

Canadian Railway and Marine World.

June, 1913.

Canadian Northern Railway Dynamometer Car.

One of the best investments made by the Canadian Northern Ry.'s mechanical department is a dynamometer car built in its Winnipeg shops early last year for testing the motive power on its western lines.

The exterior of the car is shown in fig. 1, and the floor layout and interior arrangement in fig. 2. It is a converted passenger car of the older type, the interior arranged for the convenience of the operator, and as a business car for the mechanical department. The designs were all prepared under the supervision of S. J. Hungerford, Superintendent of Rolling Stock, from whom the following information was obtained.

The dynamometer draft gear is shown in fig. 3. The body of the old car has been reinforced by building into the underframe two 15 by 6 in. I beams, extending the car length, to which the draft gear at both ends is attached. These beams are spaced 26 ins. apart between the webs, as shown in fig. 3.

Between the web is attached a section of $\frac{3}{4}$ in. plate, $44\frac{1}{8}$ ins. long, the edges of which are flanged, and secured to edges of which are flanged, and secured to the webs of the large I beam by twenty two $\frac{7}{8}$ in. rivets on each flange. To the under side of this plate is secured the dynamometer draft rigging, nesting between two 12 in. channels, the backs of which are $14\frac{1}{4}$ ins. apart. Three under brackets across between the lower flanges of the large I beams support the channels from the bottom, forming a rigid box construction.

the inside, through which passes a tapered key pin, securing the U connector to the piston rod. The location of the cylinder is shown in this same view, and the construction in fig. 4. The construction allows for cylinder flanges, by which means the cylinder is attached to the webs of the body I beams.

The cylinder is an iron casting, bored to a $16\frac{1}{2}$ in. diameter, with a central 15 in. portion 16 in. diameter, in which the piston fits. The piston is 12 ins. long, containing six $\frac{1}{4}$ by $\frac{1}{4}$ in. annular grooves

double pins are placed between the ends of the U connector and these lugs, holding the U connector in its normal central position, the pull or push being taken up by the springs inside the yoke in the usual manner, the dynamometer cylinder arrangement being made dead. When the dynamometer is in operation the springs in the yoke are useful in taking up sudden shocks, relieving the cylinder, but in no way affecting the readings.

From the ends of the oil cylinder there are pipe connections to the dynamometer

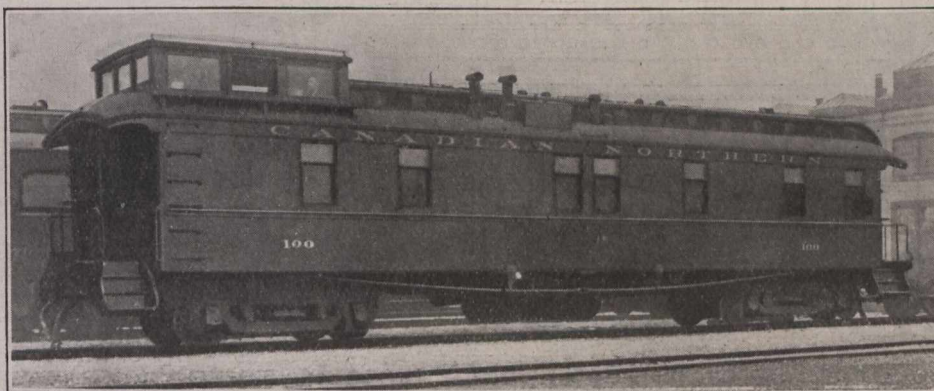


Fig. 1.—Canadian Northern Railway Dynamometer Car.

room in the car. On the floor of the car there is located a pump for pumping the cylinders full of oil, with a by pass between the cylinder ends, connected to the pump, by means of which the oil can be shifted from one end to the other, when after a long run, the leakage around the piston has been found to be sufficient to bring the piston too near one end. The customary practice in centering the piston, when leakage has shifted its position, is to open the by pass, and have the locomotive pull or push on the drawbar, shifting the piston back to normal, the by pass being then closed. In summer the oil used is dynamo oil, and in winter equal parts of dynamo and signal oils.

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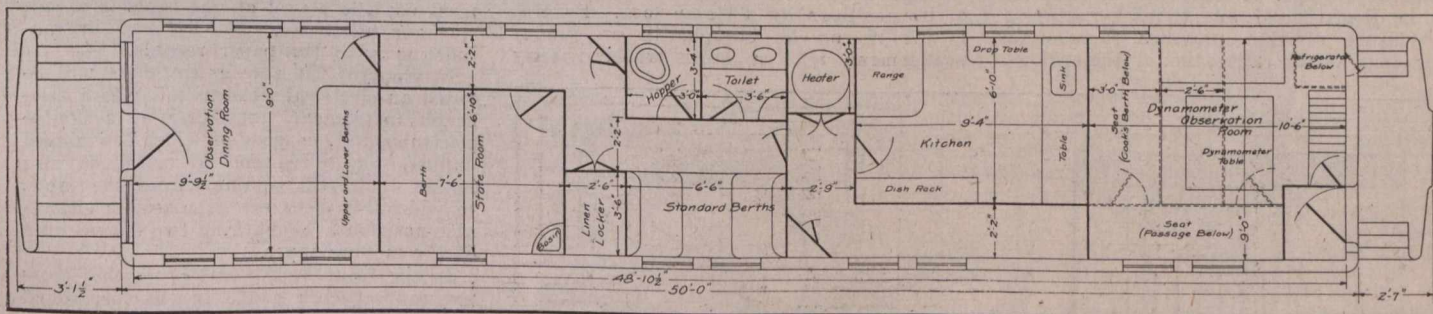


Fig. 2.—Floor Plan and Interior Arrangement of Dynamometer Car.

The coupler and yoke are of the usual type, carrying two spring plates, between which are the usual nested coiled springs. All this portion is of standard construction. Along the sides of the coupler yoke are the two arms of a heavy U connector piece, inward lugs on the latter forming bearings against which the spring plates bear, carrying the pull or push from the coupler into the U connector, all as shown in the plan view, fig. 3.

Through the base of the U, passes a piston rod, secured to the U by a block on

eliminated as much as possible. Under both legs of the U connector are two 8 in. rollers, each pair being carried on a shaft in bearings on the under side of the side channels, the weight of the yoke, coupler and spring plates being carried by the same means.

In the plan view of fig. 3 it will be noticed that there are side lugs attached to the inner face of the side channels, near the ends of the normal position of the U connector; these lugs are shown in section. When the dynamometer is not in use,

of the car will permit, there being just standing room, with a close clearance for outside obstructions over the top of the cupola. All four sides have observation windows for outside inspection. The room is reached by a short tier of steps at the end of the car.

In the centre of the room is the dynamometer table, shown in fig. 5, the top of which is shown in fig. 6. On the top of the table is the dynamometer recording apparatus, the main part of which is shown in fig. 7. It will be observed that integral

to a solid cast frame there are two small cylinders, bored to a diameter of 0.796 in., giving an area of $\frac{1}{2}$ sq. in. These cylinders connect through the pipe connections mentioned to the ends of the dynamometer cylinder. Both cylinders are single ended, opening towards each other.

Between the two cylinder bores is an aluminium piston rod, the ends of which are turned, and brass piston sleeves fitted thereon. These sleeves are turned with four packing grooves, 1-64 in. deep. At the

top of the recording table.

As mentioned, a sheet of paper can be put in continuous motion over the face of the table under the recording pen. The mechanism that moves this paper is shown in fig. 5. On one of the axles of the four wheel truck there is mounted a 4 groove rope pulley, with a corresponding wheel mounted on a shaft on the frame of the recording table. Four spring belts pass around both wheels, passing up through a box opening in both main and dynamometer

prevents it from unrolling too rapidly. From this roll the paper passes up over a roller, the top of which is flush with the table top, thence forward on the table, and over a similar roller, and down on the front paper roll, on which it is wound by the worm mechanism, which can be thrown in and out at will.

The paper passing over the table is to be seen in fig. 6, all the recording apparatus being shown there also. On the pantograph arm is the pressure recording pencil. To

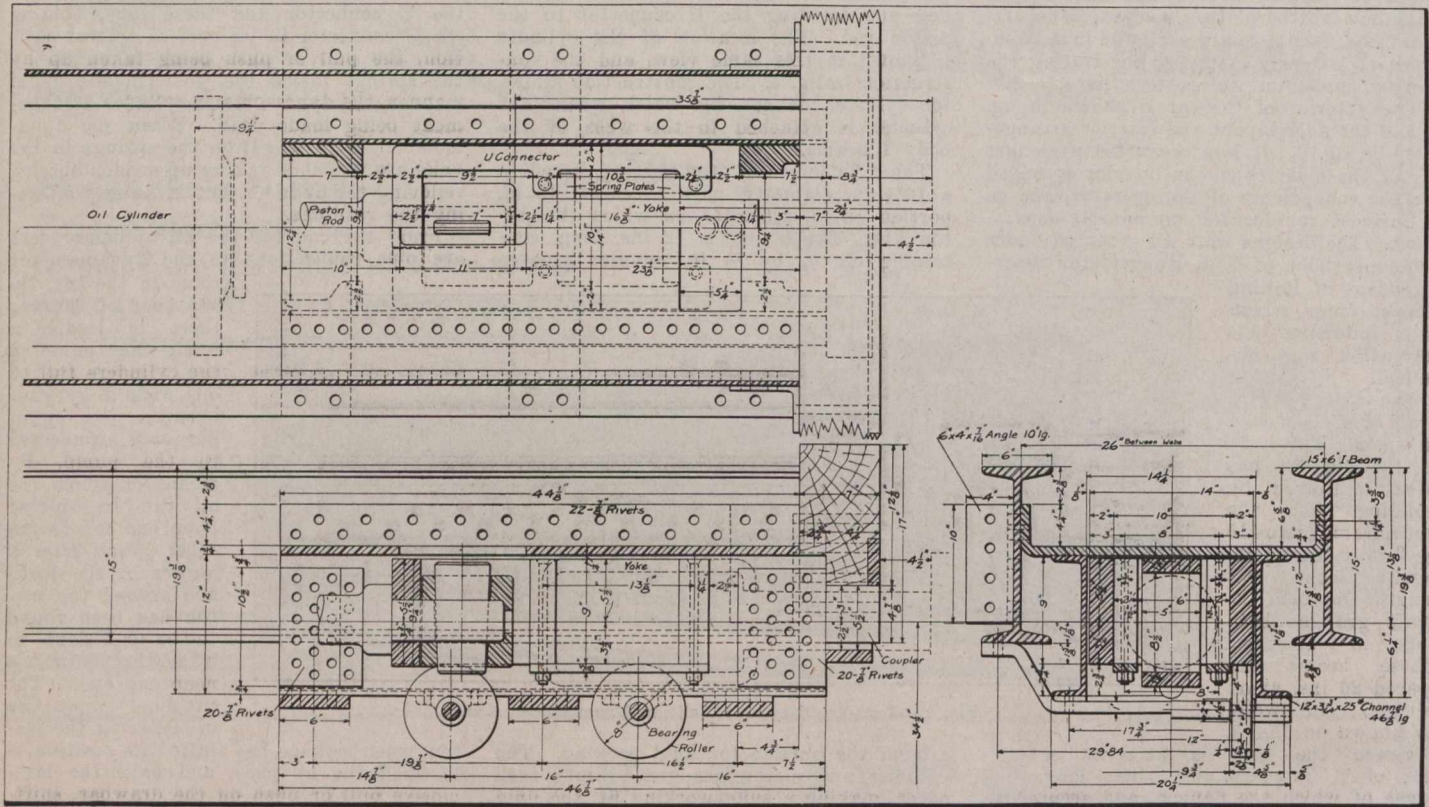


Fig. 3.—End Construction and Draft Rigging of Dynamometer Car.

centre of the piston rod there is a type of crosshead, connected to it by a wrist pin, the outer ends of the cross head attaching to connecting rods which pass alongside each cylinder to cross heads at the rear of each cylinder. Between each crosshead and the cylinder head are calibrated indicator springs, so that the distance of piston displacement due to oil pressure is a measure of that pressure to a scale dependent on the calibration of the springs.

room floors. The motion of this frame wheel is in consequence dependent directly on the speed of the car.

The carrying shaft is connected by a universal joint to a short worm shaft, the end furthest from the universal joint being carried in a bearing that can be moved through a small arc, and clamped in any of its positions by a clamp lock. By this means it can be brought in or out of engagement, with a worm wheel directly

the rear is an indicating pressure gauge, connected in with that end of the pressure recording cylinder, the dynamometer cylinder pressure being there indicated for that end of the cylinder. At the rear end, under the table, is another gauge, for indicating the pressures on the other end of the cylinder. The opposite end, being that most used, is placed on the table in a conspicuous place, and can be read in conjunction with the paper records.

In front of the rear gauge there will be noted an electrical ticker, similar to a telegraph instrument, consisting of a double electromagnet, in front of which is a hinged flapper, the lower end of which is also hinged to a rod running across the table, to which two pens are attached, in adjustable positions, for marking two datum lines on the moving paper.

In the front of this rod is another cross rod connecting a gauge in the foreground with the black box in the left background. The latter is a speed recorder, connected through a long spring belt with a pulley on the truck axle. A flexible cord in the speedometer connects with this front cross rod, the rear end of the cross rod connecting with the gauge in the foreground, this gauge indicating the speeds on the dial face. The speeds are also recorded graphically by a stylograph pen attached to the cross rod.

The pens on the rear cross rod are so adjusted as to give datums for the pull on the far side of the paper, and for the speed on the near side of the paper. The electrical attachment on the far end of this

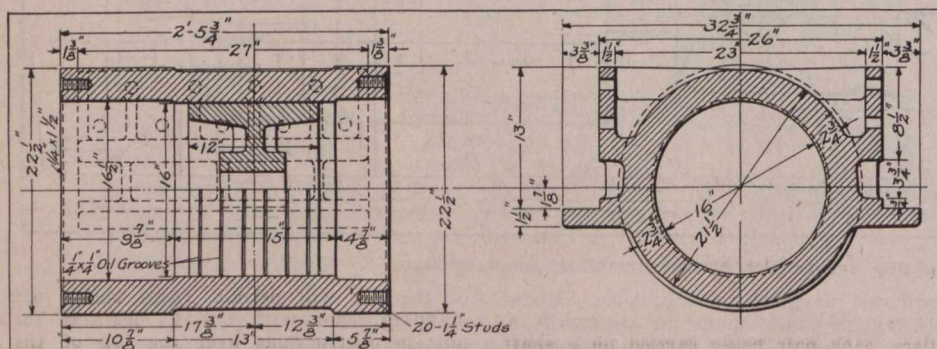


Fig. 4.—Oil Draft Cylinder of Dynamometer Car.

The springs at each end only operate one at a time, depending on the end of the dynamometer cylinder in compression. Through a pantograph movement a stylograph pen on the outer end of an arm multiplies the extent of the piston displacement, marking the same on a sheet of paper that passes continuously over the

beneath it, a pinion on the same shaft as the latter meshing with another gear on a lower shaft, this latter shaft carrying between the frames a recording paper roll. On the rear part of the table frame is another paper roll, carried on a shaft on bearings on the rear legs. A friction brake regulates the movement of this roll, and

rod is connected with a push button on each side of the cab, so that the observer at the car side, on approaching a mile post, presses the button, the hinge of the electrical apparatus flapping, drawing the datum pencils towards it momentarily, a spring forcing them back to normal position on the release of the button, the jog in the datum thus made forming the mile post indication.

Both speed and pull are recorded on the paper to a known scale, but in operation, as a double check, it is the practice to mark the pressure and speed indicated on the indicating gauges on the paper at the same time that the number of the mile post is marked opposite the datum jog. Intermediate points are also pencilled down on the paper, where the table observer notes any points in the traced curves that he wishes to record. Memoranda can also be written down in the margin at the same time. For this purpose, and to observe the paper as it passes over the table for the greatest period of time, there is a glass plate let into the table face near the front edge, under which the paper passes. The pressure, as given by the indicating pressure gauge, is in lbs. per sq. in., and in order to interpolate into the drawbar pull, this must be multiplied by the area of

Victoria Rolling Stock and Realty Co. of Ontario, Ltd.

The annual report for the year ended Feb. 15 says that during the year the company did not issue any new debentures, and outstanding debentures against leases were reduced by \$160,000. All payments

ASSETS.	
Obligations on leases	\$ 906,741.66
Debentures held by company and accrued interest	24,536.13
Cash in bank	104,208.77
Call loans	240,000.00
	\$1,275,486.56

LIABILITIES.	
Capital stock subscribed .. \$600,000.00	
Capital stock paid up	\$ 240,000.00
Debentures outstanding	960,000.00

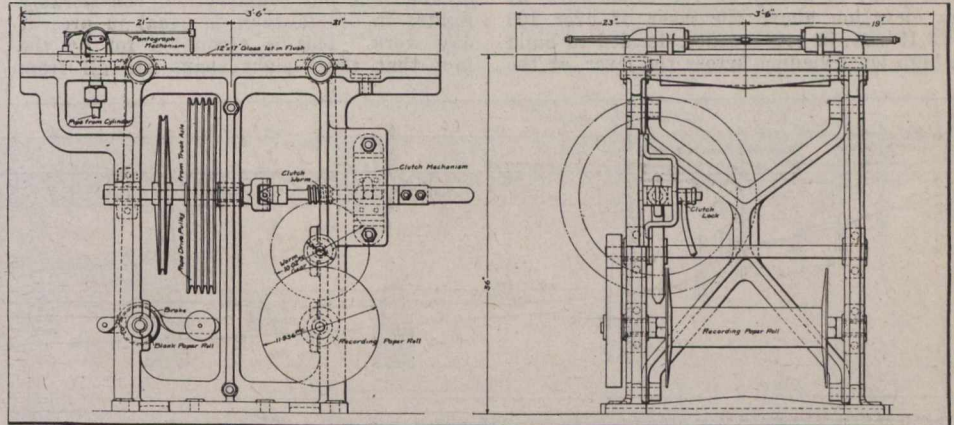


Fig. 5.—Dynamometer Table with Throw In Apparatus.

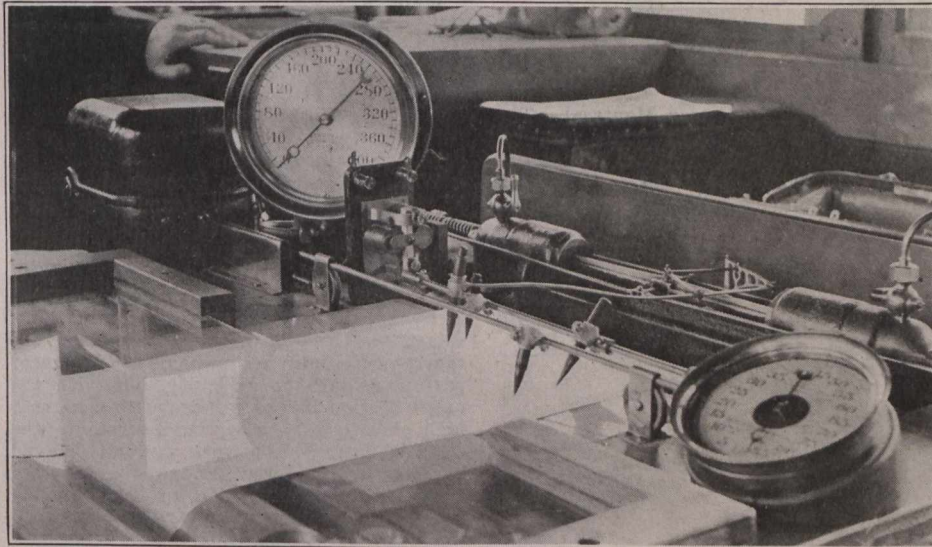


Fig. 6.—Top of Dynamometer Table, with Indicating Apparatus.

the dynamometer cylinder, which, for the forward end, is 188 sq. ins.

The wisdom in constructing such a car was soon demonstrated by a few trial runs over different divisions of the system. The tonnage rating of nearly all the locomotives was found to be far too low, and with the information gleaned from the observations made, the loading was increased in a great many instances. Practically every one of the many C.N.R. lines through the west have been gone over with the different locomotives used on the division, and the maximum rating over each section, for each of the different locomotives, determined. This information on each of the divisions is placed in the hands of the locomotive foreman, so that he now knows exactly what loading each locomotive can be given to obtain its maximum efficiency, when an order for a locomotive is given him by the operating department.

One advantage of steel interior finish on steel passenger cars, is that the finish can be made up in special shops and rapidly assembled in the car, instead of the slow method of cutting and fitting as followed for wooden interior finish.

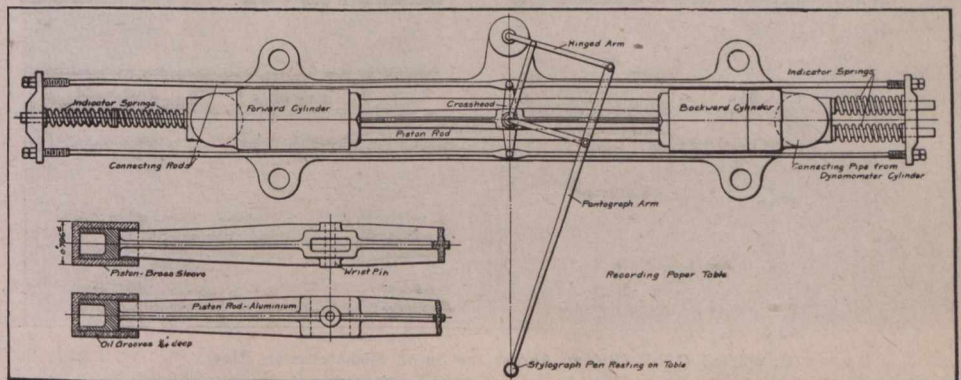


Fig. 7.—Indicating Oil Cylinders with Pantograph Mechanism.

maturing during the year were promptly met. The profit on the year's business after charging up directors' fees and expense account, was \$31,386.45, out of which a dividend of 6% per annum on the paid up capital stock was paid, amounting to \$14,400, leaving \$16,986.45 carried forward to profit and loss account, which now stands at \$67,486.56.

Interest accrued on same	8,000.00
Balance at credit of profit and loss	67,486.56
	\$1,275,486.56

PROFIT AND LOSS ACCOUNT.	
Balance at credit of profit and loss account, Feb. 15, 1912	\$ 50,500.11
Rents received and accrued on leases and interest on advances and debentures held by company	77,312.52
	\$127,812.63
Interest paid and accrued on debentures ..	\$ 43,756.57
Expense account	869.50
Directors' fees last year	1,300.00
Dividend account	14,400.00
Balance carried forward	67,486.56
	\$127,812.63
Original cost of rolling stock held under existing leases	\$2,939,370.00
Amount paid in on account by railway companies in addition to interest	1,979,370.00
	\$ 960,000.00
Total amount of the company's debentures outstanding	\$ 960,000.00

The directors for the current year are:— Sir Edmund B. Osler, President; W. D. Matthews, Vice President; D. Coulson, Hon. J. S. Hendrie, F. G. Osler, D. R. Wilkie.

The theory of the collapsible vestibule is that in the event of a collision the closing up of the car bodies through the depth of of the vestibule gives the cars that much extra shock-absorbing space, amounting to approximately 8 ft. between each pair of cars, removing to a large degree the shock and resulting damage to the car body and the human load.

Canadian Pacific Railway Bridge at Outlook, Sask.

Early this year the bridge across the South Saskatchewan River, near Outlook, Sask., on the C.P.R.'s Moose Jaw northwest line, was opened to traffic. The bridge in its several stages of completion is shown in the accompanying illustrations.

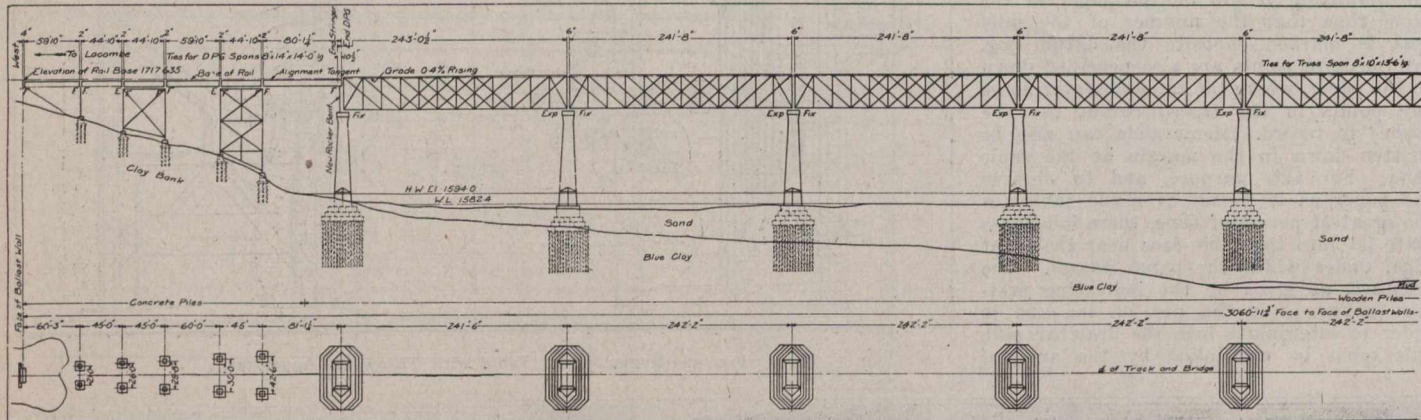
The prairie on both sides of the river at this point is nearly at the same level, at an elevation above the river of over 100 ft. It was, in consequence, decided to build a high level viaduct across the river, at the

All the river piers are carried on wooden piles, driven at a close spacing in the sand and clay of the river bed. The nature of the ground was such as to require extraordinary means in order to obtain a good foundation.

The river spans are all 240 ft. long, of the link pin construction, considerably lighter in design than is usual in present day work. This is accounted for by the fact that these eight spans are all from

Lawrence bridge. The shore spans are carried on steel bents, resting on concrete foundations. The latter are carried on concrete piles, instead of wood piles as used in the river construction. Two lengths of new shore spans have been employed, 45 and 60 ft., the latter size bridging between the steel towers. The bents are of varying length to conform to the shore foundation.

At the east end of the bridge the elevation is 1,729.65, and at the east end, 1,717.63. The normal water level is 1,582.4. Thus the maximum elevation above the river at the



C.P.R. Bridge Across the South Saskatchewan River at Outlook, Sask. (Continued on next page.)

level of the prairie, instead of making cuts on either side to bring the track level down nearer the river. This latter course would have necessitated heavy approaches in either direction, and it is questionable whether the heavy cutting required would have been any more economical from the standpoint of initial cost, apart from a consideration of the cost of operating trains over such a dip. The prairie level on both sides was such as to provide for a bridge

the company's old bridge across the St. Lawrence at Lachine, near Montreal. The new bridge at this latter point was rebuilt and double tracked last year, a description of the work appearing in Canadian Railway and Marine World for April, 1912. The old bridge was still in excellent condition, and did not require renewing, except for the fact that the line out of Montreal carries the heaviest rolling stock on the system, and the traffic is quite

west end is 147.25 ft., making the bridge one of the highest in Canada. With the total length of 3,004 ft., it is a bridge of considerable proportions.

Work was carried on through the winter of 1911-12. The river foundations were sunk by means of caissons, and it was in the use of the latter that some difficulty was experienced. The caisson in the deepest part of the river was completely washed away by spring freshets, occasioning some delay. On the piles sunk in the caisson, the concrete was built up in moulds. The lower part occasioned no difficulty, but with the upper section it was necessary to construct high elevators to raise the concrete to the elevated forms. The work was not delayed by the winter weather, as the concrete moulds were encased with an outer wooden wall, with an intervening air space between the two walls. In this space were run steam pipes to keep the mould warm for the proper setting of the concrete in the extreme weather encountered in that northern latitude. The methods of conducting the work in warm weather are shown in the illustrations, as is also the system of false work for erecting the main link spans.

The designs for the bridge were made in the office of P. B. Motley, M. Can. Soc. C.E., Bridge Engineer, Montreal, and the constructional work was performed under the supervision of J. G. Sullivan, M. Can. Soc. C. E., Chief Engineer, Western Lines, Winnipeg.



Completed C.P.R. Bridge Across the South Saskatchewan River.

with a uniform 0.4% rising grade from the west.

The central portion of the bridge consists of eight 240 ft. spans, on high concrete piers, with 45, 60 and 80 ft. shore spans, carried on bents. The concrete river piers are of a particularly heavy construction, and of a total height from the base of 125 ft. These were carried down to a sufficient depth to be free from frost and scour. The enormous size of these piers is shown in the accompanying illustrations.

dense, requiring a double track bridge. So while the old bridge was not considered suitable for its former service it was quite adapted for a branch line. It has therefore been moved to its new location in the bridge under description.

All the shore spans, save the three 80 ft. plate girders, one at the west and the other two at the east end of the bridge, are new, and have been designed to the latest main line specifications. The 80 ft. spans, like the longer river spans, come from the St.

A new axle train lighting system has been tried on the Santa Fe system, involving a number of radical departures. The inherent characteristic of the generator is that it gives the same polarity for either direction of rotation, eliminating the necessity for any pole changer. The variation in voltage is reduced to narrow limits and no lamp regulator is required. The system adjusts itself automatically to different conditions of load produced by variations of schedule or by change of season, so that no manual adjustment is required to meet these different service conditions. At the same time useless overcharge of the battery is eliminated, thus establishing conditions favorable to long battery life.

The Grand Trunk Railway's New Locomotive House at St. Lambert.

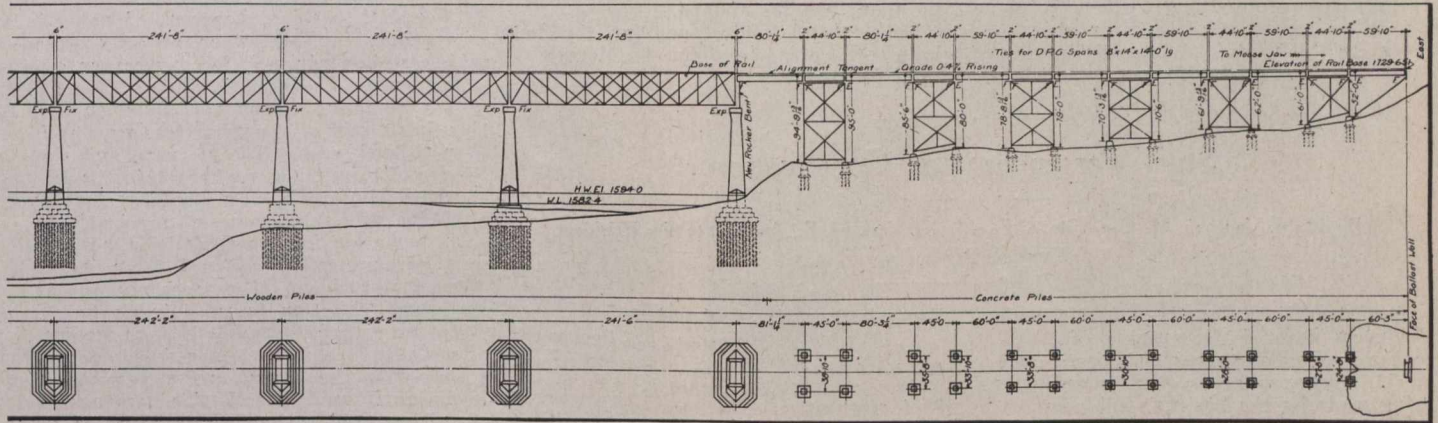
The locomotive house which the G.T.R. is building at St. Lambert, near Montreal, and which is nearing completion, will house 27 of the largest locomotives and will have adequate repairing facilities. The structure, which as a whole comprises round-house, machine shop, boiler house, fan house, office and stores, castings store, and sundry accessories, is built of concrete,

The difficulties presenting themselves during the course of construction have been many and varied, particularly an influx of water, both on and below the surface, in addition to which practically the whole site has been raised 7 ft. by means of a fill, to suit the grade of the St. Lambert yard. All the buildings were designed in the Chief Engineer's office, and the work

in the roof over each stall is a telescopic smoke jack, the hood of which can be regulated and lowered to fit the smoke stack of the locomotive, this ensuring the smoke and fumes being carried direct to the open air.

At the centre of the radius of the round-house is an 85 ft. diameter standard turntable, built by the Dominion Bridge Co., the concrete pit, etc., for same being constructed by the contractors. The turntable is operated by compressed air from the main air compressor.

The whole of the main buildings are



C.P.R. Bridge Across the South Saskatchewan River at Outlook, Sask. (Continued from last page.)

steel, brick, and timber, the whole on concrete foundations 2 1/4 ft. thick, carried down to solid rock, which is found about 2 1/2 ft. below natural ground line.

In addition to the main buildings, there are, of course, the necessary coaling station (a gravity fed plant of 500 tons capacity), sand house, drying plant, water col-

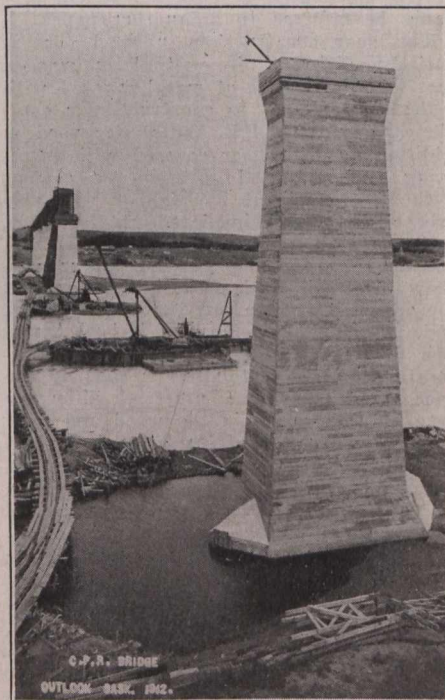
was carried out under the supervision of J. C. Seyfried, structural engineer, F. M. McGuigan Jr., being responsible for the layout and grading.

The St. Lambert freight yard when complete will be one of the largest on the G.T.R., and will accommodate 2,100 cars, the present accommodation being only 1,240. The yard is double ended, the tracks being duplicated on both sides of the main line, so that each branch gives room for

heated by air drawn through steam coils and heated and forced through ducts by a rotary fan which is installed in the fan house. The fan is about 12 ft. in diameter.

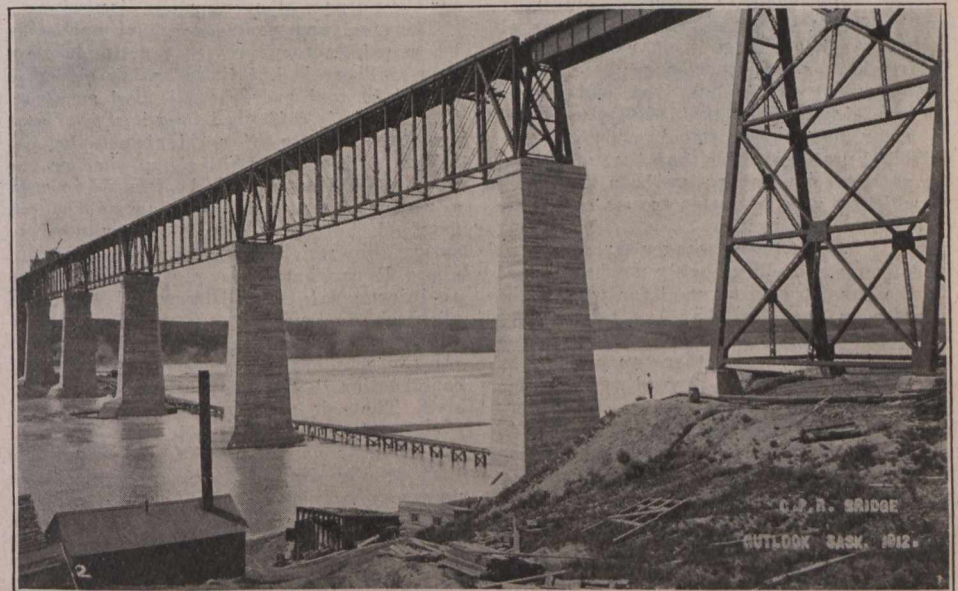
Entered through no. 1 stall is the machine shop and boiler room, about 155 ft. by 50 ft. of similar construction to the locomotive house, with a track the full length of the shop. A large concrete repair pit is also installed.

In the machine shop the motive power



High Concrete Piers on New C.P.R. Bridge.

umns, etc. There are many incidental appliances auxiliary to the locomotive house, some of which are of quite new design, and in other cases the erstwhile standard patterns have been improved and brought up to date, including water columns, concrete pits for same, hot wells, and a model sanitary system and lavatory accommodation for employes.



Construction Work on the New C.P.R. Bridge at Outlook, Sask.

60 cars.

Each of the 27 stalls of the locomotive house is furnished with a concrete pit, 66 ft. long, the walls being of sufficient thickness to allow for jacking, and in 4 stalls are furnished drop pits for driving and truck wheels.

Daylight is obtained from large windows, 14 ft. high by 11 ft. wide in series of 3 for each stall, and in the roof is fixed a continuous lantern light 5 ft. high, made to open in sections for ventilation. Fitted

will be both electricity and compressed air, and it will be replete with machinery for speedy handling of overhauls and repairs. The castings store built in conjunction with the building will stock all the requisite parts, etc.

Along the entire length of the machine shop runs a concrete pit in which all the various ducts, pipes, etc., will be placed, with portable covers, thus giving easy access to the pipes.

The boiler room is equipped with two

200 h.p. vertical wick tube boilers, which supply the steam for heating, also for operating the various auxiliary engines.

Coal is supplied by an inclined runway for the coal trucks, from which it is hopped into chutes and gravity fed to the bunkers in the boiler room. The breeching, which is of brick and steel, is carried from the boilers through the end wall to a reinforced chimney stack 125 ft. high. The ashes are automatically hopped by gravity to ash doors, from which they are conveyed by small trucks and a compressed air hoist, and sent up to the surface.

The water supply is derived direct from the St. Lawrence River, which is some 2½ miles away. On the river shore adjacent to the Victoria Jubilee Bridge is the pump house, which is of concrete and brick.

The pumping plant comprises a duplicate set consisting of 1,500 gallons a minute double stage turbine pumps, each driven by a 40 h.p. squirrel cage motor.

The whole of the apparatus is to work automatically so as to require no attendance. The entire plant is installed by Allis-Chalmers-Bullock Co., of Montreal.

The main intake, which is a 10 in. flexible jointed pipe, is carried out to about 1,000 ft. from the river bank, where the suction valve is situated. From the pump house to the locomotive house site is laid a 10 inch cast iron heavy water main, which, together with its various branches, makes up about 3 miles of pipe.

The general contractors for the buildings, etc., are the John S. Metcalf Co., Ltd., Montreal.

Steel Passenger Car Construction.

By H. H. Vaughan, M. Can. Soc. C.E., M. Am. Soc. M. E., Assistant to Vice President,
Canadian Pacific Railway.

The American Society of Mechanical Engineers devoted the evening of April 8 to the reading of papers and discussion on steel passenger cars, the arrangements being made by the Society's sub committee on railways. The introductory paper was contributed by Mr. Vaughan, who is a member of the society, as follows:

The advent of the steel passenger car has brought with it many new problems and an opportunity for more diverse opinions than any other change that has taken place in car equipment. The construction of the wooden passenger car developed along fairly uniform lines. The varieties of framing were few and the differences unimportant, while the introduction of steel platforms, wide and narrow vestibules, reinforced end and sill construction and similar improvements occurred gradually, and with practically similar designs on all railways. The change from wood to steel in freight car construction resulted in the abandonment of designs that had almost become standardized and the introduction of many new types, but in this case the principal problem, other than that of obtaining satisfactory designs, has been the extent to which it was advisable to use composite or all-steel construction.

In the case of the passenger car, the types to be employed will probably not be changed by the substitution of steel for wood. The increase in capacity that has taken place in freight equipment cannot be duplicated in passenger cars, and there appears to be no tendency at present toward any increase in length or carrying capacity. The questions that now confront us relate rather to the design and construction of cars of the present type and of the materials that may be advantageously employed in place of the wood which has been used for so long. They are complicated by the necessity of providing for greater safety for the passengers than was secured in the wooden car, with an equal degree of comfort and the difficulty of anticipating the behaviour of this new equipment in case of accident. Certain difficulties such as the best systems for heating, lighting and ventilation, are common to both steel and wood construction, and improvements in these matters pertain to general progress rather than the use of steel construction. The following list, while probably incomplete, outlines in a brief way the important variations that must be considered in deciding on the preferable construction of steel passenger equipment:—

Framing	Steel underframe.
	All steel frame { Centre girder Side girder
Outside finish	Plated.
	Sheathed.
Roof construction....	Clerestory.
	Circular.
Inside finish	Steel.
	Wood.
End construction....	Design and strength.
Floor	Design and material.
Insulation	Material.

No doubt questions of equal importance have been omitted, and in many cases those mentioned require careful consideration with regard to degree, as for instance, the strength of the framing or the thickness of the insulation. The list illustrates, however, the diversity of possible solutions of the preferable steel passenger car, and the following personal opinions are presented for the purpose of opening the discussion:—

The steel underframe does not appear to be a satisfactory or permanent development. There is but little saving either in weight or cost over the all steel construction, and it is difficult to see how the same strength in case of accident can be obtained. Experience will show whether the wood superstructure can be secured in such a way as to prevent working as the car gets old, but as it cannot be arranged to carry any weight this appears questionable. It can hardly be regarded except as an intermediate step between all wood and all steel construction.

In all steel construction the side girder car presents advantages, but as in freight construction, both types will probably persist. The side girder construction obtains greater strength in the side framing without superfluous weight, and it is possible that greater framing strength may prove necessary. With equal strength of side framing the side girder car may be made lighter than the centre girder type, and the weight of steel passenger cars is one of the most serious problems to be faced by any railway not having a level line. American passenger equipment was already excessively heavy per passenger carried with wood construction, and the use of steel has increased this weight from 10 to 20%, which is a most serious matter. Apparently side girder cars as so far constructed have a decided advantage over the centre girder type in their light weight and greater strength in case of accident tending to crush in the side of the car. This will probably lead to the use of this type on roads on which weight is of importance.

In spite of the many advantages of the

sheathed car in case of construction and maintenance, it appears that the cost and weight of the additional metal will prevent its extensive use. This question is chiefly one of appearance and convenience, and is of minor importance.

The circular roof has been extensively introduced on steel passenger cars on account of its lightness and simplicity of construction. It has the objection that deck sash ventilation cannot be employed. The Pullman Co., while using the clerestory roof has, however, discontinued the use of deck sash ventilation, so that evidently in its opinion this objection is not important. The deck sash is, however, of value in a standing car, and when properly screened is certainly advisable in hot weather, especially when the road is dusty. The C.P.R. has compromised on this question and is using a roof of approximately circular form with deck sash. The strength and simplicity of the circular roof is retained, with the ventilating qualities of the clerestory type.

The preferable material for inside finish is a matter for future decision. With the ample protection afforded by a steel car against accident, there does not appear to be any objection to wood inside finish, on the ground of safety. It is more ornamental than steel and a better insulator. Probably on no question in passenger car design is opinion so divided, amongst both railway and carbuilders. There is today very little difference in cost, and it certainly appears probable that in the future the tendency will be to adopt steel interior finish if not entirely, at any rate to a great extent.

The construction of the ends of the cars has received considerable attention, and the strength now usually employed is enormously greater than anything attempted in wood construction. Several excellent designs have been devised, which will probably be referred to in another paper.

The floor construction in steel cars is entirely different from that in wooden cars, and is usually of metal covered with a flexible cement. In constructing a sample car for the C.P.R. the writer used in addition an underfloor covered with insulating material, and covered the cement with ½ in. of cork. This car was also exceptionally well insulated at the sides, 2 ins. of cork being used next the outside plating. Tests during the past winter have shown that this car is actually warmer than the ordinary wooden car, the same amount of heating surface being used in both types. The floor was tested by taking the temperature of water standing in cans on the floor, there being no practical difference between the results in the wood and steel cars. The question of insulation is an important one, both in hot and cold weather, and while other insulation might no doubt be equally effective, it is interesting to be able to advise that with proper insulation there is no question of the steel car being satisfactory.

Other papers were read as follows:— Problems of steel passenger car design, roof structure for steel cars, suspension of steel cars, six wheel trucks for passenger cars, steel interior finish for steel passenger cars, painting of steel passenger cars, provisions for electric lighting in steel passenger cars, provision for electrical equipment on steel motor cars, air brakes for heavy steel passenger cars, cast steel double body bolsters, platforms and end frames for steel cars, underframes for steel passenger cars, special ends for steel passenger cars.

Argentina had 19,240 miles of railway at the end of 1912.

Railway Mechanical Methods and Devices.

Air Operated Bulldozer at the Grand Trunk Railway Port Huron Shops.

At the G.T.R. car shops at Port Huron, Mich., air operated bulldozers are in use, satisfactorily substituting power driven machines of larger proportions on certain classes of work, principally that of a lighter

this practice, it was found possible to make a good upsetting job on this machine.

Smaller sizes of bulldozers, using two instead of three cylinders, are also made up, the cylinders in this case being smaller, handling the lighter class of work, leaving the heavy for the larger machine. Both kinds make a very satisfactory substitute for mechanically driven bulldozers.

angle by a special clamp, in the lathe tool post, and the ring forced across the carriage ways against a thin milling saw.

The attachment used in these shops consists of a block of steel, 4 ins. long by $2\frac{1}{4}$ ins. wide and 2 ins. thick, welded to the outer end of a 10 in. bar of $1 \times 1\frac{1}{8}$ in. bar, to which it is set at an angle of 45 degs., the angle of the required cross cut

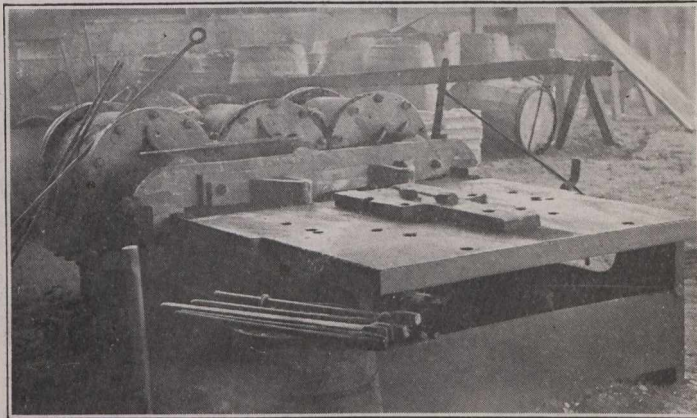


Fig. 1.—Air Operated Bulldozer of Powerful Design.

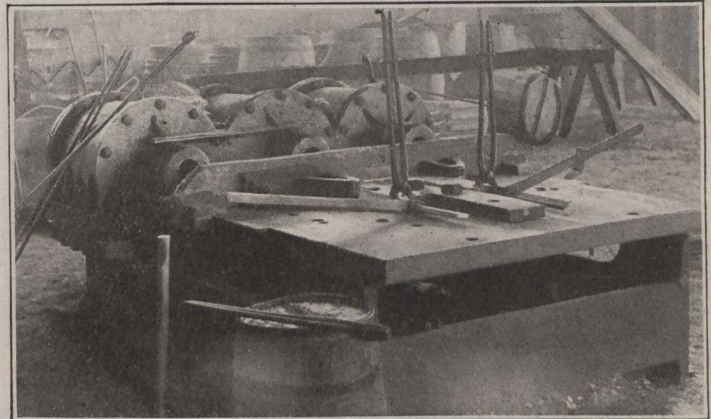


Fig. 2.—Bulldozer Forming a Car Step.

nature, although the size of some of the pieces handled is rather surprising.

One of the machines in the Port Huron shops is shown in the accompanying two illustrations. A cast iron base frame carries at the rear three passenger car air cylinders, ranged side by side with the attaching surface, secured to a corresponding face of the supporting frame. On the front end of the frame there is attached a large surface plate of cast iron, on which the bulldozer tools are guided. The bulldozer head has a guiding lug on each side, which passes down under the side of the table top for guiding laterally. The three air plungers are all attached to the rear of this head and act simultaneously, causing a uniform pressure to be exerted across the width of the table. This distribution of pressure makes a lighter construction of head possible. The machine is operated through the vertical lever to the rear, to which is attached an extension rod for the convenience of the operator when in front of the machine.

Fig. 1 shows the machine set up for making car steps. The male part of the die is attached to the table as usual, and the female part to the bulldozer head, the red hot bar when placed between the two being bent around the form of the male die. When in this position, as shown in fig. 2, the sides of the partially completed step are secured in position on each side by the vertical tongs, over the handles of which are slipped retaining rings. An operator on each side, with a U ended tool, seizes the projecting ends and twists them down through a quarter circle (a little further down than the position shown). These tools being then removed, the ends are hammered down flat on the table, producing the standard car step familiar to all. This process of making the steps is unique, but shows the scope and possibilities of the machine.

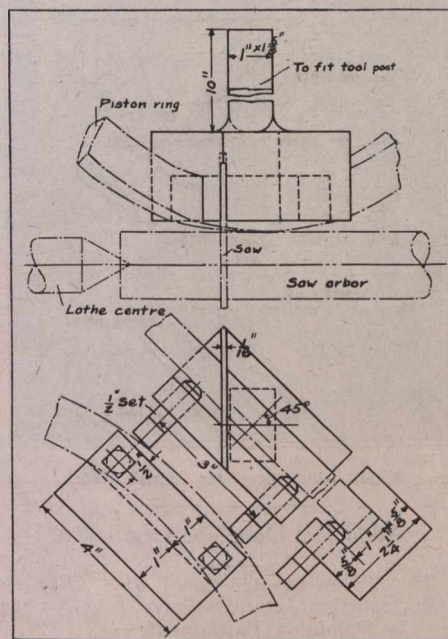
This particular machine is used for all sizes of work, including such heavy and awkward pieces as coupler pockets, which it can easily bend around to shape. It is also used with a special jig for upsetting the ends of brake rods, which were formerly made by welding a section of larger stock on the end of the rod. The law prohibiting

Cutting Piston Rings at the Grand Trunk Railway Stratford Shops.

The practice of making piston rings out of cast iron rings slightly larger than the bore of the cylinder into which they are to fit, and cutting out a small diagonal piece so that the ring might compress to give

in the ring. In the outer face of the block there is a channel 1×1 in., into which the ring is slipped, the outside to the front, and held in position by two $\frac{1}{2}$ in. set screws through the lower side. Vertically through the front face there is a $1-16$ in. slot, extending in beyond the bottom of the face channel.

The cutting saw is mounted on an arbor between the lathe centres, and the work forced up to it, quickly cutting through the ring. The second cut for the removal of the spring piece is made in the same manner, first moving the ring around the required amount.



Jig for Cutting the Spring Gap in Piston Rings

the required diameter, and the ring be thus given the necessary spring to keep it at all times snugly sprung out against the cylinder wall, is familiar to all who are in touch with steam engine practice. Ordinarily, this small section removed to give the spring is cut out with a hacksaw, the ring being held for the purpose in a bench vise.

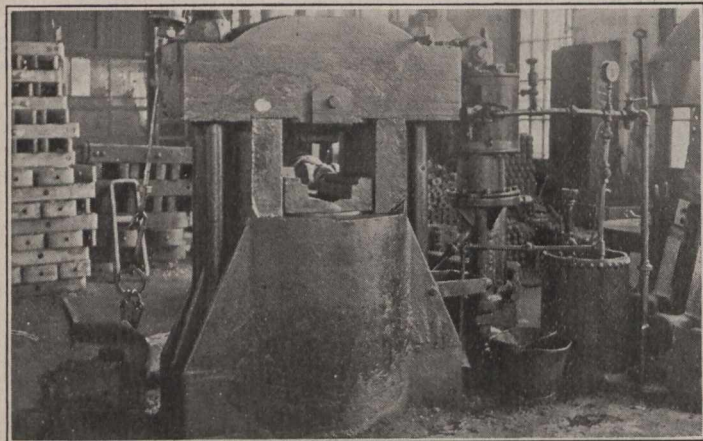
At the G.T.R. locomotive shops at Stratford, Ont., another method of cutting the rings is employed, and is illustrated herewith. The ring to be cut is held at an

Coupler Stripping Press at Canadian Pacific Railway Winnipeg Shops.

In stripping the wrought iron coupler yoke from the cast coupler, when either one is broken and requires renewing, the usual practice is to cut off one head of each of the uniting rivets, this being done in the time honored sledge and chisel manner. This practice still exists in the majority of shops. In the C.P.R. Winnipeg blacksmith shop this operation is performed in a simple manner in a hydraulic press. This press, with its auxiliary apparatus, is shown in the accompanying illustration. It is a very heavy structure, the lower part consisting of a cylinder casting, with upwardly projecting side arms, on the top of which is attached a head casting, the whole held together by 4 large bolts. The plunger operates upward from the cylinder casting below. The head of the plunger is so formed as to support a united coupler and yoke on the edges of the latter, leaving the central or coupler portion unsupported from below. On the under face of the press head there is mounted a block of the width of the coupler shank, so that, as will be seen from the explanation preceding, the block on the plunger head will fit over the stationary block. The couple and yoke are placed in the press, resting on the yoke edges. The plunger pressure from below is on the yoke edges, while the retarding force from above is on the central coupler shank, the result being that the rivets are

sheared on both sides on the joining faces. The operation of the press is very quick and effective.

The operating fluid is fuel oil, forced in by an air operated oil pump adjoining, the air end being a locomotive compressor unit, with a small hydraulic pump lower end. The oil reservoir is a partially buried steel tank.



Coupler and Yoke Stripping Press.

The press is provided with an air hoist from above, with handy clamps for lifting the coupler. Different sizes of dies are provided for the various sizes of couplers operated on.

Small Air Drill at Canadian Northern Railway Shops.

In the tool room of the Canadian Northern Ry. Winnipeg shops, a small portable air drill has been converted into a stationary bench drill, as shown in the accompanying illustration. The air drill is of the earlier type of portable drills, consisting of a single cylinder, with a reciprocating motion, the connecting rod attaching to a crank right on the drill spindle, the motion being kept uniform by a comparatively heavy flywheel.

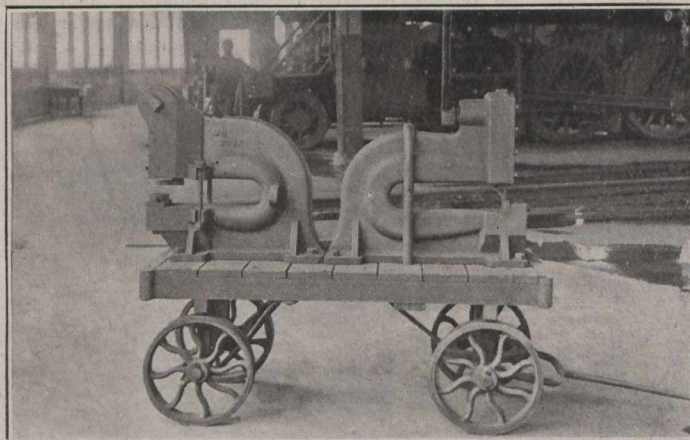
This motor has been mounted in vertical bearings on a support attached to the side of a surface plate, which is set on the tool room bench. To the top of the vertical stand there is fulcrumed an operating lever, the upper end of the drill spindle connecting thereto. This is attached to a spring from above, normally holding the spindle in its highest position. By the fulcrumed lever the drill can be brought down on the work. While not very powerful, it is useful for a lot of the small drilling found in a tool room.

Portable Punch and Shears in Michigan Central Railroad Windsor Locomotive House.

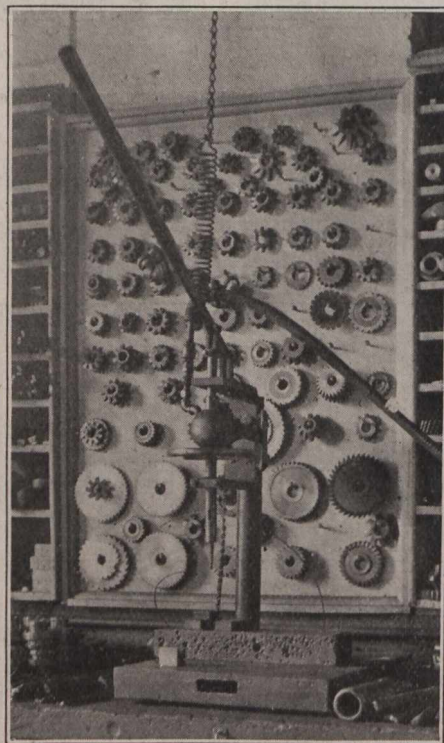
Locomotive house repairs are quite varied in their character, but are never of such a nature that they cannot be handled with simple tools, as the instant the repairs required assume heavy proportions the locomotive is sent to the back shop—or at least should be. Anything that will simplify the repair work in the locomotive house, and get it back into service with the least delay, is of considerable worth.

In the M.C.R. locomotive house at Windsor, Ont., a useful appliance in the form of a small punch and shear has been added to the equipment, as shown in the accompanying illustration. The two are mounted back to back in their usual relation to each

other, on a small truck, on which they can be moved to the work, dispensing with the necessity of bringing the work to the machine. For light work they are very useful, one of the particular fields of usefulness in the locomotive house being that of putting smoke box netting in shape, and the punching and trimming of boiler lagging.



Portable Locomotive House Punch and Shears.



Small Air Motor for Bench Work.

Additional Dominion Legislation.

The following additional acts affecting transportation interests have been passed by the Dominion Parliament:—

Algoma Eastern Ry.—Extending time for construction.

Athabaska Northern Ry.—Extending time for construction.

Calgary, Edmonton and Fort McMurray Ry.—Incorporation.

Canadian Northern Ry.—Extending time for construction of certain lines and authorizing construction of additional branch lines.

Canadian Northern Ry.—Extending time for building certain lines.

Canadian Western Ry.—Extending time for construction.

Caribou, Barkerville and Willow River

Ry.—Extending time for construction and authorizing building of additional lines.

Dominion North Western Ry.—Incorporation.

Guelph and Goderich Ry.—Extending time for construction.

Huron and Ontario Ry.—Extending time for construction and changing title to Toronto and North Western Ry.

Kettle Valley Ry.—Extending time for construction.

Manitoba-Ontario Ry.—Incorporation.

New Orleans and Grand Isle Traction Light and Power Co.—Changing name to New Orleans and Grand Isle Ry., Light and Power Co.

Niagara, St. Catharines and Toronto Ry.—Extending time for construction.

Pacific and Hudson Bay Ry.—Extending time for construction.

Quebec, Portland and International Short Line Ry.—Incorporation.

Shuswap and Okanagan Ry.—Extending time for construction.

Southern Central Pacific Ry.—Extending time for construction.

Intercolonial Railway Finances.

In the House of Commons, Mar. 31, the Minister of Railways said:—"The estimated surplus of the past year's operation of the Intercolonial Ry. is between \$900,000 and \$1,000,000. It has been a pretty successful year, the revenue being the largest in the history of the road. The estimated revenue is \$12,000,000. In comparison with the last three years the results show up remarkably well. The revenue of the last three years was as follows:—1911-12, \$10,593,785; 1910-11, \$9,863,783; 1909-10, \$9,268,234. The following amounts have been taken out during the year and charged to working expenditure:—Rail renewals, \$60,000; fire renewals, \$60,000; equipment renewals, \$300,000. The average price of coal was 12c. a ton higher than in the previous year, and this year the increase will be 25c. a ton. The amount paid in wages for handling the business is about \$350,000 in excess of the previous year.

Contracts have been let for rolling stock during the current fiscal year amounting to over \$3,000,000. A large quantity of rolling stock has also been ordered at the Moncton shops. With the exception of \$1,000,000 which was included in the current estimates, the rolling stock ordered will be paid for out of the revenue of the last two and the current years.

A more elastic paint is required for the finish of steel cars, as the linear expansion of steel is about double that of wood.

The Economics of Railway Location.

The presidential address, read before the Canadian Society of Civil Engineers at its last annual meeting by the retiring President, W. F. Tye, was published in full in Canadian Railway and Marine World for March. Engineering Record, of New York, made the following comments on the address:—

"Mr. Tye puts just emphasis on the necessity of balancing the available traffic, the cost of construction and the expense of operating the completed line. The engineer sometimes forgets the real purpose of the railway—that of getting business and handling it economically.

"Two parts of the paper are somewhat misleading. Mr. Tye states that the greater the proportion of ruling grade on a division, the lighter the train loads must be. Many elements enter into the determination of the economical train load for a division, and the effect of the profile cannot be dismissed so briefly. Ignoring the time allowable for getting a train over the division, it might be possible to run heavier trains over a division having 60% of ruling grade and well-spaced level places for engines and firemen to rest, than over a division with its 20% of ruling grade concentrated and continuous. In this case there would still be the question as to whether the low speed on the ruling grade would be permissible. If not, the train loads would have to be reduced, and the profile with only 20% of ruling grade, and with the chance of higher speed on the remaining 80%, might have the advantage.

"In stating that the introduction of 100 10 deg. curves in the route of the 18 hour trains from New York to Chicago would add only 80 minutes to the running time, Mr. Tye overlooks the fact that in order to average 49 miles per hour over the entire distance, in spite of stops and slow orders through cities and at other points, this train must go much faster than 49 miles an hour on a large part of the route, and that to get up to such speed usually requires a distance of several miles. With a 10 deg. curve every 10 miles this train could maintain its present necessary speed only for short stretches, and it may be doubted whether it could maintain a schedule of 24 hours for the distance. Adding to this the danger involved in a failure to slow down, it can hardly be considered good practice to introduce sharp curves on high speed lines where they can possibly be avoided. One of the railways running these fast trains is in fact spending large sums to get rid of the few remaining 7 deg. curves.

"Other points, however, brought out by Mr. Tye deserve hearty endorsement. An important end served by the use of trestles instead of embankments, he points out, is the determination of the proper openings for waterways where records are not available. By the time the trestle has to be replaced, sufficient data should be at hand.

"A point made by Mr. Tye that is worthy of much emphasis is the building of a pioneer road which is at all likely to become anything more than an unimportant branch line is the desirability of working from the ideal alignment and profile, and considering the economics of putting in temporary detours and heavy grades that can be rectified individually as desired. Such a line may be more expensive to operate than one built on a uniformly lower standard. The first cost will be less, however, and if there is little business in sight, and hence little to be handled, the increased operating expenses will not be serious when taken in conjunction with the fixed charges. The pioneer

railroad builders of the United States could hardly have foreseen the demands that the future would make on their lines. Canada, however, has the benefit of the experience of the U.S., and if she profits by it she will not find it necessary 20 or 40 years hence to rebuild her roads in 100 mile sections, as has been done in the U.S., in order to enable them to handle their business."

Comments by H. K. Wicksteed, B.A.Sc.,
M. Can. Soc. C.E.

In response to a request, Mr. Wicksteed, Chief Engineer of Surveys, Mackenzie, Mann & Co., Ltd., has favored us with the following comments, which will doubtless be read with much interest:—

"I have been much gratified by Mr. Tye's able address before the Canadian Society of Civil Engineers, and, in spite of my having had little spare time, would probably have acceded to your request for comment before had it not been that he had covered the ground so completely and, to my mind, so satisfactorily. The criticism in the Engineering Record is thoughtful, but I am not at all sure that it has made much of a point in connection with the exception it takes to Mr. Tye's statement that 'the greater the proportion of ruling grade on a division the lighter the train loads must be.' I think it will be generally conceded that given a 100 mile division, with a certain amount of rise and fall and a specified ruling grade, it will not ordinarily make much difference whether we use this maximum sparingly or liberally, but the question of endurance comes in as well as that of adhesion; endurance, not only on the part of the fireman, but of the locomotive itself, and I think Mr. Tye is, in the main, quite correct, that even with a fixed maximum there is a distinct gain to be made in reducing the length of that maximum as much as possible. I have always been less timid than most people about introducing curvature into a road and have been much criticized in consequence. It is therefore a keen satisfaction to me to find so high an authority as Mr. Tye willing to go even further than I do.

"I think, however, that in referring to the 18 hour trains between New York and Chicago, he merely wished to take an extreme case as an illustration, and would not in his own practice recommend 10 deg. on a first class road, except under the most severe provocation. But taking his proposition as it stands, it is more than probable in actual practice that many of these 10 deg. curves would be 'bunched' in one locality, and that the one slow down would cover several of them at once, so that the Engineering Record's argument as to the amount of time lost in getting up speed again is much weakened. This practice of 'bunching' sharp curvature is, I think, a thoroughly good one for this reason alone. The first curve being put in to avoid some prohibitively expensive piece of work, we may introduce several more of the same radius on either side of it, for the sake of a comparatively small saving and do little harm thereby.

"Mr. Tye's address was, I think, intended to cover the ordinary conditions obtaining in Canada today, and in nine out of ten of the new roads being built, the question of high speeds is not that which concerns us most, but rather the construction of the cheapest road possible consistent with moderate economy of operation, and that which can with the least expenditure be subsequently developed and improved into one of the highest class. If this principle be ac-

cepted we have in the last clause the strongest argument perhaps that can be advanced for curvature as opposed to steep grades as a means of reducing cost. A rise of 100 ft. with a 1% grade between two long stretches of level, which we wish to take out and improve to 0.5%, means the complete abandonment, not merely of the two miles of heavy grade, but of two miles of the level as well, and generally the acquisition of new right of way. The taking out, or flattening, of a few curves on a steep side hill, is generally a trifling matter in comparison, and the existence of the road alongside, actually in operation, is a help in the construction work. I can heartily endorse the policy of studying out and even in some cases laying down on the ground the ideal location and building diversions from it to avoid the present expense of the heavier portions. I can remember a case not long ago where a 50 ft. cut in hard rock was avoided by 5 curves of 10 deg., 'bunched' together, and giving very light work in comparison, and another where a circuit involving 2 miles extra distance was made to avoid a tunnel. The line in each case was so adjusted that there would be the least possible abandonment of work when the final line was put through. Temporary sags in the grade over long fills have of late been much used to the same end, and of course, in this case, there is practically no abandonment of original work, as the alignment remains unchanged. Deep sags, however, with the necessary accompaniment of abrupt changes in grade, are very objectionable things on a busy road, especially if very long trains are handled, and the lifting of the track itself, by successive increments to the fill, is not only, under the same circumstances, very embarrassing and troublesome to the traffic, but dangerous as well. Other things being equal, I prefer a crooked line as a temporary expedient.

"Mr. Tye's point as to the use of temporary trestles is especially interesting, in view of the fact that timber trestles have of late fallen into disfavor. This is, no doubt, largely a reaction from the excessive freedom with which they were used 25 years ago. The C.P.R. was, probably, among the first to revolt against the raising of grades to avoid rock cutting, and to trestle all the resulting fills, whether they contained streams or not. The road was low in first cost, although not pre-eminently so, but the maintenance and renewal charges were high and the danger of fire enormous. In the latter days of the first construction, the grades were lowered until cut and fill nearly balanced in ordinary work, even in rock. When a really heavy fill was met with it was boldly trestled. Under this system, not only were small trestles almost eliminated, but in most cases the rock filling was sufficiently porous to take the transverse drainage, and obviate, for a time at any rate, the necessity for expensive culverts which would have been necessary in the case of earth filling. A point in connection with capital saving expedients introduced liberally on portions of the C.P.R. is the substitution of stream tunnels for masonry culverts. In some cases the opportunities were so great that the location was modified in order to take advantage of them.

"Perhaps the most striking feature of Mr. Tye's address is the limits to which he is prepared to go. Twenty years ago, when a paper of similar tenor was read before the same society, the author was 'jumped on' for proposing 10 deg. as the standard for a development road. He has seen no reason to change his views since, and the criticism, it is only fair to state, came from men who

had had no experience with anything sharper than 4 deg. or 5 deg. on their main lines. Yet these same men were using curves, as sharp or sharper, on their main line turnouts, and running over them at considerable speed, in spite of the extra drawback of a break in the outer rail at the frog and the total absence of any super-elevation. Mr. Tye's 14 deg. looks excessive but it is really moderate in comparison with the curvature in some of the western roads, such as the Denver and Rio Grande, the Colorado Midland, etc., where curves from 15 deg. to 24 deg. were freely used, and on one branch of the Union Pacific there was a 30 deg. for 180 deg. of angle. These have been successfully worked for years, and I verily believe that fewer accidents are attributable to them than to the heavy grades on some straight lines. In case of a breakaway, or loss of control, the sharp curve acts as a brake in either direction, the action of the grade is accelerative and acceleration has meant the death of a good many hundreds of people in a few dozens of accidents.

"Mr. Tye makes a strong point of the desirability of saving money on the open road, to spend in terminals in cities and towns. Mr. Wellington did the same before him, and there is no doubt, in the main, as to the validity of their arguments. Some curious exceptions to the general rule have come under my notice; examples of the rapid development now going on and how necessary it is to forecast such developments. The Toronto, Hamilton and Buffalo Ry. was located 20 years ago, skirting the edge of the City of Brantford, and apparently completely out of it in regard to freight business. It made connections with powerful allies, and being on good level ground, which extended for some distance along it, the factories actually pulled up stakes and moved over to the railway, which is now in a better strategic position than the roads which had the start of it by 30 years. A similar development took place along the Chateauguay and Northern Ry., near Montreal, where the older roads are pouring out money to get into the territory of the newer. Attention should be given not only to the present position of a city's industries, but to the direction in which future development is likely to take place. In both the cases cited, there was, I am quite sure, no particular intention to anticipate future growth but merely to get the cheapest line available."

A Railway Company's Liability for Loss of Baggage.

An important case, *Spencer vs. C.P.R.*, was decided recently in the York County Court, in Toronto, by Judge Denton, as follows:

The material facts of this case are not in dispute. The plaintiffs are husband and wife, and live in Toronto. The plaintiff, Harriet E. Spencer, wishing to pay a visit in St. Thomas, bought at the defendant's ticket office in the Union Station, Toronto, a 1st class ticket to St. Thomas, Ont., and return. She took with her a trunk containing principally her wearing apparel. On June 25, 1912, she returned to Toronto. In St. Thomas she was driven to the station in a taxi cab. She asked the driver to check her trunk. This he did and took the baggage check and handed it to her through the window of the railway car in which she had already taken her seat. She put the baggage check in her satchel without reading it. The train conveying both herself and the trunk arrived at Toronto about midnight. An effort was made to get

the trunk that night but it was too late, the Canadian Transfer Co.'s office being closed. It has been proved that the trunk arrived at the Union Station and was placed in the baggage room that night. It was claimed the next day but was found to be missing and has not been found.

The plaintiffs bring their action to recover the value of the trunk and its contents. The defendant relies upon the printed notice on the baggage check, which says in effect that the company shall not be liable for any loss or destruction or damage to baggage for amount in excess of \$100. The defendant brings this \$100 into court and says that this is the extent of its liability. In my opinion the defence fails. The plaintiff bought a ticket from Toronto to St. Thomas and return. Under this contract the defendant was obliged to convey not only the passenger but also her baggage (up to a limited weight). Under sec. 283 of the Railway Act the railway is obliged to affix a check to every parcel of baggage having a handle, loop or suitable means of attaching a check thereupon, delivered by a passenger to the company for transport and a duplicate of such check shall be given to the passenger delivering the same. The check so given to the passenger is not the contract between the parties; it is only evidence of the receipt of the property destined to a certain point and is given as an additional precaution to prevent the baggage being given to the wrong person. This check is for the joint convenience of the passenger and the railway company and is in no sense part of the contract unless made so. (*Gamble v. Great Western Ry. Co.* 24 U.C.R. 407.) Before the defendant can avail itself of the printed condition on the baggage check it must show not only that the plaintiff was aware of the stipulation on the check limiting the liability, but also that this stipulation was accepted by her as a term of her contract. (*Lamont v. Canadian Transfer Co.*, 19 O.L.R. 291.) If the defendant's contention in this case were given effect to the result would be that a passenger who, by purchasing a ticket without any such stipulation, has a contract which obliges a railway to carry him and his baggage without any limitation of liability, may have his contract altered by being afterwards presented with a notice which he does not read and to which he does not give his assent. It seems to me clear that before the defendant can rely upon such a notice purporting to limit its liability it must have the notice printed on its ticket as part of the contract of carriage, or it must show that the passenger agreed to the notice printed on the baggage check being part of the contract.

In case this view should not be the right one I think it well to state another ground upon which in my opinion the plaintiff is entitled to succeed. There is no doubt, I think, on the authorities that it is competent for the defendant in its contract to limit its liability (although not to relieve itself altogether) for its own negligence. In other words, it is competent for the parties in entering into the contract to agree on the amount that shall be paid in case of loss even where negligence is shown. (*Robertson v. G.T.R.*, 24 S.C.R. 611.) It probably is the case that the form used in limiting the liability must now be approved by the Board of Railway Commissioners. That was done in this case, so that the question to be determined here is whether the language printed on the baggage check is wide enough to include loss or destruction or damage to baggage by the negligence of the railway company. I do not think it is. Contracts of this kind

are construed strictly against the company, and where the exemption does not expressly relate to negligence, or where an intention to include negligence cannot be inferred from the language used, it is held not to include negligence. See cases collected in *Jacobs' Railway Law*, pg. 479. There is nothing in the language printed on this baggage check that would lead one to think that even the railway company, much less the Board of Railway Commissioners, which approved the form, had in mind to limit the liability for loss or damage caused by negligence.

The question then remains, has negligence been shown? That is a matter upon which different opinions may be held, but I think I am doing the railway company no injustice in finding upon this evidence that there was negligence. G. L. Healy, Baggage Master at the Union Station, was called as a witness for plaintiff. He negatives the theory that the trunk could have been stolen, in the sense that a thief could come in and feloniously carry it away, but he has sworn that on an average there are 10 pieces of baggage missing every month all the year round from the baggage room at the Union Station. He says that it is a wonder there are not more lost, because of the open condition of the room. The baggage room has four doors leading on to Station St. and one leading to the tracks; Healy says that it is not a good room for safety, that in all modern well equipped stations the public are entirely excluded from the baggage room, whereas in this antiquated station the public are allowed to go in and out. This leads to confusion and interference with the men in their work. The evidence in this case leads one to believe not that the trunk was stolen by someone who came in and carried it away, but that by the mistake of the railway officials it has been sent on to some other destination. The evidence, I think, supports a finding that there was negligence here on the part of the railway company in not supplying proper and sufficient accommodation for the men for the doing of their work properly and in allowing the baggage to be handled under a negligent system, and that this negligence may well have caused the loss.

Then what is the damage. The total sum claimed by both the plaintiffs is \$367.50. Of this amount the trunk, valued at \$20, and part of the contents valued at \$7, total \$27, were owned by the husband; the balance, \$340.50, was owned by the wife. The female plaintiff has sworn that the values placed upon the contents of the trunk are reasonable. I accept her evidence. There will be judgment then for the plaintiff, Harriet E. Spencer, for \$340.50. As to the husband plaintiff I doubt if he is entitled to anything. It is at least doubtful if a person not travelling with the baggage can sue. (*Becker v. Great Eastern Ry. Co.*, L.R. 5 Q.B. 241.) There will be the usual stay for 30 days.

The C.P.R. has appealed from the decision.

A Scale Testing Car is being built by the U. S. Bureau of Standards for testing scales in yards, grain elevators, and other places where interstate traffic is handled. It will not itself be used as a load, but will carry movable weights, which will be used for testing. It is proposed to have the car carry a number of standard weights of 10,000 lbs. each, and a large number of 50 lb. weights. A truck, capable of carrying 50 tons, will be carried on the car to be used for moving the standard weights, in testing scales. The car will be equipped with a crane for lifting the truck and the heavy weights.

New Hopper Bottom Box Car on the Grand Trunk Railway.

Something over a year ago, a hopper bottom box car was built to the designs of J. Coleman, Superintendent of Car Department, G.T.R., which has been patented by him in both Canada and the United States. Since the date of its construction, it has been in almost constant service in the grain trade between Midland, Ont., and Portland, Me., trying the car and gathering data with a view to remedying any defects in the construction that may develop while in service conditions.

The body of the car is of the outside steel frame construction, built about a steel centre sill. This type of outside steel frame work car is familiar to all railway men, so needs no further description. It is in the interior construction and addition of special hoppers that the car is unique. The accompanying two illustrations show the outside and interior construction.

The nearest construction to which the hopper bottoms can be compared, is that of the large steel gondolas for handling coal, and which dump through the bottom through drop doors, the interior construction being such that the coal slides towards the open doors. As the interior view sets forth, the steel centre sill down the length of the car, alters this comparison considerably, making the construction decidedly original.

At the centre of the car are four hoppers, of steel construction, located in pairs, one each side of the centre sill, centrally about the doors, the pairs uniting in a ridge at this point. The slope of the walls of the hoppers is at an angle of about 35 degrees, both walls being the same. The hopper doors all open inward toward the centre of the car, the door portion forming the lower half of the sloping wall of the hopper. These doors are united in adjacent pairs, the lower edges being connected together by a piece of angle the width of the double hopper, the operating mechanism connecting to this cross angle.

The hinged edge of the door is so constructed that when the door is closed, the meeting edges along the hinge are in close contact, forming a tight, grain proof door. A special feature of the hopper arrangement is the manner in which the doors are sealed so as to be proof against the leakage of the smallest grains. Around the three closing edges of the hopper opening are rivetted two angles, the outer one by the inner face of the angle to the outside of the box, and the inner angle by the outer face to the inner face of the hopper, the two inwardly projecting edges being set apart the thickness of the angle flange, plus a little clearance. The closing edges of the door are also constructed with a double angle. On closing, the webs of the angles on the door and hopper mesh into each other, so that the grain to escape must pass along the face of the angle webs, four times. The fit is such that it would be practically impossible for the grain to follow such a course. In service, this seal has been found most effective.

The closing link for the doors is attached to the cross angle of the latter under the car centre sill, the link running backward, connecting to the rear of the hopper with a pin on a horizontal worm gear, which is secured to the under side of the steel centre sill. This worm gear is operated by a worm on the inner end of the shaft to the left of the rear hopper in the outer view of the car. The worm shaft has a hand wheel at the outside of the car, as shown. When closed by the worm gear mechanism, the doors are locked in position on their

outer edges by the hook arrangement to be seen on the outer edge of the door.

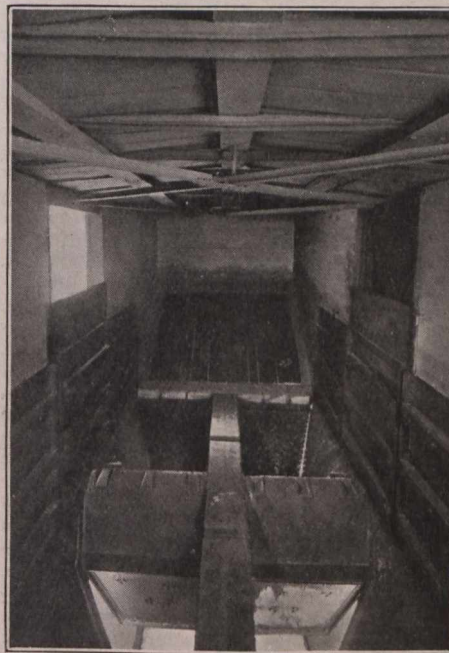
In the car shown in the illustration, two types of unloading doors have been applied to the hopper. The rear hopper has a sliding arrangement of door, operated by the hand wheel shown. This arrangement has not proved as satisfactory as the hopper



Hopper Bottom Grain Car on the Grand Trunk Ry.

door arrangement, and will not be introduced in future cars.

The location of the hoppers each side of the centre sill necessitated a rearrangement of the piping and brake rigging under the car. The brake cylinder and reservoir are located between the hoppers under the centre of the car, with the brake rods running back to the trucks between the pairs of the



Interior Arrangement of G.T.R. Grain Car.

hoppers under the centre sill. The train pipe line comes out around the side of the car.

The interior arrangement of the car is very different from the standard grain car. From the hopper openings to the end of the car, the floor is sloped at an angle of about 30 degrees, which will chute out all the grain without assistance. This sloped flooring is of sheet metal construction, ribbed lengthwise for strength. These ribways consist of depressions in the sheet about 4 ins. wide and 1 in. deep, in which

are fitted oak strips to present a smooth, sloping surface.

In order that the car may be employed as an ordinary box car, as required, it is provided with three doors on each side which drop down over the hopper openings, meeting at the centre over the centre sill. These lowering doors are of ribbed sheet steel construction similar to the end slope. The six doors are all of the same size, which is the width of the side door. The drop doors each side of the side door, fit back into recesses in the car side. The central drop door, swings up as a grain door for the side door opening. A narrow board is provided for an upper section to the grain door. When these six doors are lowered, the inner surface of the car is level, as in a standard box car, save for the sloping ends.

One of the peculiar advantages of the hopper bottom car is its adaptability to carrying all kinds of bulk loads. For this reason, it is especially well adapted to carrying coal. Throughout the Northwest coal cars are seldom to be seen, nearly all the coal being handled in box cars, these travelling east with a load of grain, and returning westward with coal. The balance of traffic is thus more evenly maintained. The handling of coal is simplified by such a hopper bottom arrangement as this.

A detailed comparison between the carrying capacities and earnings of the G.T.R. hopper bottom grain car and a standard grain car, is given in the following table:—

Particulars.	Hopper	Standard
	Car.	Car.
Carrying capacity, bushels ...	1,833	1,100
Tare, lbs.	48,000	37,000
Load, lbs.	110,000	66,000
Total weight, lbs.	158,000	103,000
Ratio, carrying capacity to tare	2.29	1.78
Midland to Portland—		
Distance, miles	697	697
Ton-miles, tare	16,728	12,894
“ “ load	38,335	23,001
“ “ total	55,063	35,895
Rate per bushel, cents	5	5
Rate per ton, of grain ...	\$1.66½	\$1.66½
Rate per ton-mile, load, mills	2.39	2.39
Rate per ton-mile, load and tare, mills	1.66	1.53
Earnings on car of grain ...	\$91.65	\$55.00
Portland to Island Pond—		
Earnings on car of coal ...	\$54.02	.....
Total earnings on grain and coal	\$145.67	\$55.00
Cost of carrying car of grain from Midland to Portland at rate of 2 mills per ton-mile of load, although the average for all classes of freight is 4 mills		
	\$76.67	\$46.00
Cost of carrying car of coal from Portland to Island Pond at 3 mills per ton-mile of load, although the average for all classes of freight is 4 mills		
	\$24.67	.....
Total cost of carrying grain and coal	\$101.34	\$46.00
Earnings on 1,200 ton train, including grain and tare, Midland to Portland ..	\$1,388.42	\$1,281.36
Earnings on 7 trips, Midland to Montreal, 5 trips Midland to Portland, and 2 trips, Portland to Island Pond	\$1,207.84	\$660.00

In the tests of the car from Midland to Portland, experiments along the line of handling coal on part of the return trip have been made as indicated above. The grain was carried from Midland to Port-

land, 697 miles, and at the latter point, a load of coal was taken on for delivery at Island Pond, Vt., 149 miles, on the return trip. With the new type of car operated in this manner, the earning capacity is very nearly doubled. The car has proved so successful in service that an order for a number will be placed in the near future.

Book Reviews.

Any of the books reviewed may be obtained through Canadian Railway and Marine World at the published price.

THE PRACTICAL RAILWAY SPIRAL.—By L. C. Jordan. 155 pages; 4 by 6½ ins.; 7 illustrations. D. Van Nostrand Co., New York, \$1.50.

With the object of compiling and putting into usable form all the information in use by the leading roads in Canada and the United States, the author of this treatise got in touch with the majority of them, and obtained information regarding their several practices. He had hoped from this information to design a spiral that would satisfy the customs of the majority of these lines, but it was found on examination of the available information that the practices varied to such a degree as to make such a development out of the question. From his own experience over a wide diversity of country, he developed the "practical railway spiral" outlined in the book. The chapters contained are as follows: Super-elevation, Curve Easement, Spiral Development, and Revision. Several tables for spiral development are included, as follows: Maximum velocity on curves, minimum length of spirals, deflection angles of general spirals, functions and deflections of all spirals, radii and logarithms, corrections, tangents and externals, and tangents and externals to a 1° curve.

From a purely academic point of view the little book is very interesting, and well worth anyone's study, setting forth as it does, better, perhaps, than anyone has yet done, the reasons for the introduction of this extra "worry" into the lives and work of the location engineers, but that is as far as we can go in our commendation. The cubic parabola has been used in a more or less crude form for 50 years. There is a little dissertation on it in Rankine's monumental book, but it was A. M. Wellington who first put it into practical working shape and started to demonstrate its properties in Engineering News. He died before he had completed his demonstration, and H. K. Wicksteed, B.A.Sc., M. Can. Soc. C.E., now Chief Engineer of Surveys, Mackenzie, Mann & Co., Ltd., took up the work and wrote a paper, which was read before the Canadian Society of Civil Engineers, and published in its transactions. This evoked a remarkable amount of discussion, both from mathematical cranks and the practical men, and Mr. Wicksteed laid down then the principle, which was accepted by "all hands," that the exact mathematical form of the curve was of little consequence, and that which would come into general use was that which could be laid down in the simplest way and with the least use of figures and tables, and such a curve is the one the Canadian Northern Ry. now uses, and which the C.P.R. also uses, and which a man may run in with the instrument, even if he has forgotten to bring his book of tables out from camp with him, if he has memorized one or two of the very simplest of formulas. It appears to be generally believed that this curve is not only the simplest, but, Mr. Jordan to the contrary notwithstanding, it is also theoretically and practically at least equal to any other. At any

rate, until railways come much closer to mathematical precision in the construction of track and rolling stock, etc., etc., than they have, it is quite unnecessary to waste time in further refinements. There are other matters better worthy of our time and thought. Mr. Jordan would apparently have it believed that every degree of curve has its own proper speed, and every speed has its own proper spiral which is suited to it. Is this not all wrong in practice? The driver does not know the degree of one curve in one hundred over which he travels, and he regulates his speed only very vaguely to suit them. He will soon get to recognize that on some portion of the road there is a "bunch" of curves sharper than elsewhere, or perhaps some isolated sharp curve, and will slow down for that particular portion of the road. He will very likely find a "slow" signal displayed to warn him, and that his schedule will not be as fast over some sections as others, but that he will ever know the road well enough to adapt his speed to suit each individual curve, or be able to do so when he would, it is quite hopeless to expect. This principle is recognized on the Canadian Northern Ry. in its instructions to assistants, by exacting shorter spirals on the mountain divisions, where the curvature is sharp and continuous, and the schedule time slower, and requiring longer ones on the straighter portions of the road, but the same chord length or "pitch" of easement curve is used on a 3° as on a 6°, on the same portion of the road."

PRACTICAL LOCOMOTIVE OPERATING.—By C. Roberts and R. M. Smith. 292 pages; 6 by 8 ins.; 97 illustrations. J. B. Lippincott Co., Philadelphia, Pa. \$2.

This book is a compilation of practical locomotive operating information for enginemen, the object being the creation of greater efficiency among that class. It specializes on the running, firing and care of locomotives, apart from a consideration of the mechanical features of construction and the details of shop practices in their building and maintenance. Opening with a general consideration of the classes of locomotives, and the general theory involved in a knowledge of their employment, the writers proceed to treat locomotives more specifically, classifying them, and giving information regarding their general characteristics. Then they treat of steam, boilers, lubrication, cylinders and valves and valve gears, running and firing, disorders, parts and appliances, qualifications and responsibilities, and U. S. federal laws. From this, it will be seen that all parts of the locomotive, both as regards theory and practice are touched on. The different considerations go just far enough into the subject to make it interesting and instructive, but not so far as to make it burdensome and out of the depth of the ordinary engineman. The use of mathematical considerations has been reduced to a minimum for the same reason. The chapter on qualifications and responsibilities is of particular value to enginemen, as it contains a lot of questions on the work covered, such questions as are to be found in examinations for qualification. The last chapter on U. S. federal laws in so far as they relate to locomotive operation, is instructive. While it cannot be considered as a deep treatise on the locomotive, it is a work that seems eminently suited to meet the conditions for which it was prepared. Everything appears to be treated in a practical and intelligible manner.

It has been estimated that for a passenger car making 50,000 miles a year, the cost of hauling is 5 cents per pound per year, a very sufficient argument in favor of reduced weights.

Timiskaming and Northern Ontario Ry. Report for 1911-12.

The annual report of the Timiskaming and Northern Ontario Ry., for the year ended Oct. 31, 1912, has been issued by the Commission by which it is operated for the Ontario Government.

The line operated consists of the main line from North Bay to Cochrane, Ont., 252.8 miles; four branches, having a total length of 46.82 miles, and 92.63 miles of yards and sidings. The comparative tables of receipts and expenditure are appended. These show that the operating expenses were 81.1% of the gross earnings, compared with 66.4% in 1910-11. The increased cost of operating, the Commissioners state, is due to increases varying from 3 to 38% in wages; increased mileage of locomotives, increased cost of fuel; and the maintenance of the roadbed and equipment to the highest standard. The revenue has decreased, largely due to the fact that the Commission has placed freight rates on a basis that today are lower than on any other railway in Canada; and special rates on commodities for the benefit of settlers are in effect.

Since the close of the year the Elk Lake Branch, 28.8 miles, has been completed and opened for traffic, and a contract has been let for the building of a branch line from Iroquois Falls Jet. to the Abitibi Pulp and Paper Mills Co.'s plant at Iroquois Falls on the Abitibi River, 6.50 miles.

Following are the tables giving the result of the operation for the year, in comparison with those for the year ended Oct. 31, 1911:—

EARNINGS.		
	1911-12.	1910-11.
Freight revenue	\$929,464.66	\$974,678.33
Passenger revenue	509,681.73	653,063.01
Other revenue from transportation	89,389.05	80,507.68
Revenue from operation other than transportation	88,914.63	72,715.81
Total Revenue ..	\$1,707,450.07	\$1,780,964.83
EXPENDITURES.		
Maintenance of way and Structures	\$346,964.01	\$353,918.92
Maintenance of equipment	249,683.22	164,145.69
Traffic expenses	17,461.22	17,705.31
Transportation expenses	676,963.33	567,316.97
General expenses	93,625.91	78,911.74
	\$1,384,697.69	\$1,181,998.63
Net revenue	\$322,752.38	\$598,966.20
Ore royalties	135,500.31	17,060.56
Equipment rental	10,825.37	6,283.93
Total income	\$469,078.06	\$622,310.69
Deductions from income	14,876.32	29,158.00
Net income	\$454,201.74	\$593,152.69

TRAIN MILEAGE.—Mileage of revenue passenger trains, 439,265; mileage of revenue mixed trains, 47,530; mileage of revenue freight trains, 396,926; total revenue train mileage, 883,721. Passenger car mileage, 2,415,412; mileage of loaded freight cars north and east, 2,821,137; mileage of loaded freight cars, south and west, 1,166,742; mileage of empty freight cars north and east, 206,303; mileage of empty freight cars south and west, 1,929,294. Operating revenue per mile of road, \$5,686.07; operating revenue per train mile, \$1.94; operating expenses per mile of road, \$4,611.97; operating expenses per train mile, \$1.57; net operating revenue per mile of road, \$1,074.98.

PASSENGER TRAFFIC.—Total passengers carried earning revenue, 497,452; number of passengers carried one mile, 23,381,681; number of passengers carried one mile as per mile of road, 78,992; average distance carried, 47 miles; average amount received from each passenger, \$1.21; average

receipts per passenger per mile, 2.56 cents; passenger service train revenue per mile of road, \$2,252.38; passenger service train revenue per train mile, \$1.42. Average number of passengers per car mile, 0.10; average number of passengers per train mile, 0.48; average number of passenger cars per train mile, 4.96.

FREIGHT TRAFFIC.—Total freight carried, 562,734 tons; freight originating on road, 326,608 tons; freight received from foreign roads, 236,126 tons; freight carried northbound, 308,777 tons; freight carried southbound, 253,957 tons; tons carried one mile, 69,469,914; tons carried one mile as per mile of road, 234,695; average distance haul of one ton, 123.45 miles; amount received for each ton of freight, \$1.65; average amount received per ton mile, 1.33 cents; freight revenue per mile of road, \$3,095.75; freight revenue per train mile, \$2.10. Average number of freight cars per train mile, 14.50; average number of loaded cars per train mile, 8.97; average number of empty cars per train mile, 4.80; average number of tons of freight per train mile, 156.30.

average number of tons of freight per loaded car mile, 17.42.

EQUIPMENT.—Locomotives, 44; passenger cars, 50; box cars, 147; stock cars, 10; vans, 19; flat cars, 469; maintenance of way and structure equipment, 261.

THE PROFIT AND LOSS ACCOUNT showed \$316,252.72, brought forward from Oct. 31, 1911; \$77,831.57 received from town-sites, and \$454,201.74 from revenue account, making a total of \$848,286.03. From this \$510,000 has been paid to the Treasurer of Ontario, leaving a balance carried forward of \$338,286.03.

ASSETS.

Cost of road	\$16,535,394.50
Cost of equipment	1,991,485.03
Working assets	675,177.94
Deferred debt items	67,329.86
Land Agent	39,011.80
Nipissing Central Ry.	235,483.31
	<hr/>
	\$19,543,882.94

LIABILITIES.

Provincial Loan account	\$18,746,451.99
Working Liabilities	459,144.92
Profit and Loss (free surplus)	338,286.03
	<hr/>
	\$19,543,882.94

Quebec Central Railway Not Under Dominion Control.

Chief Commissioner Drayton, of the Board of Railway Commissioners, has given the following judgment:

Complaints have been made to the Board as to the operation and practices of the Quebec Central Ry. Co., and the question as to whether or not that railway is subject to the Board's jurisdiction, was heard at Ottawa on Mar. 15.

The Quebec Central Ry. is a provincial company incorporated under the statutes of the Province of Quebec. The railway has, however, been acquired by the Canadian Pacific Ry. Co. under lease dated Oct. 2, 1912. This lease seems to give absolute control of the railway and its operations to the C.P.R. Under it, not only the railway now constructed, but also all extensions, branches, and additions that the lessor—that is, the Q.C.R. Co.—may hereafter be authorized to construct by the Dominion Parliament of Canada, by the Quebec Legislature, or by the Board of Railway Commissioners under the provisions of the Railway Act and amendments, with all appurtenances, are leased to the lessee, the C.P.R. Co.—for 999 years.

The lessor's corporate acts are subject to contract with the lessee, the lessor agreeing not to issue any additional capital stock, bonds, or other financial obligations, without the lessee's consent; and at the same time, agreeing to sell all or any part of the existing capital stock within its control, and use its best endeavors to obtain power to create, and thereafter create and issue, additional capital stock, if the lessee so desires. On the same request the lessor must issue bonds or debenture stock to such amount or amounts and at such rate of interest, not exceeding 4 per cent., as the lessee fixes. The lessor is to apply the proceeds of such bonds or debenture stock in such proportions and in such manner towards the construction or permanent improvement of the railway as the lessee may direct; or, at the option of the lessee, the lessor is to pay over the whole or any part of such proceeds to the lessee, in order that the lessee may itself, according to its own discretion, apply the same as aforesaid. The lessee also has the right to exercise all the franchises and powers of the lessor in operating the railway, in building branches under the Railway Act or under any act of the Quebec Legislature, and has the right to use the lessor's name. The officers of the lessor

are required, on the demand of the lessee, to append their signatures and affix the lessor's seal to any document useful in the exercise of the lessor's rights and franchises. The lessee, of course, can do what it likes in connection with the running of the trains, may make such rules, regulations, and bylaws touching the railway as it deems advisable, and is to make the tariff of tolls.

The only matters left to the lessor, to warrant its continued corporate existence, seems to be the issue of further stock, bonds, and debentures, and the receipt or rent. The rent takes the form of the payment of interest on the company's bonded or debenture stock indebtedness, and a dividend upon the capital stock of the lessor for the time being issued and outstanding at 4 per cent. for the first four years of the term and afterwards at 5 per cent. It would appear that this collection is in its turn probably a matter of form, in so far as the lessor is concerned, and that the lessee probably, through some official of its own, who may have the added dignity of an official name in the lessor company, will make these payments direct to the shareholders and to the bond and debenture stock holders. On the other hand, it should be pointed out that the lessee covenants to do everything, during the term of the lease, necessary for the preservation of the property and franchises of the lessor, and for keeping alive its incorporation for all the purposes mentioned in its acts of incorporation; and that the lease contains provisions for surrender at the end of the term, and for re-entry for non payment of rent.

The probable reasons for the continuance of the corporate functions of the lessor would seem to be—first, the maintenance of the defined interests of the shareholders in the company, as represented by their stock certificates, unchanged, thus obviating difficulty in determining their interests, and making their compensation easy of adjustment in the form of the dividend secured; secondly, the issue of securities by the lessor for the purposes of the road, enabling the C.P.Ry. to construct new lines under provincial acts, if they are found favorable, and to operate said lines without interference from the Board of Railway Commissioners.

The lease was submitted to the Board for its approval under sec. 361 of the Act; and a consideration of the provisions of

that section and of sec. 362, as well as sub-sec. 21 of sec. 2, is now necessary. Sec. 361 deals with the sale or lease of a company's railway and undertaking by one company to another, either in whole or in part, or for amalgamation. Under the terms of the section, the agreement has to be submitted to the Board, with an application for its recommendation to the Governor in Council for sanction, the duty of the Board being, in the proper case, to recommend to the Governor in Council the sanctioning of the agreement.

Under sec. 362, companies agreeing to amalgamation are deemed to be amalgamated and to form one company in the name and upon the terms and conditions which the agreement provides, and the amalgamated company is to possess and be vested with—all the powers, rights, and franchises . . . belonging to, possessed by, or vested in the companies parties to the agreement. The interpretation of "railway" (sec. 2, ss. 21), shows that the word includes any railway which the company has the authority to construct or operate.

Sec. 362, however, has no application. Absolute as is the acquisition by the C. P. R. Co. of the railway in question, there is nothing in the agreement providing one way or the other for amalgamation, a matter necessary for the operation of this section.

Ordinarily speaking, sec. 361 of the Act would have no application, under the decision of the late Chief Commissioner Mabee, on the application of the Montreal St. Ry. Co. for approval of amalgamation agreements with the Montreal Terminal Ry. and the Montreal Park & Island Ry. Companies. In that instance, the local company, the Montreal St. Ry. Co., absorbed two Dominion incorporations,—the Montreal Terminal Ry. and the Montreal Park & Island Ry. Companies. Chief Commissioner Mabee held that sec. 361 deals only with federal companies and not with two provincial companies, nor with a federal and a provincial company; and that, therefore, the section had no application to the sale of a federal railway and its assets and facilities to a provincially incorporated company. This judgment would apply in the present case, if it were not for the act obtained by the C.P.R. Co. (2 Geo. V., chap. 78, s. 14), which provides that, subject to the provisions of secs. 361, 362, and 363 of the Railway Act, the company may, for any of the purposes specified in sec. 361, enter into an agreement with the Quebec Central Ry. Co., and may lease that company's railway and undertaking.

The Board recommended the agreement in question for the sanction of the Governor in Council on Nov. 25, 1912, and that sanction was granted. The Quebec Central Ry. is now operated by the C.P.R. Co. Is it a "railway" within the definition of the Railway Act? Mr. Beatty, Chief Solicitor, C.P.R., claims that its operation by the C.P.R. Co. is not under the provisions of the Railway Act, but under the special act of 1912, claiming that before the C.P.R. Co. could operate a provincial line under a provincial charter, special authority had to be obtained from the Dominion Parliament; and that the railway operated under the section of the interpretation clause already referred to, means a railway subject to the provisions of the Railway Act,—in other words, a railway either incorporated by the Dominion Parliament, or specially declared by that parliament to be a work for the general advantage of Canada.

In the case of the Preston & Berlin St. Ry. Co. v. the Grand Trunk Ry. Co., an application was made by the street railway for an order of the Board permitting it to use a small portion of the G.T.R.Co.'s land for the purposes of its street railway,—

a provincial road. The application was refused, the late Chief Commissioner Killam holding that the provision in the Railway Act giving the Board power to authorize the use by any company of the railway tracks or the land of another company applies only to a railway authorized by an act of the Dominion Parliament, or declared to be a work for the general advantage of Canada.

Everything considered, I am of the view that this Board has no jurisdiction. The line is still a Provincial line. The judgments both of Chief Commissioners Killam and Mabee affirm the proposition that the railways subject to the provisions of the Railway Act are only those subject to the jurisdiction of the Dominion Parliament, with certain exceptions of no importance here. This must be necessarily so. I think it also apparent that the mere act of a Dominion company, such as the purchase of a provincial line, cannot of itself oust provincial jurisdiction. This is not a case of a Dominion company operating a provincial line under the Railway Act, which may or may not be possible. The Board is not to be understood as determining that under no circumstances can it have jurisdiction over a company as such, enabling it to regulate operation apart from any authority to compel the building of industrial branch lines or the enlargement of the track facilities of the railway itself. Here the right of operation has been granted to the Dominion company by a special act of the Dominion Parliament.

The case appears to require legislation to deal properly with it. It seems contrary to public policy and the proper administration of the railway system, that a Dominion company, in so far as its major operations are concerned, should be subject to the Board's jurisdiction,—be, so far as this Board is concerned, entirely free from control of any kind, on a small part of the line operated, because of certain legal distinction which cannot appeal to the shipper or passenger, or in any way affect the exigencies of traffic. An undivided control in operation is probably more important than construction. Uniformity of railway practice, a most important essential, would seem to demand that railway companies, however incorporated, should, when operated by any of the large Dominion systems, be subject to Dominion control.

Ninety Per Cent. of Rail Failures, as stated by M. H. Wickhorst, Engineer of Tests for the rail committee of the American Railway Engineering Association at the recent convention of the association, are failures either of the head or web, which constitute 50% of them; or of the base, which constitute 40%. The cause of the former he ascribes to unsound ingots, and the remedy he says is a more uniform chemical structure in the ingot. For the base failures he blames laminations in the base, and suggests as a cure better mechanical rolling.

The Pennsylvania Rd. has an oven big enough to accommodate the largest passenger car, for use in baking the varnish finish on steel cars; 100 lbs. of steam in the heating coils gives a baking temperature as high as 250 degrees. The oven is contained in a separate building of light galvanized iron. Inside is a sheathing of ¼ in. sheet steel, closely conforming to the car contour, and insulated on its outer side, against the galvanized outer wall, by magnesia lagging.

It has been suggested that in order to overcome difficulties in mounting axle generators under passenger cars, truck designers should provide a generator support built integral with the truck.

Immigration and Colonization in their Relation to the Traffic Departments.

By J. E. Forslund, Western Colonization Agent C.P.R. Immigration Office.

It is a matter of common knowledge that railway construction in Canada, and more particularly in the west, at this period is quite a different matter from what it was 20 or 30 years ago. Now, thrifty communities cry for railway facilities, and it is even said that politics are responsible for extensions, not to speak of the desire of one railway company to share in the traffic from certain well favored locations. Then western Canada was almost a wilderness, if we are to judge from early reports. It must have seemed a foolhardy venture to plan a railway like the Canadian Pacific, and it was no wonder that men of finance shook their heads and stood aloof. The subsequent history of the construction and completion of this railway is too well known to refer to. Suffice it to say that the C.P.R. has reached the very conspicuous position of being the foremost transportation company in the world, a fact that all Canadians are proud of.

In the building up of this tremendous concern the land department, through its immigration work, has played a conspicuous part, and you will have to bear with a short resume of the same in order to get a full understanding of the relation of the department mentioned to the traffic departments. You will also understand that it will be necessary to deal entirely with the C.P.R., as the writer has spent all his time in this country in this company's service.

When the line was finally completed it connected widely separated communities which had sprung up during the years of construction, but intermediate parts of the wide land were empty. In these empty portions the railway company possessed large land areas which had to be administered and thus necessitated the creation of a land department with a view of selling the land. Looking at this feature now, it seems that it should not have been difficult to sell land, all of which was selected as fit for settlement, and of which a large percentage was really first class farming land. I presume that some of you are not aware of the fact that the C.P.R. at one time tried to dispose of its land grant for \$25,000,000 or \$1 an acre, without finding a purchaser. One of the chief reasons of slow sales was the vast area of free homestead land, and means had to be devised to get them absorbed, because when the even numbered sections were gone, the odd, being the company's, would have to be bought if the newcomer wished to locate in a settled district. Therefore settlers must be brought in, and an immigration department started to do the work, so that products grown by the settlers would give employment to the expectant traffic departments, both freight and passenger.

For some reasons a number of Ontario settlers, who had located in the Red River valley, moved out into the Dakotas, wherefrom they now, by the way, are returning in great numbers, and here was planted a colony of Mennonites who had been brought out by the Dominion Government from Russia. Reference to this colony is necessary, as the overflow, caused by natural increase, was directed by the company to districts which have since become well developed, populous and rich.

The company then tried its hand with Jews, Scotch crofters, Hungarians, Russians, Germans, French, Scandinavians and Finns, endeavoring to place them in sections where they would find suitable conditions for increasing their number, by calling on friends

in their old home to come and join them. Of these the two first named did not prosper, the Jew as a rule not being a farmer and the crofter being a fisherman. The other nationalities increased slowly, so that the areas covered by them did not materially extend.

In the meantime another very interesting movement had taken place. A number of German speaking Russians and Austrians living in Winnipeg made application to the Land Commissioner for aid and had been promised assistance in the shape of cattle and implements. Their delegates had selected three townships south of Dunmore, near Medicine Hat, and they were assisted to settle there, the company providing free carriage of all persons, goods and chattels. The settlement did not prosper, however, and two years later they were moved, except four families, one portion to the Edmonton district in Alberta, and one portion to Grenfell, then in the provincial district of Assiniboia, in which districts, after the hard years in the early nineties, they not only prospered but attracted a great number of friends, so that they now form considerable colonies, the members of which are well to do.

The company then turned its attention to western Ontario and took up some 150 families, chiefly from the Parry Sound district, who almost all settled in the Beaver hills, east of Edmonton. They were provided with transportation, the cost of which was paid by notes, which, with very few exceptions, were paid off as soon as the settlers got on their feet.

There was never much difficulty in directing people to the open lands, the hard question was to build colonies in the wooded parts and the company undertook to do this by assisting settlers in buying them cattle and implements, the cost of which was to be paid gradually. Lord Mount Stephen applied this principle in starting the Hungarians in Esterhazy and Kaposvar. The company followed suit by placing a number of German speaking families at Balgonie, and a few Scandinavians and Finns north of Whitewood.

Money was also advanced to deserving settlers to enable them to bring out relatives and friends from their former homes and a goodly number of excellent settlers was the result.

While all this was done under the direct supervision of the immigration office, the Mennonites commenced to find their hive too full and prepared to swarm. They applied for facilities to send delegates to spy out suitable locations, and free transportation—this was before the railway commission was called into existence—was granted. Their delegates were sent out and selected the Rosthern district, the success of which is so well known. Again the hive swarmed, this time to Swift Current, where the open level land pleased them. This district, until recently looked upon as a desert or fit only for cattle raising, has, through the move of these people become the centre of a splendid grain district, and Swift Current has for two years enjoyed the distinction of being the greatest wheat shipping centre.

The crop results obtained by the Mennonites and others who had followed them led later arrivals to try their luck further west, through the so called dry belt, with the result that almost all the land is now occupied. Reference was made a moment ago to the attempt to start the German colony at Dunmore. The few families who

remained on their locations commenced to prosper and they induced a great many friends from Europe and the United States to join them, so that gradually a large settlement has been formed in the abandoned and adjoining townships.

In connection with this I will remember the stupendous undertaking commenced by the company; the irrigation works in the from Calgary. Enthusiasts who dreamt of seeing this tract—which offered a traveller a monotonous vista of brown grey desolate prairie—dotted with lakes, thriving towns and happy farm homes, have commenced to obtain realization of their dreams. Although not fully completed the irrigation system has already worked wondrous changes. In order to sell the lands benefited by this noble work, an extensive world wide agency force has been created by J. S. Dennis, the promoter of this undertaking, who is Assistant to the President and head of the Natural Resources Department.

In order to stimulate immigration from the British Isles, the company, in conjunction with the Vice President and augmented the policy of sending return men, successful western farmers, who spent the winters in their respective old homes, returning in the spring accompanied by new settlers.

The popular Christmas excursions to eastern Canada were really started with the view of getting the people of the older provinces of the Dominion contaminated with the western fever and we all know the great success which attended the same. It later on led to the establishment of similar excursions to the United States.

While all this took place another movement, partly fathered by the company's European Manager, began. The Ruthenian, or the sheepskin clad Galician, started to arrive. They were sent in thousands into the Edmonton district and our Canadian Northern Ry. friends no doubt appreciate their industrious travel and the tonnage arising out of their farming operations. These people, whose town habits are rather boisterous, are industrious farmers, and it is unnecessary to point out their value as laborers, chiefly in construction and maintenance work. They are, however, getting too busy and well to do at home to look for work outside.

The company had in the meantime turned its attention to the possibilities of obtaining settlers from the United States, and in conjunction with the Dominion government an active campaign was started, the results of which have been and continue very gratifying. Great numbers of delegates were transported free of charge into all parts of western Canada—this also before the advent of the railway commission. They came, they saw and were conquered, returning home only to prepare to move to Canada. Seldom, if ever, has bread cast upon the waters returned in such generous measure.

The immigration work had the desired result in disposing of the homesteads within the railway belt, and stimulated the sales of land so that out of 25,000,000 acres now only some 7,000,000 acres remain to be disposed of. Some years ago the company sold some tracts to speculators, or colonization companies as they like to call themselves, but this practice has been discontinued and the company is endeavoring to reach the buyers themselves, men who will start to improve the land. This new policy embraces the ready made farm scheme in which the company's President, Sir Thomas Shaughnessy, takes such a deep interest, and also a loan policy, under which the company will advance desirable settlers about \$2,000 to assist them in improving their purchase.

The ready made farms are in groups,

which tend to highly develop certain areas and make them specially productive from the traffic man's point of view. As a matter of fact it may safely be said that at present the Natural Resources Department, under Mr. Dennis' able management, which department deals with lands, coal, timber, irrigation, mines, cattle industry, encouragement of industries and subsequent development of towns, is working solely for the benefit of the traffic men. By judicious and elaborate advertising people become interested, decide to go and look over lands and opportunities offered, which all gives the passenger department something to look after. The settlers moving in bring their effects and cattle, and after settlement they need a multitude of things which the freight man has to forward. It is possible that the traffic men do not look upon the low rates which are held out as inducements, with particular pleasure, but the end in this case surely justifies the means.

The best immigration agent is after all the satisfied settler and on the traffic department falls a great share of making him contented, and close attention to his wants will bring this about. The tourist, while he pays handsomely, may never return, while the settler will always be obliged to fall back on the railways for his very existence. The interest of the departments referred to may therefore be said to be interwoven and this fact should find a lodging place in the memories of the coming superintendents, general passenger agents and traffic managers.

The foregoing paper was read before the Western Canada Railway Club recently.

Rates on Shingles from British Columbia to Rochester, N. Y.

The Interstate Commerce Commission (U. S. A.) gave the following decision Mar. 5, in the case of C. C. Follmer & Co., vs. Canadian Pacific Ry. Co., et al.

Complainant is engaged in wholesale lumber business at Grand Rapids, Mich. It alleges that unreasonable charges were collected by defendants for the transportation of a consignment of shingles from Abbotsford, B.C., to Rochester, N.Y., and asks reparation.

Feb. 13, 1908, complainant shipped a carload of shingles weighing 40,800 lbs. from Abbotsford consigned to itself at Menasha, Wis. The shipment moved via C.P.R. and Minneapolis, St. Paul & Sault Ste. Marie Ry., hereinafter called the Soo line. It was loaded in a C.P. 36 ft. car, but before reaching Menasha was reloaded by the Soo line into two smaller cars. Upon arrival at Menasha, and in accordance with a letter of instructions from the shipper to the agent of the Soo line at that point, the shingles were reconsigned as one shipment to Rochester, N.Y., and were carried forward in the two cars via the Soo line to Manitowoc, Wis., and thence via Pere Marquette Rd. and the New York Central & Hudson River Rd. to destination. From Abbotsford to Manitowoc charges were assessed on the actual weight of the shipment, but from Manitowoc to destination they were assessed on a weight of 27,300 lbs. for the first car and on a minimum weight of 24,000 lbs. for the second car. The total charges amounted to \$388.20. Complainant contends that the charges were unreasonable to the extent that they exceeded a through rate of 80c. per 100 lbs. from Abbotsford to Rochester, based on the actual weight of the shipment. There was no joint through rate applicable to the traffic via the route of movement. There were intermediate rates as follows: A joint rate of 70c. from Abbotsford to Menasha, applying also to Manitowoc, and

a local rate of 18½c. from Manitowoc to Rochester. The local rate from Menasha to Manitowoc was 6c. From point of origin to Manitowoc the 70c. joint rate was applied, and beyond the latter point a rate of 20c. was charged, for which there does not appear to have been tariff authority.

The shipment was received by the Soo line from the C.P.R. as a one car movement, and for the transfer from one to two cars the Soo line seems to have been wholly responsible. The record affords no justification of that act. It was said that the western carriers declined to allow their equipment to go east of Minnesota Transfer, but the C.P.R. asserts that it has no such rule and prefers that its cars containing shipments from the west be sent on east. Nor is it shown why the transfer, if necessary at all, might not have been made to a car large enough to have accommodated the entire shipment. This defendant appears to have recognized its mistake and endeavored to make amends for it by reconsigning the shingles from Menasha as one shipment, and by protecting the 70c. rate on the actual weight for the extended haul over its own lines. There was no tariff authority, however, for reconsigning at Menasha on basis of the joint rate to Manitowoc. The through rate legally applicable was 94½c. per 100 lbs., made up of the 70c. rate from point of origin to Menasha and the rates of 6 and 18½c. beyond. Had the shipment continued as a one car movement to final destination the charges at the lawful rate would have amounted to \$385.56, or \$2.64 less than the amount collected. The lines east of Manitowoc were entitled to charges at their rate of 18½c. per 100 lbs., but they applied a rate of 20c.

We find that the charges collected were excessive and unreasonable to the extent that they exceeded charges that would have accrued at the combination through rate of 94½c. per 100 lbs., based on the actual weight of 40,800 lbs. There was an overcharge for the movement east of Manitowoc of 1½c. per 100 lbs., amounting to \$7.70. For the movement up to Manitowoc there was an undercharge of 6c. per 100 lbs., amounting to \$24.48, against which should be offset \$19.42, the extra charges east of Manitowoc due to the unauthorized transfer of the shipment by the Soo line from one to two cars.

We further find that complainant made the shipment in accordance with the above statement of facts, and paid charges thereon in the amount herein found unreasonable; that complainant has been damaged to the extent of the difference between the amount paid and the amount it would have paid if the lawful rates had been applied on the actual weight of the shipment, and is therefore entitled to an award of reparation against the Pere Marquette Rd. and the New York Central & Hudson River Rd. in the sum of \$7.70, with interest from April 9, 1908. An order will be entered accordingly. No order for the future is necessary, as the basis of the claim is in the nature of an overcharge, any recurrence of which should be avoided under existing tariffs.

Aerial Railway at Niagara Falls.—Arrangements are in progress whereby a Spanish company is obtaining a concession to construct an aerial railway across the whirlpool at Niagara Falls, from shore to shore on the Canadian side, forming a cut off over the deep bend in the river. It is to be used for tourist purposes exclusively. A. Balzola, the representative of the company, is in Toronto completing the preliminary negotiations. The company has had similar experience with aerial lines that it operates in Spain.

Intercolonial Railway Terminals at Halifax.

In speaking on the estimates in the House of Commons, recently, the Premier, discussing the proposal to lay out new and enlarged terminals at Halifax for the I.R.C., said, the matter had been under discussion for a long time, and had been considered by several engineers, including F. P. Gutelius, formerly Assistant Chief Engineer of the C.P.R., and F. H. Cowie, Chief Engineer of the Montreal Harbor Commission. The general conclusions of the Department were announced last autumn; the report upon which this statement was based was a lengthy one, but it contained the following recommendations:—

The proposed terminal will consist of a landing stage or bulkhead wharf 2,000 ft. long at which three of the largest ocean vessels can dock in safety without tug assistance; a wharf building the whole length of the bulkhead pier; the first floor of which will be for freight and the second floor for passengers and immigration quarters, and a union passenger station of suitable architectural design and of capacity for the increased business which is expected to come with the necessary tracks and facilities usual at terminal stations of this character. This scheme of development provides for the construction of six freight piers 300 ft. wide and 1,250 ft. long which will be equipped with necessary wharf freight sheds and railway tracks; the necessary yards for the storage and shunting of cars; the construction of an elevator which will permit of grain being loaded into ships at each of the 32 berths; a locomotive house for the cars of passenger locomotives and switch engines, and a breakwater from Point Pleasant Park to the Reid rock buoy.

It will be reached by a double track railway about five miles long which will leave the main line at Three Mile House, pass through the low divide between Bedford Basin and the Northwest Arm, skirt the Northwest Arm and reach the new terminals through a deep cutting under the lower end of Young Avenue.

It is proposed that the first unit will consist of a bulkhead pier, the freight and immigration sheds, passenger station, one ship and one freight pier equipped with sheds and tracks together with the necessary accessories, which will provide accommodation for eight of the largest ocean steamships. As soon as business warrants it, two more piers will be constructed, giving an additional capacity for eight such steamships; and in five or six years, or sooner if necessary, upon the opening of the Quebec bridge, provision will be made for a further accommodation of eight such steamships. As business develops and the demands of trade necessitate, the two southerly piers will be constructed, thus completing the scheme.

The Government having approved of this general plan, ordered the engineers to proceed with the preparation of detail plans which are not yet complete. It also purchased such properties as could be secured cheaply and is now committed to an expenditure on this account of between \$400,000 and \$500,000. It is proposed to proceed with the purchase of the remaining right of way and water frontage the plans for which were filed recently.

The expenditure is estimated as follows:—For the first unit, including the five miles of double track railway, between \$5,000,000 and \$6,000,000; for the completed scheme about \$12,000,000.

It is proposed during the coming summer to proceed with the construction of the quay walls and of the railway, and with the dock and yard filling, the construction of the

necessary overhead bridges and such other works as may be found economically convenient in connection therewith, for all of which it is estimated \$2,500,000 will be required during the approaching fiscal year. These proposals the Government is proceeding to carry out, with the sanction of Parliament, in the hope that they will provide the accommodation required by the increasing trade of the port.

Birthdays of Transportation Men in June.

Many happy returns of the day to:—

Jas. Anderson, Manager, Sandwich, Windsor and Amherstburg Ry., Windsor, Ont., born at Ayr, Ont., June 20, 1851.

W. C. Bowles, General Freight Agent, Western Lines, C.P.R., Winnipeg, born at Montreal, June 3, 1875.

J. H. Boyle, Superintendent, District 3, Lake Superior Division, C.P.R., Schreiber, Ont., born at Waterloo, Que., June 26, 1869.

F. P. Brady, Member, Government Railways Managing Board, and General Superintendent, Government Railways, Moncton, N.B., born at Haverhill, N.H., June 22, 1853.

H. W. Brodie, General Passenger Agent, Lines West of Revelstoke, C.P.R., Vancouver, B.C., born at Fredericton, N.B., June 8, 1874.

A. H. N. Bruce, M. Can. Soc. C.E., Chief Engineer, Quebec and Saguenay Ry., Quebec Ry., Light, Heat and Power Co., etc., Quebec, Que., born at Ballyscullion, Ireland, June 18, 1854.

T. Davies, Chief Dispatcher, Canadian Northern Ry., Port Arthur, Ont., born at Bangor, Wales, June 17, 1878.

A. E. Doucet, M. Can. Soc. C.E., District Engineer, National Transcontinental Ry., Quebec, born at Montreal, June 9, 1860.

E. W. DuVal, Superintendent, District 3, Saskatchewan Division, C.P.R., Saskatoon, born at Toledo, Ohio, June 5, 1885.

G. H. Eaton, Assistant Master Car Builder, Western Lines, C.P.R., Winnipeg, born in Staffordshire, Eng., June 9, 1860.

J. M. R. Fairbairn, M. Can. Soc. C.E., Assistant Chief Engineer, Eastern Lines, C.P.R., Montreal, born at Peterboro, Ont., June 30, 1873.

A. A. Goodechild, Auditor of Stores and Mechanical Accounts, C.P.R., Montreal, born at Peckham, London, Eng., June 3, 1866.

J. A. Heaman, Assistant Chief Engineer, G.T. Pacific Ry., Winnipeg, born at Memphis, Tenn., June 3, 1874.

H. W. Harding, Local Secretary, Canadian Northern Ry., London, Eng., born there June 6, 1869.

Hon. J. D. Hazen, M.P., Minister of Marine, Ottawa, born at Oromocto, N.B., June 6, 1860.

L. R. Johnson, General Superintendent, Angus Shops District, C.P.R., Montreal, born at Abingdon, Berks., Eng., June 22, 1855.

L. K. Jones, I.S.O., Assistant Deputy Minister and Secretary, Department of Railways and Canals, Ottawa, born at Port Hope, Ont., June 9, 1849.

A. C. Lytle, Assistant Superintendent of Construction, Montreal Tramways Co., Montreal, born at Hemmingford, Que., June 6, 1854.

R. S. McCormick, M. Am. Soc. C.E., Chief Engineer, Algoma Central and Hudson Bay Ry. and Algoma Eastern Ry., Sault Ste. Marie, Ont., born at Quaker City, Ohio, June 22, 1873.

D. McDonald, ex-General Manager, Montreal Tramways Co., born at St. Thomas de Montmagny, Que., June 17, 1859.

S. J. McLean, Dominion Railway Commissioner, Ottawa, born at Quebec, June 14, 1871.

J. V. McNab, Resident Engineer, C.P.R., Saskatoon, Sask., born at Ayr, Ont., June 11, 1884.

C. E. McPherson, Assistant Passenger Traffic Manager, Western Lines, C.P.R., Winnipeg, born at Chatham, Ont., June 7, 1861.

W. R. MacInnes, Freight Traffic Manager, C.P.R., Montreal, born at Hamilton, Ont., June 7, 1867.

H. J. Maguire, District Baggage Agent, Pacific Division and B.C. and Pacific Coast Service, C.P.R., Vancouver, B.C., born at Toronto, June 16, 1881.

G. Manson, Assistant to Vice President C.P.R., Winnipeg, born at Thurso, Scotland, June 8, 1863.

J. D. Morton, Assistant Comptroller, Canadian Northern Ry., Toronto, born at London, Ont., June 15, 1857.

L. Mulkern, District Freight Agent, C.P.R., London, Ont., born there, June 18, 1871.

H. A. Pepler, District Master Mechanic, C.P.R., Farnham, Que., born at Richmond, Que., June 25, 1873.

J. E. Pinault, Superintendent, Canada and Gulf Terminal Ry., St. Flavie, Que., born at Rimouski, Que., June 24, 1884.

M. J. Power, General Storekeeper, Angus Shops, C.P.R., Montreal, born there, June 19, 1877.

F. Price, Superintendent Passenger Service, G.T.R., Montreal, born there, June 11, 1864.

Allan Purvis, Manager Interurban Lines, British Columbia Electric Ry., New Westminster, B.C., born at Batavia, Java, June 29, 1864.

A. T. Tomlinson, M. Can. Soc. C.E., Chief Engineer, North Ry., Montreal, born at Grand Falls, N.B., June 22, 1869.

W. Webber, General Agent, Passenger Department, Atlantic Steamship Service, C.P.R., Montreal, born at Liverpool, Eng., June 10, 1872.

Walter White, Trainmaster, G.T.R., Palmerston, Ont., born at Toronto, June 4, 1866.

Tie Preservation Experiments.—The U.S. Forest Service, in conjunction with various railways, has been conducting experiments on ties on eight test tracks. On the oldest of these, on the Santa Fe in Texas, 5,547 ties of 13 kinds of wood were laid in 1902 to determine the relative durability of the several kinds of wood, and the efficiency of some eight preservative processes. From this test the conclusions are drawn:—1st, that zinc chloride is an effective preservative for ties subjected to the severe conditions under which they were laid; 2nd, that a fairly heavy impregnation of zinc chloride is advantageous; 3rd, that a light injection of creosote apparently adds to the effectiveness of zinc chloride treatments; 4th, that treatments with preservatives will not yield good results unless the ties are sound in the first place, and the treating properly done; 5th, that the great variation in durability of the different species in nearly all of the treatments indicates that some of the species were not properly treated; and 6th, that species which, when untreated, decay most rapidly, appear to give the greatest relative increase in service when treated.

It is announced that the C.P.R. has decided to increase the wages of locomotive drivers on lines east of Cartier, by 10%, from January last, and by 5% for those employed on lines between Cartier and Fort William. An increase of 10% on the then existing schedule was made in Aug. 1910.

Since the relocation of the Panama Rd., surveys are in progress for its operation by electricity. It is proposed to transmit from the hydro electric plant at Gatun for this purpose and for lighting the canal and operating the various machine shops.

The Canadian Pacific Railway's Ogden Shops.

The C.P.R. has recently put in operation near Calgary, Alta., a large shop plant of more than ordinary interest by reason of its size, its complete and modern character, and the speed with which it was created. The shop location is at Ogden (named after the company's Vice President, I. G. Ogden), 4.6 miles east of Calgary and 2,246.7 miles from Montreal. A preliminary description of the plant appeared in Canadian Railway and Marine World for Feb., 1912.

Its distance from those sections of the country where the greater part of the construction materials, machinery and equipment were produced, constituted the first and one of the most important problems. A second important problem arose on account of the construction season being extremely short, owing to the high latitude, frost remaining in the ground until about April 1, and returning with snow as early as Oct. 1. A third very important problem was the comparative scarcity of labor in the Canadian Northwest, this condition being greatly aggravated during the late summer months when harvesting

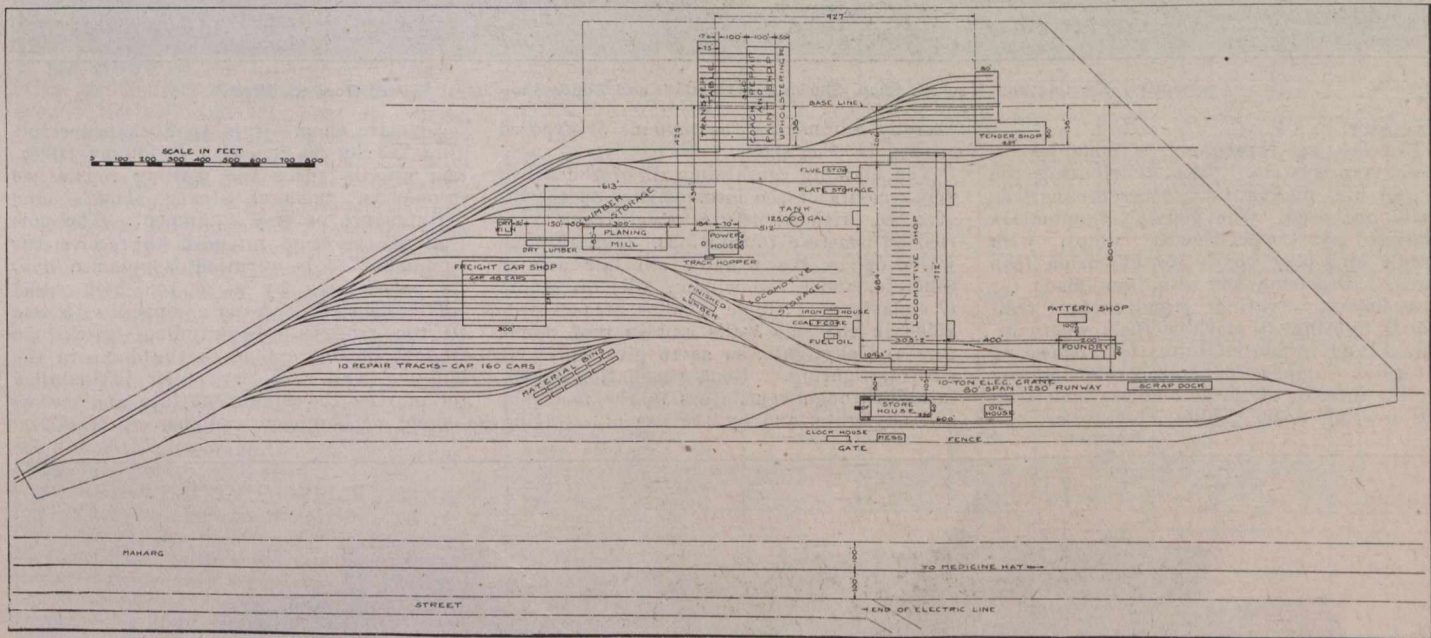
chine shop, blacksmith shop, and boiler shop.

The erecting shop is of the transverse lift over type, contains 35 bays, each 22 ft. between centres, and is 778 by 75 ft. The entire area is served by two travelling electric cranes, carried on two levels. A 120 ton crane, furnished with two 60 ton trolleys, is carried on the upper level, and is used for transferring, wheeling and un-wheeling locomotives and handling parts. One of the trolleys on this crane is equipped with a 10 ton auxiliary hoist for handling light material at a high hoisting speed. Another 10 ton travelling electric crane operates at high speed and serves the entire area of the erecting shop, for handling material in that shop and transferring same to the blacksmith shop and machine shop. The machine shop and the boiler shop are located in adjacent bays on either side of the erecting shop.

Provision is made on the crane columns in the erecting shop for attaching portable jib cranes for use in dismantling and erecting material on the front ends of locomotives. These cranes are placed where de-

by the travelling electric yard crane which travels across the end and outside of the locomotive shop. Space for the lighter machine tools is provided in a shop 60 3/4 ft. wide parallel with and alongside of the heavy machine shop and of the same length as that shop. An overhead trolley beam is provided on the bottom board of the roof truss to permit of using a travelling electric trolley for handling material longitudinally in this shop. Provision has been made for a foreman's office elevated above the floor and having liberal glass surface in the walls so as to give the best possible view of the shop.

The blacksmith shop is located alongside of and parallel with the erecting shop on the opposite side from the machine shop. This building consists of two bays each 332 ft. long, 60 3/4 and 50 ft. wide, respectively. Space is provided for heavy forging work, steam hammers, etc., in the building immediately adjoining the erecting shop. The blacksmith shop will not be served by a travelling crane, but provision has been made for jib cranes to handle the material from steam hammers, forg-



General Location Plan, C.P.R. Ogden Shops.

begins and all labor markets are practically drained of men. Plans had, therefore, to be drawn, materials ordered, deliveries made and complete field organization perfected so that the shops could be closed in between April 1 and Dec. 1, and sufficiently heated so that inside work could be continued after cold weather had set in. How this was done will be seen by the progress diagram on page 267.

The shops consist in general of main locomotive shop (including erecting, machine, blacksmith and boiler shops); tender and wheel shop; pattern shop and pattern storage; foundry; storehouse and office building; material platforms and scrap dock; oil house; coach repair and paint shop; freight car repair shop; planing mill; boiler and compressor house; 1,260 ft. yard crane; miscellaneous structures, including transfer table and pit for coach shop, mess hall, driven wells and water tower, all service system, such as drainage, sewage, fire protection, water supply, etc.

THE MAIN LOCOMOTIVE SHOP is designed to contain the erecting shop, ma-

sured by means of the overhead travelling electric cranes. Entrance for locomotives to the erecting shop is provided through four doors, located in the west side of the shop, two of these doors being located at either end. For providing additional means for entrance of locomotives, six door openings are provided in the east wall of the machine shop, two of these being at the north end and four at the south end. All of these entrance tracks are connected up with the erecting pits of the several stalls where they enter the building, to permit of the locomotives moving into and out of the shop through these entrances should this movement become desirable or necessary.

The machine shop to contain heavy machine tools is located parallel with and adjoining the erecting shop on one side, and is 60 3/4 ft. wide, and the same length as the erecting shop. A high speed travelling crane of 10 ton capacity covers the entire area of this shop. Material can be brought into the shop through a door provided in the end of the building, the material being brought up to the end of the machine shop

ings, etc. In a building of lower cross section alongside are located the furnaces, bolt headers and other blacksmith shop machinery. This portion of the shop is served by a trolley its full length, to facilitate the longitudinal movement of material through the shop.

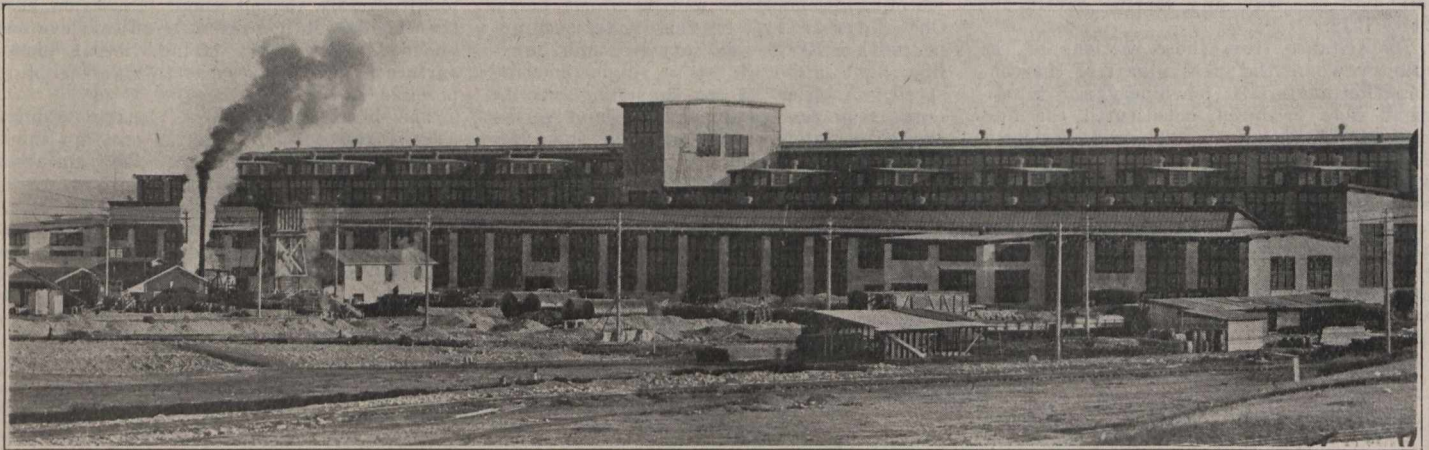
The space for the boiler shop is provided in a two bay building, alongside of and parallel with the erecting shop at the end of the blacksmith shop, 352 ft. long and the same width as the latter shop. The part of the boiler shop immediately adjoining the erecting shop is provided with a 40 ton travelling electric crane, equipped with two 20 ton trolleys, serving the entire area of the boiler shop, for handling the boilers and other material. The riveting tower is located between two of the roof trusses in the end of the boiler shop, with a 25 ton crane for serving the hydraulic riveter. In the outer of the two bays of the boiler shop, space is provided for a flue shop and boiler shop tools. The entire length of this space is served by a 3 ton overhead travelling trolley for handling material through the shop. Space for a flue rattler is pro-

vided immediately outside of and adjacent to the low bay of the boiler shop. An entrance track is provided through the outside wall of the boiler shop, on which boilers or other equipment going to this department can be delivered on cars under the travelling crane, for unloading, or may be loaded out for shipment in the same way. This facilitates the handling of boilers from steam shovels, pile drivers, ligger-woods, etc. Jib cranes are provided for serving the individual machines in the boiler shop where such service may be

voltage delivered by the power company, viz., 2,200 volts, to a sub station located adjacent to and immediately outside of the low machine bay, the transformers for stepping down to 440 volts being located in the sub station in which are also two motor generator sets for supplying direct current. The switchboard is also located in this sub station for controlling the power and lighting circuits in the machine shop, and for the tender shop and foundry. As far as possible distributing feeders are carried in conduit beneath the shop floor,

roof water proofing is four ply tarred felt, pitch and gravel, with copper flashing. Suitable drain leaders are provided and connected into underground tiled drains to carry off the water from the roof. The large skylight on the erecting shop bay is of steel bars lead covered with ribbed wired glass.

THE TENDER AND WHEEL SHOP is constructed with structural steel frame and with steel roof trusses, otherwise the general construction of the building is similar to that described for the main



Locomotive, Erecting and Machine Shop, Showing Blacksmith and Boiler Shop Bays, Viewed from the West.

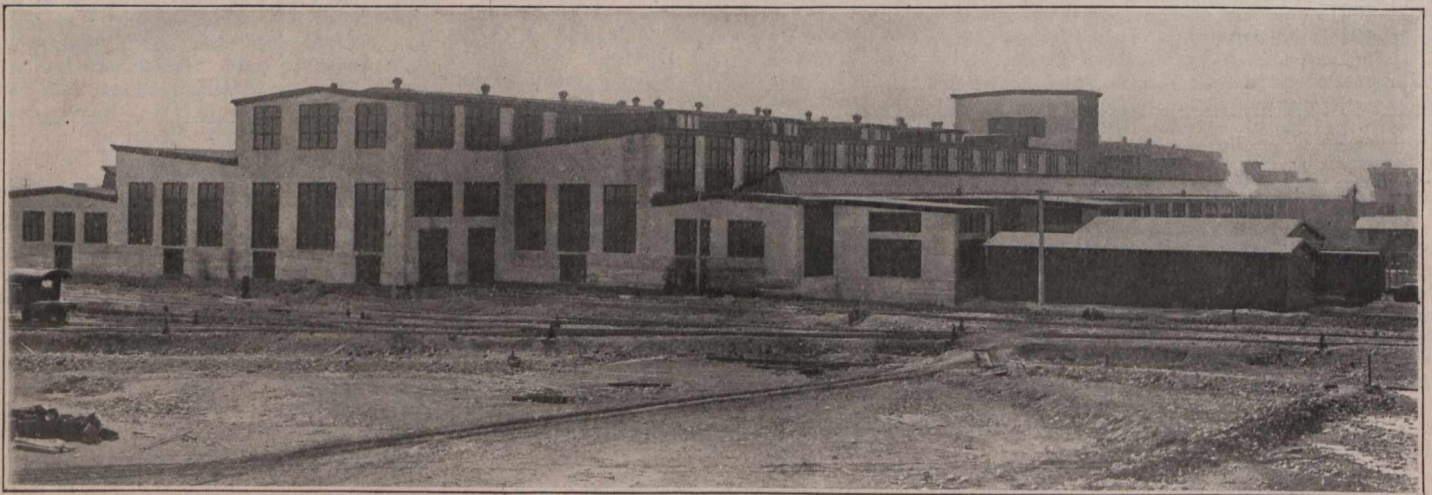
necessary.

The heating throughout is done by indirect fan system. For distributing the heated air, underground concrete and tile ducts are used. The general illumination consists of Cooper-Hewitt lamps, with circuit and plug boxes for extension loop cords. Provision has also been made for incandescent lighting circuits for individual lighting at machine tools where required, and for outlet boxes for connecting extension lamp cords to provide lighting for the interior of the locomotive boilers on the erecting floor. Toilets, lavatories, and

thereby minimizing the amount of exposed wiring in the shops.

The building containing all of the above departments of the locomotive shop is constructed with structural steel frame carried on concrete foundations. The exterior walls up to the window sill line are of concrete, above the window sills of hollow tile plastered. Ample window area is provided in the side walls and in roof monitors and skylights, so as to give sufficient natural lighting. Good ventilation is obtained through ventilators in the monitors and skylights, and by the use of swinging

locomotive shop. It is an L shaped structure 263 by 80 ft., with L 180 by 80 ft., and affords space for making repairs to locomotive tenders, steam shovels and maintenance of way equipment. The portion of the shop intended to receive the equipment to be repaired is spanned over its entire area by a 20 ton high speed travelling electric crane equipped with two 10 ton trolleys. Longitudinal tracks on 20 foot centres extend to the doors in the building wall. A car puller is installed for moving the equipment into and out of the shop. A sufficient number of tracks



Locomotive, Erecting and Machine Shop, Showing Roof Arrangement, with Special Reference to Lighting, Viewed from the Northwest.

metal lockers are provided in the various departments of this shop. A suitable system of piping is provided for distributing live steam, compressed air, fuel oil and water for fire protection, drinking and hydraulic pressure. Outlets for compressed air are provided in duplicate in the sides of each of the engine pits to supply compressed air for operating pneumatic tools.

In the main locomotive shop the electrical feeders from the power company transmission lines are carried in underground ducts, bringing the current at the

sash in the vertical walls. With the exception of the blacksmith shop and a portion of the boiler shop the floor throughout is constructed with a 1½ in. asphalt mastic wearing surface which is underlaid with a rough concrete slab about 6 ins. thick. In the blacksmith shop and a portion of the boiler shop the floor is of cinders. The roof sheathing is constructed of 2 x 4's, surfaced on one side and one edge, and spiked together on edge, thus affording good fire resistance qualities and materially reducing the heat losses. The

extend through the rear wall of the building to facilitate the movement of material into the shop. In the L portion of the building, of lower cross section, space is provided for steel tire wheel lathes, wheel and axle machinery and such other tools as are required. A depressed track carried along the ends of the wheel storage tracks outside facilitates unloading and loading of wheels and axles. The heating, lighting, and service equipment is similar to that described for the main locomotive shop.

PATTERN SHOP AND PATTERN Storage.—Space for the pattern shop and pattern storage is provided in a separate building located adjacent to the foundry, a fire wall separating the pattern shop from the pattern storage. The general construction of the building is the same as that of the other buildings—the roof of slow burning mill construction. The structure is 162 by 31 ft. wide, is heated by the direct system and lighted with keyless socket marine type incandescent lamps. A sprinkler system is provided for fire protection.

THE GREY IRON FOUNDRY building is 203 by 80 ft. wide, constructed with two bays. The frame is of structural steel carried on concrete footings. The general construction is the same as that described for the other buildings, except that the floor is of the usual clay type used in foundries and the roof over the cupola room is of corrugated asbestos. The bay of higher cross section is served over its entire length by a 10 ton high speed travelling electric crane. Jib cranes, attached to building columns, are provided. These cranes are so arranged that they may be removed from one location to another if desired, being handled by the travelling electric crane. In the side bay of lower cross section, space is provided for core making and shop moulding floor. The charging floor for the cupola is located in the centre of the lower bay. Heating is by the indirect fan system, with underground tile and concrete hot air ducts. For general illumination, flaming arcs are used in the high bay and ordinary arcs in the low bay, with outlet boxes for extension lamp cords. Toilets, lavatories, and conveniences for the men are provided; also steam, air and water service, for fire protection and drinking purposes. The location of this building alongside of and parallel with the travelling electric yard crane enables the unloading of scrap and pig iron to be taken care of by the yard crane. This close proximity of the foundry to the yard crane also reduces to a minimum the handling of the castings from the foundry to storage, to the main shop, or in loading for shipment.

STOREHOUSE AND OFFICE BUILDING.—This building is 252½ by 60 ft. One end of the building for a length of 40 ft. is carried up three stories, and contains offices on the second and third floors and a fire proof vault. The remainder of the building, for storehouse purposes, is two stories high and contains electric elevator, platform scales, material bins and shelving. The walls are of hollow tile blocks on concrete foundations. The framing is of heavy timbers, with roof sheathing of 2 by 4's surfaced on one side and one edge, and spiked together on edge. The foundations are carried up to bring the floor of the storeroom to car door height. The necessary toilet and lavatory facilities are provided. The offices are heated by direct radiation, the remainder of the building being heated by the indirect system. The lighting is by incandescent lamps. Fire protection is by automatic sprinklers. The ground floor of the storehouse has a 1½ in. asphalt mastic wearing surface. The other floors throughout the building are of wood. The window arrangement is such as to best accommodate the material bins and shelves without interference with good lighting. The storehouse is located parallel with the main locomotive shop. The space between these two buildings is spanned by a high speed travelling crane which can be utilized to handle all heavy material to and from the cars from the storage space that is provided between the storehouse and the

erecting shop. The use of this crane practically eliminates manual handling of heavy material, and permits of handling numerous small parts in quantities when contained in suitable receptacles.

MATERIAL PLATFORMS AND SCRAP Docks.—A material platform 90 by 350 ft. abuts one end of the storehouse. This platform is also carried along either side of the storehouse, where it is 15 ft. wide. It is constructed of concrete retaining walls filled in with earth and a top dressing of cinders covers the fill except along-

basement. The part of the building used for storing oil in barrels has a cinder floor. The pump room is partitioned off with a brick wall carried up to make a fire wall. Ten oil tanks with measuring pumps are installed and provision is made for conveniently emptying the oil from barrels into the tanks in the basement. The oil house basement is heated by the direct system to the high temperature necessary to render the oil fluid during extreme cold weather; the direct system being also used to heat the rest of the building. The light-

NATURE OF WORK	APRIL	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
	15 30	15 31	15 30	15 31	15 31	15 30	15 31	15 30	15 31	15 31	15 28	15 31
LOCOMOTIVE SHOP												
Foundation Excavation												
do Concrete												
Structural Steel												
Walls: Concrete & Tile												
Carpentry & Mill Work												
Roof Waterproofing												
Machine Tool Erection												
TENDER SHOP												
Foundation Excavation												
do Concrete												
Structural Steel												
Walls: Concrete & Tile												
Carpentry & Mill Work												
Roof Waterproofing												
Machine Tool Erection												
COACH SHOP												
Foundation Excavation												
do Concrete												
Structural Steel												
Walls: Concrete & Tile												
Carpentry & Mill Work												
Roof Waterproofing												
Machine Tool Erection												
POWER HOUSE												
Foundation Excavation												
do Concrete												
Structural Steel												
Walls: Concrete & Brick												
Carpentry & Mill Work												
Roof Waterproofing												
STORE HOUSE & OFFICE BLDG												
Foundation Excavation												
do Concrete												
Walls: Concrete & Tile												
Carpentry & Mill Work												
Roof Waterproofing												
FREIGHT CAR SHOP												
Foundation Excavation												
do Concrete												
Structural Steel												
Walls: Concrete & Tile												
Carpentry & Mill Work												
Roof Waterproofing												
Machine Tool Erection												
FOUNDRY												
Foundation Excavation												
do Concrete												
Structural Steel												
Walls: Concrete & Tile												
Carpentry & Mill Work												
Roof Waterproofing												
Machine Tool Erection												
PLANING MILL												
Foundation Excavation												
do Concrete												
Structural Steel												
Walls: Concrete & Tile												
Carpentry & Mill Work												
Roof Waterproofing												
Machine Tool Erection												
PATTERN SHOP & STORAGE												
Foundation Excavation												
do Concrete												
Structural Steel												
Walls: Concrete & Tile												
Carpentry & Mill Work												
Roof Waterproofing												

Progress Diagram for the Different Units of the Plant.

side of storehouse, where plank covering is laid. The platform extends to and along the sides of the oil house.

OIL HOUSE.—For storing and distributing oil a separate building is provided convenient to, but located far enough away from the storehouse and other buildings, to eliminate the fire risk. It is constructed with tile walls (plastered on the exterior) on concrete foundations, with a concrete basement at one end, for the tanks which contain the oil for local distribution. The roof is of reinforced concrete slab, as is also the floor of the pump room over the

ing of the building is with keyless socket marine type incandescent lamps. Fire protection, including sprinklers, is installed.

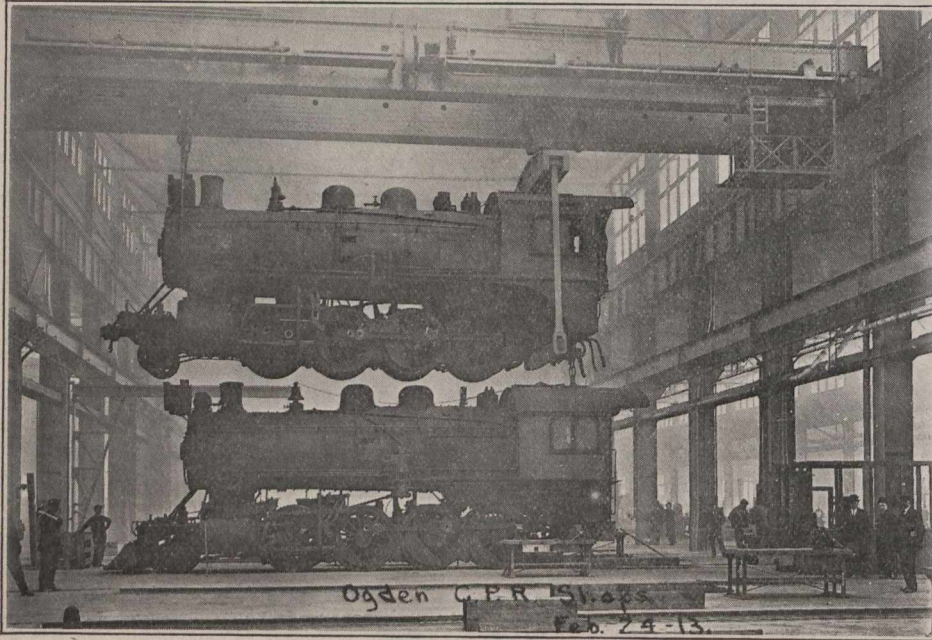
COACH REPAIR AND PAINT SHOP.—The building containing these departments is 362 by 146 ft., having 15 tracks on 24 ft. centres. It is constructed with hollow building tile carried on concrete foundation. Heavy timber posts support the roof, which is of slow burning mill construction. Otherwise, the construction is the same as that described for the main shop building. Space is provided along one side of the building for varnish room,

upholstering, office, sub store, paint storage, heating plant and air brake repairs. When necessity arises for increased shop capacity in this department it is proposed to obtain such increase by the erection of another shop on the opposite side of the transfer table. Heating is by the indirect fan system, with underground concrete and tile ducts. Lighting is by incandescent lamps. Compressed air, steam and water service, including fire protection and

are supplied. Heating is with the indirect fan system, with underground concrete and tile ducts. Lighting is by 100 watt tungsten lamps. The location of this building alongside of the lumber yard permits of handling lumber so that it can be passed through into the shop without rehandling. THE PLANING MILL is 303 by 80 ft. and contains the wood working machinery. The frame is of structural steel carried on concrete footings. The general construc-

vide steam for heating the shops and for other purposes for which steam is required throughout the shops. The building is constructed with brick walls, carried on concrete foundations, with steel roof trusses and supports for coal bunkers. The chimney is of reinforced concrete, 200 ft. high, with a minimum diameter of 9 ft. The overhead coal bunker for each boiler is divided by a reinforced concrete partition into two compartments to provide for storing and burning two kinds of coal. An overhead storage bin for ashes is provided, from which bin the cinders can be discharged by gravity into cars alongside of the building. A concrete dumping hopper is provided outside for dumping coal from cars. A pivot steel elevator raises and discharges the coal into the overhead bunker. A skip bucket, with electric hoist handles the ashes into the ash bin. The boiler units are 350 h.p. rating and are set in three batteries of two each. Five of the boilers are equipped with chain gratestokers. The sixth boiler has the shaking grates to burn shavings and other planing mill refuse. Space is also provided for three electrically driven air compressors each of a capacity of 1500 cu. ft. of free air per minute. Only two of these compressors are so far installed. Transformers and distributing panel are located in this building for transforming and distributing light and power current to the shop yard, freight car shop, planing mill, and coach repair shop. There is no direct current apparatus in this station. Provision has been made for two incoming 2200 volt lines, one of 2000 k.w. and the second of 1000 k.w. capacity for breakdown service. The steam required for the steam hammers and other shop purposes during the summer can be supplied by one boiler. The boiler capacity provided will afford one spare boiler during the extreme weather conditions when the maximum steam demand occurs.

A YARD CRANE runway, 1260 ft. long, extends from the west line of the locomotive shop and carries a 10 ton high speed traveling electric crane with 80 ft. span, serving the material yard and a portion of the storehouse platform and scrap dock.

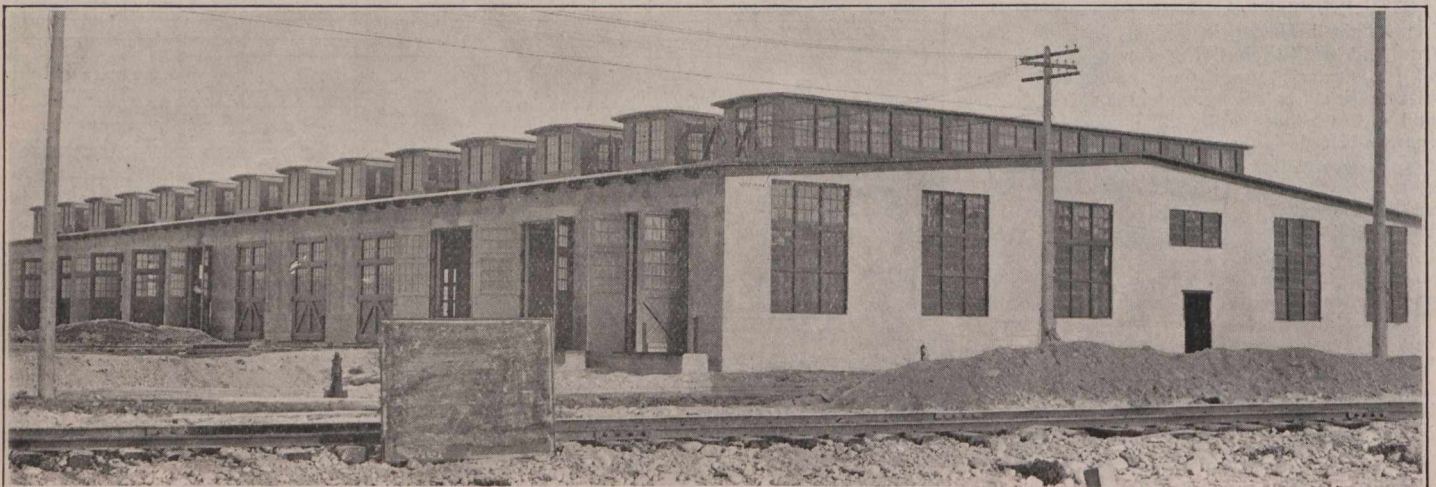


Interior of Locomotive Shops, Showing 120 Ton Locomotive Crane.

automatic sprinklers are provided. Toilets, lavatories, and conveniences for the men are also supplied in this shop.

THE FREIGHT CAR REPAIR SHOP is 231 by 303 ft. and contains eight repair tracks, spaced in pairs, with industrial track between each pair of repair tracks. A tile wall partitions off the shop, 50 ft. wide along one side, which will contain the blacksmith forges, tools, heating plant,

tion of the building is the same as that of other shop buildings. A track extends through the building longitudinally, to permit of movement of material in at one end to the various machines and out through the opposite end with the minimum amount of handling. The building is located so as to be convenient to the passenger car shop and the freight car shop. The lumber yard is located back of and at one end of the



Passenger Car Repair Shops, C.P.R. Ogden Shops.

foreman's office, toilets, and lavatories. The building is of structural steel frame with tile walls, plastered on the outside, with saw-tooth roof construction. The general construction of the building otherwise is the same as that of the other shop buildings. An overhead trolley beam is provided to permit of handling timbers with a trolley into the shop. Compressed air, steam and water service piping, and fire protection, including automatic sprinklers,

planing mill. Suitable piping has been provided for distributing compressed air and water. The fire protection system includes automatic sprinklers. Provision is made for toilets, lavatories, and metal lockers for the men employed in this department. Heating is by the indirect fan system with galvanized iron heating ducts. Lighting is by mercury vapor lamps.

THE BOILER HOUSE contains sufficient space for 2100 h.p. water tube boilers, to pro-

One of the storehouse tracks extends through under this crane, resulting in giving ample space for the storage of material alongside of the storehouse, foundry and locomotive shop. By this arrangement heavy material can be unloaded, stored, and rehandled to the shop or loaded out again by the crane for shipment, practically eliminating manual labor in the handling of all heavy material.

MISCELLANEOUS STRUCTURES.—The

transfer table for serving the coach shop is 75 ft. long, of 150 tons capacity, equipped with electric motor, with concrete transfer table pit 400 ft. long, extending out far enough at either end of the building, for providing entrance and egress at both ends.

The mess building is 269½ ft. by 31 ft. 10 ins., of wooden frame construction, covered outside with sheathing, building paper and siding and sealed on the inside with metal sheathing. It has a concrete floor, and contains a dining room and lunch room for the workmen, and a dining room for the officials, together with kitchen and pantry. Sixty feet of the length of the building is carried up two stories to provide an apprentice schoolroom and quarters for the help. Heating is by the direct system and lighting with incandescent lamps.

There are also two small buildings located near the freight repair tracks for blacksmith shops and workmen tools, and in one of them is a small toilet and office. Dry kiln, material bins, plate and iron racks, coal and coke sheds, are also provided.

For obtaining water for shop purposes there have been put down two 8 in. wells equipped with electrically operated

The location of the shops is practically on the open prairie and on the beginning of construction arrangements had to be made to house and board on the shop property a considerable quantity of labor. To this end, frame bunk houses were built, with two tiers of bunks on each side of the building, eight bunks long, each house having a capacity of 32 men. Stoves were placed in the centre aisle, and benches along the sides of the lower tier of bunks. On the coming of summer, and as the labor forces were increased, some of the men were housed in standard 12 by 14 wall tents, which accommodated four men each. A large mess room and kitchen and store-room space was also fitted up with a capacity of feeding about 400 men at one time. Great care was exercised throughout the work, in keeping the camp in a sanitary condition. This work was largely under the direction of doctors, who visited the camp each day to take care of possible sickness, and an arrangement was also made whereby those who were employed on the work voluntarily contributed a small amount from their wages for the services of these doctors. This amount also includ-

work is considered, as also its distance from larger centres, it will be appreciated that a record for prompt performance has been established.

The work was designed and built in its entirety by Westinghouse, Church, Kerr & Co., consulting and constructing engineers, of New York and Montreal, working under the direction of J. G. Sullivan, M. Can. Soc. C.E., Chief Engineer, Western Lines C.P.R., and N. E. Brooks, M. Can. Soc. C.E., then Division Engineer, Calgary, now Engineer Maintenance of Way, Western Lines, C.P.R., Winnipeg.

Construction Work on the Canadian Northern Railway Eastern Lines.

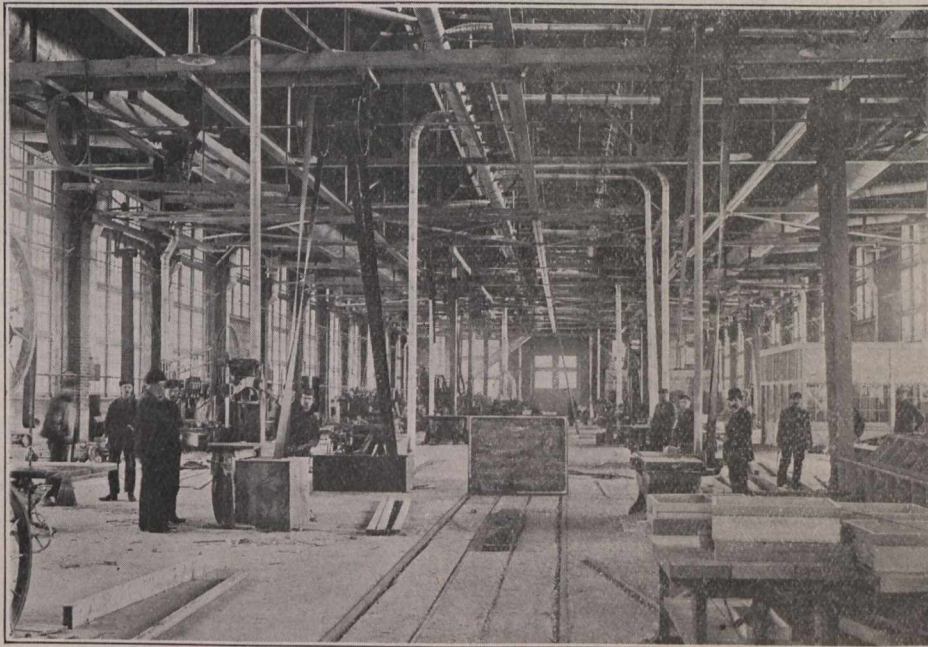
The tremendous amount of railway construction which has been carried on west of Lake Superior for many years past has possibly made many oblivious to the fact that there has also been a lot of work done east of Port Arthur. Only recently we have been given an opportunity of looking into the amount of work done on the Canadian Northern lines in Ontario during 1912.

At the commencement of work in 1912 there was a force of nearly 5,000 men and over 600 horses, which was gradually increased until July, when it reached an average of about 19,500 men and about 1,500 horses. From July to the end of the year the force gradually fell to an average of about 6,500 men and a little over 800 horses, or an average for the 12 months of nearly 7,500 men and over 1,000 horses. It was expected to keep the force up to an average of 8,500 men, but the Balkan war prevented this. The work in Eastern Ontario suffered more from the labor condition than any other part, this being particularly noticeable on the Ottawa-Sydenham line, which at no time was fully manned. The total outlay in wages was nearly \$6,000,000, or close on to \$500,000 a week.

The grading and trainfilling statistics show the following averages per mile in cubic yards:—Montreal-Hawkesbury line, 26,000; Ottawa-Capreol line, 26,081; Sudbury-Port Arthur line, 26,473, an average of 25,305 for all lines under construction. The heaviest district on the Montreal-Port Arthur line is between Pembroke and Capreol, which runs about 28,130 cu. yds. per mile. There were over 11,500,000 cu. yds. moved during the year, equivalent to about 447 miles of completed grade, or 1.5 miles of completed grade for every working day in the year.

Up to the end of the year the following grading had been done:—Montreal to Hawkesbury, 30%; Ottawa to Pembroke, 32½%; Pembroke to Capreol, 34%; Sudbury and Port Arthur, 62½%, or 50% of the whole line between Montreal and Port Arthur. The estimated amount of grading to complete the line between Montreal and Port Arthur is about 11,500,000 cu. yds. or a little less than was moved in 1912 on all the Quebec and Ontario lines. With ordinary labor conditions the grading of this line should be completed this year west of Capreol, but at the commencement of the present season's work there was considerably more grading and trainfilling to be done on the Pembroke-Capreol district than any other, and it may not be possible to complete it this year. There is probably over 4,000,000 cu. yards to move, of which over 800,000 is solid rock, this being about double what was moved in 1912.

During 1912 there was used on the eastern lines 6,250,000 ft. of pine lumber, 32,500 ft. of cedar, 36,909 cu. yds. of concrete and 4,290 tons of steel for bridges. There were 246 miles of main line track laid, equal to 0.82 miles per working day.



Interior of Planing Mill.

pumps. To supplement this supply and to provide a main source of supply for fire protection the City of Calgary has laid into the shop site, to a point midway the length of the main shop building on the west side, a 10 in. cast iron water main. The shop service and fire lines are connected on to this main and into a steel tank of 125,000 galls. capacity, which is erected on a 70-ft. steel tower, principally for use in connection with automatic sprinklers in the various buildings where these are installed. A complete fire protection system has been put in, with hydrants distributed about the shop yard.

The sewage system in the shop yard may be divided into the sanitary and storm sewers. The City of Calgary is furnishing the main sanitary sewer, beginning at the east line of the freight car shop and extending to the eastern boundary of the shop property. All the sanitary sewage lines from the various buildings are connected into this sewer. Storm sewers are provided, where necessary to carry off the roof water from the buildings where the roof construction is such that this cannot be discharged on to the ground.

ed hospital service when necessary. Due to this care there was very little sickness on the job.

As there were no accommodations for men with families near the shops the C.P.R. put into temporary service a train to carry the men back and forth from Calgary and several hundred men used this train each day. This arrangement helped the situation considerably, especially as the season advanced and all kinds of skilled and unskilled labor became more difficult to obtain. A standing order was placed through several labor agencies in Calgary to send men daily to the job. As the work neared completion the bunk houses and mess houses previously mentioned were turned over to the railway company to take care of its own men who were at that time living in cars on the property. This, of course, released the cars and permitted their use at other points.

The progress schedule will show the prosecution of the work, but it should be pointed out that it was not possible to break ground until April 1, 1912, and by Mar. 17, 1913, the locomotive shop was in full operation. When the magnitude of the

Orders by Board of Railway Commissioners.

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 took place, and not those on which the orders were issued. In many cases orders are not issued for a considerable time after the dates assigned to them.

19097. Apr. 21.—Approving location of G.T. Pacific Ry. station at Hinton, Alta., mileage 977.4 west of Winnipeg.

19098. Apr. 22.—Authorizing C.P.R. to cross G.T. Pacific Ry. Biggar Calgary Branch with its Wilkie-Anglia Branch, at mileage 42.89 from Wilkie, Sask.

19099. Apr. 21.—Authorizing Canadian Northern Branch Lines Co. to build its Sturgis to Hudson Bay Jct. line across 11 highways in Saskatchewan.

19100, 19101. Apr. 22.—Authorizing Toronto, Hamilton and Buffalo Ry. to build second track across 3 highways at grade in Thorold Tp., and across River Road, Crowland Tp., Ont.

19102. Apr. 22.—Relieving Vancouver, Victoria and Eastern Ry. and Navigation Co. (G.N.R.) from erecting fences along its right of way between Keremeos and Princeton, B.C., until land on either side, or in vicinity, becomes settled.

19103. Apr. 19.—Authorizing C.P.R. to build extension of spur for Rileys, Ltd., Calgary, Alta.

19104. Apr. 21.—Amending order 18943, Apr. 1, re location of G.T. Pacific Ry. station at Kwinitza, B.C.

19105. Apr. 22.—Approving G.T.R. plans showing proposed structures over Peter, Mill, Ontario and Barrett Sts., Port Hope, Ont.

19106. Apr. 23.—Ordering G.T.R. to stop trains 22 and 27 at Les Cedres, Que., on flag on Sundays, to take effect Apr. 27; and approving location of station there.

19107. Apr. 22.—Authorizing C.P.R. to build road diversion at Elm Creek, Man., and to close existing crossing there.

19108. Apr. 23.—Authorizing C.P.R. to build additional track north of its main line across 20 highways from mileage 70 to 93, Moose Jaw Subdivision, Sask.

19109. Apr. 22.—Authorizing C.P.R. to build spur for Kelowna Farmers Exchange, Ltd., Armstrong, B.C.

19110. Apr. 22.—Ordering C.P.R., Canadian Northern Ry. and G.T. Pacific Ry. to allow inspection by Dominion Government counsel, or representative, J. P. Muller, of all books, returns, statements and documents required for verifying, amplifying or checking any information furnished or ordered furnished to Government counsel.

19111. Apr. 23.—Approving revised location of C.P.R. Swift Current Northwesterly Branch from mileage 35.32 to 111.65, from Swift Current, Sask.

19112. Apr. 23.—Approving character of proposed drainage works relating to Toronto, Hamilton and Buffalo Ry. tracks and lands in Townsend and Oakland Tps., Ont.

19113. Apr. 23.—Authorizing C.P.R. to connect with Calgary Power Co.'s spur at Seebe, Alta.

19114. Apr. 21.—Authorizing C.P.R. to build spur for Fernie-Fort Steele Brewing Co., Fernie, B.C.

19115. Apr. 23.—Approving Campbellton, Lake Ontario and Western Ry. (C.P.R.) plans showing proposed structures over Elgin and Prospect Sts., Bowmanville, Ont.

19116. Apr. 24.—Approving location of C.P.R. Swift Current Northwesterly Branch from mileage 111.9 to junction with Calgary and Edmonton Ry. Lacombe Easterly Branch in Sec. 18-36-10, w. 4 m., Alta., excepting between mileage 169 and 175; and authorizing the building across 93 highways.

19117. Apr. 24.—Authorizing C.P.R. to build extension to Standard Sanitary Mfg. Co.'s siding in Toronto.

19118. Apr. 23.—Rescinding orders 17552 and 17781, Sept. 21 and Oct. 16, 1912, re rates on pressed brick from Bradford, Pa., to Windsor, Ont.

19119. Apr. 23.—Dismissing complaint of Blind River Board of Trade and London Rolling Mill Co. alleging that G.T.R. and C.P.R. discriminate against Blind River and other points on north shore of Lake Huron, in favor of Sault Ste. Marie, Port Arthur and Fort William in rate on bar iron in carloads from Toronto, Hamilton and London.

19120. Apr. 26.—Authorizing Canadian Northern Ry. to build cutoff in Winnipeg from its yards, southeasterly along north side of River Park to east side of Pembina St.; and rescinding order 17908, Oct. 2, 1912, which authorized connection of its Fort Rouge and eastern yards.

19121. Apr. 25.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build bridge across Burnham St., Cobourg, Ont., mileage 120.74 from Glen Tay.

19122. Apr. 25.—Authorizing C.P.R. to build across road allowance at grade at Rosyth, Sask.

19123. Apr. 23.—Authorizing C.P.R. to build

spur for Massey-Harris Co. in Swift Current, Sask.

19124. Apr. 26.—Authorizing C.P.R. to build temporary track, for one year from date, on its Bergen Northeasterly Branch across West Kildonan Road and Winnipeg Electric Ry., in Kildonan Municipality, Man.; trains of both companies to stop before making crossing.

19125. Apr. 23.—Authorizing C.P.R. to build road diversion at Neidpath, Alta., and close existing crossing there.

19126. Apr. 23.—Authorizing Saskatchewan Government to build highway across C.P.R. in s.e. ¼ Sec. 12-33-21, w. 2 m.

19127. Apr. 25.—Authorizing G.T.R. to build sidings for International Harvester Co. of Canada, Ltd., Hamilton, Ont.

19128. Apr. 25.—Approving Grand Valley Ry. Standard Freight Tariff, C.R.C. 3.

19129. Apr. 26.—Amending order 19074, Apr. 17, re diversion of Canadian Northern Ry. Oak Point Branch at Rosser, Man.

19130. Apr. 28.—Amending order 18954, Mar. 31, re building of C.P.R. main line to Golden townsite, B.C.

19131. Apr. 28.—Approving location of C.P.R. station at Kandahar, Sask.

19132. Apr. 28.—Authorizing C.P.R. to operate bridges 96.2 and 100.6, Sherbrooke Subdivision, Que.

19133. Apr. 28.—Authorizing G.T.R. to rebuild bridge 143, District 2, Montreal Division, to carry its line over White River, about 1 mile east of Upton, Que.

19134. Apr. 28.—Authorizing G.T. Pacific Branch Lines Co. to build Third St. and Souris Ave. across its Regina Boundary Branch at Frohbisher, mileage 134.9 and 135.5 respectively, Cannington District, Sask.

19135. Apr. 28.—Amending order 18987, Apr. 7, by changing Engelfield to Engelfeld, re operation of station there by Canadian Northern Ry.

19136. Apr. 28.—Authorizing C.N. Ontario Ry. to build across channel between two islands in Riviere des Prairies, Que.; at mileage 39.8 from Hawkesbury.

19137. Apr. 28.—Authorizing G.T.R. to use bridge 186 over Becancour River, near Lyster, Que.

19138 to 19141. Apr. 29.—Authorizing C.P.R. to build extension to spurs on Bureau Wharf, Three Rivers, Que.; to build spurs for Jewell Lumber Co., Hanbury, B.C.; City Cold Storage Co. and National Manufacturing Co., Regina, Sask.; and J. P. Marion, Montreal.

19142. Apr. 30.—Authorizing C.P.R. to build bridges 144.8, Portal Subdivision, Sask.; 14.7, 17.7, and 9.6, Brandon Subdivision, Man.

19143. Apr. 30.—Authorizing Canadian Northern Ry. to build its Delisle Branch across 29 highways.

19144. Apr. 29.—Authorizing G.T.R. to build siding for Gurney Foundry Co., Toronto.

19145. Apr. 26.—Authorizing Saskatchewan Government to build highway crossing over C.P.R. in s.e. ¼ Sec. 34-18-33, and close and convey to C.P.R. portion of regular road allowance between Secs. 34 and 27-18-33, w.p.m., temporary crossing about 600 ft. to south to be closed by C.P.R.

19146. Apr. 28.—Ordering Campbellford, Lake Ontario and Western Ry. (C.P.R.) to provide suitable farm bridge crossings for A. D. Colwill, J. Rickard and T. Penfound, and undercrossing for R. R. Stevens, Darlington Tp., Ont.

19147. Apr. 26.—Approving revised location of G.T. Pacific Branch Lines Co.'s Brandon Branch, mileage 11.55 to 13.88, Brandon District, Man.

19148. Apr. 25.—Authorizing Esquimalt and Nanaimo Ry. to build branch from main line between Victoria and Wellington, mileage 1.31, to Newton and Greer Co.'s premises, Esquimalt, B.C.

19149. Apr. 26.—Authorizing C.P.R. to use bridges at Ninth Ave. subway at 179.1, Calgary Subdivision; and 7.7 and 7.8, Laggan Subdivision, Alta.

19150. Apr. 30.—Approving revised location of C.P.R. Gleichen-Shepard Branch from mileage 15.63 to 27.90 from Gleichen, and authorizing the building across 13 highways.

19151 to 19153. Apr. 28, 29.—Approving change in location of C.P.R. station at Warner, Alta.; and location of stations at Ernfold, Dikie and Sovereign, Sask.

19154. Apr. 28.—Amending order 18898, Mar. 20, re location of C.N. Ontario Ry. station at Janes.

19155. Apr. 30.—Authorizing C.N. Saskatchewan Ry. to build its Wroxton Westerly Branch across C.P.R. Minnedosa-Saskatoon Section, in s.w. ¼ Sec. 9-26-4, w. 2 m.

19156. Apr. 30.—Amending order 17923, Nov. 5, 1912, re building of G.T. Pacific Branch Lines Co.'s Regina-Moose Jaw Branch under Lake View Ave., Moose Jaw, Sask.

19157. Apr. 30.—Authorizing G.T.R. to build siding and spur for Maple Sand and Gravel Co., Vaughan Tp., Ont.

19158. May 2.—Approving location of C.P.R. station at Rokeby, Sask.

19159. May 2.—Authorizing Hull Electric Co. to build spur from its main line between Hull and Aylmer for Connaught Park Jockey Club of Ottawa, South Hull Tp., Que.

19160. May 2.—Approving plan of Mar. 14,

showing Edmonton, Dunvegan and British Columbia Ry. Co.'s standard high wooden trestle frame bents.

19161. May 3.—Approving location of G.T. Pacific Ry. station at Yates, Alta., mileage 917 west of Winnipeg.

19162. May 2.—Amending order 18999, April 5, re location of C.P.R. and Kettle Valley Ry. joint station at Grand Forks, B.C.

19163. May 2.—Approving location of Esquimalt and Nanaimo Ry. station at mileage 2.7, Evans Road Crossing, Cowichan Lake Branch, Vancouver Island, B.C.

19164. Apr. 30.—Authorizing C.N. Ontario Ry. to build across two highways in Fraser Tp.

19165. Apr. 30.—Authorizing Canadian Northern Ry. to build its Delisle Branch across public road between Secs. 30 and 29-25-6, w. 3 m.

19166. May 3.—Authorizing C.P.R. to build bridges 21.9, London Subdivision, Ont., and 144.6, Portal Subdivision, Sask.

19167. Apr. 30.—Authorizing C.P.R. to build spur for General Supplies, Ltd., Calgary, Alta.

19168. May 2.—Approving location of C.P.R. station at Penzance, Sask.

19169. Apr. 30.—Amending order 19053, Apr. 10, re location of C.P.R. Bassano Easterly Branch.

19170. May 3.—Authorizing Hamilton Cataract Power, Light and Traction Co. to erect power line over Toronto, Hamilton and Buffalo Ry., Saltfleet Tp., Ont.

19171. May 5.—Authorizing Toronto Suburban Ry. to build across C.P.R. into Prison Farm, Guelph Tp., Ont.

19172. May 3.—Ordering Canadian Northern Ry. to build fourth class station at Kendal, Sask., extend platform to 260 ft., and lay walk across station grounds to connect with sidewalk across the main street; work to be completed by October 1.

19173. May 5.—Authorizing C.N. Ontario Ry. to build bridge over Missinaibi River, Algoma District, mileage 222.5 from Sudbury Jct.

19174. May 5.—Ordering Canadian Northern Ry. to fence right of way at certain points east and west of Ochre River, to be completed by June 15.

19175. May 3.—Authorizing C.N. Ontario Ry. to build across 8 highways in Alice Tp., Ont.

19176. May 3.—Authorizing Canadian Northern Ry. to build spur for Tees and Perce Co., Edmonton, Alta.

19177. May 5.—Authorizing G.T.R. to rebuild bridge 265 at mileage 46.80, District 13, Hamilton Division, Ont.

19178. May 3.—Ordering that speed of trains over crossing east of Hanover station, Ont., be limited to 10 miles an hour.

19179. May 5.—Relieving G.T.R. from providing further protection at crossing two miles west of Drumbo, Ont.

19180. May 5.—Amending order 18941, Apr. 1, re Campbellford, Lake Ontario and Western Ry. (C.P.R.) connection with G.T.R. at mileage 93.2 from Glen Tay, Ont., by changing it to mileage 93.94.

19181. May 3.—Authorizing C.P.R. to build extension to spur for Northern Sand and Gravel Co., Milner, Man.

19182. May 5.—Authorizing C.P.R. to build bridges 4.9, near Norwood and Ardendale stations, Ont.

19183. May 5.—Authorizing C.P.R. to build road diversion and close existing crossing at mileage 13.20, Wilkie-Anglia Branch, Sask.

19184. May 3.—Authorizing C.P.R. to build extension to spur for Coquitlam Terminal Co., Vancouver, B.C.

19185. May 5.—Authorizing C.P.R. to build passing track and portion of Y at grade across road allowance at Roche Perce, Sask.

19186. May 3.—Approving location of C.P.R. stations at Stranraer, Czar, Rockhaven, Bounty and Cadogen, Sask.

19187. May 5.—Authorizing Hull Electric Co. to build spurs for R. and T. Ritchie Co., Aylmer and South Hull, Que.

19188. May 5.—Amending order 19098, Apr. 22, re crossing of G.T. Pacific Ry. Biggar-Calgary Branch by G.T. Pacific Ry. G.T. Pacific Branch Lines Co. for G.T. Pacific Ry.

19189. May 5.—Authorizing J. R. Pole, Appin, Ont., to build farm crossing over G.T.R., Ekfrid Tp., Ont.

19190. May 6.—Extending to May 30 time for installation of interlocking plant at crossing by C.N. Ontario Ry. of C.P.R. and G.T.R., near Ottawa.

19191. May 5.—Approving locations of G.T. Pacific Ry. stations at Dandurand and Medicine Lodge, Alta.

19192. May 6.—Approving location of G.T.P. Branch Lines Co. station at Delacour, Alta.

19193. May 6.—Approving location of G.T. Pacific Ry. station at Duffield, Alta.

19194. May 5.—Authorizing Canadian Northern Ry. to build spur and Y's through Lots 7 and 9, Fort Saskatchewan Settlement, Alta.; work to be completed within three months from date.

19195. May 6.—Authorizing Esquimalt and Nanaimo Ry. to build bridge 24.04 across Cook's Creek (South Fork), Comox Extension, B.C.

19196. May 5.—Approving revised location of Campbellford, Lake Ontario and Western Ry. (C.P.R.) from mileage 0 at Glen Tay to mileage 38.5.

19197. May 5.—Amending order 19120, Apr.

26, re Canadian Northern Ry. cutoff to Pembina St., Winnipeg.

19198. May 6.—Authorizing C.P.R. to build spur for Wellman Gravel and Supply Co., Edmonton, Alta., to be completed within three months from date.

19199. May 6.—Authorizing C.P.R. to build across 18 highways in Edmonton, Alta.

19200. May 5.—Approving location of G.T. Pacific Ry. station at Skeena City, mileage 32.8, Prince Rupert East, B.C.

19201. May 3.—Ordering Canadian Northern Ry. forthwith to rebuild shelter at Wroxton, Sask., to afford accommodation equal to standard fourth class station; and to appoint agent by May 15.

19202. May 7.—Approving location of C.P.R. station at Herschel, Sask.

19203. May 7.—Approving location Canadian Northern Ry. station grounds at Hanna, Alta.

19204. May 7.—Approving location of G.T. Pacific Ry. stations at Galloway, Roundcroft and Hargwen, Alta.

19205. May 6.—Amending order 18212, Nov. 6, 1912, re removal of hill near Gerrie's crossing by Toronto, Hamilton and Buffalo Ry.

19206. May 6.—Approving location and portion of revised location of C.N. Ontario Ry. through Pembroke, Stafford and Alice Tps., mileage 82.62 to 88.85 from Ottawa, excluding spur running into station grounds on Mary St., Pembroke.

19207. May 7.—Authorizing C.P.R. to build at grade additional main line track across road allowance at mileage 81.5 from Broadview, Sask., to divert road allowance and close existing crossing.

19208. May 7.—Authorizing C.P.R. to build extension to siding for Canadian Carbonate Co., Montreal.

19209. May 7.—Authorizing C.P.R. to build spur for Canadian Northern Ontario Ry. on Lot 4, Con. 2, and unsurveyed land in Nipigon Tp., Ont.

19210. May 7.—Authorizing C.P.R. to build at grade additional main line track across road allowance at mileage 71.2 from Broadview, Sask.; to divert road allowance and close existing crossing.

19211, 19212. May 5, 6.—Authorizing Toronto, Hamilton and Buffalo Ry. to build spur for Furnivall-New, Ltd., Henry New Estate, and Sawyer-Massey Co., Hamilton, Ont.

19213. May 7.—Authorizing C.P.R. to build spurs for Birds Hill Sand Co., Winnipeg, from existing spur.

19214. May 3.—Authorizing Toronto and Niagara Power Co. to erect wires across Toronto, Hamilton and Buffalo Ry. in Saltfleet, Tp., and rescinding order 18898, Mar. 19, giving similar authorization.

19215. May 6.—Ordering G.T.R. to build a 30 ft. subway, with 14 ft. headroom, at crossing of Thompson Road, Bertie Tp., Ont., 20% (not to exceed \$5,000) of cost to be paid out of railway grade crossing fund, 15% of remainder by Pere Marquette Kd., 30% by M.C.R., 47½% by G.T.R., and 7½% by Bertie Tp.; plans to be submitted within 30 days from date for approval, and work to be commenced within 30 days after approval, and completed within four months.

19216. May 7.—Amending order 19114, Apr. 21, re C.P.R. spur for Fernie-Fort Steele Brewing Co., at Fernie, B.C.

19217. May 7.—Approving plans and location of G.T.R. station at Jordan, Ont.

19218. May 8.—Rescinding order 18862, Mar. 7, that unless Canadian Northern Ry. withdraw portion of its location plan within 20 days it shall take steps to acquire certain lots at Regina, Sask.

19219. May 7.—Ordering G.T. Pacific Ry. to erect a no. 2 B.R.C. flag station at Cooking Lake, Alta., plans to be submitted by June 1, and work to be completed by Aug. 1.

19220. May 8.—Approving location of G.T. Pacific Ry. station at mileage 422, Prince Rupert East, B.C.

19221, 19222. May 8, 7.—Authorizing G.T.R. to build sidings for A. Tesser, Penetanguishene, and Borden Milk Co., Norwich Tp., Ont.

19223. May 7.—Authorizing Canadian Northern Ry. to build spur across 3 highways in Alberta.

19224. May 8.—Authorizing C.P.R. to build spurs for Crown Grain Co., Winnipeg.

19225. May 5.—Ordering G.T.R. and C.N. Ontario Ry. to erect fences and cattle guards at farm crossing on Lot 17, Con. 3, Trafalgar Tp., at expense of J. Mason and Son, Oakville, Ont.

19226, 19227. May 9.—Authorizing Lake Erie and Northern Ry. to build across Concession, Walnut, Bruce and Main Sts., Galt, and to divert Grand Valley Ry. between station 908-150 and 937-169, North Dumfries Tp., Ont.

19228. May 9.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build across Kingston Road at mileage 74.70 from Glen Tay, Ont.

19229. May 10.—Ordering C.P.R. to install gates, to be operated day and night, at Osler Ave., North Toronto: work to be completed within 2 months from date, 20% to be paid by the railway grade crossing fund, and remainder, with entire cost of operation and maintenance to be paid by the City and company equally.

19230. May 9.—Approving plan of temporary trestle to be built by Quebec, Montreal and

Southern Ry. over St. Francois River at St. Francois du Lac, Que.

19231. May 9.—Authorizing C.P.R. to build spur for East Kootenay Lumber Co., Ltd., of Jaffray, B.C., at mileage 2.4, Fort Steele Sub-division, Alberta Division, near Colvalli.

19232. May 9.—Ordering that crossings of King and John Sts., Weston, Ont., be protected by two sets of gates, operated day and night from tower placed to enable watchmen to see highway: cost to be paid,—1-5 by the railway grade crossing fund, and 1-3 of remainder by Weston Village, G.T.R. and C.P.R. together; cost of, with maintenance, by the last three equally.

19233. May 9.—Authorizing Central Ontario Ry. to build spur for Ontario Marble Quarries Co., Duncannon Tp., Ont.

19234. May 9.—Approving location of G.T. Pacific Ry. stations at Ansell, Obed, and Bickerdike, Alta.

19235. May 8.—Authorizing G.T.R. to build siding for Hinde and Dauch Paper Co. of Canada, Ltd., Toronto.

19236. May 10.—Ordering Campbellford, Lake Ontario and Western Ry. (C.P.R.) and Canadian Northern Ry. to build overhead crossing on farm of John Pearse, Cedar Grove, Scarborough Tp., Ont.

19237. Apr. 29.—Ordering that wages of watchman, appointed at Sunnyside crossing, Mimico, Ont., be paid equally by City of Toronto, G.T.R. and Toronto and York Radial Ry.

19238. May 10.—Ordering that when City of Hamilton, Ont., has provided underground conduits the G.N.W. Telegraph Co., C.P.R. Telegraphs and Bell Telephone Co. remove poles, wires and cables from portions of certain streets.

19239. May 9.—Ordering G.T.R. to protect crossing of King St., Cobourg, Ont., by a flagman, 20% to be paid by Town of Cobourg.

19240. May 12.—Amending order 18915, Apr. 14, re location of C.P.R. station at Vanguard, Sask.

19241, 19242. May 12.—Authorizing C.P.R. to build bridges, 28.6, near Hornby, Ont.; 22.2, Streetsville Jct., Ont.; 42.5, near Cardigan station, N.B.; 32.4 and 5.9, Brandon Subdivision, Man.; and 46.37, Broadview Subdivision, Manitoba Division, over Boss Hill Creek, Sask.

19243. May 8.—Authorizing C.P.R. to build road diversion and grade crossing in Sec. 12-20-17, w. 4 m.; and close that portion to be diverted within its right of way.

19244, 19245. May 12.—Authorizing Lake Erie and Northern Ry. to build under G.T.R. at Paris, Ont., and at grade across G.T.R. at station 1074+72.9.

The Canadian Pacific Railway to Expend \$100,000,000 in Construction, Betterments, Etc., This Year.

Sir Thomas Shaughnessy, President, C. P.R., is reported as having cabled from London to Montreal, recently, as follows:—"Since my arrival in England my attention has been drawn to a recently published cable message to the effect that the C.P.R. Co. contemplated an expenditure of \$50,000,000 this year in Canada in laying double tracks, constructing branch lines and putting a tunnel through the Rocky Mountains, which will provide an alternative route with a much easier grade than now exists, and will enable the railway through the tunnel to be worked by electricity if required.

"That report can only refer to western Canada, for, as a matter of fact, our contemplated expenditure over the whole system during the near future will be more like \$100,000,000, exclusive of new rolling stock.

"This will not involve another appeal to the London money market for fresh capital, because all our financial arrangements have been already made a long way ahead."

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

Calgary and Edmonton Ry.	Acres.
Canadian Northern Ry.	1,757.00
Canadian Pacific Ry. grants	772.32
Canadian Pacific Ry. roadbed and station grounds	2.15
Grand Trunk Pacific Ry.	6.02
Qu'Appelle, Long Lake and Saskatchewan Rd. and Steamboat Co.	44.80
Total	623.50
	3,205.79

Traffic Orders by Board of Railway Commissioners.

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

C.N.R. Standard Freight Mileage Tariff.

19006. April 9. Re application of Canadian Northern Ry., under sec. 327 of the Railway Act, for approval of its Standard Freight Mileage Tariff, C.R.C. no. E. 212, for use on its lines east of Port Arthur, superseding the Standard Freight Mileage Tariffs of the Canadian Northern Ontario, Canadian Northern Quebec, Niagara, St. Catharines & Toronto, Bay of Quinte, Central Ontario, Quebec & Lake St. John, and Irondale, Bancroft & Ottawa Railway Companies, it is ordered that the said tariff be approved.

Examination of Railway Companies' Records.

19110. April 22. The rates for carriage of freight traffic upon railway lines operating in Canada, west of Port Arthur. Upon the application of counsel for the Dominion Government, under sec. 26 of the Railway Act—it is ordered that the C.P.R., the Canadian Northern, and the G.T. Pacific Railway Companies, do allow inspection by counsel retained by the Dominion Government or their representative, J. P. Muller, of all books, returns, statements, and documents required by him for verifying, amplifying, or checking any of the information furnished or ordered to be furnished to counsel for the Government.

Rates From Bradford, Pa., to Windsor, Ont.

19118. April 23. Re order 17552, Sept. 21, 1912, made upon the application of the Cadwell Sand & Gravel Co., Ltd., and directing that the proportion, viz., 88c per ton, accruing to the G.T.R. as its percentage division of the joint rate of \$1.60 a ton charged from Bradford, Pa., to Windsor, prior to April 20, 1912, be restored by the G.T.R. within 45 days from the date of the order; and order 17781, Oct. 16, 1912, postponing the effective date of such order until a rehearing of the matter should be had: Upon the rehearing at Ottawa, Jan. 21, 1913, it is ordered that the said orders 17552 and 17781, be rescinded, and that the application of the Cadwell Sand & Gravel Co. be refused.

Bar Iron Rates to Blind River.

19119. April 23. Re complaint of Blind River Board of Trade and London Rolling Mill Co., Ltd., alleging that the G.T.R. and the C.P.R. unjustly discriminate against Blind River and other points on the north shore of Lake Huron and in favor of Sault Ste. Marie, Port Arthur, and Fort William, in the rate charged on shipments of bar iron, in carloads, from Toronto, Hamilton, and London to Blind River and points, Sault Ste. Marie, Port Arthur, and Fort William; it is ordered that the complaint be dismissed.

Protection of Level Crossings by Signals.

—The Board of Railway Commissioners is impressed with the large number of accidents occurring at level railway crossings (crossings of one railway by another) which are not protected by signal system, with or without derails approved by the Board; and has asked railway companies to show cause why an order should not issue requiring them to install, within three years, an interlocking system to be approved of by the Board for the protection of all level crossings which are not so protected, between tracks of steam railways, and between tracks of steam and electric railways.

Changes in the Government Railways Management.

The Government Railways Managing Board, established May 1, 1909, has been abolished, and F. P. Gutelius, M. Can. Soc. C.E., has been appointed General Manager of Government Railways, with jurisdiction over the Intercolonial and Prince Edward Island Railways. Following is the report of a committee of the Privy Council approved May 5:—

"On a memorandum from the Minister of Railways and Canals, representing that as the result of close and careful consideration of the existing system under which the operation of the Government Railways is immediately controlled, he is strongly impressed with the desirability of a change in the present system. The Minister represents that by an order in council of April 20, 1909, based on the statutory authority of the Government Railways Act, which empowered the Governor in Council, from time to time, to make regulations, inter alia, for the management, proper use and protection of the Government Railways, the then existing position of General Manager of Government Railways was abolished and a board was constituted, under the name of the Government Railways Managing Board, to supervise and direct all departments of the railways owned or operated by the Dominion Government. This arrangement came into effect on April 1, 1909, and has been continued up to the present time.

"The Minister, considering it expedient, recommends that, in pursuance of the above cited statutory authority, the following be fixed as the organization to be in force on and after May 1, 1913, for the Government Railways—the Intercolonial Ry. and the Prince Edward Island Ry.—as at present constituted, and as the same may hereafter be extended or modified; together with their respective branches; such organization to be in supersession of the existing organization:—1. The Government Railways Managing Board to be abolished; 2. The position of General Manager of Government Railways to be substituted therefor; 3. F. P. Gutelius, of Montreal, to be appointed to the management of the said Government Railways, under the title of 'General Manager of Government Railways'; 4. The said General Manager to supervise and direct all departments of the said Government Railways; 5. The duties and power of the said General Manager to be as hereunder defined, viz.:—He shall have the powers usually vested in the executive of railway corporations; he shall prepare or modify, subject to the Government Railways Act and the Provident Fund Act, and, with the approval thereto of the Governor in Council first obtained, carry out rules and regulations, as follows: For the organization of the staff and officials of the said railways; for the conditions of employment of the railway service; for the purchasing of supplies and the sale of materials; for the ascertaining and collection of the railway tolls, dues and revenues; those to be observed by the conductors, engine drivers and other officers and servants, and by all companies and persons using such railways; those relating to the rolling stock to be used in the trains on such railways; 6. He shall make to the Minister of Railways and Canals a special and comprehensive report at the end of each fiscal year on the expenditures and receipts of the railways under his control, and on all occurrences and transactions of importance; and shall further furnish such reports as may from time to time be required of him by the Minister. The Minister further recommends that the said F.

P. Gutelius shall hold office for a definite period of two years, and, thereafter, during the pleasure of the Minister, at a salary of \$20,000 a year.

"The committee concur in the foregoing and submit the same for approval."

The members of the Government Railways Management Board, which has been abolished, were, A. W. Campbell, M. Can. Soc. C.E., Deputy Minister of Railways and Canals, Chairman; D. Pottinger, I.S.O., Assistant Chairman; E. Tiffin, General Traffic Manager; F. P. Brady, General Superintendent; and J. B. T. Caron, General Solicitor. Mr. Campbell will henceforth give his entire time to the department's work in Ottawa, which is increasing rapidly; Mr. Pottinger, who has served the country faithfully for a very long period, and who is 69 years of age, will be superannuated; Messrs. Tiffin and Brady are being retained in their respective positions as General Traffic Manager and General Superintendent for the present, and Mr. Caron's position, which was created Dec.



F. P. Gutelius, M. Can. Soc. C.E.,
General Manager, Canadian Government Railways.

29, 1910, is being abolished.

FREDERICK PASSMORE GUTELIUS, M. Can. Soc. C.E., was born at Mifflinburg, Pa., Dec. 21, 1864, and graduated from Lafayette College as civil engineer in 1887. He entered railway service in 1888, since when he has been, to 1892, Assistant Engineer and Assistant Supervisor, Pennsylvania Rd., Pittsburg, Pa.; 1885 to 1898, General Superintendent, Columbia and Western Ry.; 1898 to 1900, Superintendent, C.P.R., Nelson, B.C.; 1900 to 1902, in various positions in C.P.R. Engineering Department; 1902 to Mar., 1906, Engineer of Maintenance of Way, C.P.R., Montreal; Mar., 1906, to Sept. 15, 1908, Assistant Chief Engineer, Eastern Lines, C.P.R., Montreal; Sept. 15, 1908, to Dec. 30, 1910, General Superintendent, Lake Superior Division, C.P.R., North Bay, Ont.; Dec. 30, 1910, to Jan., 1912, General Superintendent, Eastern Division, C.P.R., Montreal; Jan., 1912, to April 30, 1913, one of the commissioners to investigate expenditure and other matters in connection with the con-

struction of the National Transcontinental Ry.

DAVID POTTINGER, I.S.O., was born at Pietou, N.S., Oct. 7, 1843, and entered railway service, July, 1863, since when he has been, to May, 1871, clerk in freight office, Nova Scotia Ry., Halifax; May, 1871, to Nov., 1872, cashier, same road; Nov., 1871, to Aug., 1874, station master, Intercolonial Ry., Halifax, N.S.; Aug., 1874, to Feb., 1879, General Storekeeper, same road; Feb., 1879, to Nov., 1892, Chief Superintendent, same road; Nov., 1892, to Apr., 1, 1909, General Manager, Intercolonial Ry. and Prince Edward Island Ry., Moncton, N.B.; Apr. 20, 1909, to April 30, 1913, Member, Government Railways Managing Board, and in charge of the general office work and accounting department, and from Feb., 1910, to Apr. 30, 1913, also Deputy Chairman, Government Railways Managing Board. He also acted for the Board, as Chairman of the Provident Fund Board, and of the Insurance Association.

Canadian Pacific Railway Passenger Department Bulletins.

The C.P.R. Passenger Department has for some time past been issuing monthly bulletins to the departmental officials, including ticket agents, etc., which are unique and in advance of anything we have seen got out for a similar purpose. They are attractively printed on tinted, toned paper, 8 by 11 inches, and contain a vast amount of information that materially assists officials in keeping thoroughly posted, and aids them in securing business.

As an example, the April bulletin, which is before us, contains 8 pages of matter, under 23 headings, as follows:—C.P.R. track service, with details of changes in service all over the system; changes in station names; C.P.R. hotels, with particulars of opening dates for the summer houses; Edmonton bridge, progress of work and brief description; automatic block signalling system; equipment, list of orders placed; C.P.R. steamships, descriptive matter of the two new Pacific liners; Canadian Australian Royal Mail Line, description of s.s. Niagara; British Columbia coast steamships, illustrated description; C.P.R. forestry protection and development, ticket steering passengers to the Orient or Australia; minor children unaccompanied must not be ticketed via Canadian-Australian line; printed destination tickets; refunds; baggage arrangements; new tariffs; local tariff book; homeseekers excursions; conventions; Brockville-Morristown ferry; connecting steamer lines; Canadian progress, with special relation to Toronto's development; Canadian West, development notes, containing a lot of information showing the progress of western communities. Excellent illustrations are given of the dining saloons of the new Pacific steamships and of the B. C. coast fleet.

The bulletins are issued by G. C. Wells, Assistant to Passenger Traffic Manager, Montreal, who is performing through them a service that cannot fail to stimulate the department's various officials and to equip them more thoroughly for the development of increased passenger travel.

A press report, purporting to have been received from Ottawa, dated Apr. 28, and published in the daily press recently, stated that the Dominion Government had awarded a contract to F. H. Hopkins and Co., Montreal, for machinery for dredges at the proposed Hudson Bay Ry. terminal, and the amount of the contract was given as \$13,500. We are advised by the firm mentioned that they know nothing of such a contract having been awarded them.

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TORONTO, CANADA, JUNE, 1913.

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April Copies of Canadian Railway and Marine World Wanted.

Through an unfortunate oversight in our office, no copies of Canadian Railway and Marine World were filed, and this was not discovered until the supply of the edition had been exhausted.

We are particularly anxious to get fifteen copies at least, and should be very much indebted to any subscribers who have April copies on hand, and who do not bind them in an annual volume, as many do, if they will mail them to us.

Prizes for Flower Gardens on the Canadian Pacific Railway.

The C.P.R., as in past years, is offering prizes for the best flower gardens on each general superintendent's division, as follows:—

General superintendent's grand prize for best station garden on whole division, \$25.
Locomotive foreman's prize for best flower garden at locomotive house, 1st, \$10; 2nd, \$5.

Section foreman's prize for best flower garden surrounding section house, 1st, \$10; 2nd, \$5.

For best station flower garden on each superintendent's division, 1st, \$10; 2nd \$5.

Each man can only secure one prize, that is to say, if a station agent secures the general superintendent's grand prize, he cannot obtain the superintendent's prize.

Railway Route Maps Approved.

The Minister of Railways and Canals has approved route maps covering the following lines,—

Canadian Pacific Ry., Apr. 16, from Kipp, Alta., northeasterly, 40 miles;

Apr. 16, from Suffield to Blackie, Alta., about 90 miles;

Canadian Northern Ry., Apr. 16, revision of Regina-Red Deer line, 20.18 miles;

Apr. 19, from Deer Lake to Callendar, 68 miles.

Conductors' Wages on the Canadian Northern Railway.

It is said that an arrangement is being made between the Canadian Northern Ry. and its conductors, which will effect a settlement of the differences as to wages which has been the subject of investigation under the Industrial Disputes Investigation Act, 1907. The Board of Conciliation consisted of Mr. Justice Haggart, of the Manitoba High Court, chairman; W. Cross, Winnipeg, representing the company, and H. Holt, representing the men. The investigation was brought about owing to the company declining to grant a demand of the conductors for various changes in the existing schedule of rules and wages, including an increase of wages and a reduction in working hours from nine to eight a day. The board began its sittings Mar. 31, and its report was submitted to the Minister of Labor, April 25. The report, which is signed by the Chairman and H. Hall, recommends the adoption on July 1 of a new schedule providing for the payment to passenger conductors of an average wage of \$165 a month, conductors on mixed and way freight trains to receive 4.80c per mile, and conductors on through freight and working trains 4.25c per mile. These rates involve increases over the schedule at present in force. The board also recommends that eight hours work per day "should be considered sufficient

except in extreme cases." Mr. Hall, however, adds a statement in which he claims that the increases given in some of the mileage rates were inadequate, and that the new schedule should have been made effective from Jan. 6, instead of being set forward to July 1. A minority report was submitted by Mr. Cross, in which he claimed that the minimum guaranteed wages of the company's conductors compared favorably with the salaries of professional men, and had been increased over 40% since 1896, when the schedule was agreed upon, which schedule was 10% higher than the wages which were paid in 1896. He also claimed that the new schedule in some matters violated certain well known union principles.

Since the publication of the report the parties have been endeavoring to get together, with the result that an understanding has now practically been reached.

Canadian Railway Club's Annual Meeting.

The report presented at the annual meeting in Montreal, May 13, shows a membership of 800, with receipts for the year ended April 30 of \$4,229.85, and a balance on hand of \$3,626.93. The retiring President, Jas. Coleman, Superintendent, Car Department, G.T.R., was given a past president's jewel. The following are the officers, etc., for the current year:—

President, R. W. Burnett, General Master Car Builder, C.P.R.; 1st Vice President, W. McNab, Principal Assistant Engineer, G.T.R.; 2nd Vice President, C. Murphy, General Superintendent of Transportation, C.P.R.;

Executive Committee.—D. Crombie, General Superintendent of Transportation, G.T.R.; R. M. Hannaford, Assistant Chief Engineer, Montreal Tramways Co.; Prof. H. O. Keay, McGill University; E. C. Lloyd, Assistant Auditor of Stores and Mechanical Accounts, C.P.R.; J. Hendry, Master Car Builder, G.T.R.; L. C. Ord, General Car Inspector, C.P.R.

Audit Committee.—E. B. Tilt, Engineer of Tests, C.P.R.; W. H. Robb, Canuck Supply Co.; C. Manning, Secretary to Superintendent of Motive Power, G.T.R.

Secretary.—Jas. Powell, Chief Draughtsman, G.T.R.; Treasurer, W. H. Stewart, Assistant Superintendent, C.P.R.

All of the officers, etc., elected are residents of Montreal, except W. H. Stewart, of Ottawa. The meeting was followed by a smoking concert.

Dominion Government Railway to Hudson Bay

A short train made the first trip across the bridge over the Saskatchewan River at Pas, Man., May 15. This marks the completion of the first stage of the work, and gives direct railway connection with the construction work now in progress to Port Nelson. Tracklaying is in progress, and it is expected to have the first 85 miles completed this season. The tracklaying and ballasting is being done by Boyd and McArthur, and the building of stations, etc., by McMillan Bros., Winnipeg. Forty carloads of material for the general contractors were delivered at Pas, May 5, and are being taken in to the grading camps beyond mileage 85. (May, pg. 225.)

In order to prevent the crowding out of paying passengers on its trains, the Chicago and Alton Rd. has issued instructions to its employes to take places in smoking cars, whenever necessary, when travelling on the company's service.

Mainly About Transportation People.

Mrs. Flock, wife of J. H. FLOCK, K.C., London, Ont., Honorary Counsel, Canadian Ticket Agents' Association, died May 16.

Miss Helen McNicoll, daughter of D. McNICOLL, Vice President, C.P.R., has been elected a member of the Royal Society of British Artists.

D. McNICOLL, Vice President, C.P.R., returned to Montreal, May 1, via Victoria, Vancouver and Winnipeg, after a short holiday in California.

R. BLACK, Trainmaster, Pere Marquette Rd., St. Thomas, Ont., was reported, May 7, to be recovering from an attack of typhoid fever.

Mrs. Phippen, wife of F. H. PHIPPEN, General Counsel, Canadian Northern Ry., Toronto, was presented at court in London, Eng., recently.

J. QUINLAN, District Passenger Agent, G.T.R., Montreal, who has not been in good health recently, left early in May for Hot Springs, Ark., for treatment.

J. QUINLAN, District Passenger Agent, G.T.R., Montreal, who has not been well for some little time, went to Hot Springs, Ark., early in May, for treatment.

A. BRITTAIN, for many years City Engineer of Montreal, died there May 7. His father was a well known railway construction engineer in the east of England.

A. KNIGHT, foundry foreman, was presented with a diamond scarf pin by the employes of the Canadian Northern Ry. car shops at Winnipeg, May 1, on retiring from the company's service.

M. G. MURPHY, District Passenger Agent, C.P.R., Toronto, left for Mount Clemens, Mich., May 1, to recuperate after an attack of inflammatory rheumatism. He returned to duty May 19.

A. D. SWAN has resigned his position as assistant engineer to the Montreal Harbor Commission, and will leave shortly to take charge of some harbor construction work in Chile, South America.

M. T. MALONEY, an employe of the Allan Steamship Line, and well known in marine circles at Montreal, Halifax, N.S.; St. John, N.B.; and Boston, Mass., died in Montreal, May 15.

The Canadian Ticket Agents' Association has admitted the following as members: H. G. Letch, B. of Q. R., Tamworth, Ont.; R. Harvey, G.T.R., Parkhill, Ont.; C. E. Jenney, G.T.R., Toronto.

H. M. PRICE, who died at Quebec, April 29, was a director of the old Quebec Bridge Co., and up to the time of his death was a director of the Lake Superior Corporation.

H. WILLIAMS was presented with a mahogany desk and chair by the staff of the G.T.R. pay office, Montreal, recently, on his retiring from the position of Paymaster.

H. P. TIMMERMAN, Industrial Commissioner, C.P.R. Eastern Lines, and Mrs. Timmerman, have taken up their residence for the summer at Duck Cove, near St. John, N.B.

W. RICHARDSON, of the shipbuilding firm of Swan and Hunter and Wigham Richardson, Ltd., Newcastle-on-Tyne, Eng., arrived in Montreal, May 9, on a business visit.

F. M. RATTENBURY, who designed the C.P.R. hotel at Victoria, B.C., and who is Reeve of Oak Bay, near that city, has presented the municipality with an acre of land for park purposes.

D. C. COLEMAN, General Superintendent, C.P.R., Manitoba Division, gave an address on "The Human Side of a Great Corporation," before the Winnipeg Advertising Club, May 9.

D. HOGAN, formerly Foreman, C.P.R. Bridge and Building department at Windsor, Ont., was presented with a sum of money by the employes of the department, May 5, on retiring after 28 years service.

W. E. DUPEROW, General Agent, Passenger Department, Grand Trunk Pacific Ry., Vancouver, visited his office, May 1, after having been absent for some time on account of illness.

SIR THOS. G. SHAUGHNESSY, Lady Shaughnessy and the Misses Shaughnessy, have returned to Montreal, being passengers on the Empress of Ireland, which reached Quebec from Liverpool, May 23.

F. P. GUTELIUS was the principal guest at a dinner given by the Halifax Board of Trade, May 16, on his first visit to the city as General Manager of the Government Railways.



G. T. Bell,
Passenger Traffic Manager, Grand Trunk Ry., and
G.T. Pacific Ry.

M. E. DUNCAN, Vice President and General Manager, Canadian Car and Foundry Co., Montreal, is recovering from the effects of a recent operation at John Hopkins Hospital, Baltimore, Md.

J. A. TELFER was presented with a purse of gold by the G.T.R. passenger staff, Toronto, May 19, on retiring from the position of station ticket agent there. He has retired from railway work on superannuation, after about 50 years service.

T. BELL, who recently retired from the C.P.R. advertising department, Montreal, was made the recipient of gifts from the staff, for himself, wife and children, recently, prior to his leaving to take up his residence in Winnipeg.

A. L. Smith, a gentleman cadet at the Royal Military College, Kingston, Ont., aged 17, and son of the late CECIL B. SMITH, M. Can. Soc. C. E., of Toronto, was drowned near Kingston, May 2, with another cadet while canoeing.

W. DOWNIE, General Superintendent, Atlantic Division, C.P.R., St. John, N.B., has been granted leave of absence for a year. He will pay a short visit to the Pacific coast and spend the remainder of his holiday in Europe.

T. BOWES, who has for some years been in charge of the Intercolonial Ry. freight sheds at Halifax, N.S., retired May 1, after a continuous service of 50 years with the I.R.C. and its predecessors. He was presented with an address and a purse of gold.

R. WAUGH, was presented with a quantity of cut glass, recently, by a number of business friends, on the occasion of his retirement from the position of G.T.R. agent at Stratford, Ont., to take a new position in the transportation department at Hamilton.

Z. A. LASH, K.C., director and Senior Counsel, Canadian Northern Ry., Toronto, has been appointed to represent the Dominion Government on the special commission to adjust the differences between the Dominion and British Columbia Governments, regarding subsidies.

W. J. GRANT, District Freight Agent, C.P.R., Hamilton, Ont., and Mrs. Grant, sailed from Montreal, May 15, by the s.s. Tyrolea, for Trieste, Austria, for a trip through Austria, Germany, Belgium, Holland and England, expecting to return to Hamilton about Aug. 1.

J. L. WELLER, Chief Engineer, Welland Canal, who recently returned from the Panama Canal, where he had been to study various matters in connection with canal construction, has had one eye removed. His eyesight has troubled him for some time, and the removal of one eye was decided on in the hope of saving the sight of the other.

C. MURPHY, General Superintendent of Transportation, C.P.R. Eastern Lines, became suddenly ill at Toronto, May 15, and was taken to the Western Hospital, where he was found to be suffering from appendicitis. He was, however, much better the following day, and subsequently returned to Montreal, where he rapidly improved.

D. M. McINTYRE, K.C., Chairman, Ontario Railway and Municipal Board, was presented with an oil portrait of himself, and a tie pin, by citizens of Kingston, Ont., May 1, in recognition of his services as Mayor and City Solicitor there. He handed over the portrait to the Mayor to be placed in the city hall with portraits of other former mayors.

G. E. McGLADE, C.P.R. city ticket agent, agent C.P.R. telegraphs, and agent Dominion Express Co., Brockville, Ont., has resigned these positions to become secretary of the reorganized Grimsby Beach Co., Grimsby, Ont. On May 9, he was presented with an address and \$500 in gold by the citizens of Brockville, on leaving to take over his new position.

COLLINGWOOD SCHREIBER, C.M.G., General Consulting Engineer to Dominion Government, arrived in Vancouver, B.C., from Ottawa, May 17, on his way to the Hazleton district to make an inspection of construction on the Grand Trunk Pacific Ry. He was accompanied on part of the trip by Mrs. Schreiber and Miss Grace Ritchie.

J. R. BOOTH, who was the builder and practically the owner of the Canada Atlantic Ry. (now part of the G.T.R.), had a narrow escape from drowning, May 6, owing to the bursting of a dam on the Ottawa River, at one of the lumber plants which he operates. He is over 80 years of age, but was superintending the work at the yard at the time of the accident.

SIR WM. MACKENZIE, Lady Mackenzie

and A. D. Davidson, Land Commissioner, Canadian Northern Ry., arrived at Quebec by the s.s. Royal Edward May 5, after spending some weeks in Europe. Sir William is reported to have stated that he had secured ample funds for some time to come, which would be applied largely to the extension of the main transcontinental line and other lines already in course of construction.

E. H. McHENRY, formerly Chief Engineer, C.P.R., who recently resigned the vice presidency of the New York, New Haven & Hartford Rd., has formed a partnership with W. S. Murray, the Chief Electrical Engineer of the company, who has also resigned. The firm, to be known as McHenry & Murray, engineers, have opened an office in New Haven, Conn., as railway engineers, and will take over practically the entire electrical engineering force of the New Haven Rd. and will direct all the new electrification work of that company as consulting and constructing engineers.

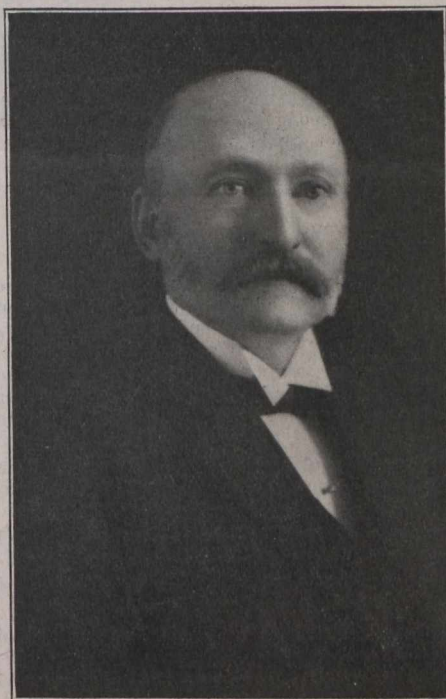
J. A. CHARTERS, whose appointment as Agent, Sleeping and Dining and Parlor Cars and News Department, C.P.R., Vancouver, B.C., was announced in our last issue, was born at Moncton, N.B., Sept. 3, 1884, and entered railway service Mar. 12, 1906, since when he has been, to Sept., 1906, stenographer, General Manager's office, Intercolonial Ry., Moncton, N.B.; Sept., 1906, to Mar., 1907, stenographer, Sleeping, Dining and Parlor Car Department, C.P.R., Montreal; Mar. to Aug., 1907, stenographer, Engineering Department, G. T. Pacific Ry., Winnipeg; Aug., 1907, to Dec., 1908, chief clerk, Sleeping, Dining and Parlor Cars and News Department, C.P.R., Winnipeg; Dec., 1908, to Feb., 1913, chief clerk, same department, C.P.R., Vancouver, B.C.

MALCOLM C. MACFARLANE, who has been appointed acting District Engineer, District F, National Transcontinental Ry., was born at Almonte, Ont., Apr. 23, 1855, and commenced railway service in 1881, since when he has been, to 1885, Resident Engineer, Kingston and Pembroke Ry., between Mississippi station and Renfrew, Ont.; 1889 to 1890, Assistant Engineer in connection with sewerage plans at Brockville, Ont.; 1891 to 1895, Assistant State Engineer in Wyoming; 1895 to 1898, in U.S. Government service in Wyoming, Kansas and Oklahoma; 1898 to 1905, Location and Construction Engineer, Canadian Northern Ry., in Ontario, Manitoba, Saskatchewan and Alberta; 1905 to Apr., 1913, Division Engineer, Division F, National Transcontinental Ry. in Ontario.

G. T. BELL, who has been appointed Passenger Traffic Manager, G.T.R. and G.T. Pacific Ry., Montreal, was born there Sept. 7, 1861, and entered railway service in 1878, since when he has been consecutively, to Nov., 1880, clerk, car mileage office, Great Western Ry.; Nov., 1880, to Nov., 1882, stenographer, General Passenger Agent and Rate Clerk's Office, same road; Nov., 1882, to Jan. 1, 1884, Chief Clerk, Assistant Passenger Agent's Office, G.T.R.; Jan. 1, 1884, to Apr. 25, 1892, Chief Clerk, General Passenger Agent's Office, same road; Apr. 25, 1892, to Apr., 1896, Assistant General Passenger Agent, same road, Montreal; Apr., 1896, to Aug., 1899, Assistant General Passenger and Ticket Agent, same road, Montreal; Aug., 1899, to May, 1900, First Assistant General Passenger and Ticket Agent, same road, Chicago, Ill.; May, 1900, to Aug., 1908, General Passenger and Ticket Agent, same road, Montreal; Aug., 1908, to Apr., 1909, General Passenger and Ticket Agent, G.T.R., and G.T.P.R., Montreal; Apr., 1909, to May, 1913, Assistant Passenger Traffic Manager, G.T.R. and G.T.P.R., Montreal.

Death of W. E. Davis, Passenger Traffic Manager, Grand Trunk Railway.

The death took place at Ashleigh, Ste. Anne de Bellevue, Que., somewhat suddenly, May 15, of W. E. Davis, one of the best known railway traffic officials on the continent. He was at his office on May 13, but was taken ill on the following day, and died as stated. He had been suffering for some time of cirrhosis of the liver. The funeral took place May 17, when a large number of representatives of Canadian and U. S. railways attended. A special train left Bonaventure station, conveying a large party to Ste. Anne de Bellevue, where a portion of the service was conducted. The coffin was subsequently placed on the official car Muskoka, the special train returned to Montreal, and the funeral service was completed at Mount Royal cemetery. While this was in progress, flags on all G.T.R. buildings from the Atlantic to the Pacific were half-masted, and the city ticket offices in the larger cities were closed for half an hour. He was a member of the Isleway Club of Ste. Anne de Bellevue, and the Canadian



The Late W. E. Davis.

Club of Montreal, and was also Vice President of the Northern Navigation Co., one of the constituent companies of the Richelieu and Ontario Navigation Co.

He was born at Wilson, N.Y., Aug. 2, 1850, and entered railway service in 1868, as office boy on the Hannibal and St. Joseph Rd., now a part of the Burlington Rd. In Aug., 1877, he was appointed Passenger Agent, Chicago and Lake Huron Rd., Chicago, Ill., which later included the Detroit, Grand Haven and Milwaukee Ry., Toledo, Saginaw and Muskegon Ry., and Cincinnati, Saginaw and Mackinaw Ry., remaining in that capacity until the consolidation of these G.T.R. subsidiary companies under the new management, Apr. 1, 1896, since when he has been, to May 1, 1900, General Passenger Agent, G.T.R., Montreal; May 1, 1900, to May 15, 1913, Passenger Traffic Manager, G.T.R., and from Sept., 1908, also Passenger Traffic Manager, G.T. Pacific Ry., Montreal. He was also a director and one of the Vice Presidents of the Northern Navigation Co., one of the constituent companies of the

Richelieu and Ontario Navigation Co.

The higher officials of the company have given expression to their appreciation of the late Mr. Davis' work, and of his unassuming and kindly nature, which is evidenced by his large circle of friends of all classes. On account of his great liking for the French Canadian people, arrangements were made whereby he was buried near the grave of the late Dr. Drummond, the habitant poet. The late Mr. Davis was one of the earliest subscribers to Canadian Railway and Marine World, being on the subscription list continuously from its inception in 1898.

The Grand Trunk Railway Semi Annual Meeting.

The report for the half year ended Dec. 31, 1912 was considered at the semi annual meeting in London, Eng., recently. The revenue account shows gross receipts, £4,612,758 11s. 0d.; working expenses, £3,334,682 4s. 10d.; net receipts, £1,278,076 6s. 2d.; less balance from rentals, outside operations and car mileage, £87,084 13s. 9d., leaving a total net revenue £1,190,991 12s. 5d.; to which are added amounts received from controlled companies and general interest account, £192,055 15s. 6d., making total net revenue receipts of £1,383,047 7s. 11d., an increase of £197,992 as compared with the same period in 1911.

The Chairman of the Board, A. W. Smithers, in moving the adoption of the report, referred to the death of Sir William H. White, and the appointment of W. Molson Macpherson as his successor as a director. In analyzing the report he alluded to the largely increased item for car rentals, due to having to release G.T. Pacific Ry. cars, which had been used on the G.T.R., causing the company to use cars of other roads, and intimated that power will shortly be asked for the incorporation of the Canada Atlantic Ry. as an integral portion of the system, so that the finances may be rearranged and fresh capital introduced, which will be necessary on account of expected increased traffic due to the operation of the G.T. Pacific Ry. The Detroit, Grand Haven and Milwaukee Ry. finances will also be reorganized shortly. In dealing with the G.T. Pacific Ry. he stated that track had been laid for 1,124 miles west of Winnipeg and 195 miles east of Prince Rupert, leaving about 427 miles to complete, which it is anticipated will be completed by the fall.

Reference was also made to the difficulties experienced during the past year, due to the unexpected death of the then President, C. M. Hays, and a difficult money market, the latter caused by the Balkan war and possible European complications. A number of new works were postponed or stopped, in order to continue work on the G.T.P.R. main line, and generally speaking, the difficulties had been surmounted. He eulogized the President, E. J. Chamberlin, considering his record to date highly satisfactory, judged by the test of the state of traffic.

The report was adopted, and the following dividends for the half year declared:—2% on the 4% guaranteed stock; 2½% on the first preference stock; 2½% on the second preference stock, and 2% on the third preference stock. The Grand Trunk Act, 1913, and the Grand Trunk Pacific Act, 1913, were adopted, and the retiring directors, Sir Henry M. Jackson, Sir Felix O. Schuster, Lord Welby, and E. J. Chamberlin, were re-elected; as were also the auditors, H. C. Newton, for England, and B. H. Brown, for Canada.

Railway Rolling Stock Notes.

The Intercolonial Ry. has ordered 500 steel frame box cars, 30 tons capacity, from the Nova Scotia Car Works.

The Duluth, Winnipeg and Pacific Ry. (C.N.R.) has ordered 200 steel underframe flat cars, and has received 100 box cars from the Mount Vernon Car Mfg. Co.

The C.P.R., between Apr. 12 and May 14, ordered the following rolling stock:—14 vans, 3 freight refrigerator cars, 8 stock cars, and 1 stores supply car, from its Angus Shops, and 500 steel frame box cars from the Canadian Car and Foundry Co.

The Intercolonial Ry. has received the following additions to rolling stock,—140 box cars, 60,000 lbs. capacity, and 32 box cars, 80,000 lbs. capacity, from Canadian Car and Foundry Co.; 9 box cars, 60,000 lbs. capacity, from Nova Scotia Car Works; 4 switching locomotives from Canadian Locomotive Co., and 1 freight locomotive from Canada Foundry Co.

The Grand Trunk Ry. has ordered 2,000 box cars from the Canadian Car and Foundry Co.; 2,000 box cars from the Eastern Car Co.; 50 Mikado locomotives from the Montreal Locomotive Works; 3,000 box cars from the Western Steel Car Co.; 1,000 gondola cars from the Pressed Steel Car Co.; and 25 Mikado locomotives from the Baldwin Locomotive Works.

The Canadian Copper Co., Copper Cliff, Ont., has ordered 25 Otis all steel ore cars, from Hart-Otis Car Co. These cars will be built by Canadian Car and Foundry Co. Following are the chief dimensions:—

Length over end sills	24 ft. 11½ ins.
Length inside	23 ft.
Width over all	9 ft. 11¼ ins.
Height inside	9 ft. 6 ins.
Height from rail	7 ft. 5 13-16 ins.
Number of doors on each side	4
Capacity	100,000 lbs.

The Canadian Northern Ry., between Apr. 14 and May 14, received the following additions to rolling stock:—6 first class cars, 5 baggage cars, 200 box cars, from Canadian Car and Foundry Co.; 3 second class cars, 100 flat cars, from Crossen Car Co.; 80 Hart cars, from Hart-Otis Car Co.; 2 combination cars, from Preston Car and Coach Co.; 10 light and 15 heavy ten wheel locomotives from Montreal Locomotive Works; 8 consolidation locomotives from Canadian Locomotive Co.

The C.P.R., between Apr. 12 and May 14, received the following additions to rolling stock:—30 horse cars, 9 tourist cars, 5 sleeping cars, 10 suburban cars, 6 box baggage cars, 12 baggage and express cars, 6 class G2 locomotives and 2 class E3 locomotives, from its Angus shops; 567 steel frame box cars, 423 steel frame flat cars, 1 ballast car; 3 tourist cars, from Canadian Car and Foundry Co.; 284 steel frame box cars from National Steel Car Co.; 99 steel frame box cars from Nova Scotia Car Works; 3 Lidgerwood unloaders from Canadian Allis-Chalmers, Ltd.; 2 Jordan ballast spreaders and 4 ballast ploughs from F. H. Hopkins and Co.; 6 class G2 locomotives from Montreal Locomotive Works; 42 steel frame box cars from Barney and Smith Co.; 16 air dump cars from Western Wheeled Scrapper Co.; 10 sleeping cars from Pullman Co.

The Canadian Car and Foundry Co., between Apr. 15 and May 15, delivered the following rolling stock:—5 first class cars, 7 wooden baggage cars, 227 wooden box cars, 30 tons capacity, 122 wooden ballast cars, 40 tons capacity, to Canadian Northern Ry.; 3 wooden tourist cars, 503 box cars and 396 steel underframe flat cars, 40 tons capacity, to C.P.R.; 2 slag cars, for its own purposes; 1 wooden Lidgerwood flat

car, to F. H. Hopkins and Co.; 104 steel frame box cars, 30 tons capacity, 161 steel frame box cars and 19 wooden ballast cars, 40 tons capacity, to Intercolonial Ry.; 3 steel street car bodies, to Montreal Tramways Co.; 100 wooden ballast cars, to J. D. McArthur Co.; 10 steel underframe flat cars and 8 wooden ballast cars, 40 tons capacity, to Toronto, Hamilton and Buffalo Ry.; 8 steel underframe flat cars, 40 tons capacity, to Windsor, Essex and Lake Shore Rapid Ry.

Reports as to large orders for rolling stock to be placed by the Canadian Northern Ry. and the G.T. Pacific Ry. are running their course through the daily press, and have even been reproduced as authentic by some technical papers. The value placed on these phantom orders is \$85,000,000, of which the C.N.R. is credited with \$50,000,000 worth, and the G.T.P.R. with the balance. So far as one of the companies is concerned, we have been officially advised that there is no truth in the report, and its author can scarcely be considered responsible, and probably the same can be said of the report as to the other company. The information as to rolling stock ordered and received by the various companies, as published by Canadian Railway and Marine World, is gathered from official sources, and great care is exercised to have it as complete and up to date as possible, so that no one interested in such matters need go beyond our pages for such information as he may require on the subject.

Railway Finance, Meetings, Etc.

Canadian Pacific Ry.—The directors have declared a dividend of 2½% on the common stock, for the quarter ended Mar. 21, being at the rate of 7% per annum, from revenue, and 3% per annum from interest on the proceeds of land sales and from other extraneous assets, payable June 30, to shareholders of record May 31.

Grand Trunk Pacific Ry.—There has been filed with the Secretary of State at Ottawa, certificates showing that the G.T.P. Ry. Act of 1913 had been assented to and accepted by the holders of debentures issued under chap. 100 of the statutes of 1906, and by the shareholders.

Grand Trunk Ry.—There has been filed with the Secretary of State at Ottawa, certificate of the chairman of the general meeting of shareholders held in London, Eng., April 10, at which the G.T.R. Act of 1913 was assented to and accepted.

Kettle Valley Ry.—A special meeting of shareholders will be held at 45 King St. West, Toronto, June 2, to approve of a lease of the company's lines to the C.P.R. Co., and to authorize an issue of bonds to defray the cost of construction of the line.

Lake Erie and Detroit River Ry.—The annual meeting was held May 6. Following are the directors for the current year:—S. M. Felton, E. N. Weller, Detroit, Mich.; A. Leslie, H. L. McDowell and J. A. McDougall, Walkerville, Ont.

Napierville Jct. Ry.—The Delaware and Hudson Co.'s report for 1912 shows an increase in N.J.R. operating revenue over 1911 of \$12,400.11, and in operating expenses an increase of \$11,089.12. The net income was \$19,416.44, or 3.23% on the capital stock outstanding. The reasons given for the increase in operating expenses were severe weather conditions in the early part of the year and extensive repairs to locomotives. There was also an increase in claims for personal injuries of \$5,000.

Ottawa and New York Ry.—New York and Ottawa Ry.—These two lines, which extend from Ottawa, Ont., to Tupper Lake, N.Y., the International boundary, being the end of each, are owned by the New York Central and Hudson River Rd. In order to bring about a simplification of accounting the N.Y.C. and H.R. Rd. has absorbed the N.Y. and O. Rd., which has ceased to exist. There will be no change in the management or operation of the Ottawa and New York Ry., the Canadian line, which crosses the International boundary by the bridge across the St. Lawrence River at Cornwall, Ont.

Quebec, Montreal and Southern Ry.—The Delaware and Hudson Co.'s report for 1912 shows an increase in Q.M. & S.R. operating revenue of \$224,466.20 over 1911. The operating expenses increased \$16,109.96, and the net income, independent of interest charges due to the parent company, were \$156,378.98, an increase of \$19,599.18.

Rutland Rd.—There has been deposited with the Secretary of State at Ottawa, an agreement between G. T. Jarvis, D. W. Pardee and E. L. Rossiter, vendors; the Guaranty Trust Co., of New York, as trustees, and the Rutland Rd., and also a lease to the Rutland Rd., the Guaranty Trust Co. being trustee, dated April 1. These documents refer to the Rutland and Noyan Ry., which the Rutland Rd. owns in Canada.

Temiscouata Ry.—Net earnings for Feb., \$5,420. Aggregate net earnings for eight months ended Feb. 28, \$39,982.

Grand Trunk Railway Betterments, Construction, Etc.

Southern New England Ry.—The President and other officers of the G.T.R. and the subsidiary lines interested had a conference at Providence, R.I., May 1, as to the situation of the Southern New England Ry. projects, but nothing was given out, or has since transpired as to the results of the conference.

Owen Sound-Meaford Line.—The question of the building of a line from Owen Sound to Meaford, Ont., is again being discussed. The people of Owen Sound have expressed their readiness to guarantee bonds for \$200,000 if the G.T.R. will renew the offer made a few years ago. C. Eaton is reported to be in communication with the G.T.R. on the matter.

Holmdale Switch.—The Brantford, Ont., City Council decided, April 29, to repudiate the agreement it had made with the G.T.R. as to the construction of a switch into the Holmdale district.

Windsor Yards Electrification.—In connection with the prosecution of the G.T.R. at Windsor, Ont., for a violation of the smoke bylaw, May 6, the company's officials present said if the experiments being made to reduce the smoke did not prove satisfactory to the court, the company would consider the question of electrifying the yards between Windsor and Walkerville.

Locomotive House at Liskeard.—Press reports state that the company has purchased land in Liskeard, Ont., on which a locomotive house is to be built. The G.T.R. is operating over the Timiskaming and Northern Ontario Ry., using its own rolling stock, but has at present no locomotive house, except at Nipissing Jct., the point of junction. At Cochrane the T. and N.O. Ry. connects with the National Transcontinental Ry., which is to be operated by the Grand Trunk Pacific Ry. Liskeard would therefore form a divisional point between the two points of junction with the G.T.R. lines. (May, pg. 227.)

Canadian Northern Railway, Construction, Betterments, Etc.

Montreal-Ottawa-Port Arthur Line.—D. R. Hanna, Third Vice President, is reported to have stated in a recent interview that it is expected to have the track laid on this line by the fall, with the exception of the section between Ottawa and Capreol, Ont., on which there is considerable heavy construction.

The Montreal-Hawkesbury portion of the line is well advanced, the principal work necessary to its completion being the bridges at the Bank River. The Hawkesbury-Ottawa line is completed and in operation. In connection with this part of the line, the company asked the Dominion Parliament to confirm the sale to it of a portion of the property of the Carillon and Grenville Ry. As this sale is a matter of dispute with the Central Ry. of Canada, and is now before the courts, the application was withdrawn.

The line is under construction from Ottawa westwards to Capreol, where connection will be made with the Toronto-Sudbury line. Eastward from Port Arthur the line is well advanced to completion, and this will be completed to Ruel, the point to which the line has been built from Sudbury.

Canadian Northern Ontario Ry.—The last section of the Toronto-Ottawa line to be completed is that between the Jack River and Smiths Falls, Ont. The ballasting and final completion of the line will take several months.

Sir Donald Mann, Vice President, had an interview with the Mayor of Hamilton, May 12, in reference to the route of the line there, the location of passenger and freight terminals, and other matters.

We are officially advised that the company has a route surveyed for a line from north of Parry Sound to Callendar, Ont., but it is not likely that the line will be built this year. The proposed line leaves the Toronto-Sudbury line at mileage 170 north of Toronto, and runs northeasterly through the villages of Whitestone, Golden Valley, Restoule and Nipissing to a junction with the company's transcontinental line near Callendar. The standard of curvature will be six degrees, although there will be one or two which will be temporarily sharper. The line will cross the Whitestone, Maganatawan, Pickerel, Comanda Creek, and Wistiwasung streams. The crossings of the Maganatawan and South Rivers are the only crossings of any moment—the former comprising a deck span of 100 ft. and some 300 ft. of trestle approach, 45 ft. above the water; and the latter 300 ft. long and 25 ft. high. There is a very large quantity of timber to be brought out from the townships of Mackenzie, Mills and Patterson, the estimate is from 350 to 400 million feet, 100 million feet being pine. Aside from running through this area of timber, the line traverses for over half the distance a very fair agricultural country, which has been settled since the early days of the lumber industry.

Canadian Northern Ry.—The big fill on the cut off at Rainy Lake, Ont., which has been under construction for several years, and which has cost about \$3,000,000, was completed May 12. The work was fully described in our issue of Aug., 1912.

Application is being made to the Board of Railway Commissioners for a recommendation to the Governor-in-Council to sanction the amalgamation of the C.N.R. and the C.N. Branch Lines Co.; under which charter a number of branch lines in Saskatchewan and Alberta have been built.

Canadian Northern Pacific Ry.—A special train conveying members of the British Columbia Government ran over the line from New Westminster to the end of steel at Yale, May 14. Reports of the progress of construction show that a distance of about 60 miles separates the grading gangs which are working east and west, and this gap is expected to be nearly closed up by the end of the year. The bridge work is also being rapidly pushed.

Construction on the branch from Kamloops to Vernon, etc., is, we are advised, suspended at present. There is said to be no intention on the part of the company to electrify it at present, as stated in the daily press. (May, pg. 227.)

Canadian Northern Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, compared with those for 1911-12, from July 1, 1912:—

	Gross Earnings	Expenses	Net Earnings	Increase
July	\$1,829,700	\$1,335,100	\$494,600	\$133,000
Aug.	1,745,800	1,375,000	270,800	56,100
Sept.	1,671,500	1,248,000	423,500	4,100
Oct.	2,351,200	1,645,900	705,300	24,000
Nov.	2,508,700	1,631,900	876,800	212,600
Dec.	2,132,000	1,551,000	581,000	77,200
Jan.	1,513,400	1,243,200	270,200	46,500
Feb.	1,398,700	1,130,200	268,500	30,900
Mar.	1,685,900	1,254,400	431,500	4,700
	\$16,837,900	\$12,414,700	\$4,423,200	\$590,000
Incr.	\$2,499,000	\$1,909,000	\$ 590,000	.....

Mileage in operation during the foregoing period, 4,927, against 3,981 in the previous year. Approximate earnings for April, \$1,745,300, against \$1,608,100 for April, 1912.

Canadian Pacific Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases or decreases, compared with those for 1911-12, from July 1, 1912:—

	Gross Earnings	Expenses	Net Earnings	Increase
July	\$12,052,398.58	\$7,604,221.68	\$4,448,176.90	\$745,148.57
Aug.	12,251,715.87	7,533,790.21	4,717,925.66	642,354.65
Sept.	11,579,733.98	7,329,430.13	4,250,303.85	332,857.05
Oct.	13,000,397.80	7,999,510.61	5,000,887.19	379,782.44
Nov.	12,362,668.42	8,104,527.38	4,258,139.04	270,772.55
Dec.	12,219,278.72	7,823,559.21	4,395,719.51	289,989.25
Jan.	9,679,607.39	8,017,233.61	1,662,373.78	579,516.08
Feb.	9,477,685.55	7,227,616.21	2,250,069.34	136,202.67
Mar.	11,111,892.78	7,256,475.89	3,855,416.89	137,015.78
	\$104,065,377.09	\$68,896,364.93	\$35,169,012.16	\$3,513,639.04
Incr.	\$14,719,003.33	\$11,205,364.29	\$3,513,639.04	.....

Approximate earnings for April, \$11,476,000, against \$11,028,000 for April, 1912.

Grand Trunk Railway Earnings, Etc.

The following figures show the earnings and expenses of the G.T.R., C.A.R., G.T. Western Ry. and D.G.H. & M.R. for four months ended Apr. 30, as compared with those for same period in 1912:—

	1913	1912	Increase
G.T.R.	\$13,852,824	\$11,500,188	\$1,852,636
C.A.R.	740,411	639,027	101,384
G.T.W.R.	2,369,509	2,118,952	250,557
D.G.H. & M.R.	724,636	650,598	74,038
Totals	\$17,187,410	\$14,908,765	\$2,278,645

Grand Trunk Pacific Railway Earnings.

The earnings of the Prairie Section and Lake Superior Branch for April, were \$502,706, and the aggregate for four months ended Apr. 30, \$1,670,011.

At the annual convention of the Master Car and Locomotive Painters' Association of U.S. and Canada, which will be held at Ottawa, Sept. 9 to 12, papers will be read on railway paint shop supplies, finishing steel car equipment, safety first as regards the paint shop, economy in locomotive painting, paint protection for steel equipment, silvering mirrors, removing old paint from equipment and brushes.

National Transcontinental Railway Construction.

The contractors for the building of the terminals for this railway at Quebec—M. P. and J. T. Davis—started work April 30 at Cap Rouge, and along the river frontage from the site of the Quebec Bridge to the Champlain Market. The steel work for the superstructure of the bridge is being delivered.

The locomotive shed to be built at O'Brien, Que., will have accommodation for 12 locomotives, and will have boiler and engine rooms attached. The foundation will be of concrete, and will be carried up to 3 ft. 11¼ in. above base of rail, the remainder of the wall to be of brick. The roof, of tar and gravel, will be supported on wooden columns, girders and beams, in the roundhouse part, and on steel trusses in the boiler and engine room part. The stalls will be 91 ft. long; the engine room will be 43 ft. by 48 ft. 2 in., and the boiler room 29 ft. 3 in. by 43 ft.

Owing to the small amount of work necessary to complete the line on Districts D and E, T. S. Armstrong, District Engineer, took over the work of the two districts May 1, the engagement of H. M. Balkam, of District D, being terminated April 30. (May, pg. 226.)

Grand Trunk Pacific Railway Construction.

J. E. Dalrymple, Vice President, returned to Montreal, May 13, after having completed a trip of inspection over the line. He stated that a regular passenger and freight service will be put in operation from Montreal and Toronto, to Edmonton, June 7. The train service will be to Sarnia, thence by the Northern Navigation Co.'s vessels to Fort William. From this point a train service will be operated over the G.T.P.R. Lake Superior branch to the junction with the National Transcontinental Ry.; thence over that line to Winnipeg, then over the G.T.P. Ry. to Edmonton. The section of the N.T.R. between Lake Superior Jct. and Cochrane, Ont., is expected to be open for traffic by the end of August, when a regular train service will be put on from Toronto to Cochrane, Ont., by G.T.R. to Nipissing Jct., thence over the Timiskaming and Northern Ontario Ry. to Cochrane. On the G.T.P.R. line west of Winnipeg, Mr. Dalrymple stated that construction is being pushed west of Tete Jaune Cache, by 10,000 men. There is 425 miles between the ends of steel being pushed west and that coming east from Prince Rupert. At the Pacific Coast terminal it is proposed to build an elevator with a capacity of 10,000,000 bush. Collingwood Schreiber, C.M.G., Dominion Government General Consulting Engineer, is on a trip of inspection over the line. J. W. Stewart, of Foley, Welch and Stewart, left Vancouver, May 12, for Prince Rupert and Hazelton, B.C., where he had arranged to meet Mr. Schreiber.

Tracklaying has been completed on the Regina-International boundary branch, and connection has been made with the Great Northern Ry. branch from Neche, N.D.

The site of the N.W.M.P. barracks at Calgary, Alta., was taken over by the G.T.P. Ry. May 11, and work will be started on an early date on laying it out for terminal purposes. (May, pg. 226.)

The Minister of Railways and Canals has given notice of a resolution in the House of Commons, providing for an increase in the salary of the Chief Railway Commissioner, from \$10,000 to \$12,500 a year.

Canadian Pacific Railway Construction, Betterments, Etc.

Atlantic Division.—W. Downie, General Superintendent, and other officials, inspected the New Brunswick Ry. and Coal Co.'s line, between Norton and Minto, N.B., May 1. Mr. Downie is reported to have said the C.P.R., while taking over the line, did not intend to make any change in its operation until after the completion of the Fredericton and Grand Lake Ry. and Coal Co.'s line.

Eastern Division.—Work was resumed May 1, on the second track, which has been under way for some time between Farnham and Montreal. The work now in progress between Farnham and St. Johns is expected to be completed by the end of the year.

We are officially advised that it is not expected to do any further construction this year on the extension of the Northern Colonization Ry. from Mount Laurier to a junction with the Ottawa, Northern and Western Ry. at Maniwaki, Que.

Ontario Division.—A section of the elevated tracks at North Toronto has been so far completed that a start was made in operating trains over it May 12. There is a great deal of filling yet to be done.

The second track being constructed from the end of the present track, west of Islington, to Guelph Jct., will be laid south of the present track, 13 ft. centre to centre. There will be no change of gradients or alignment. There will, however, be some sidings put in at different points, to facilitate traffic. The work is expected to be completed by the fall. Johnston and Girouard are the contractors, and a good deal of local labor is being employed. F. W. Morrison, Dixie, Ont.; G. Raynor, Streetsville, Ont., and W. Maharg, Guelph Jct., are the resident engineers in charge; with H. Wellwood as District Engineer, the whole work coming under C. W. P. Ramsay, Engineer of Construction, Montreal.

Pacific Division.—The second track work is being started at the east end from Cal-

gary, and a good deal of work is being arranged for in the way of reducing gradients. The new work will reduce the summit by 533 ft. The terminal, which will be built under the Selkirks, will be 28,000 ft. long, and will eliminate 4.5 miles of snow sheds and 2,260 ft. of steel bridges. Tenders for the bridge are under consideration. Press reports state that the company propose to build a tunnel of considerable length in order to bring about the lowering of the gradients of the line through Kicking Horse Pass, but we are officially advised that nothing of the kind is contemplated at present.

Numerous tenders are reported to have been received May 10 for the following second track construction:—From Revelstoke, mileage 0 to 24, Shuswap subdivision; Kamloops East, mileage 104 to 129, Shuswap subdivision; Kamloops West, mileage 0 to 9, Thompson subdivision.

The double track is now in use from Vancouver to Hammond, 24.1 miles, and it is expected to be completed between Hammond and Mission Jct., early in June, and from Mission Jct. to Ruby Creek, early in September. Ruby Creek is 81.1 miles east of Vancouver.

The C.P.R. has filed plans with the city of Vancouver showing a proposed tunnel under the city. The tunnel as proposed will be 4,000 ft. long, with practically level gradients. It is designed to carry a single track, and will enter under the city at the intersection of Thurlow St. with the C.P.R. south boundary of the front yard on Burrard Inlet. It will then run under Pender St. to the crossing of Hamilton St., curving south, and will end approximately at the intersection of Georgia St. with the C.P.R. boundary in the False Creek yards. It is expected to find the sandstone and hard pan, usually met with in foundation work in Vancouver, in the construction of the tunnel. (May, pg. 223.)

P. H. Secord and Sons with the concrete abutments for the bridge at Jubilee Terrace, Brantford. It is expected that work will be started at an early date south of Brantford towards Port Dover, but the principal effort of the contractors are to be devoted to completing the Brantford-

North Ry.—Arrangements are reported to have been completed for placing four engineering parties in the field to locate the route for this projected railway. A. T. Tomlinson, Chief Engineer, will have charge of the work. No. 1 party will work from Mount Laurier, Que., northerly; No. 2 party will work southerly from the same point; No. 3 party will start from Lachute, Argenteuil county, and work north, while No. 4 party will work south from the Bell River crossing of the National Transcontinental Railway. F. H. Clergue, who represents the syndicate which owns the charter, is reported to have stated recently that it is proposed to start construction at four points, Montreal, north and south from the Bell River crossing of the National Transcontinental Railway, and south from James Bay. It is expected to send out a steamboat with a party of engineers and supplies to James Bay in July. The four survey parties already referred to will cover the first section of the line from Montreal to Bell River. This section of the line, a press report states, is expected to be completed at the same time as the National Transcontinental Railway, so as to give that line a direct connection with Montreal. (May, pg. 220.)

Pacific Great Eastern Ry.—Track laying was reported to have been started, April 28, at the point where the line starts off from the Howe Sound and Northern Ry. Grading camps extend northerly for about 20 miles from Newport, B.C., and a wagon road has been cut out for 20 miles, and is being extended to the summit of the coast range. Arrangements are reported to have been completed for the building of a wagon road southerly from Pemberton Meadows to the summit of the coast range, where it will connect with the road being built northerly. Supplies are being sent into the various grading camps on the section between Newport and Lillooet. Engineering parties started out, April 30, to make the final location for the line from Lillooet to Fort George, and the general contractor, P. Welch, is preparing to sublet this portion of the work.

Negotiations are still in progress for the right of way from North Vancouver to Newport, the starting point of the Howe Sound and Northern Ry., which has been incorporated with the P.G.E. Ry. If certain lands are sold to the company for the right of way the company has offered to start construction in June and to have the line completed to Point Atkinson within six months, operating an electric service thereon. A considerable number of property owners signified their willingness at a meeting held May 6 to accept the terms offered, and it was expected that a complete agreement would be reached by May 30.

The Provincial Minister of Railways has approved the company's plans for standard bridges on the line as follows:—60 ft. deck and through truss spans; 100 ft. through and span deck truss spans; 125 ft. through spans; 150 ft. through and deck spans. (April, pg. 169.)

Quebec and Saguenay Ry.—Press reports state that the financial affairs of this company have been adjusted, and that construction will be resumed at an early date. It is said the line will be completed to Tadoussac for the present, the finishing of the work between that point and Murray Bay being a matter of future arrangement.

Railway Development

Projected Lines, Surveys, Construction, Betterments, Etc.

Atlin Ry.—Application is being made to the Dominion Parliament for the incorporation of a company with this title to build a railway from Atlin Lake, southerly to the Taku River on the International boundary, and a branch to Telsin Lake, B.C. Smith and Johnston, Ottawa, are solicitors for applicants.

Esquimalt and Nanaimo Ry.—The line into the Cowichan Lake district, which branches off from the Port Alberni line at Duncans, B.C., has been completed, and is expected to be opened for traffic early in June.

We are officially advised that the locomotive house, machine shops, boiler house and store to be built on the Songhees reserve at Victoria, will be on the C.P.R. standard plans. The machinery for these shops will be transferred from the present shops at Wellington. The plans for the lay out of the yard and station buildings have not been completed. (May, pg. 219.)

Kettle Valley Lines.—Construction work was stopped on the Kelowna-Naramata section of the line, a distance of 47 miles, May 3, when several hundred men left the camps. This will affect the work considerably, as railway labor is very scarce at present. The contractors were figuring in getting well through with the grading on all the

sections under construction by the end of the year.

An agreement has been made between the company and the Great Northern Ry. for the joint use of the section of the line from the summit of the Hope Mountains down the Coquihalla Valley to Hope, 57 miles. The K.V. Ry. will build the line, at an estimated cost of \$75,000 a mile, and the G.N. Ry. will pay a percentage on this cost as an annual rental. On a large portion of this mileage the construction will be very heavy, as it will include 12 tunnels, one over half a mile long, and much rock cutting. Tenders will be asked for this work early in June. (May, pg. 219.)

Lake Erie and Northern Ry.—The Board of Railway Commissioners has approved in a general way the route selected through the city of Brantford, Ont., and the details are being worked out by the engineers.

Grading camps have been established on the right of way between Galt and Paris by the general contractors, Johnson Bros., Port Hope. Sub contracts have been let to Scriven and White for grading from Blue Lake towards Paris, and to Davis and Martin for grading from Paris towards Blue Lake. D. A. Grant is general foreman of construction. A start has been made by

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.

Allan Line Steamship Co.—C. A. LEWTHWAITE has been appointed Travelling Passenger Agent, vice J. F. Pratt. Headquarters, Winnipeg.

Canadian Freight Association.—R. G. McCRAW, heretofore Travelling Freight Agent, Minneapolis, St. Paul and Sault Ste. Marie Ry., Toronto, has been appointed Travelling Transit Inspector, C.F.A. Headquarters, Toronto.

Canadian Government Railways.—F. P. GUTELIUS, M. Can. Soc. C.E., has been appointed General Manager, Canadian Government Railways, vice the Government Railways Managing Board, abolished. Office, Moncton, N.B. Full particulars of the change in management are given in this issue, on another page.

Canadian Northern Quebec Ry.—H. H. SMITH, heretofore chief clerk to General Manager, has been appointed Car Service Agent. Office, Moreau St. Station, Hochelaga, Montreal.

Canadian Northern Ry.—W. J. WHITESIDE, heretofore Advertising Agent, having been transferred to the Publicity Department, which is in charge of R. CROASDELL, the position of Advertising Agent has been abolished, and the advertising work has been placed under R. L. FAIRBAIRN, General Passenger Agent, Eastern Lines, Toronto.

ARTHUR PENNY, heretofore in the General Advertising Agent's office, G.T.R., Montreal, has been appointed on Mr. Fairbairn's staff.

A. E. KNIGHT, heretofore chief linen clerk, Sleeping, Dining and Parlor Car, Hotel and News Department, Winnipeg, has been appointed Platform Inspector, Sleeping and Dining Cars, vice A. H. Murphy, resigned. Headquarters, Winnipeg.

J. DONAHUE has been appointed chief linen clerk, Sleeping, Dining and Parlor Car, Hotel and News Department, Winnipeg, vice A. E. Knight, promoted.

C. N. JONES, heretofore storekeeper, Sleeping, Dining and Parlor Car, Hotel and News Department, Prince Albert, Sask., has been appointed Sleeping and Dining Car Agent at Saskatoon, Sask., vice C. Oliver, resigned.

A. PATRICK has been appointed storekeeper, Sleeping, Dining and Parlor Car, Hotel and News Department, Prince Albert, Sask., vice C. N. Jones, promoted.

W. C. TURNER has been appointed acting Trainmaster at North Battleford, Sask., vice F. W. Ross on sick leave.

A. L. JOHNSTON has been appointed Agent at Minneapolis, Minn. Office, 311 Nicollet Ave.

Canadian Pacific Ry.—H. C. GROUT, heretofore Assistant General Superintendent, Atlantic Division, St. John, N.B., has been appointed acting General Superintendent, while W. Downie is on leave of absence for a year. No appointment will be made as Assistant General Superintendent, at least for the present.

D. NESBITT, heretofore chief carpenter, Kingston and Pembroke Ry., Kingston, Ont., has been appointed Foreman of Bridges and Buildings, Kingston Subdivision, C.P.R., Kingston, Ont.

W. H. POLLEY, heretofore ticket agent, King Edward Hotel, Toronto, has been appointed Travelling Passenger Agent. Headquarters, Toronto.

F. H. HETHERINGTON has been ap-

pointed Locomotive Foreman at White River, Ont., vice — Johnson.

A city ticket office has been opened at 404 Victoria Ave., Fort William, Ont., A. J. BOREHAM, City Passenger Agent.

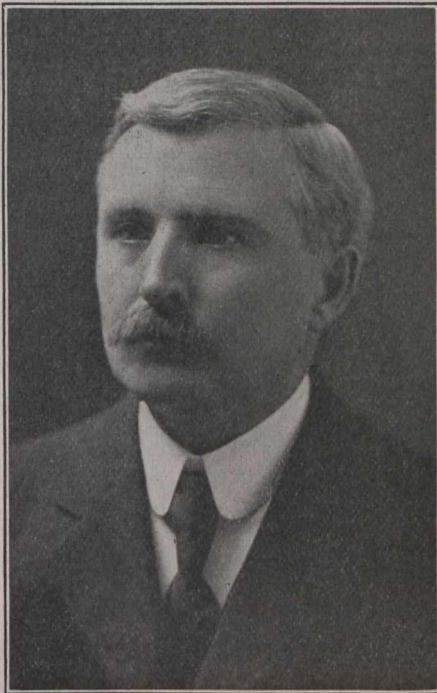
H. J. REED, heretofore Night Locomotive Foreman at Winnipeg, has been appointed Locomotive Foreman at Ignace, Ont., vice W. Bryce, transferred.

J. MORTON has been appointed Night Locomotive Foreman at Winnipeg, vice H. J. Reed, transferred.

V. G. MELSTED, heretofore Resident Engineer, Brandon, Man., has been appointed Engineer of Water Service, Winnipeg.

E. LANDORTH has been appointed Resident Engineer, Brandon, Man., vice V. G. Melsted, assigned to other duties.

R. ARMSTRONG, heretofore Superintendent, District 3, Saskatchewan Division, Saskatoon, has been appointed Superintendent, District 4, Manitoba Division, vice E. W. DuVal, transferred. Office, Souris.



R. Armstrong,
Superintendent, District 4, Manitoba Division,
Canadian Pacific Railway.

E. W. DUVAL, heretofore Superintendent, District 4, Manitoba Division, Souris, has been appointed Superintendent, District 3, Saskatchewan Division, vice R. Armstrong, transferred. Office, Saskatoon.

G. BELL has been appointed Locomotive Foreman at Wilkie, Sask., temporarily.

F. W. ALEXANDER, A.M. Can. Soc. C.E., heretofore Assistant Division Engineer, Calgary, Alta., has been appointed Division Engineer, vice N. E. Brooks, promoted. Office, Calgary, Alta.

K. A. DUNPHY has been appointed Resident Engineer, District 2, Alberta Division, vice J. Robertson. Office, Calgary.

A city ticket office has been opened at 215 Eighth Avenue West, Calgary, Alta., in charge of F. J. HURKETT.

W. G. MACPHERSON has been appointed Locomotive Foreman at Alyth, Alta., vice R. S. Teague, transferred.

R. S. TEAGUE, heretofore Locomotive Foreman at Alyth, Alta., has been appointed Locomotive Foreman at West Calgary, Alta., vice W. J. Coleman, transferred.

C. H. SEWELL, heretofore yardman, has

been appointed Yardmaster, Nelson Terminal, B.C., vice F. Young, resigned.

J. ARCHIBALD, heretofore Shop Foreman at Vancouver, B.C., has been appointed Locomotive Foreman at Coquitlam, B.C.

W. MORGAN, heretofore leading hand at Vancouver, has been appointed Car Foreman at Coquitlam, B.C.

A. STURROCK, heretofore Shop Foreman at Fort William, Ont., has been appointed Shop Foreman at Vancouver, B.C., vice J. Archibald, transferred.

C. J. BRASOR, heretofore Assistant Import Freight Agent, Chicago, Ill., has been appointed Agent, Foreign Freight Department, New York, vice L. D. Cole, resigned. Office, 1 Broadway.

J. J. MORTON, heretofore in the Import Freight Agent's office, Chicago, Ill., has been appointed acting Assistant Import Freight Agent there, vice C. J. Brasor, transferred to New York.

W. McLEOD has been appointed Assistant Chief of the Department of Investigation, Western Line, vice F. J. Andrews, assigned to other duties.

Grand Trunk Pacific Ry.—G. T. BELL, heretofore Assistant Passenger Traffic Manager, G.T.R., and G.T.P.R., has been appointed Passenger Traffic Manager, G.T.R. and G.T.P.R., vice W. E. Davis, deceased. Office, Montreal.

The following agents have been appointed:—Landis, Sask., A. G. Jamieson; Ebenezer, Sask., W. J. Pelland; Wabamun, Alta., L. A. Fadden; Edson, Alta., R. H. Christie; Pocohontas, Alta., B. B. Holland; Coalspur, Alta., W. L. Dobie.

Grand Trunk Ry.—G. T. BELL, heretofore Assistant Passenger Traffic Manager, G.T.R., and G.T.P.R., has been appointed Passenger Traffic Manager, G.T.R. and G.T.P.R., vice W. E. Davis, deceased. Office, Montreal.

H. WILLIAMS, Paymaster, Montreal, has been superannuated under the pension rules.

C. H. MASSIAH, heretofore in Treasurer's office, has been appointed Paymaster, vice H. Williams, superannuated. Office, Montreal.

W. M. TISDALE, heretofore of Woodstock, Ont., has been appointed Chief Special Agent, Eastern Lines, Montreal, vice James Hodge, transferred to Toronto.

V. G. SNELL, heretofore Soliciting Freight Agent, Montreal, has been appointed City Freight Agent, there. This is a new position.

R. A. BECKER has been appointed Supervisor of Signals, Eastern Lines, with charge of interlocking plants, automatic signals, electric crossing bells, etc. Office, Montreal.

JAS. EDWARD, heretofore Commercial Agent, Moncton, N.B., has been appointed Division Freight Agent, Ottawa, Ont., vice A. D. Huff, resigned.

G. PEPALL, Assistant Foreign Freight Agent, Toronto, heretofore in charge of the export traffic only, west of Belleville, Ont., to the Detroit and St. Clair Rivers, has been given charge of the import freight traffic also.

E. R. THORNE, heretofore Soliciting Freight Agent, has been appointed City Freight Agent, Toronto.

F. R. CLARK, heretofore Travelling Freight Agent, Toronto, has been appointed Soliciting Import Agent there.

F. G. GOULD, heretofore Soliciting Freight Agent, Toronto, has been appointed Travelling Freight Agent there, vice F. R. Clark, transferred.

G. S. DONALDSON, heretofore rate clerk, has been appointed Soliciting Freight Agent, Toronto, vice F. G. Gould, promoted.

E. R. THORPE, heretofore Soliciting Freight Agent, Toronto, has been appoint-

ed City Freight Agent, there. This is a new position.

W. H. PATTON has been appointed Supervisor of Signals, Ontario Lines. Office, Toronto.

JAMES HODGE, heretofore Chief Special Agent, Montreal, has been appointed Chief Special Agent, Ontario Lines. Office, Toronto.

R. R. ALBERTSON, heretofore ticket agent at Niagara Falls and Suspension Bridge, Ont., has been appointed depot ticket agent at Toronto, vice J. A. Telfer, superannuated.

A. S. MUNROE, heretofore Travelling Freight Agent, has been appointed Commercial Agent, London, Ont. This is a new position.

R. W. BENSETT has been appointed Supervisor of Signals, Detroit, Mich.

N. E. BAKER has been appointed Supervisor of Signals, Battle Creek, Mich.

The following agents have been appointed:—St. Bazile, Que., E. D. Auclair; Craigs Road, Que., J. E. Laplante; Levis (passenger), Que., J. S. Migneault; St. Michel, Que., L. H. Trudeau; Whites, Que., J. A. Roch; Beaconsfield, Que., H. E. Roy; Prescott, Ont., W. J. Ferguson; Aurora, Ont., H. Hall; Burlington, Ont., I. D. Hodgins; Wyebridge, Ont., A. Fallowfield; Stratford, Ont., H. MacDougall; Port Colborne, Ont., M. Broderick; Caledonia, Ont., W. Salkeld; Norwich B. & T., Ont., C. R. Anderson; Port Dover, Ont., C. W. Staib; Clifford, Ont., R. Axworthy; Greenfield, Ont., E. Levoeur; Arnprior, Ont., G. J. Valin; Toronto, outside agency, C. E. Jenney.

Halifax and Southwestern Ry.—J. Bain, heretofore Superintendent, has been appointed General Superintendent. Office, Halifax, N.S.

Intercolonial Ry.—The portion of the National Transcontinental Ry. between Moncton, N.B., and the Quebec boundary having been transferred to the I.R.C. until the complete line is taken over by the G.T. Pacific Ry., the jurisdiction of I.R.C. officials has been extended to cover operations over that line, and no special officers will be appointed.

See also Canadian Government Railways.

Kettle Valley Ry.—W. J. McLEAN, heretofore Master Mechanic, Duluth, Winnipeg and Pacific Ry., has been appointed Master Mechanic, K.V.R., as reported in our last issue. Office, Penticton, B.C.

Minneapolis, St. Paul and Sault Ste. Marie Ry.—E. FREMLIN, heretofore City Ticket Agent, C.P.R., Chatham, Ont., has been appointed Travelling Freight Agent, M. St. P. & S.S.M.R., Toronto, vice R. G. McCraw, resigned to enter Canadian Freight Association's service.

National Transcontinental Ry.—The portion of the N.T.R. between Moncton, N.B., and the Quebec boundary has been transferred to the Intercolonial Ry. for operation.

W. B. CRONK, General Superintendent, has resigned, and it is understood that E. P. CRONK, Superintendent at Edmundston, N.B., is also leaving the service.

M. C. MACFARLANE, heretofore Division Engineer, District F, has been appointed acting District Engineer, District F. Office, St. Boniface, Man.

North Ry.—A. T. TOMLINSON, M. Can. Soc. C.E., heretofore Consulting Engineer, has been appointed Chief Engineer. Office, Montreal.

G. L. MATTICE, M. Can. Soc. C.E., formerly in National Transcontinental Ry. service at North Bay, Ont., has been appointed District Engineer, N. Ry. Office, Montreal.

The following locating engineers have been appointed:—A. McLellan, A. W. Whit-

ney, W. D. Robertson, H. B. Tourigny and J. F. Rose.

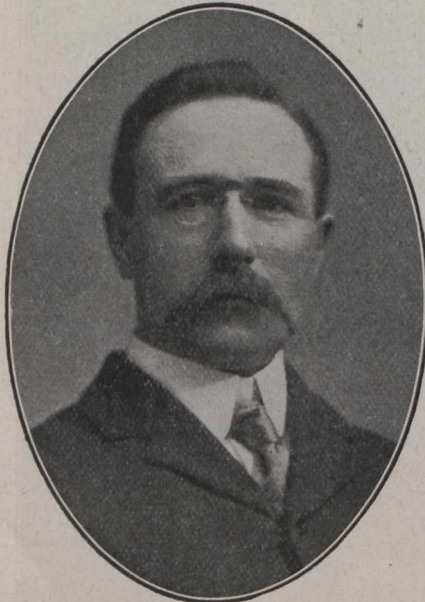
Oregon-Washington Rd. and Navigation Co.—A. E. D. STEWART, heretofore at Seattle, Wash., has been appointed Travelling Freight and Passenger Agent at Vancouver, B.C., vice J. B. Courtright, transferred.

J. B. COURTRIGHT, heretofore Travelling Freight and Passenger Agent at Vancouver, B.C., has been appointed City Ticket Agent at Tacoma, Wash.

Pere Marquette Rd.—N. McNEIL, heretofore in P.M.R. service at St. Thomas, Ont., is reported to have been appointed Agent at London, Ont., vice R. J. Tait, resigned on account of ill health.

Prince Edward Island Ry.—See Canadian Government Railways.

Western Canada Railway Club.—At the annual meeting in Winnipeg, May 9, the following officers, etc., were elected,—President, J. G. LeGrand, Bridge Engineer, G.T. Pacific Ry.; Vice Presidents, A. H. Eager, Superintendent of Shops, Canadian Northern Ry., and L. O. Genest, General Storekeeper, C.P.R.; Secretary, W. H. Rosevear; Treasurer, E. Humphreys; Executive Committee, A. McCowan, A. E. Cox, C.



J. Bain,
General Superintendent, Halifax and South
Western Railway.

Powell, L. Kon, J. Logan, T. G. Armstrong, W. L. Fallis and W. E. Dobbs; Audit Committee, J. B. Parker, A. C. Bray, and G. C. Walker.

The Northern Pacific Ry. announces the putting in operation of a new passenger service between St. Paul, Minn., and Winnipeg, Man., starting April 27. The train leaves St. Paul at 5.50 p.m., and running via Grand Forks, N.D., reaches Winnipeg, over the Canadian Northern Ry., and Midland Ry. of Manitoba tracks, at 8.50 a.m. returning from Winnipeg at 5.15 p.m., and reaching St. Paul, 8.11 a.m. The train consists of standard sleeping cars, drawing room car, dining and observation car. It runs into the Fort Garry Union Station, Winnipeg.

The Railway Storekeepers' Association, held its annual convention at Chicago, Ill., May 19 to 21, when in addition to a number of regular subjects, a list of topical subjects were discussed.

The usual half yearly meeting of the C.P.R. Master Mechanics was held at Winnipeg, May 5, when general matters coming under their jurisdiction were discussed.

Trade and Supply Notes.

The matter which appears under this heading is compiled, in most cases, from information supplied by the manufacturers of, or dealers in, the articles referred to, and in publishing the same we accept no responsibility. At the same time we wish our readers distinctly to understand that we are not paid for the publication of any of this matter, and that we will not consider any proposition to insert reading matter in our columns for pay or its equivalent. Advertising contracts will not be taken with any condition that accepting them will oblige us to publish reading notices. In other words, our reading columns are not for sale, either to advertisers or others.

THE UNITED STATES LIGHT AND Heating Co.'s directors have elected the following officers:—Chairman Board Directors, C. A. Starbuck; President, J. A. Smith; Vice Presidents, F. P. Frazier, W. P. Hawley; General Manager, A. H. Ackermann.

THE OHIO BRASS COMPANY, Mansfield, Ohio, was recently awarded a contract by the Boston Elevated Rd. Co. for 610 automatic air connecting coupler and draft gear equipments for heavy subway and elevated train service.

THE SAFETY CAR HEATING AND Lighting Co., New York, N.Y., has received an order for 16 type C Pintsch buoys with mantle lantern, from the 5th Lighthouse District, Baltimore, Md. These buoys are to be used to mark the Fort McHenry Channel, which is the approach to the city of Baltimore. The Lighthouse Department has completed a new tender, the Woodbine, a small boat equipped with kerosene engines of about 160 h.p., to take care of these buoys. They will be charged on station by equalizing pressure from high pressure flasks, the Woodbine being especially designed to carry the flasks. Arrangements are being made by the Safety Car Heating and Lighting Co. to equip the Pintsch plant at Baltimore with high pressure compressor to take care of this work.

The Travelling Engineers' Association will hold its 21st annual convention at Chicago, Ill., Aug. 12 to 15. Among the subjects to be discussed, and the papers to be read, are, uniform instruction to engineers on the handling of superheat locomotives, credit due to the operating department for power utilization and train movement which reduces the consumption of fuel per ton mile, the care of locomotive brake equipment on line or road and at terminals, and methods of locating and reporting defects, advantages obtained with the brick arch in locomotives, what we can do to eliminate the black smoke evil on locomotives, scientific train loading and tonnage rating and the best methods to obtain maximum tonnage haul for the engine over the entire division, taking into consideration the grades at different points on the division.

Grand Valley Ry.'s Freight Tariff.—On the application of E. B. Stockdale, General Manager, Trusts and Guarantee Co., Toronto, as Receiver for the Grand Valley Ry. Co., under sec. 327 of the Railways Act, the Board of Railway Commissioners has approved the Company's Standard Freight Tariff C.R.C. 3, to supersede Standard Freight Tariff C.R.C. 1.

The International Railway Fuel Association held its annual convention at Chicago, Ill., May 21 to 24, when a number of subjects were discussed, including, standard form of contract covering the purchase of railway fuel coal; location, construction, development and operation of a bituminous coal mine; sub bituminous and lignite coal as a locomotive fuel; self propelled railway passenger cars; scaling locomotive boilers and resultant fuel loss; modern locomotive coaling station, its design, construction, operation and maintenance.

Electric Railway Department.

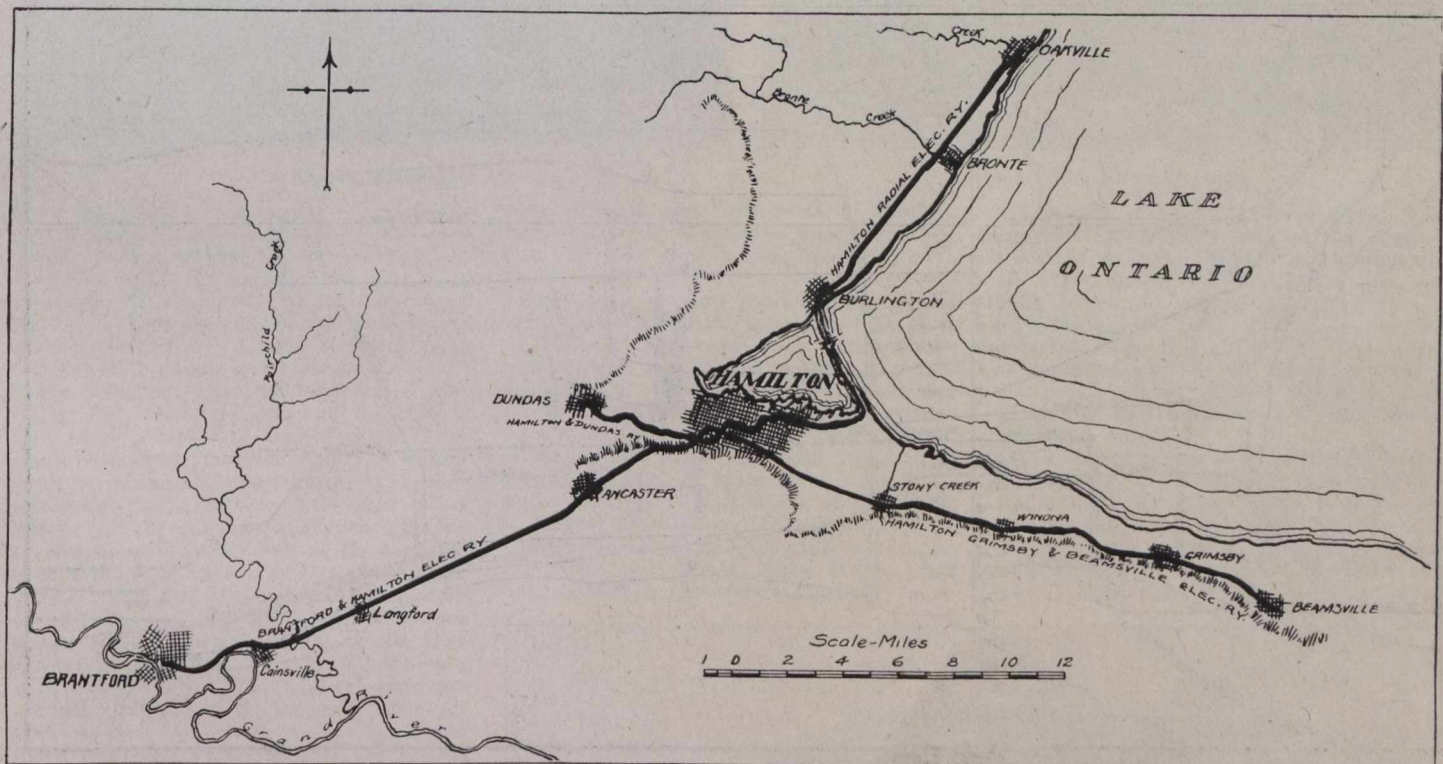
The Dominion Power and Transmission Co.'s Railway System.

The Dominion Power and Transmission Co. owns or controls the whole electric railway situation in and around Hamilton, Ont. The several companies operating electric railway lines, and certain of the electric power and transmission companies had, about 1900, been taken over by a holding company called the Hamilton Electric Light and Cataract Power Co. This company was expanded in its scope by the incorporation of the Hamilton Cataract, Power, Light and Traction Co., under an Ontario charter, Feb. 5, 1903, the new company absorbing all the interests of the other company with its several subsidiary companies.

way situation in Hamilton and vicinity. The completion of the Hamilton terminal building shortly after the incorporation of the new company, enabled the several subsidiary companies to move their offices to this central point, and while the original companies are still retained in their initial form, the holding company acts as the administrative company for them all.

The Hamilton Street Ry. operates on all the electric railway lines in the city on which a purely local business is conducted, and is a unit apart from the radial lines, which, while operating over the lines of the street railway company in the centre of the city, have for the most part their

cline Ry. line runs up to the foot of the mountain on James South, returning as far north as the crossover just north of King St., a total return distance of 1½ miles. From the same crossover, the Wentworth St. line runs along King East and up Wentworth St., the latter a single track line to the foot of the east end incline railway, a return distance of 3¼ miles. The remaining line is that on York St., which crosses over at the corner of James St., running out York to Dundurn Park, a round trip distance of 2¾ miles. These are all the purely local lines owned by the street railway company, but over the radial line the King East and Barton line



Radial Lines of the Dominion Power and Transmission Co.

The Dominion Power and Transmission Co. was incorporated by Dominion charter, Jan. 22, 1907, to absorb the Hamilton Cataract, Power, Light and Traction Co., a move made necessary by the urgent demands for an increase in the financial capacity of the latter company, which had become inadequate to meet the expansion in the company's business, and contemplated extensions. As four fifths of the old company's stock was taken over, the new company was in every way a successor to the former one, only on a much larger scale. The electric railway and related companies taken over from the Cataract Co. in this merger, included the Hamilton Radial Electric Ry. Co., Hamilton Street Ry. Co., Hamilton and Dundas Street Ry. Co., Hamilton Electric Light and Power Co., and the Lincoln Electric Light and Power Co. In addition, the company acquired the direct ownership of the Brantford and Hamilton Electric Ry. Co., and the Hamilton Terminal Co., both of which were then building, and the control of the Hamilton, Grimsby and Beamsville Electric Ry. Co., giving complete control of the electric rail-

own lines, acquired in the early days before the present amalgamation. The routing of the several city lines, of which there are six, is shown in the accompanying map of the city. The six lines are as follows:—G.T.R. and James South, James North and King West, King East and Barton, Wentworth St., Incline Ry., and York St. The G.T.R. and James South line, leaving the G.T.R. station, runs south on James St., west on Herkimer St., and around via King West to James St., and thence back to the station, a total round trip distance of 4¼ miles. The James North and King West line might be termed the reverse of the last mentioned route, following James St. south from the boat wharf, along King West, and around the loop via Herkimer St. to James and back to the wharf, a total distance of 5 miles. The King East and Barton line follows a U route, along King East from Sherman St. to James, and thence north to Barton St., travelling east to the other terminus at Ottawa St. The total round trip distance is 10½ miles, the longest route of any of the city car lines. The remaining three lines are stubs. The In-

operates alternate cars from the point where the radial line crosses Barton St., out through the industrial area, to the large plants of the newer industries that have been established in Hamilton of recent years. This line is called the Deering section of the King East and Barton line, on account of the fact that the Deering plant of the International Harvester Co. is the largest plant served on the division.

The traffic on the street railway lines is particularly heavy, as Hamilton is so laid out along the foot of the mountain as to make the distances from east to west considerable. From the fact that the city depends for the most part on its industries, the street car traffic fluctuates from very light during factory hours, to heavy rushes through short periods before and after factory hours. The heaviest rush hour traffic is from the Deering section of the King East and Barton line, where the bulk of the factories are located. For this rush hour service on this section, it is possible for the company to use the poorest of its equipment, for the bulk of the traffic transported from that section is of the

rough, foreign element. During 1912, the street railway lines moved a total of 14,100,000 people. To accommodate this large number, the normal service on the lines consists of 36 cars, which is increased to 46 on the main lines during rush hours. In addition there are held in reserve some 25 for heavy rush hour service, particularly over the Deering line.

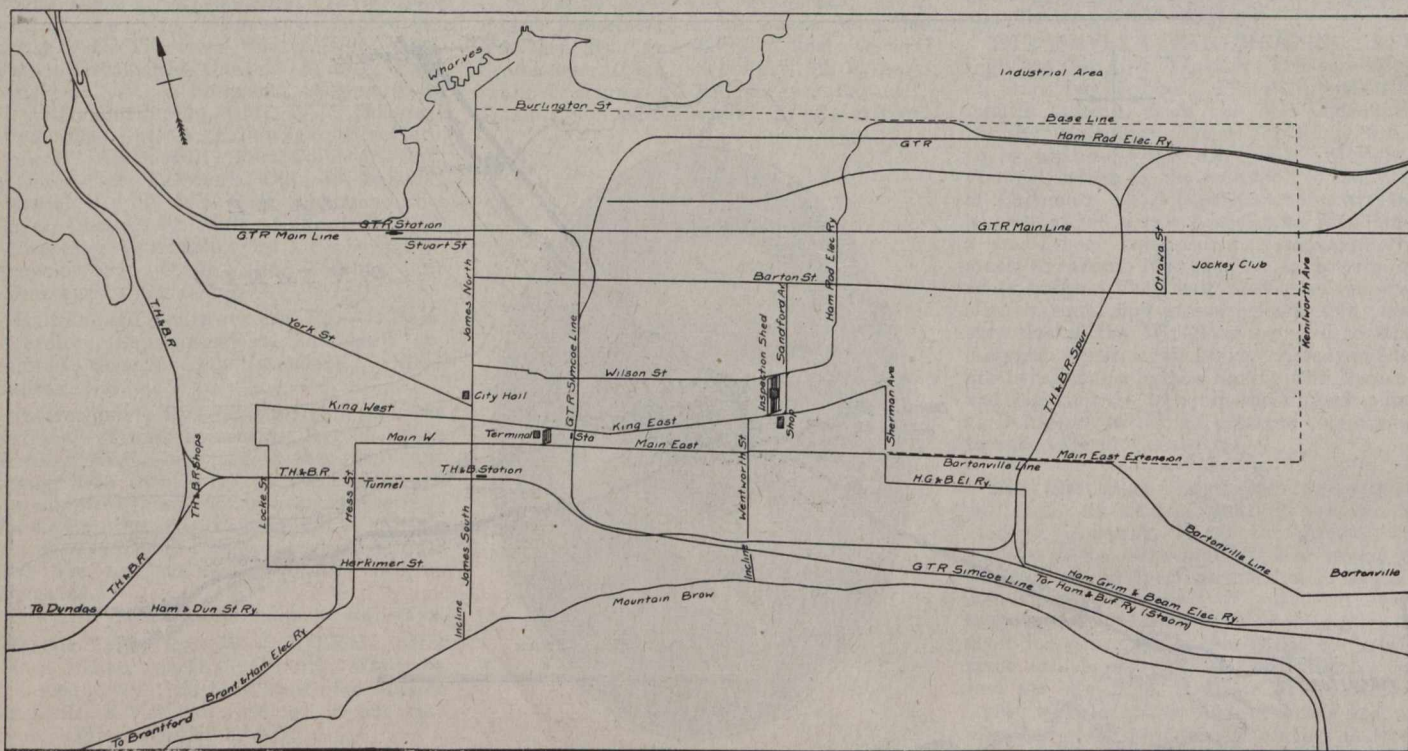
The rolling stock consists of a total of 95 passenger cars, 44 of which are double truck. The latest types of both single and double truck cars used on the lines are shown in the accompanying illustrations. The equipment has been considerably increased of late by the addition of quite a number of these two types of cars, which are of the very latest type of construction. The additional equipment consists of three sweepers and a sand car.

For several years, no extensions have been made to the city system, as the lines as then existing covered such a wide territory that additional mileage would not have proved profitable. This year, several

housing summer cars in winter, and vice versa. All the daily movements are from the other barn. The inspection shed is shown herewith. It is a brick building, with reinforced concrete column and roof construction, 160 ft. long, and 4 tracks wide. Along the east side are separate rooms, a central one containing the heating apparatus, consisting essentially of a 60 h.p. boiler for heating the shop by the vacuum system. The four through tracks have pits in the shop section, the east pit having 4 drops in addition, for the removal of motors and wheels. Covered storage space for cars in daily service is not deemed necessary. To the rear of the inspection shed, the 4 tracks extend to Wilson St., this space to the rear being used for storage purposes. In addition to these four through tracks, there are three additional ones on the west side, and one on the east side, one on each side being a through track. The side rooms of the inspection building contain carmen's room and local repair room for light running repairs. A

the machine shop. Over the top of the machine shop is the winding room, reached by an elevator, where repairs to the armature and field coils are attended to. On the other side of the erecting shop, over the top, is the woodworking department. While the whole shop is very congested, and the equipment small, the work turned out is unusual. In these shops, many of the older cars have been completely remodelled, and heavy repairs are constantly being put through. A complete new car has even been constructed. The present understanding is that the shop will not be in service for any great length of time for its present work, as a complete new shop is projected, the details of which have not as yet been developed.

The radial lines emanating from Hamilton are four in number, covering the principal districts around the city. Each of the separate companies maintains its own separate existence financially, but in all other respects there is no distinction among the several lines operated by the Dominion



Street, Radial, and Steam Railway Lines in Hamilton.

extensions are contemplated, one of which is at present under way. This latter, the main one of the additions, is to be a double track line from James North, near the waterfront, along Burlington St. and the base line, paralleling the radial line in the industrial area to Kenilworth Ave., the terminus of the extension. It is also proposed to extend the Barton St. line from its present terminus at Ottawa St., along in front of the Jockey Club, also to Kenilworth Ave., and similarly with the King East line from the terminus at Sherman Ave., along Main East to Kenilworth Ave. These three extensions are to be joined up by a connecting line from the base line to Main East. These extensions are taking in the sections of the city that are growing most rapidly, the development in the east end being quite phenomenal.

The company's shops are not very extensive. The repair shops are on the south side of King East and Sanford Ave., and across the street, on the north side, is the inspection shed. Another shed on Stuart St., near the G.T.R. station, a former horse car barn, is used for storage purposes,

small building to the west of the main building contains the fender making and repairing department. From King East, the cars enter the shed and yard from a single ladder track from King East, and can be drawn from the storage yard along the single service track along Wilson Ave. to the rear of the yard. This line leads along to the street railway operating office at the corner of James North and Gore St. There is also another single track service line from the rear of the yards on Sanford Ave. to Barton St., which serves as a cut off in running the cars into the industrial area from the car sheds in the rush hours, and means a saving of considerable dead mileage.

The repair shop, across from the inspection shed, is an old building, containing two through tracks from King East, terminating in a turntable at the rear, over which the cars can be turned out into Sanford St. or into the paint shed, which is in a building to the rear and west of the main shop. The main shop has two pits under the two through tracks. Along the side of this erecting portion of the shop is

ion Power and Transmission Co. Two of the companies operate under Dominion charters, and the other two under Ontario charters, which introduces a peculiar element into the operation of the lines, as each pair comes under different railway jurisdiction.

For the purposes of furthering the usefulness of the consolidation of the different lines, a central terminal station was built immediately after the formation of the new company, owned and operated by the Hamilton Terminal Co., a subsidiary company, in which are located all the officials of the main company, and the offices for the lighting and power business conducted by the company in conjunction with its railway interests. It is a large four story and basement structure of considerable architectural beauty, and was described in Canadian Railway and Marine World at the time of construction. It occupies a central position on King East, not far from the Gore at the corner of King and James. On the east side of the terminal building are four tracks extending through from King East to Main East, the

first street to the south. This latter street is the main artery for radial cars, three of the lines branching off from this single track cross town line. The main floor of the terminal building contains a commodious waiting room with ticket clerk and other facilities such as would be found in any well appointed steam railway station. The cars for the several lines come into the tracks at the side of the station. The company owns the Temple Theatre, a vaudeville house to the rear of the terminal station, which is a very productive traffic drawing project.

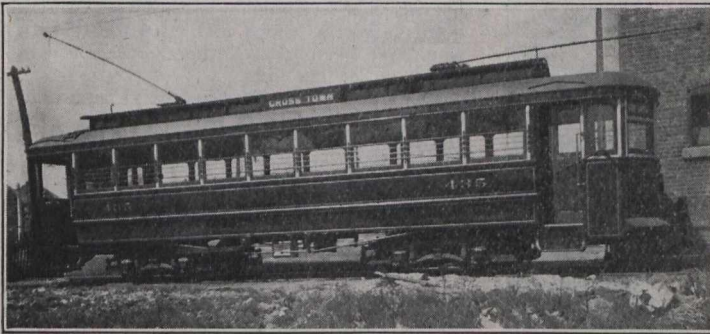
All the several lines house their equipment in the yards mentioned earlier, where all the repairs to the cars are made as well

quired, but at the Dundas end there is a complete station, with agent and usual station facilities. The line follows the highway throughout its full length.

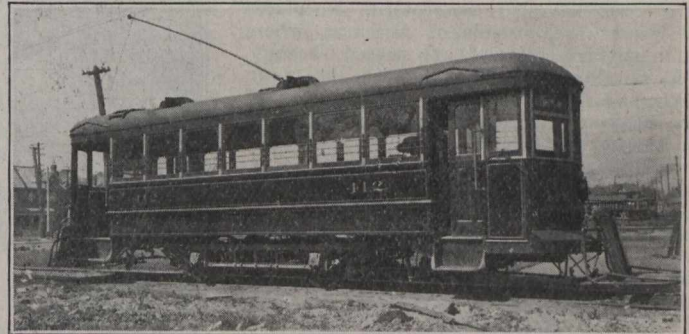
THE HAMILTON RADIAL ELECTRIC Ry. carries the heaviest business of any of the radial lines running out of Hamilton. This company operates under a Dominion charter. For a number of years it was operated as far as Burlington, and about 1908 was extended to Oakville. The rolling stock consists of 7 double truck passenger cars and a freight car. The traffic over this line is almost exclusively passenger, particularly in the summer when Burlington Beach is in full swing. Leaving the terminal station and travelling east along

different conditions, which are met by the addition of a special service as far as the Beach. It is over this line that the heaviest traffic is carried. The summer service is half hourly, and while the cars cannot operate in trains, they frequently leave in sets of 4 and 5, running on very close headway. The total passenger traffic on the line this last year was 1,165,000. Practically no freight is handled over the line.

THE HAMILTON, GRIMSBY AND Beamsville Electric Ry. is one of the oldest units of the system, operating under an Ontario charter obtained in the 90's. It extends from Hamilton to Beamsville, 22 miles, through the populous fruit district of the Niagara peninsula. This territory



Typical Double Truck City Car.



Typical Single Truck City Car.

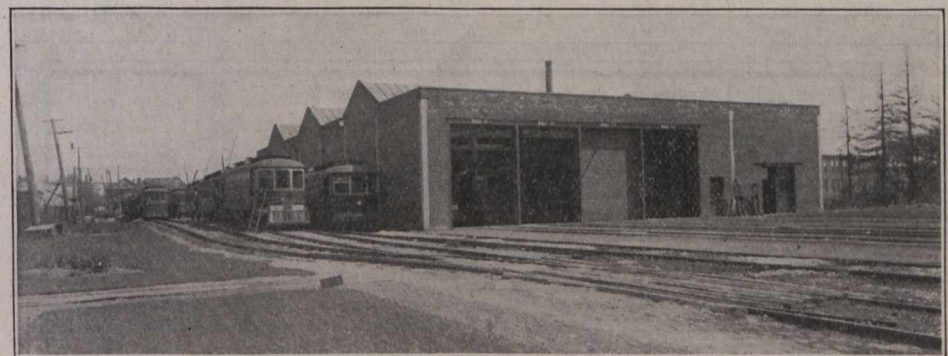
Each line owns a certain proportion of the radial rolling stock, although the cars owned by the different companies may not be operating on the lines of that particular company, the separation of the cars being merely for convenience in car accounting, the distribution of the cars over the lines following the exigencies of the service.

The Hamilton Terminal Co. owns 6 passenger cars, 1 freight car, and 1 combination snow plough and freight car. These cars are used as a surplus supply of rolling stock to relieve the line requiring the additional equipment for any particular emergency. All the passenger cars owned by the several radial lines, as well as the terminal company, are of the heavy interurban type, double truck, and of a very solid construction throughout. Several different designs are in service, but in general details they are very much alike. They are all equipped with straight air. The freight motor cars are all equipped with the automatic air brake system for service in handling steam line freight cars in trains over the system and in interchange work.

THE HAMILTON AND DUNDAS Street Ry. is one of the principal lines running out of Hamilton. It has an Ontario charter. On leaving the terminal station it follows Main St. to James South, and thence along Herkimer St. to the country highways, which it follows into Dundas. The traffic handled is almost exclusively passenger, and, in consequence, the equipment only includes three double truck passenger cars. The total passenger traffic last year was 707,500. A large number of people employed in Hamilton live in Dundas, giving heavy morning and evening loads. Apart from this heavy through traffic, there is a great deal of local traffic picked up, as the line passes through suburbs of the city not as closely served by the city lines. The H. & D. line also passes through a growing settlement between the two termini called the West Hamilton survey, which also augments the local traffic. The line runs 18 cars a day each way. The total length of the line between termini is 7 miles, with 5 principal intermediate stops. As there are no important self contained settlements intervening, no stations along the line are re-

quired, but at the Dundas end there is a complete station, with agent and usual station facilities. The line follows the highway throughout its full length. Leaving the city limits on the base line, the line continues on a double track, following its own right of way as far as the southern approach to the Beach, when it again goes on the highway. Passing the full length of the Beach, it crosses the canal on the highway bridge, and then on to Burlington, this latter portion from the bridge being single track line, as that is the end of the heavy sum-

mer beach traffic. From Burlington, the line follows its own right of way through a prosperous farming community, and through the village of Bronte to Oakville, the eastern terminus. The single track portion of the line at the time of construction was graded all the way, for the subsequent addition of a second track. Up to the present, the traffic has not warranted this addition. Between termini, there are 9 main stops, with numerous intermediate flag stops. The Oakville terminal is a complete station, with agent.



Inspection Shed and Storage Yards.

mer beach traffic. From Burlington, the line follows its own right of way through a prosperous farming community, and through the village of Bronte to Oakville, the eastern terminus. The single track portion of the line at the time of construction was graded all the way, for the subsequent addition of a second track. Up to the present, the traffic has not warranted this addition. Between termini, there are 9 main stops, with numerous intermediate flag stops. The Oakville terminal is a complete station, with agent.

The total length of the line is 21½ miles, over which there are operated during the winter 18 cars a day each way. During the summer the heavy beach traffic creates

the summer, from June on through into the winter, is particularly heavy. In addition, in the early spring, the shipments of nursery stock from off the line are considerable, and the volume of traffic is such as to keep the company's freight motors in constant service.

This line has a direct connection with the C.P.R. and T.H. & B.R. at Kinnear, in East Hamilton. The principal outside connection for freight originating on the line is with the G.T.R. at Winona, where the latter company has put in comparatively extensive yards for the handling of the interchange freight.

Between the two termini there are 12 principal stops, and at four of the stations

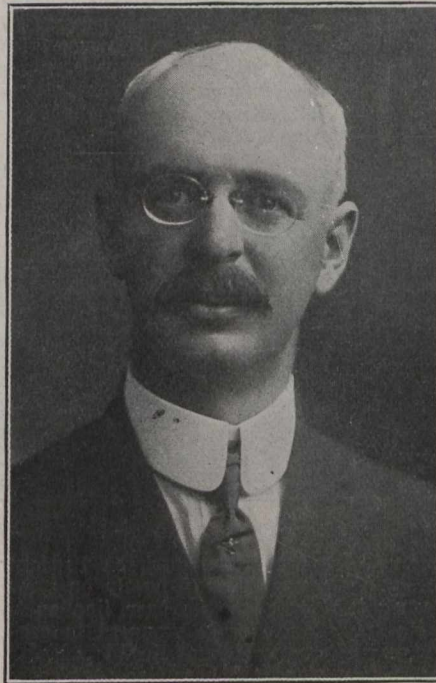
along the line, Stoney Creek, Winona, Grimsby and Beamsville, there are agents. There are numerous intermediate flag points. 18 cars per day are operated each way, exclusive of the excursion traffic to Grimsby Beach, a distance of 20 miles from Hamilton, which is heavy in the summer.

THE BRANTFORD AND HAMILTON Electric Ry. is the newest of the radial lines running out of Hamilton, extending from that city to Brantford, 23 miles. This line leaves Hamilton from the terminal station, going along Main and Hess Sts., and out of the city on its own right of way, which it follows to Brantford, going into that city along the canal in the lower part of the town. The route followed is very hilly, the height of land between the two towns having to be crossed. No places of importance, outside of Ancaster, where an agent is stationed, are passed through. The development along this line has been rather marked, considering the newness of the project. On account of the frequency of the service, a large through traffic between the cities has been developed. This, in addition to the local traffic picked up along the line for both cities, brought the number of passengers carried up to 490,500 last year. The fact that both ends of the line are in prospering cities has been a most important factor in booming the road. But little freight traffic is handled.

Power for all the companies lines, and for distribution in its capacity of power transmitter, is generated at DeCew Falls, near St. Catharines. This plant has a very high head, and with large storage areas under the company's control, a plant of very high efficiency has been developed. Its total capacity is 43,600 k.w., produced in 10 generators, ranging in capacity from 2,500 to 4,600 k.w. each, with 500 k.w. exciter unit. Power is developed at 2,400 volts, 3 phase, and 66 cycles. The original installation use 66 cycles, an odd frequency for modern installations, and in consequence, subsequent installations have had to be the same. Sixty cycle equipment can be used on the system by speeding up.

At the power plant, the pressure is stepped up to 40,000 volts, for transmission to the different points on the line, and for power purposes, the company having about 200 miles of transmission lines.

of which contain in each in addition to other equipment, a 2,000 k.w. d.c. set. On the Oakville line, there is a 450 k.w. d.c. set at Burlington, and a 250 k.w. d.c. set at Oakville. On the Brantford line is a 600 k.w. d.c. set at Brantford, and two intermediate sets of similar capacity en route. The Beamsville line has a 600 k.w. d.c. set at Grimsby, and a 300 k.w. d.c. set at Stoney Creek. There are other stations at



E. P. Coleman,
General Manager, Dominion Power and Transmission Co., Ltd.

points along the line for the supply of power for local municipalities and industries.

The officials of the company are as follows:—J. R. Moodie, President; W. C. Hawkins, Managing Director; E. P. Coleman, General Manager; G. E. Waller, Gen. Supt. of Railways; W. G. Angus, Gen. Supt. of Light and Power; D. N. Miller, Supt. Street Ry.; F. B. Griffith, Superintendent

New Car Shed and Shop for London and Lake Erie Ry. and Transportation Co.

A plan of this company's new car shed and shop at St. Thomas, Ont., mentioned some time ago in these columns, is shown in the accompanying illustration. The line operates between London and Port Stanley, a resort on Lake Erie, a distance of 22 miles, passing through St. Thomas, 14 miles from London. The principal normal service is between these two cities, but in the summer a heavy traffic is carried from both these cities to the lake. The method of conducting this traffic by the aid of double truck trailers was described in these columns in Oct., 1912. For general operation, St. Thomas is the most central point, and the shops and transformer station have been located there since the construction of the line.

The shed shown has recently been completed. It is a brick structure 210 by 90 ft., with four full length tracks, giving sufficient accommodation for the company's full rolling stock equipment of sixteen 50 ft. cars. This, however, is never required, as several are always located at the London terminal.

The main part of the building is divided into two sections by a central fire wall. The east, or repair shop section, contains two pits, one the full length of the building, and the other half the length, running forward from the rear of the building, both 5 ft. 7 ins. deep, a normal pit depth. Near the rear of the shop is a cross pit, on which the trucks for cars over the inspection pits may be removed by means of intersecting turntables. The rear section of the shop adjoining this cross pit is for truck repairs.

The several shops are located in rooms along the east wall, and comprise a carpenter, blacksmith, machine and winding shop. In front of these is the store room, with the superintendent's office at the front end, opening both to the shop and street. The shop is equipped with overhead travelling crane.

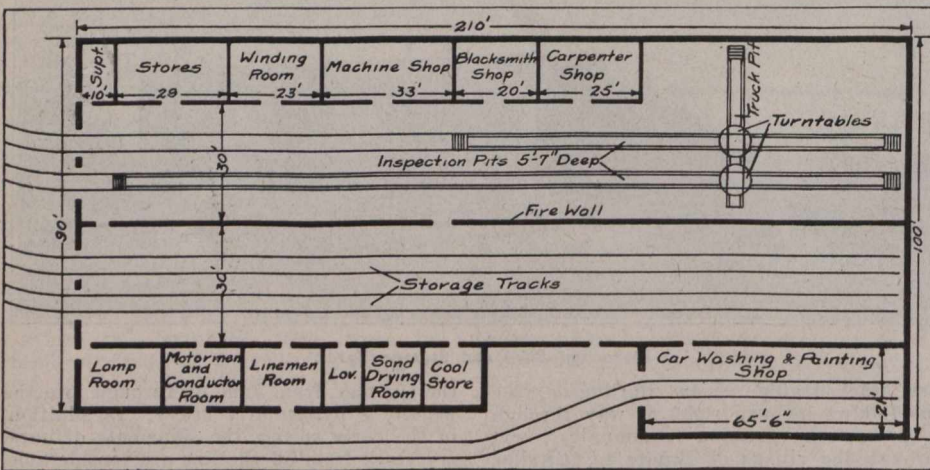
The west portion of the building contains two plain storage tracks, separated from the repair shop by the fire wall. Along the west wall, outside this section, are the auxiliary rooms, in a long lean-to building.

A car washing and painting shop is provided to the rear of these rooms, entered from the outside, and completely separated from the main building by a fire wall, a necessary precaution for a paint shop. This shop is 65½ ft. long, and will conveniently accommodate one car.

The shops are located on the south side of Talbot St., the main street of St. Thomas, at the west end of the city, at the point where the line leaves the city streets northbound on its own right of way. The new transformer station is located alongside to the west. This latter building also contains the local ticket office and waiting room. To the rear is the company's local freight shed.

The Illinois Traction Co., an electric traction system, doing steam railway work, under a steam railway charter, carried 40,000 passengers during the past year in its electric sleeping cars, and has ordered new cars of this type to meet the demands of an increased traffic.

The Sandwich, Windsor and Amherstburg Ry. gave an increase to its conductors and motormen on May 1. The old wages were from 20 to 22½c. an hour, the new ones are from 23c to 25c. The men will receive an increase of ½c. an hour every 6 months until they reach the maximum of 25 cents.



London and Lake Erie Railway and Transportation Co.'s Car Shed and Shop.

Only the lines for railway purposes will be considered. Between DeCew Falls and Hamilton, there are three distinct transmission lines, two on the height of land, and the third along the lower land. These all come to an open air switching station in Hamilton. At different points along the line, the pressure is stepped down and changed to d.c. in motor generator sets. In Hamilton, there are three substations, two

Interurban Railway Division and Claims Agent; C. K. Green, Superintendent of Construction; J. B. Griffith, Purchasing Agent; and J. O. Binkley, Shop Superintendent.

The switchboard which the Bell Telephone Co. recently installed in the tower of the new C.P.R. Windsor St Station, Montreal, has a capacity for 1,200 lines.

British Columbia Electric Ry. Construction, Betterments, Etc.

The company has announced plans for the erection of three car barns, these being extensions of its present buildings of this class in Vancouver, New Westminster and North Vancouver. The Vancouver car barns will be 400 ft. by 52 ft., to accommodate 40 cars on four tracks. The location is along the Lulu Island Ry. line, and the barn will serve both its interurban division and several branches of the Vancouver city lines. Tracks will be laid from the Kitsilano line, and also from the 4th Avenue line, entering the barns from opposite sides. The building will have a concrete foundation and will be built of wooden frame covered with corrugated iron. At present a small barn is located at the point, which is equipped with shops for emergency repairs. The plans call for a duplication of the new barn on a location immediately to the east in the near future. The new barns at New Westminster will be on 12th Street, and will be 240 by 104 ft. Eight tracks will be provided into these barns, which will accommodate the cars of the New Westminster city line and the interurban branches of the company's service. This structure will also have a concrete foundation, with building of corrugated iron. The North Vancouver barn will have a concrete foundation and steel frame, covered with corrugated iron. It will not be as large as the Vancouver or New Westminster barns, but will amply provide for the accommodation of the North Vancouver cars for some time to come.

J. R. Freeman, the engineer who is representing the Dominion Government in connection with the erection of the great dam at the outlet of Lake Coquitlam by the B. C. Electric Ry. Co., recently made an inspection of the work and addressed a public meeting at New Westminster. Press reports quote him as saying that G. R. G. Conway, Chief Engineer, B. C. E. Ry. Co., had co-operated with him concerning the construction of the dam in every possible way and, as a result, it will be one of the safest in the world. The water supply of New Westminster is taken from Lake Coquitlam, and Mr. Freeman said that the provisions made by the company to preserve the purity of this supply entailed an expenditure of nearly \$1,000,000, this covering clearing about the lake, erection of new water works intake, etc. The dam will probably be completed in June, this being in advance of expectations. It will be 98 ft. high and 600 ft. wide at the base, and 850 ft. long and 40 ft. wide on the crest. In the construction 1,055,000 cu. yds. of material will be handled. The storage capacity will be 7,404,000,000 cu. ft., giving a reserve supply during the dry season of over 53,700,000 k.w.h. of electric energy.

The company has offered to construct a four mile line across West Vancouver Municipality, as an extension of the North Vancouver lines. West Vancouver was recently created as a separate district, and the company has rights in the section by reason of a franchise covering the old municipality at North Vancouver. As West Vancouver is but sparsely settled, the offer to build the line requires that a guarantee be given as to operating expenses other than interest on invested capital. The annual cost of operating an hourly service over the line is estimated at \$10,000 a year. The question is under negotiation between the company and the municipal authorities.

The electors of Burnaby Municipality recently granted the franchise covering tram transportation for 36½ years, the vote be-

ing 713 for, and 299 against, thus giving a good majority over the requisite three fifths. The immediate demands of the franchise are that the company shall build a line of two-miles on Hastings St. East, this being an extension of its Vancouver line. Another line one mile long, is to be built on the North Road, as soon as arrangements are made for the high level bridge over the Brunette River, this line being an extension of the New Westminster lines.

The company has decided to build a large repair shop on D.L. 118, Burnaby Municipality, just outside the city of Vancouver. Westinghouse, Church, Kerr and Co. have been engaged as consulting engineers for this plant and their staff is preparing plans. It is the company's intention to make these shops up to date in every particular, the idea being that this plant shall do all the heavier repair work for all lines operating on the southern mainland of British Columbia. The shops will be called the Horne-Payne repair shops, in honor of the Chairman of the Board of Directors, R. M. Horne-Payne, of London, Eng.

Wages on Regina Municipal Railway.

The Regina Municipal Railway has recently advanced the pay of conductors and motormen, a comparison of the old and new rates per hour being given below:—

	Old.	New.
First 6 months	25c	27½c
Second 6 months	28c	30c
Second year	30c	35c
Third year and thereafter ..	32c	37½c

The above is on a basis of 10 hours per day. Men without experience are not paid until proficient.

Proposed Electric Ry. for Medicine Hat.

The City Council of Medicine Hat, Alta., has entered into a preliminary agreement with the Montreal Engineering Co., for the building of an electric railway in the city, and will submit a bylaw approving of the same to a vote of the ratepayers. The company is given an exclusive franchise for 20 years within the present city boundaries, or any extended boundaries. Construction is to be started within three months, and three miles of line are to be put in operation within nine months; an additional three miles within 12 months, and a further three miles within 20 months after the final signing of the agreement. The location of these nine miles is to be fixed by the council, and further extensions are to be located as the population warrants. The company is to pay taxes on lands used for its purposes until the population reaches 40,000; after which it is to pay taxes and 5% of its gross earnings until the city has a population of 100,000, when 10% of the gross earnings in addition to taxes is to become payable. The city has full power over the streets on which the lines are to be built, and is to decide the style of construction, and to control the schedule on which the cars are to be operated. The city may take over the franchise at the expiration of the 20 years, at valuation plus 15%. This price is not to include land, or anything for the franchise. The company is to accept the city's 5% bonds in payment. If the city does not take over the line at the end of 20 years, the franchise is to be extended for five years, at the end of which time the city may take over the line at valuation. The company has the right to transfer the present agreement to a company to be incorporated under the name of the

Medicine Hat Electric Ry. Co., but it cannot amalgamate with any other similar company unless with the consent of the city. The route of the nine miles is named in the agreement. Starting from the City Hall, the lines will reach the exhibition grounds, the Canada Cement Co.'s plant, and the Maple Leaf Milling Co.'s plant. The city is to supply natural gas at five cents per 1,000 ft., or electricity at one cent per k.w. hour, for the operation of the cars. (Dec., 1912. pg. 622.)

Toronto and York Radial Railway Legislation.

The Ontario Legislature, at its recent session, passed an Act respecting the T. & Y. R. Ry. Co., giving it the power to have a second track on a portion of Yonge St., Toronto, to build lines to connect its present Toronto termini and to operate its Metropolitan Division from Toronto to Lake Simcoe on Sundays, the latter right having previously been confined to its Scarboro and Mimico Divisions. The principal provisions are as follows:—

The company may, subject to the provisions of The Municipal Franchises Act, construct, equip and maintain double tracks upon Yonge St., in the city of Toronto, from the point where the company's rails leave Yonge St., near Woodlawn Ave., to the northerly limits of the city, and may operate upon the double tracks, subject to an agreement to be entered into with the city.

The Ontario Statutes, 1898, chap. 66, sec. 21, sub. sec. 16, which provided that the issue of bonds, debentures or other securities authorized should not exceed \$20,000 for each mile of street railway track constructed or under contract for construction, has been amended by limiting the issue of bonds, etc., to \$30,000 for each mile of single railway track.

The company may operate its cars upon its Metropolitan Division, or upon any part thereof, upon Sunday for the carrying of passengers only, except as provided for in subsec. 2, sec. 136, chap. 209, Revised Statutes of Ontario, 1897, subject to regulations to be imposed by the Ontario Railway and Municipal Board. The subsection referred to allows cars to be run into the city on Sundays up to 10 a.m., for the transportation of milk, and out of the city after 5 p.m.

The company may, subject to the provisions of The Municipal Franchises Act, survey, construct, equip and maintain railways, extensions and branches between and to connect the present Toronto termini of its Scarboro, its Metropolitan and its Mimico Divisions, either upon, across, over or under such highways within the city of Toronto as the city may agree to, and upon such highways as may be agreed upon by the other municipalities having the respective control thereof, and the company, or upon private right of way, or upon both such highways and such private right of way.

The company's extensions and branches authorized by that and previous Acts are to be commenced within two years and completed within five years of the passing of the Act.

L. A. Rivet, K.C., has been nominated by the Attorney General of Quebec, to oppose the contentions of the Montreal Tramways Co. before the Court of Appeals. These proceedings involve the jurisdiction of the Public Utilities Commission to intervene in the matters in regard to which the M. T. Co., and the Montreal City Council differ.

Electric Railway Projects, Construction, Betterments, Etc.

Brandon Municipal Ry.—The first car was run over this electric street railway, May —. (Feb., pg. 90.)

British Columbia Electric Ry.—The site is being cleared for the suburban car terminal facilities at the corner of Pandora Ave. and Douglas St., Victoria. The tracks to connect the different city lines with the terminals are being laid. (May, pg. 235.)

Additional information will be found under "British Columbia Electric Ry. Construction, Betterments, etc." on another page.

Buffalo and Fort Erie Ferry and Ry. Co.—The Ontario Legislature has authorized the company to increase its capital stock, first mortgage and refunding bonds, for the purpose of electrifying the present line between Fort Erie Ferry and Fort Erie Beach, Ont. It is reported that the line will be extended at an early date to Bridgeport and Port Colborne. (April, pg. 185.)

Burrard-Westminster Boundary Ry. and Navigation Co.—We are officially advised that it is the intention of the British Columbia Government to make an expenditure of \$200,000 on the preliminary work on the projected bridge across the Pitt River at Coquitlam this year. This bridge is to be built in connection with a railway from Vancouver to Mission City. The estimated total cost of the bridge is \$500,000. The line in connection with which the bridge is to be built is a section of the lines authorized to be constructed by the B.-W.B. Ry. and Navigation Co., which is owned by the Western Canada Power Co. The annual meeting of the W. C. P. Co. was held in Ottawa, April 28. Following are the officers and directors for the current year:—President, C. A. Cahan, K.C.; Vice President, T. J. Drummond; other directors:—A. R. Doble, W. McNeill, C. Sweeney, A. H. B. Mackenzie, R. F. Hayward, D. F. Hicks; Secretary-Treasurer, O. B. McCallum; Assistant Secretary-Treasurer, C. H. Lowe. The company is supplying 40,000 h.p. of current to the British Columbia Electric Ry., and has contracts for the supply of 65,000 h.p. The company has power to develop 100,000 h.p., the plant for the delivery of which it expects to have completed by 1920. (April, pg. 185.)

The Canadian Resources Development Co., which owns a considerable area of property in the vicinity of Port Arthur, Ont., has, for the purpose of opening it up, built an electric railway, 1.5 miles, from Fort William Road, westerly along Central Ave., to the golf links road. The company has one double end car on the line, 101 B. 2 Westinghouse motor. W. W. Lock, Port Arthur, is Manager.

Cape Breton Electric Co.—At a special meeting of the Sydney, N.S., City Council, May 5, it was decided to permit the building of some additional lines in the vicinity of the car barns, and a siding on Prince St., on condition that an improved service be given to the pier and that material be placed between the tracks as desired by the engineer. The Council urged the company to extend its tracks along Victoria Road to Broadview, or to New Waterford, (May, pg. 235.)

Dominion Power and Transmission Co.—Ex-Mayor Patterson of Galt, Ont., is reported to have stated, May 17, that he had authority from E. P. Coleman, General Manager, Dominion Power and Transmission Co., for the statement that construction will be started at an early date on an electric railway line to connect Hamilton with Galt, Ont. The new line will branch

off from the company's Brantford and Hamilton Ry., and is expected to run via Lynden and Troy to a point west of Sheffield, and then parallel to the Stone Road, entering Galt at East Main St., with the idea of having a union terminal with the Lake Erie & Northern Ry. (Jan., pg. 39.)

Dunnville, Wellandport and Beamsville Electric Ry.—The Dunnville, Ont., Town Council has granted the company an extension of a year within which to build its line in that town. The grading of the line between Dunnville and St. Anns is nearly completed, the bridges are built, and ties have been laid for some distance. The line will connect at St. Anns with the Toronto, Hamilton and Buffalo Ry., and it is expected to have this section in operation by the fall. A bylaw granting the company a franchise for a system of lines in the town has been prepared and will be submitted to the ratepayers at an early date. J. A. Ross, Wellandport, Ont., is President, and M. R. Campbell, Wellandport, is Secretary. (Oct., 1912, pg. 520.)

Forest Hill Electric Ry.—The Ontario Legislature has incorporated a company with this title to build the lines described on pg. 141 of our March issue. (April, pg. 185.)

The Frontier Electric Ry. announces that work will be begun shortly on its line to connect Niagara Falls, Buffalo, Tonawanda and North Tonawanda, N.Y.

Guelph Radial Ry.—Press reports state that the Guelph, Ont., City Council will relay 3,000 ft. of track with 80 lb. rails during the summer. (Mar., pg. 141.)

Hamilton Incline Ry.—The plans for the proposed new incline railway from Wentworth St., Hamilton, Ont., to the top of the Mountain were discussed by the Board of Control, May 8, but no decision was reached. The company is ready to start construction as soon as the plans are approved by the City Council. G. F. Webb, Hamilton, is interested. (April, pg. 185.)

Hamilton Mountain Electric Ry.—The Ontario Legislature has incorporated a company with this title to build a line from the Horning Mountain west to Mount Albion. (April, pg. 185.)

Hamilton St. Ry.—Grading is in progress on the base line east of Iroindale, Hamilton, Ont., for the extension of the street railway. This part of the work is being done by the City Council. It is expected to have the extension from Kenilworth Ave. to Iroindale open for traffic early in July. (April, pg. 185.)

Lethbridge Municipal Ry.—The Lethbridge, Alta., City Council is asking the ratepayers for authority to raise \$31,000 by debentures for the purpose of building some extensions in North Lethbridge. (May, pg. 235.)

London St. Ry.—We are officially advised that the company is not considering the installation of any new engines or generators, as stated in recent press reports. The company, however, has under consideration the question of installing some new boilers, but no decision has been reached. (Nov., 1912, pg. 573.)

Montreal and Southern Counties Ry.—The committee of the Montreal City Council, which has been investigating the company's application to build a double track on Youville Square, has recommended the Council not to grant the application. (May, pg. 235.)

Montreal Tramways Co.—We are officially advised that appropriations amount-

ing to about \$1,000,000 for track and electric construction and renewals have been passed. The question of a large expenditure for increased power is under consideration.

At a sitting of the Quebec Utilities Commission, April 30, it was decided to hold over any further enquiry into the company's affairs until the question of jurisdiction has been settled by the courts.

No further action has been taken in the matter of the several reports on the condition of the street railway service, and it was not expected that there would be any conference between the Council and the company before the end of May. (May, pg. 237, and April, pg. 185.)

Niagara, Welland and Lake Erie Ry.—We are officially advised that it is expected to start construction almost immediately on a branch up north Main St. to Parkway Heights, Welland, Ont. This will be about a mile long and will involve the construction of a pile trestle over the Welland River. It is also proposed to build a branch along East Main St. to Rosedale, and an extension from the Michigan Central Rd., on South Main St., to the Dain Mfg. Co.'s plant at Dainville. These lines will involve the crossing of the G.T.R. in the one case and of the M.C. Rd. in the other. An interlocking plant will be installed at the G.T.R., but it has not yet been decided whether the M.C. Rd. will be crossed at grade, or by a subway. The company has power to extend its lines to Niagara Falls, and Port Colborne, thence along the Lake Shore to Fort Erie, altogether about 45 miles. T. R. Cumming, Welland, Ont., is Chief Engineer. (May, pg. 235.)

Nipissing Central Ry.—A deputation from Liskeard and vicinity waited on the Ontario Government, May 9, to urge the extension of the line from Liskeard to North Timiskaming, Ont. (Jan., pg. 39.)

Ottawa and St. Lawrence Electric Ry.—The Ontario Legislature has authorized the company to increase its capital stock to \$5,000,000; to issue bonds for \$30,000 a mile; has extended the time for construction, and allowed it to acquire the North Lanark Ry. shares, etc.

A meeting of the shareholders will be held at Ottawa, June 3, to approve of an agreement with the Ottawa and St. Lawrence Construction Co. for the building and equipment of the line. It is also proposed to change the head office from Ottawa to Toronto. F. Iveson, Toronto, is Secretary. (Mar., pg. 141.)

Portage Radial Ry. and Canal Co.—W. Richardson returned to Portage la Prairie, Man., May 8, and is reported to have stated that the directors had received two applications for the franchise to build the line, and that the applicants had been given to the end of the month to look into the project. The principal question was as to the amount of power for which customers could be obtained. (April, pg. 169.)

Quebec Ry., Light and Power Co.—We are officially advised that the company has under consideration a two mile extension over the Drouin bascule bridge across the St. Charles River into Limoilou, Que., but nothing definite has been decided. (May, pg. 2325.)

Regina Municipal Ry.—A Regina, Sask., correspondent writes:—"The construction of the extensions to the street railway system is being gone ahead with just as rapidly as material and workmen can be had. Over 200 men are now employed, and it is expected that over 400 will soon be at work. The double tracking of Dewdney

St. from Albert St. to Pasqua St. is being rushed, and as soon as this is completed the street will be paved. The Albert St. north line is nearing completion, and an effort is being made to complete the double tracking of Thirteenth Ave. during June. It will probably be well on in the summer before construction is started on the lines to the north eastern section of the city. As soon as the Broad St. subway is completed a car line will be laid from South Railway St. to Dewdney St. via the subway, which will give all sections of the city direct connection with the warehouse section. (May, pg. 235.)

St. John Suburban Ry.—Press reports state that this newly incorporated company has started surveys for its projected electric railway at St. John, N.B. J. A. Jones, St. John, is engineer in charge. (May., pg. 235.)

Saskatoon Municipal Ry.—We are officially advised that the contract for the building of the electric railway from Saskatoon to Sutherland, Sask., has been let to Lonergan and Hansford, Saskatoon. It will be approximately three miles long, and will be built under the direct supervision of E. Hanson, City Electrical Engineer. The line is being built by private interests, and on completion will be handed over to the city for operation. The Sutherland Town Council, May 8, passed a resolution offering to grant a franchise for the operation of an electric railway on certain streets if the proposed line were extended. A joint committee has been appointed to arrange the details.

The Saskatoon City Council has been approached by a real estate company with an offer of \$5,000 towards the cost of an extension of the city car line to Tuxedo Park and vicinity.

The ratepayers are being asked to vote, May 16, on a bylaw to raise \$100,000 for extensions of the street railway. (May, pg. 236.)

Swift Current, Sask.—Application has been made to the City Council for a franchise for an electric railway. The proposition is to build about six miles of line at a cost of about \$150,000. The promoters have acquired two half sections of land in North Swift Current, on one of which a power house and car barns will, it is said, be built if the franchise is granted. F. H. Cooper, Chicago, Ill., is the principal promoter.

Toronto and York Radial Ry.—The Ontario Legislature has authorized the company to build a second track on certain parts of Yonge St., subject to conditions to be named by the Ontario Railway and Municipal Board, if the company and the Toronto City Council cannot agree. The Act also grants an extension of time within which the company may build certain lines authorized. (May, pg. 236.)

Toronto Eastern Ry.—The Scarborough, Ont., Township Council, May 12, approved of the route of this line to Scarborough Village. Construction is in progress between Bowmanville and Pickering, but is not being proceeded with at a rapid rate. While it is possible that this section will be finished this year, it is not likely that any further mileage will be put under contract at present. (May, pg. 236.)

Toronto Suburban Ry.—Work is in progress along this line from the west bank of the Humber River to near Guelph, Ont., by forces of local men working under the general contractor, Ewen Mackenzie. No contract, we have been informed, for the building of any part of the line beyond Guelph has been let. It is expected to have the greater part of the Toronto-Guelph line in operation by the fall. (May, pg. 236.)

Vancouver Island Hydro-Electric and

Tramway Co.—Press reports state that all arrangements have been completed by a company with this title to build an electric railway at Ladysmith, Vancouver Island, B.C. The town has granted a franchise, and the company proposes to build extensions to Chemainus, Duncans, Nanoose and Nanaimo. It is stated that construction would be started at once and that 50 miles of track will be laid within the next twelve months. Montague Yates, Victoria, is interested in the company. (May, pg. 236.)

Winnipeg Electric Ry.—It is expected that the extension to Stonewall will be completed, so far as tracklaying, by July, and that the ballasting and overhead work will be finished so as to permit of the operation of traffic early in the fall. The grading from Middlechurch to Stoney Mountain was practically completed last year, and work has been started on the remaining section of the line. (April, pg. 186.)

Halifax Electric Tramways Legislation.

The Nova Scotia Legislature, May 9, by a vote of 17 to 12, threw out the application for the incorporation of the Halifax Tramways and Power Co., and also threw out the Halifax City Council's application for authority to acquire the property and franchise of the H.E.T. Co. Summaries of these bills were given on pg. 237 of our May issue. Subsequently the Legislature took up the consideration of an application of the H.E.T. Co. for amendments to its act of incorporation and amending acts. The measure met with considerable opposition, but was passed May 13. It contains two sections, the first providing that the capital be increased from \$1,500,000 to \$2,000,000 by the issue of an additional 5,000 shares. The second section repeals the whole of chap. 78 of the statutes of 1912, which provided for an extension of the present franchise, which expires in 1910, for 21 years, on the present terms; the division of the net profits as follows:—a payment of a dividend of 8% on the common stock; an amount equal to 4% on the common stock to be set aside for extensions and improvements on the property; and the balance to be equally divided between the city and the company. This part of the act was only to come into operation by proclamation. The second part of the act, which came into force on passing, and was to remain in force for a year, prohibited any increase of the company's capital stock or borrowing powers, or the leasing or sale of the company to any other similar company. The object of the city in obtaining the passing of this act was to enable it to continue negotiations for the purchase of the property.

The Legislature has also passed an act amending the Public Utilities Act in several details. Arising out of the discussions on the affairs of the H.E.T. Co., the following amendment to the original bill was introduced May 10, and became part of the act as passed May 13:—"The powers, rights, and privileges secured to any public utility by virtue of any statute, or by any contract or agreement ratified by statute, shall not be altered, diminished or enlarged by the Board, but the Board may at any time enquire into any rights, powers, privileges, or limitations, enjoyed by or imposed upon any contract ratified by the Legislature, in so far as the exercise of the same affects the public interest and may make such recommendations to the Legislature in connection therewith as may seem right and just."

Electric Railway Finance, Meetings, Etc.

British Columbia Electric Ry.—Gross earnings for March, \$571,163; operating expenses, \$374,079; net operating earnings, \$197,084; renewal funds, \$51,620; net earnings, \$145,464; approximate income from investments, \$35,000; net income, \$180,464, against \$491,782 gross earnings; \$307,958 operating expenses; \$183,824 net operating earnings; \$37,935 renewal funds; \$145,889 net earnings; \$25,000 approximate income from investments; \$170,889 net income for March, 1912. Aggregate gross earnings for nine months ended Mar. 31, \$5,137,701; net earnings, \$1,751,543, against \$4,283,459 aggregate gross earnings, and \$1,510,420 net earnings for the same period 1911-12.

Cape Breton Electric Co.—A press report says that while the complete annual report is not available, it is known this company has passed through its best year. Announcement has been made that the directors have decided to increase the dividend rate from 5 to 6%, the new rate going into effect for the present quarterly declaration.

Cape Breton Electric Co.—Gross earnings for March, \$28,099.37; operating expenses and taxes \$15,965.83; net earnings \$12,133.54; interest charges, sinking and improvement funds \$5,081.66; net income \$6,051.88, against \$24,409.89 gross earnings; \$15,856.32 operating expenses and taxes; \$8,553.57 net earnings; \$5,635.84 interest charges, sinking and improvement funds; \$2,917.73 net income for Mar. 1912. Construction charges during March \$6,387.69.

London St. Ry.—Gross earnings for April, \$25,077.87; expenses, \$19,668.40; net earnings, \$5,409.47; deductions, \$2,371.25; net income, \$3,038.22; aggregate gross earnings for four months ended Apr. 30, \$101,767.46; expenses, \$73,035.06; net earnings, \$28,713.50; deductions, \$9,511.10; net income, \$19,220.40.

St. Thomas St. Ry.—Cash fares and ticket sales for April, \$1,430.70, against \$1,113.79 for April, 1912. Passengers carried, 38,257, against 31,302 in April, 1912.

Saskatoon Municipal Ry.—Traffic receipts for April, \$13,914.80; operating expenses, including interest on capital expenditure, and sinking fund, etc., \$14,597.25. Average traffic receipts per car mile, \$25.93; average number of passengers per car mile, 5.41; operating expenses per car mile, \$27.20.

Sherbrooke Ry. and Power Co.—Press reports state that at a special meeting of shareholders on May 5, it was announced that the gross earnings were running about 50% higher than a year ago, and that the net results were showing a gain of over 25%. The prospects of the year were said to be excellent, particularly in the power department.

Toronto Ry., Toronto and York Radial Ry., and Allied Companies.—Gross earnings for March, \$772,491; operating expenses, maintenance, etc., \$405,788; net earnings, \$366,703, against \$668,194 gross earnings; \$333,371 operating expenses, maintenance, etc.; \$334,823 net earnings for March, 1912. Aggregate gross earnings for three months ended Mar. 31, \$2,267,732; net earnings, \$1,083,306, against \$1,954,550 aggregate gross earnings; \$984,099 net earnings for same period 1912.

Winnipeg Electric Ry.—Gross earnings for March, \$329,016; operating expenses, \$189,950; net earnings, \$139,066, against \$298,838 gross earnings; \$161,826 operating expenses; \$137,013 net earnings for March, 1912. Aggregate gross earnings for three months ended Mar. 31, \$1,000,945; net earnings, \$433,570, against \$917,519 aggregate gross earnings, \$415,338 net earnings for same period 1912.

Edmonton Radial Railway Co.'s Double Track Work.

Canadian Railway and Marine World for May published particulars as to the permanent track work decided on for this year. We have since been officially advised that contracts have been let for the following work:—

Street	From	To	Feet
Jasper	8th St.	11th St.	1200
Ninth	Jasper	High Level Br.	2500
Fifth West	Whyte	" "	2080
Main	First St.	6th St. South	2080
Athabasca	24th St.	42nd St.	5900
Alberta Ave.	Kirkness	C.N.R. Tracks	6062
Norwood	First	Kirkness	1480
Jasper East	Penitentiary Br.	Exhibition Grnds.	6335
Nelson	First St.	24th St.	9240
Kinnaird	Spruce	Oak	1080
Spruce	Kirkness	Agnes	5760
Twenty-fourth	Short	Alberta	7120
Fifth East	Whyte	7th Ave. North	2330
Saskatchewan	9th St.	Curry St.	3796
Curry	Saskatchewan	McDougall	1995
Twenty-fourth	Jasper	Stoney Plain	1778
First	C.N.R. Tracks	Norwood	4250
Whyte	4th St. West	5th St. West	600
Syndicate	Ross	Norwood	1700
Kirkness	Norwood	Alberta	3802
Whyte	7th St. East	Mill Creek	1000
Fifth East	7th St. West	11th St. North	1400

The contracts have been divided among the City Construction Co., Brown and Hargraves, Crown Paving Co., Worswick Co., Manders and Gregory, Bitulithic Co. and National Paving Co.

Sunday Operation by London and Lake Erie Ry. and Transportation Company.

At the Toronto Assizes in June, 1912, the Chancellor heard the case of W. Kerley, of St. Thomas, Ont., against the L. & L.E.R. & T. Co., claiming three penalties of \$400 each for operating the line on three Sundays in Dec., 1911, or, as an alternative, an order to restrain the railway from operating on Sundays, the case having been entered with the Ontario Railway and Municipal Board's consent. The Chancellor gave judgment for the plaintiff, for \$1,200 and costs of action, \$600 to go to plaintiff, who has since died, and \$600 to the city of London.

The case was appealed, and on May 5, Sir William Meredith, Chief Justice of Ontario, delivered the judgment of the Appellate Division, allowing the appeal with costs, and dismissing the original action with costs.

The company has started a Sunday service over the whole line between London and Port Stanley, leaving London and Port Stanley at 9.30 a.m., St. Thomas south at 8.40 a.m., and north at 9.15 a.m., and hourly thereafter, until the last car leaves London for Port Stanley at 8.30 p.m., Port Stanley for London at 9.30 p.m., and for St. Thomas at 10.30 p.m.

The Ontario and West Shore Railway Muddle.—Canadian Railway and Marine World for April and May contained full particulars of a report on the condition of this partly built line by H. W. Middlemiss, A.M.I.C.E., Toronto, and also other references to the history of the undertaking, and its apparent abandonment by its principal promoter, J. W. Moyes, of Toronto. In order to protect the municipalities which guaranteed the bonds, the Ontario Legislature has passed an act vesting the company's franchise and all property, rights and privileges in Thomas Stothers, of Duncannon, in trust for the municipalities, but subject to the rights of the company's creditors, and the bondholders and trustees for bondholders. The Ontario Railway and Municipal Board fixed May 30 as the date for hearing the various parties interested, with a view to making an investigation of the whole matter.

Personal Paragraphs.

PATRICK DUBEE, Secretary and Treasurer, Montreal Tramways Co., and President, Canadian Street Railway Association, has returned from England.

W. G. MURRIN has been appointed Mechanical Superintendent of the British Columbia Electric Ry. He comes from London, Eng., where he was connected in an executive capacity with the London United Ry.'s staff.

W. H. FRASER, of the British Columbia Electric Ry.'s staff, has been appointed Electrical Superintendent, vice D. M. Kennedy, resigned. Mr. Kennedy will spend the next few weeks travelling through Canada and the United States, inspecting electrical plants.

W. F. GRAVES, heretofore Superintendent of Tracks, Chicago City Railway, Chicago, Ill., has been appointed Chief Engineer and Superintendent of Construction, Montreal Tramways Co., vice J. D. Evans, resigned to enter another company's service.

This gem is from the Toronto Mail and Empire:—"Galt, May 18.—On Saturday former Mayor Thomas Patterson announced that he had authority from Monsignor W. J. Coleman, of the Dominion Power and Transmission Co. of Hamilton, for the statement that construction would start in the near future on a radial electric line from Hamilton to Galt."

H. H. HUMESTON has been appointed Superintendent of Transportation in charge of the operation of the cars, London St. Ry., London, Ont., vice J. A. Young, resigned. He was an employe of the company about ten years ago, and has since been in Detroit United Ry. service. The report that C. Johns, of St. Thomas, Ont., another former employe of the company, had been appointed, is incorrect.

Electric Railway Notes.

The Montreal Tramways Co. has received three steel street car bodies from Canadian Car and Foundry Co.

Three cars arrived at Brandon, Man., May 8, for the new municipal electric railway.

The American Electric Railway Association's annual convention will be held at Atlantic City, Oct. 13 to 17.

The Manitoba Commission of Public Utilities is considering the question of the interruption of the street car traffic by processions in Winnipeg.

The Edmonton Radial Ry. management is not, we are officially advised, contemplating the purchase of any more cars, as stated in press reports.

The Windsor, Essex and Lake Shore Rapid Ry. has received eight steel under-frame flat cars, 40 tons capacity, from Canadian Car and Foundry Co.

The Aberdeen (Scotland) Tramways were the first in Europe to adopt p.a.y.e. cars, a converted car having been in use since Dec., 1912. Ten new double deck p.a.y.e. cars have been put in service recently.

The Brantford St. Ry. employes, it is reported, are organizing a union, to be affiliated with one of the larger organizations, in order to make a demand for increased pay and shorter hours. The present maximum rate is reported to be 16c. an hour.

The Guelph Radial Ry. is adding a double ended car of the p-a-y-e type, to its

rolling stock. It is equipped with Westinghouse 101B2 motors, K28 controllers, Consolidated Car Heating Co.'s heating system, longitudinal seats, sanitary hand straps, etc., and is built by the Preston Car and Coach Co.

The Sunday operating of cars over the Toronto civic car line to East Toronto, was commenced, May 11, the authority necessary for such operation having been recently granted by the Ontario Legislature in an act promoted for various civic purposes.

The petitions for the rule nisi against E. A. Robert, President Montreal Tramways Co., and H. R. Mallison, Secretary of the Imperial Trust Co., in connection with their refusal to produce the original copy of the deed between the Corporation Agencies in the Superior Court, in the case of Vipond against Lovett, were dismissed May 12.

The Toronto and York Radial Ry., under authority of an act passed by the Ontario Legislature recently, commenced Sunday operation of its cars over the whole of its Metropolitan Division, May 18, on the same schedule as is in force on week days, which provides for cars between Toronto and Newmarket hourly, and from eight to ten cars through to Sutton during the day. Over 16,000 people were carried on the opening Sunday.

The motormen and conductors of the Port Arthur and Fort William Electric Ry. struck work, May 11, on their demands for a revised schedule being refused. The schedule under which they had been working has some time yet to run before expiry, and local opinion generally confirms the stand taken by the joint commission operating the line. A number of other men were engaged, and the service was recommenced, with some reductions.

The Hydro Electric Railway Act, providing for the construction and operation of electric railways throughout Ontario, by the Hydro Electric Commission, or by corporations under agreements with the Commission, and which was given in full in Canadian Railway and Marine World for May, passed its third reading in the Ontario Legislature, Apr. 21, with but two trifling verbal amendments, which do not in any sense alter the bill.

The Supreme Court of Canada has dismissed the appeal of the British Columbia Electric Ry. Co. vs. Vancouver, Victoria and Eastern Ry. and Navigation Co. This was an appeal by the B.C.E.R. Co. from a decision of the Board of Railway Commissioners, authorizing the V.V. & E.R. & N. Co. to construct Hastings, Pender, Keefer and Harris streets, Vancouver, across its tracks by overhead bridges, the B.C.E.R. Co. being ordered to pay 20% of the cost of constructing Harris Street and Hastings Street Bridges, the cost of depressing the V.V. & E.R. & N. Co.'s tracks to be included in the cost of the work. Two of the judges dissented from the judgment.

The Toronto Board of Control decided, May 19, to engage experts to value the Toronto Ry. and Toronto Electric Light Co.'s properties, the acquirement of which it is proposed to submit to the ratepayers in the near future, under legislation passed at the recent session of the Ontario Legislature, and which was fully dealt with in our last issue. B. J. Arnold, of the Arnold Co., Chicago, and J. W. Moyes, of Toronto, were mentioned as those likely to be appointed. In connection with the proposed acquirement of these properties, Sir William Mackenzie, President, stated on his return from Europe, that the two would have to be taken over together, as they could not be separated. Negotiations are proceeding between him and Mayor Hocken.

Marine Department.

The Dominion Canal Statistics for the Season of 1912.

Following are the principal portions of the report on canal statistics for 1912, as issued by the Department of Railways and Canals:—

The total volume of traffic was as follows:—

	Tons.	Increase.	Decrease.
Sault Ste. Marie	39,669,655	8,717,946	.....
Welland	2,851,915	314,286	.....
St. Lawrence	3,477,188	371,480	.....
Chambly	618,415	18,586	.....
St. Peter's	74,809	.....	489
Murray	170,081	6,624	.....
Ottawa	392,350	72,279	.....
Rideau	160,133	.....	12,094
Trent	77,150	19,860	.....
St. Andrew's	95,549	48,414	.....

Total 47,587,245 9,569,475 12,583

The increment for the year 1912, as compared with 1911, was 9,556,892 tons, equal to 25.1%.

It must not be assumed that the net business of the canals amounted to 47,587,245 tons. There is duplication to the extent of several million tons, and unavoidably so. For example, all traffic between Fort William and Montreal is first credited to the canal at Sault Ste. Marie, then to the Welland Canal, and finally to the St. Lawrence Canals. In the same way, freight shipped from Ottawa to New York finds a place first in the returns of the Ottawa River Canals, next the Lachine Canal, and lastly in the Chambly Canal. This situation is not essentially different from that which arises with regard to railway traffic, and is inseparable from the statistical system which has long been in vogue. In dealing with the question of the average freight rate on the inland waters further on the actual net tonnage will be indicated.

The following statement shows the growth of traffic through the canals during the past decade:—

Year	Tons.
1903	9,203,817
1904	8,256,236
1905	9,371,744
1906	10,523,185
1907	20,543,639
1908	17,502,820
1909	33,720,748
1910	42,990,608
1911	38,030,353
1912	47,587,245

The expansion for the ten year period between 1903 and 1912 was 417%.

The following comparative statement of traffic shows on what canals the growth has taken place during the past four years:—

	1909.	1910.	1911.	1912.
Sault Ste. Marie	27,861,245	36,395,687	30,951,709	39,669,655
Welland	2,025,951	2,326,290	2,537,620	2,851,915
St. Lawrence	2,410,629	2,760,752	3,105,708	3,477,188
Chambly	752,117	669,299	599,820	618,415
St. Peter's	79,850	85,951	75,298	74,809
Murray	102,291	177,941	163,457	170,081
Ottawa	336,939	385,261	320,071	392,350
Rideau	91,774	134,881	172,227	160,133
Trent	59,952	46,263	57,200	77,150
St. Andrew's . . . . .	.....	8,283	47,135	95,549

Comparing the years 1911 and 1912, following was the tonnage by classes and canals:—

	1911.		Manu- factures.	Products of Forest.	Products of Mines.	Total.
	Tons.	Tons.				
Sault Ste. Marie	3,219,929	978	854,516	56,853	26,810,433	30,951,709
Welland	1,089,605	574	539,865	250,423	657,162	2,537,620
St. Lawrence	1,003,090	9,943	557,992	551,155	983,528	3,105,708
Chambly	41,093	315	25,370	396,704	135,537	599,820
St. Peter's	16,538	2,153	11,828	7,120	37,659	75,298
Murray	1,109	13	143,399	1,622	17,214	163,457
Ottawa	9,779	2,467	65,452	202,797	39,576	320,071
Rideau	6,084	2,684	114,937	34,350	14,172	172,227
Trent	951	397	12,551	31,342	12,049	57,290
St. Andrew's	82	.....	33,153	13,773	127	47,135
Total	5,389,070	19,624	2,359,063	1,546,139	28,716,457	38,030,353

1912.						
Sault Ste. Marie	4,530,792	372	975,303	54,114	34,109,074	39,669,655
Welland	1,205,912	678	625,569	227,684	792,072	2,851,915
St. Lawrence	1,119,567	9,375	464,091	578,760	1,305,395	3,477,188
Chambly	19,706	338	11,600	425,313	161,458	618,415
St. Peter's	15,427	2,996	7,583	11,161	37,642	74,809
Murray	448	37	101,511	706	67,379	170,081
Ottawa	5,278	2,880	20,958	226,600	136,634	392,350
Rideau	3,995	3,151	18,814	28,642	105,531	160,133
Trent	2,514	361	3,459	67,489	3,327	77,150
St. Andrew's	37	.....	60	14,153	81,299	95,549
Total	6,903,676	20,188	2,228,948	1,634,622	36,799,811	47,587,245

The ratio which each of the foregoing classes bore to the total volume of traffic during the past three years is shown in the following statement:—

	1910.	1911.	1912.
	Per cent.	Per cent.	Per cent.
Agricultural products	10.2	14.2	14.51
Animal products	1.2	.1	.04
Manufactures	5.2	6.2	4.68
Produce of forests	3.9	4.0	3.43
Produce of mines	79.5	75.5	77.34

Until 1908 a separation was not made as between Canadian and United States traffic. Since that date a record has been kept of the country of origin, as far as the canals of Canada are concerned. The facts with respect to vessel tonnage and freight tonnage during the past five years are given in the following table:—

Year.	Canadian Vessels.		U.S. Vessels.		Freight Tonnage.		Total.
	No.	Tonnage.	No.	Tonnage.	Canadian.	United States.	
1908	29,040	6,780,789	7,489	4,835,320	5,012,147	12,490,673	17,502,820
1909	22,507	7,811,578	9,996	16,459,322	7,378,057	26,342,691	33,720,748
1910	25,337	8,931,790	11,462	21,777,297	7,883,614	35,106,994	42,990,608
1911	25,585	9,172,192	10,370	18,231,622	7,792,907	30,237,446	38,030,353
1912	27,371	10,237,335	11,785	24,636,190	9,376,529	38,210,716	47,587,245

The proportions of freight tonnage originating in Canada and the United States during the five years for which the facts are available, have been as follows:—

Year.	Canadian per cent.	U.S. per cent.
1908	28.7	71.3
1909	21.8	78.2
1910	18.3	81.7
1911	20.5	79.5
1912	19.7	80.3

The large and growing difference between the traffic of Canada and the traffic of the United States through Canadian canals, arises almost wholly at Sault Ste. Marie. For example, in 1912 the proportion of strictly Canadian traffic which passed through the Canadian canal at Sault Ste. Marie was 10.3, and the traffic of that canal represented 83% of the total for the whole Dominion. Of the traffic which

Year.	Canadian per cent.	U.S. per cent.
1908	28.7	71.3
1909	21.8	78.2
1910	18.3	81.7
1911	20.5	79.5
1912	19.7	80.3

passed through the Canadian canal at Sault Ste. Marie in 1912, iron ore constituted

over 87%. In other words, out of 35,579,293 tons of U.S. traffic at Sault Ste. Marie, 31,141,063 tons was made up of iron ore.

The situation changes at the Welland. In 1912, out of a total of 2,851,915 tons, Canadian traffic aggregated 1,553,116 tons, or 54%. The St. Lawrence canals during the same period showed 2,340,143 tons of Canadian business, out of a total of 3,477,188, or 67%. The proportions with regard to vessel tonnage in 1912 were: Canadian, 29.36%; United States, 70.64%.

The rapid settlement of the Western provinces has created a steadily deepening interest in the movement of Canadian wheat. From 1895 down to 1909 a separation of Canadian and U.S. products was not made in canal statistics; but since the

Year.	Canadian.	United States.	Total.
1895	4,518,334	.....	4,518,334
1896	19,314,234	.....	19,314,234
1897	17,925,834	.....	17,925,834
1898	9,746,600	.....	9,746,600
1899	12,759,634	.....	12,759,634
1900	9,292,034	.....	9,292,034
1901	9,639,534	.....	9,639,534
1902	27,912,500	.....	27,912,500
1903	32,233,934	.....	32,233,934
1904	29,794,100	.....	29,794,100
1905	25,983,100	.....	25,983,100
1906	34,389,300	.....	34,389,300
1907	49,399,967	.....	49,399,967
1908	58,574,034	.....	58,574,034
1909	48,047,833	.....	48,047,833
1910	51,774,833	.....	51,774,833
1911	63,641,000	.....	63,641,000
1912	83,743,034	.....	83,743,034

latter year a careful record has been made of the facts in that regard. The following shows the volume of Canadian wheat brought down through the Canadian canal at Sault Ste. Marie:

Year.	Bushels.
1895	4,518,334
1896	19,314,234
1897	17,925,834
1898	9,746,600
1899	12,759,634
1900	9,292,034
1901	9,639,534
1902	27,912,500
1903	32,233,934
1904	29,794,100
1905	25,983,100
1906	34,389,300
1907	49,399,967
1908	58,574,034
1909	48,047,833
1910	51,774,833
1911	63,641,000
1912	83,743,034

*For the first time represents Canadian wheat only. The figures of preceding years include U.S. wheat which passed through the Canadian canal.

The foregoing figures do not represent the total volume of Canadian wheat which came down from the Northwest in 1912. They have reference wholly to the number of bushels which passed through the Canadian canal at Sault Ste. Marie. There came through the U.S. canal at that point 23,020,833 bush. It was ascertained from the Customs Department that 10,724,498 bush. of Canadian wheat went out from Duluth in 1912 in bond. Of this latter quantity 7,646,634 bush. had been accounted for in the totals of the two canals at Sault Ste. Marie, leaving 3,078,264 to be added to the figures just given. The total quantity of Canadian wheat moved by water in 1912 would therefore be 109,842,031 bush., as compared with 65,622,481 in 1911.

Without reference to which of the two canals was used at Sault Ste. Marie, the

account with respect to Canadian wheat might be presented in this form:—

From Fort William	99,117,233 bush.
From Duluth, in bond	10,724,798 do
Total	109,842,031 do

The account is still incomplete. Canadian flour to the amount of 2,828,980 barrels passed through the Canadian and U.S. canals at Sault Ste. Marie, and, allowing 5 bush. of wheat to the barrel, this would mean an addition of 14,144,900 bush., bringing the final total of Canadian waterborne wheat up to 123,986,931 bush.

An analysis of the distribution of Canadian wheat after it had passed through the Canadian and U.S. canals at Sault Ste. Marie, was this year made from the ships' reports filed at both offices. For several years past the facts had been gathered only with respect to the Canadian canal. In 1912 copies were procured of all ships' reports taken at the U.S. canal; so that more comprehensive figures are this year made available. Taking first the Canadian canal, following was the distribution of Canadian wheat in 1912:—

	Bushels.
Fort William to Montreal	13,726,166
" Georgian Bay	17,648,334
" other Canadian ports	19,676,100
" Buffalo	25,045,806
Duluth to Montreal	283,500
" Buffalo	5,714,367
" Georgian Bay	1,418,767
" other Canadian ports	230,000
Total	83,743,034

Through the U.S. canal at Sault Ste. Marie the distribution of Canadian wheat in 1912 was as follows:—

	Bushels.
Fort William to Montreal	1,202,933
" Georgian Bay	1,852,834
" other Canadian ports	782,600
" Buffalo	19,182,466
Total	23,020,833

Adding 3,078,264 bush. of Canadian wheat from Duluth, which could not be classified, owing to the form in which the U.S. records are kept at Sault Ste. Marie, the total of 109,842,131 is accounted for. Joining the two accounts, the distribution of Canadian wheat for 1912 assumes the following shape:—

	Bushels.	Per Cent.
Fort William to Montreal	14,929,099	13.6
" Georgian Bay	19,501,168	17.8
" other Canadian ports	20,458,700	18.6
" Buffalo	44,228,266	40.2
Duluth to Montreal	283,500	.2
" Georgian Bay	1,418,767	1.3
" other Canadian ports	230,000	.2
" Buffalo	5,714,367	5.2
" unclassified	3,078,164	2.9
Total	109,842,031	

The "other Canadian Ports" referred to in the above statement are ports between Georgian Bay and Lake Ontario.

Exactly 50 per cent. of all the Canadian wheat which came down by water in 1912, followed wholly Canadian channels.

In order that a comparison respecting Canadian wheat may be made with the facts in preceding years, the following table is brought down to the end of 1912, the figures representing bushels:—

	1909.	1910.	1911.	1912.
Fort William to Montreal	10,517,266	13,185,370	12,761,666	14,929,099
" Georgian Bay	13,384,400	12,753,200	9,881,234	19,501,168
" other Canadian ports	10,149,633	9,603,400	11,889,666	20,458,700
" Buffalo	12,841,334	15,693,363	27,945,600	44,228,266
Duluth to Montreal	520,000	315,000	283,500	283,500
" Buffalo	528,200	224,500	710,334	5,714,367
" Georgian Bay	28,000	461,500	1,418,767	1,418,767
" other Canadian ports	79,000	.....	.....	230,000
" unclassified .....	.....	.....	.....	3,078,164
Total	48,047,833	51,774,833	63,641,000	109,842,031
Through U.S. canal	9,117,328	5,321,446	1,981,481	.....
Grand total	57,165,161	57,096,279	65,622,481	109,842,031

The following statement of percentages presents the foregoing tables respecting Canadian wheat in a convenient form for

purposes of comparison, the figures representing percentages:—

	1909.	1910.	1911.	1912.
Fort William to Montreal	21.9	25.5	20.1	13.6
" Georgian Bay	27.9	24.6	15.6	17.8
" other Canadian ports	21.1	18.5	18.7	18.6
" Buffalo	26.7	30.3	43.8	40.2
Duluth to Canadian ports	1.3	.6	.7	1.7
" U.S. ports	1.1	.5	1.1	5.2
" unclassified .....	.....	.....	.....	2.9

In a succeeding paragraph facts will be presented which may explain in some measure the conditions which have operated in the movement of Canadian wheat.

In the canal statistics for 1911, it was intimated that plans had been perfected for the ascertaining of the average rate per ton per mile on the inland waters. Those plans involved the recording of the freight rate in each ship's report filed at the various canal offices. As an alternative those operators who wished to do so were permitted to send a monthly statement to Ottawa of tonnage, mileage and gross freight earnings. Ship owners were also required to send in at the close of the season a report showing:—Total tons carried, total ton mileage of loaded vessels, gross receipts from freight. On the whole, and having regard to the difficulties which are inseparable from the inauguration of new undertakings of that character, the results were satisfactory. For example, out of a net Canadian tonnage of 6,942,278, definite information was received with regard to the mileage and freight earnings on 6,292,661 tons. St. Peters and St. Andrews canals were left out of the scheme for 1912, and they accounted for 170,358 tons; so that the actual net Canadian tonnage affected was 6,771,920. Returns were thus received in relation to 93% of Canadian business. These returns covered all classes of traffic, and it might reasonably be assumed that had every ton been accounted for, the result would not have been altered.

The Canadian returns applied to 6,292,661 tons of freight, to 3,286,187,160 ton miles, and to gross freight earnings amounting to \$6,378,893.43. From U.S. shipping companies reports were received covering 26,030,661 tons, out of a total net tonnage of 36,840,812. These reports had reference to all classes of commodities, and were thoroughly typical of the whole business on Canadian inland waters. It may be confidently asserted that absolutely complete returns would not have materially affected the final calculation of the average rate per ton per mile. The number of ton miles accounted for amounted to 21,799,392,809, and the gross earnings on U.S. freight to \$14,617,368.60.

Using the factors which have been indicated—the ton mileage and the gross earnings from freight—the results are as follows:—

Canadian traffic:—	
Average rate per ton	91.04 cents.
" per mile	0.194 "
U.S. traffic:—	
Average rate per ton	56.62 cents.
" per mile	0.067 "

Without an explanation, the difference between the Canadian and U.S. rate per

	1909.	1910.	1911.	1912.
Fort William to Montreal	10,517,266	13,185,370	12,761,666	14,929,099
" Georgian Bay	13,384,400	12,753,200	9,881,234	19,501,168
" other Canadian ports	10,149,633	9,603,400	11,889,666	20,458,700
" Buffalo	12,841,334	15,693,363	27,945,600	44,228,266
Duluth to Montreal	520,000	315,000	283,500	283,500
" Buffalo	528,200	224,500	710,334	5,714,367
" Georgian Bay	28,000	461,500	1,418,767	1,418,767
" other Canadian ports	79,000	.....	.....	230,000
" unclassified .....	.....	.....	.....	3,078,164
Total	48,047,833	51,774,833	63,641,000	109,842,031
Through U.S. canal	9,117,328	5,321,446	1,981,481	.....
Grand total	57,165,161	57,096,279	65,622,481	109,842,031

ton per mile will not be understood. Of the 36,840,812 tons of U.S. traffic through Canadian canals in 1912, no less than 31,

134,251 tons, or nearly 85%, consisted of iron ore. Upbound coal accounted for a

	1909.	1910.	1911.	1912.
Fort William to Montreal	21.9	25.5	20.1	13.6
" Georgian Bay	27.9	24.6	15.6	17.8
" other Canadian ports	21.1	18.5	18.7	18.6
" Buffalo	26.7	30.3	43.8	40.2
Duluth to Canadian ports	1.3	.6	.7	1.7
" U.S. ports	1.1	.5	1.1	5.2
" unclassified .....	.....	.....	.....	2.9

further 2,945,441 tons, or 8%. In fact, if iron and coal were eliminated from the total account, the volume of Canadian traffic would exceed the U.S. The transportation of iron ore and coal is a special feature of the trade of the Great Lakes. Most of the ore is carried by the vessels of the Pittsburg Steamship Co., and the rate in 1912 was 55c per ton from the head of Lake Superior to ports on Lake Erie. These vessels are owned and operated by the iron interests of Pittsburg, and do not carry other commodities than ore and coal—ore down and coal up. For this upbound coal, without regard to ownership of the vessels, the rate last year was 30c. per ton. Thus, while wheat was being carried to Buffalo at as high a rate as 2.616c. per ton per mile, iron ore was passing over the same route at .063c. Coal was being moved upward at the still lower rate of .046c. per ton per mile. In a word, any analysis of freight rates on Canadian inland waters would be misleading which failed to recognize, and to separate for special treatment, this overwhelming movement of ore and coal under the conditions indicated.

To measure the conditions which influenced the movement of Canadian wheat to Montreal or Buffalo, it is necessary to know the freight rate on wheat from Buffalo to the Atlantic seaboard during 1912. It was officially ascertained from the Buffalo Chamber of Commerce on Feb. 14, 1913, that these rates per bushel were:—May to end of Sept., on lake wheat for export, 4½c.; in October, 5½c.; after Nov. 15, 6c. Thus, the all water rate from Fort William to Montreal in May was 5.444c. per bushel, and the combined water and rail rate from Fort William to the U.S. seaboard (say New York) was 7.219c. In November, the water rate from Fort William to Montreal was 7.129c. per bushel, and the combined water and rail rate from Fort William to the U.S. seaboard, via Buffalo, was 8.616c. The apparent difference in favor of Montreal was 1.765c. per bushel in May, and 1.487c. in November, so far as the rates of freight were concerned.

There remains to be presented the facts with respect to traffic by way of Fort William and Georgian Bay ports. The average rate for the season was 2.629c. per bushel. It was officially ascertained that the rail rates from Georgian Bay to Montreal were as follows:—

C.P.R.	6c. per bushel
G.T.R., Jan. 1 to June 30	5c. " "
" July 1 to Sept. 30	4c. " "
" Oct. 1 to Dec. 31	5c. " "

The movement of Canadian wheat during 1912 has been discussed in a preceding division of this report. There remains the matter of the freight rate on it. Special care was taken during the year to ascertain with accuracy the rates which were charged on waterborne wheat. The facts in that regard were carefully tabulated. They yielded the following results:—

Fort William to Buffalo:—	
Per ton per mile .....	.103 c
Per bushel	2.863 "
Fort William to Georgian Bay:—	
Per ton per mile .....	.163 "
Per bushel	2.629 "
Fort William to other Canadian ports:—	
Per ton per mile .....	.115 "
Per bushel	2.384 "
Fort William to Montreal:—	
Per ton per mile .....	.160 "
Per bushel	5.774 "

The lowest rate prevailed in May, and the highest in December. The rates per ton per mile and per bushel in these months were as follows in cents:—

	May.		December.	
	Per ton per mile.	Per bush.	Per ton per mile.	Per bush.
Fort William to Buffalo .....	.106	2.719	.150	3.905
“ Georgian Bay .....	.012	1.835	.259	3.967
“ other Canadian ports .....	.099	2.012	.232	4.403
“ Montreal .....	.147	5.444	.193	7.129

There was not any wheat actually brought down from Fort William to Montreal in December; and the rates in the foregoing table are for November. The largest volume of wheat moved between Fort William and Montreal occurred in October, when the average rates were .0184 per ton per mile and 6.149 cents per bushel. For the same month the rates from Fort William to Buffalo were 0.084 per ton per mile, and 2,259 cents per bushel. The maximum rate of the season between Fort William and Montreal was in effect in November, and was 8c. per bushel.

Speaking broadly, it might be assumed that the combined water and rail rate is adjusted to practically equal the all water rate.

In the canal statistics for 1911 the causes which operated to divert a large percentage of Canadian wheat from Canadian to U.S. channels, despite the lower transportation cost between Fort William and Montreal, were discussed. Among them were:—The availability of ocean tonnage at New York, the consideration of time in making delivery at foreign ports, and the rates of marine insurance. It is obvious that these causes must have continued to operate effectively in 1912.

The question is frequently, and quite naturally, asked:—How do freight rates by water compare with freight rates by rail? It has always seemed to the writer, as the officer of this Department in charge of transportation statistics, that data should be available which would permit such a comparison to be fairly made; but the question will never be fully and satisfactorily answered until carriers by water are required to report in precisely the way railways are asked to do. This year, for the first time, accurate information has been obtained with regard to the average rate per ton per mile on the waterborne traffic of the Great Lakes. That rate, so far as Canadian business was concerned, was found to be 0.194 cent. It is pointed out, however, that this rate does not take cognizance of the special conditions under which traffic on the inland waters of Canada is conducted, and the contribution of the Government should be taken into the reckoning. There is pertinency in such a contention. It would seem, at all events, to be proper to include the interest charge on the capital cost of the canals and the annual outlay by Government for upkeep. The facts in that regard are definitely known. This plan omits all expenditures for harbors, lighthouses, dredging, buoying, etc., which might be included; but, whether they should be included or not, the matter is ruled out for the time being by reason of the fact that the sum of such expenditures is not definitely known. The capital cost of the canals connected with Canadian inland waters was, up to Mar. 31, \$103,400,588.64. The interest on this capital sum, at 3½% would be \$3,619,021. The cost of maintenance of the Canadian canal system for the year ended Mar. 31, 1912, was \$1,725,737.46. These sums added together give a total of \$5,344,758.46. Assuming, as may be fairly done, that the entire Canadian business through Canadian canals last year was on the basis of the ascertained rate, by a simple calculation it may be demonstrated that the contribution to

the freight rate by Government amounted to 76.99c. per ton, or 0.140c. per ton per

	Ton.	Ton per Mile.
Actual freight rate	91.04	.194
Government contribution..	76.99	.140
Total	\$1.6803	.334

It has been ascertained through official channels that the rail rate of the C.P.R. on wheat from Fort William to Montreal, 995 miles, is 12c. per bushel. This rate would thus be equal to \$4 a ton, or 0.402c. per ton per mile. The average water rate on a bushel of wheat from Fort William to Montreal in 1912 was 5.774 cents, or \$1.92 a ton. The addition of the Government contribution of 0.140 a ton per mile to the water rate between Fort William and Montreal would be equal to \$1.72 a ton. Adding \$1.92 and \$1.72 together, we have a total water rate of \$3.64 a ton, compared with \$4 a ton by rail.

The average rate per ton per mile of all Canadian railways for the year ended June 30, 1912, was 0.757 cent. It is therefore manifest that water rates, plus the Government contribution to canal service, were lower than rail rates in 1912. It is also equally clear, from a study of the transportation problem as a whole, that there are other factors than the freight rate which operate to direct the movement of traffic in any particular channel.

For the season of 1912 the insurance rates in force on Canadian inland waters were as follows:—On the insurable value of the hull, covering all risks from the head of the lakes down to the foot of Lake Erie 5¾%. An additional 1% was charged on vessels moving as far east as Ogdensburg, and a further 1% was payable from Ogdensburg to Montreal. Thus the rate on a vessel voyaging from Fort William to Montreal was 7¾%. A still further charge of ½% was imposed on vessels outside of the Lakes Protective Association of Cleveland, or the Canadian Lake Protective Association.

The Richelieu and Ontario Navigation Company's Schedule for 1913.

Following on the absorption of other passenger steamboat lines by the R. & O. N. Co., a complete revision of the sailing schedule for the passenger service has been arranged as follows:

TORONTO-CHARLOTTE-MONTREAL LINE.—Daily, except Sundays to June 30, and thereafter, to Sept. 13, daily. Up to June 21 the steamboats Toronto and Kingston will be used, and after that the steamboat Rochester will leave Toronto Tuesdays, Thursdays and Saturdays, transferring passengers at Ogdensburg, N.Y., to steamboats Rapids King, Rapids Queen and Rapids Prince, for Prescott and points east; and the steamboats Toronto and Kingston will sail on other days in alternate weeks.

TORONTO-THOUSAND ISLANDS-PRESCOTT LINE.—On Tuesdays, Thursdays and Saturdays by the steamboats Toronto and Kingston, alternately each week.

MONTREAL-QUEBEC LINE.—Daily to Sept. 30 and daily except Sundays thereafter, by the steamboats Montreal and Quebec.

SAGUENAY LINE.—To July 2, Tuesdays, Wednesdays, Fridays and Saturdays;

to Sept. 6, daily; to Oct. 18, Tuesdays, Wednesdays, Fridays and Saturdays; to Nov. 15, Tuesdays and Saturdays by steamboats Murray Bay, Tadousac and Ste. Irene.

MONTREAL-SAGUENAY LINE.—Tuesdays and Fridays, July 8 to Sept. 12, by steamboat Saguenay.

CHARLOTTE-THOUSAND ISLANDS-OGDENSBURG LINE.—June 20 to Aug. 30, on Tuesdays, Thursdays and Saturdays, by steamboat Rochester, transferring passengers at Ogdensburg, to steamboats Rapids King, Rapids Queen and Rapids Prince for Prescott and points east.

NIAGARA LINE.—To June 7 and Sept. 8 to 20, four trips daily from Toronto, calling at Niagara-on-the-Lake, Queenston and Lewiston; June 9 to Sept. 8, six trips daily and four trips each Sunday, calling at the same ports, by steamboats Cayuga, Chippewa and Corona.

TORONTO-HAMILTON LINE.—Four trips daily, except Sundays, to June 16, by steamboats Macassa and Modjeska, and thereafter by steamboats Modjeska and Turbinia. The Macassa will then probably be operated to Grimsby Beach.

HAMILTON-TORONTO-MONTREAL LINE (Inland Lines, Ltd.)—Leaving Hamilton, Wednesdays and Saturdays; Toronto, Mondays, Wednesdays and Saturdays, and Montreal, Fridays, Saturdays and Tuesdays, by steamboats Belleville, Dundurn and Majestic.

DETROIT-CLEVELAND-TORONTO-Thousand Islands-Montreal Line.—Leaving Detroit, Tuesdays; Cleveland, Wednesdays; Montreal, Wednesdays, by steamboats City of Ottawa and City of Hamilton.

TORONTO-OLCOTT BEACH LINE.—Two trips daily to Sept. 6, by steamboat Chicora.

Vessels and Officers for 1913, of Inland Lines, Limited.

The following list of vessels to be operated by Inland Lines, Ltd., during the present season was received too late to be included in the season's list published in our last issue. The first column gives the name of the vessel, the second that of the captain, and the third that of the chief engineer in each case.

Donnacona	R. Alexander	F. Wilson
Dundee	I. Woolner	E. Shaw
Dundurn	W. Collins	S. Murray
Dunelm	C. R. Albinson	G. Wilson
Emperor	G. W. Pearson	G. Smith
Empress of Ft. William	D. Burke	J. Murphy
Empress of Midland	J. Wilson	J. Dee
Glenellah	G. Mackay	W. McWilliams
Majestic	W. Cox	D. S. LaRue
Midland King	W. Cunningham	J. McCreager
Midland Prince	I. Tindall	I. Pickard
Midland Queen	W. Laviene	F. Goodwin
Nee-paw-h	W. W. Allen	I. Carr
Rosedale	W. Jewitt	H. McWilliams
Stadacona	J. Cannally	G. Laird
Strathcona	C. Dineen	J. Payne
Wahcondah	W. Linton	I. Kennedy
Winona	B. Garvie	C. M. Arnot

The Dominion Government has appointed Prof. E. E. Haskell, of Cornell University, W. J. Stewart, Chief Hydrographer, and V. W. Forneret, Superintendent, St. Lawrence Ship Channel, to investigate the effect of further dredging operations on the water levels in the St. Lawrence, and the probable need of compensating works to deepen the channel where water is shallow, and also to investigate the effect of the withdrawal of water from the Great Lakes for the Chicago Drainage Canal. The recent application of the Chicago Drainage Commissioners for increased withdrawals was refused, and it is claimed that they are a present diverting more water than they are entitled to do, with a consequent lowering of levels at various points.

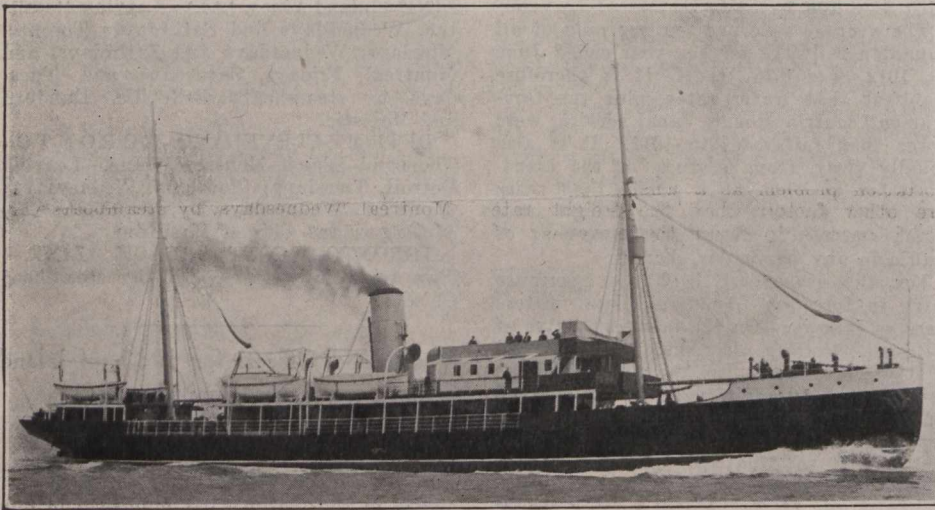
The Reid Newfoundland Company's s.s. Kyle.

The R.M.S. Kyle has been built recently at Newcastle on Tyne, Eng., for the Reid Newfoundland Co., for its coastal service between St. John's, Nfld., and Cape Chudleigh, on the coast of Labrador, a service occupying a fortnight for the round trip, and often having to be carried on through ice.

The vessel is finely modelled, 220 ft. long by 32 ft. beam, and has passenger accommodation for 68 first class and for 141 second class. The accommodation generally is of the most up to date and comfortable description, being well lighted electrically, heated by steam and thoroughly ventilated. The first class passengers will be berthed amidships. They will have a fine promenade deck, and in a house on that deck there is a comfortable smoking room, the walls being of oak, slightly fumed, with corresponding furniture upholstered in green leather. In the same house are the captain's room, the chief officer's room, and the wheelhouse. Below this, on the upper

The vessel is fitted with an installation of wireless telegraphy, a complete installation of electric light, including a search light, and an efficient arrangement of steam heating suitable for the climate. She is propelled by a set of single screw triple expansion engines, having cylinders, 18½, 30½ and 50 ins. dia. by 36 ins. stroke, supplied with steam from two single ended boilers, 13¾ ft. dia. by 11½ ft., fitted with six corrugated furnaces, and working under forced draught at a pressure of 180 lbs. per sq. in., the main condenser being of the latest "Uniflux" type. On the trial trip off the Tyne, a speed of 13¾ knots an hour was attained. Amongst the auxiliary machinery in the engine room may be mentioned steam and hydraulic reversing engines, a pair of feed pumps with direct contact feed heater, a centrifugal circulating pump, a feed water filter, auxiliary condenser, two steam ash hoists, an indicator fitted on bridge to indicate the movement of the main engines, circulators to the boilers, etc.

The trial trip was made on May 5, when the owners were represented by R. G. Reid, General Superintendent.



Reid Newfoundland Co.'s R.M.S. Kyle.

deck, are the ladies' room and the first class dining saloon. The ladies' room has walls of sycamore, satinwood furniture upholstered in old rose moquette, and the whole effect is very charming. Aft of the ladies' room is the entrance to the first class dining saloon, which is a fine room with walls and furniture of polished mahogany, the latter being upholstered with blue leather. This room is divided from the entrance by a very effective screen of polished mahogany, filled in with stained glass. The entrance hall and staircase connect the smoking room, dining saloon and first class staterooms, etc., and are panelled with polished mahogany, whilst the floor is of indiarubber tiling. There are 15 first class staterooms on the main deck below the dining saloon, with accommodation for 68 persons, one room being for ladies, with 10 berths. These are all enamelled white, with mahogany furniture and upholstered with rose colored moquette. The second class passengers will be berthed in the after part of the vessel. On the main deck there is a compartment for 102 men, and aft of this another for 39 women. Above, on the upper deck, right aft, there are two hospitals, one for men, the other for women, together with rooms for doctors, baths, etc. The officers and engineers have rooms on the main deck at the sides of the engine casing, and the galley is placed on the upper deck forward of the engine casing, conveniently near the dining saloon.

New Steamboat for Canadian Pacific Ry. Kootenay Lakes Service.

The steamboat Nasookin, which was built at Port Arthur, Ont., and shipped to Nelson, B.C., where she was reassembled, was launched at Nelson, Apr. 30. Her dimensions are, length between perpendiculars, 200 ft., length over all 236 ft., beam 40 ft., draught 5 ft. She will be driven by a stern wheel, 24 ft. dia., and the propelling machinery will consist of tandem compound jet condensing engines with cylinders 16¾ and 35¾ ins. dia. by 96 ins. stroke, supplied with steam at 200 lbs. by a locomotive boiler. The hull is entirely of steel, and her total displacement will be about 600 tons. Passenger accommodation for over 200 is arranged on three decks, the whole being of the most modern type, the furnishing being chiefly in cedar panelling finished in white enamel. A complete electric lighting plant is being installed by the Canadian General Electric Co., and the fire apparatus and life saving appliances are most complete. The construction is being carried out under the general supervision of J. C. Gore, Superintendent of the B.C. Lake and River Service.

The new harbor at Rotterdam, Holland, will, it is said, be the largest artificial harbor in the world, the water having covered 766 acres. It will be 28 ft. deep.

Transfer of the Jaques Steamboats.

Inland Lines Ltd., which is owned by the Richelieu and Ontario Navigation Co., has acquired the Montreal and Great Lakes Steamship Co.'s steamboat Bickerdike, and the Jaques Transportation Co.'s steamboat C. A. Jaques, and will operate them in connection with its other vessels, as it will also the steamboats City of Hamilton and City of Ottawa, owned by the Montreal and Lake Erie Steamship Co. Following are the chief particulars of the vessels mentioned.—City of Hamilton, built at Buffalo, N.Y., 1871, former name, Japan, length 220 ft., breadth 32.5 ft., depth 14 ft.; tonnage, 1,574 gross, 869 register, screw driven by engine of 80 n.h.p.; City of Ottawa, built at Buffalo, N.Y., 1871, former name, India, length 220 ft., breadth 32.5 ft., depth 14 ft.; tonnage, 1,529 gross, 838 register, screw driven with engine of 80 n.h.p.; Bickerdike, built at Buffalo, N.Y., 1873, former name, Arabia, length 233 ft., breadth 34.5 ft., depth 14.2 ft., tonnage, 1,515 gross, 864 register, screw driven with engine of 124 n.h.p.; C. A. Jaques, built at Dumbarton, Scotland, 1909, length 249 ft., breadth 43 ft., depth 22.7 ft., tonnage 2,105 gross, 1,590 register, screw driven with engine of 212 n.h.p. This last mentioned vessel is on the British register.

We are officially advised that captains and chief engineers have been appointed, as follows.—Bickerdike, captain, D. Charland, chief engineer, J. Melville; City of Hamilton, captain, J. L. Baxter, chief engineer, J. White; City of Ottawa, captain, A. Mackay, chief engineer, P. Lefaive.

New Steamship Princess Maquinna for Canadian Pacific Railway British Columbia Coast Service.

The C.P.R. s.s. Princess Maquinna, which is stated to be the largest vessel to have been built at Esquimalt, B.C., will shortly be ready to undergo her steam trials. She is intended for service on the west coast of Vancouver Island. She has been specially designed for this somewhat rough service, all the decks, with the exception of the boat deck, being enclosed by the steel sides of the vessel, and the usual housing above the awning deck has been eliminated.

She is built of steel throughout, in accordance with Lloyd's rules for class 100 A1. There is a double bottom and she is fitted with five tanks, the third, situated under the cross bunker, being reserved for the storage of oil fuel. There is passenger accommodation for 104 first and about 30 second class, the first class staterooms all being located on the awning deck. On the main deck, aft, is the dining saloon, with accommodation for 90 passengers. The walls are panelled in mahogany, with cornices and pilaster finishing. The smoking room is located on the boat deck, aft, and is finished in hard wood. On completion she will be equipped with eight metal seamless lifeboats, each 22 ft. long, and there will be a complete fire service. The propelling machinery consists of triple inverted direct acting surface condensing engines, with cylinders 20, 34 and 53 ins. dia., by 36 ins. stroke, supplied with steam at 180 lbs. by two boilers, each 13½ by 12 ft.

Two derricks will be placed aft, two forward, and two for the main hatch. The speed of the vessel provided for in the contract is 13½ knots an hour, but it is anticipated that she will exceed this in her trials.

Compulsory Use of Radiotelegraphy on Canadian Vessels.

The bill to provide for the compulsory use of radiotelegraphy on Canadian vessels, after having passed through the House of Commons, recently received its first and second readings in the Senate. Since the bill was originally introduced some amendments have been made, chiefly at the instance of the Dominion Marine Association, a number of the member companies of which contended that the principal provisions created a considerable hardship on them. The amended portion of the bill, provides that from July 1, 1913, vessels trading from any Canadian port, whether registered in Canada or not, carrying 50 or more persons and plying between ports more than 200 miles apart; or carrying 250 or more persons and plying between ports more than 90 miles apart; or carrying 500 or more persons and plying between ports more than 20 miles apart, must be equipped with radiotelegraph apparatus capable of receiving and transmitting messages at least 100 miles. Vessels operating on the rivers of Canada, including the St. Lawrence as far seaward as Father Point, or on the lakes of Canada, except Ontario, Erie, Huron and Superior, are exempt from the provisions of the bill, as are also vessels operating in the Bay of Quinte, and on the Toronto-Hamilton route in Lake Ontario, and in the Georgian Bay in Lake Huron.

The Dominion Marine Association and C. J. Smith, then General Manager, Richelieu and Ontario Navigation, and subsequently, H. H. Gildersleeve, Manager, Western Lines, R. & O. N. Co., failed to have the vessels plying between Toronto and the Niagara River exempted, but on the motion for the third reading of the bill in the Senate, May 15, it was referred to a

committee so that the company might make representations on the subject, with a view to further amendment.

Since the bill left the House of Commons Marine and Fisheries Committee, and prior to its passage through the lower house, the date when it is to become effective was changed from July 1, 1913, to Jan. 1, 1914, and the provision in sec. 7, for a penalty of \$500 and costs and 6 months imprisonment for infringement was altered to read, \$500 and costs or 6 months imprisonment.

The New Welland Ship Canal.

Rapid progress is being made in the preparation of the plans for the new Welland Canal, by the canal engineers, and it is expected that they will shortly be approved by the Dominion Government.

Connecting Lakes Erie and Ontario, this projected canal will be the third one to be built, the present one being commonly called the new canal, and the original one the old canal. The projected canal will here be referred to as the new canal, and not the existing one as at present.

The route of the canal on entering from the south, at Port Colborne, is the same as that of the present canal as far as Thorold, from which point the new canal will follow an almost straight line through Merritton to Lake Ontario, coming out into the latter at the mouth of Ten Mile Creek, about 3 miles east of the present outlet at Port Dalhousie. The present canal at Thorold swings off to the east in a wide sweep, and then back in a northwesterly direction. The new route, following an almost due northerly route, will cross the present canal at Merritton. The section of the existing canal between Thorold and Merritton is to be abandoned, but the portion of the present canal from Merritton to Port Dalhousie will be retained as an

auxiliary to the new canal. The territory at present covered will thus be practically unchanged as regards the presence of a canal service.

The existing canal has 25 locks, 270 by 45 ft., with a depth of 14 ft. of water over the sills. The total drop from the highest stretch of canal level, which is 568 ft., the mean level of Lake Erie, is 325.5 ft., to the Lake Ontario normal water level of 242.5 ft. The length of this canal is 26.75 miles.

The new canal is to have 7 locks of which nos. 4, 5 and 6 from Lake Ontario will be in flight, each 800 by 80 ft., with a lift of 46.5 ft., with 30 ft. of water over the sills. The levels of the present and new canals at Merritton will be the same, making possible their joining there. The main gates of the new canal are to be of the single leaf type, with mitre gates for places of minor importance. While the depth of the locks is to be 30 ft., the intermediate distances are only to be enlarged to a 25 ft. depth at present, pending future requirements. The total length will be 25 miles.

The time of lockage of the present canal, is from 11 to 20 mins. per lock. In the new canal, on account of the increased size of the locks, it is expected that this time will average about 20 mins. As there will be 18 fewer locks, the saving in locking time will be in the neighborhood of 3 hours.

The plans for the canal have been developed under the direction of J. L. Weller, M. Can. Soc. C.E., Engineer in Charge, St. Catharines, and Alfred Noble, of New York, has been retained as a consultant in connection with the work.

During April, 33 steam vessels, with a total net tonnage of 1,221, and 24 sailing vessels, with a total net tonnage of 2,482, were removed from the Canadian register.

The Richelieu and Ontario Navigation Co. has abolished the position of Naval Architect, formerly held by A. Angstrom.

List of Steam Vessels Registered in Canada during April, 1913.

No.	Name	Port of Registry	When and Where Built	Length	Breadth	Depth	Gross Tons	Reg. Tons	Engines, Etc.	Owner or Managing Owner
133823	A. V. Roy ..	Montreal	1913 Sorel, Que.	97 5	20 1	8 0	173	88	56 1/2 n.h.p. sc.	Sincennes-McNaughton Line, Ltd., Montreal.
133802	Adonia S. ..	Lunenburg, N.S. ..	1913 Tancook, N.S.	46 8	12 4	6 0	19	18	1	D. Slaunwhite, M.O., Terrence Bay, N.S.
133734	Baboe (a) ..	Vancouver, B.C. ..	1909 Dockton, Wash.	39 5	13 4	4 5	18	13	2 1/2	Powell River Co., Vancouver, B.C.
131134	Batchawana ..	Ottawa	1912 Toronto	49 0	13 0	7 7	52	29	4 4-5	Minister of Railways and Canals, Ottawa.
133740	Bentineck (b) ..	Vancouver, B.C. ..	1912 Hoquiam, Wash.	52 0	15 0	7 4	34	23	4	Ocean Falls Co., Vancouver, B.C.
131010	Betty D (c) ..	St. John, N.B.	1898 Buffalo, N.Y.	86 2	23 4	10 8	145	98	80	Norton Griffiths Dredging Co., Montreal.
133825	Cabotia (d) ..	Montreal	1880 Gibraltar, Mich.	243 5	35 6	19 6	1530	932	"	A. McLaurin, Montreal.
131056	Calgarian ...	Port Arthur, Ont. ..	1913 Port Arthur, Ont. X.	244 0	42 8	26 0	2326	1302	115 3-5	Western Dry Dock & Shipbuilding Co., Ltd., Port Arthur, Ont. (1)
133826	Canobie (e) ..	Montreal	1887 Detroit, Mich.	250 3	37 4	19 8	1748	1051	94 2-5	Lehigh Coal Co., Montreal.
133841	Cavalier II. ..	Vancouver, B.C. ..	1913 Vancouver, B.C.	25 5	8 0	3 7	6	4	1	G. T. Wadds, Vancouver, B.C.
133736	Chief Skugaid ..	"	1913 "	77 1	18 0	8 0	80	55	3 1/2	Canadian Fish & Cold Storage Co., Vancouver, B.C.
131136	Excudit (f) ..	Ottawa	1912 Collingwood, Ont.	212 0	38 0	15 3	1161	607	175	Minister of Marine and Fisheries, Ottawa.
88682	Excudit (f) ..	St. John, N.B.	1885 Portland, N.B.	73 5	17 5	7 9	105	89	1	R. A. Cameron, St. John, N.B.
133737	Fredelia III. ..	Vancouver, B.C. ..	1912 St. John, N.B.	73 5	17 5	7 9	105	89	1	R. A. Cameron, St. John, N.B.
131042	I Go	Vancouver, B.C. ..	1912 Seattle, Wash.	44 5	13 0	5 4	25	17	2 1/2	Canadian Fish & Cold Storage Co., Vancouver, B.C.
133821	John Duncan ..	Sorel, Que.	1910 Sorel, Que.	46 6	8 0	3 2	7	5	1 1-5	R. Wilkie, Sorel, Que.
130871	Lilono	Montreal	1891 Green Bay, Wis.	233 0	37 6	20 3	1517	924	96	Canada Cement Transport, Ltd., Montreal.
130627	Lily M. Hodge ..	N. Westminster, B.C. ..	1912 N. Westminster, B.C. ..	35 8	8 3	3 0	8	5	1 1/2	W. R. Jaynes, New Westminster, B.C.
131048	M. & F. No. 8 ..	Yarmouth, N.S.	1913 Yarmouth, N.S.	56 0	13 7	6 6	34	28	2	Lockeport Cold Storage Co., Lockeport, N.S.
131049	M. & F. No. 8 (g) ..	Sorel, Que.	1906 Sorel, Que.	264 0	45 1	18 4	2050	1270	154	Minister of Marine and Fisheries, Ottawa.
131132	Maggie K.	Sorel, Que.	1905 Dantzig, Germany ..	235 5	38 8	13 5	1332	838	136	"
131180	Malada	Ottawa	1912 Buckingham, Que.	48 2	11 5	4 4	25	13	4 4-5	Minister of Public Works, Ottawa.
130870	Miono	Lunenburg, N.S. ..	1 13 Tancook, N.S.	47 2	13 3	7 0	22	21	1 1-5	H. Fleet, M.O., Blandford, N.S.
133731	Miowera	N. Westminster, B.C. ..	1911 N. Westminster, B.C. ..	30 0	6 6	2 0	5	3	1	R. Jaynes, New Westminster, B.C.
133752	Muscallonge ..	Vancouver, B.C. ..	1910 Vancouver, B.C.	35 5	9 3	5 0	12	8	1 4-5	W. F. Clapham, Vancouver, B.C.
133738	Nasutlin	St. John, N.B.	1896 Port Huron, Mich.	128 0	24 5	12 0	390	245	51	Norton Griffiths Dredging Co., Montreal.
133751	Nereid	Vancouver, B.C. ..	1912 Whitehorse, Yukon.	115 0	27 1	3 8	405	256	9 1/2	British Yukon Navigation Co., Vancouver, B.C.
131133	Orkney	St. John, N.B.	1912 Waterborough, N.B.	53 6	15 6	6 3	40	28	13	T. W. Smith, St. John, N.B.
133753	Pluvia (j) ..	Ottawa	1913 Ottawa	25 8	6 2	2 8	3	2	3-5	J. L. Scobie, Bristol, Que.
133822	Pueblo	St. John, N.B.	1901 Phippsburg, Me.	49 3	16 5	6 5	42	29	10 3-5	Norton Griffiths Dredging Co., Montreal.
133824	Sarnor (k) ..	Montreal	1891 Milwaukee, Wis.	236 1	36 3	19 3	1493	905	88	Canada Cement Transport, Ltd., Montreal.
133732	Shimoiget ..	Montreal	1888 West Bay City, Mich.	227 6	36 0	21 3	1319	1152	80	H. M. Norris, Montreal.
130511	Sissiboo	Vancouver, B.C. ..	1896 Marine City, Mich.	67 6	14 6	5 8	43	29	4 1/2	Packers Steamship Co., Vancouver, B.C.
133842	Thornietta ..	Weymouth, N.S.	1913 Little River, N.S.	66 0	16 0	6 9	61	29	17	B. H. Morehouse, Sandy Cove, N.S.
133733	Vireve	Vancouver, B.C. ..	1912 Seattle, Wash.	44 0	8 5	3 6	14	10	4 2-5	Port Moody Investments, Vancouver, B.C.
133733	Vireve	"	1913 Vancouver, B.C.	31 7	8 3	3 0	7	5	1	A. Marshall and W. R. Spencer, Vancouver, B.C.

(a) formerly, Union. (b) formerly, Pacific. (c) formerly, Charles F. Dunbar. (d) formerly, Hiawatha. (e) formerly, Iron King. (f) formerly, Neptune. (g) formerly, Galveston. (h) formerly, Vigilante. (j) formerly Wm. G. Small. (k) formerly, Britannic. (1) Owners, Canada Interlake Line, Ltd., Toronto.

The Dominion Wreck Commissioner's Judgment in the Royal George Wreck.

The British Board of Trade has allowed the appeal of Capt. Harrison, who was master, Canadian Northern Steamships s.s. Royal George when she ran ashore in the St. Lawrence River last fall, and has restored his certificate. The full report of the judgment, giving the grounds on which the Dominion Wreck Commissioner's judgment was reversed, had not been received up to the time of going to press, but Capt. Harrison is reported to have said that he can claim command of the vessel and his salary from the time of the stranding. Enquiry at the Canadian Northern headquarters in Toronto elicits the information that Capt. Harrison will not be reappointed to the company's service.

Until the complete judgment is received, comment is reserved, but as there is some misapprehension on the matter, it may be mentioned that Capt. Harrison holds a British Board of Trade certificate, and in the Shipping Casualties Act regarding such investigations, it is provided where a certificate issued by the Board of Trade has been cancelled or suspended, it shall be forwarded, with the report and evidence, to the Board of Trade in London.

The Journal of Commerce, Liverpool, Eng., in commenting on the result of the appeal, recently said:—"Apparently, when an accident befalls a ship in Canadian waters the Government regards the investigation which follows as a sort of prosecution, the unhappy officers being subjected to a close and searching cross examination on every detail, the obvious aim of the Government being to convict the unfortunate mariner of culpable negligence or recklessness. It has been suggested that this line has been taken in order to divert attention from the manifest, and, in many cases, preventable difficulties of the St. Lawrence navigation, captains and officers generally, in spite of the efforts of the Dominion Government being still of the same mind as underwriters, that much yet remains to be done before the passage of a vessel through this waterway can be regarded as a normal and ordinary journey."

The writer of the article above quoted from the Journal of Commerce is either lamentably ignorant of the facts, and therefore incompetent to express an opinion, or else he is blinded by insular prejudice or some other cause. His charge as to the way in which marine investigations are conducted in Canada is utterly without foundation. Of course, captains whose ves-

sels get into trouble are closely and searchingly examined in order to bring out the facts, but they have every opportunity to defend themselves and can be represented by counsel. The charge that the Government's aim is to convict captains of culpable negligence, or recklessness, is absolutely false and mendacious, and the suggestion that this is done to divert attention from alleged difficulties of the route is equally foundationless. Further comment is reserved until the full text of the Board of Trade's decision is received. In the meantime it may, however, be pointed out that representatives of that body, who probably have never seen the St. Lawrence and know nothing about it, are hardly likely to be accepted, at least in Canada, as any better authorities than Canadian officials who thoroughly know the route.

The Richelieu and Ontario Navigation Company's Provincial Advisory Boards.

Canadian Railway and Marine World for March contained a list of the R. & O.N. Co.'s directors, with the statement that two advisory boards would be appointed, to act respectively for the company in Ontario and Quebec. We have been officially advised that the following have been appointed:—

QUEBEC ADVISORY BOARD.—W. Molson Macpherson, Chairman; P. Galibert, F. Carrell, Sir George Garneau.

ONTARIO ADVISORY BOARD.—Sir Henry M. Pellatt, Chairman; J. P. Steedman, T. P. Phelan, A. E. Dymont.

Following are the directors of two of the subsidiary companies:—

NORTHERN NAVIGATION CO.—President, Jas. Playfair; Vice Presidents, J. R. Binning and W. E. Davis (since deceased); other directors, Jas. Carruthers, J. E. Dalrymple, H. B. Smith, F. Pardee, W. J. Shepherd, E. Bristol, M.P.; F. A. Magee, H. H. Gildersleeve and H. W. Richardson; Manager, P. Paton; Secretary, F. A. Magee; Treasurer, C. A. Macdonald, formerly Assistant Manager, which position has been abolished.

NIAGARA NAVIGATION CO.—President, Sir Henry M. Pellatt; Vice President, Jas. Carruthers; other directors, Jas. Playfair, J. R. Binning, J. P. Steedman, H. B. Smith and W. D. Matthews; Comptroller and Treasurer, J. I. Hobson; Secretary, F. P. Smith.

The Cunard Steamship Co. has declared a dividend of 10% for 1912, as against 7½% for 1911, and 5% for 1910.

Atlantic and Pacific Ocean Marine.

The wireless telegraph station at Cape Race, was destroyed by fire, May 5. The loss is estimated at \$10,000.

C. A. Lewthwaite has been appointed Travelling Passenger Agent for the Allan Line Steamship Co., with headquarters at Winnipeg, vice J. F. Pratt.

The Hamburg-American Line s.s. Sithonia arrived at Vancouver, May 5, from Europe, via the Suez Canal, inaugurating a new service with the Pacific coast.

The Dominion Lighthouse Board is considering the question of adopting, on the suggestion of the Shipping Federation of Canada, a new lighting of the ship channel in the St. Lawrence, having red lights on one side and white lights on the other.

Shipping reports from the Pacific coast, state that for the year ended Mar. 31, 11,407 vessels, with a registered tonnage of 9,046,115, berthed at Victoria, B.C., showing an increase of 1,500 vessels and 2,000,000 tons over the previous year.

The enquiry into the recent collision of Furness, Withy and Co.'s s.s. Chiltern Range with an iceberg, was opened at Montreal, May 14. It was decided that as the vessel had sustained no material damage, and for other reasons of policy, to adjourn the enquiry indefinitely.

On the introduction of the bill, in the House of Commons recently, for the incorporation of the Vancouver Harbor Commissioners, it was stated that 8 monthly ocean steamship services, 1 bi-monthly, 1 tri-weekly, 2 bi-weekly, and 1 weekly, are being operated out of Vancouver.

A Montreal press dispatch states that the Italia Co., and the Navigazione Generale Italiana, will inaugurate a double steamship service between Italy and Canada during this season, the former company making Halifax and Boston its ports, and the latter Quebec and Montreal. Both companies are allied with the Hamburg-American Line.

The operation of a steamship service between Victoria, Vancouver and Salina Cruz, Mexico, which has been undertaken intermittently by various companies, has again been started. The first vessel on the new service arrived at B.C. ports recently, from Salina Cruz. The line is under the management of W. R. Grace and Co., who have chartered the Norwegian s.s. Thode Fagelund, and who anticipate putting on a regular monthly service.

Referring to the published statements that the new Atlantic mail service agree-

List of Sailing Vessels and Barges Registered in Canada during April, 1913.

No.	Name	Port of Registry	Rig	When and Where Built	Length	Breadth	Depth	Reg. Tons	Owner or Managing Owner	
133827	A. L. No. 1	Montreal	Sloop	1913	Pierreville, Que.	108 5	23 2	8 0	157	A. Laperriere, Pierreville, Que.
133739	A. M. 4	Vancouver, B.C.	Scow	1902	Vancouver, B.C.	70 0	30 0	7 5	152	W. W. White, Vancouver, B.C.
131176	Arcola	Lunenburg, N.S.	Schr	1913	Lunenburg, N.S.	106 8	26 3	10 4	97	H. Adams, M.O., Lunenburg, N.S.
133735	C. S. & B. 1 (a)	Vancouver, B.C.	Barge	1891	Eureka, Cal.	165 0	36 5	11 8	399	Coastwise St. & Barge Co., Vancouver, B.C.
134015	Colin	Quebec, Que.	Scow	1912	Quebec, Que.	122 2	21 4	8 5	198	W. Q. Stobo, Quebec, Que.
131177	Delawana	Lunenburg, N.S.	Schr	1913	Lunenburg, N.S.	106 8	26 3	10 4	95	B. Cook, M.O., Rose Bay, N.S.
37514	Jessie Brown	Sydney, N.S.	"	1858	Shelburne, N.S.	66 6	20 5	8 0	56	W. G. Richards, Grand River, P.E.I.
130774	L. S. No. 8	Sault Ste. Marie, Ont	Dredge	1896	Duluth, Minn.	100 0	31 3	6 7	383	S. L. Penhorwood, Sault Ste. Marie, Ont.
131043	M. & F. No. 2	Sorel, Que.	"	1896	Sorel, Que.	168 2	32 0	12 8	509	Minister of Marine and Fisheries, Ottawa.
131044	M. & F. No. 3	"	"	1900	"	149 7	32 3	11 8	580	"
131045	M. & F. No. 4	"	"	1900	"	149 7	32 2	12 0	530	"
13 046	M. & F. No. 5	"	"	1901	"	160 4	35 2	12 8	520	"
131047	M. & F. No. 6	"	"	1902	"	177 1	34 5	12 2	559	"
131069	McDougald (b)	St. John, N.B.	"	"	U.S.	114 6	40 3	12 3	806	Norton Griffiths Dredging Co., Montreal.
131098	McMartin (c)	"	"	"	"	229 7	37 0	10 9	1348	"
131093	Nina Lee	Shelburne, N.S.	Schr	1913	Allendale, N.S.	89 7	25 4	9 2	79	J. B. Foote, Grand Bank, Nfld.
131178	Nordica	Lunenburg, N.S.	"	1912	"	102 8	25 0	10 3	98	J. Backman, M.O., LaHave, N.S.
131135	P. Waters	Ottawa	Barge	1913	Hull, Que.	113 0	24 2	7 8	179	Ottawa Transportation Co., Ottawa.
133801	Pasadena	Lunenburg, N.S.	Schr	1913	Mahone Bay, N.S.	102 2	25 0	10 4	91	W. Ernst, M.O., Mahone Bay, N.S.
131179	V. E. Himmelman	"	"	1912	"	109 2	26 2	10 6	99	W. Duff, M.O., Lunenburg, N.S.
131175	W. T. White	"	"	1912	LaHave, N.S.	104 0	26 0	10 4	99	L. Knock, M.O., Rose Bay, N.S.

(a) formerly, Bangor. (b) formerly, No. 6. (c) formerly, Denver.

ment with the Dominion Government provided for the construction of ships capable of being used as mail steamships in peace and armed cruisers in war, Sir Thomas Shaughnessy is reported to have said recently in England:—"This is all mere speculation or an attempt at intelligent anticipation of some possible future scheme. As this contract is for one year only, it must be obvious that nothing so costly and comprehensive as a fleet of mail steamships armored and equipped for use as war cruisers and forming a part of a scheme of Imperial naval defence for the North Atlantic, can be embraced within that agreement. It is only a mail contract."

Maritime Provinces and Newfoundland.

The Fredericton Steamship Co., Ltd., application for the incorporation of which was announced in our last issue, has been incorporated, with \$5,000 capital, and office at Fredericton, N.B.

Permission has been granted to change the names of the following steamboats:—W. G. Small, no. 133,753, registered at St. John, N.B., to Pluvia; and Charles F. Dunbar, no. 131,010, registered at St. John, N.B., to Betty D.

The British s.s. Glace Bay, under charter to the Dominion Iron and Steel Co., ran ashore during a fog, near Cape Race, May 3, while on her way in ballast, from Sydney, N.S., to Wabana, Nfld., for ore, and became a total loss.

E. Fleming has been appointed agent for the Eastern Steamship Co., at St. John, N.B. He was in the company's service for several years at Boston, Mass., but latterly has been in the steamship business at St. John, where his father is harbor master.

The steam tug G. S. Mayes was launched recently at St. John, N.B. Her dimensions are, length 92 ft., depth 22 ft., depth 11 ft. She is to be equipped with machinery taken from the steam tug Dirigo, which is also owned by G. S. Mayes, St. John.

The Crystal Stream Steamship Co., St. John, N.B., has appointed F. S. Mabee and J. Williams, as captain and chief engineer, respectively, of its steamboat D. J. Purdy; and B. Dykeman and G. Blewett, as captain and chief engineer, respectively, of its steamboat Majestic, for this season.

Burton Stewart, Manager for Norton Griffiths and Co., St. John, N.B., is visiting London, Eng., to confer with the head officials with regard to the season's plans for work in Canada. It is reported that a Canadian board will be appointed for the company. The chief work in hand is the Courtenay Bay development in St. John harbor.

The Department of Marine has awarded the contract for the construction of a first class single screw steel steam lightship to be delivered at Halifax, N.S., to Bow MacLachlan and Co., Paisley, Scotland, for \$127,384. The chief dimensions will be:—Length between perpendiculars, 114 ft.; breadth, moulded, 29 ft.; depth, moulded, 14 ft. 8 ins.

The Nova Scotia Steel and Coal Co., New Glasgow, N.S., has chartered, for 10 years, the steamships Wagama and Wascana, just built on the Tyne, Eng. They are built on the cantilever principle with clear holds, free from beams, pillars and other obstructions, and have five very large hatches for the rapid loading and discharge and the minimizing of any trimming of coal or ore cargoes. Their dimensions are, approximately:—Length, 380 ft.; beam, 52½ ft.; moulded depth, 30 ft.; deadweight capacity, 8,000 tons. The Wagama will be operated

between Wabana, Nfld., and North Sydney, N.S., and between North Sydney and Montreal in the ore and coal trades respectively. The Wascana is expected to arrive on this side July 1 for similar purposes.

At a public meeting at St. John, N.B., recently, to consider the question of urging the more rapid development and improvement of the harbor facilities at Sand Point, W. Downie, General Superintendent, Atlantic Division, C.P.R., representing the steamship companies, stated that whereas there had been ample accommodation during the first part of the season, considerable congestion had occurred towards the close. If the present rate of increase were maintained, the exports and imports at St. John would be doubled in the next five years, and he suggested the erection of grain conveyors by those owning the piers, the Government, or by the city, and if by the city, then a charge sufficient to meet interest and sinking fund requirements should be made.

Province of Quebec Marine.

An order in council has been issued amending the rules and regulations for the management and working of the Levis dry dock.

Dredging is in progress at the mouth of the St. Charles River, Quebec, and it is anticipated that sufficient will have been accomplished by the end of the season to allow of the building of 1,000 ft. of the pier wall.

The establishment of a ferry service between Maisonneuve and Longueuil near Montreal is being discussed by the Maisonneuve council, and it is expected that a contract for its operation for 10 years, will be made with the Quebec and Levis Ferry Co.

The Montreal-Valleyfield and Soulanges Navigation Co., Ltd., has been incorporated under the Dominion Companies Act, with \$20,000 capital, and office at Lachine, Que., with power to acquire and operate steam and other vessels and conduct a general transportation business in passengers and freight.

The St. Johns and St. Lawrence Co., Ltd., has been incorporated under the Dominion Companies Act, with \$20,000 capital and office at St. Johns, Que., to carry on the general business of transportation, except railroading, to carry on a general towing business, and in connection therewith to own and operate steam and other vessels, and build docks, dry docks, harbors, warehouses, etc. The incorporators are, E. Langlois, J. Cartier, J. C. Harbeck, St. Johns, Que.; G. Guillet and A. Thuot, Iberville, Que.

The Lake Champlain and St. Lawrence Ship Canal Co. is applying to the Dominion Parliament to revive its corporate powers, and to extend the time for the building of a canal from the St. Lawrence River, in Chambly County, Que., to the Chambly Canal, or the Richelieu River, of such dimensions as to make it a navigable channel of not less than 80 ft. wide at the bottom, and not less than 9 ft. deep, and the building of railway lines alongside, and wharves, docks, etc., in connection therewith.

During the committee stage of the Quebec Harbor bill, which authorizes the expenditure of over \$3,000,000 on harbor improvements, the Minister of Marine stated, recently, that it is expected to have the grain elevator completed by the spring of 1914, and that the proposed terminal facilities will be ready within two years. The elevator will have 1,000,000 bush. capacity.

The dredging in the harbor is being done this year by contract, but it is proposed that the Harbor Commission have its own dredging plant.

Ontario and the Great Lakes.

The Ontario Car Ferry Co.'s car ferry Ontario No. 1 was docked at the Polson Iron Works, Toronto, recently, for the fitting of new smoke stacks and the overhauling of her engines.

The Quebec Transportation and Forwarding Co.'s steam tug Florence ran aground near Cardinal, in the St. Lawrence River, May 11, and was reported to be on her side and partially filled with water.

The Cleveland and Buffalo Transit Co. announces that it will operate its vessel City of Ohio, which was run between Cleveland and Buffalo last year, between Cleveland and Port Stanley during this season. She is being overhauled and refitted.

Permission has been given for changes of names of the following steamboats, acquired from foreign owners:—Mars, to Martian; Hero, to Hero No. 1; Pioneer, to Natronco; Saturn, to J. Frater Taylor, and Uranus, to W. C. Franz.

The Northern Navigation Co.'s s.s. Noronic, now under construction at Port Arthur, will be launched June 2. She is 385 ft. long with 52 ft. beam, and will have accommodation for 600 passengers. She will be ready for service on the opening of navigation in 1914.

The ice breaking steamboat J. T. Horne was launched at Port Arthur May 9. She is built after the same model as the ice breaker James Whalen, her dimensions being:—Length, 125 ft.; breadth, 28 ft.; depth, 16 ft.; and is owned by James Whalen.

Dredging has been recommenced in Fort William harbor, the season's work comprising the removal of 25 acres of solid earth on the Kaminstikwia River, for a turning basin, the deepening and widening of the channel of the Mission and McKellar Rivers, the building of additional slips, etc.

The Cleveland and Buffalo Transit Co.'s s.s. City of Ohio will be placed in service between Port Stanley, Ont., and Cleveland, Ohio, June 19, leaving Port Stanley on Tuesdays, Thursdays and Saturdays at midnight, and Mondays at 1 p.m., in connection with the London and Lake Erie Ry. and Transportation Co.'s electric car service between London, St. Thomas and Port Stanley.

It is announced that a contract has been placed at Port Arthur, by a Montreal transportation company, for the construction of what is termed the largest exclusive bulk freighter ever built in the British Empire. The dimensions given are:—Length, 625 ft. over all, 605 ft. keel, 59 ft. beam, and 32 ft. depth. It is stated that she will be built on the Isherwood system, and will be equipped with triple expansion engines.

With reference to recent press reports to the effect that the Lake Erie and Northern Ry. intends operating a car ferry service between Port Dover, Ont., and Erie, Pa., we are officially advised that the company will come to no decision until it is definitely ascertained what steps the Government will take to make the necessary improvements to the harbor at Port Dover.

H. J. Lamb, of the Public Works Department, is reported to have stated in London, Ont., May 7, that the Government intends to carry out the proposals for the improvement of the harbor at Port Stanley. The

work covers the building of a breakwater along the east side of the harbor, about 1,000 ft., and the deepening of the harbor to allow of the admission of vessels drawing 18½ ft.

The s.s. Turret Crown, while down bound with 105,000 bush. of grain, collided with the s.s. William H. Mack, near Whitefish Point, during a fog, May 4. She was considerably damaged near the boiler house to the starboard, but proceeded to Sault Ste Marie, where she was anchored, resting on the bottom in 12 ft. of water, while some temporary repairs were undertaken. She was subsequently lightered of her cargo and proceeded to Collingwood for general repairs.

The Pembroke Transportation Co., Ltd., has been incorporated under the Dominion Companies Act, with \$40,000 capital, and office at Pembroke, Ont., to own and operate steam and other vessels for purposes of general transportation, and to carry on the business of general carrier. The incorporators are:—W. L. Hunter, J. C. Hunter, J. W. Smith, W. H. Bromley, E. A. Dunlop, Pembroke; C. L. McCool, Sheen Tp., Que.; M. F. Johnston, C. A. McCool, Ottawa, and T. B. Marion, Des Joachims, Que.

It is announced from Buffalo, N.Y., that the Canadian and Fort Erie Ferry Co., and the American and Canadian Ferry Co., have been formed to operate the ferry service between Buffalo and Fort Erie, in connection with which considerable trouble has been experienced in the past. The Buffalo and Fort Erie Co.'s vessels will, it is said, be taken over and operated. The outcome is more or less a matter of agreement between the Buffalo and Fort Erie Co., the Independent Ferry Co., and the Dominion Minister of Marine, by whom the old license to operate the ferry was revoked.

The Montreal and Lake Erie Steamship Co.'s steamboat City of Montreal, which was recently damaged by fire at Montreal, has been sold to J. H. Hall, Ottawa. She is being thoroughly overhauled and repaired, and will be operated between Montreal and Lake Superior ports, during this season. A. Lefebvre has been appointed captain, and F. E. Hamelin, chief engineer. The City of Montreal was built at Buffalo, N.Y., in 1871, her name then being, China. Her dimensions are, length 220 ft., breadth

32.5 ft., depth 14 ft., tonnage 1,554 gross, 868 register, and she is screw driven with engine of 80 n.h.p.

A number of reports are current in Montreal and Toronto, as to further absorptions of other large navigation companies by the Richelieu and Ontario Navigation Co. In previous issues of Canadian Railway and Marine World, we have given various details of the general reorganization of the company, its financial and general interests, and connections with the Furness, Withy and Co.'s interests, and the British Maritime Trust Co., from which some idea of its aims with regard to the development of the navigation of Canadian inland waters, may be gathered. Many of the reports are founded on mere conjecture as to what might take place, and others are anticipating events which might follow in the natural course of development.

The St. Lawrence and Chicago Steam Navigation Co.'s s.s. James Carruthers was launched at Collingwood, May 22. Her dimensions are, length over all, 550 ft. 8 ins.; length between perpendiculars, 529 ft.; beam, 58 ft.; moulded depth, 31 ft.; estimated carrying capacity, 15,000 tons, thus making her the largest cargo carrying vessel on the Canadian lakes. She is equipped with triple expansion engines with cylinders 24, 40 and 66 ins. diam., by 42 ins. stroke, supplied with steam by three Scotch boilers, each 13 ft. diam. by 11 ft. long, at 185 lbs. The furnaces, which will be fitted with forced draught, will have a grate area of 45 sq. ft. to each boiler. She is built with side tanks, six compartments, and there are 31 hatches, spaced 12 ft. centres. Miss L. C. Wright, daughter of A. A. Wright, General Manager, St. Lawrence and Chicago Steam Navigation Co., performed the christening ceremony.

British Columbia and Pacific Coast Marine.

The C.P.R. s.s. Princess Victoria resumed her service May 7 after completing her machinery overhaul at Victoria.

The C.P.R. s.s. Tees, which grounded on the mud in Franklin Creek, near Victoria, recently, was released with no damage May 4 and continued on her route.

A press report from Vancouver states that C. H. Nicholson, Manager, G.T. Pacific Coast Steamship Co., is visiting Winnipeg to confer with the management regarding plans for a vessel to be built in readiness for traffic in 1914.

Marine Express, Ltd., has been incorporated under the British Columbia Companies Act, with \$100,000 capital, and office at Vancouver, to own and operate steam and other vessels for the transportation of passengers and merchandise.

N. Hardie, heretofore local manager for Dodwell and Co., agents for the Blue Funnel Line, Victoria, B.C., has been appointed in a similar capacity at Vancouver, and has been succeeded at Victoria by H. B. Davenport, heretofore at Tacoma, Wash.

The Lincoln Steamship Co.'s s.s. Ophir was destroyed by fire on the Fraser River, near Ladner, May 9, and six of the crew lost their lives. She was a wooden vessel of about 200 tons deadweight capacity, and was valued at about \$24,000.

The Canadian Yukon Navigation Co., Ltd., has been incorporated under the Dominion Companies Act, with a capital of \$50,000, and office at Dawson, Yukon, to own and operate steam and other vessels for the conveyance of passengers and merchandise, and to carry on other incidental business. The incorporators include H. Fisher and L. P. Sherwood, barristers, Ottawa.

George Bury, Vice President, C.P.R., is reported to have stated at Vancouver, May 10, that contracts had been placed for the construction of two modern vessels for the coast service. J. W. Troup, Manager, B.C. Coast Service, is in Great Britain dealing with the matter. It is stated that the vessels will be about 5,000 tons, and altogether a distinct advance on any of the present vessels in service on the coast.

The British Columbia Fisheries Co., Prince Rupert, has appointed the following captains and chief engineers for its vessels for this season:—Canada, captain, L. Anderson; chief engineer, E. R. Seater. Gryme, Captain, J. Haans; chief engineer, J. McCubbins. Triumph, captain, J. Morrison; chief engineer, W. Vicars. The s.s. Imbricaria, which has been built in Great Britain for the company, will be put into service as soon as she arrives on the coast.

Sault Ste. Marie Canals Traffic.

The following commerce passed through the Sault Ste. Marie Canals during April, 1913.

ARTICLES			CANADIAN CANAL	U. S. CANAL	TOTAL
Copper.....	Eastbound.....	Short tons		1,053	1,053
Grain.....	".....	Bushels	4,105,553	3,132,799	7,238,352
Building stone.....	".....	Short tons			
Flour.....	".....	Barrels	86,060	177,230	263,290
Iron ore.....	".....	Short tons	185,959	106,959	292,918
Pig iron.....	".....	".....			
Lumber.....	".....	M. ft. b.m.	495	142	637
Silver ore.....	".....	Short tons			
Wheat.....	".....	Bushels	7,920,005	11,463,050	19,383,055
General merchandise.....	".....	Short tons	2,160	14,011	16,171
Passengers.....	".....	Number	25	1	26
Coal, hard.....	Westbound.....	Short tons		214,814	214,814
Coal, soft.....	".....	".....	135,894	378,490	614,384
Flour.....	".....	Barrels			
Grain.....	".....	Bushels			
Manufactured iron.....	".....	Short tons	5,835	22,402	28,237
Iron ore.....	".....	".....			
Salt.....	".....	Barrels	3,990	2,907	6,957
General merchandise.....	".....	Short tons	24,046	24,936	48,982
Passengers.....	".....	Number	165	2	167
Summary.					
Vessel passages.....	".....	Number	208	374	582
Registered tonnage.....	".....	Net	520,681	996,652	1,517,333
Freight—Eastbound.....	".....	Short tons	536,210	561,913	1,098,123
" — Westbound.....	".....	".....	166,345	641,087	807,432
Total freight.....	".....	".....	702,555	1,203,000	1,905,555

The Canadian canal opened April 14, and the U. S. canal April 18.

The Ontario and Quebec Navigation Company Changes Hands.

This company has been acquired by Aemilius Jarvis and Co., Toronto. The company was originally incorporated in 1905, with R. B. Hepburn as General Manager, and J. deC. Hepburn as General Freight and Passenger Agent, and with offices at Picton, Ont. Following are the officers and directors of the new company:—President, Albert Oakley; other directors, Aemilius Jarvis, A. D. Morrow, Morgan Jellett, W. J. Chalmers, Toronto, and B. R. Hepburn, M.P., Picton, Ont. Secretary, C. D. Henderson, Toronto.

The vessels which have been taken over are, the steamboats Aberdeen, Alexandria, Aletha, Brockville, Geronia, Lloyd S. Porter, Varuna, and Water Lily; and the barges Isabel Reed and Rob Roy. They will be operated on the same routes and schedules as last year, and J. deC. Hepburn, who has been General Manager of the old company, will continue in that capacity. It would not be at all surprising if the recent transfer of ownership turned out to be a preliminary step to the acquirement of the line by the Richelieu and Ontario Navigation Co.

Canadian Notices to Mariners.

The Department of Marine has issued the following:—

72. Mar. 31. Ontario, Detroit River, Limekiln Crossing channel, south light vessel withdrawn, fog bell discontinued.
73. Mar. 31. United States of America, Detroit River, changes in Grosse Isle south channel range lights.
74. Mar. 31. United States of America, Detroit River, change in Ecourse back range light.
75. Apr. 3. New Brunswick, south coast, Bay of Fundy, off north end of Adam Island, bell buoy to be established.
76. Apr. 3. Nova Scotia, south coast, off entrance to Port Medway, southwest breaker, whistling buoy to be established.
77. Apr. 3. Nova Scotia, south coast, Green Island, intended change in character of light.
78. Apr. 3. Prince Edward Island, south coast, Northumberland Strait, Tryon Shoal, whistling buoy re-established.
79. Apr. 5. Ontario, Detroit River, gas buoy at junction of Ballard Reef and Livingstone Channels, change of light, additional light.
80. Apr. 5. Ontario, River St. Mary, Sault Ste. Marie Canal, channel at lower entrance, gas buoy established.
81. Apr. 12. North Atlantic Ocean, Transatlantic steamship routes, ice patrol service.
82. Apr. 14. Ontario, Lake Ontario, Newcastle harbor, outer portion of east pier together with the lighthouse carried away by a storm, hydrographic notes.
83. Apr. 14. Ontario, Lake Erie, Pelee Passage, southeast shoal lightship, main mast and red ball removed, change in character of light.
84. Apr. 14. United States of America, Niagara River, Tonawanda Channel, Strawberry Island cut, intended changes in buoyage.
85. Apr. 14. United States of America, Detroit River, Bar Point channels, intended changes in buoyage.
86. United States of America, Lake Huron, Sturgeon Point light, characteristic to be changed.
87. Apr. 15. British Columbia, Vancouver Island, west coast, Barkley Sound, eastern channel, Kelp Bay, uncharted rock.
88. Apr. 15. British Columbia, Vancouver Island, east coast, Saanich Inlet, Senanus Island, gas lighted beacon established.
89. Apr. 15. British Columbia, Strait of Georgia, sandheads of Fraser River, new lightship.
90. Apr. 15. British Columbia, Burrard Inlet, Vancouver harbor, Parthia Shoal, dredging completed.
91. Apr. 15. Ontario, Georgian Bay, east side, approach to Parry Sound, Black Rock day beacon blown down, Cameron Island day beacon blown down.
92. Apr. 15. United States of America, Lake Erie, Ashtabula, light established on inner breakwater.
93. Apr. 15. United States of America, St. Clair River, St. Clair Flats canal lower light, change in color of light.
94. Apr. 16. New Brunswick, south coast, Bay of Fundy, Great Salmon River, light established.
95. Apr. 16. Nova Scotia, west coast, Trinity Ledge, bell buoy to be replaced by gas and whistling buoy.
96. Apr. 16. Quebec, Gulf of St. Lawrence, Magdalen Islands, Amherst Island, Pleasant Bay, Amherst wharf, hand fog horn at light station.
97. Apr. 16. Quebec, Gulf of St. Lawrence, Moisie River, change in positions of range lights.
98. Apr. 17. North Atlantic Ocean, ice warnings.
99. Apr. 17. North Atlantic Ocean, caution with regard to ice.
100. Apr. 17. Newfoundland, south coast, Fortune Bay, Garnish, change in character of light.
101. Apr. 17. Newfoundland, south coast, Fortune Bay, Long Harbor Point, lighthouse established.
102. Apr. 19. British Columbia, Canadian list of lights and fog signals, new edition.
103. Apr. 19. British Columbia, Queen Charlotte Islands, Hecate Strait, Skidegate Inlet, off Lawn Point, change in position of gas and whistling buoy, correction.
104. Apr. 22. Nova Scotia, Minas Basin, Avon River, Mitchener Point, light improved.
105. Apr. 22. Nova Scotia, south coast, West Ironbound Island, character of light corrected.
106. Apr. 22. Nova Scotia, south coast, Mahone Bay, Quaker Island, light improved.
107. Apr. 22. Nova Scotia, south coast, Halifax harbor, Herring Cove, light improved.
108. Apr. 22. Nova Scotia, Strait of Northumberland, Pictou harbor, Pictou bar, light improved.
109. Apr. 22. Chart of anchorages in Hudson Strait issued.
110. Apr. 22. Hudson Bay, James Bay, chart of Rupert Bay.
111. Apr. 24. Nova Scotia, Annapolis Basin, Digby pier, intended change in character of light.
112. Apr. 24. Nova Scotia, south coast, Halifax harbor, George Island, intended change in character of light.
113. Apr. 24. Nova Scotia, south coast, Halifax approach, Devil Island, westerly light improved.
114. Apr. 24. Nova Scotia, south coast, Jeddore Rock, intended change in character of light.
115. Apr. 24. Nova Scotia, south coast, Nixonmate shoal bell buoy, change in position.
116. Apr. 24. Nova Scotia, north coast, Northumberland Strait, entrance to Pictou, Skinner Reef, gas buoy replaced by gas and bell buoy.
117. Apr. 26. Quebec, River St. Lawrence below Quebec, Traverse of St. Roch, lower end, position of lightship no. 20.
118. Apr. 26. Quebec, River St. Lawrence below Quebec, Traverse of St. Roch, gas buoy to be established.
119. Apr. 26. Quebec, River St. Lawrence, Channel Patch, change in position of gas and bell buoy.
120. Apr. 29. Ontario, Canadian list of lights and fog signals, new edition.
121. Apr. 29. Ontario, River St. Lawrence, Gananoque, dredging, buoys established.
122. Apr. 29. Ontario, Lake Ontario, Presqu'île Bay, gas buoy to be established. Salt Reef light to be discontinued.
123. Apr. 29. Ontario, Georgian Bay, French River, front range lighthouse blown down, temporary light.
124. May 2. Nova Scotia, south coast, Lockeport, Laurier Rock, bell buoy to be replaced by gas and bell buoy.
125. May 2. Prince Edward Island, south coast, Northumberland Strait, Hillsborough Bay, Prim Reefs gas and whistling buoy, amended position.
126. May 2. Prince Edward Island, south coast, Northumberland Strait, Bedeque Bay, Summerside, dredging, front range light removed.
127. May 2. Quebec, Gulf of St. Lawrence, off Fame Point, experimental submarine bell buoy withdrawn.
128. May 2. Quebec, River St. Lawrence, Manikougan Shoal, whistling buoy replaced by gas and bell buoy.
129. May 2. England, south coast, Plymouth Sound, dredging in progress.
130. May 2. Ontario, Lake Huron, north channel, Little Current, bridge under construction, temporary light.
131. May 6. British Columbia, Vancouver Island, Quatsino Sound, Bergh Cove, buoy established.
132. May 6. British Columbia, Burrard Inlet, English Bay, False Creek, change in position of lights.
133. May 6. Japan, Sanuki Province, Shodo-shima, Okadobana, lighthouse established.
134. May 7. Nova Scotia, south coast, La Have gas and bell buoy to be replaced with gas and whistling buoy.
135. May 7. Nova Scotia, south coast, entrance to Halifax harbor, Sambro Outer Bank, lightship removed, gas and whistling buoy replaced in position.
136. May 7. Nova Scotia, south coast, Halifax approach, change in color of Devil Island westerly lighthouse.
137. May 7. Prince Edward Island, north coast, Malpeque harbor, Fish Island main light, illuminating apparatus.

The Richelieu and Ontario Navigation Co.'s New Incorporation.

Full particulars of the charter obtained by the Richelieu and Ontario Navigation Co., Ltd., were given in our last issue. The following circular, explaining the change, was sent to the shareholders of the original company, the Richelieu and Ontario Navigation Co., over the signature of the President, Jas. Carruthers:—

"Your directors have for some time past had under consideration the advisability of putting the company on the same footing and on a line with the other large navigation, transportation and commercial corporations carrying on business in Canada, by adopting their common charter and securing for the company the general privileges and advantages enjoyed by companies incorporated under ordinary letters patent of the Dominion. The charter under which the company has conducted its operations since its organization in 1857 was long ago found altogether inadequate to meet the company's growing requirements, with the result that the company has very frequently of late years been put to the trouble, delay and expense of applying to Parliament for further powers. With a view to avoiding these difficulties in the future, your directors have decided, upon the advice of eminent counsel, that the time has come when the company should be put under the general law of the country, and have entered into an agreement with the Richelieu and Ontario Navigation Co., Ltd., for the union, amalgamation and consolidation of the stock, franchises and undertaking of the company with the stock, franchises and undertaking of the Richelieu and Ontario Navigation Co., Ltd., a company incorporated under letters patent of the Dominion, with an authorized capital of \$15,000,000 divided into shares of \$100 each. The issued and outstanding capital of your company now amounts to \$10,000,000, and a like amount of capital will be at once issued by the new company, and the consolidation effected by an exchange of shares, share for share, the balance of the authorized capital remaining in the treasury for future requirements. The new company will take over the assets and liabilities of your company as a going concern, and your directors are convinced that this consolidation is in the best interests of the company."

Furness, Withy & Co.'s Interests in Canada

A prospectus which was issued some little time ago in England by the British Marine Trust, Limited, offering shares and debentures for subscription contains some interesting information as to the company's operations in Canada, which is extracted as follows:—

The company was originally established in 1888 to carry on such business as is ordinarily transacted by a trust and mortgage company. In 1896 Furness, Withy & Co., Ltd., acquired a controlling interest in the undertaking, and in the following year the name was changed from the British Maritime Mortgage Trust, Ltd., to the British Maritime Trust, Ltd.

As the vast developments in Canada have led to a large demand for capital, the board has been directing its attention for some time past to the Dominion as a promising field for extending the business of the Trust. Through its association with Furness Withy & Co., the Trust commands an excellent Canadian organization of long-standing in touch with projected enterprises of every kind, and in a position to gain at first hand all essential information relating thereto, thereby ensuring prudent selections for investment. As a further aid in dealing with proposals from the Dominion, the directors have retained the services of a Canadian adviser, who has taken up residence in London. With so many projects being thrust upon the market, they realize the need for great care in the selection of companies and properties for investment purposes, and this has led them to adopt the precaution of placing reliable expert advisers permanently upon their staffs to assist in closely examining into the nature, scope and prospects of such enterprises as are submitted to them from time to time. The soundness of an undertaking and the responsibility of its management are all important considerations in regard both to the security of capital and its earning capacity.

The directors of the Trust are nominees of Furness, Withy & Co., who hold the controlling interest in the undertaking.

The directors have conducted an important series of investigations and negotiations into a number of highly promising projects, among which are the following:—

A substantial holding in the old established business of the Richelieu and Ontario Navigation Co., representing approximately 12,000 shares of \$100 each. It is paying quarterly dividends at the rate of 8% per annum. Besides owning a fleet of steamboats its properties comprise offices, shipyards, workshops, warehouses, docks, sheds, wharves, pontoons, hotels, cottages, etc., covering about 150 acres in all, and situate at Montreal, Sorel, Three Rivers, Quebec, Murray Bay, Tadousac, Longueuil, etc. In this already large undertaking there has now been merged the Northern Navigation Co., with its fleet and valuable properties at Collingwood, Sault Ste. Marie, Point Edward and Gore Bay. Further, and on terms of contracts to which the Trust is a party, there have also been taken over the Inland Lines, Limited, with its steamers, and other related interests. The entire combination—which also amongst other recent acquisitions includes the Niagara Navigation Co.—possesses a fleet of some 70 steamers, by far the most extensive transport and passenger trade on the Great Lakes of Canada.

Valuable freehold properties in the best business and commercial districts of Montreal, Toronto and Winnipeg, for which the Trust is in close treaty.

An important harbor proposition in Vancouver, which should not only be a very

valuable asset in connection with the shipping development of that port consequent upon the opening of the Panama Canal, but which, if acquired on the terms proposed, should represent a considerable increment of value as real estate.

Vessels Removed From Register.

The following vessels were removed from the register, between Jan. 1 and Mar. 31, for the reasons assigned:—

Steam:—Archie, Vancouver, B.C., 11 tons, broken up; Beaver, Vancouver, B.C., 2 tons, broken up; Brant, Vancouver, B.C., 13 tons, broken up; Ella Ross, Deseronto, Ont., 125 tons, burnt; Empress, Vancouver, B.C., 2 tons, broken up; Gertrude M., Yarmouth, N.S., 25 tons, burnt and condemned; Nereid, St. John, N.B., 20 tons, broken up; Nidge, Vancouver, B.C., 39 tons, wrecked; Oscar, Victoria, B.C., 61 tons, burnt; Swastika, Kingston, Ont., 6 tons, sold to foreigners; Uncle Tom, Port Stanley, Ont., 3 tons, broken up.

SAILING:—A.L.B., Lunenburg, N.S., 22 tons, broken up; Aldine, Lunenburg, N.S., 99 tons, stranded; Alexander, Sydney, N.S., 78 tons, broken up; Alexander Black, Dorchester, N.B., 575 tons, abandoned at sea; Amateur, Victoria, B.C., 18 tons, sunk; Arthur H. Wright, Lunenburg, N.S., 99 tons, transferred to Newfoundland; Bess, Digby, N.S., 24 tons, wrecked; Cape Beale, Victoria, B.C., 13 tons, wrecked; Carrie A., Sydney, N.S., 73 tons, wrecked; Chacheemah, Victoria, B.C., 10 tons, wrecked; Clayola, Windsor, N.S., 123 tons, lost; Cluaran Beag, Sydney, N.S., 18 tons, broken up; Columbia, Yarmouth, N.S., 22 tons, sold to foreigners; Coup d'Etat, Yarmouth, N.S., 12 tons, broken up; Echo, Victoria, B.C., 24 tons, abandoned; Florence E. Getson, Lunenburg, N.S., 99 tons, foundered; Forest, Flower, Yarmouth, N.S., 26 tons, burnt; Frank Newton, Sydney, N.S., 40 tons, broken up; Freddie M., Yarmouth, N.S., 10 tons, broken up; G. P. Taylor, Yarmouth, N.S., 13 tons, lost; George Killam, Digby, N.S., 30 tons, sunk in collision; Henry G. Ives, Pictou, N.S., 88 tons, broken up; Hustler, Barrington, N.S., 39 tons, wrecked; Lady Bourque, Yarmouth, N.S., 11 tons, broken up; Lila D. Young, Lunenburg, N.S., 10 tons, transferred to Newfoundland; Lila B. Hirtle, Lunenburg, N.S., 99 tons, transferred to Newfoundland; Lilly Dale, Yarmouth, N.S., 11 tons, broken up; Lorena Jane, Windsor, N.S., 11 tons, broken up; Lottie, Yarmouth, N.S., 12 tons, lost; M. T. Williams, Sydney, N.S., 16 tons, transferred to Newfoundland; Maggie Bell, Barrington, N.S., 46 tons, dismantled; Martha Ella, Yarmouth, N.S., 13 tons, broken up; Mary H., Yarmouth, N.S., 28 tons, broken up; Muriel M. Richard, Lunenburg, N.S., 97 tons, foundered; Nellie H. Ham, Barrington, N.S., 26 tons, broken up; Nellie Myrtle, Digby, N.S., 11 tons, broken up; Nita M. Conrad, Lunenburg, N.S., 91 tons, transferred to Newfoundland; Nokomis, Yarmouth, N.S., 67 tons, lost; P. B. Locke, Toronto, 305 tons, lost; Primrose, Yarmouth, N.S., 34 tons, broken up; Prince, Yarmouth, N.S., 10 tons, broken up; S. A. Crowell, Yarmouth, N.S., 23 tons, broken up; S. C. Hood, Yarmouth, N.S., 12 tons, broken up; St. Croix, Windsor, N.S., 653 tons, sold to foreigners; Ste. Anne, Barrington, N.S., 11 tons, wrecked; Ste. Celestine, Quebec, Que., 53 tons, lost; Sea Slipper, Charlottetown, P.E.I., 41 tons, sank; Sigefroi, Yarmouth, N.S., 41 tons, wrecked; Stella Maud, St. John, N.B., 99 tons, wrecked; Theresa, Victoria, B.C., 63 tons, sold to foreigners; Thrush, Yarmouth, N.S., 13 tons, broken up; Togo, Winnipeg, 58 tons, burnt; True Blue, Yarmouth, N.S., 8 tons, broken up;

Ungava, Lunenburg, N.S., 88 tons, transferred to Newfoundland; Unity, Pictou, N.S., 246 tons, transferred to Barbados; Yamaska, Lunenburg, N.S., 98 tons, transferred to Newfoundland.

The Canada-West Indies Steamship Service.

On the third reading of the bill dealing with the reciprocal trade agreement with the British West Indies, in the House of Commons, recently, the acting Minister of Trade and Commerce stated that in response to advertisements for tenders published some time ago, for a service between Canadian ports and the West Indies, several tenders were received, but they were all unsatisfactory. The Royal Mail Steamship Co. tendered for a fortnightly service in return for a subsidy of \$200,000 a year, with the stipulation that it could discontinue at the end of a year if the results were not satisfactory. The Canada West Indies Co. offered to provide a service for 15 years, for a subsidy of \$300,000, and an additional \$130,000 a year from the West Indies and British Guiana. The company also made it a condition that its vessels call at Boston, Mass., but as exception was taken to this, it was withdrawn.

This latter company is not, as reported, a subsidiary of the C.P.R., though there are some C.P.R. people connected with it. Under these circumstances the Government had entered into a contract for one year, to June 30, 1914, with Pickford and Black, Halifax, N.S., for a 12 day service with the West Indies. The contractors have undertaken to join with other people in the contract, and one of the firm had left for Great Britain to make the necessary arrangements. Four boats are to be utilized, two of which are in the present service, for which a subsidy of \$50,000 a year will be paid, and two new vessels of 4,500 gross tons are to be supplied, for which a subsidy of \$150,000 a year will be paid. These vessels are to be capable of giving a 12 knot service, and will have accommodation for 50 first class, 40 second class and 200 third class, passengers. It is reported from England that no vessels have been chartered from the Royal Mail Steam Packet Co.

Richelieu and Ontario Navigation Co.'s Shareholders

The largest holder of R. and O. N. Co.'s stock is the British Maritime Trust Co., London, Eng., which has 11,891 shares. The following are among the other prominent holders with their respective number of shares:—Jas. Carruthers, Montreal, 600; F. A. Magee, Hamilton, Ont., 310; J. W. McConnell, Montreal, 1,675; Sir Henry M. Pellatt, Toronto, 528; T. P. Phelan, Toronto, 1,000; Jas. Playfair, Midland, Ont., 2,728; J. S. Playfair, Toronto, 500; H. Richardson, Kingston, Ont., 1,502; A. H. Sims, Montreal, 1,000; H. B. Smith, Owen Sound, Ont., 400; W. Southam, Hamilton, Ont., 290; Southam Ltd., Hamilton, Ont., 1,139; J. P. Steedman, Hamilton, Ont., 1,053; W. Wainwright, Montreal, 256; Walton and Magee, Hamilton, Ont., 1,150. Banks, trust companies and brokers who have stock standing in their names are not included in this list, as such stock is in almost all cases held as collateral against advances.

The Department of Railways and Canals received tenders Apr. 16, for the construction of a steel tug boat, to be delivered at either Quebec, Montreal, St. John, Halifax or Sydney, by Sept. 1.

Book Reviews.

Any of the books reviewed may be obtained through Canadian Railway and Marine World at the published price.

RAILROAD CONSTRUCTION.—By C. L. Crandall and F. A. Barnes. 321 pages, 6x9 ins., 81 illustrations. McGraw-Hill Book Co., New York, \$3.

Many books have from time to time been written on the subject of railway construction, but the majority seem to touch on the theoretical considerations involved rather than the practical carrying forward of the project. This work differs from the majority to a marked degree in this respect, covering in a comprehensive manner not only the theoretical outline of the planning of the work, but also the actual methods of doing the work, illustrating and describing the latest types of machines and equipment required to economically push forward a railway line. That the methods of railway building have been altered very considerably within the last few years is emphasized in dealing with the machinery

used. The rapid progress in the methods of conducting the work are shown by illustration and description. The chapters are as follows:—Introductory, Earthwork, Rock Excavation, Tunneling, Masonry, Foundations, Culvert and Bridge Masonry, Trestles and Bridges, Track Material and Roadbed, and Estimates and Records. From this it will be seen that the subject is covered from every view point. A more detailed examination of each of the chapters shows that each of the several phases of the subject is considered quite fully. The book is based to a considerable degree on the standardization work of the committees of the American Railway Engineering Association.

THE HUMAN FACTOR IN WORKS MANAGEMENT.—By James Hartness. 159 pages, 5x9½ ins. McGraw-Hill Book Co., New York. \$1.50.

The human factor in works management is probably the least controllable of all the factors entering into the production of a given product. Much thought has been given to the solution of the sociological problem involved in knowing just how to handle the workmen to the best advantage, not only to themselves, but to the employer. As a result of the many studies of the subject, there is a great diversity of opinion, with the result that in the majority of cases the employer still resorts to the old "hit and miss" method, or depends on that elusive faculty some-

times termed the sixth sense. The treatment of the subject by Mr. Hartness is decidedly unique, and may be summed up as a brief for super specialization of all, from the highest executive to the humblest workmen, numerous arguments being advanced in refutation of the statement that continued repetition of any one operation not only is injurious to the physical welfare of the workman, but also that his mental faculties are thereby impaired. The scope of the book is shown by the chapters, as follows:—The Value of Habit, The Inertia of Habit, The Different Views of Industrial Organization, Increasing the Assimilating Capacity, Some Non Technical Phases of Machine Design, and Machine Building for Profit. Mr. Hartness has had such a complete experience in the subject he is treating, in his development of the firm of which he is President, that his views are assured a careful consideration by all readers.

Transportation Conventions in 1913.

- June.—American Society for Testing Materials, Philadelphia, Pa.
 June.—Association of Railway Electrical Engineers, Atlantic City, N.J.
 June 11-13.—American Railway Master Mechanics' Association, Atlantic City, N.J.
 June 16-18.—Master Car Builders' Association, Atlantic City, N.J.
 June 17.—Train Despatchers' Association of America, Los Angeles, Cal.
 June 17-19.—International Association of Railway Special Agents and Police, Salt Lake City, Utah.
 June 17-20.—American Association of Freight Agents, Buffalo, N.Y.
 June 18.—Freight Claim Association, Bluff Point, N.Y.
 June 24-25.—Association of Transportation and Car Accounting Officers, Charlevoix, Mich.
 July 15-18.—International Railway General Foremen's Association, Chicago, Ill.
 July 22-25.—International Railway General Foremen's Association, Chicago, Ill.
 Aug.—Travelling Engineers' Association, Chicago, Ill.
 Aug. 12-15.—Railway Gardening Association, Nashville, Tenn.
 Aug. 18.—International Railroad Master Blacksmiths' Association, Richmond, Va.
 Sept. 8-12.—Roadmasters' and Maintenance of Way Association, Chicago, Ill.
 Sept. 9-12.—Master Car and Locomotive Painters' Association of U.S. and Canada, Ottawa, Ont.
 Oct. 8.—Association of Water Line Accounting Officers, Philadelphia, Pa.
 Oct. 14.—Railway Signal Association, Nashville, Tenn.
 Oct. 21-23.—American Railway Bridge and Building Association, Montreal.

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Transportation Associations, Clubs, Etc.

The names of persons given below are those of the secretaries.

Canadian Car Service Bureau, J. E. Duval, 401 St. Nicholas Building, Montreal.

Canadian Freight Association (Eastern Lines), 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, 413 Dorchester St. West, Montreal.

Canadian Street Railway Association, Acton Burrows, 70 Bond Street, Toronto.

Canadian Ticket Agents' Association, E. de la Hooke, London, Ont.

Central Railway and Engineering Club of Canada, C. L. Worth, 409 Union Station, Toronto. Meetings at Toronto 3rd Tuesday each month, except June, July and August.

Dominion Marine Association, Counsel, F. King, Kingston, Ont.

Eastern Canadian Passenger Association, G. H. Webster, 54 Beaver Hall Hill, Montreal.

Engineers' Club of Montreal, R. W. H. Smith, 9 Beaver Hall Square, Montreal.

Engineers' Club of Toronto, R. B. Wolsey, 94 King St. West, Toronto.

Great Lakes and St. Lawrence River Rate Committee, Jas. Morrison, Montreal.

International Water Lines Passenger Association, M. R. Nelson, New York.

Niagara Frontier Summer Rate Committee, Jas. Morrison, Montreal.

Nova Scotia Society of Engineers, A. R. McCleave, Halifax, N.S.

Quebec Transportation Club, J. S. Blanchet, Quebec.

Ship Masters' Association of Canada, H. O. Jackson, 376 Huron street, Toronto.

Shipping Federation of Canada, T. Robb, 526 Board of Trade, Montreal.

Western Canada Railway Club, W. H. Rosevear, 25 1/2 Princess St., Winnipeg. Meetings at Winnipeg 2nd Monday each month, except June, July and August.


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