. Mount Royal tunnel at Montreal.

The following additional information has been furnished by the contractors, Foley Bros., Welch & Stewart: "The heading, 7½ x 10 ft. in section, was driven through slate, containing quartzite bands, by a gang consisting of 3 drill runners, 2 drill helpers, 8 muckers, 1 trackman, 1 pumpman, and 1 walking foreman for two headings. The grade was a 1% slope downward and the haulage was done by mules. A pump had to be placed at the face of the heading before dropping the drill bar for the lifter holes. This bar was 9½ ft. long and carried three Ingersoll-Rand water Leyner drills. After the machine men had finished drilling the top holes of the heading and were waiting for the muck to be cleared away before dropping the bar to drill the lifter holes, they would oil their machines and connect up the air and water lines so that they could start drilling 1½ minutes after the bar had been placed in its new position. Shooting was done 4 times in 24 hours on 12 days, 5 times in 24 hours on 16 days, and 6 times in 24 hours on 2 days. The record round was 3 hr. 40 min. Two complete rounds were fired in 8 hours on Nov. 27 and 28. The record day's work was 37 ft. on Nov. 27. The record week's work was 220 ft. from Nov. 23 to 29. While the record of 817 ft. in a month was made in November that month contained only 30 days. Including Dec. 1 a record of 852 ft. was made for 31 days."

Following is the record of the construction during December:—

East end pioneer heading 544 ft.; quartzite with some schist.

East end centre heading 523 ft.; schist with some quartzite.

West end pioneer heading 852 ft.; slate with small quartzite bands.

West end centre heading 686 ft.; slate with small quartzite bands.

The advance of 852 ft. in the west pioneer heading in December, makes a new American record, the previous record being 817 ft. as stated above.

A. C. Dennis, M.Can.Soc.C.E., is Superintendent for the contractors; Jos. Murphy is Assistant Superintendent East End, and Jos. Fowler, Assistant Superintendent West End.

A suggested cause of frame breakage lies in the drop, upwards of 3 ins. in many cases, that a locomotive must take in passing off a turntable.

Canadian Northern Railway Construction, Betterments, Etc.

Canadian Northern Quebec Ry.—The Dominion Parliament is being asked to extend the time for the building of the following lines:—From Rawdon northerly to the National Transcontinental Ry., with a branch to Joliette, and from St. Jerome to St. Eustache, Que.

The company has under consideration a project for the building of a branch from Huberdeau, the terminus of the old Montford and Gatineau Ry., to St. Remi, Que., eight miles.

James Bay and Eastern Ry.—The Dominion Parliament is being asked for an extension of time for the building of the projected line from Lake Abitibi easterly and south easterly, passing the south end of Lake St. John, to the mouth of the Saguenay River. About 30 miles of this line from Roberval, at the southern end of Lake St. John, westerly, is under contract, to J. P. Mullarkey.

Canadian Northern Ontario Ry.—The old locomotive house at North Trenton, Ont., with equipment, and considerable other property was destroyed by fire, Jan. 4. The damage is estimated at \$100,000. The company has under survey, a line from Toronto to Niagara Falls, Ont., 79.13 miles. The surveys are practically completed, and the negotiations with the local authorities are well advanced. The section has been reported on several occasions to have been put under contract, but nothing is likely to be done on it at present.

The Dominion Parliament is being asked to extend the time for the building of the following lines: From Washago to Kincardine; from Arnprior to Gananoque; from Pembroke to Cobourg or Port Hope; from Frenchman's Bay to Owen Sound; from Niagara River to Goderich; from Hawksbury to or near Lanark; from Berlin through Guelph, Acton and Brampton to Toronto; from Berlin to St. Marys and Woodstock; from Sarnia to Chatham and from Orillia to Goderich, with a branch to Owen Sound, all in Ontario.

Canadian Northern Ry.—The ratepayers of Port Arthur defeated the bylaw confirming the agreement for the transfer of certain lands on the waterfront. The City Council has arranged to reconsider the agreement, with a view of having the matters about which there is a difference amicably adjusted.

The Board of Railway Commissioners has authorized the opening for traffic of the line between Grand Marais and Bird's Hill, Man., 50 miles temporarily.

The Board of Railway Commissioners has authorized the opening for traffic of the line from the junction with the Balke River subdivision, north of Camrose, Alberta, to a junction with the C. N. Western Ry. near Strathcona, 46 miles.

It was reported in Edmonton, Alberta, Jan. 12, that the bridge over the Pembina River, on the Onoway-Peace River line had been completed. The grading on Whitecamp, will, it is expected, be finished in the spring, and the track laid, so as to get the steel in for the bridge across the McLeod River. The approaches and abutments have already been completed for this bridge. A train service has been put in operation to Sangudo, at the Pembina River, 32 miles from Onoway.

The Dominion Parliament is being asked to extend the time for the building of the following lines:—From Strathcona southerly to Calgary; from near Swan River westerly to the Saskatchewan River; from Regina to Red Deer with a branch to Dalmeny; from

mileage 40 on the Oak Point branch, via Oak Point to Grand Rapids on the Saskatchewan River; from Winnipeg through Springfield to the eastern boundary of Manitoba; from Strathcona via Calgary to the confluence of the Little Bow and Belly Rivers, and on to Lethbridge. This latter line was originally authorized to be built by the Alberta Midland Ry., which has been amalgamated with the C. N. R. The section of the line from Strathcona to Calgary covers the same territory as the C. N. R. Strathcona-Calgary line mentioned first in the lines for the construction of which an extension of time is asked.

A Vancouver telegram says that track laying on the main transcontinental line in British Columbia was completed at Basque, on the North Thompson River, about 200 miles from Vancouver, Jan. 23, and that ballasting should be finished by April 15. There is now continuous track from Port Mann, B.C., to Port Arthur, Ont., where there is a gap of about 2 miles, the C.N.R. at present using C.P.R. tracks as a connection between its eastern and western lines. From Port Arthur east, track is laid to the west portal of Mount Royal tunnel, Montreal, except at Pembroke, Ont., Chats Falls, Riviere des Prairies, Que., where bridges are being built.

Vancouver Terminals.—Work is being prosecuted on the reclamation work on the site of the proposed terminals at False Creek, Vancouver. The bulkhead, which will form a barrier around 65 acres of the 164½ acre tract is practically completed. The bulkhead extends practically half way down the proposed terminal site to a point where it branches off diagonally to China Creek. The Pacific Dredging Co., which has the contract for excavating a deep-water channel in False Creek, and for supplying

material for the filling in of the C. N. R. terminal site, is working a short distance to the west of Granville St. bridge, and moved its dredge east of Connaught bridge Jan. 14. More than 3,250,000 yards of filling will be required to reclaim the entire area owned by the C. N. R. Of this amount 1,100,000 has been deposited. (Jan., pg. 23.)

Railway Expenditures in British Columbia.

—Sir Richard McBride, Premier of British Columbia, is reported to have said Jan. 2, that more than \$26,000,000 was expended upon railway construction in the Province during 1914. Of this, \$8,195,000 was expended by the Canadian Northern Ry.; \$12,885,000 by the Pacific Great Eastern Ry., and \$5,000,000 by the Kettle Valley Ry. With the completion of the work on these lines about 1,900 miles of new main line track would be added to the railways in the Province. It will be noted that the expenditure mentioned by the Premier only covers work done on lines for the construction of which the Province is guaranteeing bonds. It does not include the Grand Trunk Pacific Ry., the C. P. R. second track, Kootenay Central Ry., and other construction, or the Great Northern Ry. terminals construction expenditure in Vancouver, all of which are being carried out independent of financial aid from the Province.

Ralph T. Hatch, Sales Agent, National Malleable Castings Co., St. Paul, Minn., writes: "I have always been very much interested in Canadian Railway and Marine World, particularly during my residence in Montreal, in charge of the company's Canadian office, and I consider it one of the most complete, comprehensive and satisfactory publications on the continent covering railway and railway supply matters."

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

The following figures have been compiled by the Trade and Commerce Department, from official reports received by it:—

	Wheat. Bush.	Oats. Bush.	Barley. Bush.	Flax. Bush.	Totals. Bush.
Week ended Jan. 14, 1915.					
Fort William:—					
C. P. R.	154,653	75,017	16,018	3,547	249,235
Consolidated	404,897	162,860	29,969	75,150	672,876
Empire Elevator Co.	308,672	235,197	25,032	98,196	667,097
Ogilvie Flour Mills Co.	647,717	83,518	11,173	.....	722,408
Western Terminal Elevator Co.	308,140	84,177	9,215	235,996	637,528
G. T. Pacific	637,445	369,450	20,510	78,272	1,105,677
Grain Growers' Grain Co.	887,779	290,215	59,004	.....	1,236,998
Fort William Elevator Co.	328,969	92,511	25,625	45,841	492,946
Eastern Terminal Elevator Co.	172,562	110,784	7,330	.....	290,676
Port Arthur:—					
Port Arthur Elevator Co.	1,055,020	454,795	59,002	71,695	1,640,512
D. Horn & Co.	25,967	8,564	.....	39,676	74,207
Dominion Government Elevator....	247,904	107,697	3,251	68,275	427,127
Total Terminal Elevators	5,179,725	2,054,785	266,129	716,648	8,217,287
Saskatoon Dominion Government Elevator					
.....	450,136	594,226	14,157	.....	1,058,519
Moosejaw Dominion Government Elevator					
.....	1,310,423	331,648	13,525	190	1,655,786
Total Interior Terminal Elevators					
.....	1,760,559	925,874	27,682	190	2,714,306
Depot Harbor					
.....	.....	98,650	.....	.....	98,650
Midland:—					
Aberdeen Elevator Co.					
.....	377,313	138,281	.....	.....	515,594
Midland Elevator Co.					
.....
Tiffin, G.T.P.					
.....	497,383	793,354	.....	.....	1,290,737
Port McNicoll					
.....	2,383,234	754,587	.....	85,729	3,223,550
Collingwood					
.....	27,691	.....	.....	.....	27,691
Goderich					
.....	*362,433	*158,141	.....	*33,417	*553,991
Goderich					
.....	708,190	99,777	.....	.....	807,967
Harbor Commissioners, Quebec.....					
.....	2,993	52,775	.....	.....	55,768
Kingston:—					
Montreal Transportation Co.					
.....	15,076	5,660	.....	.....	20,736
Commercial Elevator Co.					
.....	38,275	82,243	.....	.....	120,518
Port Colborne					
.....	662,772	301,288	90,326	†38,369	1,092,755
Prescott					
.....
Montreal:—					
Harbor Commissioners no. 1					
.....	314,721	.....	9,067	17,908	341,696
Harbor Commissioners no. 2					
.....	221,964	613,550	25,704	19,982	881,200
Montreal Warehousing Co.					
.....	28,916	265,431	228,977	18,601	541,925
West St. John, N.B.					
.....	729,299	589,908	.....	.....	1,319,207
Total Public Elevators	6,370,265	3,953,645	354,074	†38,369	10,891,990
Total quantity in store	13,310,549	6,934,304	647,885	175,637	21,823,582
*Grain afloat in vessels. †Corn.					

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Standard General Specifications for Concrete and Reinforced Concrete.

At the Canadian Society of Civil Engineers, in Montreal, in January, the committee on concrete and reinforced concrete presented specifications for adoption by the Society as a standard general specification. Following are extracts from the committee's report, signed by W. J. Francis, Chairman:—

"Since the re-appointment of the committee at the annual meeting in Jan., 1914, a great deal of consideration has been given to the draft then submitted. A certain amount of discussion took place at the annual meeting. Subsequently the various branches of the Society were specially requested to discuss the document, and many of the secretaries thereof forwarded discussions. A number of members took part in written discussion as individuals. In all, the written discussions approximated 30,000 words. The views expressed varied from high compliments to such phrases as "utter nonsense." All of the discussion was transcribed and issued to every member of the committee.

"At the last annual meeting the committee desired an extension of time in order that further consideration might be given to the question of shearing action in reinforced concrete beams. This series of tests was arranged for at informal meetings early in the year. The Atlas Construction Co., through its President, C. M. Morsen, a member of the Committee, very kindly made sixty-four 8 x 12 in. concrete beams, 11 ft. long. In the McGill University laboratories these beams were tested under the direction of Prof. H. M. MacKay and Prof. E. Brown, both members of the society and of the committee. All the beams were tested to destruction, some at the age of two months and the balance at the age of three. The tests took 12 days of laboratory time. The results were most conclusive, and were subsequently considered by the committee. Later in the present season the details of these tests will be presented to the Society in the form of a paper, but it is incumbent upon me here to emphasize the great amount of labor that Mr. Morsen, Prof. MacKay and Prof. Brown have given the Society in this regard. After having all the discussion and the results of the tests, the committee resumed its regular weekly sessions in the early autumn, and I now forward the result of the deliberations which it is trusted will meet the Society's approval.

"In July last the committee was deprived of the wise counsel of one of its most enthusiastic members by the death of Dean Galbraith. It is with the greatest pleasure that I refer to the cordial relations that have existed in the committee during the whole of its two years of existence, and to the great interest which every member of the committee has taken in the work. All have been in close touch with the deliberations, and I believe the draft may be taken as the unanimous view of the following representative engineers composing the committee,—S. Baulne, Consulting Engineer and Professor de Constructions Metalliques et Beton Arme, at Ecole Polytechnique, Montreal; E. Brown, Professor of Applied Mechanics, McGill University; E. Brydone-Jack, Consulting Engineer and Professor of Civil Engineering, University of Manitoba; P. Gillespie, President Canadian Cement and Concrete Association, and Professor of Applied Mechanics, University of Toronto; H. M. MacKay, Professor of Civil Engineering, McGill University; E. S. Mattice, President Structural Engineering Co., and Sales Manager Dominion Bridge Co., Montreal; C.

N. Monsarrat, Chairman Quebec Bridge Commission, Montreal; C. M. Morssen, Consulting Engineer and President Atlas Construction Co., Montreal; P. B. Motley, Chief Bridge Engineer, C.P.R., Montreal, and H. Rolph, Secretary, John S. Metcalf Co., Montreal. While some have been unable to attend all the meetings for various good reasons, a number have not missed a single meeting during the two years the Committee has been in existence.

Great Northern Railway Lines in Canada.

Vancouver, Victoria and Eastern Ry. and Navigation Co.—The Board of Railway Commissioners has rescinded its order requiring the company to build overhead crossings at Pender, Keefer and Harris Streets, Vancouver, but reserving the rights of any person to apply to have the crossings suitably protected with signs, etc. This was the order against which the British Columbia Electric Ry. successfully appealed to the Imperial Privy Council, that company having been directed to pay a portion of the cost of the bridges named.

Vancouver Terminals.—Plans have been filed with the Vancouver City Council for the bridges across the Grand View cut at Clarke Drive and Woodland Drive, and also for the approaches. According to the agreement with the city, the first bridge has to be completed by April 1, and the second by Sept. 1. (Jan., pg. 14.)

Corrections for the Erring.

"St. Johns, N. B.—St. Johns Ry. Co. plans to construct 1½ mile track during 1915. W. D. Reid, Gen. Mgr., St. Johns." —From Engineering Record, New York.

There is no St. Johns in New Brunswick, and no St. Johns Ry. Co., but there is a St. John's in Newfoundland, also in Quebec. W. D. Reid is President and General Manager of the St. John's St. Ry. Co., St. John's, Nfld., which is owned by the Reid Newfoundland Co.

The Canadian Ticket Agents' Association's executive committee, at a meeting in Toronto, Jan. 21, accepted a joint invitation from the Chicago and North Western Line and the Union Pacific System, tendered through their representatives at Toronto, B. H. Bennett and J. J. Rose, to hold its next annual outing at Denver, Col., Oct. 11 to 13. E. de la Hooke, who has been the association's Secretary-Treasurer continuously since its establishment, was presented with a travelling bag by a number of transportation men.

Western Dominion Ry.—Application is being made to the Dominion Parliament for an extension of time for the building of this projected line, the route plans of which are under the consideration of the Minister of Railways, as described in our Dec., 1914, issue. O. E. Culbert, Calgary, Alberta, is Secretary. (Dec., 1914, pg. 545.)

One method of hardening high speed steel is to heat it slowly up to the sweating point, or 2,200 degrees Fahr., after which cool the cutting point of the tool in oil, and when thoroughly black, cool rapidly in a compressed air blast.

High temperatures increase the tendency in lead storage batteries to form the white insoluble sulphate in the plates, and in consequence, storage batteries should be carefully watched in the extremely warm weather.

The Toronto Board of Control is opposed to a proposal by the Mayor, to ask for authority to spend \$50,000 on a motor omnibus system in the city.

Canadian Pacific Railway Construction, Betterments, Etc.

Winnipeg Terminals.—Work has been started on the changes to be made at the Winnipeg station. The area formerly used as a dining room is being transferred into a ticket office. As soon as this is completed the present ticket office will be arranged for a telegraph office and information bureau. The present baggage room is to be converted into a waiting room, and at its west entrance will be located the new dining room and lunch counter. It is said that connection will be made with the Royal Alexander hotel kitchen, which will be utilized in supplying food to the station dining room. In order to give easy access to the subway beneath the new overhead tracks, a flight of broad stone steps will be placed, beginning near the centre of the present rotunda or main waiting room. The ladies' waiting room will remain as at present situated. It was stated at the City Hall, Jan. 15, that the estimated cost of the station alterations is about \$1,500,000.

Rogers Pass Tunnel.—Considerably more than two miles of the preliminary bore has been driven from both sides of Mount Macdonald, one of the principal peaks in the Selkirk range. From the eastern end, the drillers were recently 6,600 ft. into the heart of the mountain, and from the western end 4,300 ft. A large portion of the tunnel, which will be double track, has been finished ready for traffic. The acceleration of speed during the past few months will, it is expected, enable the contractors to complete the tunnel early in the summer of 1916, some six months ahead of the date called for in the contract.

British Columbia Division.—The Board of Railway Commissioners has authorized the opening for traffic of half a mile of second track on the Thompson Subdivision, B. C., mileage 0 to 0.5.

Press reports state that work will be started shortly on the building of an oil tank, with a capacity of 54,000 barrels, at Vancouver, by the Union Oil Co., which supplies the C.P.R. with oil for its oil burning locomotives.

H. Rindal, Division Engineer, had a conference with the New Westminster City Council, Dec. 22, in connection with the laying of industrial tracks along the north side of certain recently improved water lots. The city has asked him to prepare the necessary plans. (Jan., pg. 15.)

Kootenay Central Ry.—The total length of this line from Colvalli, on the Crowsnest branch, to Golden, on the main transcontinental line, is 166.7 miles. A mixed train service was put in operation over it, Jan. 1, the official authorization to run trains over the last completed section from Edgewater, mileage 59 south of Golden, to Wasa, mileage 131.7, having been given by the Board of Railway Commissioners, Dec. 23.

Eastern Canadian Passenger Association.

—At the annual meeting in Montreal, Jan. 5 the following were elected as the executive committee:—R. L. Fairbairn, G. P. A., Canadian Northern Ry., Toronto; W. P. Hinton, A. P. T. M., Grand Trunk Ry., Montreal; J. F. Pierce, G. P. A., Canada Steamship Lines, Ltd., Montreal; W. Stitt, G. P. A., Canadian Pacific Ry., Montreal. J. F. Pierce was elected chairman of the association and R. L. Fairbairn, chairman of the executive committee. G. H. Webster was re-elected Secretary. The rules committee consists of R. L. Fairbairn, W. P. Hinton, W. Stitt, J. W. Hanley, G. C. Martin, N. Mooney, L. W. Landman, H. H. Melanson, and F. T. Grant.

Railway Rolling Stock Notes.

The C. P. R. has ordered 3 steel frame box cars, 40 tons capacity, at its Angus shops.

The G. T. R. has received 10 first class cars from Canadian Car and Foundry Co.

The Intercolonial Ry. has received a 100 ton wrecking crane from the United States.

Armstrong, Whitworth and Co., Montreal, have ordered 6 industrial cars, 2 tons capacity, from Canadian Car and Foundry Co.

The Crossen Car Co. has completed 5 baggage cars for the Canadian Northern Ry., and is building steel underframe colonist cars for the same company.

The C. P. R., between Dec. 15 and Jan 15, received the following additions to rolling stock: 1 steel first class car, 4 steel baggage and express cars, 39 flat cars and 1 class D4 locomotive, from its Angus shops; 2 double track snow ploughs from Canadian Car and Foundry Co., and 1 ore car from National Steel Car Co.

The Intercolonial Ry. has ordered 5 steel single track snow ploughs, C. P. R. standard type, from Canadian Car and Foundry Co. Following are the chief details:—

Length over all	32 ft. 1 9-16ins.
Width over side sills	8 ft. 9 1-8 ins.
Height top of rail to top of eaves angle,	11 ft. 3 ins.
Height top of rail to top of cupola, approx.	14 ft. 10 ins.
Width over wings extended	16 ft.
Extreme width of cupola	8 ft. 9 ins.
Extreme length of cupola	4 ft. 11 1/4 ins.
Truck centres	18 ft.
Wheel base, leader truck	4 ft. 2 ins.
Wheel base, rear truck	5 feet. 3 ins.

Railway Finance, Meetings, Etc.

Canadian Pacific Ry.—The company, desiring to anticipate repayment of the principal of its sterling 5% first mortgage debenture bonds, due July 1, has authorized Baring Bros. and Co., London, Eng., until further notice, to redeem them at par with accrued interest from Jan. 1 to date of payment, less income tax. Bondholders desiring to avail themselves of the offer must deposit their bonds with the July 1 coupon attached, at Baring Bros. and Co.'s London office.

Canadian Pacific Ry.—Application is being made to the Board of Railway Commissioners for a recommendation to the Governor in Council to sanction a lease to the C. P. R. of the New Brunswick Coal and Ry. Co.'s line, dated Oct. 8, 1914, and of the Fredericton and Grand Lake Coal and Ry. Co.'s line, dated Nov. 4, 1914. The last named extends from Fredericton to Minto, and the first named from Minto to Chipman, N. B. The F. and G. L. Coal and Ry. Co.'s line was built in 1913-14. The N. B. C. and Ry. Co.'s line was operated for some years prior to the lease in behalf of the Province of New Brunswick.

The company is applying to the Dominion Parliament for authority to lease or charter any of its steamships, ferries or other vessels to any incorporated company having for its object the owning or operation of vessels, and to subscribe for, or acquire, stocks, bonds or other securities of such companies.

Grand Trunk Ry.—The Dominion Parliament is being asked to authorize the company to make from time to time advances to any company the controlling interest of which is held for the benefit of the G. T. R. or the G. T. Pacific Ry.; to buy and sell the stock, bonds or other securities of any such company, and to use for that purpose the proceeds of any class of stock issued or to be issued by the G. T. R.

Pere Marquette Rd.—According to a re-

port prepared by M. E. Cooley, on behalf of the receiver and of the Michigan State Commission, the P. M. R. has a reproduction value of \$96,562,771. The reproduction cost, less depreciation, is given at \$78,545,241. The cost per mile of the road is figured at \$45,392, or, less depreciation, \$36,770. Of the mileage, 2,586 is in Michigan, and 2,966 in five other states and in Canada.

Shuswap and Okanagan Ry.—A meeting of shareholders was called to be held at Victoria, B. C., Jan. 25, to pass bylaws changing the date of the annual meeting, and removing the head office to Montreal. J. E. McMullen, C. P. R. offices, Vancouver, is acting Secretary.

Temiscouata Ry.—Aggregate gross earnings for six months ended Dec. 31, \$114,688; operating expenses \$91,541; net earnings \$23,147, against \$123,545 aggregate gross earnings; \$101,854 operating expenses; \$21,691 net earnings, for same period 1913.

The Toronto, Hamilton and Buffalo Ry. has, it is reported, passed the dividend on its \$3,500,000 stock, and the explanation is made that the funds which ordinarily would have gone out in the dividend were added to the proceeds of loans from various companies represented in the ownership of the road, including the C.P.R., New York Central, and Michigan Central, for the construction of the company's new line, the Erie and Ontario Ry. between Smithville,

White Pass and Yukon Route.—Gross earnings from Jan. 1 to Dec. 7, 1914, \$1,545,140 against \$1,089,345 for same period 1913.

The Winnipeg Aqueduct Construction Co., Ltd., has been incorporated under the Dominion Companies Act, with \$250,000 capital and office at Winnipeg, to take over, in whole, or part, the interests of the Northern Construction Co., Ltd., and Carter-Halls-Aldinger Co., Ltd., or either of them, in contracts entered into with the Greater Winnipeg Water District, relating to the building of an aqueduct, and in connection therewith to build and operate construction railways, telegraph and telephone lines, etc. The provisional directors are, C. V. Cummings, W. H. Carter, J. B. McLean, F. E. Halls, G. H. Elliott and G. H. Davis, Winnipeg.

Balk Line on Railway Platforms.—The Board of Railway Commissioners has ordered the New York Central Rd. to paint a balk line along its platforms in Canada, to show passengers the limit of safety when standing waiting incoming trains. An application to compel the company to raise the height of its platforms to conform to the standard height in the Dominion, viz., 9 ins., was dismissed. It was stated in the course of the hearing that two accidents had occurred on the St. Lawrence and Adirondack line recently, owing to waiting passengers standing too close to the edge of the platform.

American Railway Engineering Association.—R. Trimble, Chief Engineer, Maintenance of Way, Pennsylvania Lines west of Pittsburg, Northeastern System, Pittsburg, Pa., has been nominated for President for the ensuing year, and J. G. Sullivan, Chief Engineer, Western Lines, C.P.R., Winnipeg, has been nominated as Vice President. Among the nominations for directors, of whom three are to be elected, are H. R. Safford, Chief Engineer, G.T.R., Montreal, and F. H. Alfred, General Manager, Pere Marquette Rd., Detroit, Mich.

The genuine engineer, like the genuine man in any walk of life, will be preparing all his life. Each achievement he will value not merely for the wealth or glory it brings him, but as a preparation for some thing beyond. He who has got through all preparation work is dead.

Transportation Appointments Throughout Canada.

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

Canada Steamship Lines, Ltd.—J. J. PHELAN, formerly Purchasing Agent, Montreal, has been appointed Assistant Mechanical Superintendent, Montreal, not Assistant to Mechanical Superintendent, as stated in our January issue.

Canadian Government Railways.—S. B. WASS has been appointed Assistant Superintendent, St. John and Quebec Ry., in charge of station service, train service and track. Office, Fredericton, N.B.

On Dec. 19, F. P. Brady, General Superintendent, Canadian Government Railways, issued a circular announcing that J. J. McMANUS had been appointed Assistant Superintendent, National Transcontinental Ry., between Hervey Jct., and Parent, Que., in charge of station service, train service and track, with office at Hervey Jct., Que. On Jan. 22 we were officially advised that the Canadian Government Railways had discontinued operating the portion of the N.T.R. referred to, and that the appointment of Mr. McManus was therefore void.

Canadian Northern Ry.—S. E. LEGER, heretofore Travelling Freight Agent, Montreal, has been appointed City Freight Agent, Quebec, Que., vice A. A. Buckle, transferred.

A. A. BUCKLE, heretofore City Freight Agent, Quebec, Que., has been appointed Travelling Freight Agent, Montreal, vice S. E. Leger, transferred.

J. BARBOUR, whose appointment as Chief Claim Agent was announced in our last issue, will continue to perform the duties of Right of Way Agent, which position he held previous to his present appointment. Office, Toronto.

Canadian Pacific Railway. JAMES MANSON, heretofore Assistant to Vice President at Winnipeg, has been appointed Assistant to the Vice President of the Company (George Bury) at Montreal.

ARTHUR HATTON, heretofore Superintendent of Car Service, Western Lines, Winnipeg, has been appointed General Superintendent of Car Service, vice G. S. Cantlie, who, at his own request, has been granted leave of absence for an extended period, in order that he may take command of the Montreal unit to be organized for service with the Third Contingent of the Canadian Expeditionary Force. Office, Montreal.

G. WHITELEY, heretofore Master Mechanic, Alberta Division, Calgary, has been appointed Assistant Superintendent of Motive Power, Eastern Lines. Office, Montreal. This is a new position.

A. A. WHITE has been appointed Tie and Timber Agent, St. John, N.B., reporting to the General Tie Agent, Montreal.

C. KYLE has been appointed Master Mechanic, Atlantic Division, vice C. R. Ord, retired on account of ill health. Office, McAdam Jct., N.B.

W. EVANS, heretofore Roadmaster, Chapleau, Ont., has been appointed section foreman at Sturgeon Falls, Ont.

W. B. HALL, heretofore section foreman, Carling, Ont., has been appointed Roadmaster, White River Subdivision, Chapleau, Ont., vice W. Evans, transferred.

T. HIGGINS, heretofore Freight Shop Foreman, Fort William, Ont., has been appointed Car Foreman there, vice T. Spence, promoted.

D'ALTON C. COLEMAN, who has been appointed Assistant General Manager, Western Lines, Winnipeg, as announced in

our last issue, has charge of maintenance and operation.

H. J. HUMPHREY, heretofore Car Service and Fuel Agent, Moose Jaw, Sask., has been appointed Superintendent of Car Service, Western Lines, vice A. Hatton, promoted. Office, Winnipeg.

W. E. CLINE, heretofore Chief Dispatcher, District 4, Alberta Division, Edmonton, is reported to have been appointed Chief Dispatcher, District 2, Manitoba Division, vice G. T. Coleman, transferred. Office, Winnipeg.

A. E. DALES has been appointed District Master Mechanic, District 3, Manitoba Division, vice L. G. Fisher. Office, Brandon.

G. T. COLEMAN, heretofore Chief Dispatcher, District 2, Manitoba Division, Winnipeg, has been appointed Car Service Agent and Fuel Agent, Moose Jaw, Sask., vice H. J. Humphrey, promoted.

A. STURROCK, heretofore District Master Mechanic, Cranbrook, B.C., has been appointed Master Mechanic, Alberta Division, vice G. Whiteley, promoted. Office, Calgary.

R. J. COLLINS, heretofore dispatcher, Moose Jaw, Sask., is reported to have been appointed Chief Dispatcher, District 4, Alberta Division, vice W. E. Cline, transferred. Office, Edmonton.

JOHN McRAE, heretofore Locomotive Foreman, Revelstoke, B.C., has been appointed Shop Foreman, Kamloops, B.C., vice G. Dillard.

L. G. FISHER, heretofore District Master Mechanic, District 3, Manitoba Division, Brandon, is reported to have been appointed District Master Mechanic, District 5, Alberta Division, vice A. Sturrock, promoted. Office, Cranbrook, B.C.

W. C. MACKENZIE, heretofore storekeeper at Grand Forks, B.C., has been given a position in the Car Department there, the position of storekeeper having been abolished.

T. SPENCE, heretofore Car Foreman, Fort William, Ont., has been appointed General Car Foreman, Vancouver, B.C., vice W. C. Hodgson, transferred.

W. C. HODGSON, heretofore General Car Foreman, B.C., has been appointed Mill Foreman there, vice G. Logan, transferred to the bench.

Central Vermont Ry.—E. J. GUTHRIE, heretofore agent, pier 29, East River, New York, has been appointed Superintendent, Southern Division, C.V.R., vice John McCraw, assigned to other duties, and also Superintendent, Central Vermont Transportation Co. Office, New London, Conn.

JOHN McCRAW, heretofore Superintendent, Southern Division, New London, Conn., has been appointed General Agent there.

Delaware and Hudson Co.—M. J. POWERS, heretofore chief clerk to General Passenger Agent, has been appointed General Passenger Agent, vice A. A. Heard, resigned. Office, Albany, N.Y.

Grand Trunk Pacific Ry.—C. E. BROOKS, heretofore Locomotive Foreman, Edmonton, Alta., has been appointed General Foreman in charge of Shops, Transcona, Man., vice M. B. Dube, who has left the service.

The headquarters of the Stores Department has been moved from Portage la Prairie to Transcona, Man. W. J. STURGES is Storekeeper.

J. GORDON, heretofore Foreman Electrician, Car Department, has been appointed General Electric Foreman, Motive Power Department, Transcona, Man.

A. C. TURTLE has been appointed Foreman Electrician, Car Department, Transcona, Man., vice J. Gordon, transferred.

H. McCALL, heretofore Superintendent, Edson, Alta., has been appointed Superintendent, with jurisdiction from Winnipeg to Watrous, and the Melville-Canora Branch, Sask., vice G. S. Cooke, resigned. Office, Melville, Sask.

J. A. MITCHELL has been appointed Locomotive Foreman, Biggar, Sask., vice A. S. Wright.

A. KILPATRICK has been appointed Superintendent, with jurisdiction from Edmonton to Prince George and intersecting branch lines, vice H. McCall, transferred. Office, Edson, Alta.

J. G. BROWN, heretofore Joint Car Inspector, Camrose, Alta., has been appointed Car Foreman, Jasper, Alta., vice W. B. McNiece, transferred.

W. B. McNIECE, heretofore Car Foreman, Jasper, B.C., has been appointed Car Foreman, McBride, B.C.

The following station agents have been appointed:—Elie, Man., W. J. Pelland; Loverna, Sask., F. A. Peacock; Ebenezer, Sask., D. W. McCarthy; Bickerdike, Alta., V. A. Scott; New Norway, Alta., F. F. Yerex.

Grand Trunk Ry.—J. W. FARRELL, Trainmaster, Districts 2 and 3, Eastern Lines, Richmond, Que., has had his jurisdiction extended over District 1, E. S. Cooper, formerly Trainmaster at Island Pond, Vt., having been transferred to Montreal, as announced in our last issue.

W. J. NIXON, heretofore Trainmaster, District 5, Eastern Lines, Montreal, has been appointed Trainmaster, District 4, Montreal.

F. W. WARREN, heretofore Locomotive Foreman, Coteau Jct., Que., has been appointed Locomotive Foreman, Southwark Terminal, Montreal, vice D. Ross, transferred to Western Lines.

E. B. MEEHAN has been appointed Locomotive Foreman, Coteau Jct., Que., vice F. W. Warren, transferred.

J. HENDERSON, Supervisor of Track, Brockville, Ont., who was on leave owing to ill health, has resumed his duties.

F. COOK, heretofore charge hand, has been appointed Foreman, Temder Shop, Stratford, Ont.

R. E. HOWICK has been appointed station agent at Welland Jct., Ont.

N. P. NORTH has been appointed Trainmaster, Durand, Mich., vice R. Kelley, deceased.

Intercolonial Ry.—See Canadian Government Railways.

Lake Shore and Michigan Southern Ry.—See New York Central Rd.

Lake Superior Corporation.—THOS. GIBSON, of Toronto, heretofore a director and Secretary, has been elected President, succeeding J. Frater Taylor, who continues as President, Algoma Steel Corporation, Ltd., and has also been appointed General Manager of the same. The Lake Superior Corporation has among its subsidiary companies, Algoma Steel Corporation, Algoma Central and Hudson Bay Ry. Co., Algoma Eastern Ry. Co., International Transit Co. and Trans St. Marys Traction Co.

Lehigh Valley Rd.—H. C. DAVIS, General Agent, New York, having resigned, that position has been abolished.

F. E. SIGNER has been appointed General Eastern Freight Agent, New York.

M. C. ROACH, Superintendent, New York Division, New York, has had his jurisdiction extended so as to assume charge of the operations and the handling of all freight on the piers in New York, Jersey City and National Stores, and of the movement of the company's floating equipment in New York harbor.

A. P. BEAM has been appointed General Baggage Agent. Office, South Bethlehem, Pa.

C. T. O'NEAL, heretofore Superintendent, Buffalo, N.Y., has been appointed Superintendent, Lake Division, vice F. G. Rogers. Office, Buffalo, N.Y.

Midland Ry. of Manitoba.—J. L. KNIGHT has been appointed acting Auditor and chief clerk, vice R. G. Thackray, who is on active service with the Canadian expeditionary force. Office, Winnipeg.

National Transcontinental Ry.—See Canadian Government Railways.

New York Central Rd.—The New York Central Rd. is the name of the new company which has taken over the New York Central and Hudson River Rd. and the Lake Shore and Michigan Southern Ry.

IRA A. PLACE has been appointed Vice President, in charge of the Law Department and of the Land and Tax Department. Office, New York.

ALBERT H. HARRIS has been appointed Vice President and General Counsel, and will perform such duties as may be assigned to him from time to time by the President, in addition to those of General Counsel. Office, New York.

E. T. GLENNON has been appointed Assistant Vice President, in charge of such matters as may be referred to him by the Vice President or General Counsel of the Company. Office, New York.

A. T. HARDIN, heretofore Vice President, New York Central and Hudson River Rd., New York, has been appointed Vice President, N.Y.C. Rd., in charge of the Operating Department, embracing transportation, construction, roadway and equipment. Office, New York.

J. J. BERNET, heretofore Vice President, Lake Shore and Michigan Southern Ry., Chicago, Ill., has been appointed Resident Vice President, N.Y.C. Rd., and will act as the general representative of the company in the Illinois territory, and perform such other duties as may be assigned to him. Office, Chicago, Ill.

P. E. CROWLEY, heretofore General Manager, New York Central and Hudson River Rd., has been appointed Assistant Vice President, Operating Department, N.Y.C. Rd. Office, New York.

New York Central Rd.—Under the reorganization plan two grand divisions will be established—the Eastern, under the supervision of W. J. Fripp as General Manager, with headquarters at Albany, and the Western, under D. C. Moon, General Manager of the Western division, with headquarters at Cleveland. A. S. Ingalls, who will have charge of the line between Buffalo and Toledo, with headquarters at Cleveland, and F. H. Wilson, who will be in charge of the line between Toledo and Chicago, with headquarters in the last named city. Under Mr. Fripp there will be three general superintendents:—T. W. Evans, who will have charge of the line between Buffalo and Syracuse and from Montreal to Clearfield, Penn.; E. J. Wright, in charge of the line between Syracuse and the electric zone in New York, including the line into the Adirondacks and the Harlem division, and M. Bronson, who will have immediate charge of the electrical division.

Pere Marquette Rd.—P. BIRREL, heretofore Commercial Agent, Pittsburg, Pa., has been appointed Commercial Agent, Detroit, Mich.

St. John and Quebec Ry.—See Canadian Government Railways.

Toronto, Hamilton and Buffalo Ry.—W. J. WARNICK, heretofore Chief Dispatcher, Hamilton, Ont., has been appointed Trainmaster there.

W. H. STANILAND, heretofore Night Chief Dispatcher, Hamilton, Ont., has been appointed Chief Dispatcher there, vice W. J. Warnick, promoted.

L. V. HARRINGTON, heretofore dispatcher, Hamilton, Ont., has been appointed Night Chief Dispatcher there, vice W. H. Staniland, promoted.

Wabash Rd.—HENRY MILLER, General Manager for the Receiver, having resigned, all business heretofore handled by him is now dealt with by S. E. COTTER, General Superintendent, and all departments hitherto under the General Manager's jurisdiction have been transferred to the General Superintendent. Office, St. Louis, Mo.

White Star-Dominion Line.—The management of the Portland, Me., and Montreal offices has been merged, the company's operations at the former port are now directed entirely from Montreal. JOHN TORRANCE has been appointed Manager, and P. V. G. MITCHELL, Assistant Manager.

Grand Trunk Railway Betterments, Construction, Etc.

Montreal Track Elevation.—It was reported, Jan. 15, that steps were being taken by the Montreal City Council to have the matter of the G.T.R. track elevation from Bonaventure station to St. Henri, pushed forward, with a view of construction being started during this year.

Merriton to Thorold, Ont.—We are officially advised that during 1914 the G.T.R. completed the construction of a three mile diversion between the above named points, necessitated by the new location of the Welland Canal. The Board of Railway Commissioners, Jan. 12, authorized the opening for traffic of a portion of this deviation, and to have a temporary crossover with the present line at bridge 11, Welland Canal.

Port Huron Shops.—The citizens' committee of Port Huron, Mich., are reported to have completed the purchase of the property of the Port Huron Engine and Thresher Co., in order to hand it over to the G.T.R. for the erection of new shops. The Thresher Co. is expected to vacate the property by June 1. Orders are reported to have been placed for \$250,000 of machinery for the shops, for early installation in such of the Thresher Co.'s buildings as will be retained. (Jan., pg. 14.)

Great North Western Telegraph Co.'s Matters.

Consequent on the merging of the Great North Western and the Canadian Northern Telegraph Companies, the G. N. W. T. Co.'s principal office in Winnipeg in future will be in the premises heretofore occupied by the Canadian Northern Telegraph Co. at the corner of Main St. and Portage Ave. The office at 436 Main St., occupied by the G. N. W. T. Co. for many years, will be closed. F. W. Lee, heretofore Manager of the Canadian Northern Telegraph Co.'s Winnipeg office, has been given charge of the G. N. W. T. Co.'s office in Winnipeg Grain Exchange.

There will be no other consolidation of the G. N. W. and Canadian Northern Telegraph offices, except at a few small places in Ontario and Manitoba. In the west the G. N. W. T. Co. had only some half dozen small offices on the Canadian Northern lines, and in the east the Canadian Northern had commercial lines only from Toronto to Sudbury and Toronto to Ottawa. The G. N. W. T. Co. has for some time operated the telegraph lines on the Canadian Northern Quebec Ry., and the portion of the Canadian Northern Ontario Ry. in Ontario as far west as Ottawa. The two telegraph systems were not at all in competition, the G. N. W. operating in the east and the Canadian Northern in the west.

The Canadian Northern Ry. has a telegraph line between Toronto and Winnipeg, which has been used for railway purposes only. It is expected that the G. N. W. T. Co. will erect at least one copper wire from Montreal, or Toronto, to Winnipeg at a very early date, and this will be followed by continuing the through line to the Pacific Coast, after the completion of the Canadian Northern Pacific Ry. in British Columbia, which is approaching rapidly.

The Western Union Telegraph Co.'s lines in the Maritime Provinces east of Moncton, exclusive of those connecting from the International boundary to the cable landing stations, will be taken over by the G. N. W. T. Co. as soon as valuations can be made. The Western Union lines in British Columbia, now operated in the G. N. W. T. Co.'s name, will also be taken over as soon as details can be arranged. These lines extend from the Washington-British Columbia boundary to New Westminster and Vancouver, with cable connection to Victoria. The mileage is pole 140, wire 360.

Special Cable Rates to the Expeditionary Forces.

By special arrangements between the telegraph and cable companies a cable service has been arranged, whereby week end letter cablegrams may be sent to soldiers, sailors and nurses serving with the expeditionary forces in the United Kingdom, or on the Continent, and also for the free transmission of messages relating to wounded combatants.

The special rates for the week end letters are:—From New Brunswick, Quebec and Ontario, 5c. a word; from Manitoba, 9c. a word, and from Saskatchewan and Alberta, 11c. a word. All such messages must have the letters EFM placed before them, which will be charged as one word, and if the persons to whom such messages are addressed are in France or Belgium, they will be forwarded by mail from London.

The arrangement for wounded soldiers' messages restricts the privilege to bona fide enquiries by relatives concerning persons officially reported to have been wounded or killed, and matter of a social nature must not be included in the messages. These messages must be addressed to the Minister of Defence at Ottawa, who will arrange their further free transmission. The letters WSM must be prefixed to such messages. The number of free messages which may be sent by relatives concerning any individual wounded combatant is limited to three. Persons offering such messages must present the original official advice or information about the particular casualty to which the message relates, and each message sent must be checked on the original advice. No free messages are allowed in respect of persons reported only slightly wounded. In all cases of special messages under these arrangements, whether free or not, the following particulars, considered essential by the British authorities, must be given as far as practicable:—regimental rank and name; squadron, battery or company; regiment or unit; expeditionary force concerned, whether British, Canadian, Australian, etc., or in case troops not with expeditionary forces, the name and place where stationed must be given. If the sender should not be in possession of all the required particulars, the message may still be sent, but all messages are at senders' risk and no enquiry concerning them can be undertaken. It is also stated that messages concerning persons officially reported to be suffering from disease or sickness come within the category mentioned.

Electric Railway Department

Interurban Passenger Cars on Nipissing Central Railway.

The two interurban cars for the Nipissing Central Ry., which were described preliminarily in Canadian Railway and Marine World for June, have been delivered, and a floor plan and exterior of one of them are given herewith: They have a total seating capacity of 52 in the three compartments. Following are some of the principal dimensions: Length over buffer, 51 ft.; over vestibules, 50 ft.; over body, 40 ft.; centre to centre of trucks, 28 ft.; width over sheathing, 8 ft. 9½ ins.; aisle width, 1 ft. 10 ins.;

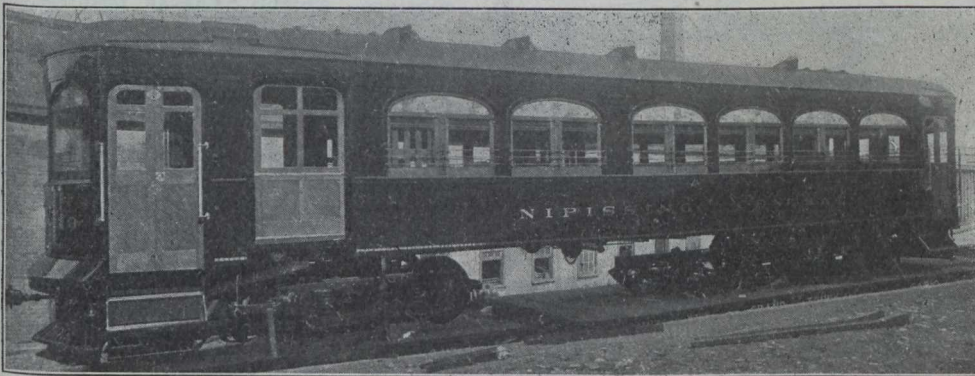
The vestibule platform is dropped 10 ins. below the car level, the side sill knees being 3-16 in. plate 12 ins. deep at the end sill plate, reinforced top and bottom with 2 by 2 by ¼ in. angles, and secured to the underside of the sills. The centre sill knees are two 6 by 3½ by 7-16 in. angles, extending from the bumpers to 4 ft. back from the body bolster. The bumpers are 6 in. 8 lb. channels, bent to the contour of the vestibule end, and with the top bevelled back at 45 degrees and covered with sheet iron.

whistles, etc. The car lighting is by two rows of pendant lights along the ceiling with a 3 lamp cluster in each vestibule.

The air brake equipment is the Westinghouse A.M.M. type, supplied by a D.I.E.G. compressor with a 600 volt motor. It has a type J governor, M. 15 D brake valves, B 6 feed valves, M 1 triple valve, a type R, 10 by 12 in. brake cylinder, B 3 conductor's valves and 3½ in. air gauges illuminated by a 6 volt lamp. There is also a geared hand brake equipment at each end of the car.

The trucks are Brill 27 M.C.B. type, with a 6½ ft. wheel base. The wheels are 33¼ ins. diam., steel tired with retaining rings, and with cast steel centres. The tires are 5 ins. wide by 3 ins. thick, and the axles have 4¼ by 8 in. journals. The motor equipment on these cars is the Westinghouse 306 double end cont. ol. with four motors, two on each truck, with a controller in each end of the car. The car is also equipped with an integrating wattmeter, rated at 600 volts, 400 amperes.

These two cars were built by the Preston Car and Coach Co., under order from the Timiskaming and Northern Ontario Ry. Commission, which also operates the N.C.R.



Exterior View of Interurban Car, Nipissing Central Railway.

height from rail to underside of side sills, 3 ft. 1 in.; height from rail over roof, 12 ft. 4 ins.; height from floor to top of window sill, 2 ft. 5 ins.; and height from vestibule platform to floor of car, 10 ins.

The underframing is of steel throughout, comprising essentially two centre sills of 7 in. 17½ lb. I beams spaced 12½ in. centres, extending from end sill to end sill, with a ¼ in. cover plate top and bottom, extending from bolster to bolster, and two side sills of 6 by 3½ by 7-16 in. angles extending from end sill to end sill, with a 3-16

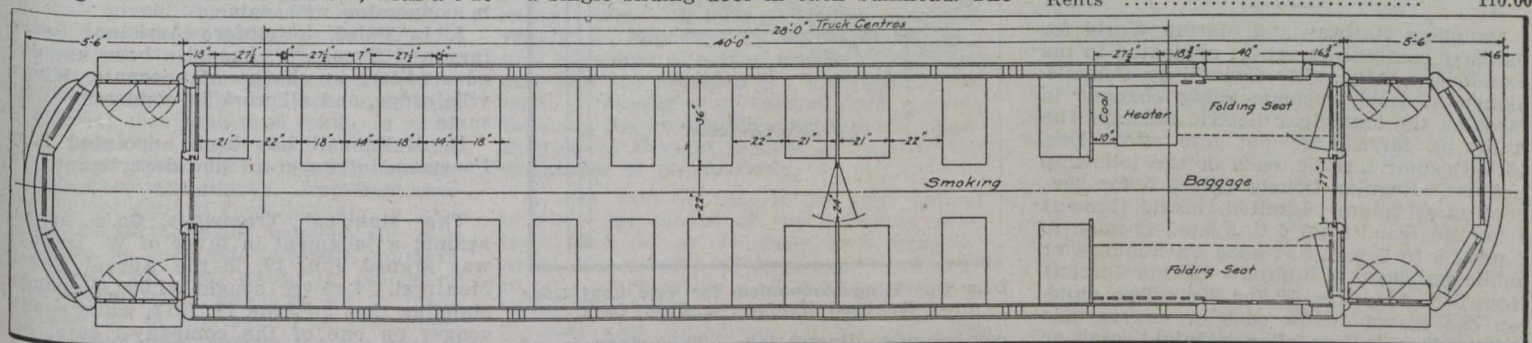
The flooring is of 1 by 2½ in. yellow pine, laid longitudinally with a special mat surface. The platform flooring is hard maple, 7¼ by 2½ in. The floor has trap doors. The body posts are of ash 2½ ins. thick. The car roof is of the single arch type, supported on 14 steel carlines, 1¾ by ½ in., with intermediate ash carlines at 10 in. centres. The roof boards are ½ in. thick, covered with no. 8 canvas.

There is a 24 in. swinging door between the general and smoking compartments, and a single sliding door in each bulkhead. The

Saskatoon Municipal Ry. Operating Results.

The financial statement of the city of Saskatoon, Sask., for the ten months ended Oct. 31, contains the following, covering the operations of the municipal railway and of its extension to Sutherland, operated under an agreement with the council of that town:—

Saskatoon Municipal Railways.	
Cash fares	\$73,468.12
Ticket sales	44,682.87
City departments	782.31
Chartered cars	269.55
Advertising	1,829.84
Rents	110.00



Floor Plan of Interurban Car, Nipissing Central Railway.

in. truss plate, 30 ins. deep, extending from end sill to the baggage door post, with the side sills under the baggage door reinforced by a 6 by 5/8 in. plate, 9 ft. long. Pine side sills resting on the short flange of the steel side sill, are bolted to the latter. The end sills are built up of a 9 by 3/8 in. steel plate, having a 6 by 3½ by 7-16 in. angle along the bottom outer face. The wooden end sills are of oak. The side and centre sills are tied with 4 in. 6¼ lb. channels at each side of each bolster, and braced diagonally each side of the bolster with 4 in. channels. There are 5 intermediate cross bearers of 4 in. 6¼ lb. channels, evenly spaced, and two crossbearers of 4 in. 7½ lb. I beams, located 4 ft. each side of the car centre line, extending beneath the sill.

vestibule doors are folding, in two parts, hinged against the bulkhead, and fitted with automatic folding apparatus. The car steps are 36 ins. wide, double at each door, the lower one with a 10 in. tread, and the upper one with a 9 in. tread, with 10 in. risers. There are 14 reversible seats, 36 ins. long, on a single pedestal and spring upholstered in rattan. There are also 8 stationary cross seats of similar construction, and two folding seats, one along each side of the baggage compartment.

The heating is provided for by a forced draught heater in the baggage compartment, and there are 10 ventilators, five on each side of the roof. The equipment also includes destination signs, signal bells, hand straps, fare register, arc headlight, signal

Miscellaneous	484.33	
		\$121,627.02
Superintendence of way and structures	\$ 721.36	
Maintenance of way	3,021.73	
Maintenance of electric lines	954.73	
Maintenance of buildings and fixtures	496.57	\$ 5,194.39
Superintendence of equipment	568.84	
Maintenance of cars and locomotives	3,890.52	
Maintenance of power equipment	60.64	
Maintenance of electrical equipment of cars and locomotives	1,370.30	
Miscellaneous equipment expenses	3,849.12	9,739.42
Traffic expenses		914.84
Superintendence of transportation	2,091.97	

Power purchased	24,794.10	
Conductors, motormen and trainmen	47,233.33	
Miscellaneous transportation expenses	8,328.53	82,447.93
General expenses	3,660.99	
Injuries and damages	34.90	
Insurance	2,759.15	
Stationery and printing	157.34	
Stores and stable expense	320.05	6,932.44
		\$105,229.02
Profit on operating		16,398.00
		\$121,627.02

Saskatoon and Sutherland Electric Railway.

Cash fares	\$ 6,547.43	
Ticket sales	974.13	
Chartered cars	12.50	
Advertising	2.40	
		\$ 7,574.36

Superintendence of way	\$ 43.35	
Maintenance of way	481.80	
Maintenance of electric lines	90.15	
Maintenance of buildings	41.20	\$ 656.50
Superintendence of equipment	50.25	
Maintenance of cars	473.65	
Maintenance of electrical equipment	147.45	
Miscellaneous equipment expenses	103.85	775.20
Traffic expenses		
Superintendence of transportation	114.90	
Power purchased	1,766.50	
Wages—Conductors and motormen	2,497.15	
Miscellaneous transportation expenses	286.83	4,665.33
General expenses	228.22	
Insurance	72.00	
Stationery and printing	15.78	
Stores and stable expense	7.49	323.49
Capital charges: interest	441.58	
Sinking	157.51	
Depreciation	411.85	1,010.34
		\$7,485.41
Profit		88.95
		\$7,574.36

Recapitulation.

Profit on operating, city line	\$ 16,398.00
Profit on Sutherland extension	88.95
Balance, loss	26,743.34
	\$43,230.29
Interest	\$24,497.51
Sinking fund	9,085.58
Depreciation	9,647.20
	43,230.29
	\$43,230.29

Fares on Lethbridge Municipal Railway.

Canadian Railway and Marine World for January contained a report presented to the Lethbridge, Alta., City Council by Commissioner A. Reid, recommending changes in fares on the municipal electric railway. The following fares were put into effect Dec. 15:—Regular fare 5c. cash or the following tickets: Regular tickets (lilac) 5 for 25c., good at all hours. Limited tickets (brown) 6 for 25c., good from 6 to 8 a.m., 12 noon to 2 p.m., 5 to 7 p.m., not good on Sundays or public holidays. Children's tickets (green) from 5 to 14 years, 10 for 25c. Two children can travel on 5c. cash or one regular ticket. Double fare after midnight, cash or tickets. City employees' tickets for use on city's business only, 25 for \$1.

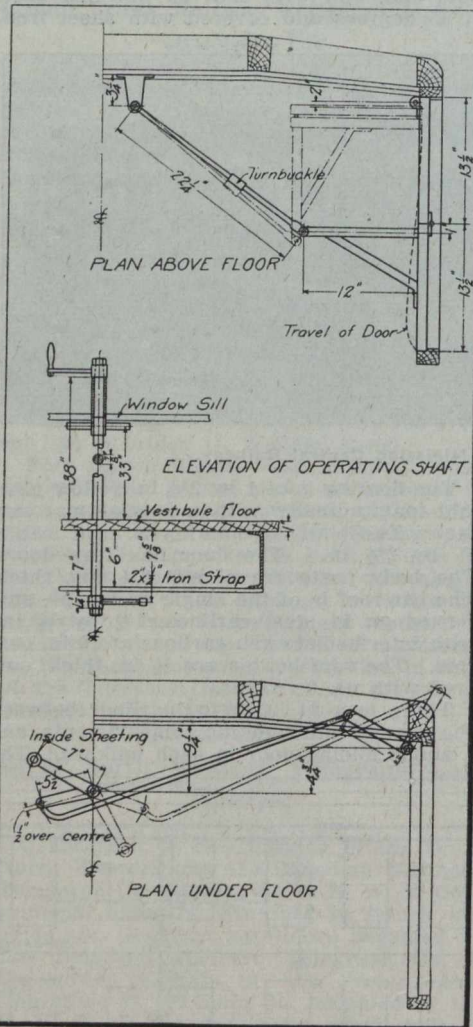
The proposal made by the North Lethbridge Association to reduce the fares to 8 tickets for 25c. was decided against by the commissioners after a long discussion, during which it was shown that the railway would have had to carry 334,000 passengers in addition to the 917,000 carried during 11 months of this year, to give the same revenue.

We are advised that the one man one car system is giving good satisfaction and operating expenses were reduced \$9,000 during nine months of 1914. Of course that cannot all be credited to the one man system, because the car mileage has also been reduced. At present the operating expense is just about equal to the revenue.

Door Operating Mechanism on the Montreal Tramways Company's Cars.

During the last three years, all the new cars added to the Montreal Tramways Co.'s rolling stock, have been of steel frame construction, of a design essentially the same as the first of the type which was described in detail in Canadian Railway and Marine World, Mar., 1912. Since the delivery of the first lot, a number of changes in detail have been made from time to time, and among these is the door operating mechanism.

In the original cars of this design, there was a single leaf swing door from the front vestibule. In more recent cars this has been replaced by a two leaf door, operating with the mechanism shown in the ac-



Door Operating Mechanism for Two Leaf Door on Montreal Tramways Co.'s Cars.

companying illustration. This door is of the folding type, operating without guides, thereby eliminating the possibility of the doors jamming. The inner leaf of the two leaf doors is hinged to the front corner post of the vestibule by a long rod, to which it is secured, and which passes through the vestibule floor, the lower end having a 7 in. crank fastened to it. The operating shaft is in the centre line of the car, midway between the controller and air brake valve. It is a 7/8 in. round shaft with a 7 in. crank handle on the upper end, and a 5 1/2 in. crank on the lower end, the latter connected to the door hinge shaft crank by a 3/4 in. rod, threaded on one end for adjustment. Through this link, the inner leaf of the door may be swung open or closed. To guide the outer leaf of the door, which is hinged to the inner leaf, at the top of this leaf there

is an A frame, standing out 12 ins. from the door, connected by a 22 1/4 in. adjustable rod to an anchor in the front vestibule wall. This restrains the movements of the outer leaf so that its outer edge is in a line approximately parallel to the car side, folding in place against the front vestibule wall.

The several links as mentioned may be adjusted as required, for close fitting of the door. The under floor link is made with an offset inner end, so that when the door is closed, that end is just over the centre 1/2 in., automatically locking in the closed position. This design of door operating mechanism has been worked out by D. E. Blair, Superintendent of Rolling Stock, Montreal Tramways Co., to whom we are indebted for the data on which this article is based.

Windsor, Essex and Lake Shore Rapid Railway Appointments.

Consequent on the accidental death in December of A. W. Westman, Superintendent, A. Eastman, Vice President and General Manager, has made the following appointments:

C. P. Cooper has been appointed Superintendent, in charge of general operation. He has been with the company in various capacities from its construction days, and has been Chief Dispatcher for 4 years.

W. W. Chishoim, heretofore Chief Engineer of Power Plant, has been appointed Electrical Engineer, with supervision over power house, rolling stock and line Department. He has been with the company for 7 years.

A. Baltzer, heretofore Shop Foreman, has been appointed Master Mechanic, in charge of shops and all work in connection therewith.

A. R. Keele, heretofore Assistant Dispatcher, has been appointed Chief Dispatcher, in charge of train crews and train movements.

W. Long has been appointed Assistant Dispatcher. He was at one time with the company in the same capacity but has been in business for himself of late.

C. Loop, who has been acting Roadmaster for the past year, has been appointed Roadmaster, with charge of tracks and all work in connection with same.

J. L. Baird, heretofore Assistant Secretary and Treasurer, has also been appointed Auditor, in charge of accounts, Kingsville office, and all work in connection with same.

H. McDougall has been appointed Line Foreman, in charge of line department.

The Montreal Tramways Co.'s appeal against a judgment in favor of W. Lefevre was argued Jan. 19, in the Appeal Court, Montreal. Lefevre sought \$1,500 damages, claiming that on June 11, 1912, while a passenger on one of the company's cars, his arm came in contact with an obstruction which caused painful wounds and damage to clothes. The company contended that Lefevre imprudently put his arm out of a window while the car was in motion, the injury and damage resulting as a consequence. Lefevre rejoined that the company should have effectively protected the window on that side of the car. The lower court awarded \$999 damages. Judgment was reserved.

Motor omnibusses are, it is said, to be installed in Chicago, Ill., where \$3,000,000 will be spent on their inauguration. They will be owned by the municipality, and a 5c fare will be charged. It is reported that similar vehicles will be used in San Francisco, Cal., to ensure adequate transportation facilities during the Panama-Pacific Exposition.

Toronto Suburban Railway Company's Appeal Granted by British Privy Council.

The Toronto Suburban Ry.'s appeal against the Ontario Railway and Municipal Board's order, requiring it to pave portions of Davenport Road, Toronto, has been granted by the Judicial Committee of the Privy Council, in London, Eng. The case came before the Ontario Board on the application of the city, dated April 25, 1912. The city asked that the railway company be directed to reconstruct and put in a proper state of repair its track and sub-structures on Bathurst St. and Davenport road, and also the roadway used for railway purposes, and 18 ins. on each side of the tracks. The Board ordered the railway company to dig out and pave the track allowance and 18 ins. on each side with such material as the Board's engineer should direct.

The company appealed to the Appellate Division of the Supreme Court of Ontario, which held that the Board had jurisdiction to order the railway to pave and to determine the character of the pavement, but that it could not delegate this power to its engineer, and referred the matter to the Board that it might direct what kind of material should be used. The company contended that under the agreement in force between it and the municipality it was obliged only to repair the portions of the roadway, not to construct a new roadway or pavement. The difference in the cost of repairs and the cost of construction as proposed by the city is estimated by the company at \$50,000.

A Canadian Associated Press cablegram of Jan. 20, stated that the Lord Chancellor, in delivering judgment that morning, said the question which presented the real difficulty arose on the construction of the agreement made in Sept., 1899, between York Tp. Council and the railway company. The land which formed the subject of dispute was included in 1909 within the limits of Toronto corporation, which succeeded to rights and obligations of the other corporation.

Under this agreement the railway company was given the right to construct a railway along roads, including Bathurst St. and Davenport Road. The controversy which arose was substantially as follows:—"Roads in which rails had been originally laid were at that time mud roads, or at all events unpaved. Respondent corporation desired that these roads should be dug out and paved with blocks. Appellant company did not contest their liability to keep the portion of the roads between the rails and 18 ins. on each side in repair, but maintained that they were under no obligation to reconstruct this space so as to make it a roadway of improved character such as the corporation designs for the rest of the roadway on each side.

In support of their case the city relied not only on the agreement itself, but on the Ontario Railway and Municipal Board Act, and as a result of an application by the city the Board made an order directing the railway company to put tracks in proper repair, also to dig out and pave the part of the roadway used for railway purposes, the city being ordered to pave the remaining parts and the Board's engineer to supervise the carrying out of this order.

On appeal to the Supreme Court it was declared that the Board had jurisdiction to make the order, and that the word "tracks" included all that part of any roadway occupied by the railway. The portion of the order appointing the engineer to deter-

mine the kind of pavement to be used was, however, varied on the ground that it did not, as it should, in the view of the court, have done, prescribe the kind of pavement which the company lay, and it was remitted to the Board to determine what kind of pavement it should be.

The Lord Chancellor proceeded: "Their Lordships cannot give to the word 'tracks' used in the context, in which it occurs in section, the wide interpretation placed on it by the court, which extends it not only to rails, but to ground occupied not only between rails, but up to 18 ins on each side. They think the words in section indicate an interpretation of more restricted and literal kind, and exclude from the power given by section the general roadway itself, as distinguished from rails, etc., laid upon it."

In the opinion of their Lordships the other question which arises on interpretation of clause 6 of the agreement of 1899, presents a greater difficulty, and it is only after much consideration that they arrived at a conclusion on this point. It is argued that the obligation of the railway company extends to a portion of the travelled road which the company occupies in whatever improved condition that portion may have been put, the purpose of the section being to secure that the entire roadway shall be in the same condition throughout its entire breadth.

This argument does not, however, suffice to determine the question at issue. It may well be if the roadway has been improved by the city, that the standard of repair is what is contended for, but assuming this to be so the conclusion does not warrant the further inference that the company have bound themselves to change the condition of a portion of the roadway assigned to them by paving it, and so raise the standard of their obligation. It is one thing to undertake to keep what is handed over in proper repair on the footing of maintaining it in a state into which it has been put, and quite a different thing to interpret an agreement "to keep clean and in proper repair" as imposing an obligation to lay a new pavement of a kind which did not exist and was not provided for when the agreement originally was entered into, merely because the municipal authorities have themselves thought it right to improve the remainder of the roadway.

It may well be that if the city desires to pave the whole of the travelled road they may do so at their own expense, using the powers conferred by clause 17 to take up street or road for any purposes within the province and the privileges of the municipal corporation, but the restricted language of clause 6 which imposes an obligation on the railway company appears prima facie to confine that obligation to keeping in proper repair what is already there and not to extend it to doing works which would give a portion of the road between and beside the rails a new character.

"For these reasons their Lordships are of the opinion that the Ontario Railway and Municipal Board had no jurisdiction to make the order appealed from and that the Supreme Court of Ontario was wrong in affirming that order. They will therefore advise His Majesty that the appeal should be allowed and the orders in question be discharged. The city must pay the costs of the appeal and of the appeal to the Supreme Court."

Single Truck Cars for the Toronto Civic Railway.

Three single truck, p.a.y.e., double end operation cars have been ordered by the Toronto Civic Railway for its new Bloor St. West line, which will be similar in most particulars to those in service on the other three lines except that the latter are double truck cars. The new cars will have steel underframes, with arch roofs. The body length will be 21 ft., with 6 ft. platforms 8 ft. wide, making an overall length of 33 ft., and 34 ft. over the buffers. The car floor will be 36 ins. above the rail level, the platform, 26 ins., and the steps, 14 ins. The body will be especially wide, viz., 8 ft. 5 ins. over side sheathing. The cars will be mounted on E21 trucks, having 33 in. cast iron wheels and an 8 ft. wheelbase. The total car weight will be about 25,000 lbs.

Each car will have seating accommodation for 32 persons, in 8 cross seats in the centre of the car, with 4 longitudinal seats, seating 4 each, two at each end. The platforms will have a single door on one side, and double doors on the other, with a folding step from each, the single door with its step, to be operated by the motorman, and the double doors with their steps, to be operated by the conductor from his position inside a pipe railing. The cars will each have two 40 h. p. Westinghouse 533 form L interpole ventilated motors, operated by a C. G. E. K10 controller at each end. The seats will be of rattan. There will also be 6 automatic ventilators in the roof. The cars will be painted a dark green color outside, with an interior finish of golden oak. The ceiling will be of painted agasote. Heating will be by hot air heaters. There will be hand straws suspended from the ceiling over each longitudinal end seat. The cars are being built by the Preston Car and Coach Co. We are indebted to D. W. Harvey, Assistant Engineer, Works Department, for the foregoing information.

Substations on the Toronto Suburban Railway.

Contracts have been let by the Toronto Suburban Ry. for three substations on its Toronto to Guelph line, at Islington, Georgetown and Guelph, Ont., the latter at the corner of Dundas Road and Bay St. The Georgetown station will have 1,000 k.w. capacity, in two 500 k.w. units, while each of the other two will have a single 500 k.w. unit, with provision for the addition of a similar unit in the future. Power will be received at 25,000 volts, a.c., 3 phase, 25 cycle, and will be stepped down and passed through 500 k.w. rotary converters, which will deliver to the line at 1,500 volts, d.c.

The three stations will be of a brick and concrete construction. The Islington station will be provided with living accommodation for the operator, either above the station or in a building adjoining. The Georgetown and Guelph stations will also contain a waiting, baggage and express rooms, and dispatching offices, providing railway station facilities. These will not be added to the Islington layout, as it is not in a densely populated district.

Motor Busses for Toronto. At the Toronto City Council's inaugural meeting for 1915 Mayor Church suggested that the Legislature should be asked to authorise the city to spend \$50,000 on motor busses, without the consent of the people.

The man most in demand today is the one who combines thorough training with natural executive or administrative ability.

Semi-Steel Cars for Niagara, St. Catharines and Toronto Railway.

The Niagara, St. Catharines and Toronto Ry. has received six 55½ ft. semi steel cars for its interurban service. They have an overall height of 13 ft., with a body width of 10 ft., with underframing and sides of steel. The total weight of each car is about 75,000 lbs., and they have a seating capacity for 67 persons each. They are designed for operation in two car trains, for which purpose the front car has in addition to the main and smoking compartments, common to both classes of cars, a baggage section. The leading car has high backed seats with head roll upholstered in green leather, and the rear car is upholstered in plush. A passage way, alongside the smoking compartment, leads from the car end into the main compartment without necessitating passage through the smoking room.

The cars are finished in polished quarter cut oak, inlaid with white holly, in a mission finish, agasote headlinings and empire decks, all carried on the steel framing. The trimmings throughout are statuary bronze. Special attention has been given to the ventilation and lighting. They are also equipped with the latest type of forced draught electric heaters with thermostat control. The exterior finish is a steel gray, with black and gold lettering, which has

pany whose trains are operated either by steam or electricity seeks the Board's approval for a crossing of its tracks over the tracks of an existing railway under the Board's jurisdiction, the expense of installing the crossing and the cost of maintaining protective devices is usually put upon the junior road. The trains of the senior road are given the right of way at the crossing over trains of a similar class of the junior road. For the purpose of ensuring the rights of the senior road at the crossing, it is usual to require that the man being placed in charge of the protective devices installed at the crossing should be nominated by, or acceptable to, the senior road; but, as all the expense is placed upon the junior, the man in charge of the crossing is paid by the junior road.

"In the case before us, the Winnipeg Electric Ry., while admitting its obligation to pay the flagman at the Logan Ave. crossing, objects to carrying him on its pay roll and suggests that he should be put upon the pay roll of the senior company and that the C.P.R. should be reimbursed by the Winnipeg Electric Ry. whatever amounts it has to pay the man in wages. It is evident that the railway companies are endeavoring to avoid any legal consequences which may flow from an act of negligence of the man in charge of the crossing, which might fasten responsibility on his employer. Without expressing an opinion as to

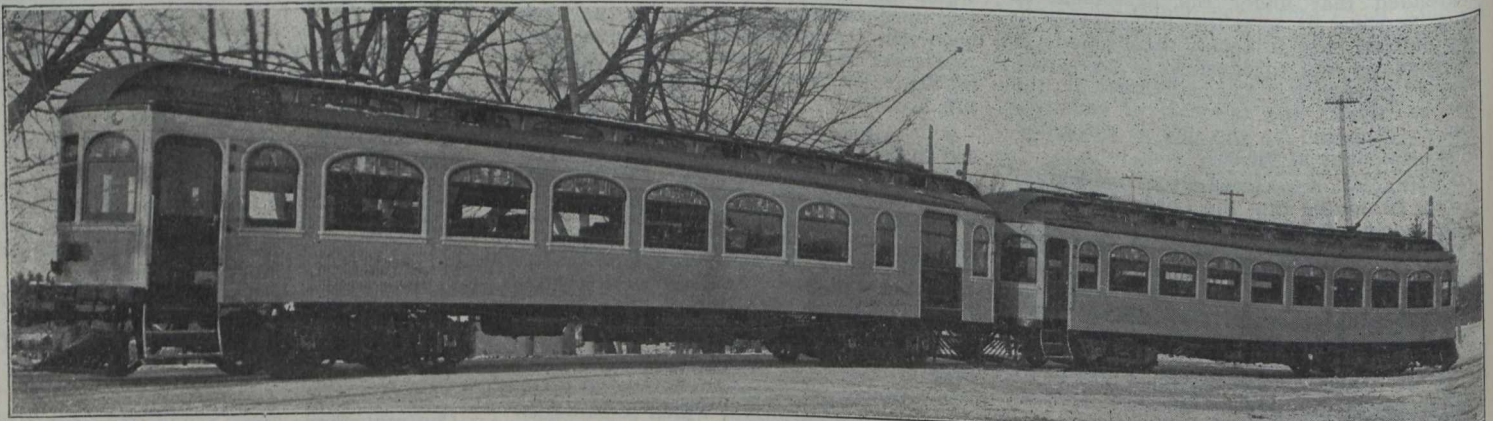
Mainly About Electric Railway People.

Mrs. Thomas Ahearn, wife of the President, Ottawa Electric Ry., died at Ottawa, Jan. 3. She was very active in many prominent works of a philanthropical and educational nature.

A. E. Beck, K.C., Permanent Counsel, British Columbia Electric Ry., Vancouver, who has retired to re-engage in private practice, was presented with a cabinet of silverware by the head office staff at a farewell dinner, Dec. 30.

W. P. Cooke has been reappointed Chairman of the Port Arthur (Ont.) City Utilities Commission, which controls, among other utilities, the municipal electric railway. The commission consists of four elected members, with the mayor ex officio. In future, elections will be for two year terms, and two of the members will retire each year.

William Wesley Chisholm, who has been appointed Electrical Engineer, Windsor, Essex and Lake Shore Rapid Ry., Kingsville, Ont., was born at Caradoc, Ont., Oct. 17, 1876, and entered railway service in June, 1896, since when he has been, to Apr., 1897, switchman, Michigan Central Rd., St. Thomas, Ont.; Apr., 1897, to Mar., 1898, yard conductor and Assistant Yardmaster, Toronto, Hamilton and Buffalo Ry., Hamilton, Ont.; Mar., 1898, to June, 1903, brakeman,



Two Car Train, Niagara, St. Catharines and Toronto Railway.

been adopted as standard by the company. They are also equipped with electric markers and classification lights.

The wheels are steel tired, with cast iron centres and M. C. B. journals. The electrical equipment consists of four GE219 75 h.p. motors, with type M.K. multiple unit control, the master controller having dead man release handle. The air equipment consists of the Westinghouse A.M.M. train control. They are equipped with Tomlinson radial automatic couplers, with the automatic air connecting feature. They are also equipped with straight air brakes. They were built by the Preston Car and Coach Co.

Responsibility for Watchmen at Railway Crossings.

Following a hearing at Winnipeg, Nov. 16, 1914, D'Arcy Scott, Assistant Chief Railway Commissioner, gave the following decision, Dec. 31, respecting the responsibility for watchman at the Winnipeg Electric Ry.'s crossing over the C.P.R. at Selkirk Ave.:-

"A difference of opinion as to which company should be responsible for the acts of a flagman having arisen between the Winnipeg Electric Ry. Co. and the C.P.R. Co., the matter has been referred to the Board. The question has been before the Board on several occasions. Where a railway com-

pany whose trains are operated either by steam or electricity seeks the Board's approval for a crossing of its tracks over the tracks of an existing railway under the Board's jurisdiction, the expense of installing the crossing and the cost of maintaining protective devices is usually put upon the junior road. In many cases it is a detriment; but, crossings must be allowed in the public interest. It is the advent of the junior road at the point of crossing that produced an element of danger. The junior road gets the benefit of being permitted to cross the tracks of the senior, and it should bear all the expense and responsibility; unless, of course, an accident is caused by the negligence of an employe of the senior road. In cases of this kind I think the proper practice is to have the man in charge of the crossing on the junior company's pay roll. If the man nominated by the senior company is not acceptable to the junior company, it is a simple matter for the two companies to find a man who would be acceptable to both.

"It will probably be sufficient for a copy of this memorandum to be sent to the parties interested; but, if either of them requires a decision put in the shape of an order, an order can go accordingly. I want to point out that the above does not apply in the case of a street railway which is owned and operated by a municipality and is operated on a municipal highway. In such cases a different principle applies."

Michigan Central Rd., St. Thomas, Ont.; May, 1905, to Nov., 1907, Assistant Chief Engineer, City Pumping Station, St. Thomas, Ont.; Nov., 1907, to Jan. 1, 1915, Chief Engineer, Power Plant, Windsor, Essex and Lake Shore Rapid Ry., Kingsville, Ont.

A. W. Westman, Superintendent, Windsor, Essex and Lake Shore Rapid Ry., who was electrocuted at Kingsville, Ont., Dec. 21, as stated in Canadian Railway and Marine World for January, was born in London Tp., Middlesex County, Ont., Aug. 1, 1879. He started work with the London, Ont., Street Ry. in March, 1897, as a pitman, and in 1900 was put on overhead trolley construction and was subsequently appointed Line Foreman. In March, 1908, he went to the Windsor, Essex & Lake Shore Rapid Ry. as Superintendent of Shops at Kingsville and in July, 1909, was appointed Superintendent in charge of line, track equipment and operation, in which position he succeeded in solving some of the most important problems in connection with the operation of the single phase system.

The proper forging heat for high speed steel is said to be between 1,650 and 1,900 degrees Fahr., dependent on the different makes of alloys. Forging below these temperatures will cause the crystals to crush and rupture.

British Columbia Electric Railway's Annual Report.

Following are extracts from the report of the year ended June 30, 1914, presented at the annual meeting in London, Eng., recently:—The directors regret that the report is not of so satisfactory a character as those which the shareholders have been accustomed to receive in the past, and that, in order to maintain the usual dividends, it will be necessary to supplement the profits by a transfer of £10,000 from the reserve. The directors recommend this course with some hesitation, in view of the extremely unfavorable outlook for the current year caused by the war, but they desire to avoid throwing any additional hardship upon the stockholders at this time, and for that reason propose to draw upon the reserve. At the last annual meeting it was pointed out that the earnings for the year now under review, were being adversely affected by the conditions then prevailing. The depression in trade, to which reference was then made, unfortunately became accentuated as the year advanced, and rigid economy has been necessary to achieve the results shown by the accounts. Further economies are still being effected wherever it is possible to put them into force.

The following charges have been made against the revenue account for the year:—

Provision for renewals maintenance	£149,921	10	8
Added to capital amortization ..	2,455	6	4
Total	£152,376	17	0

The net profit for the year, after making the above deductions, amounts to	£393,956	7	8
Add—			
Balance brought forward from last year	9,518	19	4
Amount transferred from reserve fund	10,000	0	0
	£413,475	7	0

Deduct—			
Interest on debentures and debenture stock to June 30, 1914....	£132,990	19	5
Dividends already paid—			
On 5% cumulative perpetual preference stock for the year to June 30, 1914	72,000	0	0
On preferred ordinary stock for the year to June 13, 1914	86,400	0	0
On deferred ordinary stock for the six months to Dec. 31, 1913 ..	57,600	0	0
	348,990	19	5

Leaving available for further distribution	£ 64,484	7	7
From this the directors have recommended the payment of a dividend on the deferred ordinary stock at the rate of 8% per annum for the six months ended June 30, 1914, making 8% for the year	57,600	0	0
To carry forward to next account	£6,884	7	7

Owing to the depression, the large employers of labor in British Columbia have been temporarily forced to postpone all new work, and as a result it is reported that there has been a decrease in the population of Vancouver and the neighboring districts of approximately 20,000 inhabitants; and there has consequently been a decrease of over 8,500,000 in the number of passengers carried during the year. The financial effect of this decrease in passengers would have been even more marked but for the small advance in fares put into force in Sept., 1913. The directors anticipated some

improvement during the latter half of the present year, but these hopes were extinguished on the outbreak of war. All companies operating in a new country have at times to face periods of severe reaction in the development of their business. As a result of the war commercial conditions in British Columbia could not well be worse than they are at present, and the revival in trade may be greatly retarded. Stockholders must consequently be prepared for a drastic reduction in future dividends, but the directors believe that the halt in the development of the Province will, in the end, result in more stable conditions.

During the past year the expenditure on capital account has been reduced to a minimum. A public utility company must continuously incur certain capital outlay to comply with its franchise obligations, but the policy of limiting expenditure to absolute necessities will be rigidly followed until the return of more prosperous times.

In reviewing the work which has been accomplished, the Chief Engineer reports that the plant is in a satisfactory state of efficiency, and that the company is in an excellent position to profit by the improvement in the business conditions of B. C. when it takes place.

It is with the greatest regret that the directors announce that J. Buntzen, who retires at the annual meeting, has decided not to seek re-election, owing to his continued residence in Denmark. Mr. Buntzen has, however, consented to accept the position of adviser to the directors, and they intend to appoint him. The benefit of his invaluable advice and experience will thus be available to the company. During the first eight years of the company's existence Mr. Buntzen was General Manager in British Columbia, and the company owes him a debt of gratitude for his many years of close devotion to its affairs and for the benefits secured by his clear judgment and foresight. In order to be kept in the closest touch with the conditions prevailing in British Columbia and with the details of the company's business, the board has appointed R. H. Sperling (who has for the past nine years held the position of General Manager in British Columbia) as Assistant to the Chairman, and has elected him a director in succession to Mr. Buntzen. The Board has appointed to succeed Mr. Sperling as General Manager, Geo. Kidd, formerly Secretary and recently Comptroller to the Company. The board are confident that they have secured a very capable successor to Mr. Sperling. The directors again have pleasure in expressing their appreciation of the loyal and satisfactory services rendered by the management and staff in British Columbia.

Although the Directors recognize that the immediate future must be a period of adversity, during which a large reduction of dividends will be necessary, they see no reason to lose confidence in the future of the company's undertakings.

The comparative statement appended to the report shows the income, after charging renewals maintenance to have been \$410,229 in 1913-14 against \$401,836 in 1912-13. The number of passengers were 63,429,023 in 1913-14 against 71,973,822 in 1912-13.

The following expenditures were made on capital account:—Rolling stock, \$718,543.32; permanent and double tracking and sundry improvements, \$267,002.01; track extensions, \$206,988.11; lighting extensions, \$79,427.50; power extensions, \$50,477.45; steam plant, \$44,788.39; lands and buildings, \$512,900.07; electrical machinery, \$477,

995.77; extending light and power system, \$135,597.89; North Vancouver, rolling stock, meters, transformers, and initial installations, \$2,784.48; sundries, \$48,641.66; Transmission lines and railway feeders, \$25,556.59. Total, \$2,571,003.24. In addition to the above there was a capital expenditure of £317,386 9s. 9d. by subsidiary companies.

The chairman, R. M. Horne-Payne, was unable to attend the annual meeting, but had prepared some remarks, which were read by T. Blundell Brown. The report and accounts were adopted and the retiring directors, R. M. Horne-Payne and R. H. Sperling, were re-elected.

Electric Railway Notes.

The City of Brantford has received six cars for its municipal electric railway, from the Preston Car and Coach Co.

The Regina, Sask., Public Utilities Committee has directed that monthly statements showing receipts and expenditures on the Municipal Ry. be presented.

The Niagara, St. Catharines and Toronto Ry. has received 2 suburban cars, 55 1/2 ft. long, the balance of an order for six, from the Preston Car and Coach Co.

Mayor Spence, in his inaugural address to the Brantford, Ont., City Council, Jan. 10, urged the appointment of a Public Utilities Board to manage the municipal railways and other public utilities owned by the city.

The Toronto Suburban Ry. has installed a telephone dispatching system on its Weston and Woodbridge Division. Cars are being operated between West Toronto and Weston every quarter of an hour, and to Woodbridge every two hours.

The Mayor of Toronto proposes to ask the Ontario Legislature for legislation to nullify a recent decision of the Imperial Privy Council, which decided that the Toronto Ry. could not be compelled to build and operate lines outside the city limits as defined in 1891.

The British Columbia Electric Ry. started operating its cars in Victoria, B.C., on a new schedule, Jan. 4. One or two services have been abandoned, and on other routes the interval between cars is 15 instead of 10 minutes. On Sundays the service starts at 9 a.m. and ceases in the evening an hour earlier than formerly.

The Saskatoon, Sask., City Council, Jan. 7, in passing the street railway estimates for this year, desired to have the Commissioners bring in a detailed report on the public utilities, of which the municipal railway shows a loss. Press reports state that "a general shake up of far reaching importance is due very shortly." A telegraphic dispatch, dated Saskatoon, Jan. 10, and published in outside papers, states that notice of motion has been given for an early meeting of the Council, to consider the selling of the municipal railway and the granting of a franchise to a private company.

In connection with the recent negotiations between the Toronto City Council and the Toronto Ry. and Toronto Electric Light Cos., concerning the proposed purchase of the two companies by the city, John Mackay and Co., Toronto, have presented a claim on the city for \$42,546.50, including a personal fee of \$37,500, and also fees for counsels' opinions. City Counsel Geary has given his opinion that the city is not liable, claiming that Mr. Mackay was not legally retained. In addition to the foregoing amount, expenditures during the period negotiations were in progress, total \$25,123.44, including Bion J. Arnold \$10,744.49; J. W. Moyes \$2,200; W. A. Ross and Co. \$6,948.95; D. E. Thomson, K. C. \$5,200, and miscellaneous \$30.

Electric Railway Projects, Construction, Betterments, Etc.

Brantford Municipal Ry.—The Brantford City Council is operating the Brantford St. Ry. and the Grand Valley Ry., the latter of which extends from Brantford to Galt, Ont., under the title of the Brantford Municipal Ry. For legal purposes, the old titles are not affected. The official inauguration of the lines under municipal ownership was celebrated Dec. 18, when the Commissioners gave the Mayor and a large number of guests a trip and entertained them at luncheon. Hydro Electric Power Commission's power is used on the Galt section of the line, and over the Paris section from Jan. 1. In Brantford, power is secured from the Dominion Power and Transmission Co. Hydro Electric Commission's power. (Jan., pg. 28.)

British Columbia Electric Ry.—During 1914, the company expended about \$90,000 on laying down permanent tracks, principally on Fort St. and Pandora Ave., Victoria, B.C., and \$12,000 was expended on the betterment of other tracks in the city.

During 1914, the company laid 7.83 miles of permanent track in Vancouver and suburbs, to replace temporary tracks, all the work having been done in connection with the city's street paving operations. In Victoria, in addition to 1.05 miles of ordinary reconstruction work, the company replaced 2.49 miles of temporary tracks with permanent ones. New lines were built as follows:—Vancouver and suburbs, 2.13 miles; New Westminster and suburbs, 0.50 mile; Victoria and suburbs, 1.29 miles; interurban lines, 5.14 miles; total, 9.06 miles. The single track mileage of the company's lines at Dec. 31, 1914, was:—

	Miles.
Vancouver and suburbs	97.39
New Westminster and suburbs	16.66
Victoria and suburbs	41.55
North Vancouver and suburbs	11.07
Interurban lines	180.38
Total	347.05

(Nov, 1914, pg. 516.)

Eastern Ontario Electric Ry.—The Ontario Legislature is being asked to extend the time within which this projected railway from Cornwall to Toronto, and from Ottawa to Brockville, with branches, may be built. The company was incorporated in 1909, with head office at Cobourg, Ont., the provisional directors being E. C. Rendell, Transportation Superintendent, Mobile and Ohio Ry., Mobile, Ala.; Jas. Duncan, President, Litchfield and Madison Ry., Alton, Ill.; W. A. Robinson, New York; C. H. Krause, St. Louis, Mo.; E. J. Krause, St. Louis, Mo.; W. H. Lincoln, Boston, Mass.; G. E. Smith, Boston, Mass. In 1913, an extension of time for construction was granted and the provisional directors changed by striking out all but E. C. Rendell, and G. E. Smith, and substituting the following:—H. Hastings, C. S. Foss, G. T. Taylor, Boston, Mass. The company now desires to substitute the name of L. R. Murdock, Boston, in place of H. Hastings. The notice of application is signed by G. E. Smith, for the company. (Mar., 1913, pg. 141.)

Guelph Radial Ry.—We are officially advised that a 1,200 ft. switch has been built on Suffolk St., Guelph, Ont., to connect with the G.T.R. It will not be used for traffic until the spring. (Dec., 1914, pg. 553.)

Humber Valley Electric Ry.—The Ontario Legislature is being asked to extend the time for the construction of this projected railway from Dundas St., Lambton Mills, along the west bank of the Humber River to Bloor St., Toronto, crossing to the east bank of the river and continuing to the Lake Shore Road, with branches not to exceed three miles in length. W. N. Ferguson, To-

ronto, solicitor for company. (May, 1913, pg. 235.)

Hydro Electric Power Commission of Ontario's Projected Railways.—The question of the building of an electric railway from the Niagara frontier, via Hamilton, to the Georgian Bay is under the Commission's consideration. Controller Morris, Hamilton, is reported to have stated, Jan. 4, that F. A. Gaby, Chief Engineer of the Commission, had shown him plans for a line from Queenston and Dunnville, through Hamilton, to Georgian Bay, and that the surveys had been completed for this and connecting lines from Dunnville to Beamsville, from Queenston to Beamsville, and from Guelph to Toronto; that preliminary surveys had been made on other sections of the district to be served, and that the surveys would be resumed almost immediately. The construction of the line, Mr. Morris said Mr. Gaby informed him, would depend entirely on the action Hamilton was prepared to take.

The hydro electric bylaw was defeated by the ratepayers of Newmarket, Ont., Jan. 3, by 398 to 287 votes. T. H. Lennox, M.L.A., is reported to have said: "Newmarket defeated the Hydro radial bylaw last summer, and this additional reverse would seem to exclude that area from the radial zone." The bylaws voted on at the recent municipal elections were enabling, and money bylaws for the power lines. Representatives of the municipalities which have accepted the radial railway bylaws are expected to meet at an early date to discuss the situation. Newmarket village and Uxbridge township are the only places where the bylaws were defeated last summer.

Arrangements are being made for a meeting at London, Ont., of representatives of the townships interested in the building of an electric railway from London to St. Marys and Exeter, under the Commission. (Dec., 1914, pg. 553.)

Montreal and Southern Counties Ry.—The Montreal City Council has decided to grant the company an extension of time for the laying of tracks across McGill St. indefinitely. The agreement called for the starting of work by Jan. 1. It was subsequently found that the Board of Railway Commissioners could not deal with the matter until after that date, and the Montreal Tramways Co. started proceedings to have the agreement set aside, hence the necessity for the postponement of date fixed for starting work. (Dec., 1914, pg. 553.)

Montreal Tramways Co.—The Quebec Legislature is being asked by the town of Mount Royal for an extension of time within which it may make arrangements with the M. T. Co. and the Montreal Public Service Corporation for the building of electric railways, etc.

The Montreal Board of Control, Jan. 4, in accordance with a resolution passed Dec. 30, began a systematic study of the M. T. Co.'s franchises, etc., with a view of reaching a definite solution of the whole question. The documents involved include 23 separate franchises, granted by the various municipalities now forming the city of Montreal; numerous engineering and statistical reports; and several suggested plans for settling the matters involved, and they make a volume of over 600 pages. At the discussion on Jan. 9, the City Attorney was directed to give an opinion as to the various franchises, the rights comprised in them, and the legal value of the same, exclusive of the renewal of bylaw 210 and its amendments.

The Board of Control has passed a resolution urging the City Council to arrange for the construction of a tunnel under the La-

chine Canal, near the present Wellington Bridge, and to arrange for the cooperation of the M. T. Co. and the Dominion Government in the work. The tunnel would replace the bridge. The Council, Dec. 11, voted \$1,500 to secure the service of an expert to aid E. R. MacLeod, the city engineer in charge of railway work, to prepare plans. (Dec., 1914, pgs. 554 and 555.)

Niagara, Welland and Lake Erie Ry.—Application is being made to the Ontario Legislature for the confirmation of an agreement granting the right to the company to operate a surface street railway in Welland, and the confirmation of a second agreement fixing the assessment of the company's property there at specific sums for five year periods, terminating in 1934. J. F. Gross, Welland, Ont., solicitor for company. (Mar., 1914, pg. 135.)

Ottawa Electric Ry.—The franchise for the operation of an electric railway, granted by the village of Hintonburg, Ont., which now forms part of the city of Ottawa, expires May 11. The lines affected by the franchise are those from the west side of Somerset St. bridge, along Holland Ave. as far as the G.T.R. bridge on the way to the Experimental Farm. From Holland Ave to the city limits westerly, the company's lines are on their own right of way, so are not affected by the agreement. The city proposes to take up the consideration of the matter at once. (Dec., 1914, pg. 553.)

Pictou County Electric Co.—We are officially advised that the company has under consideration the building of an extension from Potiers bridge to Pardale, N.S., half a mile. L. T. Flaherty, New Glasgow, N.S., is Manager.

St. John's, Newfoundland.—Press reports state that the Reid Newfoundland Co. proposes to build about a mile and a half of additional track during this year. W. D. Reid is President and General Manager, St. John's, Nfld.

Toronto.—A proposition has been made by E. A. Wallberg, 11 Adelaide St. E., to the City Council for the construction, at an estimated cost of \$200,000, of an electric railway from Leaside to Merton Ave., North Toronto.

Toronto Civic Car Lines.—The estimates on capital expenditure prepared for the Toronto City Council include \$300,000 on account of street railway repairs and \$800,000 on account of the construction of new city owned lines.

At the municipal election, Jan. 1, the ratepayers voted in favor of raising \$105,000 for the building of a civic line from St. Clair Ave. southerly, by way of Lansdowne Ave., to Bloor St. West, to connect two of the car lines operated by the city; also, of raising \$320,000 to build and equip a line in North Toronto, from the C.P.R. tracks at Alcorn Ave., northerly by Mount Pleasant cemetery and Mount Pleasant Road to Randeigh Ave. The ratepayers also voted in favor of the purchase by the city of that portion of the Toronto and York Radial Ry. from Queen St. East, along Kingston Road, to Main St., about 1¾ miles.

The Toronto Lacrosse and Athletic Association and other ratepayers in North Rosedale, are applying to the Ontario Legislature for an act "to compel the city of Toronto to lay down and operate a municipal car line from the south limit of the North Glen Road bridge, Ward 2, along Glen Road to Summerhill Ave., south on McLellan and Scholfield Aves., east on Highlands Ave., and south on Glen Road to the place of commencement; to compel the city to reconstruct the North Glen Road bridge, so as to accommodate a double line of car tracks; and to enable the city to issue debentures for the cost of the car line and the reconstruction of the bridge, without the consent

of the ratepayers, inasmuch as the ratepayers voted before affirmatively for the said car line."

Toronto Eastern Ry.—Application is being made to the Dominion Parliament for an extension of time for completing the line authorized to be built from Toronto easterly to Cobourg, Ont., with branches as follows:—From Cobourg or Port Hope northerly to Peterborough; from Scarborough tp. to Markham, Stouffville or Uxbridge; from Oshawa northerly via Lake Scugog to Lindsay; from Oshawa southerly to Lake Ontario. Young and McEvoy, Toronto, solicitors for company. (July, 1914, pg. 356.)

Toronto Suburban Ry.—When work ceased for 1914 on the extension to Berlin, track had been laid from near Lambton to mileage 43.50, that is 41.50 miles of steel had been laid. Of this, 15 miles had been ballasted and the poles had been put up on 16 miles. We are officially advised that it is intended to start operations immediately and that it is hoped to have the line in operation to Georgetown by July and to Guelph by October. Power converter stations are to be built at Islington, Georgetown and Guelph.

Plans for the bridge over the Humber River have been prepared. It will have a total length of 502 ft. and will consist of four plate girder spans, resting on three steel towers and two concrete abutments. It will be 12 ft. lower than the C.P.R. double track bridge completed recently. E. T. Wilkie is Chief Engineer. (Nov., 1914, pg. 517.)

Toronto and York Radial Ry.—The Ontario Legislature is being asked to extend the time for the building of the various lines and branches authorized, and for power to lay out a double track line on Yonge St., Toronto, from the company's southerly terminus to the north limits of the city, subject to such an agreement with the city of Toronto as shall be approved by the Ontario Railway and Municipal Board. (Sept., 1914, pg. 431.)

Tramways Limited.—The agreement between the Edmonton, Alberta, City Council and the company was ratified by the ratepayers, Dec. 14, 1914, the voting being: For the bylaw, 8,849; against, 4,499; majority in favor, 4,350.

The directors are:—A. E. Farncomb, President; H. Stutchbury, S. D. Hogan, G. Creedwell, S. Carson, W. Golley, S. H. Smith.

Local press reports state that the company has already graded several miles from the city limits, and has bought right of way from the landholders along the side of the road allowance. (Jan., pg. 28.)

Electric Railway Finance, Meetings, Etc.

British Columbia Electric Ry.—The percentages payable to Vancouver for 1914 were \$69,503.01, against \$81,166.73 for 1913. The number of passengers carried decreased from 46,731,449 in 1913 to 37,549,575 in 1914.

British Columbia Electric Ry. and allied companies.—Gross earnings for November \$648,485; operating expenses, maintenance, etc. \$501,224; net earnings \$147,261, against \$746,152 gross earnings; \$544,508 operating expenses, maintenance, etc.; \$201,644 net earnings, for Nov. 1913. Aggregate gross earnings for five months ended Nov. 30., \$3,324,836; net earnings \$762,931, against \$3,760,507 aggregate gross earnings; \$976,721 net earnings, for same period 1913.

Cape Breton Electric Co.—Gross earnings for November, \$30,044.59; operating expenses and taxes \$17,847.12; net earnings \$12,197.47; interest charges \$5,227.58; balance \$6,969.89; bond sinking and improve-

ment funds \$1,373.34; balance for reserves depreciation, etc. \$5,596.55, against \$34,848.93 gross earnings; \$18,080.19 operating expenses and taxes; \$16,768.74 net earnings; \$4,808.33 interest charges; \$11,960.41 balance; \$1,190 bond sinking and improvement funds; \$10,770.41 balance for reserves depreciation, etc., for Nov. 1913. Aggregate gross earnings for 11 months ended Nov. 30, \$321,510.99; net earnings \$130,004.17; interest charges, etc., \$71,540.07; net balance \$59,826.08, against \$343,371.06 aggregate gross earnings; \$150,218.49 net earnings; \$66,896.15 interest charges, etc.; \$83,322.24 net balance for same period 1913.

Edmonton Radial Ry.—The financial report for 1914 laid before the Edmonton, Alberta, City Council contains the following:—"The year's operations in the street railway department have added approximately \$220,000 to the accumulated deficit at the beginning of the year of \$504,000. This deficit includes over \$250,000 for depreciation. The total receipts during 1913 were \$632,008.82, and in 1914 \$643,055.53, an increase in passenger and freight receipts of over \$11,000."

London St. Ry.—Gross earnings for December, \$33,922.34; expenses \$24,058.86; net earnings \$9,863.48, against \$29,816.72 gross earnings; \$21,330.57 expenses; \$8,486.15 net earnings for Dec. 1913. Aggregate gross earnings for 12 months ended Dec. 31, \$373,184.72; expenses \$265,503.39; net earnings \$107,711.33.

London and Port Stanley Ry.—The London (Ont.) City Council, at its inaugural meeting, Jan. 11, made no change in the London Railway Commission, which has charge of the L. & P. S. Ry. The members are Sir Adam Beck, chairman, P. Pocock, M. D. Fraser and W. Spittal.

Montreal Tramways Co.—A report presented to the Montreal Board of Control, Jan. 7, claimed that the M.T. Co. was indebted to the city as follows:—Taking up snow in 1912-13, \$20,696.45; in 1913-14, \$95,703.12; company's share of St. Lawrence Boulevard tunnel, \$15,000; percentage on receipts for year ending Oct. 1, 1914, estimated, \$472,511; total, \$603,911.57. The City Treasurer stated that the city was being compelled to pay large sums in interest on account of the company not paying promptly.

E. A. Robert, President, and J. L. Perron, K.C., had a conference with the Board of Control, Jan. 20, to arrange a settlement of all financial matters in dispute between the company and the city.

Moose Jaw Electric Ry.—The directors announced, Jan. 7, according to a press dispatch, that owing to the general depression through the west, and the decrease in traffic, they were unable to declare the semi-annual dividend but that the resumption of dividend payments was not far off.

Saskatoon Municipal Ry.—The estimates for this year, presented to the Saskatoon, Sask., City Council, Dec. 31, show as estimated receipts, \$136,405, with an expenditure of \$173,405, distributed as follows:—Maintenance of ways and structures, \$5,600; maintenance of equipment, \$10,500; traffic expenses, \$900; conducting transportation, \$95,300; general and miscellaneous, \$7,905; capital charges—interest, sinking fund and depreciation, \$56,200. Estimated deficit, \$36,000.

Receipts for Dec., 1914, \$12,900.75, against \$14,039.58 for Dec., 1913; operating expenses, \$11,925.60; capital charges, \$4,424.10; deficit, \$3,448.95. Total car mileage, 58,781, against 60,133 in Dec., 1913. On the Sutherland line the receipts were \$713.97; operating charges, \$808.55; the capital charges, \$101; deficit, \$195.58; passengers carried, 13,631.

A statement made, Jan. 6, shows the result of the first four days operation of the street cars under the ticket system, as compared with the corresponding four days of Dec., 1914. The number of passengers carried was 31,612, representing \$1,375, against 29,489 passengers and \$1,483 under the cash fare system previously in operation. The \$1,375 mentioned represents the value in cash of the tickets deposited in the fare boxes, and not of the strips of tickets sold.

Sherbrooke Ry. and Power Co.—Gross earnings for five months ended Nov. 30, 1914, \$63,065.07; operating expenses \$37,482.45; net earnings \$25,582.62, against \$61,416.54 gross earnings; \$36,812.45 operating expenses; \$24,604.09 net earnings, for same period 1913.

Toronto Ry., Toronto and York Radial Ry. and allied companies.—Gross earnings for November \$824,634; operating expenses, maintenance, etc., \$431,109; net earnings; \$393,525, against \$849,279 gross earnings; \$409,973 operating expenses, maintenance, etc.; \$439,306 net earnings, for Nov. 1913. Aggregate gross earnings for 11 months ended Nov. 30, \$9,296,377; net earnings \$4,531,278, against \$8,893,984 aggregate gross earnings; \$4,438,524 net earnings, for same period 1913.

The Toronto Ry.'s gross receipts for December were \$497,424.20, compared with \$523,829.17 in Dec. 1913. The percentage paid to the city for December was \$59,610.68 against \$65,685.99 in Dec. 1913. The aggregate gross receipts for 1913, were \$6,134,912.15 against \$6,049,018.92 for 1913. The city percentage for 1914 was \$953,940.24, an increase of \$39,949.31 over the previous year.

Winnipeg Electric Ry.—Gross earnings for November, \$330,398; operating expenses \$206,394; net earnings \$124,004, against \$360,082 gross earnings; \$198,874 operating expenses; \$161,208 net earnings, for Nov. 1913. Aggregate gross earnings for 11 months ended Nov. 30, \$3,732,901; net earnings \$1,547,412, against \$3,698,831 aggregate gross earnings; \$1,658,193 net earnings, for same period 1913.

Winnipeg Electric Ry.—An issue of \$1,500,000 of one and two year 6% notes has been placed on the Chicago, Ill., Exchange by W. A. Read & Co. The notes have been issued to pay off the floating indebtedness.

The City Treasurer reported, Jan. 16, that the company's receipts, upon which the city is entitled to 5% amounted during 1914 to \$2,320,538.13, five per cent. on which is \$116,026.90. In addition to this the city is entitled to \$20 for each car operated, and it is estimated that 310 cars will be paid on, making \$6,200, or a total of \$112,226.90; about \$3,000 less than in 1913.

Brandon Municipal Ry. Wages.—As stated in Canadian Railway and Marine World for January, the management reduced the car hours from 18 to 17 hours a day and paid motormen 8½ hours each, not allowing for reporting time, which is 10 minutes. As stated, the motormen sent a request to the City Council to be paid for reporting, and also asked 9 hours' pay. We are officially advised that the City Council acceded to the request, and that the line is running 18 hours a day again. Ten minutes is allowed for reporting at the car barn only, and the rate of wages is 30c. an hour. Conductors are not employed, the one-man car system having continued in operation since Feb. 12, 1913.

Centre entrance stepless cars are to be put in operation as trailers on the Detroit United Ry., Detroit, Mich. They will be built of steel, the point of entrance being 14 ins. above rail level, with an interior step of 9 ins.

Electric Railway Track Laid in 1914.

The following table gives information contained in replies received to Canadian Railway and Marine World's annual circular as to new track laid in 1914. The figures show a total of 80.60 miles against 204.19 in 1913 and 106.56 miles in 1912:—

	Miles.	Miles.
British Columbia Electric Ry.		
Vancouver and suburbs	2.13	
New Westminster	0.51	
Victoria and suburbs	1.29	
Interurban lines	1.21	
Fort William Electric Ry.		5.14
Extensions		2.00
Guelph Radial Ry.		
Suffolk St. switch to G.T.R.		0.50
Hamilton St. Ry.		
Extensions, Kenilworth Ave., etc.		2.30
*Montreal Tramways Co.		
Various extensions		5.00
Moose Jaw Electric Ry.		
Boulevard Heights extension	1.00	
Extension on Hall St.	1.00	
*Port Arthur Electric Ry.		2.00
Extensions		2.00
*St. John Ry.		
Kanes Corner extension		1.50
Saskatoon Municipal Ry.		
Extension on Ave. 26		2.00
Suburban Rapid Transit Co.		
Extensions near Winnipeg		1.37
*Toronto Eastern Ry.		
Extension		1.73
Toronto Suburban Ry.		
Near Islington to mileage 43.50		41.50
Winnipeg Electric Ry.		
Various extensions		7.56
Winnipeg, Selkirk and Lake Winnipeg Ry.		
Stony Mountain to Stonewall		7.50
Total		80.60

Discussion of the Edmonton Municipal Railway Situation.

A summary of Commissioner Harrison's report to the Edmonton (Alta.) City Council on the Edmonton Radial Ry.'s affairs was given in Canadian Railway and Marine World for Dec., 1914, on pg. 551. The Edmonton Bulletin of Jan. 8 contained a page article by J. Chalmers, a former Commissioner, reviewing the history of the construction and operation of the line from its inception to Sept. 30, 1914.

The first section of the article deals with the earliest attempt made to obtain electric traction in Edmonton in 1893, the next attempt in 1904, when the Tretheway franchise was granted, and the subsequent resolution of the city in 1907 to undertake the construction of the line itself under the charter of the Edmonton Radial Ry. The construction of the various lines, with car barns and equipment, is then traced year by year down to the end of 1913, and for the first nine months of 1914. At that date the city owned 52.6 miles of track, for the construction and equipment of which it had issued bonds for \$3,242,538.33. On a population of 67,000 this represents a track mileage per 1,000 of 0.80 mile, and a cost of \$56,672 a mile of track. The mileage of line owned is distributed as follows:—Permanent double track, 30.9 miles; permanent single track, 1.2 miles; temporary double track, 8.8 miles; temporary single track, 10.4 miles; sidings, 1.3 miles; total, 52.6 miles.

The system has produced a deficit for every year since its opening, but Mr. Chalmers claims that this is not due to the past or the present management, but to too low a fare being charged in proportion to the cost of operation, and to the unwise and unwarranted extensions made at different times. On the first of these points Mr. Chalmers says there is really only a small part which is controllable expenditure. Out of the five cent fare 30.6% goes for capital charges; 34.1% for wages; 15%

for power charges; 12.9% for depreciation, leaving 7.4% for direct controllable charges. On the second point Mr. Chalmers refers to the Vermillion Ave. line, built in opposition to the recommendation of the Commissioner, and since removed; and the building of four extensions, on one of which there is a loss of \$16,000 a year; on another of \$17,000, and on a third the fares are not sufficient to pay for the power used on the route. Then there was the agreement with Strathcona, which when the two cities were amalgamated, called for the building of certain extensions, and necessitated the giving of one fare over the whole area.

Mr. Chalmers puts the total deficit from operation at \$574,000, and against this he places a book charge of \$246,000 for depreciations, which amount has not yet been spent. There has been paid in cash \$166,000 into the sinking fund, which will have a net shortage of \$162,000. The city charter provides the annual deficit may be liquidated in the general rate, and Mr. Chalmers thinks this might very properly have been done. He also points out that the entire cost of the system has been met by the issue of bonds, whereas in a company

Canadian Electric Railway Association.

PRESIDENT—C. B. King, Manager, London Street Railway Co.

VICE PRESIDENT—James D. Fraser, Director and Secretary-Treasurer, Ottawa Electric Railway Co.

HONORARY SECRETARY - TREASURER—Acton Burrows, Managing Director, Canadian Railway and Marine World.

EXECUTIVE COMMITTEE—The President, Vice President, Secretary-Treasurer and

E. P. Coleman, General Manager, Dominion Power and Transmission Co.

Patrick Dube, Secretary-Treasurer, Montreal Tramways Co.

A. Eastman, General Manager, Windsor, Essex and Lake Shore Rapid Railway Co.

H. M. Hopper, General Manager and Purchasing Agent, St. John Railway Co.

Wilson Phillips, Superintendent, Winnipeg Electric Railway Co.

C. L. Wilson, Assistant Manager, Toronto and York Radial Railway Co.

ASSISTANT SECRETARY—Aubrey Acton Burrows, Business Manager, Canadian Railway and Marine World.

OFFICIAL ORGAN—Canadian Railway and Marine World, Toronto.

system, the bond issue would have been limited, and considerable common stock issued, upon which no dividends need have been paid for some years. On the other hand, when the bonds are redeemed the city will own the entire line.

In conclusion he deprecates the making of experiments, and expresses the opinion that even with the present weight of capital charges, and high cost of operation, the line can be made to meet operating costs, if further unwise extensions are not made, or other expenditures not called for.

Equipment for London and Port Stanley Railway.

Contracts are being placed by the London Railway Commission for the electrical equipment outlined in Canadian Railway and Marine World for December and January. The substation equipment, to be supplied by the Canadian Westinghouse Co., consists of the complete equipment for two substations, one in London, at the local hydro electric power house, and the other at St. Thomas, in the Hydro Electric Power

Commission of Ontario's substation. Each plant will have two complete 500 k.w. 1,500 volt sets, with transformers and rotary converters for receiving 13,200 volt a.c. and delivering from the rotary converters at the line voltage of 1,500 volt d.c. This contract will include the switchboards and wiring, complete.

Three 60 ton, 1,500 volt locomotives, all steel construction, as described in our December issue, will be supplied by the Canadian General Electric Co. This company will also supply complete electrical and air equipments with multiple unit control for the six motor cars. These motor cars will each have four 125 h.p. motors with dynamotor control and lighting, and a 1,500 volt air compressor. The electrical and air equipment for the three trailer cars will also be provided by the same firm.

The car equipment will consist of six motor cars and three trailer cars. Five of the motor cars will be 59 ft. 3 compartment all steel cars, as described in our January issue, the bodies for which will be supplied by the Jewett Car Co., Newark, O. For these cars there will be 5 sets of high speed interurban car trucks, to be supplied by the Baldwin Locomotive Works, Philadelphia, Pa. The sixth motor car, also 59 ft. long, will be an express car, and this, with the trailer cars, also of wooden construction, and of the same size, will be supplied complete by the Preston Car and Coach Co.

Latticed steel construction poles, spaced at 180 ft. centres on tangents, are being erected. Catenary suspension is being used, consisting of a 300,000 c.m. supporting cable, carrying a 40 grooved trolley wire. The track renewal work, described in Canadian Railway and Marine World for September, is practically completed, with the exception of some of the side tracks and crossings.

Among the Express Companies.

F. Deno, heretofore route agent, Dominion Ex. Co., has been transferred to the Superintendent's office at Winnipeg.

T. H. McGarrell, heretofore route agent, has been appointed Agent, Dominion Ex. Co., North Bay, Ont., vice H. H. Carr, transferred.

W. A. Gibson, heretofore Assistant Foreign Agent, American Ex. Co., Vancouver, B.C., has been appointed Foreign Agent, Winnipeg, Man., vice G. Mitchell, resigned.

C. N. Spooner, heretofore Assistant Superintendent, Western Division, Dominion Ex. Co., has been appointed route agent at Moose Jaw, Sask., and his former position has been abolished.

The Canadian Ex. Co.'s earnings, etc. for Aug., 1914, were as follows:—Charges for transportation, \$610,098; express privileges, \$310,850; total transportation revenue, \$299,228; non transportation revenue, \$10,636; total operating revenue, \$309,864; total operating expense, \$282,815; net operating revenue, \$27,049; taxes, \$8,000; operating income, \$19,049, against \$598,397 charges for transportation; \$284,113 express privileges; \$314,283 total transportation revenue; \$18,868 non transportation revenue; \$333,152 total operating revenue; \$291,664 total operating expense; \$41,488 net operating revenue; \$5,600 taxes; \$35,888 operating income for Aug., 1913.

The Beck Manufacturing Co., Ltd., has been incorporated under the Dominion Companies Act, with \$400,000 capital, and office at London, Ont., to take over the various businesses carried on there by Sir Adam Beck and the Beck Manufacturing Co., and in connection therewith to build, own and operate vessels, wharves, docks, tramways, railway sidings, etc.

Marine Department

Construction and Classification of Great Lakes Vessels.

Jos. R. Oldham writes Canadian Railway and Marine World, from Cleveland, Ohio, as follows:—Referring to the interesting correspondence in your excellent journal re construction and classification of Great Lakes vessels. As the author of the Great Lakes Register of Shipping, copyrighted by me in 1893, and the inventor of the modern type of arched girder vessels, patented in 1902, possibly you will favor me with a little space to endeavor to throw some degree of light on this subject.

Lloyds' Register had no connection with the original design or construction of these vessels. Indeed, I unhesitatingly aver that no iron bulk cargo vessel had ever been classed, or even constructed, without hold beams or pillars, prior to the advent of the modern bulk cargo vessel about 11 years ago. I may go further and state that these ships are of purely American, even of local, design.

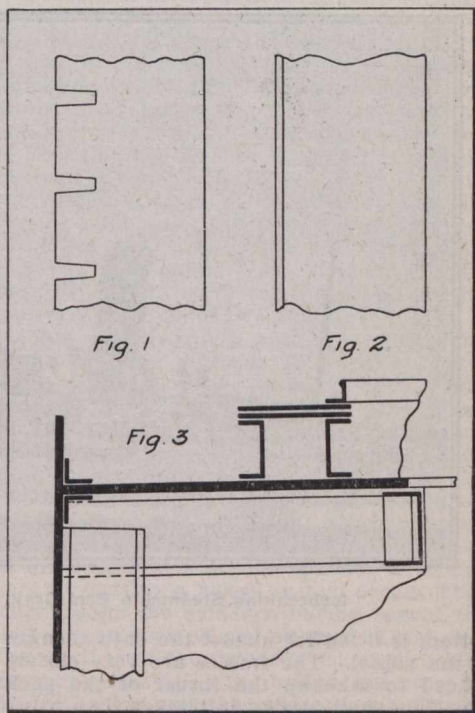
The longitudinal frame construction system tends to produce a strong ship, and possibly with economy of material, in vessels having two or more continuous decks, when supported by strong transverse bulkheads, spaced less than one and one half times the breadth of the hull apart. But for large bulk cargo ships, which have their deck cut away for more than 60% of the moulded breadth, to provide suitable hatchways for the Great Lakes trade, the absence of continuous vertical side framing, in metallic contact with the shell plating, appears to more than counterbalance the increase of longitudinal strength due to the disposal of more continuous material longitudinally, between the transverse bulkheads.

While numerous transverse bulkheads, having continuous metallic contact with the shell, may supply transverse strength to the hull, they, at the same time, destroy the continuity of the longitudinal framing, and though systematic bracketing, coupled with strong riveting, may produce efficiency, in combination with two or more decks, not abnormally cut away to provide large hatchways, no system of bracketing the abutment of frames on the bulkheads can give the same, or equal symmetrical longitudinal stiffening, to that provided by continuous stringer plates and bars. Moreover, bracket plates, with their riveting subject to tensional stress, cannot be compared with double strapped plates having rivets in double shear. As regards the transverse between the bulkheads, a notched plate, say as per accompanying fig. 1, while almost worthless to resist the vertical component of the transverse stresses, is about equally weak for resisting compression, though such notches are well adapted for resting the longitudinals on during fabrication. This, indeed, would seem to be the function par excellence of the notched transverse. An unnotched transverse plate, while not adapted to hold a frame in place during framing, as per fig. 2, does supply perfect support to the side plating in proportion to its sectional area.

Over the bottoms of lake vessels close spaced longitudinal frames are superfluous, as there is a redundancy of longitudinal strength provided by the deep plate girders between the lower and the heavy upper bottom. The deck stringer plates seem to require the assistance of strong longitudinal girders along their inner edges, as, notwithstanding their great strength, such

plates have frequently proved unequal to the work required of them. Possibly such girders as per fig. 3 would supply the requisite strength to these decks, while at the same time raising the hatches, though not beyond an impracticable height, say 22 ins. above the deck.

As regards general structural strength and weight, the longitudinal system does not appear to warrant the slightest reduction, to say the least, but such reductions as have been allowed appear to be due to the unprecedentedly favorable support accorded by Lloyds' Register to a novel system of construction, rather than to merit or structural design. This prompt and zealous approval of longitudinal construction is in marked contrast to the reception accorded to McIntyre's most excellent proposal to cut the transverse frames at the bilge and fit longi-



tudinal plates and bars, extending continuously through the bulkheads. This system only received the tardy approval of that most conservative classification association after many years had foolishly been spent to secure proper classification for vessels so constructed.

Lloyds' Register may be justified in recommending longitudinal construction for certain types of salt water vessels, provided they do not sanction such light framing as has been experimented with here. They have, however, no warrant, nor experimental illustration, to show that such construction, at least en masse, is safely applicable to the construction of Great Lakes vessels.

Two 1200 h. p. Diesel engines have been installed in two ocean-going torpedo-boat destroyers which will be launched before long on the Clyde in Scotland, for the Japanese Government. These engines will be used on cruises only, as the use of oil permits a great saving of fuel. In addition the ships have twin steam turbines, each of 1200 h. p. capacity.

The Passage of Steamships Through the Panama Canal.

Vessels using the Panama Canal are towed through the locks, and do not pass through under their own steam. Ordinarily, six electric locomotives are used, two forward for towing and steadying the vessel in the lock chambers, two amidships for towing and afterwards checking the vessel's headway, and two aft for steadying her and checking headway. The average rise and fall in each lock is about 30 ft., so that when a vessel is at its lowest level the lead through the chocks to the locomotives on the lock walls is often very sharp, and unless the chocks are closed the line will have a tendency to slip out and damage the rail and other light construction in the vicinity. Experience has demonstrated the fact that most of the chocks and bits are too light in construction, and that the chocks in particular should not only be made heavier and stronger so that their jaws may stand a vertical strain, but that they should be of a permanently closed character, and not be made with open jaws. In cases where open jawed chocks are installed, they should at once be replaced with closed ones, or be fitted with an appliance for closing them, taking care that the appliance itself will stand a heavy vertical strain in case the line slips from under the jaws.

With some minor modifications there are three general designs of chocks usually installed on ocean-going steamships, viz.—heavy cast iron open jawed, secured on deck or to the upper edge of the side plating; the same, but with rollers in each end, and oval closed chocks let into the side plating for leads to covered and well decks. The last mentioned give very satisfactory results, but the first two are liable to cause damage from the change both in the vertical and horizontal lead of the line, due to change in the level of the water, and the angle from the locomotives when shifting from a towing to a retarding position, or vice versa, and these should be replaced. In many cases the bits have been found to be too light in construction, or poorly secured. They should be sufficiently strong to withstand the strain of a wire line 1½ ins. diam., with a pull of 50,000 lbs., and be firmly rivetted to the deck, and if necessary where the deck is of wood or light plating, they should have an under deck plate, or be secured between two deck frames. It has been noted that some vessels have light iron cleats rivetted to the inside of the side plating or to the deck plates in lieu of bits. This is very unsatisfactory, as almost invariably they will not stand the strain owing to their light construction, or insecure fastening. They should be replaced by bits.

In the installation of chocks and bits for Panama Canal towing, attention should be given to placing the several sets in convenient and accessible places, and that in each set there should be but a short distance between the chock and its accompanying bits. In some cases suitable bits have been installed, but there were no convenient or accessible chocks, hence the bight of the tow rope has a tendency to slip off the bits, and if the lead be under the rail, endangers carrying it away. In such cases chocks should be installed at once. While the Panama Canal assumes the liability for any damage to vessels during lockage, for which it may be responsible, yet it will not do so when vessels are not fitted with

proper appliances for canal towage, and when damage may result in consequence thereof, hence steps should be taken immediately to remedy any defects. A vessel which presents herself for transit through the canal, which has complied with these recommendations, and which is thoroughly and strongly so equipped for towing, will not only have her passage through the several locks greatly facilitated, but will avoid the annoyance and expense due to possible damage to chocks, bits, rail and other light equipment, for which the Panama Canal will not assume responsibility. The canal pilot will always examine each vessel's towing appliances before she enters the locks, and will not only call attention to any defects, but will gladly offer advice and suggestions toward remedying any that may be found, and at the same time will furnish the master or captain with a brief notice in reference to such alterations as in his opinion should be made before the vessel next passes the canal.

The Kenora-Robert R. Rhodes Collision.

The investigation into the collision between the Canada Steamship Lines s.s. Kenora and F. E. Hall & Co.'s s.s. Robert R. Rhodes, near Archibald Shoal, in the St. Lawrence River, Aug. 4, was concluded recently before Capt. L. A. Demers, Dominion Wreck Commissioner, assisted by Captains F. Nash and J. McGrath, as nautical assessors. After a considerable amount of evidence had been taken the court adjourned, and on reassembling it was found that the witnesses on behalf of the Kenora were not present, due to the fact that the vessel had been ordered away on the night previous. King, counsel for Canada Steamship Lines, Ltd., owners of the vessel, expressed to the court his surprise at such action by some official of the company without consulting him, and stated that he felt his position keenly, and wished to assure the court that he was not a party to such contempt of court as had been shown. The court, after carefully weighing the evidence which it had gathered, notwithstanding the fact that some of the witnesses had not testified, considered that it had sufficient data to arrive at a decision. The judgment read that the exchange of whistles prior to the actual collision were contradictory, but notwithstanding the lack of corroboration on one side or the other, the fact remained that the faster vessel, the Kenora, was also the overtaking vessel, and therefore it was the master's duty to keep clear of the other, and by passing her so close was a dangerous and reckless manoeuvre, as the displacement wave created by her passage could have no other result than to neutralize the steering power of the Robert R. Rhodes, as well as drawing her to the Kenora, which actually happened. As to the damage suffered by the Robert R. Rhodes, the court did not think it necessary to refer to it in this judgment, as it had only to judge as to the causes responsible for the accident. The court severely reprimanded both the master, William Brian, and the pilot, D. Charland, of the Kenora, as by their manoeuvres they invited disaster. As the Kenora did not collide with the Robert R. Rhodes, the certificate of the master of the Kenora was not dealt with, but he was cautioned to be more careful in future. The court found that the Robert R. Rhodes did not contribute to the casualty, and exonerated the master and officers of all blame.

War Insurance.—A recent official dispatch from the British Government, announced that the insurance rate for cargo under the Government war risks insurance scheme had been reduced from 2 to 1½ guineas per cent.

A Dominion Government Icebreaker for Russian Service.

The Dominion Government icebreaking steamship Earl Grey, which is illustrated on this page, was sold recently to the Russian Government, and has been utilized in the White Sea, more especially to keep the port of Archangel open to as late a date as possible. She arrived at Archangel, Oct. 23, after a remarkably good run. She has been renamed Canada by the Russian Government. She was built in 1909 by Vickers, Son and Maxim, Barrow in Furness, Eng., and is of the following dimensions,—length overall 279½ ft., length between perpendiculars 250 ft., breadth moulded 47½ ft., depth moulded 26½ ft., draught normal 17 ft. 7 ins., displacement 3,400 tons, i.h.p. 6,000, speed 18 knots. The hull is subdivided into numerous water tight compartments and the doors of the principal compartments are so built that they can be closed simultaneously from the navigating bridge. A water tight bunker bulkhead extends on each side of the vessel throughout the length of the boiler rooms, and a double

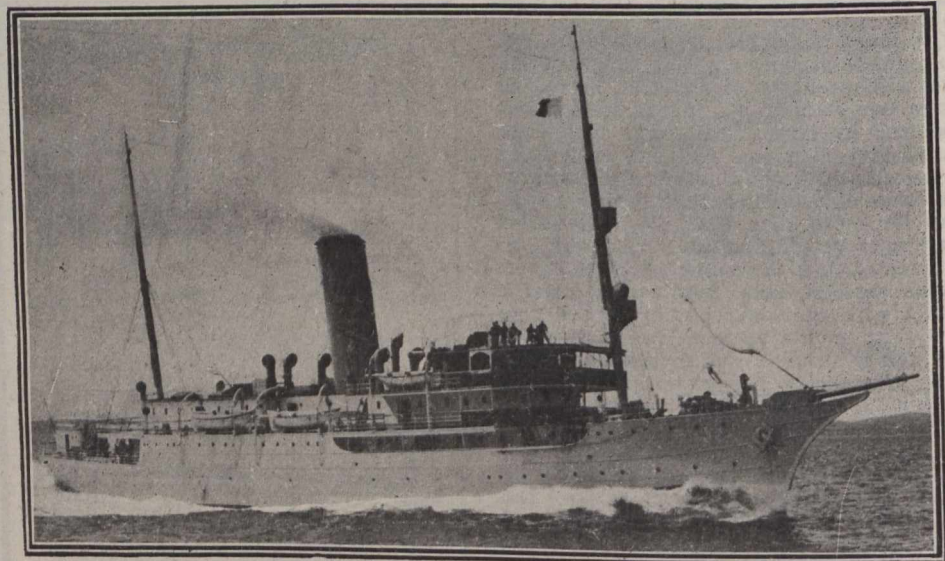
usual, and the whole of it, as was also the hull, was built to the requirements of the British Board of Trade, Lloyd's Registry of Shipping, and the Canadian Steamboat Inspection Act.

While in Canada, the Earl Grey was used in the winter service between Prince Edward Island and New Brunswick, for which she was specially built. The contract price for the construction, equipment and delivery of the vessel was £103,000.

The service to Prince Edward Island is being maintained during this winter by the Dominion Government steamships Minto and Stanley, both of which are efficient icebreakers, and no difficulty in maintaining regular communication is anticipated.

The icebreaking steamship J. T. Horne, which has also been acquired by the Russian Government, as announced in a recent issue, was expected to sail from Canada for Archangel during January.

A dispatch from Archangel, dated Jan. 21, stated that the icebreaker had been disabled, and that a number of vessels had been frozen in, with little likelihood of their being released before the general breakup of the ice.



Icebreaking Steamship Earl Grey, sold to the Russian Government.

bottom is fitted for almost the entire length of the vessel. The frames are very closely spaced to take up the thrust of the pack ice. The shell plating is thicker than usual and the outer skin is doubled along the water line right fore and aft and to the bottom of the keel in the forebody, where the friction of ice tends to wear away the material faster than in ordinary marine service. The procedure is to drive the vessel forward until the forebody glides on to the floe sufficiently to cause the vessel's weight to crush the ice. In order that the weight may be increased at will, large tanks are built into the structure, and the pumps for filling and emptying these tanks deal with 250 tons an hour. The vessel is also equipped for breaking ice when going astern, and the counter is suitably strengthened to resist shocks. The rudder takes the form of the vessel, so that the vessel's movements are in no way impeded by ice floes. The propelling machinery consists of engines of the triple expansion three crank type with cylinders 27½, 43 and 70 ins. diam. by 39 ins. stroke, supplied with steam at 180 lbs. by four boilers of the cylindrical type 15 ft. diam., two of which are double ended and 21 ft. long, and two single ended 11 ft. long, with suspension furnaces and equipped with forced draught. All the machinery, and the propeller blades are of considerably greater strength than is

Shipping of War Office Supplies, Etc., From Canada.

When on the declaration of war the Dominion Government was asked by the Imperial Government to supervise the purchase and transport of commissariat supplies which Canada could provide for the expeditionary force in Europe, the Hon. R. Rogers, Minister of Public Works, was selected to take charge of the work. Among others, he consulted Sir Thos. Shaughnessy, who placed at his disposal, without cost to the Government, the services of A. H. Harris, Special Traffic Representative of the C. P. R., together with such of the company's staff as Mr. Harris might select, this staff eventually numbering nearly 20 picked men, and as a result a large tonnage has been moved to the seaboard and thence to French ports of call.

The value of expert handling was demonstrated by the prompt chartering of vessels on a minimum charter rate, enabling the administration to maintain an average freight on oats during the past three months of 25 cts. per hundred lbs., and \$7.50 a gross ton on hay. Although, owing to the scarcity of tonnage, freight rates have risen rapidly since September, five vessels cleared from Montreal for a French port the latter part of November, the charter parties averaging

28c. per 100 lbs. on oats and \$8 on hay, a saving of close on 50 per cent. on current commercial rates. The C. P. R. made no charge for use of its docks by the chartered vessels and has warehoused everything free—being helped in this by the Allan Line, which also placed portions of its sheds at the Government's disposal. Over 600,000 sacks have been stored in and passed through C. P. R. sheds, and in addition, vast quantities of sacked oats were piled in the upper sections of the C. P. R. dock warehouses and subsequently loaded into chartered vessels consigned to French ports of call. The Ontario, Manitoba and Alberta Governments received the same treatment in connection with the forwarding of their gifts.

The shipments handled by this Administration under Mr. Harris' supervision from Sept. 1 to Nov. 30, including flour, War Office supplies, and French army blankets, total 120,000 tons of freight, free of storage, dockage, or steamship demurrage charges. The rapidity with which supplies went forward was shown in a cable from England to "go slow," as they were arriving too fast to be properly handled. A record has been established which it will take a long time to beat, and those concerned have come in for well merited congratulation.

The season of St. Lawrence navigation being closed, War Office supplies are being forwarded during the winter via Maritime province ports under Mr. Harris' supervision.

St. Lawrence and Chicago Steam Navigation Company's Annual Report.

Following is the 24th annual report issued over the signatures of W. D. Matthews, President, and A. A. Wright, Managing Director:—

"The season of 1914 was one of the most unprofitable to vessel interests in the history of the Great Lakes. The disorganization of business brought about by the greatest war in the world's history and consequent uncertainties as to its effect, along with local causes, cutrailed the movement of heavy freight like coal, ore and lumber to such an extent that so many vessels were thrown into the grain carrying trade that during a great part of the season rates were forced below the cost of transportation. We look forward, however, to a gradual improvement in lake business during 1915, and, with an average crop next fall in Canada and the United States, earnings should be materially increased.

"Our new steamer, the J. H. G. Hagarty, was delivered to us in Aug., 1914, and is fully up to expectations in every way and should increase the earnings very materially. We are pleased to state that the company's steamers had no accidents during the season worth mentioning, and the balance at credit of our insurance fund has been increased \$9,000 after taking care of the expenditure of a considerable sum, strengthening the deck houses and hatches on our old steamers, and we feel that our fleet is now among the best and most seaworthy on the lakes.

"The directors from the earnings of the season have paid a dividend of 3%, amounting to \$28,992, and carried forward the balance, \$9,018.98, to credit of profit and loss, which added to the previous balance, makes a total of \$231,169.55 at credit of that account."

ASSETS.

Five steamers: Iroquois, W. D. Matthews, G. R. Crowe, E. B. Osler, and J. H. G. Hagarty	\$1,310,000 00
Cash in bank and office	8,299 25
	\$1,318,229 25

LIABILITIES.

Capital stock, fully paid	\$ 966,400 00
Accounts and bills payable	50,345 06
Insurance fund	70,314 64
Balance of profit and loss carried forward	231,169 55
	\$1,318,229 25

PROFIT AND LOSS.

Balance forward Jan. 2, 1914	\$222,150 57
Steamships earnings	\$54,639 00
Interest	4,140 55
	58,779 55
	\$280,930 12
Cost of management	\$ 20,768 57
Dividend 3%, payable Jan. 2, 1915	28,992 00
Balance carried forward	231,169 55
	\$280,930 12

The directors, who were re-elected for the current year, are:—President, W. D. Matthews; Vice President and Secretary, J. H. G. Hagarty; Managing Director, A. A. Wright; other directors, Jas. Carruthers, Capt. S. Crangle, G. R. Crowe, C. S. Gzowski and Sir Edmund Osler.

Stranding of the s.s. Navarra.

The formal investigation into the stranding of the s. s. Navarra, near Holmes Island, N. S., Dec. 30, 1914, was held at Yarmouth, N. S., Jan. 7 and 8, before Capt. L. A. Demers, Dominion Wreck Commissioner, assisted by Capt. B. R. Hilton and J. W. Anderson, as nautical assessors. The Navarra is owned by Donald and Taylor, Glasgow, Scotland, and was under charter to the Admiralty for carrying supplies to the allied troops in France. She was built in 1909, and is a steel vessel of 4,387 tons gross and 3,847 tons register. She sailed from St. John, N. B., Dec. 29 for Havre, France, and struck in the early morning of Dec. 30.

After reviewing the evidence, the court condemned the methods followed by both the master and second mate, as well as the mate, in navigating the vessel. The judgment was as follows.—First of all the master sails from St. John with an old chart of 1890, upon which there are very few buoys marked; thereupon he sets a course without, as he acknowledged, making any allowance for the influence of tides, but plotted the course on his charts in a similar manner as if he were navigating a vessel in mid ocean. The court admits the evidence having regard to his being on deck off and on until 11 o'clock. The weather at the time did not require his constant presence on the bridge, but according to the log and the evidence submitted, up to 12 o'clock the weather was very hazy or thick on account of the heavy rain, and therefore it was the ordinary prudence required of a master, especially one who is a stranger to this locality and to the Bay of Fundy. The court cannot accept the courses nor the positions he has given, as possible. On the other hand, admitting such to be the case, the course laid down to pass Seal Island was absolutely too fine for safety, as in all probability this vessel would have brought up on Blonde Rock instead of stranding where she did, and would likely have entailed loss of life as well as loss of property. The court has examined the deviation book and finds that at intervals observations were made to ascertain the error of the compass, but did not find that any observation had been taken from the time the vessel left Jamaica until she got to Halifax and back to St. John. On account of the weather and the overcast sky the day she left St. John it was impossible to obtain an observation, but on the whole it would appear that the compass was very nearly correct, with very little error on most courses, the greatest error being 6 degrees, which was not on the course that was being steered at the time of the stranding. As for the

second officer who was on the bridge from 8 to 12, in view of the conditions of the weather, the court is of opinion that from 11 to 12, there was a total disregard of the rules of the road, also of ordinary prudence which is demanded in navigating a vessel in this locality. The fact of seeing a light on his port bow, which he took as Great Yarmouth light, and not ascertaining the position of his vessel by looking at the chart and taking soundings, and wondering if it was possible in view of the distance intervening and the time elapsing between leaving Lurcher light, as he supposed, for his vessel to be there, and to have hauled his vessel out until the exact position could be found. If ordinary precautions had been taken there is not the least doubt that the vessel would be safely out to sea at the present time. Taking into consideration the direction from the Lurcher lightship to the place where the vessel stranded, with her speed and the time which elapsed, it is an impossibility for the vessel to have fetched into that place, that is, following the courses and positions given by the master and the second mate. With regard to the first officer, who came on deck at 12 o'clock, and who was on duty when the vessel stranded, if, as he stated, objects could be seen some two miles distant, a poor lookout must have been kept by himself and the man who was performing that duty, for them not to have observed a lloom, or something which would have caused some uneasiness in their minds as to the location of the vessel. There was also a lack of judgment and indifference shown when he came on deck and accepted the second officer's course as leading to Seal Island, when had he plotted the course down by the bearing which had already been taken, he would have found that the course would have brought them on the Blonde Rocks, and in view of the condition of the weather, he likewise should have diminished the speed of the vessel, and observed the rule of the road with regard to fog signals. Therefore the court cannot come to any other conclusion than that there has been shown on the part of the master, first and second officers, a great amount of negligence in navigating the vessel, or it may explain their conduct as culpable errors of judgment, and it agrees that in view of the trust that had been placed in these men on this special occasion, when the vessel was loaded with provisions and material much needed by the allied armies in France, it was their duty as Britishers, if loyal, to take exceptional precautions, more than ordinary precautions, to bring this property safely to its destination. This is a case where the court will be justified in using great severity in its finding, but in view of the conflicting justice with mercy, and for the reasons enumerated, suspend the certificate, no. 026201, of the master, Robert Milliken, for 10 months from Jan. 8; the mate's certificate, no. 003,791, of the second officer, A. G. Alexander, for 6 months from Jan. 8, and the master's certificate, no. 025,230, of the chief officer, W. S. Miller, for 3 months from Jan. 8, without the option, in any case, of lower certificates being granted.

An order in council has been passed at Ottawa approving regulations for the prevention of the giving out of information calculated directly or indirectly to be useful to the enemy, covering the movements and disposition of vessels and war supplies, the photographing or sketching of any docks or harbors, or other marine facilities, including buoys, beacons, etc., the use of telegraph lines, telephones and wireless telegraph installations, damages to railway bridges and other transportation facilities.

Changes in Bills of Lading Re Grain Overages and Shortages.

At a meeting in Detroit, Mich., on Jan. 6, Great Lakes vessel owners brought to a successful issue the fight they have been waging with the grain shippers of Canada and the United States for several years in the effort to secure relief from liability for shortage in the outturn of cargo. The bill of lading has heretofore thrown upon the vessels the full responsibility. The vessel owner got the benefit of any overrun in the outturn of his cargo, but, on the other hand, the actual cash value of any shortage was deducted from his earned freight. This "cut throat" clause in the bill of lading, as it was called, left the vessel owner ignorant of whether any particular cargo would show a loss or a profit.

In Sept., 1914, the vessel owners of both countries met at Buffalo, and agreed to refuse to carry in 1915 except upon new conditions which would throw the gambling chance upon the shipper, whose agent, the elevator, weighs the grain. A conference with shippers in Nov., 1914, was adjourned until Jan. 6, at Detroit, and the firm fight of the vessel owner for the basic principle that the shipper, in this case, must take the risks, resulted in a fair compromise shown by a new clause to be inserted in the bill of lading.

The committees of the three associations of carriers, viz., The Dominion Marine Association, The Lake Carriers' Association and The Association of Lake Lines of Buffalo met in Detroit, Jan. 5, to prepare for the conference on the following day and simply decided to adhere to the position previously taken and to insist that vessel owners would no longer carry the risk of discrepancy in the loading and outturn weights. They appointed Francis King, of Kingston, the Dominion Marine Association's Counsel, to state their case to the conference on the 6th. The representatives of the shippers also held a preliminary meeting on the 5th to arrange their programme. The parties came together on the 6th and at this conference all the leading grain exchanges and boards of trade at shipping points in both countries interested in any way in the lake grain trade were represented, prominent among these being Winnipeg, Montreal, Toronto, Chicago, Duluth, Minneapolis, Buffalo, New York, Baltimore and other inland and seaboard ports. Individual shippers and elevator owners also appeared. The vessel owners were represented on the Canadian side by L. L. Henderson, President Dominion Marine Association, and A. E. Mathews, A. A. Wright, G. E. Fair and H. W. Cowan, of Toronto, and F. King, of Kingston. The Lake Carriers' Association was represented by its President, W. Livingstone, its General Counsel, H. D. Goulder, the chairman of its committee on the bill of lading, A. W. Thomson, and W. H. McGean, H. K. Oakes and A. E. R. Schneider. The Association of Lake Lines was represented by C. M. Heald, W. H. Smith, of Montreal, and J. Rogers, of Buffalo.

An exhaustive discussion took up most of the day and a happy conclusion was ultimately reached by the appointment of a small joint committee of shippers and carriers, who retired, and in a short time reported a solution whereby the shipper would underake the risk in outturn in consideration of the carrier allowing a fixed deduction of one-quarter bushel per thousand as tare. A committee of shippers is working on a scheme to carry the shortages and overages by insurance, or otherwise, and they will consult with a committee of the carriers. The carriers in the meantime have agreed to make charters, or issue bills

of lading, only upon the conditions set out in the new clause given below, which is to form part of every contract and supersede the old "cut throat" or gambling shortage clause in the bill of lading.

The vessel owners proposed to insert the following clause in the bill of lading:—

"Provided that the vessel shall not be responsible for shortage exceeding $\frac{1}{4}$ bush. per thousand; the vessel to deliver all grain on board collect freight upon actual turn-out, and make no claim for any over-run; and that where grain is carried at the same time for more than one shipper the shortage, if any, shall be ascertained separately with respect to the grain carried for each of such shippers; save that where two or more of such shipments are carried in the same compartment of the vessel, the shortage, if any, resulting upon unloading the last of such shipments, over and above the $\frac{1}{4}$ bush. per thousand on the total amount shipped in that compartment, shall be borne pro rata by such shipments."

At the conference with the grain shippers the following compromise clause was agreed on:—

"The vessel shall make no claim for any over-run in the out-turn of cargo, and assumes no responsibility for shortage, but shall allow a fixed amount of $\frac{1}{4}$ bush. per thousand as tare, to be deducted from the freight. All grain on board is to be delivered and freight is to be collected upon actual out-turn. Where two or more shipments are carried in the same compartment of the vessel, the shortage, if any, resulting upon unloading the last of these, shall be borne pro rata by the shippers."

Notwithstanding the understanding arrived at at the Detroit meeting between the vessel owners and the grain shippers, C. B. Watts, of Toronto, appeared before the Dominion Grain Convention in Toronto on Jan. 13 and objected to the new clause which is to be inserted in bills of lading. F. King, Counsel, Dominion Marine Association, spoke in support of the clause, and others taking part in the discussion were A. A. Wright, Managing Director, St. Lawrence and Chicago Steam Navigation Co., also counsel for the Canada Steamship Lines, Ltd., Canadian Pacific Ry., the terminal elevator owners and the Dominion Government elevators. It was decided by the Commission that the application would have to be made in writing, and the Commission would then consider the request, and if it thought it advisable to do so, would recommend the Government to amend the Grain Act.

The following clause in the bills of lading heretofore in use is to be eliminated:—"All deficiency in cargo to be paid by the carrier, and deducted from the freight and any excess in the cargo to be paid for to the carrier by the consignee."

Disposal of Captured Foreign Vessels.—

It is announced that the British Admiralty is offering for sale, to British subjects only, a number of steamships captured at various times during the war from foreign belligerents. With the object of getting a number of these vessels into service, with a view to relieving the shipping situation, exceptional terms of payment are being arranged. If the purchasers desire, payment may be made 25% in cash and the balance in three annual payments, the first being due one year from the date of purchase, with interest at 4%. Any purchaser will be required to give a bond with sureties, to the effect that none of the vessels will be resold to enemies or foreigners for a certain period after the termination of the war, and declarations will also have to be given that no enemy or corporate body consisting principally of enemies or foreigners are in any way interested in the purchase. Prize sailing vessels may be purchased by neutral foreigners on guarantee that they will not be resold to enemies of Great Britain, but the steamships are to be sold only to British subjects.

Great Lakes Charts Placed Under Dominion Control.

The Department of Naval Service at Ottawa has received from the British Admiralty all the copper plates used for publishing the Admiralty edition of the charts of the Great Lakes, with an intimation that the Lords Commissioners think that the Canadian Hydrographic Office is in a better position than the British one to look after keeping the charts up to date. Owing to the fact that all these charts were engraved in England there has always been considerable difficulty and delay in keeping them properly corrected, but in future this will be more closely attended to in this country. About 50 copper plates valued at \$20,000 have been received and it is hoped that most of these will be reprinted in the early summer.

The first surveys on the Great Lakes, with any pretence to accuracy, were made by Admirals Bayfield and Owen about 1820, and until 1883 these were the only charts in existence of the Canadian shores. They delineated the shore line and islands with remarkable accuracy considering the times, but shoals and soundings were conspicuous by their absence. In 1883, as a result of the loss of the steamboat Asia, S. J. Dawson, then M. P. for Algoma, prevailed upon the Government to undertake a proper hydrographic survey of the Great Lakes and this has been continued ever since, with the result that Lakes Ontario, Erie, Huron and Georgian Bay have been completed, and work on Lake Superior is about half finished. Between 1883 and 1910 only one steamboat was employed in this work, the old Bayfield, which was succeeded by the new Bayfield, but in 1911 the Department placed an additional steamboat on Lake Ontario.

Skagway Wharf Burned.—The complete destruction by fire of the 1000-ft. wharf at Skagway, Alaska, was reported by wireless early in January. The loss is estimated at \$210,000, of which \$60,000 represents the value of the wharf; the warehouse and its contents accounting for the remainder. With the exception of the ore and bunker chutes all the structures on the wharf were gutted by the fire. The destruction of the wharf will cause great inconvenience to shipping, it is reported, as the wharf was used for handling all the freight transhipped at this port for the interior over the White Pass and Yukon Route. The wharf will be rebuilt, it is reported, but during its reconstruction shipping will be obliged to use an old wharf abandoned several years ago.

C.P.R. Vessel Building.—Press dispatches from Great Britain, which stated recently that the C.P.R. had acquired five additional steamships, all of which were on the stocks at various yards in the United Kingdom, were misleading. The impression conveyed was that the C.P.R. was about to add five more vessels to its fleet, than had previously been announced. The facts are that no additional vessels have been ordered. The s.s. Metagama, a sister vessel to the Mis-sanabie, will soon be in service; two Pacific Coast vessels, Princess Margaret and Princess Irene, just completed, have been requisitioned by the Admiralty, and two one-class cabin steamships to be named Melita and Medora are being built at Glasgow. All of these have been referred to previously in Canadian Railway and Marine World.

M. Cussen, Assistant Comptroller, Canada Steamship Lines, Ltd., Montreal, writes:—"I beg to enclose my renewal subscription to Canadian Railway and Marine World, and assure you that I always look forward to receiving each copy."

Mainly About Marine People.

A. A. Allan, of the Allan Line Steamship Co., Montreal, has been appointed an honorary colonel.

F. Gilchrist, formerly of Port Colborne, Ont., has been appointed Manager of the New Ontario Dock Co. at Sault Ste. Marie, Ont, vice S. L. Penhorwood, resigned.

Miss Frances Hazen, second daughter of **Hon. J. D. Hazen**, Minister of Marine, was married at St. John, N.B., Jan. 1, to Major T. M. McAvity, 26th Battalion.

G. W. C. Hensley, of Pickford and Black, Ltd., Halifax, N. S., has been elected President of the Halifax Board of Trade, for this year.

W. B. McAllister, heretofore Passenger Agent, Allan Line Steamship Co., Boston, Mass., has been appointed Assistant Manager there, vice F. D. Lilley retired.

F. D. Lilley, Assistant Manager, Allan Line Steamship Co., Boston, Mass., has retired after 33 years service with the company. For the past 15 years he was located at Boston, prior to which he was at Montreal.

E. J. Guthrie has been appointed Superintendent in charge of the operation of the Central Vermont Transportation Co.'s steamers operating between New London, Conn., and New York, N.Y., with office at New London, Conn.

John Fleetwood, who retired recently from the position of Passenger Traffic Manager of the White Star-Dominion Line at Liverpool, Eng., was given a present by the local staff, Jan. 8, in recognition of his 40 years service.

J. J. Phelan, formerly Purchasing Agent, Canada Steamship Lines, Ltd., Montreal, has been appointed Assistant Mechanical Superintendent, Montreal, not Assistant to Mechanical Superintendent, as stated in our January issue.

Albert Ballin, Director General, Hamburg American Steamship Co., has, it is stated, at the request of Emperor William, taken over the management of Germany's entire railway system and the work of delivering food supplies to the German army.

Capt. James Carney, and **Alex. McDonald**, master and chief engineer, respectively, of the C. P. R. car ferry Ontario, on the Detroit River, have retired from active service, after having served the company since the Ontario was first placed in service 25 years ago.

W. C. Donaldson, one of the Managing Directors of the Donaldson Line, died in Great Britain, Dec. 30, aged 45. He was one of the sons of the founder of the line, and was well known in Canada, where he made frequent trips in connection with the company's business.

Calvin Austin, President, Eastern Steamship Corporation, Boston, Mass., has been appointed receiver of the corporation, with office at Boston. In addition to other coast-wise services, the company has operated one between Boston and St. John, N.B., for several years.

Capt. C. Troop, who retired recently from the position of Marine Superintendent, C. P. R., London, Eng., was presented with an address by the local marine staff. Prior to entering C.P.R. service he was with Elder Dempster Co., and the Beaver Line, the latter being acquired by the C.P.R.

Sir William Price, who was created a knight bachelor, Jan. 1, has been at various times, director, Quebec Ry., Light and Power Co., and Quebec Steamship Co., President Quebec Board of Trade, and a provisional director of the projected Trans-Canada Ry. He is Chairman of the Quebec Harbor Commission.

Capt. V. R. O'Reilly, commander of the C.P.R. s.s. Montreal, was presented by the Quebec Board of Trade, Jan. 5, with a silver salver in recognition of his services in saving the crew of the brig Evelyn under difficult circumstances in the North Atlantic on Nov. 30, 1913. At the time of the rescue he was in command of the C.P.R. s.s. Monmouth.

Capt. H. St. George Lindsay, Superintendent of Pilots, and **W. I. Gear**, Steamship Agent, Montreal, have been appointed honorary colonels; and **Thomas Robb**, Manager, Shipping Federation of Canada, and **P. V. G. Mitchell**, Assistant Manager, White Star-Dominion Line, Montreal, have been appointed honorary majors, in connection with their work in the transportation of the Canadian contingent from Canada.

Sir Thomas Sutherland, Chairman, Peninsular and Oriental Steam Navigation Co.,



J. F. Pierce,
General Passenger Agent, Canada Steamship
Lines, Ltd.

has retired after occupying that position for 34 years. When he took hold of the company's affairs, the concern was practically bankrupt, and it was stated recently that if the business was to be wound up now the shareholders would receive a cash payment of at least three times the par value of their stock. He is one of the directors of the Suez Canal Co. He celebrated his 80th birthday recently.

The White Star-Dominion Line, in announcing the death of **James Thom**, reference to which was made in our last issue, makes the following comments:—"Mr. Thom has long been a highly esteemed and honored representative of the company in the conduct of its Canadian business, and his loss will be greatly lamented by all who knew him. It is fitting at this time that we record our appreciation of his long and faithful services, during which the company's interests under his charge have shown remarkable development and progress, and we are sure that all who knew him share the respect and esteem in which

we held him, and our sense of the loss we have all sustained."

G. J. Desbarats, who was created a Companion of the Order of St. Michael and St. George, Jan. 1, was born at Quebec, Jan. 27, 1861. He entered the civil service in 1879, as an engineer of canal construction and other public works. For several years he acted as assistant to the Chief Engineer of Canals, and from 1892 to 1896 was Inspector of Railway Construction in British Columbia; 1896 to 1899, Engineer in Charge, Galops Canal construction; 1899 to 1901, on hydrographic survey on the St. Lawrence River, and in 1901 he was appointed to supervise the work of rebuilding and enlarging the Government shipbuilding yards at Sorel, Que., and continued to act as Agent for the Marine Department, until his appointment as acting Deputy Minister of Marine, in 1908, being confirmed in that position in 1909, and appointed Deputy Minister of Naval Service in 1910. He has been a member of the Canadian Society of Civil Engineers since 1907, and was a councillor in 1907, and Vice President in 1909.

C.P.R. taxation in Owen Sound.—The Owen Sound Town Council is asking the Ontario Legislature to declare that the average value per acre of the land adjoining the C.P.R. tracks in the town shall be deemed to be the value per acre of the company's right of way, and that the company's docks and wharves shall be assessed for taxation. It is asked that an act shall be passed and made retroactive to Jan. 1, 1915.

Empress of Ireland Fund.—The fund which was opened for the relief of those dependent on the victims of the sinking of the C.P.R. s.s. Empress of Ireland, last year, was closed in London, Eng., Dec. 31. The total received is approximately \$427,000, about \$62,000 of which was forwarded through the Montreal Board of Trade. In addition to the foregoing, about \$3,000 has been sent by the Quebec Board of Trade.

Submarine Construction in Canada.—A press dispatch from Montreal, Jan. 15, states that Canadian Vickers, Ltd., is building eight first class submarines at their plant at Maisonneuve, and that these will be ready for service by August. The rumors which have been current to the effect that the plant is controlled by U. S. interests, or that such interests are concerned in its management, have been unequivocally denied.

Niagara Dredging, Ltd., has been incorporated under the Ontario Companies Act, with \$40,000 capital and office at St. Catharines, Ont., to carry on a general dredging business, and deal in contractors' and shipping supplies, etc. **J. S. Campbell**, **C. Bowman**, **H. M. Campbell**, **M. M. Harris** and **V. S. Moyer**, St. Catharines, are the provisional directors.

The Southern Pacific Co., early in January, placed in operation, what is stated to be the largest railway ferry steamboat in the world. It is being run on the Caraquez Strait, between Port Costa and Benecia, Cal. It is named Contra Costa, and is 433 ft. long by 116 ft. wide over guards, and will accommodate 2 locomotives and 36 freight cars, or 24 passenger cars.

The British Admiralty has announced that for the purpose of national defence, it has been necessary to close certain channels in the approaches to the port of Liverpool, Eng., and that all incoming vessels flying foreign flags, and all British vessels from all foreign and colonial ports must take a licensed Mersey pilot.

The C. E. Deakin Co., Ltd., contractors, Montreal, have gone into liquidation, a winding up order having been granted.

Atlantic and Pacific Ocean Marine.

The Allan Line s. s. Alsatian is being utilized as the flag ship of Rear Admiral Dudley de Chair.

The Allan Line s.s. Livonian, formerly Ludgate Hill, built in 1881, is reported to have been sold.

The Allan Line has chartered the steamships Ocean Monarch, Scottish Monarch and Verdun for its transatlantic freight service.

The C.P.R. has placed, through the Montreal office of Marsh & McLennan, Inc., insurance on its Atlantic and Pacific steamships, amounting to about \$25,000,000.

The C.P.R. s.s. Montrose, under charter to the British Admiralty as a transport, was reported to have been driven ashore at Dover, Eng., during a storm at the end of December.

The Ulster Steamship Co., operating the Head Line between ports in Ireland and Canadian and U.S. ports, is reported to have a vessel under construction in Belfast, to be ready for service this year.

Since the outbreak of war, and the taking over of all the C. P. R. transpacific vessels by the Admiralty, Canadian mails for the Orient have been carried across the Pacific by Japanese steamships.

The Great Northern Steamship Co.'s s.s. Minnesota, which has not been in service since Sept., 1914, is announced to re-enter the Pacific service, Feb. 6, when she will sail for Hong Kong.

The C.P.R. s.s. Tyrolia, formerly Lake Erie, has been sold to the British Government. She was built in 1900, and is 7,535 tons gross, 4,846 tons register, and was acquired by the C.P.R. from the Beaver Line.

The s.s. Navarra, under charter to the British Government, with a cargo of war supplies, bound from St. John, N.B., to France, ran ashore on Holmes Ledges, Tusket Island, Bay of Fundy, Dec. 30, and was reported to be a total loss. The cargo has been saved.

The s. s. Camino, which left San Francisco, Dec. 5, for Rotterdam, with relief supplies for the Belgians, was reported, Jan. 18, to be broken down and in a helpless condition, about 180 miles southeast of Sable Island. Dominion and U. S. vessels were sent to her assistance, and she was taken in tow and arrived at Halifax, Jan. 26.

The U. S. Government presented the captain of the Red Star Line s. s. Kroonland, recently, with a gold watch and chain, and various members of the crew with gold, silver and bronze medals, according to service, in commemoration of their rescue of 89 persons from the s. s. Volturmo when she was burned at sea, Oct. 10, 1913.

It is announced that there is every probability of the inauguration of a steamship service between Vancouver and Bristol, Eng., via the Panama Canal. The City of Bristol sent a deputation to Vancouver recently to investigate the possibilities of such a service, and it is stated that some arrangement is being made with a well established company to supply it.

The Donaldson Line s. s. Tritonia, which was reported recently to have struck a mine off the Irish coast, and which report was afterwards denied, is now stated to have been abandoned after striking a mine about 38 miles west of Inistrahull, Ireland, when bound from the Manchester Ship Canal to St. John's Nfld. She was insured for £25,000, and was built in 1893.

The Union Steamship Co. of New Zealand's new steamship, for service between

Australasia and Canada, is expected to be ready for launching at Glasgow, Scotland, shortly, and will probably make her maiden voyage in May. She is larger than any other vessels of the company's fleet, and, it is stated, will be given a Canadian name, as was the last of the company's vessels, namely, Niagara.

The steamship companies are booking Russian and Finnish passengers through to Petrograd and Helsingfors and Abo, via Gothenburg, Karuni and Tornea, which service was suspended on the outbreak of war. Passengers must have in their possession the necessary passports to enable them to travel through England and Scandinavia, and they must have sufficient money to pay for their maintenance while awaiting connections at various points.

The Hamburg American Line s.s. Dacia was reported recently to have been sold to E. N. Breitung, Marquette, Mich. It is said that she will be used in shipping freight to German ports under the U.S. flag. In view of the regulations under which Great Britain and the Allies are working, which, in the main, do not recognize the transfer of the ownership of the enemies' vessels in a neutral port, it is possible that the vessel will be captured by the British should she carry on such operations. The whole question of shipping by neutral countries is at present under

serious consideration by the British Government, and no doubt will be satisfactorily dealt with.

The British Admiralty, which, on the outbreak of war, requisitioned the whole of the C.P.R. Pacific fleet, has released the s.s. Monteaagle. She was expected to arrive at Vancouver from Hong Kong during January, when she would be given a thorough overhaul and replaced in the transpacific service. No indication is given as to where she has been operating during her service under the Admiralty. The Empress of Asia and Empress of Russia are on scout duty and holding German shipping in harbor, the Empress of Japan and Monteaagle have been acting as transports for troops, and the Empress of India has been purchased for use as a hospital ship for India by the Maharajah Scindia of Gwalior.

Maritime Provinces and Newfoundland.

The s. s. Seal left North Sydney, Jan. 19, with the winter mail for Magdalen Islands.

The s.s. Bear River, which operates between Digby, N.S., and St. John, N.B., broke her main shaft while in the Bear River, Jan. 2. Repairs were made and the service resumed a week later.

It is reported that the C.P.R. s.s. St.

Sault Ste. Marie Canals Traffic.

The following commerce passed through the Sault Ste. Marie Canals during 1914.

ARTICLES		CANADIAN CANAL	U. S. CANAL	TOTAL
Copper.....	Eastbound	Short tons 2,887	88,877	91,764
Grain.....	"	Bushels 32,293,503	36,044,479	68,338,072
Building stone.....	"	Short tons		
Flour.....	"	Barrels 2,208,392	7,511,031	9,719,423
Iron ore.....	"	Short tons 20,893,142	10,516,927	31,410,069
Pig iron.....	"	" 4,200	14,179	18,379
Lumber.....	"	M. ft. b.m. 21,129	431,019	452,148
Silver ore.....	"	Short tons		
Wheat.....	"	Bushels 98,093,481	52,190,014	150,283,095
General merchandise.....	"	Short tons 72,701	173,483	246,184
Passengers.....	"	Number 13,177	15,613	28,790
Coal, hard.....	Westbound	Short tons 334,087	1,9 6,418	2,240,505
Coal, soft.....	"	" 2,006,457	10,240,259	12,246,716
Flour.....	"	Barrels 150	512	662
Grain.....	"	Bushels		
Manufactured iron.....	"	Short tons 58,786	182,518	221,304
Iron ore.....	"	" 3,996		3,696
Salt.....	"	Barrels 100,316	676,892	777,208
General merchandise.....	"	Short tons 377,473	693,647	1,071,120
Passengers.....	"	Number 16,832	14,179	31,011
Summary.				
Vessel passages.....	Number	6,078	12,689	18,717
Registered tonnage.....	Net	17,295,958	24,690,381	41,986,339
Freight—Eastbound.....	Short tons	24,803,622	14,667,041	39,470,663
—Westbound.....	"	2,794,845	13,104,426	15,899,271
Total freight.....	"	27,598,467	27,771,467	55,369,934

COMPARATIVE STATEMENT FOR THE SEASONS 1913 AND 1914.

Items		Season 1913	Season 1914
Vessels : Steamers.....	Number	19,789	14,994
Sailing.....	"	1,992	1,832
Unregistered.....	"	2,014	2,041
Total.....	"	23,795	18,717
Lockages.....	"		
Tonnage : Registered.....	Net	16,867	13,502
Freight.....	Short	57,989,715	41,986,389
Passengers.....	Numbers	79,718,344	56,369,934
Coal : Hard.....	Short tons	77,194	69,801
Soft.....	"	2,44,574	2,240,505
Flour.....	Barrels	15,878,364	12,246,716
Wheat.....	Bushels	10,212,667	9,715,085
Grain.....	"	204,821,507	150,284,095
Manufactured and pig iron.....	Short tons	112,230,369	68,338,072
Salt.....	Barrels	402,912	239,683
Copper.....	Short tons	730,431	777,208
Iron ore.....	"	85,378	91,764
Lumber.....	m. ft. bm.	48,109,353	31,413,765
Building stone.....	Short tons	599,536	452,148
General Merchandise.....	"	6,151	
		1,770,860	1,317,304

The Canadian canal was opened April 20 and closed Dec. 14, 1914; season, 239 days. The U.S. canal was opened April 20 and closed Dec. 14, 1914; season, 242 days.

George, which was taken over recently by the Government for patrol duty in the Bay of Fundy, has been laid up for the winter, and that the C.P.R. s.s. Montford is taking her place.

The Government wharf at Miscou harbor, Little Shippigan, N.B., has been completed. It is 860 x 20 ft., with a head block 30 x 40 ft., the L being on the east side. It extends out from the south end of Miscou Island.

Press reports from Newfoundland state that the Reid Newfoundland Co.'s s. s. Lintrose is to be sold for war purposes, and that the company's s. s. Kyle will replace her on the Port aux Basque and North Sydney route.

E. A. Labelle and F. Robinson, two of the Montreal Harbor Commissioners, inspected the harbor works at St. John, N.B., at the end of December, at the invitation of the Minister of Marine. The chairman of the commissioners, W. G. Ross, intended to be present, but was prevented through illness.

In referring to the car ferry service, which will be inaugurated shortly, between New Brunswick and Prince Edward Island, the President of the Charlottetown Board of Trade, stated recently that he believed that such service would before long, be supplemented by the operation of one or more improved aeroplanes.

A press dispatch from Halifax, states that the s. s. Wacousta, which arrived, Jan. 9 from Sydney, N. S., where she had been fitted out for icebreaking work for the Russian Government at Archangel, will be used locally for patrol work. It is stated that it was discovered that she was unable to carry sufficient fuel for the trip across the ocean, and the project was abandoned.

The ice breaking steam tug, J. T. Horne, which was sold some time ago to the Russian Government for use in the harbor at Archangel, and which made an unsuccessful attempt to cross the ocean, has had a number of necessary alterations completed at Sydney, N.S. A false deck has been built with heavy planking on a steel frame about 7 ft. high, running from the bow to abaft the deck house. She left Sydney, Jan. 7, for Halifax, where she is to provision and prepare for the trip.

The Kilkeel Co.'s s. s. Kilkeel, which went ashore early in January, on the Bald Rock shoal, near Canso, N. S., has become a total loss. She was chartered by the Inverness Ry. and Coal Co., which, with the vessel owning company, is closely allied with the Canadian Northern Ry. The Kilkeel was built at Paisley, Scotland, in 1895, and was driven by engine of 39 n.h.p. Her dimensions were,—length 135 ft., breadth 21 ft., depth 9.4 ft.; tonnage, 252 gross, 56 register.

Province of Quebec Marine.

The Quebec Harbor Commissioners are asking the Government for a loan of \$1,500,000 in order to complete certain harbor works. At an interview in Ottawa, Jan. 15, the Minister of Marine promised that the application would receive the Government's attention.

The ship channel across the Horseback bar in the St. Lawrence, between Quebec and Montreal, has been changed slightly in direction, and a new channel 450 ft. wide by 30 ft. deep at extreme low water has been completed. The change will necessitate the abandonment of the Cap Charles range lights, and the establishment of a new range in the alignment of the Calvaire above Cap Charles. The new lights will be exhibited

on the reopening of navigation. The Cap Charles channel has also been widened and deepened, to the same dimensions as the foregoing channel, with the exception of a length of 1,250 ft. by the buoy 77Q, where the old depth of 27½ ft. at ordinary low water exists. This will be completed to 30 ft. during the year.

Ontario and the Great Lakes.

The Northern Navigation Co.'s s. s. City of Midland suffered considerable damage to the interior, by a fire broke out in the passenger saloon, while she was at her winter berth at Collingwood, Dec. 30.

A Collingwood press dispatch states that the Playfair interests have placed a contract with Pratt, Haney and Marfariane for the construction of a large cement coal dock, which is to be equipped with the most modern coal handling machinery, at Midland.

The United States Lake Survey reports the levels of the Great Lakes in feet above tidewater for December, as follows,—Superior 602.08; Michigan and Huron 579.62; Erie 571.31; Ontario 244.83. Compared with the average December levels for the past ten years Superior was 0.23 ft. below; Michigan and Huron 0.61 ft. below; Erie 0.45 ft. below, and Ontario 0.77 ft. below. It was anticipated that during January, Superior would be 0.3 ft. lower, Michigan and Huron 0.2 ft. lower, that Erie would remain stationary, and that Ontario would be 0.1 ft. higher.

The grounds in the vicinity of the Brockton Point light station are being improved for park purposes, a concrete retaining wall and a boulevard are being built and a new lighthouse is under construction. The lighthouse is a square tower with sloping sides and an octagonal lantern. The structure is 42 ft. from the base of the tower to the top of the lantern ventilator, with the light 40 ft. above high water mark. As soon as the lighthouse is completed the illuminating apparatus will be removed from the present wooden structure and installed in the new tower.

James Carruthers, President; J. W. Norcross, Managing Director, and C. A. Barnard, K. C., Solicitor, Canada Steamship Lines, Ltd., returned to Montreal, early in January, after a business visit to England. It is said that while they were there the company's operating results for the past season were discussed with the English committee, who are reported to have expressed their satisfaction, considering the state of business during the latter part of the year. Press reports state that the company has received \$1,250,000 for additional working capital, from the English committee.

British Columbia and Pacific Coast Marine.

The C.P.R. s.s. Princess Charlotte has been withdrawn from service for the winter. She is to be thoroughly overhauled and re-

fitted in readiness for service on the Alaska route in the summer.

The C. P. R. has installed an elevating apparatus on its wharves at Vancouver, to enable cargoes to be handled with ease at any stage of the tide.

The Imperial Oil Co.'s oil tank steamer Azov is being repaired at North Vancouver, after suffering considerable bottom damage by running on reefs off the coast of Chili about three months ago.

The Department of Marine, which issued special regulations recently for the navigation of Barkley Sound, has announced that these have been cancelled and that navigation in all parts of the sound is again open to all vessels.

C. Gardiner Johnson, Secretary to the Vancouver Pilotage Authority, stated recently, after the annual meeting of the commissioners, that they were aiming at a reduction of the compulsory pilotage charges for Vancouver, Howe Sound and Powell River. Suggestions had been forwarded from time to time to the Marine Department for consideration, and approval will have to be received from Ottawa before any announcement as to the extent of the reduction can be made.

The Border Line Transportation Co. has been organized at Seattle, Wash., to take over the steamboats Dispatch and Fulton, heretofore operated by the Border Line Transportation Co., and the steamships Alki and Northland, heretofore operated by the Northland Steamship Co. The vessels will be run to southeastern Alaska and British Columbia ports. A. F. Haines, Manager of Dodwell & Co., steamship agents, Seattle, is Manager, and H. C. Bradford, heretofore Manager and Secretary, Northland Steamship Co., is Traffic Manager.

C. P. R. Steamship Ownership.—The C. P. R. is applying to the Dominion Parliament for authority to lease or charter any of its ships, vessels or ferries to any incorporated company having for one of its objects the acquiring and operating of such vessels, and to hold and dispose of shares and securities of such company. Press dispatches state that such a move indicates the placing of the company's vessels under subsidiary companies, which question has been before the directors for several years. In the annual report for 1913-14, the earnings from steamships, etc., were not included in the general accounts, but figured under the head of special income account.

Canada to Russia. To accommodate Russians who want to return to their own country, the C.P.R. has arranged a rate of \$ 4.25 from St. John, N.B., to Petrograd. The route is by C.P.R. steamships to Liverpool, thence to a port in Sweden or Finland, and from there to Petrograd.

When one considers that the true progress of the entire civilized world is due almost entirely to the work of its engineers, the importance of providing the engineering profession with the highest possible education in both theoretical and practical lines cannot be exaggerated.—Waddell.

Shipments of Grain From Fort William and Port Arthur.

The Lake Shippers' Clearance Association, which has its headquarters at Winnipeg, has furnished the following statistics of grain shipped through it from Aug. 1 to the close of navigation in December for each year from 1909 to 1914. The figures given are bushels.

	Wheat.	Oats.	Barley.	Flax.	Totals.
1909	33,795,957	8,226,966	1,663,459	1,877,655	45,564,037
1910	37,732,591	6,726,362	886,603	2,044,126	47,389,682
1911	47,633,639	11,518,982	1,403,835	809,266	61,365,722
1912	56,782,457	11,409,343	3,315,322	5,692,951	77,200,073
1913	92,796,796	25,805,453	7,100,439	9,973,963	135,676,651
1914	53,579,911	8,916,971	1,876,476	3,611,806	67,985,164

Telegraph, Telephone and Cable Matters.

James Rainnie, who has been in Western Union Telegraph Co.'s service since 1866, the past 47 years having been spent at Sackville, N. B., has retired.

L. Longmoore, who was night manager, Montreal Telegraph Co., at Montreal, about 50 years ago, and who retired from active service some 20 years ago, died at St. Lambert, Que., Jan. 10, aged 78.

The British military authorities advised telegraph and cable companies recently that plain language messages for Great Britain and beyond, containing only one text word, would not be passed.

Nelson McRae, who died at Wyebridge, Ont., Jan. 21, aged 76, was local manager of the Montreal Telegraph Co. at Wyebridge in 1872, and later acted for the Great North Western Telegraph Co. till the company closed its office there.

George Haddon Stead, whose appointment as Superintendent, District 5, Great North Western Telegraph Co., Saskatoon, Sask., was announced in our last issue, was born at Eccles, Lancashire, Eng., Apr. 29, 1875, and commenced his telegraph service in 1889, since when he has been, to Apr., 1902, successively, messenger, delivery clerk, counter clerk, operator, bookkeeper and chief operator, G.N.W.T. Co., Winnipeg; Apr., 1902, to Oct., 1910, local manager, Canadian Northern Telegraph Co., Winnipeg; Oct., 1910, to Dec. 31, 1914, Superintendent, Western Lines, C.N. Telegraph Co., Winnipeg.

The Montreal Telegraph Co.'s report for 1914, shows total assets of \$2,313,556, and liabilities consisting of, capital \$2,000,000; excess in value of property \$151,823; dividend payable \$40,000; unclaimed dividends, etc., \$4,214; contingent fund \$117,517. The property is operated by the Great North Western Telegraph Co., under a lease for 97 years from July 1, 1881, and the operation, maintenance and dividends are guaranteed by the Western Union Telegraph Co. The officers for the current year are:—President, Wm. McMaster; Vice President, W. R. Miller; other directors, B. McLennan, R. MacD. Paterson and H. E. Rawlings, the last mentioned succeeding the late W. Wainwright.

Transportation Conventions in 1915.

- Jan. 19-21.—American Wood Preservers' Association, Chicago, Ill.
- Mar. 10-10.—American Railway Engineering Association, Chicago, Ill.
- April.—American Association of Demurrage Officers, Boston, Mass.
- Apr. 26.—Association of American Railway Accounting Officers, Atlanta, Ga.
- May.—Association of Railway Claim Agents, Galveston, Tex.
- May.—Railroad Master Tinnors', Copper-smiths' and Pipefitters' Association, Chicago, Ill.
- May 4-7.—Air Brake Association, Chicago, Ill.
- May 12.—American Association of General Baggage Agents, Los Angeles, Cal.
- May 17-19.—Railway Storekeepers' Association, Chicago, Ill.
- May 17-20.—International Railway Fuel Association, Chicago, Ill.
- May 19.—American Railway Association, Atlantic City, N.J.
- May 20-21.—American Association of Railroad Superintendents, San Francisco, Cal.
- May 21-24.—American Association of Freight Agents, Richmond, Va.
- May 26-28.—Master Boiler Makers' Association, Chicago, Ill.
- June 9-11.—American Railway Master Mechanics' Association, Atlantic City, N.J.
- June 14-16.—Master Car Builders' Association, Atlantic City, N.J.
- June 15.—Train Despatchers' Association of America, Minneapolis, Minn.
- June 16.—Freight Claim Association, Chicago, Ill.
- June 22-25.—Association of Railway Telegraph Superintendents, Rochester, N.Y.
- July.—American Railway Tool Foremen's Association.

- July 14-17.—International Railway General Foremen's Association, Chicago, Ill.
- Aug. 17.—International Railroad Master Blacksmiths' Association, Philadelphia, Pa.
- Sept. 14-16.—Roadmasters' and Maintenance of Way Association.
- Sept. 14-17.—Master Car and Locomotive Painters' Association of the United States and Canada, Detroit, Mich.
- Sept. 21-24.—Railway Signal Association, Salt Lake City, Utah.
- October.—American Association of Dining Car Superintendents.
- Oct. 4-8.—American Electric Railway Association, San Francisco, Cal.
- Oct. 19-21.—American Railway Bridge and Building Association.

Transportation Associations, Clubs, Etc.

- The names of persons given below are those of the secretaries unless otherwise stated:
- Canadian Car Service Bureau—J. Reilly, Manager, 401 St. Nicholas Building, Montreal.
 - Canadian Electric Railway Association—Acton Burrows, 70 Bond Street, Toronto.
 - Canadian Freight Association (Eastern lines)—G. C. Ransom, Canadian Express Building, Montreal.
 - Canadian Freight Association (Western lines)—W. E. Campbell, 502 Canada Building, Winnipeg.
 - Canadian Railway Club—J. Powell, St. Lambert, Que. Meetings at Montreal 2nd Tuesday each month, 8.30 p.m., except June, July, and August.
 - Canadian Society of Civil Engineers—C. H. McLeod, 176 Mansfield St., Montreal.
 - Canadian Ticket Agents' Association—E. de la Hooke, London, Ont.
 - Central Railway and Engineering Club of Canada—C. L. Worth, 409 Union Station, Toronto. Meetings at Toronto, 3rd Tuesday each month, except June, July, and August.
 - Dominion Marine Association—F. King, Counsel, Kingston, Ont.
 - Eastern Canadian Passenger Association—G. H. Webster, 54 Beaver Hall Hill, Montreal.
 - Engineers' Club of Montreal—R. W. H. Smith, 9 Beaver Hall Square, Montreal.
 - Engineers' Club of Toronto—r. B. Wolsey, 94 King Street West, Toronto.
 - Express Traffic Association of Canada—W. H. Burr, Chairman, Toronto.
 - Great Lakes and St. Lawrence River Rate Committee—James Morrison, Montreal.
 - International Water Lines Passenger Association—M. R. Nelson, New York.
 - Niagara Frontier Summer Rate Committee—James Morrison, Montreal.
 - Nova Scotia Society of Engineers—A. R. McCleave, Halifax, N.S.
 - Quebec Transportation Club—A. F. Dion, Quebec.
 - Ship Masters' Association of Canada—Capt. E. Wells, 45 St. John Street, Halifax, N.S.
 - Toronto Transportation Club—W. A. Gray, 143 Yonge Street, Toronto.
 - Western Canada Railway Club—Louis Kon Box 1707, Winnipeg. Meetings at Winnipeg, 2nd Monday each month, except June, July, and August.

Trade and Supply Notes.

The matter which appears under this heading is compiled, in most cases, from information supplied by the manufacturers of, or dealers in, the articles referred to, and in publishing the same we accept no responsibility. At the same time we wish our readers distinctly to understand that we are not paid for the publication of any of this matter, and that we will not consider any proposition to insert reading matter in our columns for pay or its equivalent. Advertising contracts will not be taken with any condition that accepting them will oblige us to publish reading notices. In other words, our reading columns are not for sale, either to advertisers or others.

F. H. Hopkins & Co., railway and contractors' supplies, etc., Montreal, have opened an office at 1206 Union Trust Building, Winnipeg, in charge of J. W. Purcell.

Algoma Steel Corporation Ltd., Sault Ste. Marie, Ont., has reopened its Montreal office at 211 McGill St., and has appointed G. A. Irwin Sales Manager.

Northern Crane Works, Ltd., Walkerville, Ont., has issued a booklet, "Cranes and Hoists," illustrating and giving particulars of a number of cranes of various types for railway and other service.

Canadian National Carbon Co., Ltd.—W. H. Arkenburg, formerly Publicity Manager, Union Switch & Signal Co., has been ap-

pointed to the National Carbon Co.'s Sales Department, with charge of railway and signal work in Canadian territory.

The National Steel Car Co., Ltd., Hamilton, Ont., has, we are officially advised, received orders for about \$250,000 of work from the British Government and for over \$1,000,000 worth from the French Government.

The National Boiler Washing Co., Ltd., Montreal, which installs boiler washing plants in locomotive houses and in industrial heating plants, is now conducting its western business from 1206 Union Trust Building, Winnipeg, the office being in charge of J. W. Purcell.

Canadian Car & Foundry Co. The President, Senator Curry, who has been in Europe, was expected back in Montreal at the end of January. W. W. Butler, Vice President, arrived in London from Canada on Jan. 5. A press cablegram says that the company is opening an office in London.

Wall calendars for 1915 have been received from Bird-Archer Co., manufacturers of boiler chemicals, New York; W. W. Butler Co., Ltd., railway, marine and mining supplies, Montreal; Hart-Otis Car Co., Ltd., Montreal; and Pratt & Whitney of Canada, Ltd., small tool manufacturers, Dundas, Ont.

Ohio Brass Co., Mansfield, Ohio, has issued O-B Bulletin for November and December, as a car equipment number, containing, among other matter, articles on Tomlinson couplers, a high speed third rail interurban railway, O-B trolley retrievers, and overhead construction at Atlantic City and Shore Ry.'s car barns.

The Herbert Morris Crane & Hoist Co., Ltd., Toronto, has issued book 46, a loose leaf binder containing a collection of bulletins illustrating and describing, with dimensions and price lists, a selection of its standard manufactures, including chain blocks, trolleys, travelling blocks, hand cranes, overhead runways and various lifting and shifting devices and accessories. It has also issued in separate form, but suitable for insertion in the binder, Bulletin B11, respecting its belt-driven friction hoist.

Buoy Lighting.—The Department of Marine has decided to establish a uniform system of characteristic for gas lighted buoys and gas beacons, making buoy or beacon lights which are to be left on the starboard side in going up stream, occulting red lights, and port hand lights occulting white lights. That is, red buoys will carry red lights and black buoys white lights. For special positions, such as middle grounds, fairways, etc., special arrangements will be made. White lights will, however, be favored where possible. It is proposed to make the changes on the opening of navigation, or by May 1.

The Ideal Incinerator and Contracting Co. has been incorporated under the Ontario Companies Act, with power among other things to build railway sidings and switches, and to carry on the business of general contractors, and to manage tramways, docks, harbors, piers, wharves, canals, etc., but the company is not to operate or control any public utility or municipal franchise. The provisional directors are:—J. T. White, K. W. Wright, G. R. Sproat, F. M. McDowell, Miss M. W. Allan, Toronto.

The writing of first class specifications and contracts is an art that cannot be acquired except through experience; but nevertheless its acquisition can be hastened materially by a thorough drill at the technical school in the underlying principles of such writing as well as in the practice of their composition.—Waddell.