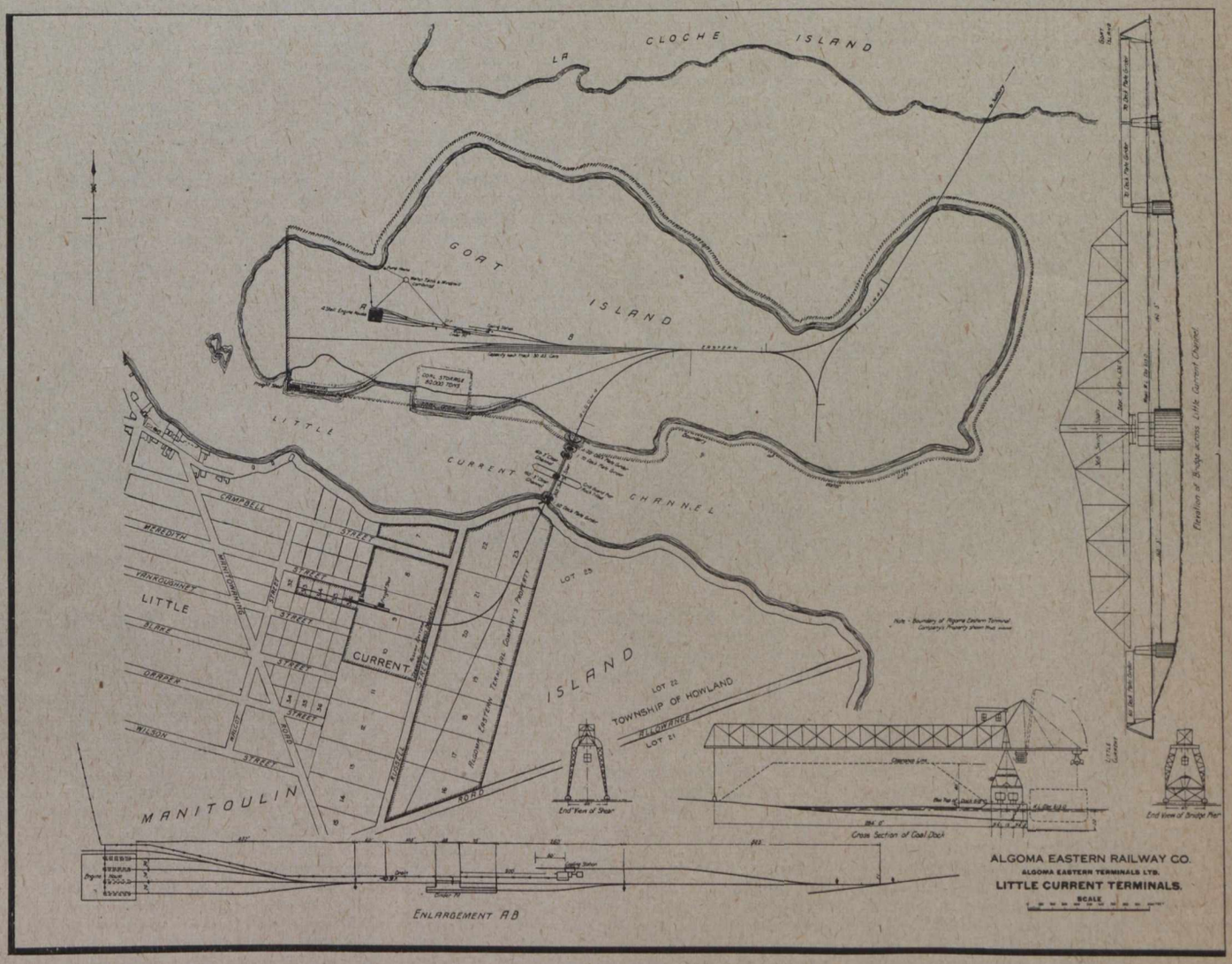
Canadian Railway and Marine World.

October, 1913

Algoma Eastern Railway Terminals at Little Current.

By R. S. McCormick, M. Am. Soc. C.E., Chief Engineer.

The Algoma Eastern Ry. Co. has its line completed as far as the site of the terminals on Goat Island, opposite Little Current, on Manitoulin Island, Ont. The terminal facilities are now being pushed to completion this autumn and include some interesting features. The work covers the extension of the main line from Goat Island, the site of the yard and docks, over the boat channel to Manitoulin Island, entering Little Current on the east side of the town. A small station building of frame construction, together with a small local freight house, is situated just at the edge of the town, easy of access and convenient for local business.



Little Current Terminals, Algoma Eastern Railway.

The bridge crossing the channel is made up of two 70 ft. deck plate girder approach spans on the Goat Island side, a 368 ft. through draw bridge span and a 60 ft. approach span on the Manitoulin side, making a total length between abutments of 573¾ ft. The clear height above meanwater level is 17½ ft. and there is a clear opening for boats of 160 ft. each side of the centre pier. The foundations consist of two wing abutments, three intermediate piers and a pivot pier. These are of concrete, there being a total of 2,570 cu. yds. of concrete in the whole foundation. The protection, or rest pier, is composed of timber cribs filled with stone, extending at right angles to the centre line of the bridge tangent. These cribs are built of round hemlock timber, well drift bolted together, extending to within 2 ft. of low water level; above this elevation square B.C. fir timber is used. The water is 24 ft. deep at this centre pier, the bottom is solid limestone rock, requiring very little work to prepare for sinking the cribs. At the pier points and abutment sites a little preparation, consisting of shooting up the bottom to level up and roughen up the smooth rock was done to guard against any tendency of the piers sliding. The foundation work was done under contract by the Foundation Co. on a cost plus a fixed sum basis. The work was let Sept. 27, 1912, and completed May 1, 1913—and is a very fine job of pier work. The piers in deep water were built inside cofferdams of heavy timber, concrete being deposited in the centre pier to within 2 ft. of low water, where the neat work begins. Gravel and broken stone were both used for the coarse aggregate for the concrete, care being taken to heat all material and the water in cold weather. While the channel where this structure is situated did not freeze up last winter, due to the swift current, ice formed at both ends of it and caused considerable trouble by breaking away and running through it. The current here runs both ways, depending upon wind conditions, and sometimes reverses its direction several times in 24 hours, so that great care had to be exercised in handling the dams and cribs.

The superstructure is of steel, from plans

made by Boller, Hodge and Baird, consulting engineers, New York, and is designed under the specifications of the Railways and Canals Department, for class 1 loading, and consists of one 368 ft. c.c. through draw span, with one 60 ft. and two 70 ft. over all deck plate girder approach spans, all single track, with one walkway. The approach spans are 6 ft. 6½ ins. and 7 ft. 6½ ins. deep out to out of flange Ls., which in all cases are 6 ft. 6 ins. with 14 in. cover plates. The girders are spaced 8 ft. c. to c. and are thoroughly braced with top and bottom lateral bracing and stiff end and intermediate cross frames. Transverse 10 in. I beams are riveted to the top flanges to form supports for the walkway.

The draw span is 368 ft. long, c. to c. of end bearings, with trusses spaced 18 ft. 3 ins. c. to c., the length being divided up into 12 panels of 30 ft. 2 ins. each with a central panel of 6 ft. over the pivot pier. The depth of truss varies from 30 ft. at the end to 57 ft. c. to c. of chords at the centre over the pivot pier. All members are designed to resist both tension and compression except members L4-U5, U5-U6, U6-U6, which sustain tension only and are made of eyebars. The end posts, top chords and main diagonal posts at the pivot pier are built of 21 in. web plates, 24 in. covers, 3½ by 3½ in. top Ls and 5 by 3½ in. bottom Ls. The lower chords from end to end are built of 20 in. web plates with 4-3½ by 3½ in. Ls and with 13 in. side plates where necessary. All intermediate diagonals, except where eyebars are used, are built of 18 or 20 in. web plates, with 4 Ls 3½ by 3½ in.; the verticals are built of a plate and 4-6 by 3½ in. Ls where they act as hangers and of 2-15 in. Ls where they act as post.

The floor system consists of stringers 53 ins. deep, riveted into the floor beams 66 ins. deep, which are in turn riveted into the verticals of the trusses. Top and bottom bracing is of Ls, designed for tension only in the case of the top laterals, and for both tension and compression in the case of the bottom laterals. Each portal consists of 4-7 by 3½ in. Ls latticed with 3½ by 3½ in. Ls, forming a frame 3 ft. 9½ ins. deep with two plate braces. Transverse bracing at intermediate points consists of 4 Ls 5 by 3½ ins. laced with 3½ by 3½ in. Ls, forming frames of varying depth according to the height of the trusses. The transverse bracing at the centre posts is arranged to allow room for the operator's house, and consists of frames similar to the intermediate transverse bracing, above the house, and in addition heavy kneebraces connecting to the 24 in. box girder supporting the house. The centre posts are braced longitudinally by 3½ by 3½ in. Ls, which stay the two adjacent posts against longitudinal flexure and at the same time allow the truss to adjust itself during erection to two bearing points over the pivot pier.

The span while swinging turns on a pivot provided with steel and phosphor bronze discs 25 ins. in diameter, and is steadied by eight trailing wheels running on a cast steel track 25 ft. in diameter. The main rack circle and the track are cast together in 13 sections. The two main centre girders are 105 ins. deep out to out of Ls, with 8 by 8 in. flange Ls and 18 in. cover plate and carry the dead load of the span to the pivot girders 6.5 ins. deep resting on a steel casting which bears directly on the discs. While closed the ends of the trusses are supported by cast steel wedges, which are driven by the operating machinery so as to bring a dead load reaction under each end of each truss of 60,000 lbs., thus preventing the end from rising from its support under certain conditions of loading. Each truss is supported at the pivot pier by two wedges spaced 6 ft. apart, but which are so adjusted that they take live load only, the dead load being carried by the pivot. Both the end and the centre wedges are operated by worm gears driven by shafting from the operator's house, and protected by cast iron casing, which is so arranged that the gearing runs in a path of oil. The main pinion for swinging the span is cast steel 15 ins. in diameter keyed to the 7 in. main turning shaft, and suitable gearing is provided between this shaft and the engine shaft to give the required speed.

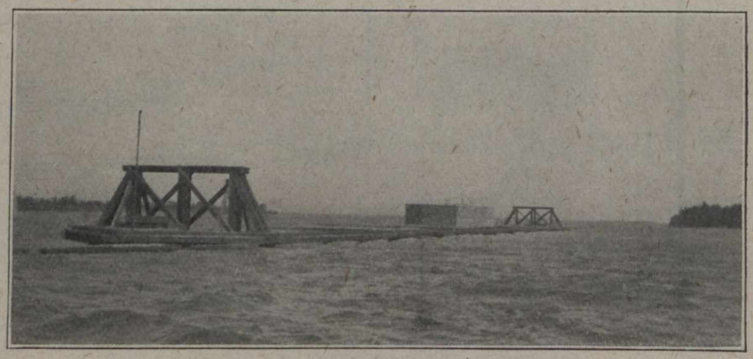
The power for turning the draw and for operating the end and centre-wedges is supplied by a 25 h.p. Fairbanks Morse gasoline engine, located in the operator's house above the tracks at the centre of the draw, the main shaft having a velocity of 220 r.p.m. and working the machinery through two friction clutches. The turning shaft and the wedge driving shaft are each provided with a jaw clutch, so that the power can be transmitted to each one as desired by moving the necessary lever. A safety device is provided for the wedge shaft, to prevent driving the wedges too far and injuring the latching machinery, consisting of a cross head connected by levers to the jaw clutch of the wedge shaft and so adjusted that when the wedges have been drawn far enough it will have moved sufficiently to disengage the jaw clutch and thus shut off the power from this shaft. The ends of the spans when closed are held in position by a latch located at the centre of the end floor beams and which is so connected with the wedge shafting that it is lifted from its socket when the wedges are withdrawn. When the span swings, the latch strikes a projection on the socket casting and is lifted, thereby disengaging a trip, which allows it to drop to its original position, so that when the span is closing the latch rollers will mount the inclined sides of the latch casting on the pier and drop into the socket, thus firmly latching the span before the wedges are driven home. All lengths of truss members are corrected to bring the lower chords in a horizontal line with the bridge closed, and the wedges driven to give a 60,000 lb. reaction at end of truss. The computed drop in end of truss when wedges are withdrawn is 1.4 ins.

The Canadian Bridge Co. was awarded the contract for this job, and this part of the bridge is now being erected. Due to delays in delivery of material from the mill, the bridge company will not complete this erection until some time in October.

The work on Goat Island consists of a small yard, including a 4 stall rectangular house, of frame construction, on concrete foundations, with concrete pits, a concrete cinder pit, a 100 ton Fairbanks-Morse elevator coal chute, and a water station consisting of a 50,000 gall. tub on a 30 ft. tower, with a windmill extension for pumping, together with an auxiliary 5 h.p. gasoline pumper. Water is pumped into this tank and from thence discharged to a 10 in. Sheffield Johnson telescopic standpipe, and to the locomotive house and coal chute for service use and fire protection.

The docks consist of a coal dock and a commercial dock. The coal dock has 450 ft. frontage in the channel. It consists of timber cribs built up to an elevation of 5 ft above water. They are of round hemlock to 2 ft. below low water, and of square 12 by 12 in. B. C. fir above this elevation. They are framed in 100 ft. sections and sunk with rock. Afterwards they are filled to top with stone. These cribs are at present in 6 to 8 ft. of water. Arrangements are completed for dredging in front of the dock by the Dominion Government. After sinking these cribs, forming the face of the proposed dock area, filling will be deposited back of same to bring the area just above water level, forming a storage ground for coal. This storage space is planned to hold 80,000 to 90,000 tons of coal. Later extensions can be made to increase this.

Nose of Protection Pier ready to sink.



Pivot and Protection Pier.

A modern unloading and reclaiming coal handling plant is arranged for in connection with this dock, to be furnished and erected by the Brown Hoisting Machinery Co., of Cleveland, Ohio, and consists of an unloading and reclaiming bridge, of 300 ft. span, covering over the storage space, with a cantilever overhang at the front of 83 ft. One end of this bridge will be carried on a portal pier arranged to run on two tracks spaced 32 ft. centre to centre. Each track will consist of two lines of 100 lb. rail, spaced 2 ft. 4 in. centres, and the other end will be carried on a shear leg, arranged to run on a similar single track.

The front track of the portal pier will be laid on two lines of B. C. fir, 24 by 24 ins. in size, laid directly on the dock cribs, the other portal track will be also laid on two lines of 24 by 24 ins. timbers supported by short 12 by 12 in. cross ties laid on rock filling. These two pairs of rails will be tied together by long cross ties 12 ins. by 12 ins. by 40 ft. spaced 10 ft. apart along the dock front. The shear leg track will be laid on 24 by 24 in. timbers, supported by concrete pedestal piers spaced 10 ft. centre to centre.

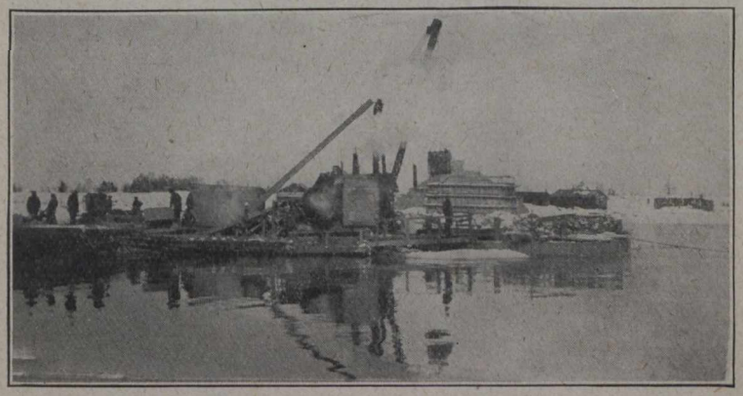
The bridge will be of sufficient capacity to unload coal out of a boat at the rate of 200 tons an hour, including the cleaning up. The bucket will be of 124 cu. ft. capacity, and

the specifications call for a rate of 500 ft. a minute hoisting and 1,500 ft. a minute propelling capacity along the runway. The bridge will be capable of propelling itself along the track at the rate of approximately 50 to 70 ft a minute, depending upon the wind.

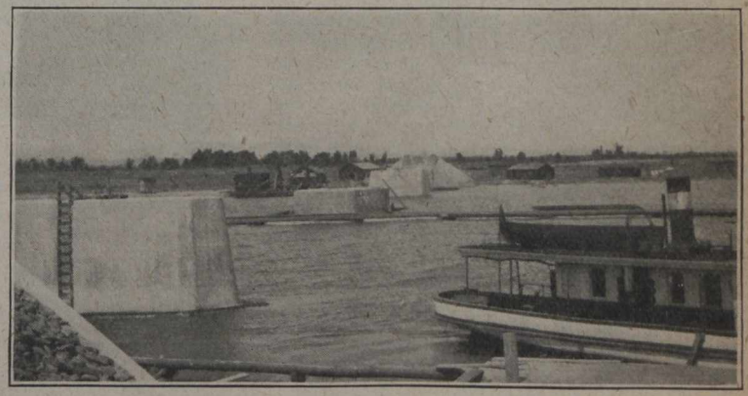
The portal structure at the dock end will be arranged to span two loading tracks spaced 13 ft. centres. A 40 ton bin will be supported directly over these tracks. The shear leg is designed so that a 40-ton receiving bin, together with the necessary shaker feed box and box car loader, may be added in the future if desired. At present it is not contemplated that other than railway coal will be handled here. This whole crane will be operated by steam. Only a single bridge will be erected now; later, if business warrants, the dock may be extended and another bridge added.

The commercial dock will be constructed on a similar plan to the coal dock, and will have a warehouse 36 by 80 ft. built on it, to which tracks will extend, as indicated on the plan. Considerable solid rock dredging will be required here to permit deep draught vessels to approach this dock.

The entire terminal work, excepting the erecting of the coal crane and the dredging, will be completed this autumn. The coal handling crane will be erected early next spring, in time to handle coal early in the season.



Concreting Pivot Pier, January, 1913.



Foundations complete, looking north.

The Foundation Co. is doing the above work on docks and terminal buildings on a percentage contract. The railway company's forces look after all track work and grading for same.

The Algoma Eastern Terminals, Ltd., is the corporate name of the company constructing these terminals. The writer is Chief Engineer, B. E. Barnhill, Sudbury, is Division Engineer, and J. R. Black, Little Current, is Assistant Engineer in direct charge of the work.

Locomotive Failures in Summer and Winter.

In a recent issue of a United States contemporary, attention was drawn to locomotive observations made on a road operating in that country. This road was rather astounded to find on investigation, that contrary to all expectations, the number and extent of its locomotive failures were considerably greater in summer than in winter. This led to an investigation of the cause, leading to the discovery that anticipated greater numbers of breakdowns in the winter, had led the officials to make greater preparations to ward off trouble, with the result that the number of breakdowns was less in winter than summer. When, following this discovery, the same precautions were taken winter and summer, the repairs were found to assume their normal condition of greater in winter than summer. Desiring to ascertain definitely the conditions as they existed on Canadian lines, Canadian Railway and Marine World sent letters outlining the above observations to mechanical operators of the principal Canadian lines, from whom the answers quoted below have been received.

W. H. Winterrowd, Mechanical Engineer, C.P.R.: "Our locomotive failures are somewhat higher in winter than they are in summer. We keep a record of our locomotive failures by means of graphics."

W. D. Robb, Superintendent of Motive Power, G.T.R.: "You do not state on what roads in the U.S. it is claimed that failures are more numerous in summer than in winter, but I think it must be a road that does not suffer such severe winter conditions or have as much snow as we do in Canada. With the power in practically the same condition, we have a greater number of failures in winter, and our records show an increase of fully 25 to 35%".

S. J. Hungerford, Superintendent of Rolling Stock, Canadian Northern Ry.: "I am inclined to think that there was some unusual condition on the U.S. railway referred to, to cause a decrease of locomotive failures in winter, as it is entirely opposed to general experience and physical conditions. The matter of locomotive failures, however, depends on a great many factors, and it is exceedingly difficult to reduce them to actual failures so that a fair comparison can be made. It is obvious, however, that the chance of fracture during severe weather is greater than in warmer weather, as the metal seems to be affected by the frost, and roadbeds become much more rigid, besides getting out of surface as a result of the frost heaving it in places where the drainage is not perfect. In addition to all this, trains that have been standing for any length of time offer greatly increased resistance, and as the additional resistance due to snow on the track is difficult to determine. it frequently happens that locomotives have to be worked proportionately harder in order to handle tonnage or make time, and this results in greater stresses in machinery, and the greater amount of water evaporated, together with the forcing of the fire, increases the risk of flue leakage. It is also practically impossible under certain weather conditions for employes to examine their locomotives as carefully, or to perform their duties as efficiently, while the usual irregularity of trains in very severe weather also acts as a handicap on locomotive house forces in looking after equipment properly. Taking it altogether, it is my opinion that there is at least twice the chance of failure in winter that there is in summer, in this particular territory at least, and our statistics seem to show this."

G. R. Joughins, Superintendent of Motive Power, Intercolonial Railway: "We, in common with most railways in Canada, find that the failures are greater in winter, but regret that we have no figures that we could give."

Concrete Water Barrels for Railway Bridges.

Concrete water barrels for railway bridges are described by H. McDonald, Chief Engineer, Nashville, Chattanooga & St. Louis Rd., in the 1912 Proceedings of the Engineering Society of the South. One design is 30 in. deep, 24 in. outside diameter at the top, tapering to 22 in. at the bottom. The sides and bottom are 2 in. thick, reinforced with a sheet of expanded metal. The cover is of iron, hinged to a lug embedded in the concrete, and is depressed so as to catch rainwater. They do not leak, the evaporation is slight, and the concrete will resist bullets (which are apt to be fired at the barrels by boys and others). The total cost is about $1 70, divided as follows:

Cover: Galvanized iron, 5 sq. ft. at 3c...	$0.15	
Hinge, bolts, rivets and wire	0.05	
Cost of making, 1 man 1 hour	0.20	$0.40
Barrel: 17 sq. ft. exp. metal at 3c.....	0.51	
0.10 cu. yd. 1:2:4 concrete	0.24	
Forms (25 barrels to one set)	0.10	
Labor	0.30	1.15
Engineering and contingencies, 10%		0.15
Total		$1.70

Other experiments have been made, using a less tapered form of barrel, galvanized iron forms, and poultry netting reinforcements. Plastering the mortar on the reinforcement has not resulted in tight barrels, but 1:2:4 concrete cast and jammed into forms has given good results. It is believed that good concrete water barrels, with metal tops, can be made for $1.30 each, in large quantities. Another design consists of a concrete box let into the ground all but about 1 ft., this upper part being marked with the number of the trestle.

The wooden barrel is the more expensive of the two, considering its capitalized cost, on the basis of six years life, leaving out all consideration of increased cost of maintenance. The ballasted deck trestle is rapidly becoming the standard on most roads, and it is thought that in the future the water barrel will seldom be needed. For this reason concrete barrels are not used to any extent on the N., C. & St. L.R.

Chilled Iron Car Wheels.—In a paper read before the New England Railroad Club recently A. A. Hale stated that, in the development of the freight car from 20,000 to 100,000 lbs. capacity, all parts of the car have been increased in weight, but no part has shown such slight increase as the chilled iron wheel. Car capacity has increased 400%, the weight of axle 149%, the weight of rail 100%, whereas the weight of the wheel has increased only 38%. In the opinion of the author, chilled-iron is the only metal of which wheels are manufactured which will stand up under extremely heavy loads without crushing or flowing.

The Montreal Warehousing Co. expects to have its 1,000,000 bush. extension to its grain elevator B, complete and ready for operation by Nov. 15.

National Transcontinental Railway Power House at Transcona.

The N.T.R. Commission, in building the large general locomotive and car repair shops at Transcona, Man., decided that the best interests of the railway, in economy, efficiency and reliability, could be served by the erection of a modern central power plant in which all steam and electrical apparatus of sufficient capacity to supply the present demands should be located. The power house is therefore one of the group of buildings described in general in Canadian Railway and Marine World for Feb., 1912. The power house is equipped throughout with the best apparatus that money could purchase, and with the care shown in the design and selection of equipment the plant is at least the equal of any in Canada, as well as being one of the largest railway repair shop power plants on the continent.

All the main buildings comprising the shops face on a central midway, which is 1,200 ft. long, and extends through the shop grounds from the locomotive house to the public highway. The buildings in which locomotive repairs are made are those at the south end of the midway and adjacent to the locomotive house, whereas the car repair buildings are on the north end of the midway and alongside the street leading to Winnipeg. The power house occupies a central position between these two groups and is on the west side of the midway. This central location is excellent for an efficient and economical distribution of steam, air, water, and electric power to the various buildings for all purposes. The necessity of possible future extension has been anticipated, and in consequence this building, in common with the others of the repair plant, may be largely extended with a minimum expense.

The power house is of very similar construction and appearance to that of all the other buildings of the plant, being concrete below window sills and local white brick above, while the roof trusses, crane tracks and coal handling and storage plants are supported on steel columns. The outside dimension of the structure is 110 by 155 ft., with the narrow frontage on the midway, and is divided by a brick fire wall into a 59 by 150 ft. engine room and a 45 by 150 ft. boiler room, the latter being on the south side of the building. The pump pit is a part of the engine room and is 16 ft. wide by 8 ft. deep, extending along the fire brick wall the entire length of the building.

The general arrangement and construction of the 59 by 150 ft. engine room is shown in one of the accompanying illustrations. It will be observed that the roof is carried on nine trusses, supported on steel columns from the side and fire walls. The design is such that with the central skylights in the roof, and large windows around three sides of the room, almost perfect natural illumination is obtained. The walls, ceiling and steel work are painted white, which aids in the illumination of the room. Ventilation is obtained through all windows and skylight ventilators. The roof is spanned by a 10 ton hand operated travelling crane, capable of handling any of the heavier parts of the engine room equipment.

The pump pit and boiler room floors are of concrete, while that of the engine room proper has a finish of maple laid on a false floor secured to sleepers bedded in bituminous concrete.

On account of the nature of the ground on which this plant was erected, it was necessary to carry the foundations for all the machinery to an average depth of 12 ft., all foundations being of solid concrete built on a reinforced slab or mat.

All auxiliary apparatus and most of the steam, air and water piping are concentrated in the pump pit mentioned previously, this leaving that portion of the power house above the floor practically clear.

The boiler room contains the entire steam generating equipment for power and heating of the locomotive and car shops, access between this and the engine room being only through fire doors. In this room are also located the coal storage bins and coal ash handling apparatus. A special track for coal supply cars runs along the south side of the power house. The 200 by 11 ft. reinforced concrete chimney is entirely independent of the building and a few feet west of it.

The generating apparatus in the engine room consists of 9 units with a total normal capacity of 2,030 k.w. divided as follows:—1,600 k.w. alternating current and 430 k.w. direct current. The generators were manufactured and installed by the Canadian General Electric Co., and the Goldie & McCulloch Co. supplied and installed all engines.

View of Engine Room, from South West Corner.

The standards adopted by the N.T.R. Mechanical Engineer for the various types of apparatus and supplies are as follows:—

High pressure steam	150	lbs. per sq. in.
Back pressure for steam heating	5	" " "
Service water pressure	60	" " " "
Fire protection water pressure	175	" " " "
Hydraulic pressure (for tools)	1,500	" " " "
Air pressure	120	" " " "
Alternating current motor	3 phase 60 cycle 550 volts.	
Direct current variable speed motor	220 volts.	
Cooper Hewitt and incandescent lights	220 volts a.c.	
Yard lighting system	7.5 amp. series arcs.	

In order to designate the various piping systems the following standard colors have been used:—

High pressure steam pipes	White.
Return steam pipe	Blue.
Low pressure exhaust for heating	Buff.
Fire service	Red.
Air line	Green.
Hydraulic piping	Brown.
General water supply	Black.

The units supplying the electrical power are divided as follows:—Three 500 k.w., a.c. 600 volt 60 cycle 150 r.p.m. generators each direct connected to a horizontal 21 by 30, 34 by 30 in. cross compound noncondensing Corliss steam engine. One 250 k.w., a.c. 600 volt 60 cycle 150 r.p.m. generator direct connected to a horizontal 18 by 30 in. simple Corliss steam engine. One 150 k.w., d.c. compound wound 250 volt 150 r.p.m., generator direct connected to 14 by 30 in. horizontal simple Corliss steam engine. Two k.w., d.c. compound wound 125 volt 275 r.p.m. exciter generators direct connected to horizontal 11 by 12 in. high speed simple engines. One auxiliary 150 k.w. motor generator set consisting of a 225 h.p. 900 r.p.m. induction motor direct connected to a 150 k.w. d.c. 250 volt compound wound interpole generator. All apparatus is noncondensing, on account of all the exhaust steam from the engine, compressor, and other auxiliary devices being required in the low pressure steam system of the shops.

The switchboard controlling these generators was manufactured and installed by the Canadian Westinghouse Co., and consists of 21 blue Vermont marble panels 7 ft. 8 ins. high, and 2 ins. thick, the entire board being 52 ft. long. There are 7 generator panels, 1 a.c. totality panel, 1 d.c. feeder, 1 a.c. general lighting, 1 arc lighting, and 10 a.c. feeder panels, the only special apparatus on the switchboard being the motor operated rheostats with which each of the generator panels is supplied. As all the power and light distribution is underground the necessary cables pass through 38 ducts in the east and west walls to the various buildings. The conductors between all generators and switchboards are rubber insulated, lead covered cables, run in iron conduits from the oil switches to generator terminals; all feeder circuits to the various buildings are paper insulated and lead covered, run in fibre or tile conduit.

There is at present 2,560 k.w. in motor and lighting load connected to this power plant, and this amount will be increased to approximately 4,060 k.w. when the car shops are fully equipped. The low load factor common in this type of shops, still gives the power plant a reasonable margin for emergencies.

The artificial lighting of both the engine and boiler rooms is performed by Cooper Hewitt type H mercury vapor lamps for general illumination, and incandescent lamps in the pump pit, pipe tunnel, and in

the boiler room basement. Extension cord receptacles are also located at various places in the building.

All the large steam driven units are lubricated by a gravity pressure system, and all waste oil flows by gravity to a filter located in the pump pit from which it is again pumped to the overhead supply reservoir.

The pit arrangement is probably the most interesting of the power house details, and is shown completely in the accompanying illustrations. The several boilers all have 8 in. U bend steam connections from the top, connecting through openings in the fire wall with a 14 in. steam main along the fire wall over the pit. From this main, the several connections to the different power units lead off, all protected with magnesia coverings, which in addition to introducing an economy, add an attractive appearance to the piping. At the engine end of each of the connections, there is a separator. Near the centre of the room are two 6 in. steam legs with separators at the lower end, connecting with a 6 in. steam main just below the floor level, this main running the full length of the pit, supplying all the auxiliary equipment there located. At the east end of the upper main, there is a 10 in. steam leg with separator, connecting with a 10 in. main that runs through the tunnel down the midway, supplying steam for shop use, but principally for the steam hammers in the blacksmith shop.

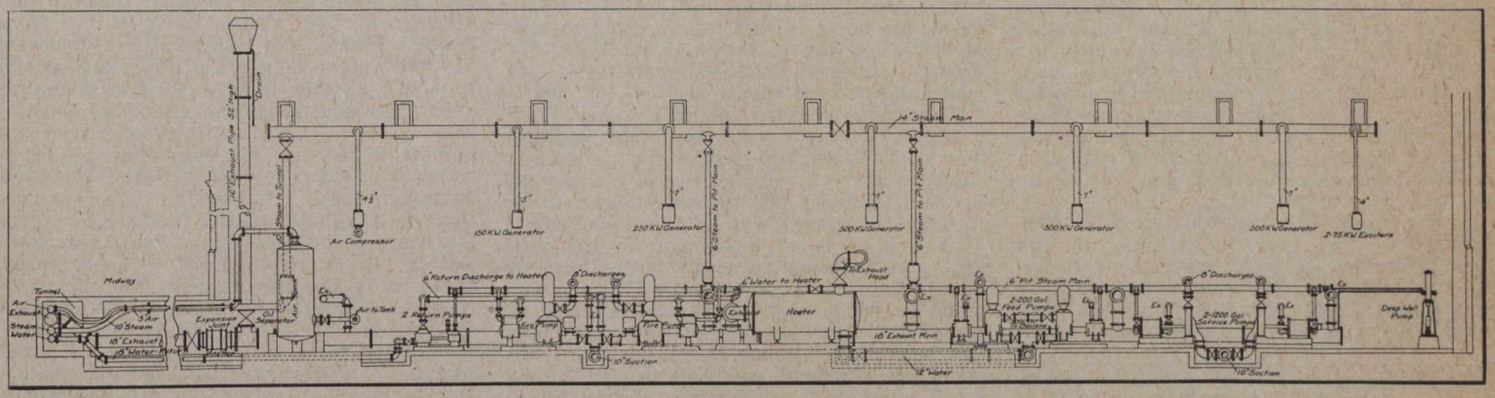
In addition to the electric generating apparatus in the engine room, there is a horizontal cross compound, Corliss, two stage air compressor having a capacity of 1,500 cu. ft. of free air per minute, at 80 to 100 lbs. per sq. in. pressure. The steam cylinders of the compressor are 16 and 25 ins. diameter, and the air cylinders, 24 and 14 ins., the stroke being 36 ins. Both air cylinders are fitted with Corliss inlet and poppet outlet valves. The speed is regulated by a combination speed and pressure governor, the normal speed being 90 r.p.m. Both air cylinders, heads and intercooler, are water cooled.

The exhausts from the different engines, all lead out from under the engines in shallow trenches under their respective engines, connecting with an 18 in. exhaust main at the bottom of the pit along the fire wall. All the buildings of the plant are heated by exhaust steam on the indirect fan system, as explained and described in the previously mentioned article. This main leads out through the front of the building into the distribution tunnel to all the buildings. At the front of the building, there is an oil separator to keep the heating system clean, and an anchor and expansion ring to take up all the linear expansion due to heat. Midway between the anchor and expansion joint, a vertical 16 in. pipe, 52 ft. high, leads up to an exhaust head on the roof of the building for atmospheric exhaust. There is a back pressure valve in the vertical pipe, which controls the pressure in the heating systems, also the back pressure in the engines; when the heating system is not required, it can be shut off, valves being located in the main just beyond the exhaust head connection.

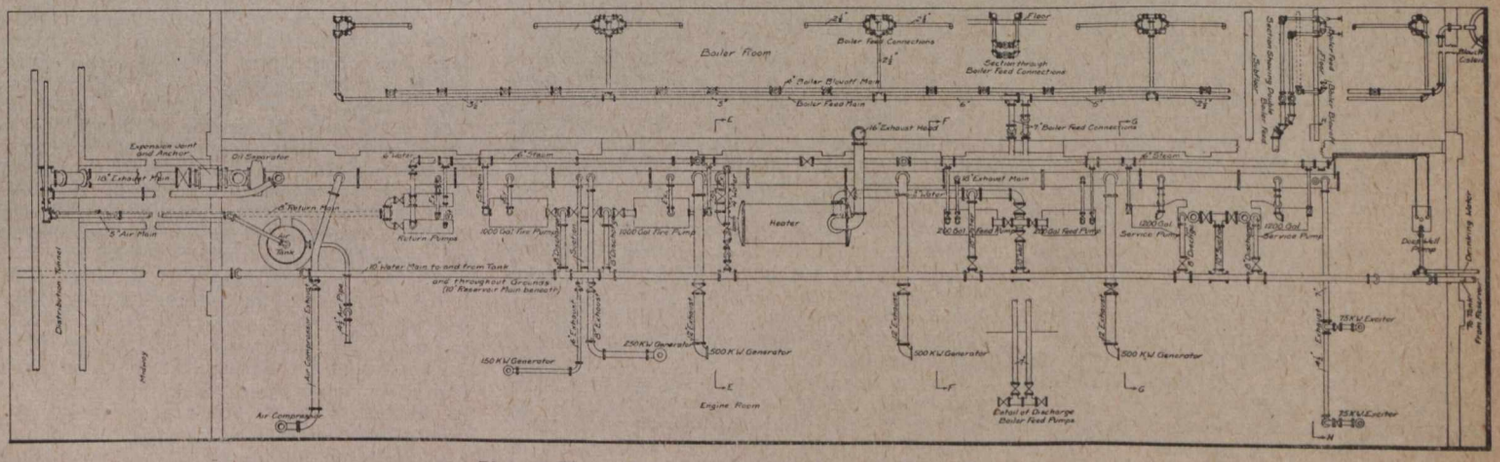
A feed water heater is located at a central point in the pit, one end connecting with the exhaust main, and the other leading on through an exhaust head similar o the one just mentioned. A valve is situated in the short connection from exhaust main to heater for cutting this out when necessary to clean the heater.

The water system is very complete. In order to obtain a soft water supply at the shop site, a pumping station was erected at the Red River. This station has suction pipes running out into deep water, connected to vertical triplex high speed pumps having a 24 hour capacity of 1,000,000 imp. gallons, direct connected through friction clutches with gas engines. There is a duplicate producer plant to ensure a continuity in the service. The water is conveyed the 6 miles to the shops through 6 in. wooden stave piping. At the shop site, some distance to the rear of the power house, the water is emptied into one end of a storage settling basin of a storage capacity of 2,000,000 imp. gallons. This reservoir is constructed of concrete, and is 60 by 270 ft., and 25 ft. deep, the top being slightly above the level of the ground. The reservoir is divided lengthwise by a reinforced concrete wall, the balance being of mass concrete. The dividing wall makes possible the use of one half of the reservoir for storage, while the other half is being cleaned, and vice versa, as the water from the river is full of sediment, requiring constant cleaning. The reservoir is roofed over with double planking supported on steel beams. Close up under the roof are hung a number of heating pipes, to prevent the water from freezing too thickly on top and interfering with the outlet pipes. The water is drawn off from the end opposite that for the entry, giving the sediment a good opportunity to settle.

From this reservoir, the water is drawn off through a 10 in. pipe, coming into the power house in a trench in the bottom of the pit along the engine room side of the auxiliary machinery pit. This main leads along the side of the pit through nearly its full length. Near the rear of the pit are two 1,200 gallon centrifugal service pumps, driven directly by two 70 h.p. Kerr turbines, drawing their water from a 10 in. suction pipe from the reservoir water main, and each delivering through an 8 in. discharge pipe into a 10 in. water main near the top of the pit on a level with the engine room floor, on the same wall of the pit as the reservoir water main. This upper water main connects at the rear, or west end, of the building with a 100,000 imp. gallon steel



Cross Section through Pit, looking towards Fire Wall.



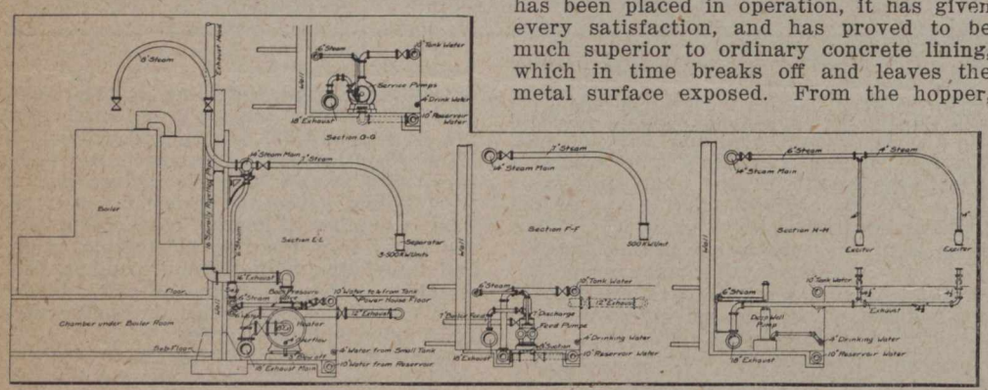
Plan of Piping Arrangement in Engine and Boiler Rooms.

water tank at an elevation of 150 ft., in the grounds to the rear of the power house. The other end of this tank main through the pit, passes out through the front of the building under the midway, making connections underground to all the buildings of the plant.

For fire purposes, there are two 1,000 gallon underwriter pumps in the pit, drawing from the reservoir main, and delivering into the tank main, and thence to the fire hydrants throughout the grounds. In case of fire, the tank can be shut off by a valve and a pressure of 175 lbs. put in the mains. All the pipes are designed to stand full pressure, or are furnished with pressure regulating valves.

Drinking water is supplied by an artesian well at the west end of the pit, delivering to a 10,000 gallon tank suspended under the main tank on the water tower. This drinking water reservoir and pump also connect through a 4 in. main over the reservoir water main in the pit, passing out at the front of the building into the distribution tunnel under the midway, and thence to the buildings of the plant.

Through the distribution tunnel, there is an 8 in. main for the return from the heating system, an 8 in. main from it connecting with the two return wet vacuum pumps near the east end of the pit. From these pumps is a 6 in. water main along



Cross Sections through Pit at Different Points.

the fire wall side of the pit, delivering into the heater through its top. This is in addition to a cold water supply pipe off the service main, which has a float control valve. From the heater, the water is drawn off through a 12 in. main beneath, and thence to two 200 gallon feed pumps to the west of the heater in the pit. This intermediate connection has two pipes united to it midway in its length, one from the reservoir water main and the other from the tank water main, each provided with a valve, so that the feed can be drawn from any one of the three sources, maintaining a constant supply. The feed water to the boilers leads back through two 7 in. mains through the fire wall.

The feed mains, after passing through the fire wall, connect with parallel 5 in. mains running the length of the boiler room in the chamber which passes under the whole area of that room. Between each pair of boilers, is a 2½ in. main running from each feed main, the two uniting through a system of elbows, and a connection running under each boiler. The whole system is duplicated and cross connected so that the possibility of a breakdown is very remote.

Air from the compressor is stored in a vertical cylindrical tank of 191 cu. ft. capacity in the pit adjacent to the compressor. From the tank, the air is delivered through a 5 in. main, which passes into the distribution tunnel, and thence to the different buildings.

The boiler room is 45 by 150 ft., and contains eight 425 h.p. city water tube boilers (a total of 3,400 h.p.) They are designed for operation up to 150 lbs. pressure, and are arranged in four batteries of two each along the fire wall dividing engine and boiler rooms. The breaching for the boilers enters the chimney about 12 ft. above the ground level, through a 15 by 6 ft. opening. The chimney has two 24 by 18 in. cleaning doors at the bottom, and stands on a concrete base 30 ft. square by 11 ft. deep, while the whose rests on 84-25 ft. wooden piles. Two of the boilers are arranged for using shavings and other refuse from the wood working shops, while the other six are equipped with chain grate stokers, which are driven by small duplicate steam engines, located in the boiler room basement, where the shafting is also placed. Directly in front of the boilers, and erected on steel columns, are located the coal and ash receiving and storage hoppers.

The coal handling plant consists of 3 parts:—crushing, conveying and storing. The coal, being first brought in cars up a ramp to a height of 7 ft. above the ground level, is dumped into a large hopper built into the southwest side of the boiler room. This hopper is of interest from the fact that a new lining material in the form of mastic flooring is used for the bottom surfaces on which the coal is dropped, and in the period that has elapsed since the plant has been placed in operation, it has given every satisfaction, and has proved to be much superior to ordinary concrete lining, which in time breaks off and leaves the metal surface exposed. From the hopper, the coal is mechanically conveyed through a crusher, located in the boiler room basement, which transports it to the overhead storage bins. Ashes from the boilers are also delivered to the conveyer and deposited in a separate hopper, from which they are dumped by means of a chute into cars outside the building. The coal crusher is operated by a 20 h.p. a.c. motor, located under the main receiving hopper, while the conveying system has a 10 h.p. a.c. motor located above the storage bins. The combined coal handling plant, which is entirely automatic, has a capacity of 40 tons per hour.

The power plant was designed under the supervision of W. J. Press, Mechanical Engineer, N.T.R., and the construction was carried out under the direct supervision of D. A. Evans, Assistant Engineer, practical operation of the plant commencing during the latter part of March, 1912.

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

	Acres.
Calgary and Edmonton Ry.	2,389.00
Grand Trunk Pacific Ry.	179.67
Grand Trunk Pacific Branch Lines Co.	45.784
Manitoba and North Western Ry.	480.00
Manitoba South Western Colonization Ry..	164.56
Qu'Appelle, Long Lake and Saskatchewan Rd. and Steamboat Co.	3,279.00
Total	6,538.014

Halifax Ocean Terminals, Intercolonial Railway.

Since the article on this subject was published in Canadian Railway and Marine World for September, the following information has been received:—

Tenders for the double track railway from Rockingham, 4 miles from North St. station, Halifax, to the site of the new terminals were asked for in two sections as follows:—A line from Rockingham to Jubilee House, Halifax, about 3.5 miles, including the formation of a freight terminal yard, and a diversion of the I.R.C. in Bedford Basin and at Fairview forming section 1. Section 2 consists of a line from Jubilee House, via Maplewood to Brussels St., two miles; thence northerly and easterly about a mile to His Majesty's lumber yard, and southerly and easterly about a mile to Reid Rock in Halifax harbor, to include filling and forming along the west shore of Halifax harbor, for the proposed bulkhead, quays and piers and the construction of a rubble mound breakwater from the shore of Pleasant Point Park, near Fort Ogilvie, to the Reid Rock. The material obtained in the excavations is to be used, so far as approved, for filling in the embankment in section 2, and the yard in section 1, The contractors are to remove all buildings on the right of way, etc., fence the same, and carry on all their operations without interfering with the traffic on the I.R.C., the Halifax and South Western Ry., or the Halifax Electric Tramway Co.

The earth cuts are to be 22 ft. wide for single track, with 13 ft. additional width for extra tracks; rock cuts are to be 20 ft. wide for single tracks, with slopes of ¼ to 1, unless otherwise oredred, and an additional width of 13 ft. each where extra tracks are required. A grade width of 16 ft. is required for embankments under 16 ft. high, and 18 ft. for embankments over 16 ft. high, with side slopes of 1½ to 1 for earth, and 1¼ to 1 in rock, and where extra tracks are to be laid, an additional width of 13 ft. is to be provided for each.

The breakwater off Point Pleasant Park is to be of the rubble mound type, to be composed of the best selected clean, hard, sound and durable rock to be obtained from the excavations, as the engineer shall direct. The least dimension of any block is not to be less than one-quarter of its largest dimension. The breakwater will consist of a rock embankment, protected on the sides and seaward end, with large "Pierre Perdu" a random rubble rip rap, and paved on top with large angular blocks of rock.

The core embankment will be 40 ft. wide at low water level of ordinary spring tides, and will be formed with side slopes of one horizontal to one vertical extending from the bottom of the harbor to low water level. The core embankment from the bottom of the harbor to 30 ft. below water level will be composed of rock of varying size, but at least half of the pieces of the remainder shall weigh not less than one ton each. The slope and ends of the breakwater 30 ft. below water will be protected with angular blocks weighing from half a ton to two tons each. On the seaward slope the protecting rip rap will have blocks weighing from two to eight tons each. From the top of the embankment at low water level to the top of the breakwater, blocks weighing from 2 to 8 tons must be used, with at least half weighing 5 tons. The top surface of the breakwater, 30 ft. wide is to be roughly paved to an even surface with roughly squared block well set and with joints not wider than 12 ins. and having all interstices tightly packed with close fitting spaces.

Locomotives Equipped for Fire Fighting on the Canadian Pacific Railway.

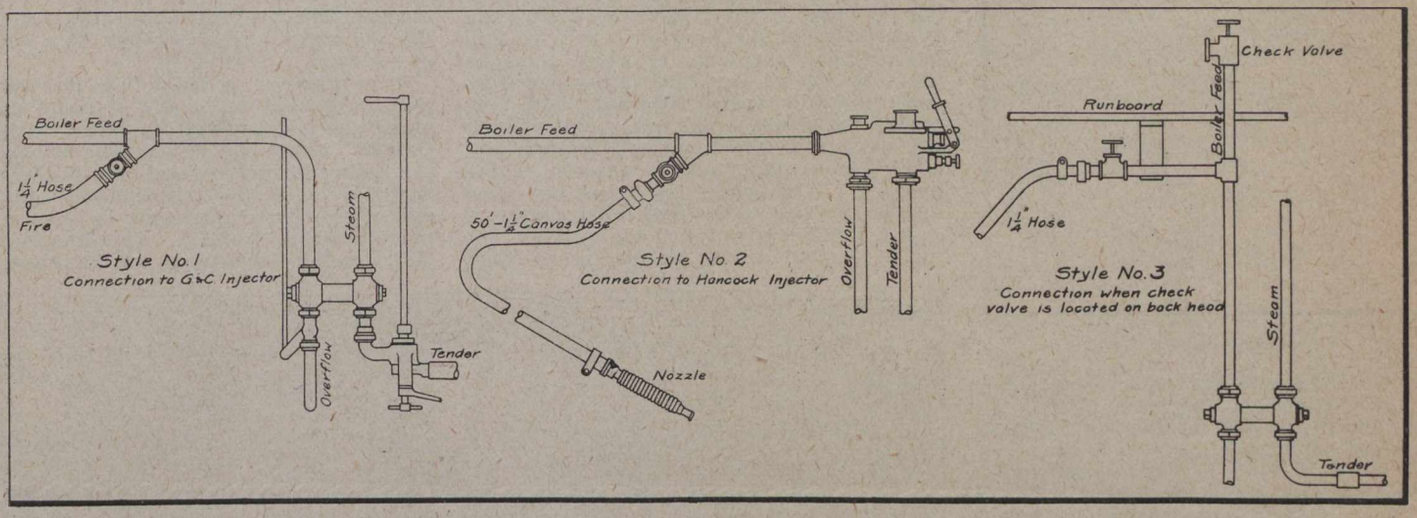
Mention has been made in the technical press that certain U. S. railways have equipped some of their locomotives with fire fighting apparatus, to act as auxiliaries to the local municipally owned apparatus at the several stations where these equipped locomotives are to be located.

For some time past, the C. P. R. has been equipping all its switching locomotives with fire fighting apparatus, and in addition to this being ordered on all new switching equipment, orders have been issued to add it to all of that class as they come in for shopping. At the end of last year, there were on all parts of the system, 162 locomotives so equipped.

The equipment is standard, apart from the method of installation on old and new locomotives. There are three different styles shown in the accompanying illustration. Style 1 is for use with the old G. & C. injector. The only change in the existing arrangement to introduce the fire apparatus, is to place a Y connection in the boiler feed pipe, with a valve connection in one of the legs for the hose connection. In style 2, the arrangement is the same except that it is for the Hancock injector. Style 3 is similar in most particulars to style 1, except that the boiler check valve is in the back head of the boiler, a practice followed with some small saddle back switching locomotives, necessitating a pipe branching off from the feed pipe and running forward under the runboard. Each side of all the locomotives is similarly equipped, so as to make the auxiliary injector of service.

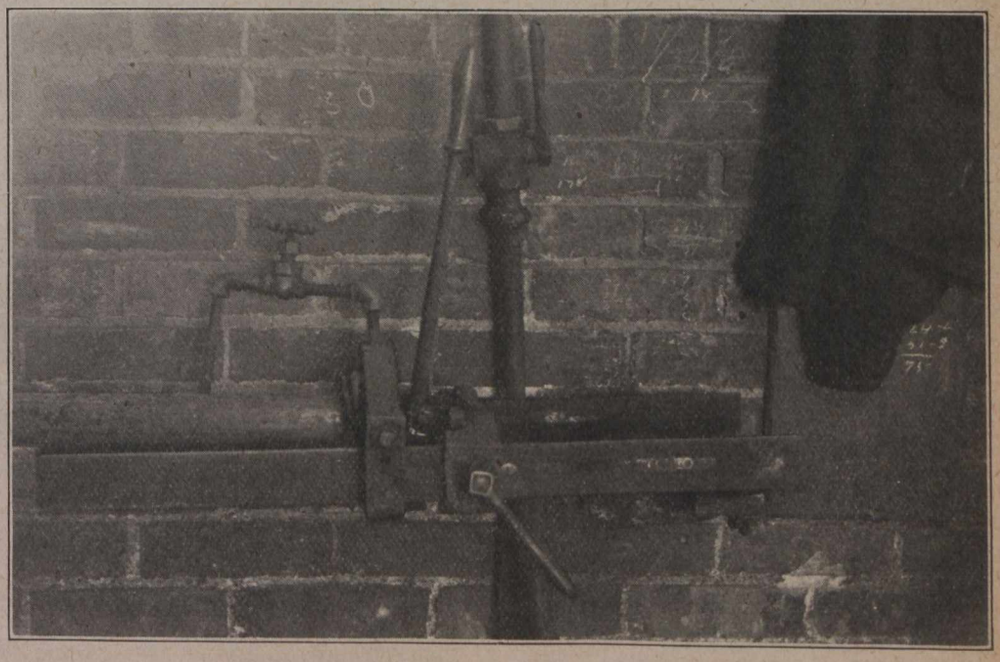
Each locomotive is equipped with 50 ft. of 1 1-4 in. canvas hose for attachment to the Y connection. This is provided with a 5-8 in. nozzle. With the pressure of the water, as forced out by the injector, a stream can be thrown for a considerable distance, with the stream of such volume as to be of considerable assistance in checking a fire in the early stages.. Each locomotive is also equipped with a nipple threaded to fit the local hydrant of the place where the locomotive is stationed, so that the hose may be used on the local service when the water in the tender has been exhausted, or when it is otherwise deemed expedient to do so

The 162 locomotives equipped are well distributed over the system, as shown by the following list of locomotive locations. Eastern Lines: Glen Yard, 3; Sortin, 4; Toronto, 8; Windsor, 1; North Bay, 1; Sherbrooke, 1; McAdam Jct., 1; Hochelaga, 10; Angus Shops, 1; London, 3; Prescott, 1; Quebec, 1; Brownville Jct., 1; Bay Shore (St. John), 3; Outremont, 9; West Toronto, 12; Havelock, 1; Carleton Place, 1; Three Rivers, 1; and Farnham, 3. Western Lines: Winnipeg, 22; Calgary, 6; Kenora, 3; Medicine Hat, 2; Red Deer, 1; Sutherland, 2; Strathcona, 1; McLeod, 1; Weyburn, 1; Fort William, 12; East Calgary, 5; Lethbridge, 2; Eholt, 1; Swift Current, 1; Portage la Prairie, 1; Wilkie, 1; Souris, 2; Smith's Jct., 1; Brandon, 5; Moose Jaw, 8; Vancouver, 9; Revelstoke, 1; Minnedosa, 1; Kamloops, 1; Ignace, 1; Regina, 3; and Cranbrook, 3.



Equipment of C.P.R. Locomotives for Fire Fighting, showing Water Connections from Boiler Feed Pier.

The test stand consists of a length of shallow channel, with water headers at each end between which the tube is placed, and the pressure applied. In this particular, most testing machines are the same. The adjustable head of this stand is out of the ordinary, and is shown in the accompanying illustration. For the accommodation of different lengths of tube, and for introducing tubes of the same length, adjustment is required. For varying lengths of tubes, there is a cross brace in the channel, secured where desired by a clamping screw on the side of the channel as indicated. The water head is loose, and may be moved within a short limit without stop adjustment.



Quick Operating Tube Testing Head.

Pivotted to the face of the stop is a lever, the lower end of which is cam shaped. In the vertical position, the tube can be introduced. By bearing down on the lever, the packed water head can be forced against the end of the tube, forming a tight, packed connection. This connection can be quickly made, and as quickly removed, facilitating the work of testing.

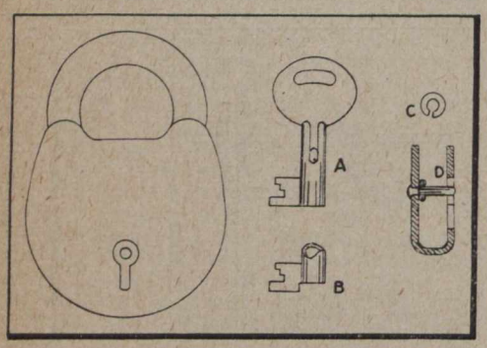
Tube Testing Head at Toronto, Hamilton and Buffalo Railway Shops.

An arrangement is in use in the T. H. & B. R. shops, Hamilton, W. T. Kuhn, Master Mechanic, for expediting the work of testing safe ended tubes. These are all subjected to a hydrostatic presure, most shops having special provision for so doing.

A paper on the railway hotel and its function, by F. W. Bergman, Manager Grand Trunk Pacific Ry. Hotels, was read before the Western Canada Railway Club in Winnipeg, Sept. 8.

An Improved Padlock.

In a large Canadian railway repair shop in Montreal nearly all of the employes have a padlock of their own for various purposes and reasons sufficiently good to themselves. Some are direct and some indirect, and many kinds are used, especially on tool boxes. In spite of their variety, however, some of the employes on the night shift delve deeper than the lock maker, and sup-



Safety Padlock.

ply themselves with keys of a dozen different kinds of design, and seem to have no great difficulty in making a private inspection of the interior of the tool boxes. In order to put a stop to these questionable transactions, we cut a small piece off the key ,as shown in the accompanying illustration at B, and made from steel wire an open ring, C. and placed the ring inside of the lock on the key guide pin at D. The lock may be readily opened by the owner of the key from which the small piece has been cut, but when the midnight prowlers come along with their false set of keys, they find that their right hands have lost their cunning, and, as they say, they are up against it, and they are compelled to turn their mechanical ingenuity to some other more honorable occupation.—J. G. Koppel, in Railway and Locomotive Engineering.

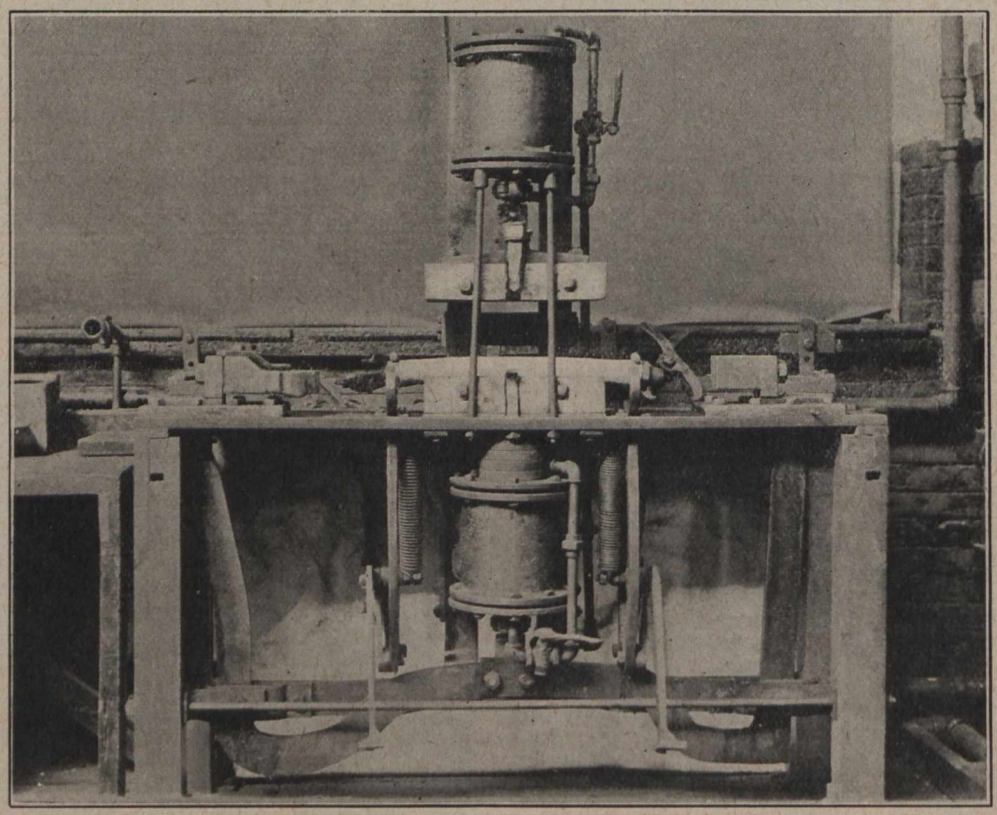
Air Hose Machine in Grand Trunk Railway Port Huron Shops.

Practically all the different types of hose repairing machines in use on the various Canadian lines have been described in Canadian Railway and Marine World. Each shop seems to have developed a machine which seems to meet its own particular requirements. In the shops at Port Huron, Mich., the machine shown in the accompanying illustration is in use, a design that was evolved and constructed there.

Mounted on legs above the table is an air cylinder, and in line with it is a similar cylinder supported from the under side of the bench. On the bench is a half die section, grooved to hold the hose, and with a corresponding section attached to the lower end of the upper cylinder plunger rod. The lowering of the latter secures the hose during the forcing in of the fittings. The latter are held in guided blocks just beyond the ends of the hose. These guided blocks are moved along their ways by bell cranks, pivotted on a frame of bar iron under the bench just below the lower cylinder. The inner ends of those two bell cranks connect to the lower cylinder plunger rod, the depression of the latter moving the guided blocks towards each other, forcing the fittings into the hose ends, the latter being held by the upper cylinder. The lower cylinder is actuated by a two way valve in front of the cylinder, so located that the operator is able to move it with his knee. The downward force of the lower cylinder, if the hose fittings are rather tight, is so great that in service, one of the bell cranks failed. In the present construction, this weakness has been remedied by a cross brace between the vertical and horizontal arms of the bell cranks.

The clamping rings over the hose ends, binding the latter to the inner end of the fittings, are tightened up into such a position that the clamping bolts can be inserted by means of the foot levers near the bottom of the view, outside of the coiled springs below the bench. Pivotted at the bench level at each end of the hose, is a pair of long pincers, the upper ends of which come up over the top of the hose clamp, tapering down to a thin edge at the point where they engage the clamp. The lower ends of each pair of pincers are connected through two short joined links, inclined upwards to the juncture. The connecting pin at this juncture is attached to the foot lever, the inner end of which is pivotted at the wall, so that the depression of the treadle forces apart the lower ends of the pincers, the upper ends closing over the clamp ring, when the bolt can be inserted and tightened. To tighten effectively, each end is operated on separately, the operator standing on the end of the treadle of the end being clamped.

The machine can also be used for pulling out the fittings from old hose, by fitting into the guided blocks the hooks shown on the bench in the right background. The guided blocks are first brought to their inner position, the hook clamps inserted in the block and attached to the fittings at each end, and by a reversal of the motion in the lower cylinder, the fittings are withdrawn.



Air Hose Machine for Inserting and Removing Fittings.

Defective roadway and defective equipment jointly caused more than 70% of all the derailments on steam railways in the United States during the quarter ended March 31, according to statistics recently published by the Interstate Commerce Commission.

Construction Railway and Grand Trunk Railway Deviation on New Welland Ship Canal.

In connection with the building of the new Welland Ship Canal, described in the Marine Department of Canadian Railway and Marine World for July, there is to be built a section of double track industrial railway for the use of the contractors, and in addition, a section of the G. T. R. Welland branch is to be diverted to make room for the new canal, which follows the course of the old railway line through this section of the canal.

It is proposed to build this construction railway double track and standard gauge, along the west bank of the canal, extending from the shore line of Lake Ontario to the stock piles of rock on section 3 of the work north of the G. T. R. main line, near the site of the tier of three double locks, a distance of about 6 miles. This line is to be built by the Department of Railways and Canals in a semi permanent manner, with at least 56 lb. rails, on good ties at 2 ft. centres, and ballasted with broken stone or gravel.

The general contractors for sections 1, 2 and 3 of the canal, which include all the locks and the terminal piers at the Lake Ontario end, will be allowed the free use of the railway for hauling the excavated material to the dump in the lake, and the contractors for sections 1 and 2 will also be allowed its use for the hauling of stone from the stock piles to the various works. Contractors for the steel and other work will also be allowed the free use of the line. A dispatching station will be maintained, with a dispatcher, who, with switchmen, will have complete control of train movements over the railway. Contractors may make connections to the line, under approval. Before using the line, the contractors will be required to sign an agreement relieving the Department of all responsibility in connection with accidents or breakag-

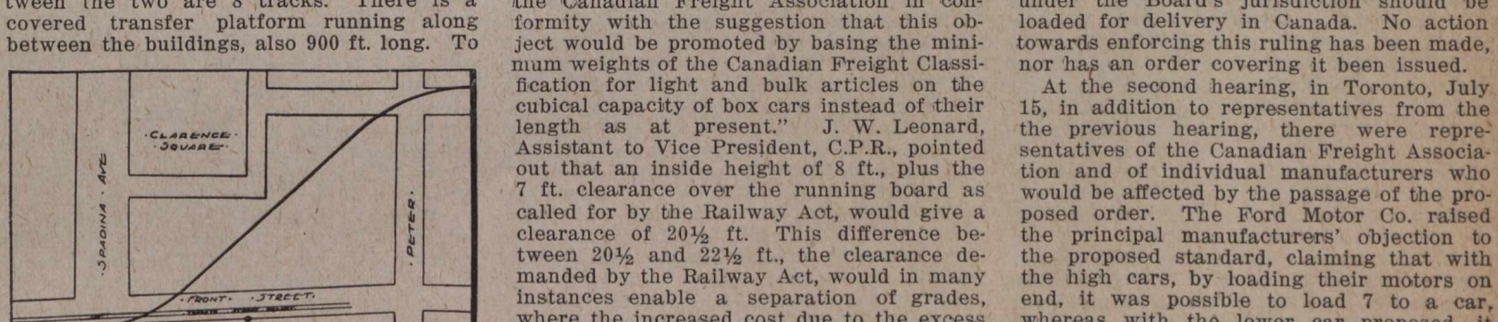
es on the line.

The section of the G. T. R. Welland Branch to be diverted is about a mile which closely follows the present canal just south of where the Welland Branch leaves the main line. The diversion will leave the main line at the same point, but instead of immediately crossing the canal, will follow the west bank, making a sweep to the west and crossing the canal at right angles about a mile south of the present crossing of the existing canal.

New Toronto Freight Terminals for Canadian Pacific Railway.

About two years ago, the C.P.R. acquired the old Government House property, corner of King and Simcoe Sts., Toronto, on which to erect new package freight terminals, the same as the G.T.R. did some few years ago on the similar property to the south. For this purpose, the balance of the block bounded by King, Simcoe, Wellington and John Sts. was acquired, and the work proceeded with. The portion of the scheme to be at present carried out is now nearing completion, and is shown in the accompanying plans.

On the Simcoe St. front, there is a large office building, the Wellington St. end three stories high, for the company's freight offices, and the northerly end, seven stories high, for the Dominion Express Co. Running back from the office buildings, there are two 900 ft. freight sheds, one for incoming and the other for outgoing freight. Between the two are 8 tracks. There is a covered transfer platform running along between the buildings, also 900 ft. long. To the north of the buildings there are three teamways, with 7 team tracks. The frontage on King St. to the north is to be utilized for future office and freight shed extensions.



Plan of New Canadian Pacific Railway Freight Terminals at Toronto.

Approach to New C.P.R. Freight Terminals.

To the west of John St., additional property was acquired for heavy team tracks. The approach to the yards is through this section of the property. The approach tracks leave the main line at Bathurst St., ascending the escarpment along Front St., reaching the upper level at Spadina Ave., as shown in the smaller illustration. From that point, the line cuts across blocks on its own right of way to the new terminal property.

R. Mee, who took the first C.P.R. passenger train to Port Moody, then the Pacific terminus, died at Vancouver, B.C., Aug. 27.

Proposed Reduction in the Height of Box Cars.

The subject of the reduction in the height of freight cars has come up before the Board of Railway Commissioners on two recent occasions. The bulk of the evidence taken indicates that the C.P.R. is the only line operating in Canada that strongly favors the proposed reduction, the principal consideration advanced being that it would facilitate the matter of grade separation. At the first hearing, in Ottawa, June 17, there were representatives of the C.P.R., G.T.R., Canadian Northern Ry., Michigan Central Rd., Wabash Rd., New York Central Lines, Pere Marquette Rd., Toronto Board of Trade, and the Canadian Manufacturers Association, all of whom took part in the discussion. The section discussed was a "consideration of the proposal that by limiting the height of freight cars to 13½ ft. from the top of the rail to the running board, trainmen would be safeguarded and grade separations facilitated; also of proposals submitted by the Canadian Freight Association in conformity with the suggestion that this object would be promoted by basing the minimum weights of the Canadian Freight Classification for light and bulk articles on the cubical capacity of box cars instead of their length as at present." J. W. Leonard, Assistant to Vice President, C.P.R., pointed out that an inside height of 8 ft., plus the 7 ft. clearance over the running board as called for by the Railway Act, would give a clearance of 20½ ft. This difference between 20½ and 22½ ft., the clearance demanded by the Railway Act, would in many instances enable a separation of grades, where the increased cost due to the excess of 2 ft. clearance would make grade separation out of the question. The late Chief Commissioner, J. P. Mabee, is claimed to have stated that there were dozens of cases in the last few years that would have been got rid of but for this consideration. Mr. Leonard further stated that there was a probability that both the C.P.R. and G.T.R. might get together and agree not to build any more cars greater than this height, as recommended by the American Railway Association in 1901, and ordered as standard by the Master Car Builders' Association.

D. Crombie, then General Superintendent of Transportation, G.T.R., stated that as 61% of their traffic in 1910 was international, it might affect that portion of their business if the height of cars were restricted in Canada and not in the U.S. This was an important factor, as it was stated by S. W. Brown, General Superintendent, M.C.R., that there are on this continent 58,000 box cars in excess of the proposed height standard. Automobile cars appear to be the worst offenders.

The discussion was continued on the feasibility of having international shippers advised of the ruling in Canada, and sending their goods in cars that would meet Canadian requirements. Mr. Leonard seemed to think this practicable, but the majority of the railway representatives were opposed to this, claiming it would work a discrimination in favor of through U.S. lines which had no such limitations.

Chief Commissioner Drayton then stated that he thought a ruling or order ought to be made that no box cars be built in Canada by railways under the Board's jurisdiction to exceed 13½ ft. high, and that these cars only should be used for shipments between points in Canada. Also, that no cars in excess of 13½ ft. should be loaded in Canada for delivery in the U.S., and that no cars on the U.S. lines of the companies under the Board's jurisdiction should be loaded for delivery in Canada. No action towards enforcing this ruling has been made, nor has an order covering it been issued.

At the second hearing, in Toronto, July 15, in addition to representatives from the the previous hearing, there were representatives of the Canadian Freight Association and of individual manufacturers who would be affected by the passage of the proposed order. The Ford Motor Co. raised the principal manufacturers' objection to the proposed standard, claiming that with the high cars, by loading their motors on end, it was possible to load 7 to a car, whereas with the lower car proposed, it would only be possible to load 3, and the suggested measure of making the cubical contents of a car the basis of minimum weights would not overcome this difficulty, as the increased length of car that this might introduce would not increase the loading capacity as far as this product was concerned. The Canada Ingot Iron Culvert Co. raised objection on the ground that as its product was light and bulky, it was necessary to pile flat cars higher than the proposed height restriction in order to secure anything like the minimum loading. The Chairman of the Furniture Section of the Canadian Manufacturers Association raised the point that U.S. manufacturers would have the advantage over Canadian manufacturers, as the former would be able to use the higher cars for shipping in their product, working a discrimination against the Canadian manufacturer, but this objection was met by the Chief Commissioner stating that the proposed order would prohibit

everything except the through movement of high cars. The substitution of the cubical content basis for minimums instead of the car length basis as at present would, in the opinion of those present, eliminate any hardship resulting from the lower car as far as the furniture manufacturers were concerned.

The principal difficulty in connection with an order that presented itself to the Chief Commissioner was the fact that at certain times of the year, principally when the grain was moving, there are so many cars travelling east on lines which carried chiefly a through business, that a large percentage have to return west light for want of loads. On returning west through Canada, they pick up what loads are available, relieving Canadian traffic conditions to that extent. In the event of an order, these lines would be prevented from carrying on this pick up business in Canada with the high cars, which might be a serious matter.

T. Marshall, Traffic Department, Toronto Board of Trade, pointed out that as there are on the average some 30,000 Canadian cars always in the U.S., the exclusion of foreign cars over the height limitation would tend to create a car shortage, for, while it was possible for U.S. shippers to eventually become advised of the car limitations in Canada, for some time it would be necessary to exchange loads at the frontier, leaving fewer Canadian cars open for engagement.

In reply to a query as to whether some revision in minimum weights would be made in the event of an order restricting the height of box cars, the Chief Commissioner stated that such a revision would be made regardless of this proposed order, for to leave the matter as at present is simply for the purpose of competition, to enable one traffic officer to get advantage of the other.

Mr. Leonard suggested that the width of box cars should be considered as well as height, as the widening of cars would necessitate the moving back of objects on the right of way, as required by an order made by the Board some years ago, in conformity with the then accepted standard.

The consideration of the matter of substituting cubical, for the length of car basis, as the minimum for light and bulky articles came up for brief discussion at this meeting, but as the railways did not seem anxious to consider the matter at that time, the consideration of this, as well as a further discussion on the reduction in the height of box cars was deferred to an unstated date.

Railway Efficiency.

By A. Crumpton, Assistant Engineer, Grand Trunk Railway, Montreal.

The product of a railway is transportation, and the measure of its efficiency is the quality and cost of producing the same. In transportation upon land the railway has proven itself pre-eminently superior to any other way. It is a far cry from a rate of $1 a ton per mile for "packing" upon men's backs, or even 25c. a ton mile by team, to ¾c. a ton mile, which is the average cost to the public by railways in America. Passengers in America pay an average charge of a little less than 2c. a mile, and a trip of 500 miles in 12 hours is common. Only the man on the inside realizes what this means, both as regards perfection and economy of construction and operation. In Europe the average freight charge per ton mile is 1½c.—double what it is in America —while passenger rates run from 1½c. to 2c. for third class to 3c to 4c. for first class accommodation. This is only of interest as showing where we stand, but does not prove anything as regards relative efficiency, the conditions of construction and operation being different on the two continents. In 1870, the average freight rate per ton mile was 2c. as against ¾c. in 1909, a reduction in 40 years of 62%.

W. M. Acworth, an international authority on railway economics, who from time to time inspects American railways in the interests of English investors, says: "It has been my opinion that in actual economy of operation the railways of the United States are first in the world."

A railway to continue and increase its efficiency must not only keep up its lines and equipment for current traffic, but must have means in advance to provide for increasing requirements. This country is rapidly growing in population and wealth, and there is an insistent demand for a better and more improved passenger service, faster freight service, and greater safety. Since these things, speaking generally, do not increase revenue they are a proper charge against operating expenses, and should be met by increased rates for transportation, where necessary. The peculiar fact is that while the public appreciates the situation in ordinary matters and expects to pay more for better pavements or better clothes, yet, in matters of transportation it demands better service but refuses to pay more for it. When, in 1910, a large section of the railways of the United States made application to the Interstate Commerce Commission for authority to increase rates, they were met by statements alleging lack of scientific management—that a million dollars a day could be saved by increased efficiency—and their request was refused. Detailed records of cost of building and maintaining railways and of conducting transportation have now to be kept by the railways, at the instance of the Commission, and the appraisal of all the railways in the United States has just been ordered, so that, no doubt, any future question of rates will be dealt with in the light of the efficiency shown by the railways. Briefly, it is claimed that the railways fail in efficiency as follows:

MAINTAINANCE OF EQUIPMENT, which consumes about 20% of the total operating expenses. "Railway repair shops throughout the country do not show 50% efficiency on an average as regards either materials or labor."—Emerson.

MAINTENANCE OF WAY, consuming about 20% of total operating expenses. "Standards of maintenance of way vary, but innumerable assays of actual work show a maintenance-of-way labor efficiency of scarcely more than 30%."—Emerson.

TRANSPORTATION, consuming about 50% of total operating expenses. "Fuel.—On the Santa Fe average fuel used per 1,000 freight train ton miles was reduced from 261 to 239 lbs. On the Chicago, Milwaukee & St. Paul 175 lbs. Dynamometer car 80 lbs."—Emerson.

"It has been demonstrated that by proper instruction, fuel consumption could be reduced at least one-half."—Brandeis.

Terminal expense, particularly the handling of less than car load lots, should be improved by the use of mechanical conveyors.

From the railway standpoint it may be said:

MAINTENANCE OF EQUIPMENT.—A fair comparison cannot be made between industrial shops, with uniform output, and railway repair shops with little uniform work, particularly as such repair work is incidental to the main purpose of producing transportation, and while low cost is desired, expedition is primarily which is required.

MAINTENANCE OF WAY.—The fact that maintenance of way forces may be scattered over thousands of miles of line makes adequate supervision difficult, and that the labor requirements vary with the season makes it impossible to always have the force as efficient as could be desired. The force required to man a thousand miles of line could be concentrated on one acre in a textile mill, so that comparisons of efficiency made under such conditions would be unsatisfactory.

TRANSPORTATION forces are strongly organized and militant, largely increasing the difficulty of reducing labor charges, but by betterment of roadway and the use of heavier power the railways are effecting such economies as are possible. In this connection Mr. Emerson said: "The efficiency of the traffic by my standards is very high; that is, the efficiency of expense in the traffic departments."

As regards economy in fuel and in its use, this has ever been a subject of investigation on the part of the railways, as also that of mechanical conveyance.

It may also be said that railway development has been proceeding along logical lines. First, the period of railway building, then one of traffic organization and consolidation, followed by one of betterments, embracing perfecting of machinery, strengthening roadbed and bridges, cutting down grades and increasing the motive power and weight of trains. And now the human factor is coming in for increased attention and systems of organization are being studied to the end that the machinery as a whole may be brought to the highest efficiency.

In this connection it will be interesting to examine the fundamental principles of scientific management as given by F. W. Taylor, its originator:

"1.—Each man in the establishment, high or low, should daily have a clearly defined task laid out before him. This task should not in the least degree be vague or indefinite, but should be circumscribed carefully and completely, and should not be easy to accomplish.

"2.—Each man's task should call for a full day's work, and, at the same time, the workman should be given such conditions and such appliances as will enable him to accomplish his task with certainty.

"3.—He should be sure of large pay when he accomplishes his task.

"4.—When he fails he should be sure that sooner or later he will be the loser by it.

"When an establishment has reached an advanced state of organization, in many cases a fifth element should be added, namely, the task should be made so difficult that it can only be accomplished by a first class man."

The railway as a proposition is characterized by its great extent, requiring unusual specialization in every branch, and this has in the earlier days led to undue centralization and the creation of departments whose heads endeavored to perform both "staff" and "line" duties. A departmental organization of this kind, projected over large areas with distant headquarters, has proved cumbersome in operation, a breeder of departmental jealousies, and unsatisfactory to both the public and employes. This type of organization is now being superseded by one in which the 'staff" and "line" functions are being separated. "Staff" functions, consisting largely of the theoretical side of the work, studying the underlying principles, whether physical or psychological, which make for efficiency in construction and operation; systematizing and standardizing every operation; providing instruction as to their application and formulating

means by inspection and otherwise for unerringly recording both their performance and neglect, is necessarily the work of specialists.

Line functions, consisting of the more practical side of the active conducting and directing of the work, is none the less the work of specialists and experts, but of execution rather than design.

Line officers are in charge of stated districts, representing the railway in general and not any particular department. Under this arrangement the different departmental activities are co-ordinated and all the advantages of the public and employes being brought into close touch with a responsible representative of the railway gained.

In line with this, the accounting for each district is done on that district, to the end that greater accuracy may be attained by first hand knowledge and the officer in charge of the district be in possession of all the figures pertaining to the work for which he is responsible, thus enabling him to supervise more intelligently.

A further development follows—that is a common office and file. While merely a detail, this has proved of great value in reducing the volume of correspondence and locating upon one file everything that pertains to any given subject. The use of this system on the railways recently known as the Harriman Lines saved half a million letters a year.

Since material as well as labor enters into the work of a district, it is logical that this, both as regards purchase and supply, should be as far as possible in the hands of the local man, in order that he may be informed on every point. In the larger matters, blanket contracts would be let and districts would simply order under these, while in minor matters, standard prices would be fixed and where goods could be purchased locally and as cheaply, preference would be given to the district, thus decreasing handling and increasing the good will of the local public. The distribution of the prime functions of railway building and operation would be:

HEADQUARTERS.—Building of railway. Construction of equipment. Creating standards for conducting transportation. Maintenance of roadway, maintenance of equipment, as well as for the necessary instruction and inspection.

DISTRICT.—Conducting transportation. Maintenance of roadway. Maintenance of equipment. A superintendent, with a staff expert in the above mentioned lines, and first hand knowledge through his accountant of actual costs to compare with standard costs, both of labor and material, would at all times know the relative efficiency of his district. The strong feature of this type of organization is that with reasonable standards of work to be performed, everybody concerned from start to finish has something to measure his work by. A New York contractor, as an experiment, arranged for each man to have a bucket to shovel into. Result—almost at once the number of buckets that came out of the hole was doubled.

The creation of standard practice, both as regards methods and cost, is merely an elaboration and extension to every operation of practice now in vogue on all railways. For example: it is decided to bring a line up to a certain standard. Careful account is taken of what exists, then the method of producing the desired result is determined, written instructions are given and the cost calculated. Or a new train service is to be put on. Its requirements are determined, time tables prepared and its cost calculated.

Working to standards throws into prominence any overrunning of standard costs, and this acts automatically, and those in immediate charge of work look into the cause and remove it if possible, and if unavoidable keep proper records of its nature, for the creation of a new standard, if necessary.

INCREASING EFFICIENCY.—Efficiency experts have placed railway efficiency at 70% as against 60% in industrial concerns generally. While the total elimination of waste is impossible, certain classes of work have on many roads reached a much greater efficiency than the above average.

The first step should be to ascertain, tabulate and analyze present practice with particular reference to unit cost of performance. In most cases this could be done with little or no additional expense, simply the introduction of forms designed to this end in place of those now in use. The knowledge so obtained would be a basis from which to work, in fact, could be used as a standard of measurement pending the introduction of proper efficiency standards. Concurrently, present standard practice, as ascertained on one road, should be compared with standard practice on other roads or elsewhere, and when a superior method is found it should be adopted. Plans should be made, written instructions prepared of every step of the operation, not only what is to be done but how, and a standard of cost.

The following is an example from shop practice: Mr. Emerson went to the Santa Fe and found the annual cost of maintaining belting was 100% of its first cost. From previous experience he knew that this figure should be about 14%. Having this to work on, the best belting obtainable was purchased, 5% above the market price being paid for the privilege of rejecting unsatisfactory belting. A man was put in charge of the belting, with instructions that belts were to be kept in condition and replaced before and not after failure. Result—failures reduced from 300 a month to 50 and cost dropped from 100% to 14%. Incidentally machines were not delayed.

In the creation of standards, details down to the tool or machine to be used for a given service are specified. For example, in section work the relative economy of hand cars and motor cars is ascertained. Cars are then studied, improved and standardized, and under given conditions, which is to be used is specified.

The following are a number of instances of increased efficiency given before the Interstate Commission:

"1.—When applied to the simple operation of loading by hand a railway car with pig iron, the performance of the individual worker increased from 12½ to 47 tons a day.

"2.—When applied to shovelling coal, it doubled or trebled the performance of the shoveller.

"3.—When applied to machine work, it developed in certain operations, increases in production, ranging from 400 to 1,800%.

"4.—When applied to bricklaying, the day's accomplishment rose from 1,000 to 2,700 bricks.

It should be borne in mind that in dealing with this side of the question that a representative of railway labor appeared before the Interstate Commerce Commission and stated that the methods referred to could not and should not be introduced into railway work. In like manner the introduction of the Mallet compound locomotive was strongly resisted by the Brotherhood of Locomotive Engineers, and organized efforts were made by conductors and trainmen to have double heading prohibited. The fact is that labor organizations, as at present constituted, are by their very nature detrimental to efficiency. Employes in their respective classes are allied with like classes on other railways, for the furtherance of their particular class interest, and where this interest demands it the interests and rights of fellow employes, the public and the owners are made subordinate to their own. With the railway the tendency is to make the standard the pace of the fastest, while with the union it is the pace of the slowest. The reasonable standard is somewhere between these extremes and should be scientifically determined, both as regards performance and remuneration, and the present system of highly organized labor holding a pistol at the head of the railways, to the detriment of classes less highly organized, abolished. It would not be easy and would take much time, but it is conceivable that with a scientifically arranged and, therefore, equitable schedule of wages covering every branch of railway service, the settlement of schedules would become a matter peculiar to each railway and not determined by conditions on other railways having no bearing on the case. Such an arrangement would at least be an effort to give a "square deal" to all classes of employes.

As showing the way how not to create standards I quote the following from Scientific Management of Railways, by W. J. Cunningham. "The year 1910 saw the successful culmination of an ambitious plan to 'standardize' the wages of conductors, trainmen, and yardmen in the Eastern States; that is, to set a uniform rate per day, per hour, or per mile for each class of service, regardless of local conditions. The road with the highest wage scale (the Baltimore & Ohio) was selected as the battle ground, and the entire forces of the train service brotherhoods focused upon it in a demand for new and unreasonably high rates. To prevent a strike the railroad invoked the aid of the Board of Mediation under the Erdman Act, and the award, while not granting the rates demanded, carried with it substantial increases over rates already considerably higher than those of other roads in the East with distinctly different operating characteristics. The new basis was then in turn forced upon practically every road in eastern territory. The increases in New England averaged between 20 and 30%, and in some cases exceeded 50%. At the same time long standing differentials between different grades of employes were seriously disturbed. Throughout, the new wage basis and working rules (prescribed partly by Governmental mediation) are far from scientific or equitable."

Cost keeping must be systematized with the same care as other operations and be beyond criticism to be effective. The familiar description of the three grades of lies had its origin, no doubt, in poor cost keeping. There is a story told of a locomotive standing in a repair shop waiting for repairs where costs were carefully (?) kept and everything had to be charged. The old locomotive came in for all doubtful and odd charges until, at the end of three months, it had $5,000 charged against it.

If time is wasted it should be known, as surely as if material is wasted, and should be considered a reflection upon the system rather than upon the individual. The trouble is that where standards are lax there is an uncertainty as to where such waste is taking place, and advantage is taken of this to let the matter go.

Cost keeping as above is becoming necessary to comply with the requirements of the Interstate Commission.

The phase of the situation which is the peculiar problem of today; that is, the bringing of the human factor in the machine up to standard—is first and last a matter of men, the production of highly trained men, for however efficient in design an organization may be, its real efficiency is measured largely by the human element. Unfortunately, under present conditions, a man en-

ters railway life at the point of least resistance and gets where he can by force of circumstances and native wit. The result is that thousands of men are struggling to hold positions for which by nature they are largely unfitted. For many railway positions men are selected, the unfitted being rejected. Why should this not be the case for all? For practically every class of material used specifications have to be complied with, and a certain standard attained to be accepted. Why should this not be the case with men? Psychology has made such strides that it is conceivable that a bureau for the purpose could in a short time pass upon all applicants, and after deciding upon their general fitness or unfitness for railway work, guide as to what particular class of work they are best adapted for. The present method of "trying men out" is both crude and expensive. How often it happens that for important work it is only after half a dozen "trys" a "hit" is scored. Inefficiency is often as much a matter of circumstances as any fault of the individual under present conditions.

When once accepted for railway service a boy or man should have definitely placed before him the necessity for qualifying for the position ahead, and failure to respond should be taken as an indication of unfitness for his particular work or lack of ambition. and the case should be dealt with accordingly. Vocational training has many enthusiastic advocates among railway officers, and is more or less the practice on some of our large systems, so that the material is not wanting for the elaboration of this idea.

It was by such means as have been outlined that the German army became well nigh invincible, and the nation which has been referred to as a nation of "Damned Professors" has in a generation by scientific administration and rational educational training of its people, notwithstanding the poverty of its natural resources, passed from inefficiency to the front rank among the nations as regards efficiency.

The nucleus of the foregoing exists on the railways as operated today and all that is needed is that present practice should be brushed up and rounded out to meet expanding needs, and more thoroughly understood by all concerned. Speaking generally, what we need is a better understanding between head and hand, the proper blending of theory and practice; the creation of a feeling down to the last man that the railway interests are his interests and that in furthering its interests he is furthering his own.

The foregoing paper was read before the Canadian Railway Club in Montreal recently.

Birthdays of Transportation Men in October.

Many happy returns of the day to:—

R. A. Burford, cashier, C.P.R. ticket office, New York City, born at Brooklyn, N.Y., Oct. 4, 1878.

T. C. Burgess, Commercial Agent, G.T.R., Minneapolis, Minn., born at New York City, Oct. 2, 1853.

G. E. Burns, Freight Claims Agent, Eastern Lines, C.P.R., Montreal, born at St. Thomas, Ont., Oct. 6, 1863.

K. J. Burns, Assistant General Freight Agent, Great Northern Ry., Vancouver, B.C., born at Rochester, Eng., Oct. 11, 1878.

F. F. Busteed, C.E., Engineer in charge of C.P.R. revision and second tracking, west of Calgary, Kamloops, B.C., born at Battery Point, Que., Oct. 10, 1858.

C. E. Cartwright, M. Can. Soc. C.E., ex-Division Engineer, C.P.R., Vancouver, B.C., born at Toronto, Ont., Oct. 13, 1864.

G. S. Cooke, Superintendent, Grand Trunk Pacific Ry., Melville, Sask., born at Montreal, Oct. 27, 1875.

A. F. Dion, Traffic Agent, Quebec Harbor Commission, Quebec, born at L'Islet, Que., Oct. 1, 1871.

L. V. Druce, Commercial Agent, G.T.R. and G.T.P.R., Vancouver, B.C., born at London, Eng., Oct. 20, 1873.

C. E. Dewey, Freight Traffic Manager, G.T.R., Montreal, born at Cheshunt, Eng., Oct. 2, 1873.

C. E. Friend, General Auditor, Canadian Northern Ry., Winnipeg, born at Brighton, Eng., Oct. 12, 1871.

W. P. Fitzsimmons, Commissioner of Industries, G.T.R., Montreal, born at Detroit, Mich., Oct. 27, 1868.

A. H. Harris, Special Traffic Representative, C.P.R., Montreal, Que., born in Devonshire, Eng., Oct. 15, 1855.

G. Hodge, General Superintendent, Eastern Division, C.P.R., Montreal, born there Oct. 2, 1874.

J. H. Hughes, Assistant Superintendent, District 2, Eastern Division, Smith Falls, Ont., born at Charlottetown, P.E.I., Oct. 7, 1865.

H. Irwin, M. Can. Soc. C.E., Consulting Right of Way and Lease Agent, C.P.R., Montreal, born at Newgrove, County Down, Ireland, Oct. 27, 1847.

J. W. N. Johnstone, General Passenger Agent, Reid Newfoundland Co., St. John's, Nfld., born at Campobello, N.B., Oct. 4, 1878.

S. Way Kent, Ticket Agent, C.P.R., Paris, Ont., born in Brant County, Ont., Oct. 23, 1879.

W. M. Kirkpatrick, Assistant Freight Traffic Manager, Eastern Lines, C.P.R., Montreal, born at Kingston, Ont., Oct. 8, 1874.

W. B. Lanigan, Assistant Freight Traffic Manager, Western Lines, C.P.R., Winnipeg, born at Three Rivers, Que., Oct. 12, 1861.

J. W. Leonard, Assistant to Vice President, C.P.R., Montreal, born at Epsom, Ont., Oct., 1858.

C. F. Lunan, Assistant Commissary Agent, C.P.R., Calgary, Alta., born at Sorel, Que., Oct. 2, 1879.

Sir William Mackenzie, President, Canadian Northern Ry., Toronto, born at Kirkfield, Ont., Oct. 30, 1849.

W. T. Marlow, Import Freight Agent, C.P.R., Montreal, born at Limerick, Ireland, Oct. 25, 1872.

R. Marpole, General Executive Assistant, C.P.R., Vancouver, B.C., born in Montgomeryshire, Wales, Oct. 9, 1850.

H. Paton, President, Shedden Forwarding Co., Montreal, born at Johnstone, Renfrew, Scotland, Oct. 5, 1852.

D. Pottinger, I.S.O., ex-Assistant Chairman, Government Railways Managing Board, Moncton, N.B., born at Pictou, N.S., Oct. 7, 1843.

H. G. Reid, Master Mechanic, Lake Superior Division, C.P.R., North Bay, Ont., born at Pembroke, Ont., Oct. 27, 1863.

W. S. Rollo, joint agent, G.T.R., and Central Vermont Ry., St. John's, Que., born at Dundee, Scotland, Oct. 8, 1852.

J. K. Savage, Superintendent, District 1, Saskatchewan Division, C.P.R., Regina, born at Forreston, Ill., Oct. 5, 1876.

Sir Thomas G. Shaughnessy, K.C.V.O., President, C.P.R., Montreal, born at Milwaukee, Wis., Oct. 6, 1853.

T. Duff Smith, Fuel Agent, Grand Trunk Pacific Ry., Winnipeg, Man., born at Barking, Essex, Eng., Oct. 2, 1868.

A. B. Spence, Travelling Auditor, Reid Newfoundland Co., St. John's, Nfld., born at Harbor Grace, Nfld., Oct. 21, 1882.

E. Sterling, Superintendent, Districts 2 and 3, British Columbia Electric Ry., New Westminster, born at Thornbury, Ont., Oct. 3, 1875.

W. S. Taylor, ex-Treasurer, C.P.R., Montreal, born at Dornoch, Sutherlandshire, Scotland, Oct. 18, 1839.

E. N. Todd, Division Freight Agent, Eastern Division, C.P.R., Montreal, born at Huntington, Que., Oct. 17, 1879.

A. W. Wheatley, Manager, Canadian Locomotive Co., Ltd., Kingston, Ont., born at Ashford, Kent., Eng., Oct. 12, 1870.

L. H. Wheaton, Resident Engineer, Dartmouth branch, Intercolonial Ry., Dartmouth, N.S., born at Sackville, N.B., Oct. 5, 1869.

Express Companies Changes in Montreal.

Half a century ago there was established in a small building on St. Francois Xavier St., Montreal, an office of the Canadian Express Co. where, under a joint arrangement, the business of the American Express Co. and National Express Co. was also carried on. At that time four horses and wagons, stabled on the premises, were sufficient to take care of the collection and delivery service in Montreal, as it then existed.

Some ten years ago the headquarters on St. Francois Xavier St. being found too small, were removed to the new Canadian Express Building on McGill St., where commodious offices, expected to be large enough for many years to come, were established. At the same time large stables were built on Chaboilles St. The business has since then grown to such an extent that it now requires about 140 horses and a corresponding number of vehicles, besides several motor trucks, and the premises of 10 years ago are now again found to be entirely inadequate for the present and future requirements of the three companies. By mutual agreement it has been decided that on or about Oct. 1 a separate office will be established at 231 St. James St. for the American and National Express Companies, where care will be taken of the ordinary package express matter, and the financial department of the American Express Co., now located in the Transportation Building at the corner of St. Francois Xavier and Notre Dame Sts. The Canadian Express Co. requires for its exclusive use in its building on McGill St. all the space heretofore occupied jointly by the three companies, and will continue its business there as in the past. The joint branch office in the Transportation Building will be closed and the work now done there will be carried on at the main offices of the companies.

The American and National Express Companies have made arrangements with the G.T.R. for a warehouse and office at the corner of Mountain and St. James Sts., and also have arranged for stable accommodation for the horses and wagons which will be required for their business. Arrangements have been made with the Collector of Customs for sufficient space in the examining warehouse on Youville Square, where all shipment in bond will be handled as heretofore.

The close and friendly arrangements between the Canadian, the American and the National Express Companies for the exchange of traffic continues as heretofore.

Railway Subsidy Contracts.

The Dominion Government has entered into contracts with the following railways under the act granting aid in construction,—

St. John and Quebec Ry., Aug. 1,—from Andover to St. John, N.B., exclusive of two bridges, 200 miles, in lieu of subsidy granted by chap. 48, 1912, sec 2, item 2.

Tillsonburg, Lake Erie and Pacific Ry., Aug. 8,—from Ingersoll north to a junction with the St. Marys and Western Ontario Ry. at Embro, 10.30 miles.

Alberta Central Ry., Aug. 8,—from Red Deer to Rocky Mountain House, 70 miles.

Canadian Pacific Ry., Aug. 8,—from Moose Jaw, Sask., northwesterly, 123 miles.

The Canadian Pacific Railway Company's Policy in the West.

Speaking at a dinner given by the Regina, Sask., City Council, July 28, at which he was the principal guest, George Bury, Vice President, C.P.R., referring to the company's policy, said: For some years past we have been unable to spend the amount of money which the President set aside for betterment and extensions in the West; due to a shortage of labor and material, rails principally. Our policy has been first to enlarge and add new units to our main line terminals, all of which have been greatly increased in capacity within the past nine years, and to build as much double track as possible in order to take care of present and prospective traffic tributary to our present lines; next, to build branch lines into such parts of the country as are well settled, but remote from transportation facilities. If you will give this policy careful consideration, I think you will agree with me that it is in the best interests of the country and of the people as a whole . . . . At present Western Canada, with a population of 2,000,000 people, is importing a large proportion of its necessary food products from the United States, Eastern Canada and elsewhere. The C. P. R. has been preaching for some years that it is not in the interests of the country in general to attempt to market too large a percentage of the Western crops in the three months intervening between the harvest and the close of navigation. The C. P. R., after all, has a larger investment in Western Canada than any other individual or body of individuals and to advocate any policy just to save a little inconvenience or expense in transportation, which would do serious injury to the country, would be exceedingly foolish, and the most extreme detractor of the company has never charged it with being foolish. Many times even within the past year we have had to sacrifice immediate returns in order to provide against future damage to Western Canada. In the fall of 1912 we prepared ourselves fully to handle just as much of the grain crop in two and a half months as the country cared to offer us, and between harvest and the close of navigation we loaded at times more grain than was ever loaded on any single railway in any part of the world in the same time. During Oct. and Nov. we moved from Winnipeg to Fort William over 40,000 loads of grain, and on occasions as many as 1,500 cars of grain a day were being inspected at Winnipeg. About 60% of this grain came from Saskatchewan, the wheat crop of Saskatchewan having grown 575% in eight years. The result of this movement was that the markets of the world could not absorb our grain as fast as it was poured into the eastern elevators, and in the opinion of many this had a depressing influence on the price. It is easy to offer counsels of perfection to the farmer who is anxious to get the money from his crop to pay his bills, but we really must prepare ourselves in some way to encourage and assist him to so market the crop that it will flow steadily and in moderation to the ultimate markets instead of descending in a flood. The cities in the West have been doing everything in their power to attract industries and to build themselves up, but it seems to me that they should likewise give some of their energies to the settling of the country surrounding them, to the encouraging of advanced agricultural methods, looking forward to having the country surrounding them sustaining a large satisfied population, whose trade will build up the cities on a permanent foundation."

Book Reviews.

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

STEAMSHIP CONQUEST OF THE WORLD.—By Frederic A. Talbot. 344 pages, 8½ by 5½ ins., with illustrations. Price 6s. London, Eng.. William Heinemann.

This is a further volume of the Conquests of Science series which William Heinemann is publishing, and of whicl. Mr. Talbot has contributed three—"The Railway Conquest of the World," "Moving Pictures: How They Are Made and Worked," and the present volume. He has also written a fourth volume, on "Lights and Lighthouses," which will shortly be issued.

The volume is not directly a history of the development of steam navigation, neither does it pretend to be technical, in any definite sense. It is written for the general reader who is a little bit interested in things of this sort, and sets out to give him in an interesting, understandable, and yet correct manner what he wants to know about the history of steam navigation; the development of the steamship of today from the modest beginnings of a century ago; something of the economics of a big liner, and a good deal about the efforts that have been made to minimize loss of life through any one of the dangers of the seas.

While reference is made to the steamships on all the seven seas, attention is mainly directed to the North Atlantic, because it was in the development of the traffic between Europe and North America that the steamship was born, and in which it has been most extensively developed. The text is illustrated by over 140 illustrations, showing the steamship in all stages, from the laying of the keel to its completion; the machinery; the decorations; the boat lowering mechanism; accidents; derelicts and salvage operations, etc.

BEESON'S MARINE DIRECTORY OF the Northwestern Lakes.—H. C. Beeson, Chicago, Ill.

The 27th annual issue contains complete lists of all U.S. and Canadian vessels on the Great Lakes, with details of their engines and boilers, and various other data useful to all those concerned with lake navigation in any way. In addition, there are concise records of the proceedings of the lake navigation associations and interesting descriptions of the many large works which have been, or are being carried out at various important points, those relating to Canada being exhaustively dealt with. It is the publisher's intention to continue and extend the descriptive section, so as to cover all the vital points relative to lake navigation and its growth from year to year, and all that is of importance which may transpire in lake marine circles.

HANDBOOK OF ENGLISH FOR ENGINEERS.—By W. O. Sypherd. 314 pages; 4½ by 7 ins. Scott, Foresman and Co., Chicago, N.Y., $1.50.

It is a notorious fact that engineers as a general rule are weak in their use of English, and it is to assist those who have a failing in that direction that this book has been prepared. That English receives but little attention in the curriculum of our various technical colleges, is a fact to be deplored, but it is a condition that has arisen through the large amount of technical work to be covered by the students in the usual four years of academic work. The elimination of that which appeared to be the least important has placed the study of English in a minor position, and while this is to be regretted, there appears to be but small chance of remedying the trouble without extending the length of what to some appears an already long enough course. This little work should be of great value to those who wish to improve themselves, and while all the standards as set forth in the book do not appeal to us as being the best practice, they are nevertheless outlined and classified in such a convenient and easily accessible manner that while the letter of the book need not be followed, many helpful suggestions may be derived. Chap. 1 is a dissertation on the general problems of engineering writing, comprising sections of introductory, the preparation of engineering papers, and exercises for practice. Chap. 2 is on mechanical details common to the various forms of technical writing, giving a list of abbreviations, etc. Chap. 3 is on business letters, analyzing the business letters, and giving numerous examples. This chapter appears to us to be the weakest, some of the forms followed not meeting our views of good practice. Chap. 4 is on reports, and Chap. 5 on articles in technical journals. Both these chapters are excellent, the former giving the young engineer good examples to follow, and the latter, a selection of good articles from several of the best of United States technical journals. Another important part of the book is an appendix, giving examples of how to prepare copy for the printers, and the manner of correcting proofs. Examples of faulty paragraphs, and misspelled words follow in a second appendix. A bibliography of works on English is given at the end for those who wish to carry on a more extended study of the language.

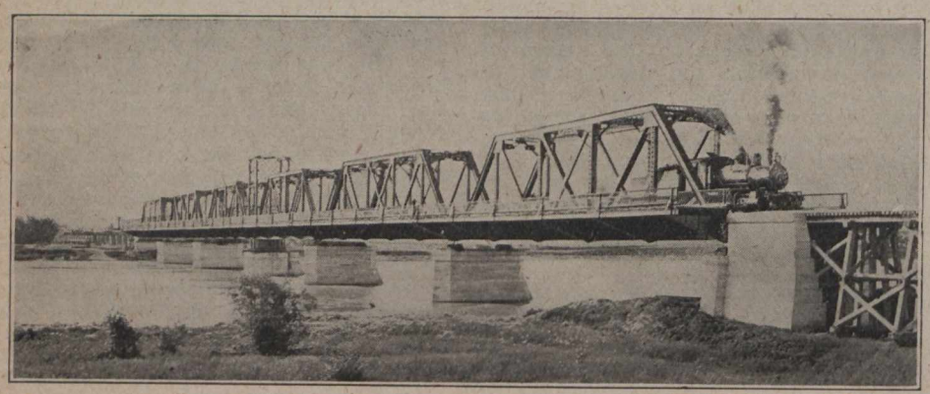
Quebec Bridge Construction.

In a recent conversation J. T. Davis, of M. P. and J. T. Davis, said his firm expects to have the substructure for the bridge completed early in November, so far as the piers, etc., on the north side of the river are concerned. The work on the south shore is not expected to be completed until the fall of 1914. The work on the north shore piers involved the building of 106,000 cubic feet of masonry above the caissons, of which over 90,000 cubic feet was reported in place, July 30.

The St. Lawrence Bridge Co., which has the contract for the manufacture and erection of the superstructure, is making good progress with its share of the work. Over 60,000,000 lbs. of steel has been delivered and is in store at the bridge site. Work has been started on the erection of the two first spans from the abutment to the intermediate pier. The plant for the erection of the big spans is being delivered, and preparations are being made for the building of these from both sides. J. D. Wilkins is engineer in charge for the Dominion Government.

The Hudson Bay Railway Bridge at Pas, Man.

Bridge at Pas.—The illustration on this page shows the bridge which has been built over the Saskatchewan River, at Pas, Man., to connect the line which the Government is building from that point to Hudson Bay, with the Canadian Northern Ry. branch line running southwesterly from Pas. The total cubic yards of concrete in piers and abutments is about 7,000. As much as 24 ft. of water was encountered at some of the piers at low water, and 42 ft. at high water, the current being about 4 miles an hour. The bottom was hardpan, covered with small boulders, necessitating the use of steel sheet piling. About 1,000,000 lbs. of the Lackawanna type was used. The piers rest upon the natural bottom at an average of about 8 ft. below the water. This portion of the work was done by Mackenzie, Mann & Co., Ltd. The superstructure is a rivetted truss designed as "class heavy" of the Department of Railways and Canals, with a highway 12 ft. clear bracketed to each side; the total weight being a little over 2,700,000 lbs. There are four fixed spans of 147 ft. each and a swing span of 262 ft., 850 ft. over all. The width of the piers for the fixed spans is 9 ft. 10 ins., and length 34 ft. 4 ins., these dimensions being over the coping. The diameter of the pivot pier is 26 ft. The swing span superstructure was fabricated and erected by the Canada Foundry Co.



The Hudson Bay Railway Bridge at Pas, Man.

G.T.R. Branch St. John's Ambulance Association.—The following have been elected as the first officers and council of the G.T.R. centre of the Canadian Branch of St. John's Ambulance Association:—Hon. President, E. J. Chamberlin; Hon. Vice President, W. Wainwright; Hon. Treasurer, F. Scott; Hon. Secretary, F. A. Bourne; Council—H. G. Kelley, M. M. Reynolds, R. S. Logan, J. E. Dalrymple, W. H. Biggar, K.C., D. E. Galloway, W. H. Ardley, W. D. Robb, J. Coleman, Dr. J. A. Hutchison, Dr. H. B. Carmichael, T. McHattie, A. A. Maver, J. Hendry, D. Crombie, T. W. K. McRea, C. G. Bowker. It was stated at the meeting at Montreal, July 30, when these officers were elected, that for over 25 years the G.T.R. had had ambulance classes at various points on the system, but that it had not had a central organization, nor had it been connected with the St. John's Ambulance Association.

Albert Davidson, General Agent, Grand Trunk Pacific Ry., Prince Rupert, B.C., in remitting his subscription, says, "I have read Canadian Railway and Marine World with interest for over ten years."

Resuscitation From Apparent Death From Electric Shock.

The Board of Railway Commissioners has issued the following circular: "Attention is directed to circular 37 issued by the Board May 3, 1909, regarding rules for resuscitation from apparent death from electric shock. These rules have recently been revised under the auspices of the National Electric Light Association, T. C. Martin, Secretary, 33 West 39th St., New York. The Board deems it advisable that you should secure copies of them, and have them posted in conspicuous places in every department, so that the knowledge therein contained shall be spread amongst all officials and employees of your institution.

"Attention is also directed to the advisability of warning employes about the absolute necessity of keeping away from all electric light or power lines. On Feb. 28, 1913, near Ingersoll, Ont., one railway man was killed by coming in contact with an electric power line through the medium of a tape line which he was using to measure the clearance between the rails and the wires. He and his companions had acquired the bad habit of throwing a string over the power wires in order to determine the distance between the wires and rails. On the occasion in question, as there was no string at hand, these men used a cloth tape line and, unknown to them, a light copper mesh, which was woven within the tape line, conveyed current from the power line through one of the men to the ground with fatal results.

"Two things are to be impressed upon your employes, first, to keep away from all electric wires; and, second, to become familiar with the rules for the resuscitation of persons apparently killed by electric shock; and to put those rules into operation when the occasion arises."

Suez Canal Traffic for 1912 amounted to a net tonnage of 20,275,120 against 18,324,790 tons in 1911. In 1912 the vessels passing through the canal numbered 5,373. In spite of the reduction on Jan. 1 in the transit dues, from 7.25 to 6.75 francs a ton the gross receipts amounted to the record figure of 136,423,831 francs compared with 134,762,199 francs in 1911.

Kingston and Pembroke Ry.—At the annual meeting at Kingston, Ont., Aug. 12, the following were elected directors for the current year,—W. D. Matthews, D. McNicoll, I. G. Ogden, G. M. Bosworth, W. R. Baker, E. W. Beatty, A. R. Creelman, H. E. Suckling and W. F. Nickel.

Increase of Freight Rates in England.

The following quotations from recent articles in the London Times are of interest as relating to existing conditions in Canada:—

"A notice has been issued on behalf of the railway companies of the United Kingdom to the effect that the rates for merchandise traffic by goods and passenger trains has, with certain exceptions, been increased. This increase is the outcome of the recently passed Railways Act, which gives the companies power to raise rates to compensate them for increased expenses as a result of the settlement of the strike of August, 1911."

"The railway industry alone of any great industry in the country has been deprived by Parliament of the opportunity of passing on to the public what may be called its increasing 'cost of production.' We mean in particular the increased cost of coal, materials, higher wages, Government insurance against accident, unemployment, etc. In other words, all improvement in railway wages and in the conditions of railway employment—and they have, of course, been substantial already—have been effected either at the cost of the shareholders, or they have come out of the funds provided by improved methods of management. If the just demands for further improvement in railway labor conditions are to be met without wrecking the whole financial edifice upon which the public industry rests, it is clear that the public must pay. If only to secure continuity of railway service, absence of strikes, etc., some moderate increase in railway charges must be established, and this is the policy which the companies are now endeavoring to carry out under the direct authority of Parliament. Opposition will, of course, be encountered, but so long as the companies, acting in unison, are not extravagant in their demands and keep them well within the terms provided for by the new Act, we do not imagine that any such opposition can avail when the matter comes before the Railway and Canal Commissioners, as it must do sooner or later. Legally and morally the claim of the railway companies is a just one, for it would be absurd to assume that the railway industry alone can flourish under economic conditions which provide for fixity of its charges to the public on the one hand, and rapidly increasing expenses on the other."

Chicago, Milwaukee and St. Paul Ry.—Press reports state that the British Columbia Government has arranged to turn over the Kitsilano Indian Reserve at Vancouver, to the C. M. and St. P. Ry., for terminal purposes, and that the Canadian Northern Ry. is interested in the project. The question of title between the Dominion and the Provincial Governments has not been finally settled, as proceedings for the abandonment of the reserve by the Indians, under the terms of the Indian Act, have not yet been taken. Under the present arrangements the C. M. and St. P. Ry. will secure an entrance into Vancouver over the Great Northern Ry. (Aug., 1912, pg. 411.)

Pacific and Hudson Bay Ry.—Press reports state that a line is being surveyed from Bella Coola, B.C., to Alexis Creek, thence across the Cariboo River between mileage 103 and 105, to Beaver, B. C. E. Both, Bella Coola, B.C., is reported to be in charge of the surveys. (May, pg. 220.)

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

19886. July 24.—Extending, to Aug. 31, time within which C.P.R. and G.T.R. install bells at crossing of Perth Road, near Kingston, Ont.

19887. July 24.—Extending, to Oct. 31, time within which C.P.R. install gates at crossing of Centre St., Chatham, Ont.

19888. July 23.—Approving location of G. T Pacific Branch Lines Co.'s station at Siding 7, Sec. 10-45-23, w. 3 m., Sask., mileage 47, Cutknife Branch.

19889. July 24.—Extending, to Oct. 15, time within which G.T.R. install interlocking plant at Paris Jct., Ont.

19890. July 24.—Authorizing Chatham, Wallaceburg and Lake Erie Ry. to take Lot 18, Chatham, Ont., for accommodation of the traffic and to secure efficient maintenance and operation of its line.

19891. July 24.—Approving location of Canadian Northern Ry. station at Radville, Sask.

19892. July 21.—Authorizing M.C.R. to build extension to siding on Moore St., between Centre and Talbot Sts., St. Thomas, Ont.

19893. July 24.—Ordering G.T.R. to install electric bell at crossing of Mill St., Milverton, Ont., to be completed within 60 days, 20 per cent. of cost to be paid out of the railway grade crossing fund.

19894. July 24.—Approving location of C.P.R. station at Nolan, Alta.

19895. July 24.—Ordering G.T.R. to remove board fence and cut down bank on its right of way at Marsh Winery Road, Stamford, Ont., for 930 ft., so that no portion of bank be more than 4 ft. above track level.

19896. July 25.—Approving location of C.P.R. station at Arnaud, Man.

19897. July 25.—Approving G. T. Pacific Ry. bylaw 14, superseding bylaw 11, authorizing J. E. Dalrymple, Vice President, and A. E. Rosevear, General Freight Agent, to prepare and issue tariffs of tolls, and rescinding order 15186, Oct. 25, 1911.

19898. July 25.—Authorizing James Bay and Eastern Ry. to build across concession road at mileage 38; side road at mileage 38.7, Mill Road at mileage 39.3, road to Mount Albert, mileage 40.35, side road, mileage 40.6, and side road, mileage 41.6, Gwillimbury Tp., Ont.

19899. July 25.—Authorizing G. T. Pacific Branch Lines Co. to carry passenger traffic over portion of its Tofield-Calgary Branch, between Trochu, mileage 121.4, and Beiseker, mileage 162.6, Alta.; speed of trains not to exceed 12 miles an hour.

19900. July 25.—Approving location of C.P.R. station at Corwhin, Puslinch Tp., Ont.

19901. July 25.—Authorizing Webb Rural Municipality 138, Sask., to build crossings over C.P.R. at Antelope, Gull Lake and Seward, Sask.

19902. July 25.—Authorizing G. T. Pacific Ry. to carry traffic on portion of main line east of Prince Rupert, B.C., between Beament, mileage 195, and Morricetown, mileage 205; speed of trains not to exceed 25 miles an hour.

19903. July 23.—Authorizing Toronto, Hamilton and Buffalo Ry. to build interlocking plant where it crosses Hamilton St. Ry., on Barton St. East.

19904. July 24.—Authorizing Campbellford Lake Ontario and Western Ry. (C.P.R.) to build by means of a bridge across William St., Cobourg, Ont., at mileage 120.34 from Glen Tay.

19905. July 25.—Ordering C.P.R., within 90 days, to install improved type of illuminated electric bell at crossing of highway at mileage 0.91 from St. Martins Jct., Que., 20 per cent. of cost to be paid out of the railway grade crossing fund.

19906. July 22.—Ordering that signboards be erected at crossings on C. Sherriff's farm, Huntingdon, Que., crossed by G.T.R. and N.Y.C. & H.R. Rd.

19907. July 25.—Ordering Pere Marquette Rd., within 60 days, to install an improved type of automatic electric bell at crossing of highway near Kingsville, Ont., 20 per cent. of cost to be paid out of the railway grade crossing fund.

19908. July 25.—Approving location of C.P.R. station at North Appin, Ont.

19909. July 26.—Approving change in location plan of Campbellford, Lake Ontario and Western Ry. (C.P.R.) to include extra land required for station grounds at Cherrywood, Pickering Tp., Ont., and approving location of station there.

19910. 19911. July 26, 28.—Authorizing Dominion Atlantic Ry. to operate over bridges over Sissiboo and Gaspereaux Rivers, N.S.

19912. July 25.—Ordering Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build farm crossing for J. D. Howden, in Lot 24, Con. 2, Whitby Tp., Ont.

19913. July 28.—Authorizing G.T. Pacific Ry. to build extension of its elevator tracks across road allowance, in its station grounds, Biggar, Sask.

19914. July 28.—Authorizing C.P.R. to build its double track across 14 highways, mileage 8.75 to 18.25, Broadview, Subdivision, Man.

19915. July 29.—Authorizing C.P.R. to build spur for John MacGregor Co., at mileage 45.16 from Aroostook Jct., N.B.

19916. July 24.—Ordering that in connection with protection of G.T.R. crossing over Yonge St., 1.5 miles south of Aurora, Ont., mileage 28.66, the side road be diverted into Yonge St.; land to be deeded to the Township by G.T.R., work to be performed by King Tp., electric bell to be installed at crossing of Yonge St. within 60 days; 20 per cent. of cost to be paid from railway grade crossing fund.

19917. July 26.—Approving location of C.P.R. station at Canyon, B.C.

19918. July 28.—Approving plan A showing details of interlocking plant of C. N. Ontario Ry. and C. N. Montreal Tunnel and Terminal Co. with Jacques Cartier and Union Ry., near Jacques Cartier Jct., Que.

19919. July 31.—Ordering G.T.R. to build siding to connect with existing siding for Greenfield Conduit Co. and others who may wish to use same in rear of Broadview Ave., Toronto.

19920. July 24.—Amending order 19348, May 16, re cattle pass on C. N. Ontario Ry. for J. Fletcher and J. Wilson.

19921. July 25.—Authorizing C.P.R. to build spur for Revelstoke Saw Mill Co., Swift Current, Sask.

19922. July 28.—Amending order 19856, July 12, ordering Brockville, Westport and North Western Ry. to build cattle pass for D. H. and C. S. Grey.

19923. July 28.—Authorizing C.P.R. to build spur for Saskatchewan Motor Co., Regina, Sask.

19924. July 26.—Authorizing G.T.R. to build sidings for Alabastine Hard Mortar, Ltd., York Sand & Gravel, Ltd., and York Sandstone & Brick Co., Scarboro Tp., Ont.

19925. July 31.—Dismissing application of G. C. Cumming, of Lyn, Ont., to compel G.T.R. to build a subway between Lyn and Brockville, mileage 127.77 from Montreal.

19926. July 31.—Approving agreement dated July 29, providing for proposed new viaduct and plans and profiles referred to in agreement dated April 25, between the City of Toronto, C.P.R., G.T.R. and Toronto Harbor Commissioners. Work to be completed within 3 years from July 29.

19927. July 31.—Amending order 19288, May 12, re compensation to be paid W. B. Fee by Georgian Bay and Seaboard Ry. (C.P.R.).

19928. July 30.—Authorizing the Vancouver, Victoria and Eastern Ry. (G.N.R.) to take certain lands in New Westminster District, B.C., and to build bridge over its tracks.

19929. July 29.—Authorizing G.T.R. to build sidings for Harris Abattoir Co. north of St. Clair Ave., Toronto.

19930. July 29.—Approving location of G. T. Pacific Ry. station at mileage 428.5, Prince Rupert East, Cariboo District, B.C.

19931. July 29.—Approving location of Campbellford, Lake Ontario and Western Ry. (C.P.R.) station at Grafton, Ont.

19932. July 29.—Authorizing C.P.R. to build its double tracks across highway diversion at mileage 84.99 from Moose Jaw, Sask., present road allowance to be diverted.

19933. July 29.—Approving location of C.P.R. station on n.e. ¼ Sec. 10, Tp. 8, r. 30, w. 2 m., Sask.

19934. July 28.—Authorizing C.P.R. to build diversion of highway and cross same at mileage 77.91 from Moose Jaw, Sask., present road allowance to be diverted.

19935. July 28.—Approving revised location of C.P.R. from mileage 65.94 to 68.04 and construction of double track between mileage 65.94 and 69.24 from Broadview, Sask., and to build across three highways.

19936. July 31.—Ordering C.P.R. to make connection with Canadian Northern Ry. spur to Government elevator at Port Arthur, Ont., within 30 days, also to be used by G.T. Pacific Ry., cost to be paid by Board of Grain Commissioners.

19937. Aug. 5.—Approving G.T. Pacific Ry. Standard Freight Mileage Tariff C.R.C. 18 to apply between stations in Alberta and British Columbia between and including Thornton, Alta., and mileage 1189, B.C.

19938. July 30.—Approving Hull Electric Co.'s bylaw 40, covering rules and regulations for the government of its employes.

19939. July 19.—Approving revised location Campbellford, Lake Ontario and Western Ry. (C.P.R.) in Lot 23, Con. A, Brighton Tp., and authorizing it to take from G.T.R. extra land required for right of way.

19940. July 30.—Authorizing C.P.R. to build spur for Regina Storage and Forwarding Co., Regina, Sask.

19941. July 29.—Approving C.P.R. revised location from mileage 66.7 to 69.6 from Moose Jaw, Sask.

19942. July 30.—Authorizing C.P.R. to build spur for DeLaval Dairy Supply Co., Peterboro, Ont.

19943. July 29.—Approving Edmonton, Dunvegan and British Columbia Ry. location through Tps. 71-72, r. 1-4, w. 5 m., from mileage 128.44 to 156.11.

19944. July 30.—Authorizing G.T.R. to build spur for Toronto Structural Steel Co., Westerr Ontario.

19945. Aug. 2.—Amending order 15090, Oct. 11, 1911, which authorized City of Hamilton, Ont., to build subway under T.H. & B. Ry. at Birch Ave.

19946. July 31.—Authorizing C.P.R., until Aug. 1, to operate over G.T.R. crossing at Tecumseh St., Toronto.

19947. July 29.—Authorizing Kingston and Pembroke Ry. to build spur for Chandler Jones Lumber Co., Palmerston Tp., Ont.

19948. July 30.—Dismissing application of R. H. Souch, Darlington Tp., Ont., to build a subway on his Lots 3 and 4, Con. 2.

19949. Aug. 1.—Amending order 19741, July 3, which authorized Campbellford, Lake Ontario and Western Ry. (C.P.R.) to cross G.T.R. at mileage 89.9, Murray Tp.

19950. Aug. 2.—Amending order 19815, July 17, which authorized City of Regina to build its municipal railway across C.P.R. Arcola Branch and spur by substituting C.P.R. for C.N.R.

19951. July 29.—Authorizing C.P.R. to build road diversion in Lots 2566 and 9005, Kootenay District, B.C., mileage 40.24 to 41.23 from Golden.

19952. July 30.—Authorizing C.N. Ontario Ry. to open for traffic the extension of its main line to connect with Algoma Eastern Ry., mileage 0 to 2.39.

19953. July 30.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to cross Bogart Ave. and Wilkie St., Belleville, Ont., at mileage 78.46 and 78.61 from Glen Tay.

19954. July 29.—Authorizing G.T.R. to build spur for Dowsley Spring and Axle Co., Chatham, Ont.

19955. July 29.—Approving revised location G. T. Pacific Branch Lines Co.'s Tofield-Calgary Branch in s.e. ¼ Sec. 11, Tp. 31, r. 24, w. 4 m., Alta.

10956. Aug. 2.—Approving plan of C.N. Ontario Ry. structure, crossing Montreal Park and Island Ry. at Sault au Recollet, Que.

19957. Aug. 2.—Amending order 18373, Sept. 17, which authorized Toronto Suburban Ry. to cross G.T.R. at Acton, Ont., and authorizing crossing at another point.

19958. Aug. 8.—Authorizing C.P.R. to build its Forsyth St. Branch across certain highways in Maisonneuve, Que.

19959. Aug. 1.—Authorizing C.P.R. to change location of siding across De Gaspe Ave., and to build extension to same in St. Louis, Montreal.

19960. Aug. 6.—Authorizing C.P.R. to build spur for Imperial Wire & Cable Co., Montreal.

19961. Aug. 1.—Approving change in C.P.R. as built at junction with Campbellford, Lake Ontario and Western Ry. (C.P.R.), at Glen Tay, Ont; and approving location of C.P.R. there.

19962. Aug. 1.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build at grade across 13 highways in Belleville, Ont.

19963. Aug. 8.—Amending order 16913 re crossing of highways by Alberta Ry. and Irrigation Co. (C.P.R.).

19964. Aug. 1.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build bridge over Moira River, at Belleville, Ont.

19965. Aug. 6.—Ordering C.P.R. to provide cattle pass for R. J. Patterson, Omemee, Ont.

19966. Aug. 1.—Authorizing C.P.R. to build additional track across Bloor St., Lansdowne Ave. and Brock Ave., Toronto.

19967. Aug. 5.—Approving clearances of C.P.R. siding at Colonial Wire Manufacturing Co.'s warehouse, Montreal.

19968. Aug. 6.—Authorizing Canadian Northern Ry. to build across certain highways on its Alsask Southeasterly Line.

19969. Aug. 5.—Ordering Canadian Northern Ry. to erect a standard passenger and freight shelter station and platform at Dufresne, Man., within 60 days.

19970. Aug. 6.—Authorizing Canadian Northern Ry. to build spur for Thomson, MacDougall & Co., near Woodlands, Man.

19971. Aug. 5.—Authorizing Canadian Northern Ry. to build across and divert public road between Sec. 36, Tp. 25, and Sec. 1, Tp. 26, R. 22, w. 3 m., on its Alsask Southeasterly Line.

19972. Aug. 5.—Authorizing Lake Erie and Northern Ry. to build across two highways in Brantford Tp., Ont.

19973. Aug. 1.—Postponing effective date of proposed increased rate on brick from Milton to Toronto to Nov. 1.

19974. Aug. 2—Amending order 5850, authorizing Toronto and Niagara Power Co. to carry wires over G.T.R. at Davenport Road, Toronto, Ont.

19975. July 30.—Approving Lake Erie and Northern Ry. location from station O, Lorne Bridge, Brantford, Ont., to station 4+50.

19976. Aug. 6.—Ordering G.T. Pacific Ry. to open crossing between Secs. 8 and 17, Tp. 10, r. 13, w. 2 m., Sask., and to divert highway between Secs. 8 and 9, to a connection with the road between Secs. 8 and 17.

19977. Aug. 7.—Authorizing C.P.R. to use certain bridges.

19978. Aug. 7.—Relieving G.T.R. from further

protecting Wilson St. crossing, Woodstock, Ont.

19979. Aug. 5.—Extending to Sept. 30, time within which G.T.R. shall build station at St. Gregoire, Que.

19980. Aug. 7.—Ordering Canadian Northern Ry. to enlarge station at Morinville, Alta., to provide waiting room at least 30 by 30 ft. with seats, lengthen platform to accommodate a four car train; and erect freight shed independent of passenger station.

19981. Aug. 7.—Relieving Windsor, Essex and Lake Shore Rapid Ry. from further protecting Pelton Crossing, Con. 7, Sandwich South Tp., Ont.

19982. July 30.—Approving location of Lake Erie and Northern Ry. from station 1107+40.7, Townsend Tp., to station 1282+32.3, Woodhouse Tp., passing through Simcoe, Ont.

19983. Aug. 7.—Authorizing G.T.R. to build siding for Imperial Wire and Cable Co., Montreal.

19984. Aug. 11.—Authorizing C. N. Ontario Ry., G.T.R. and C.P.R. to operate trains over crossings near Ottawa, Ont., without first being brought to a stop.

19985. Aug. 11.—Relieving C.P.R. from providing further protection at crossing of road allowance between Secs. 24 and 25, Tp. 31, R. 1, 5 m., Didsbury, Alta.

19986. Ang. 9.—Approving location of C.P.R. shelter at Hillhead, Ops Tp., Ont.

19987. Aug. 11.—Dismissing application of Board of Trade, Limerick, Sask., for order directing C.P.R. to provide highway crossing on Galway or Brian Sts.

19988. Aug. 5.—Authorizing G.T.R. to build culvert under its tracks in Tecumseth Tp., Ont.

19989. Aug. 7.—Authorizing C. N. Ontario Ry. to build across public road on Lot 3, Con. 5, Crerar Tp., Ont.

19990. Ang. 9.—Authorizing C.P.R. to build spur, 1,490 ft. long, across Richmond St. and land adjoining, Chatham, Ont.

19991 to 19993. Aug. 8.—Authorizing C.P.R. to build spurs for Canadian Manufacturing Co. in Dunmore, Alta.; J. Murphy, Fort William, Ont.; and Gibson, McCormack and Irvin Co., Toronto.

19994. Aug. 11.—Approving location of C.P.R. Gimli to Riverton Branch, from Gimli northerly to Riverton, Man., mileage 0, to 26.03; and authorizing building across certain highways.

19995. Aug. 8.—Authorizing C.P.R. to build bridge 109.4, Swift Current Subdivision, Sask.

19996. Aug. 12.—Authorizing C.P.R. to build, at grade, additional track across certain highways between Percival and Broadview, Sask.

19997. Aug. 12.—Authorizing C.P.R. to build, at grade, its ballast pit spur, at Carseland, across highway between Secs. 5 and 6, Tp. 22, R. 25, w. 4 m.

19998. Aug. 13.—Approving change in location of C.P.R. station at Putnam, Ont.

19999. Aug. 12.—Authorizing C.P.R. to build road diversion in n. w. ¼, Sec. 7, Tp. 22, R. 26, w. 4 m., and to build, at grade, its Gleichen-Shepard Branch across same at mileage 24.3.

20000. Aug. 12.—Authorizing C.P.R. to build extensions to sidings for Dominion Government at Petewawa, mileage 116.47 from Ottawa.

20001. Aug. 13.—Approving location of C.P.R. stations at Portreeve and Sceptre, Sask.

20002. Aug. 11.—Authorizing Winnipeg, Selkirk and Lake Winnipeg Ry. Co. to build subway at Middlechurch, to carry its Stonewall Branch under C.P.R. West Selkirk Branch.

20003. July 28.—Extending, to Sept. 15, time within which half interlocking plant was to be installed at Adelaide St., London, Ont., and authorizing C.P.R. to operate trains over crossing.

20004. Aug. 13.—Authorizing Canadian Northern Ry. to build across certain highways on its Alsask Branch, Sask.

20005. Aug. 13.—Authorizing C.P.R. to build four bridges on its Toronto, Nipigon and Chapleau Subdivisions and Toronto Section.

20006 to 20008. Aug. 12, 13.—Approving location of C.P.R. stations at Shackleton, Prussia and Lancer, Sask.

20009. Aug. 11.—Authorizing G. T. Pacific Branch Lines Co. to divert Toronto St., between Sixth and Eighth Aves., Moose Jaw, Sask.

20010. Aug. 11.—Dismissing application of Toronto Board of Trade for reduction of freight classification ratings on dried fruit.

20011. Aug. 12.—Authorizing Edmonton, Dunvegan and British Columbia Ry. to build across certain highways in Alberta.

20012. Aug. 8.—Authorizing New Brunswick Coal and Ry. Co. to build bridge 33.4 at Cumberland Bay, N.B.

20013. Aug. 9.—Authorizing Edmonton Interurban Ry. Co. to operate cars over crossing of Edmonton, Dunvegan and British Columbia Ry., (pending installation of interlocking plant) for construction purposes only.

20014. Aug. 12.—Authorizing G.T.R. to build siding for General Railway Signal Co. of Canada, Lachine, Que.

20015. Aug. 9.—Ordering G.T.R. to build subway 24 ft. wide on Bay St., Callender, Ont.

20016. Aug. 12.—Approving location of G. T. Pacific Branch Lines Co.'s station at Gorlitz, Sask.

20017. Aug. 11.—Ordering C.P.R. to install improved type of illuminated electric bell at crossing of Main St., Shelburne, Ont., within 90 days.

20018. Aug. 14.—Amending order 18705, re C.P.R. crossing of Anderson St., Grenfell, Sask.

20019. Aug. 15.—Approving location of C.P.R. station at Ronolane, Alta.

20020. Aug. 13.—Approving portion of location of C.P.R. Snowflake westerly branch from mileage 0 to 9.10.

20021. Aug. 13.—Authorizing Toronto, Hamilton and Buffalo Ry. to build bridge across Welland River at Coyle, Ont.

20022. Aug. 14.—Approving change in Campbellford, Lake Ontario and Western Ry. (C.P.R.), to include extra lands required for station grounds at mileage 137.2 from Glen Tay; and approving location of station building there.

20023. Aug. 14.—Authorizing C.P.R. to build across roadway, at grade, in Lot 1088, Kootenay District, mileage 48.69 from Golden, B.C.

20024. Aug. 13.—Authorizing C.P.R. to build Don viaduct, near Donlands, Ont.

20025. Aug. 11.—Recommending to Governor in Council for approval, The Hull Electric Co.'s bylaw 40, and rules and regulations for the government of its employes; and rescinding order 19938 in same connection.

20026. Aug. 13.—Authorizing R. H. Edgar, Bowling Green, Ont., to erect telephone line across C.P.R. at Lot 3, Con. 4, Amaranth Tp., Ont.

20027. Aug. 14.—Authorizing Dominion Atlantic Ry. to build bridge 125.9 at Jordantown Road crossing, N.S.

20028. Aug. 13.—Further extending for six months from date, time within which Esquimalt and Nanaimo Ry. was required to file standard tariff of maximum freight tolls.

20029. Aug. 13.—Authorizing C.P.R. to build bridge 39.4, Toronto Subdivision.

20030. Aug. 14.—Authorizing C.P.R. to build for Kildonan municipality, Man., subways at Scotia, Parkside, and Main Streets, and East Kildonan Road.

20031. Aug. 14.—Authorizing C.P.R. to make alterations in foot bridge at Wallace Ave., to carry it over the third track which it is now building from Parkdale to West Toronto.

20032. Aug. 14.—Authorizing C. N. Ontario Ry. to build subway over public road on Lots 81 and 82, Ste. Dorothee Parish, Que.

20033. Aug. 13.—Approving location of Canadian Northern Ontario Ry. station grounds at Amable, mileage 188.5 from Ottawa.

20034. Aug. 14.—Authorizing Canadian Northern Ry. to open for traffic portion of its diverted line, Oak Point Branch, from Sec. 21, Tp. 11, R. 2, e.p.m., 3.27 miles.

20035. Aug. 14.—Authorizing G. T. Pacific Ry. to cross highway at mileage 210.4, Ellice Municipality, Shoal Lake District.

20036. Aug. 15.—Approving location of G. T. Pacific Ry., Prince Rupert, B.C., westerly from mileage 2.25 at Seal Cove, to mileage 3.23.

20037. Aug. 14.—Authorizing G. T. Pacific Ry. to build spur for C. S. Hyman & Co., Calgary, Alta.

20038. Aug. 14.—Authorizing G. T. Pacific Branch Lines Co. to build Third St., under its line at mileage 46.8, Battleford, Sask.

20039. Aug. 13.—Relieving G.T.R. from providing further protection at Brant House crossing, east of Burlington station, Ont.

20040. Aug. 8.—Authorizing certain alterations in Campbellford, Lake Ontario and Western Ry. (C.P.R.), to provide station grounds in Bowmanville, Ont.

20041. Aug. 13.—Extending to Nov. 1, time for completion of spur for Coquitlam Terminal Co., Vancouver, by C.P.R., across Dominion, 5th, 6th and 7th Aves.

20042. Aug. 9.—Authorizing C.P.R. to build branch for General Fire Extinguisher Co., Montreal.

20043. Aug. 12.—Dismissing application of Lethbridge Board of Trade against cancellation of G.N.R. tariff, C.R.C. 720, between stations on various lines in Eastern Canada and Alberta Ry. and Irrigation Co.'s stations.

20044. Aug. 13.—Authorizing C.P.R. to revise portion of its Farnham Subdivision, Que., and to build additional track across Central Vermont Ry.

20045. Aug. 14.—Amending order 19803, July 17, re C.P.R. crossing at mileage 9.7 from Aylmer, by substituting Hull for Aylmer.

20046. Aug. 5.—Authorizing Canadian Northern Ry. to build spur for McKenzie Ellis Co., Prince Albert, Sask.

20047. Aug. 8.—Ordering C.P.R. to reduce its rate on coal from Port Burwell to Lambton and Islington, Ont., from 75c. to 70c. a ton; effective not later than Sept. 1.

20048. Aug. 13.—Amending order 19946, July 31, re C.P.R. crossing of G.T.R. at Tecumseh St., Toronto.

20049. Aug. 13.—Amending order 4669, Apr. 15, 1908, re Toronto and Niagara Power Co. carrying its wires across C.P.R., in Lot 6, Con. 3, York Tp., Ont., by providing that crossing be made in accordance with plan on file with the Board, subject to supervision of Board's Electric Engineer.

20050. Aug. 1.—Approving alteration by Campbellford, Lake Ontario and Western Ry. (C.P.R.), in Camden Tp., at mileage 45.5, to include extra lands required for station grounds.

20051. Aug. 12.—Amending order 19239, May 9 re protection at King St., Cobourg, Ont., providing that whole cost of flagman be paid by G.T.R.

20052. Aug. 12.—Authorizing G.T.R. to build two branch lines for Riordon Pulp and Paper Co., Hawkesbury, Ont.

20053. Aug. 14.—Authorizing G.T.R. to renew bridge 5, King St., Toronto.

20054. July 29.—Authorizing G. T. Pacific Branch Lines Co. to cross Harry and Francis Sts., Calgary, Alta.

20055. Aug. 9.—Approving G.T.R. plans and specifications of repairs to Little Creek Drain, in Tilbury North Tp., Ont.

20056. Aug. 12.—Rescinding order 5390, Aug. 13, 1908, re application of A. Pilon, Casselman, Ont., respecting a charge of $3 a car made by G.T.R. for switching.

20057. Aug. 13.—Ordering Canadian Northern Ry. to fence right of way on its Rossburn Branch, Man., from mileage 35 to 40, by Sept. 1.

20058. Aug. 11.—Authorizing W. Alexander, Silverwood, Sask., to build spur across Canadian Northern Ry. to n. e. ¼, Sec. 15, and n. w. ¼, Sec. 14, Tp. 37, R. 5, w. 3 m., Cory Municipality, Sask.

20059. Aug. 7.—Amending order 18616, re public road between Cons. 12 and 13, Chisholm Tp., Ont., by approving diversion shown on plan filed by C. N. Ontario Ry.

20060. Aug. 13.—Authorizing C. N. Ontario Ry. to cross and divert public road in Lot 38, Con. 18, Ferris Tp.

20061. Aug. 13.—Authorizing Canadian Northern Branch Lines Co. to cross 30 highways on its Grosse Isle Branch.

20062. Aug. 13.—Approving location of station grounds of Interprovincial and James Bay Ry., at mileage 9.56, Mercier Parish, Que.

20063. Aug. 11.—Approving terms of Bell Telephone Co. contract forms 1 and 2, in so far as they limit company's liability.

20064. Aug. 13.—Authorizing St. Lawrence Pulp and Lumber Corporation to cross Atlantic, Quebec and Western Ry. in Gaspe County, Que.

20065. Aug. 12.—Authorizing G.N.R. to remove frog and switch at crossing at Crescent, B.C., and to build new switch there.

20066. Aug. 15.—Authorizing C.P.R. to build spur for J. Gunn and Sons, Winnipeg, Man.

20067. Aug. 15.—Authorizing C.P.R. to rebuild bridge 5.7 over Mill St., Norwood, Ont.

20068. Aug. 15.—Authorizing Canadian Northern Ry. to build spur for Manitoba Gypsum Co., near Moosehorn, Man.

20069. Aug. 12.—Authorizing Canadian Northern Ry. to build branch through Block 6, Hudson Bay Reserve.

200070. Aug. 15.—Authorizing G. T. Pacific Branch Lines Co. to cross 14 highways in Battleford, Sask.

20071. Aug. 15.—Approving clearance of coal conveyer on C.P.R. at sidings of Ontario National Brick Co., Toronto Tp., Ont.

20072. Aug. 14.—Authorizing Bell Telephone Co. to erect wires and poles upon 21 streets in Montreal.

20073. Aug. 15.—Approving proposed scale P to Express Classification for Canada.

20074. Aug. 12.—Amending order 17384 to provide charges for cream up to 400 miles, to become effective not later than Sept. 18.

20075. Aug. 15.—Authorizing C.N. Ontario Ry. to build temporary level crossing over public road between Cons. B and 2, Westmeath Tp.

20076. Aug. 14.—Authorizing C.P.R. to build siding across St. Roch St., Quebec, to storage yard.

20077. Aug. 15.—Approving location of C.N. Ontario Ry. station grounds at Westmeath, mileage 79.64 from Ottawa.

20078. Aug. 19.—Authorizing C.P.R. to build three extra tracks at grade across Jamieson St., Lacombe, Alta.

20079. Aug. 15.—Authorizing C.P.R. to revise grade of crossings necessitated by double track; and to build additional track across certain highways between mileage 10 and 39.1, London Subdivision, Ont.

20080. Aug. 18.—Approving location of C.P.R. station at Bethany Jct., Ont., mileage 38.66, Toronto Subdivision.

20081. Aug. 18.—Amending order 19939 re Campbellford, Lake Ontario and Western Ry. (C.P.R.) revised location in Brighton Tp., Ont.

20082. Aug. 16.—Authorizing C.P.R. to build bridges 86.45 and 50.95 on its Sherbrooke and Schreiber Subdivisions.

20083. Aug. 18.—Authorizing C.P.R. to operate over Lachine Canal drawbridge, near Highlands, Que., without first stopping trains.

20084. Aug. 18.—Authorizing C.P.R. to build bridges 15.83, 12.65, 120.79, 9.17, 20.42, 39.11, 37.00 and 1917 on its Schreiber, Chapleau, Nipigon and White River Subdivisions.

20085. Aug. 14.—Authorizing C.P.R. to divert Pincher Creek Trail and to close portion of same within its right of way; and to build road diversion in Sec. 3, Tp. 7, R. 29, w. 4 m., Alta., in lieu thereof.

20086. Aug. 15.—Amending order 19900 re location of C.P.R. station at Corwhin, Ont.

20087. Aug. 15.—Authorizing C.P.R. and G. T.R. to operate over crossing one mile north of St. Johns, Que., at mileage 20.85, without first stopping trains.

20088. Aug. 15.—Authorizing C.P.R. and St. Lawrence and Adirondack Ry. to operate over crossing at Adirondack Jct., without first stopping trains.

Railway Transportation Problems of the Future.

By Henry K. Wicksteed, B.A. Sc., M.Can. Soc. C.E., Chief Engineer of Surveys, Mackenzie, Mann and Company Limited, Toronto.

The article under this title in Canadian Railway and Marine World for September by J. Grant MacGregor raises some interesting questions, although his exact meaning is a little hard to follow. That the operating departments use a low standard of gradients as an excuse for getting rid of their obsolete locomotive power at the expense of the construction departments is hardly a reason for abandoning a low grade standard of road in favor of a high one. It is merely an evidence that they are human and that when extra power is being purchased they prefer to keep the new for themselves and send away the old, but is not the mere possibility of employing the old in useful service, instead of consigning it to the scrap heap, an economy and an argument in favor of instead of against the low grade standards? There can be no manner of doubt that having to climb a hill of a given height, the easier the grade ascent the better, the only doubt is as to how much we can afford to pay in money, extra distance, extra curvature, or rise and fall, to accomplish the flattening, and this is not a question which can be reduced to exact figures or formula, because the data are different in almost every case and they vary even for the same road from time to time. A road may be built primarily for carrying a heavy freight traffic in one direction. A few years go by and it is found that a large and increasing tonnage is being carried in the reverse direction and that the grades opposed to it are altogether disproportionate. The road, too, designed originally as a freight road, begins to develop a large passenger business, high speed becomes an object, and the curvature, which was quite unobjectionable in the case of the slow moving freights, becomes almost prohibitive to the "Flying Limited." That no great degree of excellence can be attained without harmony and cooperation between all departments is unquestionable, but I think things are better in this respect than they have ever been before, and improving. Working men have been as a class diffident about airing their views and opinions, especially in print, before college bred engineers possessed of a greater gift of expression, and the latter have been in the past much too ready to believe that they know it all and that the trackman's advice is worthless because it does not accord with their text books, but this condition of affairs is fast being mended and some of the brightest minds are devoting much of their time to encouraging their subordinates and colleagues to talk and to think, and much of the recent progress and interest is due to this movement.

Mr. McGregor lightly touches on one element of location to which perhaps sufficient prominence has not been given, and that is the endurance or steam capacity of the locomotive. We have been too apt to believe that when we have flattened the grade to the last degree that the topography will allow, and a little below the ruling grade of the division, that we have performed the "whole duty of man" and that the length of the grade is of no consequence. This is a great fallacy, for there are plenty of locomotives which can supply the necessary drawbar pull for a short distance, but which fail in boiler capacity or endurance. We may again have the boiler capacity but not the grate area, and we may have both without the proper fuel to give the best results, and lastly, we may have all three, but the opportunity to develop them is limited by the physical ability of the firemen. It is easy to find cases where a short grade of 1% limits the capacity of the road much less than a long one of two thirds that rate of ascent.

Another question which has perhaps received less attention than it should is the judicious introduction of pusher grades. It seems to the writer that there are many cases where a reduction, not only in capital account but in actual operating cost, could be made by keeping a low ruling grade over the greater part of a road, and then sharply ascending a necessary summit, instead of adopting a somewhat steeper standard for the whole road. An entirely new and most interesting proposition was put to the writer within a few days by an engineer familiar with operating conditions in the far north. It may be put somewhat in this way. Ordinary starting resistances are about equivalent to those caused by a 3-10 to 4-10 grade; therefore we say that this grade on the open road is nearly as good as a level—that is, the drawbar pull is no more. But in our winter weather the starting pull is vastly increased by the freezing of the lubricants and other causes, and owing to increased radiation and condensation the load which the locomotive is capable of hauling on the level at fair speed is greatly reduced. Under these circumstances, while a flat grade is always better than a steep one, the relative value, the amount we can afford to spend in reducing the steep grade to the low standard, is very much reduced. It is notable that the three or four months of extremely cold weather are those during which this road is busiest. This is a notable example of how circumstances alter cases, and it is additional argument for Mr. McGregor in his contention for a central power station or stations and electrical distribution.

The modern locomotive has, we believe, nearly reached its maximum of power and weight. It has increased in height and width almost to the limit, and only in length is further increase possible, hence the great increase in this element, and in order to overcome the difficulties of running the long machines over crooked track, the ingenious but somewhat clumsy devices in articulated boilers and swivelling trucks and universal joints in steam pipe connections have been introduced. These great machines, with their high centres of gravity, are so hard on the track that they are the principal if not the only reason for the enormous expenditures for heavy rails, larger and more numerous ties, increased quantities of ballast, and lastly, for increased cost of maintenance of way and structures, and all this, or nearly all, be it remembered, is to avoid the necessity for the extra locomotive crew and attendance which the use of two locomotives instead of one would ne essitate. The big articulated or Mallet locomotives are merely devices for putting two locomotives under the control of one man and here is perhaps the strongest argument for electrical power, that two or more power units can be coupled together in an absolutely flexible train and supported on as many wheels as may be necessary to reduce the axle load to that of the standard box or pullman car and still be under the absolute control of one intelligence. Another is the question of endurance mentioned above. The electric motor does not get tired and can exercise her maximum pull as well at the top of a long grade as at the bottom and, so long as she can get the "juice" freely, almost as well at a speed of 20 miles as at 15 or even 10. Again the questions of radiation of boilers and condensation of steam do not come into anything like the same extent; only that of capital cost is opposed to the change, and while the modern locomotive is one of the most wonderful of machines in its flexibility and its independence of outside agencies, it would seem as if the time had almost come when it would be debased to such purposes as switching in yards, and hauling over temporary branch roads where the traffic is light and infrequent and cannot pay interest on the increased capital charge. Particularly is the prospect of change attractive in districts especially numerous in Canada where water power can be substituted for steam, or even where the latter can be used merely intermittently or as an auxiliary in times of drought to the enormous saving in our coal bills. There are other reasons for the change, the superior cleanliness and the fact that the electric motor is essentially a rotary engine, while the steam locomotive, as we know, is as essentially a reciprocating one, and not so well adapted to high speeds, but these are passenger service considerations and hardly come within the scope of Mr. McGregor's article. Certain it seems that many of our trunk roads or portions of them would be glad to try the change if it were not for the enormous capital amounts they have invested in steam locomotives and their accessories, engine houses, repair shops, water supplies, etc., and the temporary disorganization which the change would effect. But all this has little effect on the question of ruling gradients unless it is to emphasize the advantage of flattening them as much as possible. The time was when it was believed that the wheels of an electric locomotive gripped the rail better than those of the steam locomotive, when it was argued that because an electric locomotive could negotiate a grade of 10% it was not economy to spend money to secure a lower standard, but these times have gone by and the change to electricity, whether imminent or not, will not to any great extent affect the principles of railway location as they were laid down 20 years ago by A. M. Wellington, and as they are accepted with more or less modification and reservation, due to the greater flood of experimental light which has been thrown upon them at the present day.

"News" for J. E. Dalrymple.

A "technical" paper, published in Toronto, had the following in a recent issue:—

"J. E. Dalrymple, one of the vice presidents of the Grand Trunk Railway, and head of the traffic department at Montreal, has left the service of the G.T.R. to become vice president of the Northern Navigation Co., to which position he has been chosen. Mr. Dalrymple will still have his offices in Montreal."

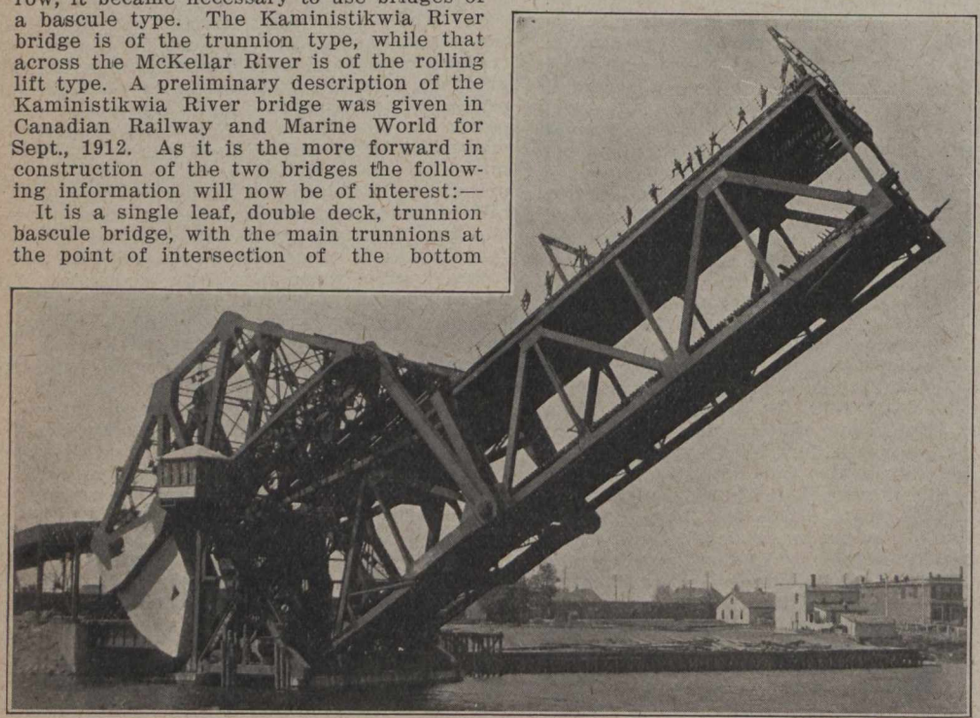
The idea of Mr. Dalrymple relinquishing the high salaried position of Vice President of the G.T.R. and G.T.P.R. to accept that of a director, to which no salary is attached, of the Northern Navigation Co., a subsidiary of the Canada Transportation Lines, Limited, is rich. The facts were given in Canadian Railway and Marine World for September as follows:—

"J. E. Dalrymple, Vice President (Traffic), G.T.R., and G.T. Pacific Ry., has been elected a director of the Northern Navigation Co., as representing the G.T.R. interests, vice W. E. Davis, deceased.

Canadian Pacific Railway Bascule Bridge Over Kaministikwia River.

The C.P.R. is building extensive terminal yards and loading docks on Island no. 1 at Fort William, Ont. In order to reach this island it was necessary to build bridges across the Kaministikwia and McKellar Rivers. Inasmuch as these are both navigable rivers, movable bridges were required, and on account of the rivers being so narrow, it became necessary to use bridges of a bascule type. The Kaministikwia River bridge is of the trunnion type, while that across the McKellar River is of the rolling lift type. A preliminary description of the Kaministikwia River bridge was given in Canadian Railway and Marine World for Sept., 1912. As it is the more forward in construction of the two bridges the following information will now be of interest:—

It is a single leaf, double deck, trunnion bascule bridge, with the main trunnions at the point of intersection of the bottom chord, and the end post of the truss (heel trunnion type), and embraces a 186 ft. movable span, giving a clear channel in the river of 180 ft. and a 40 ft. stationary span or tower. The lower deck carries a double track railway, and the upper deck a 30 ft. roadway, on which are two electric railway tracks. The counterweights are separately mounted on trunnions supported at the top of the tower, and the counterweight trusses, which carry part of the highway floor, are connected to the moving leaf through the counterweight links, which are pin connected both to the counterweight trusses and the bascule trusses. There are long approach viaducts on both sides of the river for the electric railway, to enable it to cross the bridge on the upper deck.



Kaministikwia River Bridge, Being Opened.

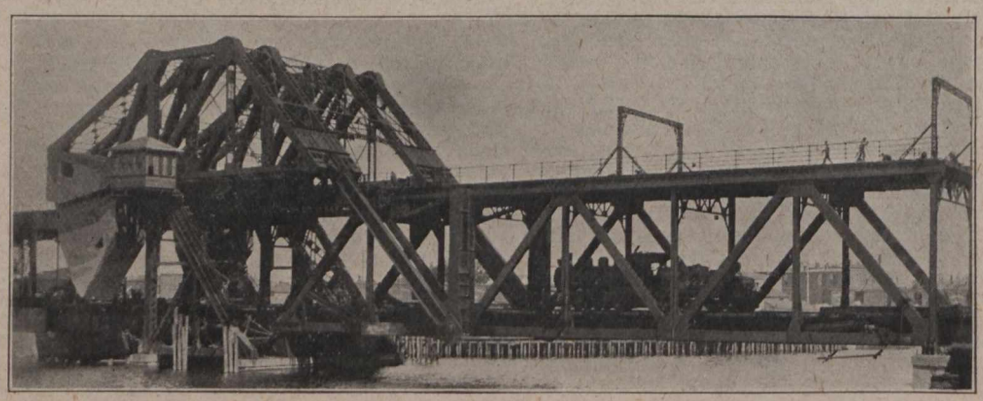
The bridge was erected in the open position by means of an erection tower such as is ordinarily used in erecting this kind of a bridge. The placing of the concrete for the counterweight was carried on simultaneously with the erection of the steel, so as to balance the structure at all times. On account of the size of the structure, the available space for the concrete was small, and it was necessary to make concrete weighing as much per cubic foot as was possible. Iron ore was used in place of stone for this reason, and concrete was obtained weighing about 175 lbs. a cubic foot. This concrete has such great tensile strength that most of the reinforcing ordinarily used in these counterweights was omitted. There was occasion to remove some of this concrete afterward, and it was found to be so tough that the only way it could be got out was by blasting.

The bridge is operated by electricity obtained from the Kaministikwia Power Co. It has two 85 h.p. motors for raising and lowering, and it is interlocked in such a way that every operation must be performed in sequence, and unless the bridge is actually moving up or down, it is held rigidly in position by a brake operated by an independent 5 h.p. motor.

The total weight of steel in the bridge, exclusive of the approaches, is about 2,500 tons. The counterweight weighs about 2,400 tons.

The bridge was designed under the direction of P. B. Motley, M. Can. Soc. C.E., Engineer of Bridges, C.P.R. It was fabricated in the Canada Foundry Co.'s Davenport works, Toronto, and all calculations in regard to counterweight were worked out in that company's engineering department after the shop drawings were made.

It is said to be the largest double track, double deck bascule bridge in the world.



Kaministikwia River Bridge, Closed.

The Great North Western Telegraph Co. has closed its offices at Crystal Beach, Hastings, Rosseau, Royal Muskoka Hotel, Ont., and Little Metis, Que.

Canadian Northern Railway Earnings, Etc.

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

	Gross Earnings	Expenses	Net Earnings	Increase
July	$1,928,800	$1,414.500	$514,300	$19,700
Aug.	1,824,800	1,416,200	408,600	37,800
	$3,753,600	$2,830,700	$922,900	$57,500
Incr.	$ 178,100	$ 120,600	$ 57,500	.....

The mileage under operation in Aug., was 4,316, against 4,297 in Aug., 1911.

Canadian Pacific Railway Earnings, Etc.

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

	Gross Earnings	Expenses	Net Earnings	Decrease
July	$11,993,062.27	$7,876,269.09	$4,116,793.18	$331,383.72
	$11,993,062.27	$7,876,269.09	$4,116,793.18	$331,383.72
Incr.	.....	$ 272,047.41	.....	.....
Decr.	$ 59,336.31	.....	$ 331,383.72	.....

Approximate earnings for August, $11,062,000, against $11,886,000 for August, 1912.

Commencing August, the mileage under operation was increased to 11,641.

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 July:—

Grand Trunk Railway.	
Earnings	$3,973,700
Expenses	2,947,000
Net earnings	$1,026,700
Canada Atlantic Railway.	
Earnings	$229,000
Expenses	291,500
Deficit	$62,500
Grand Trunk Western Railway.	
Earnings	$632,200
Expenses	551,850
Net earnings	$80,350
Detroit, Grand Haven and Milwaukee Ry.	
Earnings	$207,200
Expenses	188,400
Net earnings	$18,800

TRAFFIC RECEIPTS OF THE SYSTEM.

Aggregate from July 1 to Aug 31:

	1913	1912	Increase
G.T.R.	$8,069,356	$7,650,473	$418,883
C.A.R.	448,308	402,272	46,036
G.T.W.R.	1,263,935	1,168,503	95,432
D.G.H. & M.R.	421,703	393,618	28,085
Totals	$10,203,302	$9,614,866	$588,436

Grand Trunk Pacific Railway Earnings.

The earnings of the Prairie Section and Lake Superior Branch for August, were $462,036, and from July 1 to Aug. 31, $981,592.

A fire which broke out in the residence of PATRICK DUBEE, Secretary-Treasurer, Montreal Tramways Co., and President, Canadian Electric Railway Association, on Arlington Ave., Montreal, on the evening of Sept. 24, damaged the house and contents several thousand dollars.

Railway Development

Projected Lines, Surveys, Construction, Betterments, Etc.

Alberta and Great Waterways Ry.—It is reported from Edmonton, Alta., that among the measures to be submitted to the Alberta Legislature which opened Sept. 16, will be one providing for the building of this projected railway from Edmonton to McMurray, 230 miles, as a government work.

Algoma Eastern Ry.—The section of the line to Goat Island was opened for traffic, Sept. 15. The road is now being operated from Sudbury to Goat Island, at which point a round house and machine shop has been built. A bridge is under construction to connect Goat Island with Little Current, on Manitoulin Island, which it is expected to have ready for traffic Nov. 1. The passenger station and freight sheds will be located at Little Current. (Aug., pg. 376.)

See complete descriptive article on pg. 457 of this issue.

Delaware and Hudson Co.—The Board of Railway Commissioners has authorized the Quebec, Montreal and Southern Ry.,—the D. & H. Co.'s railway in Canada—to operate trains over the bridge across the St. Francois River, between St. Francois du Lac and Pierreville, Que. (Oct., 1912, pg. 501.)

Dominion Atlantic Ry.—The Board of Railway Commissioners has approved of a revised location for the North Mountain Branch between Grafton and Torn Lane, Cornwallis tp., N.S. (Sept., pg. 432.)

Edmonton, Dunvegan and British Columbia Ry.—J. D. McArthur, President, is reported to have stated in an interview Sept. 4, that track had been laid from Edmonton, Alta., northerly for 100 miles, and it was expected to reach the site of the bridge across the Athabasca River at Mirror Landing, mileage 130, before suspending work for the season. Ballasting gangs are following up the track layers, and it was hoped to have the line open to Mirror Landing before the end of the year. Grading and other work beyond the river was being proceeded with, and the bridge across the river was being built. (April, pg. 168.)

Essex Terminal Ry.—Surveys are reported to have been completed for the extension of the line from Sandwich to the site of the new steel plant at Ojibway, Ont., about three miles. The right of way has been secured, and the Board of Railway Commissioners has authorized the building of the extension at grade across several highways. It is expected that construction will be started at once. (April, pg. 168.)

Hudson Bay, Peace River and Pacific Ry.—At the annual meeting in Winnipeg, Sept. 10, the following were elected directors for the current year: R. M. Simpson, D. E. Sprague, D. C. Cameron, F. W. Drewry, F. W. Henbach, R. C. McDonald, R. D. Waugh, W. S. Evans, C. Midwinter. (Mar., 1912, pg. 120.)

Intercolonial Ry.—Tenders are under consideration for the erection of a brick and stone passenger station at Sussex, N.B.; and for the erection of a mechanical coal handling plant at Drummondville, Que.

Tenders are also under consideration for the building of a diversion between Nelson and Derby Jct., and for the building of a second track from St. Romuald to Chaudiere Curve, Que. F. P. Gutelius General Manager, is reported to have stated in Montreal, Sept. 15, that the contract for the latter work had been let to Soper and McDougall. The work to be done covers the construction of a second track from station 173+18 at St. Romuald to station 371+48 at Chaudiere Curve, 3.75 miles, with such sidings as may be directed. The contractor is to do all the excavating and grading, to extend or build new culverts and bridge masonry, construct protection walls and retaining walls, protect embankments with rip-rap, etc. The work is to be completed by July 1, 1914.

The revision of gradients on the Cape Breton section, Mr. Gutelius stated, Sept. 15, would be put under contract as soon as Parliament sanctioned the expenditure. It is intended to undertake the revision of gradients on the whole line.

New station buildings are being erected at Truro, N.S., and Bathurst, N.B. It is also proposed to overhaul many of the other station buildings.

Intercolonial Ry.—J. S. O. Dwyer, M. Can. Soc. C. E., who is in charge of the grade revision surveys in Cape Breton, has obtained a 0.6% gradient compensated for curvature in both directions, east and west from Point Tupper to Grand Narrows, 46.2 miles. The surveys will be continued to Sydney, 45.3 miles farther and it is expected to obtain the same gradient throughout.

Kettle Valley Lines.—We are officially advised that the contract for the line through Coquihalla Canyon to Hope, B.C., 38 miles, has been let to McArthur Brothers Co., New York, who have established headquarters at Hope, B.C., where F. C. Hitchcock, Vice President and General Manager, is now located. The work is very heavy rock and tunnel in a very inaccessible canyon, and extends from the summit of the Coquihalla near Merritt to Hope, where connection will be made with the Canadian Northern Pacific Ry., and by a bridge across the Fraser River with the C.P.R. The contractors made a start on the work at Hope on Aug. 27, C. C. Tinkler and H. A. McClure being in charge for the contractors. The work is being sublet in short sections. A wagon road is being built along the canyon, from the Hope end, as far as possible to facilitate the getting in of supplies. This road will be about 16 miles long and is estimated to cost $200,000. In addition to the heavy rock cutting there will be 12 tunnels on the 38 miles. The contract calls for the completion of the work by Nov. 1, 1914.

The company's engineers started work Aug. 26, making soundings on the Fraser River at Hope to secure a location for the bridge to be built to give connection with the C.P.R.

At Penticton, a large yard is being laid out, and a locomotive house and other buildings are being erected. The locomotive house is 90 ft. by 160 ft. and will accommodate six locomotives. The boiler house and machine shop is 100 ft. by 48 ft. (Sept., pg. 432.)

Lake Erie and Northern Ry.—Track laying is being proceeded with from Galt towards Brantford, Ont., on this line, and ballasting is in progress. Grading has so far progressed that it is not expected there will be any delay in the work of track laying into Brantford. It is expected to have this part of the line completed by Oct. 30. About 10 miles of grading have been completed between Bratnford and Port Dover, and it is expected to finish up the remaining 20 miles by Dec. 31. The whole 53 miles from Galt to Port Dover is expected to be in operation June 1, 1914. The question of the terminal site in Port Dover has not been settled.

Arrangements are being made with the Hydro Electric Commission by which the Commissioners power line from the Brant substation into Brantford will be erected along the company's right of way. (Sept., pg. 432.)

London and Port Stanley Ry.—It is said that the ratepayers of London will be asked to vote on Oct. 15 on a bylaw providing for the electrification of that line, from London to Port Stanley, Ont. (Sept., pg. 432.)

London to Port Talbot.—London, Ont., press reports state that surveys have been made by S. Wilson for a railway from London to Port Talbot, Ont.

C. M. Stewart, President of the Canadian Stewart Co., and of James Stewart and Co., New York, was in London, Sept. 17, looking over the suggested routes for the entrance of this projected railway into the city. He is reported to have stated that his company is looking for a route which will give a one-half per cent. gradient from Lake Erie to London; the company would provide its own terminal facilities, and build its own line independent of any existing line, and would not seek any bonus; it will be a steam railway exclusively. The lake terminal has not been selected, and everything will depend on the result of the surveys.

New Brunswick and Prince Edward Island Ry.—A new bridge is being placed over the river at Port Elgin, N.B., work being started Sept. 8. The construction is being done by an Intercolonial Ry. gang. (Aug., 1911, pg. 733.)

North Ry.—Press reports state that about 200 miles of the surveys for the building of this projected railway from near Montreal to the National Transcontinental Ry. at Bell River, Que., have been completed, and that the engineers expected to have their field work finished by Sept. 30. The Laurentides will be crossed at a low elevation, and from 25 miles beyond the Gatineau River, the line will run through a comparatively level country for about 150 miles right to Bell River. It is further stated that a contract for the building of the line will be let shortly. (July, pg. 332.)

Northern Pacific Ry.—G. T. Reid, Assistant to the President, is reported to have stated in an interview Sept. 3, that the revision of the line between Seattle and Sumas, Wash., via Snohomish, will not be completed until the spring of 1914. Connection will be made with the Great Northern Ry. at Huntingdon near Sumas and the G.N. Ry. will be used into Vancouver. An agreement is being negotiated with the British Columbia Government for the use of the bridge over the Fraser River at New Westminster. The terminals which the G.N. Ry. is laying out at False Creek, Vancouver, into which the N.P. Ry. trains will run, are expected to be ready in the summer of 1914. (July, pg. 332.)

Pacific Great Eastern Ry.—A. E. Kellett, Superintendent of Construction, reported to the North Vancouver Council, Sept. 6, that it was expected to have the line as far as Dundarane ready for operation by Jan. 1, 1914. This is part of the section of the line from North Vancouver to Newport, on Howe Sound.

Plans have been deposited with the Minister of Public Works at Ottawa, for a wharf and tramway, with trestle approach, at the head of Howe Sound, B.C., in front of D.L. 486, G.I., N.W.D. (Sept., pg. 432.)

Prince Edward Island Ry.—Work has been started on the car ferry terminals at Carleton Point, P.E.I., and at Cape Tormentine, N.B. ——— Fripp is engineer in charge for the Dominion Government. (Sept., pg. 433.)

Quebec Rapid Transit Co.—Unconfirmed press reports state that work will be start-

ed in the spring of 1914 on the construction of the projected line to connect Quebec, Charlesbourg, Loretteville, Cap Rouge, Ste. Foye and the Isle of Orleans. A. Taschereau, Quebec, is interested. (Jan., pg. 21.)

St. John and Quebec Ry.—A contract has been entered into between the Dominion Government and the company under the act granting aid to certain railways for the building of the line between Andover and St. John, N.B., 200 miles. This subsidy is in lieu of that granted in 1912, and does not include the building of two bridges, one across the St. John River, and the other across the Kennebecasis River.

Steel is reported to have been laid on about 25 miles between Fredericton and Rothesay, and press reports state that J. H. Corbett and Sons (Inc.), the contractors for the section to Gagetown, have been given a contract for grading the line southerly from Gagetown. The location plans of the route from Centreville northerly to Andover, have not been finally approved by the Government, but press reports state that a contract for the grading of this section has been let to McFarlane and McDonald. (Sept., pg. 433.)

Toronto, Hamilton and Buffalo Ry.—F. L. Somerville, consulting engineer, Toronto, has submitted to the Hamilton City Council a plan for the betterment of the railway entrances into the city, for use in connection with the city's application to the Board of Railway Commissioners for an order directing the T.H. and B. Ry. to abandon its present line on Hunter St. The details of the plan have not been given out, but it is stated that the estimated cost of the new route would be a little over $1,000,000. The object of the city is to have all the steam railways centralized in what is known as the Stuart St. cut. (Aug., pg. 377.)

Vancouver Island-Mainland Bridge.—At a public dinner in Victoria, B.C., recently, the Dominion Minister of Public Works stated that he was looking for an engineer to undertake the work of investigating the conditions of Seymour Narrows, with a view of constructing a railway bridge there. Seymour Narrows is the stretch of water separating the northern end of Vancouver Island from the mainland. In the original survey for what is now the C.P.R., it was marked out as a suitable place for the erection of a bridge. Several projects have been initiated since for the erection of such a structure, but nothing has come of them. (Feb., pg. 84.)

Western Dominion Ry.—Press reports state that work is to be started at an early date on the construction of this line. The projected route is from the International boundary north of Grand Falls, Mont., westerly to the Crowsnest country, tapping the coal fields, thence northely to Calgary, Alta., and then on to the Peace River country. (July, pg. 330.)

Winnipeg, Man.—The Winnipeg, Man., City Council, Sept. 8, passed a bylaw providing for the provision of a water supply for the city from Shoal Lake at a cost of $13,500,000. The report of the engineers on which the estimated cost is based contains the following:—"It will be advisable to provide a standard gauge construction railway from the point where the aqueduct leaves the Grand Trunk Pacific Ry. to Indian Bay, and our estimate includes $1,020,000 which is substantially $12,000 a mile, for the building of such railway. We have also made estimates of the cost of equipping and operating the railway, but instead of stating the sums so estimated separately they have been incorporated into the estimates of the concrete and other items of work."

Traffic Orders by the Board of Railway Commissioners.

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

Classification of Dried Fruit.

20010. Aug. 11.—Re application of Toronto Board of Trade, under sec. 321 of the Railway Act, for a reduction of the freight classification ratings on dried fruit. It is ordered that the application be not granted.

Esquimalt & Nanaimo Ry. Freight Tariff.

20028. Aug. 13.—Re application of Esquimalt and Nanaimo Railway for an order further extending time within which it may be permitted to file a revised Standard Freight Tariff for approval. It is ordered that the time within which the company was required to file the said tariff be further extended for six months from date of this order.

Freight Rates on A.R. & I. Co.'s Railway.

20043. Aug. 12.—Re application of the Board of Trade of Lethbridge, Alta., complaining against the cancellation of Great Northern Ry. tariff, C.R.C. no. 720, applying between stations on various lines in Eastern Canada and stations on the Alberta Ry. & Irrigation Co.'s railway, now known as the Coutts and Cardston subdivision of the C.P.R., and the notice by the Board calling upon the railway companies interested to show cause why the said tariff should not be reinstated since it has neither been superseded nor disallowed by the Board, as provided under sec, 338 of the Railway Act. It is ordered that the application be not granted.

Coal Rate from Port Burwell to Lambton.

20047. Aug. 8.—Re complaint of Interurban Electric Co., of Toronto, that while the C.P.R. charges 60 cents a ton on coal from Port Burwell to Toronto, West Toronto, and North Toronto, and is a party to the same rate from the Niagara frontier, 75c. is charged for the intermediate haul to Lambton, discriminating, therefore, against Lambton and in favor of the points named. It is ordered that the C.P.R. reduce its rate on coal from Port Burwell to Lambton and Islington from 75c to 70 cents per ton; the reduced rate to become effective not later than Sept., 1913.

Switching at Casselman, Ont.

20056. Aug. 12.—Re application of A. Pilon of Casselman, Ont., for an order rescinding order 5390, Aug. 15, 1908, declaring $3 a car to be made by the G.T.R. over and above the company's station rate on brick to be a reasonable charge for the additional service of switching and handling the traffic from the applicant's siding, about 2½ miles west of Casselman Station. It is ordered that 5390 be rescinded.

Cream Rates from British Columbia.

20074. Aug. 12.—Re application of the Shippers' Section of the Winnipeg Board of Trade for an order extending the application of the cream rates, approved by order 17384, Sept. 4, 1912, to permit of shipments of cream from Hubbard, Ituna, Kelliher, Punnichy, Quinton, and Raymore stations, to Winnipeg, on the same scale as approved under the order; and the notice calling upon the express companies to show cause why, in view of the Board's judgment of Oct. 27, 1911, the mileage covered should not be increased to 400 miles. Upon it appearing that the extension of the mileage to 400 miles will remove the discrimination complained of as between Ituna and Goodeve, it is ordered that order 17384 be amended to provide charges for cream up to 400 miles, as follows:

Miles.	Five-gallon cans, each	Eight-gallon cans, each	Ten-gallon cans, each
350	71 cents	91 cents	96 cents
400	79 cents	101 cents	106 cents

The amended tariff to be made effective not later than Sept. 18,

Milling Corn in Transit.

20106. Aug 15.—Re application of Empire Flour Mills, Ltd., of St. Thomas, Ont., for an order restoring the milling-in-transit arrangement on United States corn, the product of which is shipped from St. Thomas to points on or via the G.T.R. and the C.P.R. It is ordered that the application be dismissed.

Rates on Sugar from Wallaceburg.

20136. Aug. 11.—Re application of Dominion Sugar for a readjustment of the rates on sugar, in carload quantities, from Wallaceburg to Toronto and from Wallaceburg to Hamilton, over the C.P.R., G.T.R., Pere Marquette, and Chatham, Wallaceburg and Lake Erie Railways. It is ordered that the said application be not granted.

Rates on Grain and Grain Products.

General order 109. Aug. 27.—Re complaint of Dominion Millers' Association and the Campbell Milling Co. against the proposed increase in less than carload mileage rates on grain and grain products, published in tariffs of the railway companies, to take effect Sept. 1, It is ordered that the mileage rates on less than carload shipments of grain and grain products, as published in the following schedules, be suspended until further order of the Board, namely:—

Supplement no.	to C.R.C. no.	Railway Company.
10	E-2566.....	Grand Trunk
11	E-2385.....	Canadian Pacific
1	E-176.....	Canadian Northern (Eastern Lines)
2	E-145.....	Canadian Northern (Eastern Lines)
1	E-232.....	Canadian Northern (Eastern Lines)
1	2022.....	Michigan Central
3	1910.....	Michigan Central
8	245.....	Chatham, Wallaceburg & Lake Erie
3	242.....	Chatham, Wallaceburg & Lake Erie
3	115.....	Essex Terminal
4	254.....	Galt, Preston and Hespeler
2	80.....	Schomberg & Aurora
	951.....	Ottawa & New York
3	1468.....	Pere Marquette
1	218.....	Thousand Islands
5	565.....	Toronto, Hamilton & Buffalo
3	627.....	Wabash
3	102.....	Windsor, Essex & Lake Shore

The railway companies were subsequently notified that at the Board's sitting in Ottawa Sept. 16 they would be required to justify the proposed increases in rates referred to in this order.

Lumber Rates for British Columbia.

20245. Aug. 30.—Re Supplement 17 to Tariff C.R.C. no. W1615, filed by the C.P.R., and effective Sept. 3, increasing rates on lumber, shingles, and other articles taking lumber rates, from British Columbia coast and interior mills to points on its Sault Ste. Marie Division. Upon the failure of the railway company to justify the proposed increases to the Board's satisfaction, and in view of the Board's ruling that no increases should be made by railway companies, unless reasons therefor satisfactory to the Board were given, pending the decision in the Western Rates Case, it is ordered that the effective date of the advanced rates in the said supplement be suspended for 30 days from the date of this order; and that the railway company be required to show cause at the sittings of the Board to be held in Ottawa on Sept. 16, why the said increased rates should not be disallowed.

Rattan Furniture Rates from British Columbia.

20246. Aug. 30.—Re Supplement no. 24 to Tariff C.R.C. no. W1713, filed by the

C.P.R., and effective Sept. 7, increasing rate on rattan furniture from Vancouver and Victoria to points in Manitoba, Ontario and Quebec.

The order in this case is precisely similar to order 20245 above.

Coal Rates to Lambton, Ont.

20329. Sept. 13. Re complaint of Interurban Electric Co., Toronto, that on coal via Port Burwell and from the Niagara frontier it is charged 15c. a ton more to its unloading siding, in the proximity of the C.P.R.'s Lambton station, than is charged to Toronto, West Toronto and North Toronto, to which the said siding is intermediate; and that the said excess charge constitutes an unjust discrimination: it is ordered that the Michigan Central Rd., the Toronto, Hamilton and Buffalo Ry., and the C.P.R jointly be required to reduce their rate on coal, in carloads, from Suspension Bridge, New York, Black Rock, New York, and Buffalo, N.Y., to Islington and Lambton, Ont., from 75c. to 70c. per ton of 2,000 lbs., the said reduced rate to become effective not later than Oct. 27; and it is further ordered that order 20047, Aug. 8, made herein, be rescinded.

Carrying Trunks by Freight.

General order 110. Aug. 11.—Re application of R. DeB. Hovell, of Victoria, B.C., for an order directing railway companies to carry as freight passengers 1st class baggage; and the matter of the notice calling upon the railway companies to show cause why trunks containing wearing apparel and personal effects should not be accepted for carriage by freight service, when securely corded. It is ordered that railway companies be required to accept and carry by freight, trunks containing wearing apparel and personal effects, when securely corded.

Express Rates on Cream.

General order 111. Aug. 20, as amended by general order 112, Sept. 18.—Re application of H. W. Riley, of Calgary, Alta., for a reconsideration of order 17384, Sept. 4, 1912, as amended by order 17492,, Sept. 14, 1912, prescribing express rates on cream and terms and conditions of service in connection therewith, it is ordered: 1. That the application to amend order 17384, in so far as it affects the rate basis, be refused. 2. That the present tariff rates be reduced by 5c. a can by making them exclusive of delivery, and the following rules be substituted for those included in the tariff prescribed by order 17384: (1) Returned empty cans, which were carried full by this company under this tariff, will be charged at the rate of 5c. each to the original point of shipment. (2) The rates shown herein include the collection of full or empty cans at points where the company furnishes a waggon service, but do not include delivery. (3) The consignee may give the company's local agent a written general or continuing notice that until such notice is withdrawn (which shall not be within one month from the date thereof), he desires all his cream delivered by the company's waggons; and on receipt of such notice, and until its withdrawal, the company will furnish the service at an additional charge of 5c. per can. Note—Agent will preserve such notices in his possession for reference, and, if withdrawn, for at least one year thereafter. (4) No reduction from these rates will be made for smaller or partially filled cans. (5) Two 5-gallon cans will not be carried at the rate for a 10-gallon can. (6) Between common points where a competing company may have a shorter line, this company's rates will be based upon the shorter distance.

The East Coast Transport Co. is reported to have been formed for the purpose of operating a gasoline vessel between Victoria and Nanaimo, in the freight traffic.

Railway Finance, Meetings, Etc.

The Buffalo and Lake Huron Ry. Co.'s annual meeting was held at Liverpool, Eng., Sept. 3. The report for the half year ended June 30 states that after providing for the interest on the 1st and 2nd mortgage bonds the available balance, as shown by the revenue account, including the amount brought in from the previous half year, is £15,118 7s. 1d., out of which the directors recommend the usual dividend of 5s. 3d. a share, amounting to £13,784 13s. 3d., leaving a balance of £1,333 13s. 10d. to be carried forward. The company's line is leased to the G.T.R.

Central Ry. of Canada.—A London, Eng., cable Sept. 8, stated that the delay which has arisen in the payment of the coupons due in July on the company's bonds, payable in Paris, France, is owing to the voluntary liquidation of La Banque Alsacienne de Paris, but that arrangement had been made for the payment of the coupons Sept. 15.

Elgin and Havelock Ry.—Following are the officers and directors for the current year:—President, R. E. Harris; Secretary-Treasurer, F. H. Oxley; other director, C. H. Cahan.

Grand Trunk Pacific Ry.—A certified copy of bylaw 13, providing for the issue of $15,000,000 of debentures, authorized by the G.T.P. Loan Act, 1913, was deposited with the Secretary of State at Ottawa, Aug. 22.

Great Northern Mining and Ry. Co.—A meeting of subscribers was held at Eastern Harbor, N.S., Sept. 5, to approve a contract entered into with Jas. Brodie, Westmount, Que., by the directors, for the transfer to him of all the property and the entire undertaking of the company. A further meeting of shareholders was held Sept. 19, for the purpose of confirming the resolutions passed Sept. 5. The company owns coal mining properties in Inverness County, N.S., and has a charter to build a railway to connect these with a shipping port at Eastern Harbor. No railway construction has been done. The officers of the company are:—President, P. J. L. Fiset; Secretary, P. LeClerc.

Kettle Valley Ry.—A lease dated June 2, of the K.V. Ry. to the C.P.R. Co. has been deposited in the office of the Secretary of State at Ottawa. The K.V. Ry. extends from the International Boundary to Grand Forks, B.C., and is under construction from Grand Forks to the Fraser River at Hope, where a connection will be made with the C.P.R. main line. It also owns a line in the U.S., from the International Boundary to Republic, Wash., and a charter for the building of a line thence to Seattle, Wash.

Kettle Valley Ry.—The Board of Railway Commissioners has recommended the Governor in Council to sanction the proposal to lease the K.V.R. lines to the Canadian Pacific Ry. Co.

Klondike Mines Ry.—Following are the officers and directors for the current year,—President, H. B. McGiverin; Vice President, J. P. Ebbs; Secretary, A. Haydon; other directors, John Latta and C. G. Kekewich.

Mineral Range Rd.—The authority of the Michigan State Railroad Commission has been granted for the issue of notes for $115,000.

New York Central and Hudson River Rd.—A copy of an agreement supplemental to that made Nov. 23, 1912, and dated June 5, 1913, between the Guaranty Trust Co. and the N.Y.C. and H.R. Rd. Co. was deposited with the Secretary of State at Ottawa, Aug. 9. The agreement affects the Canada Southern Ry., the Ottawa and New York Ry., and the other lines in Canada in which the N.Y.C. and H.R. Rd. is interested.

Quebec and Saguenay Ry.—A writ has been issued against the company by M. J. O'Brien, contractor, for $839,511.18, for work done and materials supplied. The matter will come before the courts at the October sittings.

Thousand Islands Ry.—The annual meeting was held at Deseronto, Ont., Sept. 8. Following are the officers and directors for the current year,—President, E. W. Rathbun, Deseronto, Ont.; Secretary and Treasurer, H. W. Cooper, Gananoque, Ont.; Manother directors, C. S. Lee, Gananoque, Ont.; and B. R. Hepburn, M.P., Picton, Ont.

Wabash Rd.—The Receivers have been granted permission to sell $14,000,000 6% certificates for the purpose of taking up that amount of 5% certificates which matured Aug. 1. Default was made Aug. 1 in payment of interest on the loan which was made some time ago to retire $8,000,000 Wheeling and Lake Erie notes, which matured Aug. 1, 1908, and which have been extended several times. Interest was last paid on Feb. 1, but the local court is reported to have ordered that the payment which was due Aug. 1 be not made.

Winnipeg and Northern Ry.—Notice has been formally given that the amalgamation of the W. and N. Ry. Co. with the Canadian Northern Ry. Co. has been completed.

Safety First on the Grand Trunk Railway.

Howard G. Kelley, Vice President, has issued the following circular: "Geo. Bradshaw, Safety Engineer, has been engaged to put into effect on this system an organization for the prevention of injuries and damage to property, familiarly known as a safety first" organization. He will inspect the lines, terminals and shops and confer with officers of the various departments on matters pertaining to safety in their jurisdictions and as to the particular plan of organization best adapted to this system. From the information so obtained he will submit a report embodying recommendations which will be followed by a circular for general distribution explaining in detail the plan decided upon and methods of procedure. He will also deliver at all important centres illustrated lectures on safety, showing and explaining in a vivid and impressive manner unsafe conditions and practices responsible for injuries and how to correct or avoid them. Notice of the time and place of these lectures will be given and it is desired that every employe on the system, whose duties permit, shall attend. No employe who considers the importance of his own personal safety can afford to miss the opportunity which these lectures will afford to learn something of real practical value for the protection of his life and limb. We hope to reduce the personal injury record to the lowest possible point and to make our system the safest in the country to work for and to patronize. To accomplish this end every officer, agent and employe is requested to give his earnest and active support and co-operation in the inauguration and prosecution of this campaign for greater safety."

The American Association of Passenger Agents held its annual convention at St. Paul, Minn., Sept. 8 and 9. The chief subjects discussed, were, the field man, and how to increase our efficiency to the public and our employers. After the close of the convention, those present were taken on a trip through the Yellowstone Park, by special train to Gardiner, Mont., and thence by stage, as guests of the Northern Pacific Ry. San Francisco was decided on for the 1914 meeting.

Canadian Northern Railway Construction, Betterments, Etc.

Canadian Northern Ontario Ry.—We are officially advised that on Sept. 9, there still remained about four miles of track to lay, and about 60% of the ballasting to be done on the uncompleted portion of the line between Toronto and Ottawa. The erection of station buildings, roundhouses, etc., has been completed. Owing to the uncertainty of the amount of train filling to be done on several sections, we are informed, it is not possible to fix a date for the completion and opening of the line for traffic.

Sir Donald Mann, Vice President, made a trip of inspection over the line from the Ottawa end to Chaffey's Locks, on the Rideau River, Sept. 11. With the exception of about four miles between Chaffey's Locks and Sydenham, on which trouble is being given by some sink holes, the line is completed. Press reports state that the work of filling these is expected to be completed to permit of the operation of trains through from Toronto to Ottawa, by Oct. 15, but Sir Donald Mann, in an interview Sept. 18, is reported as stating that "six months' deferment of the opening of the line to passengers will allow the tracks to settle down."

Montreal-Ottawa-Port Arthur Line.—We were officially advised Sept. 9, that the portion of work on this line at that date was:—Grading, 60% completed; tracklaying, 42% completed; ballasting, 20% completed; erection of buildings, etc., 5% completed. The work on the line will be continued until completion, as everything is in such a shape that work may be continued regardless of the season. These figures refer to the progress of work on the whole of the line between Montreal and Port Arthur, but they do not indicate the state of completion on various sections. The line between Montreal Island and Hawkesbury is practically finished but for the completion of the bridges at the Montreal end; the section between Hawkesbury and Ottawa is in operation, and the mileage between Ottawa and Rideau Junction, the point where the line to Toronto separates, is also completed, but has not yet been opened for traffic. Between Rideau Jct. and Capreol, Ont., the line is under construction, and we were advised Sept. 17, of the following state of construction on this section: Grading from Ottawa to Pembroke, 56% completed; grading from Pembroke to North Bay, 45% completed; grading from North Bay to Capreol, 86% completed. Track has been laid from Capreol, mileage 313 from Ottawa, easterly for 44 miles to mileage 269, from just west of North Bay, mileage 231, for 19 miles to mileage 250, and from just east of North Bay at mileage 227 to mileage 186, in all 104 miles. Track has also been laid from Rideau Jct., six miles, to mileage 12, and one-half mile of track has been laid to the crossing of the C.P.R. at mileage 83 from Ottawa. The bridge work at Chats Falls, and Riviere des Prairies, is well in hand and it is expected that these will be completed this year. It is not expected to have the Ottawa-North Bay section finished until 1915, but it is expected to have the North Bay-Capreol section completed for operation about Aug., 1914. At Capreol, the line joins up with the line originally built from Toronto to Sudbury. Sudbury is now upon a branch, the line having been extended and it is now in operation to Ruel, 55.6 from the point of junction at Capreol. It is 545 miles from Ruel to Port Arthur, and it is expected to have the track laid through between these points early in January.

Canadian Northern Ry.—A new track has been put in operation at Port Arthur, Ont., for the operation of trains from Fort William. The new track begins at the diamond, and skirts the present C.N.R. yards to the station. Heretofore the trains ran over the freight train track.

The Board of Railway Commissioners has authorized the operation of traffic over the connection between the C.N.R. and National Transcontinental Railway at St. Boniface, Man.

The Winnipeg North Eastern Ry. has deposited with the Minister of Public Works at Ottawa plans of the proposed railway bridge over the Red River, from the foot of Clare Ave., Winnipeg, to south of Harrowby Ave., St. Boniface.

Ballasting is being pushed ahead on the Totogan branch, with a view of bringing it up to a higher standard. The branch is being extended and press reports state that some additional track will be laid before the end of the year.

The Board of Railway Commissioners has approved of location of the extension of the Grosse Isle Branch, which now extends to Inwood, Man., from mileage 74.47 to 80.88.

A start has been made at Yorkton, press reports state, on a line from that point to Wroxton, Sask.

The Board of Railway Commissioners has approved of location plans for the extension of the Alsask Branch from mileage 105.42 to 148.54.

It was reported to the Calgary, Alta., City Council, Sept. 12, that the line from Vegreville would be completed into Calgary within 30 days. The steel has been laid to Drumheller, to which place the line is in operation from Vegreville, but the bridges over the Bow and the Elbow rivers have not been completed. These bridges, however, are at Calgary, and all that is delaying the completion of the line is the ballasting. The gravel for this purpose has to be hauled over 130 miles.

Canadian Northern Pacific Ry.—Track has been laid easterly from Port Mann, B.C., 122 miles, a little beyond North Bend. A large steel bridge is under construction at this point over Stroma Creek, which is expected to be completed early in October. Grading is practically completed to Lytton, and work is well forward as far as Kamloops, where a big bridge is being built across the Thompson River, which will take some time to complete. Grading is well advanced north and east of Kamloops, to within about 28 miles of the work in progress from the Yellowhead Pass. Ballasting is being pushed close behind the tracklaying gangs.

Work on the proposed electric line from Kamloops to Vernon is reported to be under way, after having been suspended for some time.

The trestle work in connection with the Lulu Island Branch has been finished and the line is now ready for operation.

Sir William Mackenzie, President, in an interview Sept. 5, is reported as stating that a large portion of the proceeds of the loans recently placed in London, Eng., will be used for western development. The plans include the shops at Port Mann, terminals at Vancouver, Victoria and New Westminster, and the provision of an entrance into Vancouver by a tunnel. These several projects will be gone on with at once, but the company's entrance into Vancouver does not depend upon the building of the tunnel, an arrangement having been made by which the C.N. Ry. will use the Great Northern Ry. lines for the present.

Plans for the reclamation of the False Creek flats are being prepared, and T. G. Holt, Executive Agent, Vancouver, stated Sept. 9, that they would be sent to Toronto shortly for approval.

Vancouver Island Lines.—The contracts for the construction of the line from the Songhees Reserve at Victoria, to Patricia Bay, in the Saanich Peninsula, are reported to have been let to J. Macdonald and the Littleton-Bruce-Elsbach Co. D. D. Lewis, District Engineer, Victoria, is reported as saying, Aug. 30, that the work to be done covers the building of a line from Patricia Bay to the point at which the line to Alberni starts, mileage 4.7 from Victoria, and a line from that point into the Songhees Reserve. The engineering staff then had everything ready to go ahead as soon as the contractors arrived. The work will be rushed ahead as fast as possible.

Grading on the main line from Sooke Lake to mileage 100 is expected to be completed by Nov. 30, and good progress has been made up to mileage 140. The steel superstructure of the bridges over the Cowichan and the Koksilah Rivers is being put up. (Sept., pg. 427.)

Canadian Pacific Railway Company's Annual Report.

In publishing this report in our last issue some errors unfortunately occurred in showing the liabilities in the condensed balance sheet on page 425. The copy was put in the printers' hands correctly and was also put in type correctly, but in putting the type into the form some lines were transposed. The grand total of the liabilities was unaffected, but the totals of the amount due on mortgage bonds, $13,157,520.00, and of the current liabilities, $30,511,302.73, were transposed, and the amounts of the Algoma Branch first mortgage bonds, and current liabilities were repeated, the former incorrectly. The correct arrangement of figures is as follows,—

LIABILITIES

Capital stock		$ 200,000,000.00
Payments on subscription to new issue capital stock (60,000,000.00 at 175)		63,451,667.50
4% preference stock		74,331,339.79
4% consolidated debenture stock		163,257,224.32
Mortgage bonds:		
First Mortgage, 5%	34,998,633.33	
Less amount redeemed and cancelled	21,841,113.33	
		13,157,520.00
Algoma Branch, 1st mortgage		3,650,000.00
Current liabilities:		
Audited vouchers	14,785,322.70	
Pay rolls	6,549,901.24	
Miscellaneous accounts payable	9,176,078.79	
		30,511,302.73
Interest on funded debt and rental of leased lines:		
Coupons due July 1, 1913, and including coupons overdue not presented	1,208,016.17	
Accrued fixed charges	183,785.05	
		1,391,801.22
Equipment obligations		880,000.00
Equipment replacement fund		2,425,426.02
Steamship replacement fund		5,061,338.29
Appropriation for additions and improvements		17,912,996.41
Reserve fund for contingencies		3,569,463.37
Lands and town sites sales		63,334,285.19
Surplus		77,597,100.36
		$ 720,531,465.20

Alberta and Great Waterways Ry.—An announcement was made in the Alberta Legislature, Sept. 22, by the Premier that a final settlement had been made with the Royal Bank and others interested, in connection with the difference arising out of the proposal to build this railway, and the subsequent cancellation of the contract by the Government. The contract will be taken over by J. D. McArthur, of Winnipeg, and his associates, and the line will be built.

The Canadian Northern Telegraph Co. has opened offices at Inwood, Man., and Dummer and Hearne, Sask.

National Transcontinental Railway Construction.

We are officially advised that a contract has been let to J. Gosselin, Levis, Que., for the erection of machine and other shops for the N.T.R. at St. Malo, Que. The estimated cost of the shops is $1,500,000. A description of the several buildings covered by the contract appeared in Canadian Railway and Marine World for Sept., pg. 409.

The Minister of Railways returned to Ottawa, Sept. 12, from a trip of inspection over the line westerly from Cochrane, On. He is reported as saying that while the section of the line from Cochrane to Lake Superior Junction, to which point it is already in operation easterly from Winnipeg, would not be entirely completed until early in 1914, it can be utilized to prevent a grain blockade if one is threatened. A few sink holes are giving trouble and some bridges to replace temporary structures, have yet to be erected. The Minister made the trip to Winnipeg over the line in company with E. J. Chamberlin, President, and other officers of the Grand Trunk Pacific Ry. At Winnipeg, Sept. 4, Mr. Chamberlin said there were yet about 275 miles of the line between Cochrane and Lake Superior Jct. to be completed, so far as ballasting was concerned. (Sept., pg. 430.)

Grand Trunk Pacific Railway Construction.

E. J. Chamberlin, President, returned to Montreal, Sept. 18, after having made a brief inspection over the G. T. P. Ry. He is reported to have said in an interview that he had been 1,200 miles west of Winnipeg, and found construction work progressing very rapidly. It is hoped to have track laid into Fort George about the beginning of 1914, and to tie up with the construction proceeding easterly from Prince Rupert towards the fall.

The Board of Railway Commissioners have authorized the opening for traffic of the line from Tete Jaune, B 17, mileage 1095.3 to mileage 1189. This is at the second crossing of the Fraser River, where a large bridge is being put in.

On the line east from Prince Rupert the Board of Railway Commissioners has approved of revised location plans through Tibbits Indian reserve, mileage 321.6 to 330.1; and from mileage 459.61 into the Fort George Indian reserve at mileage 466.11. The construction is so far advanced that J. W. Stewart, of the contracting firm of Foley, Welsh and Stewart, stated in Victoria, B. C., Sept. 2, that unless something unforseen occurs, he felt safe in saying that all the track between Edmonton and Prince Rupert will be laid by April or May, 1914. He added that his firm has 20,000 men at work on the line in British Columbia.

G. T. Pacific Branch Lines.—It was announced at the G. T. P. Ry. offices in Winnipeg, Sept. 1, that it was expected that physical connection would be made between the company's Regina-Boundary line, and the Great Northern Ry. branch line early in October. This branch extends from Necho, N.D., northerly to the International Boundary.

Starting from Talmage, on the Regina-Boundary Branch, a line is under construction into Weyburn. Grading has been completed, and on the completion of the bridge across the Souris River, track will be laid. Track will only be laid into Weyburn, mileage 14, this year, but the grading has been carried about a mile farther, to a point to which it is said that the line now being built from Harte to Bandon, Man., will be extended at a future date.

The Board of Railway Commissioners has authorized the opening for traffic of the Biggar-Calgary Branch from Dodsland, mileage 48, to Loverna, mileage 104.06. This line will connect with the Tofield-Calgary line, the operation of trains over which, from Beiseker, mileage 163, to mileage 197.7, was authorized by the Board of Railway Commissioners, Sept. 11.

According to a Calgary, Alta., press report, a G. T. P. Ry. engineer stated, Sept. 3, that the company intended to undertake the construction of a line through Moose Jaw, Medicine Hat, and the Crowsnest country into Southern British Columbia, and that the line now being completed from Tofield into Calgary, will be extended south to connect with it. We are officially advised that this construction has not been decided on, and that the building of further lines is not likely to be undertaken until financial matters improve and the freight rate question has been decided. (Sept., pg. 430.)

Dominion Government Railway to Hudson Bay.

J. D. McArthur, general contractor for building the railway from Pas, Man., to Port Nelson, Hudson Bay, is reported to have stated, while in Montreal, Sept. 10, that it is expected to have 50% of the grading and 125 miles of track laid before the end of October. Alex. McMillan, of McMillan Bros., who are carrying out the grading contract, was in Winnipeg, Sept. 10, arranging for the winter supplies for the camps. He says his firm has over 1,000 men at work on the grading. There is a shortage of men at present, but he hoped to be able to get 2,000 men into the camps for the winter. The grading had been completed for the first 185 miles, and the camps are strung out beyond that point. The track laying is being done by the Hudson Bay Construction Co., which has 400 men at work. The material for the building or a wireless telegraph station at Pas has been delivered, and is in course of erection. This station will be used to secure communication with the Government vessels in Hudson Bay, which are engaged in survey work.

The contractors are operating trains over the line, so far as track is laid, and carrying passengers at 5 cents a mile. Track has been laid to McLaren, 62 miles from Pas, at the end of August. (Sept., pg. 422.)

Great Northern Railway Lines in Canada.

Midland Great Northern Ry.—The Manitoba Public Utilities Commission has decided that the company has power to expropriate land for its proposed spur tracks in the vicinity of Ross and Elgin Streets, Winnipeg. The company entered into an agreement with the city to build these spurs, but the owners of the land refused to sell the portion required for the right of way, and argued that the company could not expropriate.

International Boundary to Peace River.—J. A. Carson, of the engineering department of the Great Northern Ry., was in Edmonton, Alta., Aug. 30, and has been spending his time since in investigating the traffic possibilities of the Peace River country. Press reports state that this investigation is being made in connection with a project for building a line from Grand Falls, Mont., the terminal of a G.N.R. branch, north westerly into the Peace River country, for which the G.N.R. is said to hold a charter. (See Western Dominion Ry., in Railway Development Department.)

Vancouver Terminals.—The west pier of the new G.N.R. dock on Burrard Inlet has been completed, and a start has been made on the sheds. The dock is 450 ft. in length and 360 ft. wide, the approaches being 250 ft. long, and 280 ft. wide. About 250,000 cubic yards of material was used for filling. The sheds, which are being built by Grant, Smith and McDonnell, are expected to be completed by Nov. 1.

L. C. Gilman, assistant to the President, G.N.R., is reported as having stated in Vancouver, B.C., Sept. 8, that it is expected to begin operating trains into the new terminals at False Creek in about a year. The Northern Pacific Ry. will use the same terminals. It is not the company's intention to operate a trans Pacific steamship service, as it is purposed to work in connection with existing steamship lines trading to the port.

The reclamation work at False Creek is being pushed forward by the contractors, Grant, Smith and McDonnell. (Sept., pg. 423.)

Annual Inspection of the Canadian Pacific Railway.

Sir Thos. G. Shaughnessy, President, C.P.R., left Montreal, Sept. 3, on his annual trip of inspection over the system, prior to the annual meeting, which takes place early in October.

He was accompanied by several other directors, including R. B. Angus and H. S. Holt, from Montreal; W. D. Matthews and Sir Edmund Osler, from Toronto; and Sir William Whyte, and George Bury, Vice President, from Winnipeg. On account of the illness of Lady Shaughnessy, Sir Thomas returned to Montreal when the party had reached Moose Jaw, Sask.

The rest of the party made a complete tour of the transcontinental line and several branches, and proceeded from Vancouver to Victoria on the s.s. Empress of Asia, the latest addition to the transpacific fleet, arriving on Sept. 10 and leaving on the following day. After inspecting several of the works in progress on the main land, when they were accompanied by R. Marpole, General Executive Assistant; Hayter Reid, Manager in Chief, Hotel Department; F. W. Peters, General Superintendent, Vancouver, and H. W. Brodie, General Passenger Agent, the party left for the east, arriving at Winnipeg, Sept. 15, and Montreal, Sept. 19.

H. Maitland Kersey, the recently appointed Manager in Chief, Transatlantic and Transpacific Steamships, London, Eng., who has been in Vancouver in connection with the arrival of the new s.s. Empress of Asia, returned to Montreal with the directors.

American Society of Mechanical Engineers.—The railway session of the forthcoming meeting of this association has been fixed for Dec. 3, when steel, and steel underframe box cars will be discussed, a paper on all steel box cars being prepared by W. F. Keisel, Jr., Assistant Engineer, Pennsylvania Rd., and one on steel underframe box cars, by R. W. Burnett, General Master Car Builder, C.P.R., Montreal.

Quebec Transportation Club.—A number of the members made a trip, leaving Quebec, Sept. 14, by C.P.R., to Toronto, thence by R. & O.N. Co.'s line to Lewiston, and on to Niagara Falls, Buffalo, Rochester and Charlotte, thence by R. & O.N. Co.'s line to Montreal, where they disbanded.

Roadmasters' and Maintenance of Way Association.—The 31st annual convention was held at Chicago, Ill., Sept. 9-12. There was an attendance of over 200 members, and a considerable number of manufacturers of track materials had exhibits.

Canadian Pacific Railway Construction, Betterments, Etc.

Eastern Division.—The Board of Railway Commissioners has approved of revision in grade of portions of the line from mileage 6.35 at Farnham, northwesterly to mileage 19.89 at St. Johns, Que., and has authorized the opening for traffic of the second track from Farnham, mileage 6.7 to Iberville Jct., mileage 18.7. The first order covers the whole of the grade revision and second track between Farnham and St. Johns, and the second authorizes the use for traffic of the portion of the work which is completed.

Ontario Division.—C. P. R. engineers arrived in Kingston, Ont., Sept. 12, to examine into the improvement of terminal facilities in that city. It is said that a line will be built from Tete de Pont barracks to the present station, and that a new station will be built on Ontario St. between Brock and Queen Streets.

The ballasting on the second track from Islington to Guelph Jct. has been completed to Cooksville. The concrete work for the new bridges over the Etobicoke and Dixie creeks is being put in, and when the steel work on these is finished this section of the line will be completed. Beyond Cooksville the work is making satisfactory progress, and it is expected to have the whole 29 miles of second track in operation by the end of the year. Additional siding accommodation is being put in at Dixie and Cooksville, and a new station has been erected at Dixie. It is said that when the second track is opened a new station will be built at Streetsville, midway between the present town station and the junction station, both of which will be abandoned.

Press reports state that surveys have been made by F. B. Tapley, Resident Engineer at London, for a line to connect the St. Marys and Western Ontario Ry. with the main line running into London. It is also reported that the project for a line from Pottersburg to the downtown sections of London has been abandoned for the present.

Tillsonburg, Lake Erie and Pacific Ry.—The Dominion Government has entered into a contract under the act granting aid to certain railways, for the building of a line from Ingersoll to a junction with the St. Marys and Western Ontario Ry., at Embro, Ont., 10.30 miles.

Lake Superior Division.—The Board of Railway Commissioners has approved of revised locations of the transcontinental line at various points on the Lake Superior Division, between mileage 16.91 and 21.79, Schreiber Subdivision. These revisions are in connection with the second track now being built.

Considerable improvements are being carried out in the yards at Port Arthur, Ont., and the eastern approach thereto. In order to accommodate a third main line track, a trestle, on a reinforced concrete substructure, is being built, at the yards, similar to that now in course of construction for the second track across Current River.

Manitoba Division.—The highway approaches to the recently opened bascule bridge for railway and general traffic across the Kaministikwia River at Fort William, Ont., are expected to be completed by Oct. 31. The bridge has been used for railway traffic for some weeks.

No work has been done on the proposed alterations at the Winnipeg terminal station, the contractors — Westinghouse, Church, Kerr & Co.—being at present engaged upon the extension of the hotel which is connected with the station buildings.

It was expected that track will be laid on the line under construction from Boissevain, on the Souris Branch, to Lauder, Man., Sept. 30.

Saskatchewan Division.—The Board of Railway Commissioners has authorized the opening for traffic of the second track between Chaplin, mileage 54, to Ernfold, mileage 66.5, on the Swift Current Subdivision. Grading has been completed for some distance farther west, and it is expected that the entire second track into Swift Current will be laid by the end of October.

A contract has been entered into between the Dominion Government and the C. P. R., under the act granting aid for the construction of certain railways, for the building of a line from Moose Jaw, Sask., northwesterly for 123 miles. This line has been built and is in operation.

What is known as the Weyburn-Lcthbridge branch has been in operation for some time for 115 miles west of Weyburn. The Board of Railway Commissioners, Sept. 4, authorized the opening of a further 30 miles. The line is also being built easterly from Stirling ,Alta., and the link to connect the two sections has been authorized by the management. It is expected to have the entire line in operation by the end of 1914. Divisional points are to be located at Assiniboia and Shunavon.

Alberta Division.—Satisfactory progress is reported to be being made with the grading on the section of the Weyburn-Lethbridge line located in Alberta. The line starts out from Stirling, and will connect at the provincial boundary with the section going west from Weyburn. The line from the east is expected to be graded to the provincial boundary this year. It is expected that a divisional point will be located in Alberta in range four.

The Board of Railway Commissioners has authorized the opening for traffic of the branch line from Suffield westerly to Terrace, mileage 0 to 26.4.

The revised location plans of the Bassano easterly branch from mileage 98.72 to 115.59 have been approved by the Board of Railway Commissioners.

Alberta Central Railway.—A contract has been entered into with the company, by the Dominion Government under the act granting aid to certain railways, for the building of a line from Red Deer to Rocky Mountain House, Alta., 70 miles.

The Board of Railway Commissioners has approved of revised location plans for this line from mileage 10 to 20.

Pacific Division.—The Board of Railway Commissioners has approved of revised location plans for the Kootenay Central Ry., under construction by the C. P. R., from mileage 37.35 southeasterly to mileage 57.19.

The preliminary work for the electrification of the Castlegar-Rossland section of the C. P. R. is being progressed with. The power plant of the West Kootenay Power and Light Co. is being increased to meet the C. P. R. requirements.

The second track work between Mission Jct. and Ruby Creek, about 40 miles, is reported to be practically completed. The bridge over the Stave River at Ruskin has been completed, but that over the Harrison River is not expected to be finished before Feb., 1914. This, however, will not prevent the operation of trains over the rest of the second track. (Sept., pg. 435.)

Hotel Vancouver.—The Vancouver City Council approved plans for extensions to the C. P. R. hotel in that city, Sept. 5. The estimated cost is $1,100,000.

Grand Trunk Railway Betterments, Construction, Etc.

Southern New England Ry.—Press reports, Sept. 15, state that the various subcontractors on this line from Palmer, Mass., to the interstate line between Massachusetts and Rhode Island, have been directed to resume work. Work has been suspended for some months.

St. Lambert, Que.—A contract is reported let to Roberts and Shaeffer Co., for the building of a 600 ton coaling plant at St. Lambert, Que., at an estimated cost of $17,000.

London Improvements.—H. E. Whittenberger, General Superintendent, stated in London, Ont., Aug. 14, that nothing whatever would be done in the way of reopening the track elevation question in that city until after the work in progress in Toronto had been finished. The tracks will be elevated and a new station built, but it will be some time before anything can be done.

Holmedale Switch, Brantford.—The G.T.R. has announced to the Brantford, Ont., City Council its decision to abandon its intention to build a switch into the Holmedale industrial section for the construction of which an agreement was entered into in 1910. The right of way which was acquired for the spur is being offered for rental. (Sept., pg. 427.)

Yard Limit Rules on Canadian Pacific Railway Western Lines.

The Board of Railway Commissioners issued general order 108 under date of Aug. 11 as follows:—Re consideration of matter of yard limit boards. Upon hearing the matter at the sittings in Winnipeg, May 30, in the presence of counsel for and representatives of the Brotherhood of Locomotive Engineers, the Brotherhood of Locomotive Firemen and Enginemen, the Canadian Pacific, Grand Trunk, Grand Trunk Pacific, and Canadian Northern Railway Companies, and what was alleged; and upon reading the report of the Chief Operating Officer of the Board, it is ordered that the C.P.R. withdraw its special rule F applying to western lines, and hereafter observe the uniform rules of the Board regarding yard limits.

The C.P.R.'s rule F above referred to, in force on lines west of Port Arthur, Ont., is as follows:—Where there are no yard limit boards, the outer main track switches of passing tracks, unless otherwise directed, will be considered the yard limits within the meaning of rule 93."

In giving judgment Chief Commissioner Drayton said:—"As stated by me at the hearing I am still of the view that special rule F of the C.P.R. is in conflict with rules approved by the Board. Uniformity of practice is an essential. What the C.P.R. has found to be good practice in the east, as admitted by the company, may properly be adopted in the west. Therefore I think an order should go directing the company to withdraw its special rule F applying to western lines, and hereafter observe the Board's uniform rules regarding yard limits."

On Sept. 9 the Board passed order 20311 extending to Jan. 1, 1914, the time within which the C.P.R. shall comply with general order 108.

C.P.R. Observation Cars in Europe.—As stated at the inauguration of the C.P.R. observation car service in Austria, the anticipated extension of the route has taken place, the cars now being operated through the Austrian Tyrol to Zurich, Switzerland, over the Swiss Government Railways.

Canadian Railway AND Marine World

ESTABLISHED 1898.

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

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

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

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

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

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

SUBSCRIPTION PRICES, INCLUDING POSTAGE:

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

To other places in CANADA, and to NEWFOUNDLAND AND GREAT BRITAIN, $1 a year.

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

SINGLE COPIES, 15 cents each, including postage.

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

NOTICE TO ADVERTISERS.

ADVERTISING RATES furnished on application.

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

TORONTO, CANADA, OCTOBER, 1913.

PRINCIPAL CONTENTS.

Discontinuance of Cartage Service by the Railway Companies.

As announced at the time in Canadian Railway and Marine World, the various railway companies east of Port Arthur gave notice that they would discontinue, on Oct. 1, the arrangements under which freight in certain cities and towns has been delivered by cartage companies, under contract with the railways and the charges therefor collected with the freight charges. The matter was brought before the Board of Railway Commissioners in the interest of shippers, and was expected to have come up Sept. 16, but it was not put on the list of cases, the Board having decided that it had no jurisdiction in the matter. The Board, however, asked the railway companies to continue the service to Jan. 1, 1914. This the railways have consented to do on the basis of 3c. per 100 lbs. tonnage freight, and 20c. for smalls, the previous rates being 2½ and 15c. respectively.

The Intercolonial Ry. has issued a circular stating that its cartage service will be continued at Montreal and Ste. Hyacinthe, Que., at 2½c. per 100 lbs.

The railway companies operating west of Port Arthur gave notice recently that the practice of advancing cartage charges on outward shipments, and collecting the same from the consignee at destination would be discontinued Oct 1. Until a little over a year ago, the rates to and from Winnipeg included the charge for cartage when performed by the railway companies' cartage agents. If cars were loaded or unloaded on private sidings, or the freight carted by the shippers or consignees themselves, a reduction was made from the rates of 3c. per 100 lbs. on the first four classes, and 2c. per 100 lbs. on 5th class traffic. Upon the reissuance of the class tariffs to western points, brought about by the necessary revision of rates as a result of the decision of the Board of Railway Commissioners in the so called Regina rate case, the rates were published exclusive of cartage, i. e., shippers and consignees were obliged to furnish their own cartage, but although no cartage tariff was published an arrangement was entered into whereby the railways would bill forward, for collection from consignee, the cost of the cartage on outbound business. It is this practice of billing forward the cartage on outbound traffic that the railway companies have now withdrawn. A number of the western boards of trade have memorialized the railway companies to continue the practice above mentioned, as otherwise the shippers will have to pay the outward cartage charges themselves.

Steamship Ticket Agents Association at Vancouver.

The Ocean Steamship Ticket Agents Association has been organized at Vancouver, for business and social purposes, the members being the principal agents in Vancouver handling ocean steamship tickets, including H. G. Smith, C.P. & T.A., Grand Trunk Ry., Chairman; C. E. Lang, C.P. & T.A., Northern Pacific Ry.; John Moe, C.P. A., Canadian Pacific Ry.; G. Coombe, C.T.A., Canadian Pacific Ry.; A. W. Nase, Commercial Agent, C.M. & St. P. Ry.; J. A. M. Faulds, Manager, Passenger Department, D. E. Brown, Hope & Macaulay Co.; C. Millard, D.T.A., Canadian Pacific Ry.; A. Whitnall, C.P. & T.A., Great Northern Ry.; J. C. Irons, General Agent, Canadian Australian Royal Mail Line; V. G. Massi, Managing Director, Italian Commercial Exchange.

The objects of the Association are to outline certain rules for guidance in the members' business relations with each other and others, having also in mind that the nearer they get together socially the less liable they are to do unto others that which they would not like others to do to them. They pledge themselves to abide by conference rules in the sale of tickets and urge the general agents of the different steamship lines to confine the sale of their tickets, as much as possible, to regular railway and steamship agents, thus eliminating an undesirable class, for the good of both the steamship companies and the ticket agents.

The Association recently chartered the 60 ft. power yacht Daphrena and cruised round Howe Sound with a number of guests.

Railway Apprentices' Mechanical Drawings at the Canadian National Exhibition.

In the mechanical drawing competition at the Canadian National Exhibition at Toronto this year, drawings entered by apprentices in Canadian railway shops met with considerable success, apprentices from the G.T.R. Stratford, Ont., shops taking five out of the six prizes, and an apprentice from the G.T.R. Montreal shops, the remaining one. The competition was divided into three groups, with a first and second prize of $10 and $5 respectively in each, awarded as follows:

Hydraulic or pneumatic machinery—1st prize, H. Ord, G.T.R., Stratford, accumulator; 2nd prize, L. Ireland, G.T.R., Stratford, staybolt breaker.

Steam driven machinery—1st prize, J. F. Tonge, G.T.R., Stratford, locomotive; 2nd prize, J. Lee, G.T.R., Montreal, crane.

Electrical equipment—1st prize, L. Bixon, G.T.R., Stratford, commutator; 2nd prize, W. Dunn, G.T.R., Stratford, motor and generator.

There were 20 entries in this competition, and practically every drawing was of such a quality as to reflect great credit not only on the apprentice, but also on the instructors. The judge was J. G. Herring, Consumers Gas Co., Toronto.

Detroit and Huron Railway Co.

E. J. Chamberlin, President G.T.R., G.T.P.R. and Detroit and Huron Ry. Co., has issued a circular stating that the Detroit and Huron Ry., extending from Cass City to Bad Axe, Mich., was opened for operation of freight and passenger service on Sept. 28. The following officers are appointed and have jurisdiction:

TRANSPORTATION DEPARTMENT.—H. G. Kelley, Vice President, in charge of Construction, Transportation and Maintenance, Montreal; U. E. Gillen, General Superintendent, Chicago; J. Caldwell, Superintendent, Detroit.

TRAFFIC DEPARTMENT.—J. E. Dalryple, Vice President, in charge of Traffic, Montreal; R. L. Burnap, Assistant Freight Traffic Manager, Chicago; J. D. McDonald, Assistant General Passenger Agent, Chicago.

ACCOUNTING DEPARTMENT.—W. H. Ardley, General Auditor, Montreal.

All of the officials above mentioned are in the G.T.R. service.

Canadian Ticket Agents' Association.—The 27th annual meeting will be held at Cleveland, Ohio, Oct. 8, 9 and 10. The members and the ladies accompanying them will assemble at Buffalo, N. Y., on Oct. 7, and will leave there at 9 p.m., by the s.s City of Buffalo, as guests of the Cleveland and Buffalo Transit Co. The headquarters in Cleveland will be at the Hollenden Hotel. The party will leave Cleveland on the evening of Oct. 10 on the return trip.

Mainly About Transportation People.

SIR WILLIAM YOUNG, director, G.T.R., London, Eng., is on a tour through Canada.

SIR THOMAS TAIT has rented D. Lorne McGibbon's home in Montreal for the winter.

H. L. DRAYTON, Chief Railway Commissioner, returned to Canada, from Great Britain, Sept. 20.

JOHN R. ARNOLDI, Canadian Manager Commercial Acetylene Co., of New York, died in Toronto, Sept. 10.

A. B. GRAY, Trackmaster, Intercolonial Ry., New Glasgow, N.S., has retired on pension after 47 years service.

J. POWELL, Chief Draughtsman, Motive Power Department, G.T.R., Montreal, has gone to England on a short visit.

WM. CARPENTER SMITH, Chief Engineer of Maintenance-of-way, Northern Pacific Ry., died at St. Paul, Minn., recently.

SIR H. MONTAGUE ALLAN and Lady Allan returned to Montreal, Sept. 5, after spending the summer at Cacouna, Que.

HUGH SUTHERLAND, Executive Agent, Canadian Northern Ry., Winnipeg, left there at the end of August, on a trip through the west.

Miss Hazel Allan, daughter of ANDREW A. ALLAN, of the Allan Line, was married in Montreal, Sept. 18, to C. Heubach, of Winnipeg.

C. N. ARMSTRONG, Managing Director, Central Ry. Co. of Canada, returned to Montreal, Sept. 1, after spending the summer in Europe.

G. U. RYLEY, Land Commissioner, G.T. Pacific Ry., Winnipeg, and Mrs. Ryley expect to return to Winnipeg, during October, from a trip to Prince Rupert, B.C.

John Tombs, who died at Montreal, Aug. 29, aged 65, was father of GUY TOMBS, General Freight Agent, Canadian Northern Ry. lines east of and including Ottawa.

Miss M. Sutherland, youngest daughter of J. N. SUTHERLAND, formerly General Freight Agent, C.P.R., at St. John, N.B., and now of Oakville, Ont., was married there Sept. 15, to W. M. Cruthers, of Peterboro, Ont.

JAMES PLAYFAIR, Vice President and Managing Director, Richelieu and Ontario Navigation Co., has been elected a director of the National Landed and Investment Co., succeeding his father, the late John S. Playfair.

K. ELLIOTT, chief clerk to the Assistant Freight Traffic Manager, Western Lines, C.P.R., Winnipeg, was presented with a cabinet of silver, by a number of his associates, recently, on the occasion of his marriage.

Miss M. B. Emmerson, youngest daughter of HON. H. R. EMMERSON, M.P., ex-Minister of Railways and Canals, was married at Dorchester, N.B., recently, to H. K. Bowes, M.A., of the Railways and Canals Department, Ottawa.

Ottawa press reports state that HON. M. E. BERNIER and JAMES MILLS, the only two original members remaining of the Board of Railway Commissioners, will be superannuated in Feb., 1914, when they will have served 10 years.

F. C. N. ROBERTSON, Auditor, Pullman Co., Chicago, Ill., who was found dead in bed at the Royal Montreal Golf Club, Dixie, Que., Sept. 9, was the youngest son of the late Thos. Jaffray Robertson, of Toronto, and was buried there.

Mrs. Ussher, wife of C. E. E. USSHER, Passenger Traffic Manager, C.P.R., Montreal, and her daughters, have returned to Montreal after spending several weeks in California.

ANDREW STRANG, Collector of Customs at Winnipeg, and a well known western pioneer, who died there Sept. 4, aged 64, was, in 1865 in G.T.R. service in Toronto, and went to Winnipeg in 1868, as representative of a commercial house.

JAMES REID, President, Reid Wrecking Co., Sarnia, Ont., died at Detroit, Mich., Sept. 2. He was connected with the wrecking business on the Great Lakes for over 40 years, and retired from active business about four years ago, on account of ill health.

SCOTT GRIFFIN, European Manager, Canadian Northern Ry. and Canadian Northern Steamships, and Mrs. Griffin, have returned to London, Eng., after spending the summer in Canada, with Mrs. Griffin's parents, Sir William and Lady Mackenzie.

J. M. GRANT, who died at Southsea, Eng.

J. E. Duval,
General Superintendent of Car Service,
Grand Trunk Railway.

recently, aged 84, was Secretary of the G.T.R. in its early days, serving under three successive Presidents. He retired from the position about 40 years ago and became a member of the London Stock Exchange.

HENRI MENIER, who purchased Anticosti Island, some years ago, and who, in connection with the property, has been carrying on considerable development work there, including the construction of a railway, and the operation of a steamship line to Europe, died at Paris, France, Sept. 8, aged 60.

SIR WILLIAM MACKENZIE, President, Canadian Northern Ry., is reported to have added to his many varied interests, by acquiring control of the Canadian Fish and Cold Storage Co., owning what is stated to be the largest fishing fleet on the northern Pacific, and a large cold storage plant at Prince Rupert, B.C.

E. J. CHAMBERLIN, President, G.T.R. and G.T. Pacific Ry., has been created a Knight of Grace of the Order of the Hospital of St. John of Jerusalem, and GEORGE BURY, Vice President, C.P.R., and H. G. KELLEY, Vice President, G.T.R., have been created Esquire and Honorary Esquire of the same order, respectively.

JOHN STUART, who died at Toronto, Sept. 15, aged 83, was for several years interested in railway construction, and was one of the promoters, and a director of the Wellington, Grey and Bruce, Hamilton and Lake Erie, and Hamilton and North Western Rys. In 1880 he was a member of the Howland syndicate, which offered to build the C.P.R.

JACOB SERSON, Provincial Superintendent of Bridges for British Columbia and a resident of Kootenay, died in Nelson, B.C., recently, aged 69. He was engaged in construction work on the C.P.R. 38 years ago and was with that company, engaged mostly on bridge work, until eight years ago, when he was appointed to the position which he held at the time of his death.

Lady SHAUGHNESSY, who had not been feeling in the best of health for some time, underwent an operation, Sept. 6, at the Royal Victoria Hospital, Montreal, and is reported to be progressing satisfactorily. Sir Thos. Shaughnessy, who was on his annual trip over the C.P.R. system, prior to the annual meeting, returned from Moose Jaw, Sask., by special train immediately on being notified.

ALEXANDER McDONALD, who has been appointed Division Freight Agent, Prince Edward Island Ry., Charlottetown, was born at Vernon River, P.E.I., Nov. 17, 1846, and entered P.E.I.R. service, Apr. 1, 1881, since when he has been, to Oct. 1, 1894, chief clerk to Superintendent, Charlottetown; Oct. 1, 1894, to July 1, 1897, Superintendent, Charlottetown; July 1, 1897, to Sept. 1, 1913, chief clerk to Superintendent, Charlottetown.

J. E. LINAHEN, of the Galena-Signal Oil Co's. expert staff, who has had his headquarters at Richmond, Que., for a number of years, has been appointed Superintendent, Expert Department, in full charge of all matters heretofore pertaining to the office of Manager and with office at Franklin, Pa. E. V. Sedgwick, heretofore Manager, Expert Department, has been assigned to other duties at the New York office.

JOHN L. HODGSON, whose appointment as Master Car Builder, G.T. Pacific Ry., Transcona, Man., was announced in our last issue, was born at Simcoe, Ont., in 1858, and entered G.T.R. service at Brantford, Ont., going from there to Toronto, as Car Foreman in 1884, and to Port Huron, Mich., as Master Car Builder in 1897, in which position he remained until Aug. 21, 1913. On his leaving Port Huron, the local employes presented him with an automobile.

W. R. FITZMAURICE, whose appointment as Assistant Superintendent, Moncton and Ste. Flavie District, Intercolonial Ry., Newcastle, N.B., was announced in our last issue, was born at Bedford, N.S., Mar. 19, 1870, and entered I.R.C. service May 21, 1886, since when he has been, to 1889, operator at various stations in Nova Scotia; 1889 to 1897, assistant agent, Springhill Jct., N.S.; 1897 to 1898, agent, Oxford Jct., N.S.; 1898 to Aug. 12, 1913, agent, Amherst, N.S.

W. J. ANDREWS, whose appointment as Locomotive Foreman, C.P.R., Neudorf, Sask., was announced in our last issue, served his apprenticeship, from May, 1895, to Nov., 1901, with the Great Western Ry., Swindon, Eng., and entered C.P.R. service, Mar. 15, 1902, at Winnipeg. He was, from May 15, 1910, to May 31, 1913, Night Shop Foreman, Winnipeg; June 1 to 16, 1913, Locomotive Foreman, Winnipeg; June 17 to July 31,

1913, Locomotive Foreman, Minnedosa, Man.

J. N. FINLAYSON, for the past year engineer for Waddell & Harrington, consulting engineers, of Kansas City, Mo., on bridge construction for the Canadian Northern Pacific Ry. in British Columbia, has resigned to become Professor of Civil Engineering at Dalhousie University, succeeding Prof. C. D. Howe. Mr. Finlayson was educated at McGill University, and was instructor there for two years. For the past two years he has been with Waddell & Harrington.

J. E. DUVAL, whose appointment as General Superintendent Car Service, G.T.R., Montreal, was announced in our last issue, and whose portrait appears in this issue, entered transportation service, Nov., 1884, as agent and operator, Canada Atlantic Ry., Coteau Landing, Que., and from May, 1885 to 1902, was train dispatcher; 1902 to 1904, Car Service Agent; 1904 to 1906, Chief Inspector, Board of Railway Commissioners; in 1906 he organized the Canadian Car Service Bureau, of which he was appointed Manager, holding that position until Aug. 1, 1913.

WILLIS W. YEAGER, who has been appointed Locomotive Foreman, G.T. Pacific Ry., Wainwright, Alta., was born in Wentworth county, Ont., May 5, 1864, and entered railway service, Mar., 1887, since when he has been, to Dec., 1888, fitter, Northern and North Western Ry., Hamilton, Ont.; Dec., 1888, to Dec., 1893, fitter, G.T.R., Hamilton, Ont.; Dec., 1893, to Mar., 1909, leading hand, G.T.R., Hamilton, Ont.; Mar. to July, 1909, Locomotive Foreman, G.T.R., Hamilton, Ont.; Nov., 1909, to Sept., 1913. Locomotive Foreman, G.T. Pacific Ry., Edmonton, Alta.

In connection with the recent retirement of D. POTTINGER, I.S.O., who was Assistant Chairman of the Canadian Government Railways Managing Board, until its abolition, the Canadian Government Railways Employes Relief and Insurance Association, at Moncton, N.B., of which he had been President since its inception in 1890, has passed a resolution expressing its appreciation of the active interest taken by him in its welfare and its members, and for the manner in which he presided at its meetings, and wishing him many years of well earned rest.

W. ROBERTS DEVENISH, A.M. Can. Soc. C.E., whose appointment as Division Engineer, Canadian Government Railways, Moncton, N.B., was announced in our last issue, was born in County Tipperary, Ireland, Nov. 21, 1882, and entered transportation service in 1903, serving with the C.P.R. for eight years, in various capacities in the Engineering and Maintenance of Way Department, from rodman to Assistant Division Engineer, Lake Superior Division. He was latterly engaged as Assistant Engineer with the National Transcontinental Ry. Investigation Commission.

F. PRICE, whose appointment as Superintendent of Car Service, G.T.R., Montreal, was announced in our last issue, was born at Montreal, June 11, 1864, and entered G. T.R. service in 1879, since when he has been, to 1902, successively, stenographer, clerk to Superintendent, secretary to General Superintendent, chief clerk to Car Service Agent and chief clerk to Manager; 1902 to May 1906, Master of Transportation, Middle Division; May 1906 to Jan. 14 1913, Superintendent of Car Service, Montreal; Jan. 14 to Aug. 22, 1913, Superintendent of Passenger Service, Montreal.

G. A. STOKES, whose appointment as Division Agent, Ontario Lines, G.T.R., Toronto, was announced in our last issue, was born in Nassagaweya Tp., Ont., July 23, 1879, and entered G.T.R. service, Nov. 15, 1897, since when he has been, to Oct. 15, 1898, operator, Listowel, Ont.; Oct. 15, 1898, to Mar., 1899, relieving agent; Mar., 1899, to Apr., 1907, agent, consecutively at Harriston, Wingham, Wiarton and Brantford, Ont.; Apr., 1907, to Nov. 1, 1910, dispatcher, Stratford, Ont.; Nov. 1, 1910, to Sept. 13, 1912, Yardmaster, Don station, Toronto; Sept. 13 to Oct. 25, 1912, General Yardmaster, Toronto Terminals; Oct. 25, 1912, to Aug. 10, 1913, Terminal Superintendent, Toronto.

M. A. FULLINGTON, A. M. Can. Soc. C. E., who has been appointed Assistant Superintendent, District 4, Eastern Division, C.P.R., Ottawa, Ont., was born at Johnson, Vt., May 12, 1880, and entered C.P.R. service Oct., 1904, since when he has been, to Jan., 1905, rodman, Toronto; Jan. to Oct., 1905, transitman, London, Ont.; Oct, 1905, to Apr., 1907, Assistant Engineer, Toronto Terminals; Apr., 1907, to Jan., 1912, Resident Engineer, Districts 1 and 4, Ontario Division, Toronto; Jan., 1912, to Jan., 1913, Engineer, Dominion Atlantic Ry., Kentville, N.S.; Jan. to July, 1913, Assistant Division Engineer, C.P.R., Montreal; July to Sept., 1913, Assistant Engineer, Eastern Lines, C.P.R., Montreal.

J. Murray Gibbon,
General Publicity Agent, Canadian Pacific Railway.

E. S. SANDS, Supervising Engineer, Department of Natural Resources, C.P.R., at Calgary, Alta., has been appointed City Engineer of Houston, Tex. He is a native of Columbia, Ohio, and graduated from the University of Wisconsin in 1900. After spending two years at the university as instructor in civil engineering, he entered the U.S. Reclamation Service, and was connected with it until 1910, preparing plans and estimates and supervising construction work on several projects. For a year he was in other service, part of the time Construction Superintendent for J. G. White & Co., and part of the time Manager of the Upper Columbia Co. He then spent another year with the U.S Reclamation Service, and since April, 1912, has been in the position he now leaves.

LAFAYETTE S. BROWN, whose appointment as Superintendent, Truro, Sydney and Oxford District, Intercolonial Ry., New Glasgow, N.S., was announced in our last issue, was born at Nelson, N.B., Oct. 19, 1864, and entered I.R.C. service, Jan. 15, 1880, since when he has been, to Dec. 20, 1881, cleaning locomotives, and machinist helper, Newcastle, N.B.; Dec. 20, 1881 to Sept. 5, 1882, shunting in Newcastle yard and learning telegraphy; Sept. 5, 1882 to Nov. 25, 1883, assistant agent, Newcastle, N.B.; Nov. 26, 1883 to Oct. 4, 1898, train dispatcher, Moncton and Ste. Flavie District, Campbellton, N.B.; Oct. 4, 1898, to Apr. 30, 1912, Chief Dispatcher, New Glasgow, N.S.; May 1, 1912, to July 31, 1913, Assistant Superintendent, Moncton and Ste. Flavie and Fredericton to Loggieville, N.B., Newcastle, N.B.

COLLINGWOOD B. BROWN, A. M. Can. Soc. C. E., who was recently appointed Chief Engineer, Canadian Government Railways, Moncton, N.B., was born at Ithaca, N.Y., Aug. 27, 1879, and graduated from Cornell University. In the summer of 1898 he was an assistant on U.S. geological survey work in New York, and in the following summer acted as topographer and instrument man on survey for the New York State College of Forestry. He entered C.P.R. service in 1901, since when he has been, draughtsman and rodman, Trail, B.C.; 1902, Assistant Engineer, Bridge Department, Montreal; Assistant Engineer in charge of erection of Red River bridge, Winnipeg, and also of the construction of the annexes to the elevators at Fort William, Ont.; 1903 to 1904, Resident Engineer, District 2, Ontario Division, London; and Resident Engineer, Toronto Terminals; 1904 to 1906, Assistant Division Engineer, Western Division, Calgary, Alta.; 1906 to 1908, Division Engineer, Atlantic Division, St. John, N.B.; 1908 to 1912, Division Engineer, Eastern Division, Montreal; 1912 to July 1913, Principal Assistant Engineer, Eastern Lines, Montreal.

GEORGE SPENCER, who has resigned from C.P.R. service, and is reported to have received an appointment from the Board of Railway Commissioners, was born in London, Eng., Feb. 21, 1865, and entered railway service, July, 1880, since when he has been, to Mar., 1881, assistant agent, Toronto, Grey and Bruce Ry., Dundalk, Ont.; Mar. to July, 1881, agent, same road, Waldemar, Ont.; July, 1881, to Oct., 1882, operator, same road, Toronto; Oct., 1882, to Nov., 1883, dispatcher, same road, Toronto; Nov., 1883, to June, 1884, dispatcher, Ontario and Quebec Ry., (which leased the T. G. & B.R.), Toronto; June, 1884, to Aug., 1887, dispatcher, C.P.R. (which took over the O. & Q.R.), Toronto; Aug., 1887, to Aug., 1889, dispatcher, C.P.R., Smiths Falls, Ont.; Aug., 1889, to Oct., 1891, dispatcher, C.P.R., Toronto; Oct., 1891, to May, 1901, Chief Dispatcher, C.P.R., Smiths Falls, Ont., and in Nov., 1892, the duties of Trainmaster were added, and in Mar., 1898, the position of Trainmaster was abolished; May, 1901, to May, 1903, Chief Dispatcher, Ontario Division, C.P.R., Toronto; May, 1903, to Nov., 1906, Superintendent, District 1, Ontario Division, C.P.R., Toronto; Nov., 1906, to Jan., 1911, Superintendent, District 1, Lake Superior Division, C.P.R., North Bay, Ont.; Jan., 1911, to Sept. 8, 1913, Superintendent, District 1, Lake Superior Division, C.P.R., Sudbury, Ont.

A. COPONY, whose appointment as Master Car Builder, Western Lines, G.T.R., Port Huron, Mich., was announced in our last issue, is a British subject, born in Vienna, Austria, in 1880, where he attended the public and high schools, and graduated from the Engineering College in 1901. From Aug., 1901, to May, 1907, he occupied positions of draughtsman, designer and Department Superintendent with machinery firms in Vienna, and as Chief Inspector, Whitehead Torpedo Works, Fiume, Hungary. He went to the United States in

May, 1907, where he entered the service of the Standard Steel Car Co., Butler, Pa., as draughtsman, and later occupied positions as assistant chief draughtsman, Motor Truck Department, and on the opening of the company's Hammond works, was transferred there, and later appointed Master Mechanic, Passenger Car Department. From Feb. to Oct., 1910, he was in charge of the tool designing for the new passenger car shops of the American Car and Foundry Co., St. Charles, Mo., and engaged in experimental work at the same company's St. Louis shops. He resigned in Oct., 1910, on his appointment as Chief Draughtsman, Car Department, Western Lines, G.T.R., and was shortly after transferred to Montreal as Chief Draughtsman, Car Department, there, which position he held to the date of his present appointment.

T. C. BURPEE, M. Can. Soc. C. E., whose appointment as Superintendent Engineer, Canadian Government Railways, Moncton, N.B., was announced in our last issue, was born at Sheffield, N.B., Dec. 11, 1852, and entered railway service in Aug. 1875, since when he has been, to Nov. 1875, chairman, New Brunswick Ry.; Nov. 1876, to Jan. 1877, levelman, same road; June 1881 to Jan. 1882, rodman, Chicago, Milwaukee and St. Paul Ry., Spirit Lake Branch, Iowa; Nov., 1884 to Jan., 1885, on survey through northern Maine, International Ry.; Aug. 1885 to Jan., 1887, rodman and Assistant Engineer on Maintenance of Way, New Brunswick Ry.; Jan. 1887 to Jan. 1, 1890, Assistant Engineer, lines in New Brunswick and Maine, C.P.R.; June to Aug. 1890, transit man on preliminary survey, Bangor and Aroostook Rd.; Aug., 1890, to Apr., 1891, chief of location party, same road; Apr. 1891 to Jan., 1896, Assistant Engineer of Construction, same road; Jan. to May, 1896, chief of location party, Woodstock and Centreville Ry., N.B.; June to Dec., 1896, Assistant Engineer in charge of construction of yard at Old Town, Me., Bangor and Aroostook Rd.; May to Aug., 1897, Assistant Engineer on canal construction, Cardinal, Ont.; Aug., 1897, to 1899, Chief Assistant Engineer, Intercolonial Ry.; July, 1899, to Aug., 1913, Engineer of Maintenance, same road, Moncton, N.B.

F. BARLOW CUMBERLAND, who died at Dunain, Port Hope, Ont., Sept. 1, was born at Portsmouth, Eng., Aug. 5, 1846. He came to Canada at an early age, and was educated at the Model School, Toronto, Cheltenham College, England, and Trinity University, Toronto, taking the B.A. degree in 1867, and M.A. in 1870. In conjunction with the late Sir Frank Smith, he founded the Niagara Navigation Co. in 1880. For some years he was in the service of the Great Western Ry., and later was Freight and Passenger Agent, Northern Ry., and Traffic Manager, Lake Superior Line Steamships, afterwards amalgamated with the C.P.R. He was responsible for placing the s.s. Campana, the first one on the route, on the Upper Lakes. This was the first vessel to be cut in two in order to pass from the ocean through the St. Lawrence Canals. For several years he conducted a ticket agency in Toronto. During 1903-04, he resided in England, where he represented the Independent Order of Foresters and was President of the Canadian Club in London. He was Vice President of the Niagara Navigation Co., up to the time of its recent absorption and was connected with several financial companies, being elected a director of the Ontario Bank by the shareholders, after the suspension in 1906. Amongst various institutions with which he was connected in an official capacity, are, the St. George's Society, Toronto University, Ontario Historical Society, National Club, Toronto, Sons of England, Trinity University, Toronto, etc. He was a captain in the 10th Royals, and served in the Fenian raid. He wrote the following books: The Northern Lakes of Canada, History of the Union Jack and Flags of the Empire, and The Navies on Lake Ontario in 1812.

JAMES ROSS, M. Can. Soc. C.E., who died at Montreal, Sept. 20, was born in Cromarty, Scotland, in 1848, and was educated in Scotland and England. He spent the early portion of his business career in Great Britain in connection with railway, harbor and water works, and went to the United States in 1868, where he was, from 1870 to 1873, Resident Engineer, and Chief Engineer, Ulster and Delaware Ry.; 1873 and subsequently, Resident Engineer, Wisconsin Central Ry.; Resident Engineer, Lake Ontario Shore Rd., and on coming to Canada, was appointed Chief Engineer, and later, General Manager, Victoria Ry. In 1878-79, he built the Credit Valley Ry., and was subsequently appointed General Manager. He was also Consulting Engineer, Ontario and Quebec Ry., and, in 1883, was in charge of the building of a portion of the C.P.R. west of Winnipeg, completing the construction of the line through the Mountain District in 1885, under the General Manager, Wm. C. Van Horne (now Sir William Van Horne.) In 1886 he was engaged with the C.P.R. location east of Montreal, and looked after the legislation regarding the C.P.R. through Maine. On the completion of this work, he undertook a contract for the remaining portion of the line not provided for, and was also interested in other important contracts elsewhere. He also built the Regina and Long Lake Ry. and the Calgary and Edmonton Ry., and, in conjunction with W. Mackenzie (now Sir William Mackenzie), purchased the Toronto Ry. from the city of Toronto, in 1892, afterwards reconstructing and electrifying it, and he was also concerned in the electrification of the street railways in St. John, Montreal and Winnipeg. He, also associated with Wm. Mackenzie, acquired the tramway system in Birmingham, Eng., and formed the City of Birmingham Tramways Co., in 1896, the system being eventually electrified and taken over by the city. He later became interested in the coal industry in Nova Scotia and obtained control of and reorganized the Dominion Coal Co., later becoming President; and he was also at one time President, Dominion Iron and Steel Co., and between these two companies there was a few years ago a series of disputes, involving a long litigation, which terminated in favor of the former and the practical amalgamation of the two concerns. In 1897, with Wm. Mackenzie, he secured a charter from the Government of Jamaica, for the construction of electric railways on the island. Amongst other companies with which he has been associated in various official capacities are: Mexican Light, Heat and Power Co., Montreal St. Ry. (now Montreal Tramways Co.), Toronto Ry., Montreal Light, Heat and Power Co., St. John Ry., Winnipeg Electric Ry., Dominion Bridge Co., Canadian General Electric Co., Montreal Rolling Mills (now Steel Co. of Canada), Royal Trust Co., Ontario Electrical Development Co., Lake of the Woods Milling Co., Columbia River Lumber Co., Canada Land and Investment Co., etc. He was also interested in the Montreal Art Association, and presented the Ross Memorial Hospital to Lindsay, Ont., besides subscribing liberally to other similar institutions in Montreal and elsewhere. His favorite recreation was yachting, and he only recently returned to Montreal from a cruise in the Mediterranean. He was Commodore of the Royal St. Lawrence Yacht Club and Hon. Lieut.-Col. of the Duke of York's Royal Canadian Hussars.

Discipline of Canadian Government Railways.

F. P. Gutelius, General Manager, issued the following circular Sept. 1.:—"Commencing this date, discipline will be administered as under: It is the intention to insist on a more rigid compliance with the rules and regulations, which are made for the protection of the lives of the public and employes, as well as for the protection of the railway's property. All employes will start with a clean record, beginning this date. Any exceptional service rendered will be credited to the employe's record. A monthly discipline list will be issued. This list will show cause, extent of discipline, or action and extent of reward. Employes will, as heretofore, be subject to summary dismissal for insubordination, drunkenness on or off duty, using intoxicating liquor when on duty, frequenting saloons, or places of low repute, incompetency, dishonesty, failing to carry out train orders and rules respecting train movement. Where previously discipline was meted out by suspension, demerit marks will be placed in the record of an employe. For every repetition of an offence by the employe, the number of demerit marks will be doubled. When the demerit marks against any employe number 60, his services will be dispensed with. For every 12 consecutive months, good service, free from demerit marks, an employe will have 20 demerit marks deducted from those that may stand against his record. Employes will be advised when demerit marks are recorded against them, the same as they have hitherto been advised respecting disciplinary measures in the past."

Department of Railways and Canals, Canada.

Welland Ship Canal.
Section No. 2.

NOTICE TO CONTRACTORS.

SEALED TENDERS, addressed to the undersigned and marked "Tender for Section No. 2 Welland Ship Canal," will be received at this office until 12 o'clock noon on Wednesday, October 15th, 1913.

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

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

Parties tendering will be required to accept the fair wages schedule prepared or to be prepared by the Department of Labour, which schedule will form part of the contract.

Contractors are requested to bear in mind that tenders will not be considered unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signature, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque on a chartered bank of Canada for the sum of $150,000.00, made payable to the order of the Minister of Railways and Canals, must accompany each tender, which sum will be forfeited if the party tendering declines entering into contract for the work at the rates stated in the offer submitted.

The cheque thus sent in will be returned to the respective contractors whose tenders are not accepted.

The cheque of the successful tenderer will be held as security, or part security, for the due fulfilment of the contract to be entered into.

The lowest or any tender not necessarily accepted.

By order,

L. K. JONES,
Asst. Deputy Minister and Secretary.

Department of Railways and Canals,
Ottawa, 22nd September, 1913.

Newspapers inserting this advertisement without authority from the Department will not be paid for it.—48056.

Railway Rolling Stock Notes.

The Quebec Oriental Ry. has ordered one snow plough from the Canadian Car and Foundry Co.

The Canadian Northern Ry. has ordered three snow ploughs from the Canadian Car and Foundry Co.

The Toronto, Hamilton and Buffalo Ry. has received one rebuilt official car, from the Preston Car and Coach Co.

The Intercolonial Ry. has ordered 250 box cars, 60,000 lbs. capacity, from Canadian Car and Foundry Co.

The Canadian Locomotive Co. has delivered 2 consolidation locomotives to the Canadian Northern Ry., and 2 ten wheel locomotives to the C.P.R.

The G.T.R. has ordered 3 steel mail cars from American Car and Foundry Co., and has received 19 Mikado locomotives, 62 ins. wheel, from Baldwin Locomotive Works.

The G.T. Pacific Ry. has received 20 cabooses, nos. 390120 to 390139, from G.T.R. car shops, Montreal, and 6 dining cars, nos. 4006 to 4011, and 5 tourist cars, nos. 3410 to 3414, from Pullman Co.

The Mond Nickel Co., Coniston, Ont., has ordered one mogul switching locomotive, type 2-6-0, cylinders 20 by 26 ins., 59 ins. driving wheels, 156,000 lbs. total weight in working order, from the Montreal Locomotive Works.

The Corbin Coal and Coke Co., Spokane, Wash., associated with the Eastern British Columbia Ry., has ordered one rotary snow plough, with 17 by 22 ins. cylinders and 10 ft. 7 ins. cut scoop wheel, from the Montreal Locomotive Works.

The Canadian Car and Foundry Co. has received orders for 17 single track snow plough frames and 9 double track snow plough frames, from the C.P.R.; 3 standard snow ploughs from the Canadian Northern Ry., and 1 snow plough from the Quebec Oriental Ry.

The Intercolonial Ry. has received 233 box cars, 60,000 lbs. capacity, and 48 platform cars, from Canadian Car and Foundry Co.; 3 baggage cars from the Preston Car and Coach Co.; 110 box cars from the Nova Scotia Car Works; 25 automobile box cars from its Moncton shops, and 3 sleeping and 2 dining cars, from Pullman Co.

The C.P.R., between Aug. 4 and Sept. 13, ordered the following rolling stock from its Angus Shops,—11 stock cars, 8 freight refrigerator cars, 2 ballast cars, 6 vans, 3 wedge ploughs, 5 flangers, 5 single track flangers, 5 double track flangers, and 16 single track snow ploughs, and 9 double track snow ploughs, from its Angus Shops and the Canadian Car and Foundry Co.

The Canadian Northern Ry., between Aug. 16 and Sept. 15, received the following additions to rolling stock,—8 cabooses from its Winnipeg Shops; 4 second class cars and 60 stock cars from the Crossen Car Co., Ont.; 218 box cars from the Nova Scotia Car Works; 20 box cars and 100 flat cars from the National Steel Car Co.; 60 refrigerator cars and 35 vans from the Mount Vernon Car Co.; 5 switching locomotives from the Canadian Locomotive Co.; 1 consolidation locomotive from Canadian Allis-Chalmers, Ltd.

The C.P.R. between July 31 and Sept. 13, received the following additions to rolling stock,—563 box cars, 13 stock cars, 95 vans, 5 suburban cars, 10 box baggage cars, 1 tourist car, 8 baggage and express cars, 8 class U3 locomotives, 4 class V3 locomotives, from its Angus Shops; 1,527 box cars, 59 steel flat cars, 2 pit cars and 3 first class cars, from the Canadian Car and Foundry Co.; 200 steel frame box cars from the National Steel Car Co.; 8 Jordan spreaders and 2 Industrial wrecking cranes, from F. H. Hopkins and Co.; 40 class P1 locomotives from the Montreal Locomotive Works; 2 class D10 locomotives from the Canadian Locomotive Co.; 741 steel frame box cars and 10 sleeping cars, from Barney and Smith Car Co.; 5 dining cars from the Pullman Co.; and 2 wrecking cranes from the Bucyrus and Industrial Cos.

Following are chief details of the scoop wheel rotary snow plough with 10 ft. 7 ins. cut, which the Corbin Coal and Coke Co. is having built by Montreal Locomotive Works:—

Cylinders	17 by 22 ins.
Wheel base, trucks	4 ft. 6 ins.
Wheel base, total	19 ft. 8½ ins.
Weight in working order	148,140 lbs.
Weight on front truck	79,800 lbs.
Weight on back truck	68,340 lbs.
Boiler, type	Belpaire.
Boiler, diar. first ring	60 ins.
Boiler, pressure	190 lbs.
Firebox	92 by 50.
Tubes, no. and diar.	202—2 ins.
Tubes, length	9ft. 8 ins.
Heating surface, tubes	1,022.32 sq. ft.
Heating surface, firebox	109 sq. ft.
Heating surface, total	1,131.32 sq. ft.
Grate area	32.63 sq. ft.
Wheels, type	Steel tired.
Wheels, diar.	33 ins.
Journals	5½ by 10 ins.
Brake	Westinghouse.
Truck, type	Four wheel.
Grate, type	Cast iron rocking bars.

Following are chief details of the mogul switching locomotive, type 2-6-0, which the Mond Nickel Co. is having built by Montreal Locomotive Works:—

Cylinder	20 x 26 ins.
Tractive power	31,820 lbs.
Factor of adhesion	4.4.
Wheel base, driving	11 ft. 6 ins.
Wheel base, total	19 ft. 3½ ins.
Wheel base, engine and tender	50 ft. 2 ins.
Weight on drivers	140,000 lbs.
Weight on engine truck	16,000 lbs.
Weight, engine and tender	258,000 lbs.
Boiler, type	Straight top.
Boiler, diar. first ring	72 ins.
Boiler, pressure	180 lbs.
Firebox	108 by 41¾ ins.
Crown staying	Radial.
Tubes, no. and diar.	311—2 ins.
Tubes, length	11 ft.
Heating surface, tubes	1,778 sq. ft.
Heating surface, firebox	175 sq. ft.
Heating surface, total	1,953 sq. ft.
Grate area	31 sq. ft.
Wheels, outside diar.	50 ins.
Wheels, kind	Cast iron.
Truck wheels, diar.	30 ins.
Tender wheels, diar.	33 ins.
Journals	9 by 12 ins.
Engine truck journals	6½ by 12 ins.
Tender truck journals	5 by 9 ins.
Journal boxes	Cast iron.
Brakes	Westinghouse American.
Truck, type	Two wheel with swing centre.
Tank, type	U shape sloping top.
Capacity, water	5,000 U.S. galls.
Capacity, coal	8 tons.

Grand Trunk Pacific Railway Inspection.—The annual inspection trip over the system was recently made by A. W. Smithers, Chairman of the Board, London, Eng.; E. J. Chamberlin, President; W. Wainwright, Vice President, and W. M. Macpherson, director. About three weeks was spent in going over the line to the end of steel, stoppage being made at important points to study the country with a view to future developments.

The Board of Railway Commissioners has amended its recent order fixing the express delivery and collection limits for Steelton, Sault Ste. Marie, Ont., by extending the free area to include the triangular portion bounded by Wellington St., John St. and Cathcart St., and on both sides of Wellington St., from John St. to Hudson St.

The Canadian Northern Ex. Co. has opened offices at Lundar, Man., and Dummer and Hearne, Sask.

The Canadian Pacific Railway's Tunnel at Rogers Pass, B.C.

In connection with the building of a second track on the C. P. R., between Calgary, Alta., and Vancouver, B. C., a contract has been let, as stated in a previous issue, to Foley, Welch and Stewart, for the building of a tunnel, about five miles long, at Rogers Pass, B. C. The eastern portal of the tunnel will be at mileage 80.5, and the western portal at mileage 85.5, Mountain Subdivision, and in addition to the boring of the tunnel, the contract calls for the construction of 11.1 miles of double track line approaching the eastern portal, and 2.3 miles of double track line approaching the western portal. This work will reduce the height of the summit at which the line crosses the Selkirks by 537 ft.; will eliminate 4.25 miles of distance, and 2,500 degrees of curvature, and on 15 miles of track the gradient will be reduced from 2.2% to 1% or less. The use of about 4.5 miles of snowsheds will be obviated.

A. C. Dennis, who is in charge of the work for the contractors, states that nothing will be don in the way of starting work on the approaches to the tunnel this year. The camps at the tunnel portals have been erected, and the machinery for boring the tunnel is being delivered and set up.

The tunnel, which will be on a tangent throughout its entire length, will be on a 0.93% gradient ascending west, and will be a single one, carrying a double track 30 ft. wide by 20 ft. high. A new method of construction has been adopted for boring the tunnel. Instead of boring simply from the two ends, it has been decided to bore a pioneer tunnel 7 by 8 ft., parallel with the main tunnel, and cross cut at short intervals, so as to enable several headings to be worked simultaneously.

In boring the Canadian Northern Ry. tunnel under Mount Royal at Montreal, two shafts have been sunk from the ground level nearly 300 ft. in depth to the tunnel level. From these shafts the headings are driven in each direction, and on completion of the tunnel the shafts will be used for ventilating purposes. This method of working is always adopted in driving long tunnels, where the height from the top of the tunnel to the ground level is not too great. In the case of the Rogers Pass tunnel the height of the mountains through which it is to be driven precludes the possibility of vertical shafts being used. The pioneer tunnel will aid in the ventilation of the railway tunnel during its construction. The boring of the pioneer tunnel has been started, and the first cross cuts will be made when these have been driven about 2,000 ft. It is estimated that this part of the work will have been completed by Dec. 31. The plant for boring the tunnels is estimated to cost about $500,000. Mr. Dennis estimates that about 30 ft. of boring will be done per day, and that it will take about three years to complete the bore, from which about 250,000 cubic yards of material will be taken out through the pioneer tunnels.

The contractors are erecting model villages at the two portals of the tunnel, at a cost of $50,000. The floors of the buildings at Glacier are to be 8 ft. above the ground level, with bridges to connect the houses with the work. The buildings were designed by W. S. Painter, of Vancouver.

Dominion Railway Subsidy Agreement.—The Dominion Government, Aug. 25, entered into an agreement with the Tobique and Campbellton Ry. granting aid in the construction of a line from Plaster Rock to Riley Brook, N.B., 28 miles.

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 announcement will confer a favor by advising us.

Algoma Central and Hudson Bay Ry.—See Lake Superior Corporation.

Algoma Eastern Ry.—See Lake Superior Corporation.

Board of Railway Commissioners.—GEORGE SPENCER, heretofore Superintended, District 1, Lake Superior Division, C.P.R., Sudbury, Ont., is reported to have been appointed to a position under the Board of Railway Commissioners, at Winnipeg.

Boston and Albany Rd.—H. M. BRISCOE, heretofore Traffic Manager, has been appointed Vice President, vice J. H. Hustis, resigned. Office, Boston, Mass.

Canadian Government Railways.—R. W. SIMPSON, heretofore on the General Superintendent's staff, has been appointed General Fuel Agent. Office, Moncton, N.B.,

R. A. KLOCK has been appointed General Tie and Timber Agent. Office, Moncton, N.B.

O. CAMERON, heretofore Freight Claim Agent, Intercolonial Ry., has been appointed Freight Claim Agent, Canadian Government Railways. Office, Moncton, N.B.

G. A. FERNLEY, heretofore Soliciting Freight Agent at Toronto, has been appointed Commercial Agent at Montreal.

In our August issue it was stated that E. TIFFIN, heretofore General Traffic Manager at Moncton, N.B., had been assigned to other duties in Toronto. It should have been stated in the September issue, that he had been appointed General Western Agent, at Toronto, in charge of territory in Ontario, west of Kingston and Sharbot Lake.

See also Intercolonial Ry. and Prince Edward Island Ry.

Canadian Pacific Ry.—Press reports stated recently, that GEO. H. HAM, who has been in charge of the Publicity Department for a number of years, at Montreal, has been promoted to a position in the President's office, and would in future devote himself entirely to attending to the company's interests at Ottawa. Mr. Ham has been attached to the President's office for many years. He has retired from the Publicity Department, and is continuing the other work which he has been doing for years at Ottawa and elsewhere, but he will not devote himself entirely to representing the company at Ottawa, and his headquarters will remain at Montreal.

W. H. STEWART, heretofore Assistant Superintendent, District 4, Eastern Division, Ottawa, Ont., has been appointed Assistant Superintendent, District 1, Eastern Division, vice R. W. McCormick, promoted. Office, Farnham, Que.

G. G. GAGNON has been appointed Car Foreman at Hochelaga, Que., vice E. H. Wood, transferred.

R. W. McCORMICK, heretofore Assistant Superintendent, District 1, Eastern Division, Farnham, Que., has been appointed Superintendent, District 3, Eastern Division, vice A. L. Smith, transferred to Lake Superior Division. Office, Montreal.

M. A. FULLINGTON, A.M. Can. Soc. C.E., heretofore Assistant Engineer, Eastern Lines, Montreal, has been appointed Assistant Superintendent, District 4, Eastern Division, vice W. H. Stewart, transferred. Office, Ottawa, Ont.

A. DOBSON has been appointed Storekeeper at Havelock, Ont., vice W. J. Flynn, transferred to Lambton, Ont.

W. MAUGHAN, heretofore City Passenger and Ticket Agent, Toronto, has been appointed Assistant District Passenger Agent there. This is a new position.

T. MULLINS, heretofore Assistant City Passenger and Ticket Agent, Toronto, has been appointed City Passenger Agent there.

G. S. BEER, heretofore chief clerk, City Ticket Office, Toronto, has been appointed City Ticket Agent there.

E. H. WOOD, heretofore Car Foreman at Hochelaga, Que., has been appointed Division Car Foreman, Ontario Division, vice F. E. Warren, promoted. Office, Toronto.

W. J. FLYNN, heretofore Storekeeper at Havelock, Ont., has been appointed Storekeeper at Lambton, Ont., vice J. D. Fairbairn.

A. L. SMITH, heretofore Superintendent, District 3, Eastern Division, Montreal, has been appointed Superintendent, District 1, Lake Superior Division, vice Geo. Spencer, resigned. Office, Sudbury, Ont.

G. S. LYTLE, heretofore Inspector of Transportation, Winnipeg, has been appointed Car Service Agent, Manitoba Division, vice F. Walker, transferred. Office, Winnipeg.

W. R. Devenish, A.M. Can. Soc. C.E.
Division Engineer, Intercolonial Railway.

W. THOMAS, heretofore chief clerk to General Superintendent, Alberta Division, Calgary, is reported to have been appointed chief clerk to Superintendent of Motive Power, Western Lines, Winnipeg.

F. E. WARREN, heretofore Division Car Foreman, Toronto, has been appointed General Car Foreman, Winnipeg, vice T. G. Armstrong, promoted.

C. S. MAHARG, heretofore Superintendent of Terminals, Calgary, Alta., and who has been on sick leave for some time, has been appointed Superintendent, District 3, Manitoba Division, vice J. A. Macgregor. Office, Brandon.

S. LENARD, heretofore Locomotive Foreman at Arcola, Sask., has been appointed charge hand at Reston, Man.

R. WALKER has been appointed Locomotive Foreman at Arcola, Sask., vice S. Lenard, assigned to other duties.

J. C. PIKE, heretofore Travelling Passenger Agent, has been appointed chief clerk, District Passenger Agent's office, Regina, Sask.

A. G. BROOKER, heretofore Travelling Passenger Agent, Calgary, Alta., has been appointed Travelling Passenger Agent, Regina, Sask., vice J. C. Pike, transferred.

C. D. MACKINTOSH, A.M. Can. Soc. C.E., heretofore Engineer of Construction, Moose Jaw, Sask., has been appointed Division Engineer, Saskatchewan Division, vice T. Martin, transferred. Office, Moose Jaw.

T. MARTIN, heretofore Division Engineer, Saskatchewan Division, Moose Jaw, has been appointed Engineer of Construction, Sask., vice C. D. MacKintosh, transferred.

C. H. BALL, Winnipeg, is reported to have been appointed Chief of Special Service Department, Saskatchewan Division, Moose Jaw, vice H. Wunderling, transferred.

F. WALKER, heretofore Car Service Agent, Manitoba Division, Winnipeg, has been appointed Car Service Agent, Alberta Division, Calgary, vice F. T. Anderson, on leave.

E. HUMPHRYS, chief clerk to Superintendent of Motive Power, Western Lines, Winnipeg, has been appointed Fuel Agent, Calgary, Alta., vice A. Allan, at present on leave of absence, but who will, on his return, be assigned to other duties.

C. A. COTTERELL, heretofore Trainmaster, Vancouver, B.C., has been appointed Superintendent, District 2, British Columbia Division, vice G. E. Graham, resigned, as reported in our last issue. Office, Vancouver.

W. P. MARTIN, heretofore Wharf Agent, Vancouver, B.C., has been appointed Trainmaster in charge of Vancouver Terminals, with jurisdiction extending east to Cambridge St., vice C. A. Cotterell, promoted, as reported in our last issue.

J. ABRAMS has been appointed Wharf Agent at Vancouver, B.C., vice W. P. Martin, promoted.

H. WUNDERLING, heretofore Chief of Special Service Department, Saskatchewan Division, Moose Jaw, has been appointed to a similar position for the British Columbia Division. Office, Vancouver.

The position of Advertising Agent at London, Eng., formerly held by J. M. Gibbon, w-ho has been appointed General Publicity Agent, Montreal, has been abolished, the duties formerly undertaken by him, now being conducted in the European Manager's office, with E. C. GILL in charge.

Central Vermont Ry.—E. DESCHENES, Jr., has been appointed Auditor, vice W. G. Crabbe, deceased. Office, St. Albans, Vt.

Grand Trunk Pacific Ry.—G. W. ROBB, heretofore Master Mechanic, has been appointed Superintendent of Motive Power, and the title of Master Mechanic has been abolished. Office, Transcona, Man.

D. W. HAY, heretofore Assistant Locomotive Foreman at Wainwright, Alta., has been appointed Locomotive Foreman at Redditt, Ont., vice A. J. Roberts, transferred.

C. E. BROOKS, heretofore Locomotive Foreman at Wainwright, Alta., has been appointed Locomotive Foreman at Edmonton, Alta., vice W. W. Yeager, transferred.

W. W. YEAGER, heretofore Locomotive Foreman at Edmonton, Alta., has been appointed Locomotive Foreman at Wainwright, Alta., vice C. E. Brooks, transferred.

A. J. ROBERTS, heretofore Locomotive Foreman at Redditt, Ont., has been appointed Locomotive Foreman at Edson, Alta., vice A. H. Mahan, transferred.

A. H. MAHAN, heretofore Locomotive Foreman at Edson, Alta., has been appointed Locomotive Foreman at McBride, B.C.,

vice A. McTavish, assigned to other duties.

The following agents have been appointed:—Ingelow, Man., F. D. Livingstone; Spy Hill, Sask., A. G. Redford; Wakaw, Sask., J. H. Lewis; Bashaw, Alta., F. S. Benyon; Trochu, Alta., D. C. McCready.

Grand Trunk Ry.—K. F. NYSTROM has been appointed Chief Draughtsman, Car Department, Montreal, vice A. Copony, appointed Master Car Builder, Western Lines, at Port Huron, Mich.

T. CUSHING, heretofore Trainmaster, Richmond, Que., has been appointed Chief Dispatcher, Districts 6 and 7, Belleville Division, vice C. F. French, assigned to other duties.

C. F. FRENCH, heretofore Chief Dispatcher, Districts 6 and 7, Belleville Division, Belleville, Ont., has been appointed a dispatcher there.

The following agents have been appointed:—St. Lambert, Que., F. Crane; Howick, Que., J. E. Birtz; Newtonville, Ont., F. S. Allin; Pickering, Ont., P. C. Brown; Belle River, Ont., R. D. Ralston; Rock Lake, Ont., W. J. McCourt; Essex, Ont., outside, S. Sadler; Parry Sound, Ont., outside, H. P. Foot.

Intercolonial Ry.—J. C. FULMORE, Roadmaster, Halifax to Stellarton District, Truro, N.S., is reported to have been appointed Roadmaster, Sydney to Point Tupper District, at Sydney, N.S., vice W. P. Mills.

C. W. ARCHIBALD, Resident Engineer, Oxford to Sydney District, New Glasgow, N.S., is reported to have been appointed Roadmaster, Halifax to Stellarton District, at Truro, N.S., vice J. C. Fulmore, transferred.

A. H. SOMERS, Roadmaster, Point du Chene to St. John District, Moncton, N.B., is reported to have been transferred to the portion of the National Transcontinental Ry., between Moncton and Edmundston, N.B, which is being operated by the I.R.C.

T. McPHERSON, General Roadmaster, Moncton, N.B., is reported to have been appointed Roadmaster, Point du Chene to St. John District, Moncton, N.B., vice A. H. Somers, transferred.

G. COOPER, acting Roadmaster, Painsec Jct., N.B., to Truro, N.S., District, Moncton, N.B., is reported to have been appointed Roadmaster there.

See also Canadian Government Railways.

Lake Superior Corporation.—I. L. GODFREY, heretofore in Audit Department, Hocking Valley, Ry., Columbus, Ohio, has been appointed Comptroller, Algoma Central and Hudson Bay Ry., Algoma Eastern Ry., British America Express Co., Algoma Central Terminals, Ltd., Algoma Eastern Terminals, Ltd., Superior Rolling Stock Co., Cannelton Coal and Coke Co., Lake Superior Coal Co., International Transit Co., and Trans St. Marys Traction Co. Office, Sault Ste. Marie, Ont.

E. B. BARBER, heretofore Comptroller, Lake Superior Power Co., has been appointed Assistant Comptroller of the companies mentioned in the preceding paragraph. Office, Sault Ste. Marie, Ont.

Michigan Central Rd.—W. O. HOUSTON, heretofore Division Engineer, St. Thomas, Ont., has been appointed Division Engineer, Jackson, Mich., with jurisdiction over Grand Rapids, South Haven and Allegan Divisions, and main line from westerly limits of the Detroit Yards to easterly limits of Niles Yard.

S. D. WILLIAMS, Jr., heretofore acting Division Engineer, Niles, Mich., has been appointed Division Engineer, St. Thomas, Ont., vice W. O. Houston, transferred.

Northern Pacific Ry.—W. P. CLOUGH, heretofore Vice President, has been appointed Chairman of the Board. This is a new position.

J. M. HANNAFORD, heretofore Second Vice President, has been appointed President, (and also elected a director), vice H. Elliott, resigned.

G. T. SLADE, heretofore Third Vice President, has been appointed Vice President, vice W. P. Clough.

Pere Marquette Rd.—D. CROMBIE, heretofore General Superintendent of Transportation, G.T.R., Montreal, has been appointed for special work in the General Manager's office, P.M.R., Detroit, Mich. No official position has, as yet, been assigned to him.

G. W. COOK, heretofore Machine Shop Foreman, has been appointed acting Shop Superintendent, St. Thomas, Ont., vice W. G. Griffith, Shop Superintendent, promoted.

J. WILSON, heretofore blacksmith, has been appointed Foreman Blacksmith at St. Thomas, Ont., vice J. H. Tanner, who has left the service.

W. G. GRIFFITH, Shop Superintendent, St. Thomas, Ont., has been appointed Master Mechanic, Saginaw, Mich., vice S. A. Chamberlin.

Prince Edward Island Ry.—W. T. HUGGAN. heretofore Accountant and Auditor, has been appointed Divisional Accountant

L. S. Brown,
Superintendent, Truro, Sydney and Oxford District, Intercolonial Ry.

and District Passenger Agent. Office, Charlottetown.

A. McDONALD, heretofore chief clerk to Superintendent, Charlottetown, has been appointed Division Freight Agent there.

See also Canadian Government Railways.

Canadian Locomotive Company's Annual Report.

The report for the year ended June 13 shows manufacturing profits for the year of $377,043.25, compared with $294,323.14 for 1912. The income from investment bonds was $19,842.77. The manufacturing profits and income from investments total $396,886.02, which has been disposed of as follows:—Bond interest, $90,000.00; preferred stock dividend, $105,000.00; adjustment of sundry accounts and loss on investment bonds sold, $12,623.82; transferred to reserve for depreciation, $50,000.00; transferred to reserve for special replacements, $25,000.00; balance to credit of profit and loss, $114,262.20.

There now stands at the credit of profit and loss account $210,410.50, and at credit of reserve account, $100,000, an accumulation out of profits of $310,410.50 in two years of operation. The increase in profits over the previous year is accounted for by the increased output due to the enlargements of the works which have been under course of construction for the past year. At present the output has reached 12 locomotives a month, double what the works were capable of when this company came into possession, and it is expected before the end of the present fiscal year that this output will be increased to at least 18 locomotives a month.

The cost of additions to plant for the year amounts to $488,222.58, the funds for which have been provided by the sale of $335,244.39 of the company's investment bonds, and the balance has come out of cash from accumulated profits. Last year's report alluded to the difficulties of manufacturing whilst construction work was going on. Full efficiency from our plant cannot be expected until this work is completed.

The difficulty of housing workmen is still present, but it has been largely overcome by the erection of a block of workmen's houses by a company which the General Manager promoted.

Grand Trunk Railway Smoke Consumers.

The G.T.R. has been experimenting for some time with smoke consumers for application to locomotives, and has so far met with sufficient success to warrant the equipping of all the yard locomotives at Windsor, Ont., as well as a few others at different points on the system. The type used is very similar to the ones in use by railways in Chicago, where an anti smoke campaign has compelled the railways to use some device that will materially reduce the smoke. Along the side of the firebox, from 16 to 18 ins. above the fire, there are eight 2 in. tube openings through the water leg, 4 on each side. On the outside, back from the side sheet about 5 ins., are small steam jets, one for each opening, located in such a position that the jet at the point of entering the tube completely fills the latter, creating a strong draught, carrying in a volume of air over top of the fire. The brick arch in the front of the fire is built lower than usual, so that the air brought in through these side openings mixes thoroughly with the smoke in the firebox immediately after it is given off from the bed of coals. With a bright fire burning, the smoke is almost completely consumed. In a demonstration which the writer witnessed, several shovels of coal were thrown on a bright fire, resulting in dense smoke being given off. Turning on the steam through these side jets reduced the smoke almost instantaneously, so that the vapor given off at the stack was just slightly colored. The results of the experiments have been so successful that it is not at all unlikely the yard locomotives all over the system will be so equipped. The road locomotives may likewise be so equipped, but the advantages accruing are not considered to be as great as in yard locomotives, where the question of smoke in the atmosphere is of considerable importance to the community.

The G.T.R. is also experimenting with a circular blower in the stack, it consisting of a pipe hoop with holes in the upper side, so placed as to form a draught cone over the exhaust pipe. This is to replace the bent pipe construction heretofore in use. The draught given by the new type is very uniform.

Minneapolis, St. Paul and Sault Ste. Marie Railway Company's Annual Report.

Following are extracts from the report for the year ended June 30, of this company, which is a subsidiary of the C.P.R. The gross earnings, expenses, fixed charges and surplus income are shown in condensed form as follows:

	Soo Line	Chicago Division	Soo Line System
Gross earnings	$21,410,672.03	$10,893,990.47	$32,304,662.50
Operating expenses	12,096,214.80	7,208,299.24	19,304,514.04
Net earnings	$9,314,457.23	$3,685,691.23	$13,000,148.46
Income from other sources	871,051.19	49,038.70	920,089.89
Total income	$10,185,508.42	$3,734,729.93	$13,920,238.35
Fixed charges, taxes, etc.	4,658,092.94	2,641,379.47	7,299,472.41
Surplus income	$5,527,415.48	$1,093,350.46	$6,620,765.94

The substantial increase in gross earnings, while partially due to the unusual grain crop of 1912, reflects also the growth and general prosperity of the northwest, including the Canadian northwest and the settlement of the territory adjacent to the company's lines. Three years since, the Soo Line built a line into the Cuyuna Iron Range, located in Aitkin and Crow Wing Counties, Minn. A dock was built at Superior, Wis., to handle ore from this range to lake vessels. The first shipments were made in 1912 and aggregated about 300,000 tons. This season's shipments will be approximately 1,000,000 tons, and next season, unless the iron industry is seriously disturbed, 3,000,000 tons are expected. It is doubtful if any iron range has shown a more rapid development.

The company has in course of construction 85 miles of additional main track extending from Ambrose, N.D., west, which will be completed in time to move this season's crop. Additional mileage at this time is not contemplated and will not be until improved financial conditions prevail, or the attitude of the public, as expressed through its various avenues of political activities, assures more reasonable treatment of transportation companies.

Construction of freight terminals in Chicago is progressing satisfactorily and will be completed by Jan. 1, 1914. Funds for the construction of this terminal were fully provided at the initiation of the project. The completed property will be equal, if not superior, to any freight terminal of its size in Chicago. During the year, at a cost of $240,000, this company acquired 2,400 shares of the Belt Ry. Co. of Chicago, thus placing it on a parity with the 12 other lines interested in that company. The Belt Ry. Co. operates extensive switching lines in Chicago. The advantages of thus securing direct connection with the numerous industries adjacent to the Belt Co.'s tracks are obvious.

The consistent growth of the company's business and the more rigid exactions of the public for improved facilities and safety devices require from year to year larger expenditures for additions and betterments to the property, expansion of its shop facilities and liberal additions to its equipment. Over $1,200,000 were expended during the year for additions and betterments. Extensive additions at the principal shops, located at Shoreham, are in progress.

By means of an equipment trust arrangement aggregating $3,806,657.19, issued Jan. 1, 1913, the equipment was increased to the extent of 25 locomotives, 49 steel passenger cars of various classes, 1,700 freight cars, 300 ore cars, 20 caboose cars and 200 ballast cars. In accordance with the company's well established policy, its property and equipment has been maintained to yield its full working efficiency.

General conditions which obtain throughout the northwest at this time seem to assure a satisfactory tonnage during the current year.

Lake Superior Corporation's Annual Report.

Following are extracts from the report for the year ended June 30:—From the operations of all of the subsidiary companies, subject to deductions, $2,514,221.31. Following are the deductions:—Interest on bonds of subsidiary companies, and on bank and other advances, etc., $1,101,825.45; amounts set aside for sinking fund payments, etc., $102,511.64; paid to Lake Superior Corporation by subsidiary companies as interest on bonds and advances, and as dividends on stocks held by it, $793,148.31; balance of profits undistributed carried forward, $516,735.91. The volume of business has been fully maintained, and in view of the results of the year's operations, and of the continued satisfactory outlook, your directors feel warranted in again paying the full interest on the income bonds for the year.

ALGOMA STEEL CORPORATION.—The mills have been in continuous operation throughout the year. The output as compared with the preceding year is as follows:—

	1911-12.	1912-13.
Pig iron	258,979 tons	326,073 tons
Steel rails	241,729 "	289,343 "
Merchant mill material.	39,466 "	26,295 "

The production of pig iron and steel rails is the largest yet attained. The blast furnaces have produced in excess of expectations. In the early part of the year the rail and blooming mills were closed down for two weeks to permit of the installation of blooming and rail mills of greater capacity. This work was satisfactorily accomplished within the time indicated, and the result has been a largely increased production of steel rails. It is estimated that with further slight improvements, which are in hand, the production next year will rise to 1,200 tons of rails per day. Owing to the necessity for diverting most of the steel made to the rail mill, the operation of the merchant mills has been confined to railway material.

ALGOMA CENTRAL AND HUDSON BAY Ry.—Your directors have again to intimate increased earnings for the year. Since the last report the railway has been completed to its connection with the C.P.R., and there are now in operation 195.3 miles, in addition to the Michipicoten and Magpie branches. There is under construction the railway northward from the C.P.R. to the National Transcontinental Ry., an additional 101 miles. Grading on this section has been completed, all track laid, and 59 miles have been partially ballasted. The entire construction should be finished, and the railway ready for operation by the end of the year, when the total main line mileage will be 296.3 miles, with branch lines 37.40, making altogether 333.7 miles. The Algoma Central Ry., when completed, will connect with the Canadian Pacific, Canadian Northern and National Transcontinental Railways. These connections should prove to be of very great benefit to the company. To ensure still further the success of the operations, and to secure independence in the matter of freight rates, the company has purchased two steamers, each of 5,500 tons capacity, for the purpose of ore carrying, and from these very satisfactory results are now being obtained. During the year funds were also provided through a subsidiary company—Algoma Central Terminals, Ltd.—to provide the railway with complete terminal facilities. At Sault Ste. Marie new yards, round house and repair shops of the most modern type have been built, and a coal dock of 100,000 tons capacity a year is in course of construction.

ALGOMA EASTERN RY.—The results as compared with the preceding year show an improvement. Full benefit cannot be derived until this railway is completed and the whole line in operation. The work has been finished with the exception of the swing bridge at Little Current, the completion of which has been delayed on account of non delivery of the structural steel, but the company has a definite promise from the contractors that the bridge will be finished by the end of October. Full provision has been made in the matter of equipping this railway with all terminal facilities and docks at Little Current. The work in connection with these is still under way, and the coal dock in particular will be in readiness for the opening of navigation next year. It is expected that considerable business will be handled over this dock in view of the large coal consumption of the nickel and paper industries in the neighborhood.

INTERNATIONAL TRANSIT CO.; Trans St. Mary's Traction Co.—Both companies report that their earnings have been maintained. Within recent months the International Transit Co. has extended its lines to Bellevue Park. This park has just been opened by the city of Sault Ste. Marie, and should prove a source of increased revenue to the company.

GENERAL.—Throughout the year the corporation has continued its policy of assisting each subsidiary company to develop and strengthen its resources, and in pursuance of this policy the Algoma Steel Corporation has been enabled to acquire a large Pocohontas coal property, which is now operating through the Lake Superior Coal Co. As the Steel Corporation uses equal quantities of Pocohontas and Cannelton coal for coking purposes, and as it already owns and operates the Cannelton Coal and Coke Co., it now has all it requires so far as this particular raw material is concerned.

The necessity of developing the steel plant so as to keep pace with the increasing demand consequent upon the growth of Canada is being kept in view.

London St. Ry.—Gross earnings for August, $28,962.45; expenses $19,661.15; net earnings $9,301.30; deductions $2,450; net income $6,851.30, against $27,551.52 gross earnings; $18,071.52 expenses; $9,480 net earnings; $2,450 deductions; $7,030 net income, for August, 1912. Aggregate gross earnings for eight months ended Aug. 31, $216,802.44; expenses $154,504.95; net earnings $62,072.49; deductions $19,426.84; net income $42,645.65, against $197,565.29 aggregate gross earnings; $138,285.20 expenses; $59,280.09 net earnings; $19,268.50 deductions; $40,011.59 net income, for same period 1912.

Government Grain Elevators in Western Canada.—The Dominion Government has awarded contracts for the construction of one grain elevator at Moose Jaw, Sask., and one at Saskatoon, Sask., to Barnett, McQueen Co., Fort William, Ont., for the total sum of $2,005,620. The capacity of each elevator will be about 3,000,000 bush., but they will be so constructed that additional units may be built as they are required.

A highway tunnel, planned to be built by the city of Venice, in Italy, will be 11,800 ft. long and will be the largest of its kind. It is to connect the city with the islands Giudicca, San Giorgo and Lido, thus establishing better transportation facilities than are afforded by gondolas.

Electric Railway Department.

Toronto Civic Electric Car Lines.

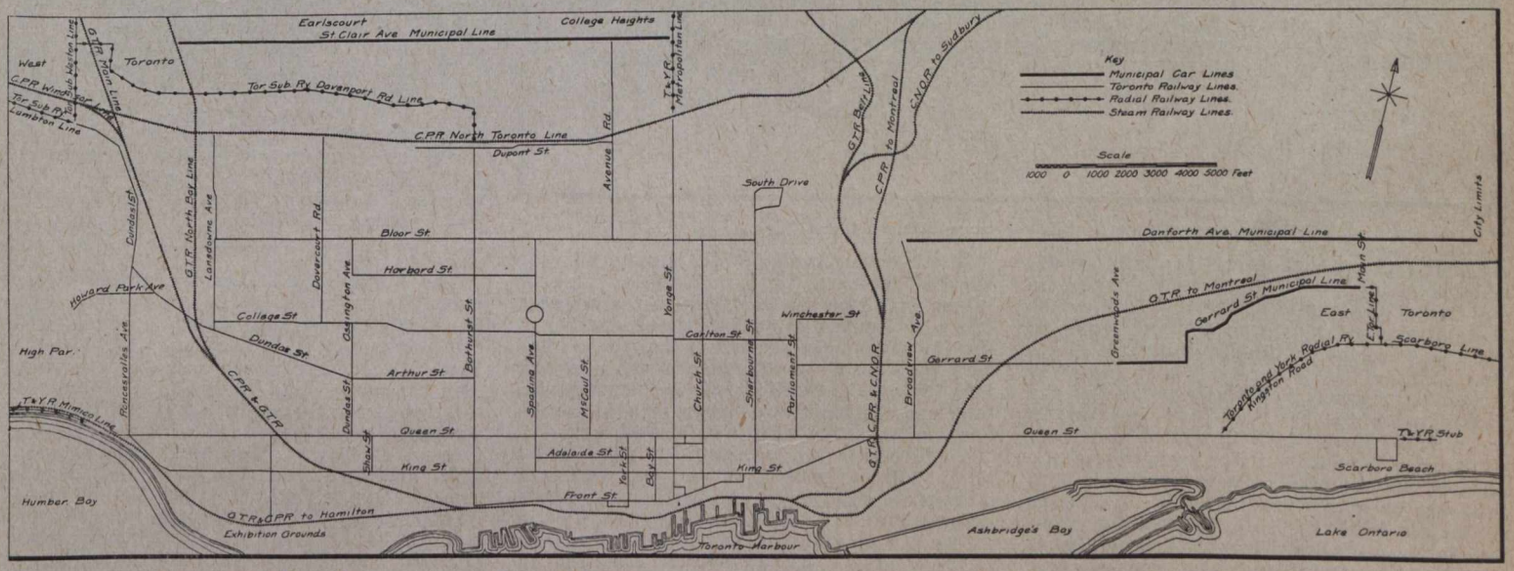
The Toronto Ry. Co. having decided not to build additional car lines in the outlying districts of Toronto as requested by the city council the city exercised the perogative vested in it by the agreement with the company, to build such lines as it required when the company holding the franchise failed to do so when petitioned. Three such lines were projected in 1910, the city taking up active work on the projects in that year. Of these lines, the Gerrard St. one has been in operation since last autumn, the St. Clair Ave. one was put in operation at the end of August, the Danforth Ave. one is expected to be completed shortly. They are all of the Toronto Ry. gauge of 4 ft. 10⅞ ins.

The Gerrard St. line was the first one completed and put in operation. It extends from the terminus of the Toronto Ry's. Parliament St. line at Greenwoods Ave., along Gerrard St., up Coxwell Ave. to negotiate a jog in Gerrard St., thence along the latter street, terminating at Main St. in the former town of East Toronto, which is now a part of city ward 1, a total distance of 1.85 mile.

single track standard gauge Metropolitan division of the Toronto and York Radial Ry. is operated. The only line of the T.R. Co. north of the C.P.R. is the Avenue Road line, which extends to St. Clair Ave. on Avenue Rd., which is about half a mile west of Yonge St. This will probably be the main point of juncture, as by the other route, there will be two transfers and three fares. The St. Clair Ave. line will serve the two rapidly growing settlements of College Heights and Earlscourt, the former now depending entirely on the Avenue Road line, and the latter on the Bathurst St. line, which is about three quarters of a mile from the centre of the settlement.

The Gerrard St. line follows a 66 ft. highway its full length, which allows for the normal spacing of the double track lines at 10 ft. 2⅞ in. centres. The substructure work of this line consists of a 12 in. depth of solid concrete, flush with the top of the ties, which are placed at 6 ft. centres, with short 2 ft. sections of ties embedded in the concrete at 2 ft. centres intervening, tie rods being used at intermediate points.

decided by the council that in view of the fact that St. Clair Ave. was one of the few through crosstown streets in the city, it would be advisable to anticipate future requirements by increasing the width beyond that of the standard 66 ft. street., making the increased width greater than that of Danforth Ave., which was increased to 86 ft. From the fact that the section from Yonge St. to Avenue Road was well built up and would involve heavy property damages, it was decided to make that portion of the avenue only 86 ft. wide, and the balance from Avenue Road to the G.T.R. tracks 100 ft., with a central 33 ft. boulevard, on which the trolley line should run, on each side of which will be a 24 ft. roadway. Each of the cross streets has a 24 ft. allowance across the boulevard. The substructure of the line is similar to that on interurban lines. On a gravel bed, the ties at 2 ft. centres are bedded, with rails similar to the Gerrard St. line, i.e., 7 in., 80 lbs. T rails, Lorain 335 section. Between the rails and on each side, the space is filled with 2 in. crushed stone. The construction of the line at the



Electric Street and Radial and Steam Railway Lines in Toronto, Showing the New Municipal Lines.

The Danforth Ave. line serves the same route as the Gerrard St. line, about ½ mile further to the north. This line extends from the terminus of the Toronto Ry's. Broadview Ave. line at the corner of Broadview and Danforth Avenues straight along Danforth Ave. to the east city limits, in the former town of East Toronto, a total distance of 3.5 miles. This line will, in addition to serving the northerly portions of East Toronto, serve the growing portion of the city northwest of the terminus of the present Broadview line, a distance heretofore unserved by any transportation facilities.

The St. Clair Ave. line runs due west along St. Clair Ave. from Yonge St., the main street of the city, to the tracks of the G.T.R. North Bay line, a total distance of 3.35 miles. At the Yonge St. terminus, the line is 2¾ miles north of the corner of King and Yonge Sts. The Toronto Ry's. Yonge St. line terminates at the C.P.R's. North Toronto line, about ½ mile south of the Yonge St. terminus of the civic line. On Yonge St. north of the C.P.R. tracks the

Over this base of concrete and ties, there is a layer of sand cushioning, on which are placed granite sets, the full width of the track allowance of 19 ft. This line is laid with 7 in., 80 lb. T rail, Lorain section 335.

The Danforth Ave. line is somewhat similar to the Gerrard St. line, except that the street allowance is 86 ft., but the track allowance of 18 ft. is the same. The substructure work consists of a layer of not less than 6 ins. of concrete, with the ties at a 2 ft. spacing resting on a 2½ in. cushion of 1 in. crushed stone, packed under the ties only. The packed up ties are embedded in concrete and the base of the rail covered over with mortar to a depth of 2 ins. with a ½in. sand and cement cushion over top, on which is laid the pavement of creosoted wood blocks. This line uses 7 in., 90 lb. grooved girder rails of Lorain 392 section, with ⅞ in. rods at 6 ft. centres.

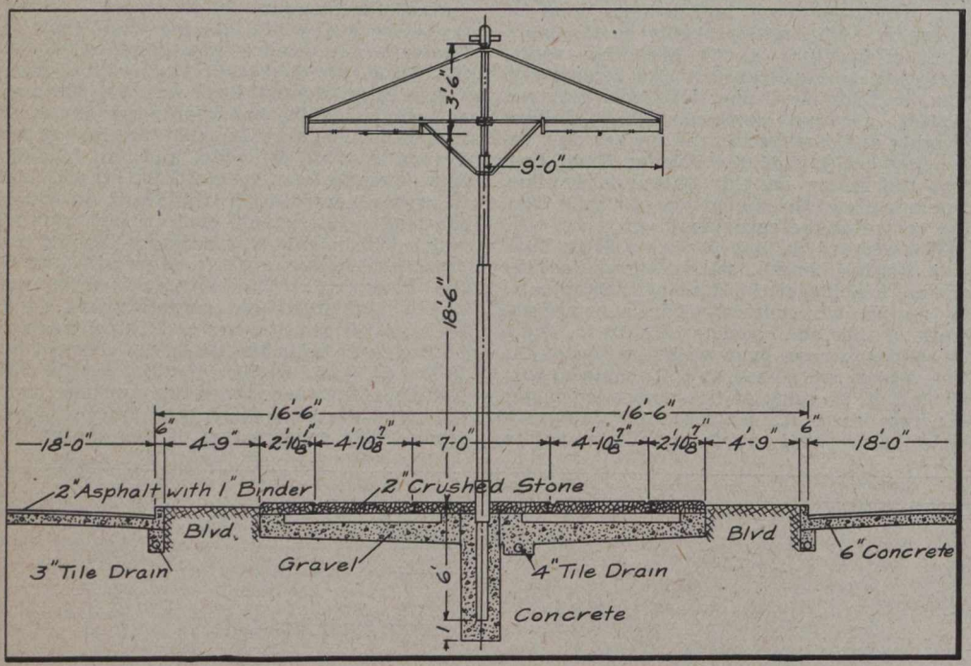
The construction of the St. Clair Ave. line is different from the other two, from the location of the double tracks with regard to the street. At the time the civic line on this street was projected, it was

street crossings is similar to the construction of the Gerrard St. line.

The track work and overhead construction of all the lines is very similar. Brazed copper ribbon is used for the bonding, the work being done by the Toronto Ry. Co. for the city. On the Gerrard St. and Danforth Ave. lines, the overhead work is supported on the one side of the street by the municipal hydro electric system's street lighting poles, while the other side uses the standard steel trolley poles. The trolley wire in all the lines is 2.0 hard drawn copper wire. The trolley suspension of the boulevard section of the St. Clair Ave. line is of the central type, with 22 ft. steel poles carrying an 18 ft. cross arm, from which the trolley wire is suspended. This central pole is bedded to a depth of 6 ft. in concrete, and at the ground level, there is a 3 ft. section of tube, projecting a foot above the ground, swedged to the pole to strengthen that portion.

On the Gerrard St. line, leaving the Greenwoods Ave. end, there is a practically level track for about half a mile, beyond

which the line commences an ascent on a grade averaging about 2.5% the greater portion of a mile, with a final steep ascent of 4.2% to the higher level entering East Toronto, the terminus of the line. Several curves are encountered, but with the exception of the two corner turns, these are negligible. On the Danforth Ave. line, the gradients are very light, the heaviest being a short section of about a quarter of a mile, where there is an ascending grade from the west of 0.9%, changing through a vertical curve to a 3.0% ascent, dropping off finally to an approximately level stretch the balance of the way. There are no curves on the line. The profile of the St. Clair line is undulating in its character, both ends of the line being at practically the same elevation, whereas the other two lines follow an ascending course. The major portion of the gradients on the St. Clair Ave. line are in the neighborhood of 1.0%, with a maximum short stretch of 3.8%. The majority of the steeper gradients have been eliminated on this line by heavy grading.



Substructure of the St. Clair Avenue Municipal Car Line.

Electrical energy is to be obtained from the Toronto Hydro Electric System, from the several substations most conveniently located to each line. The Gerrard St. line receives power from the East Toronto pumping station on Gerrard St., about 1,500 ft. beyond the end of the railway line. From there to the end of the line, there is a feeder and return line, each 350,000 c.m. The feeder line parallels the railway line to within 1,400 ft. of the city end of the line. The power question for the Danforth Ave. line has not as yet been settled. The St. Clair Ave. line receives its power from the substation on Macpherson Ave. near Avenue Road, a f eder and return, each 500,000 c.m. leading along Macpherson Ave. and up Spadina Road to the line, the feeder extending in each direction from this point.

Along the several lines, the St. Clair Ave. line particularly, there has been some heavy cut and fill work to eliminate grades. On the St. Clair Ave. line, two ravines have been negotiated. All this work, where heaviest, has been carried out in approved railway line methods with steam shovel and dump cars hauled by a dinky engine. In one of the St. Clair Ave. fills, the original plans called for a large concrete culvert, which collapsed and has been replaced by a plate girder bridge over the central part of the fill, the centre span being 100 ft., with two 40 ft. approach spans. The bridge width is 86 ft. This bridge is midway between Spadina Rd. and Bathurst St., near the centre of the line, and will allow of a ravine drive being carried under St. Clair Ave.

There are several small culverts. The Gerrard St. line has two flat top concrete culverts, 2½ ft. square. On the Danforth Ave. line, there are about 6 small corrugated iron pipe culverts under small fills. On the St. Clair Ave. line, there is a 3 by 4 ft. cedar box culvert, and one 6 ft. square flat top concrete culvert.

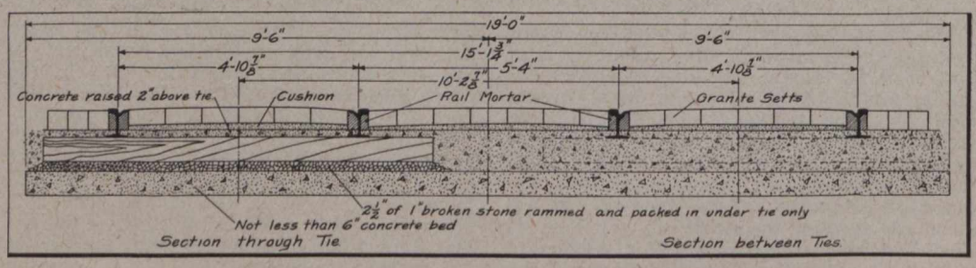
The facilities for handling the equipment are very limited as yet, as the operation of the lines has only recently commenced. The only shed is a small sheet metal shed, of very light construction, on the Gerrard St. line, near its east end, where the four cars operated on that line are stored.

To facilitate the construction work, each of the three lines had its own separate storage yard adjacent to the nearest steam railway line. For the Gerrard St. line, a strip of the G.T.R. right of way a short distance to the west of York station was acquired by the city, and running rights obtained for a narrow gauge line from this yard to the line under construction. For the Danforth Ave. line, a piece of private property on Coxwell Ave., on the north side of the G.T.R. main line, was acquired for the yards. For the St. Clair Ave. line, Station St. at the extreme west end of the line was closed by the city, forming a yard on the east side of the G.T.R. North Bay line.

The cars on the civic car lines are all of the pay as you enter and double end control type, and were built in the United States. The four cars on the Gerrard St. line are 45 ft. long, weighing 46,000 lbs., having a seating capacity for 40. The central seats are cross, with the end ones lengthwise. The cars for the St. Clair Ave. line, 20 in all, are being delivered to the city, and are being assembled as fast as they arrive from the builders. These cars are similar in most particulars to those on the Gerrard St. line, except that the seating capacity is increased to 48, there being 8 cross seats and 4 longitudinal seats at the ends. These cars are mounted on two 11 ton Baldwin trucks, on each of which are two GE 80 railway motors. The controllers are SGE K 28B. Turtle back construction is followed in the car design, and they use straight air control with a GE type CP 27 electrically operated compressor unit. On each end of the cars there is a 6 ft. platform with entrance and exit railing, both vestibules being completely enclosed. The front exit door is operated by a lever in front of the motorman, and the rear entrance and exit doors from double levers in front of the conductor, adjoining his fare box stand. A portable fare box is employed. The opening of each door drops a step, and at the same time an electric light under the vestibule back of the step is lighted in night operation. The new cars for the Danforth Ave. line are to be similar in all particulars to the ones for the St. Clair Ave. line.

The work on these lines has been carried out by the City Works Department, R. C. Harris, Works Commissioner. The design and general supervision of the work came under the charges of E. L. Cousins, now Chief Engineer of the Toronto Harbor Commission, succeeded by C. W. Power, Engineer of Railways and Bridges, while the actual construction work was supervised by A. E. K. Bunnell, succeeded by D. W. Harvey, Assistant Engineer of Railways and Bridges.

The Canadian Autobus Co., which is preparing to operate a service of autobusses in Montreal, is working in conjunction with the London General Autobus Co., London, Eng. G. Poloquin, representing the British company, has arrived in Montreal to arrange for the operation of the first consignment of vehicles for the new service. Duncan McDonald, Montreal, is in London, Eng., looking after the shipment of the buses. It is stated that 350 of these vehicles are being built by the London General Autobus Co., for the Canadian Autobus Co., and that 150 are ready for shipment.



Substructure of the Danforth Avenue Municipal Car Line.

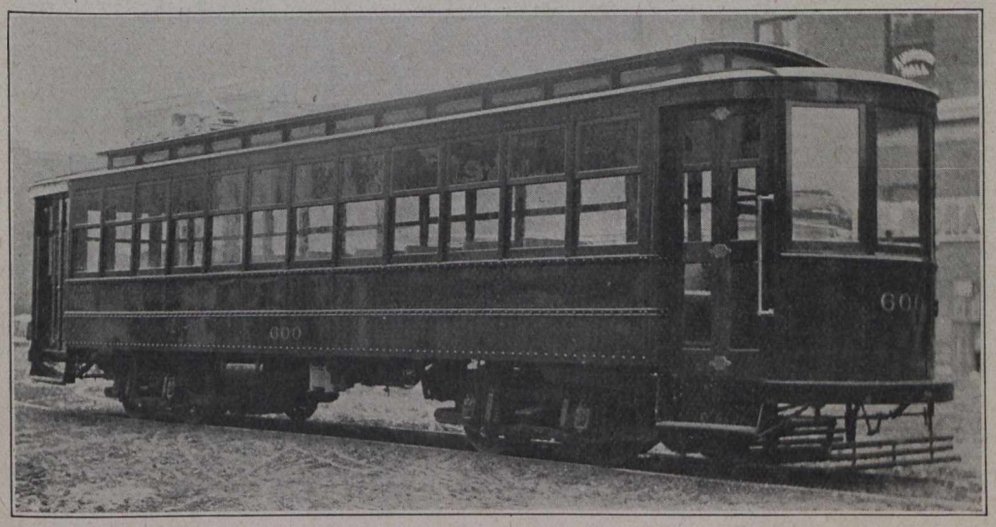
Trolley Traffic in Great Britain.—Board of Trade statistics show that during 1912 the trolley lines of Great Britain carried over three billion passengers. Figures such as this give an impressive sense of the magnitude of modern railway facilities, and the statistics are the more remarkable when it is remembered that this traffic was carried on 2,642 miles of track and in less than 13,000 cars. Significant, also, is the fact that whereas in 1900 there were 37,000 horses employed in hauling street cars, in 1912 there were only 1,500.

Ottawa's Electric Railway Company's New Cars.

The Ottawa Electric Railway has recently added to its equipment 20 double truck steel cars, with the following general dimensions:

Length over bulkheads	33¼ ft.
Length of front vestibule	4½ ft.
Length of rear vestibule	6½ ft.
Projection of bunters	6 ins.
Total length over bunters	45¼ ft.
Width of body over rubbing strips	8½ ft.
Seating capacity	42 persons.

Construction of body:—The side girder plates are 18 by ¼ in. steel in one piece full length of body, each reinforced at bottom edge with 5 by 3 by ⅜ in. angle, and at top edge with a double beaded bar, which also serves as a rubbing strip. Belt rails



Ottawa Electric Railway Car.

are of ⅜ by 2 in. round bevel edge steel bar with pressed steel shoe on which window sash rest. Side posts are faced with 2½ by 3-16 in. steel plates, which are anchored by gusset plates and rivets to top edge of side girder plates. Window head strip or letter board is also of steel 5 by ⅛ in., reinforced at top edge with angle steel 1½ by 1¼ by 3-16 in., and all together is rivetted to the top end of steel post facings. Corner posts are formed up from steel plate 3-16 in. thick. The roof is of wood construction sheeted with ½ in. T. & G. lumber and covered with canvas.

The interior finish throughout is of cherry, finished natural color. Seats are of stationary type upholstered in rattan. Curtains are of pantasote material with tin barrel shade rollers and pinch handle fixtures. The trucks are no. 27-FE-1 standard gauge 4 ft. 10 in. wheel base with 4½ in. hot rolled steel axles and 33 in. chilled iron wheels. Motor equipments are quadruple no. 101-B-2 motors with K-35 controller. Air brakes are Westinghouse schedule no. S.M.E. The cars are equipped with H.B. life guards, Consolidated Car Heating and Lighting Co. buzzer signaling systems, and electric heaters and Coleman Fare Box Co.'s stationary p.a.y.e. fare boxes.

It is said that for appearance, as well as for public accommodation, these cars are second to none in their class. They were built by the Ottawa Car Co., Ltd.

Double Deck Cars for Pittsburgh, Pa.

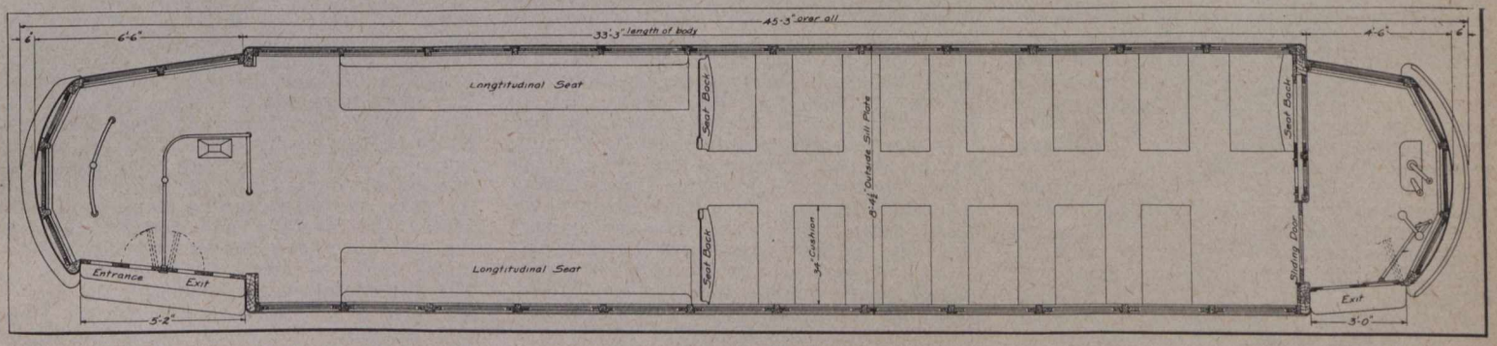
About a year ago, considerable interest was shown in the electric railway field by the introduction of the first double deck street car used on the American continent within recent years for handling city traffic. In most particulars, it differed widely from the conventional design to be found in many places abroad. This original double deck car has been improved upon, so that today, it may be considered to have passed beyond the experimental stages, as several cars of this type were built, and observations of their performances taken under actual service conditions, so that enough data were collected to make possible the construction of a double deck car that could be relied upon to fulfill the desired conditions without any points of failure such as occurred in the original designs.

The Pittsburgh Railways have recently placed in service a double deck car that has been so carefully planned on the data obtained that it appears to meet most requirements, in expeditiously handling dense crowds. The overall length of this is 47 ft. 2 ins., with a width of 7 ft. 10 ins. The car is constructed throughout of steel, and is mounted on trucks of a design that was developed some time ago by the Pittsburgh Railways, and which evoked considerable interest at the time of their first appearance on account of the small size of the wheels, making possible the low setting of the lower deck, which in the case of this double deck car is 28¾ ins. above the rail. These trucks are placed 22 ft. 2 ins. centres. The overall height is 13 ft. 8 ins.

Both entrance and exit are located at the centre, and as the cars of this line are for double end operation, the door arrangement is duplicated on each side of the car. The entrance and exit doors on each side are separated by 7 ft., the object being to avoid confusion at that focal point. The central part of the car is low set, the step into the car being only 13¼ ins. above the ground, followed by a slight ramp of 1½ ins., a step of 12 ins., followed by a 2 in. ramp leading into the ends of the car where cross seats are located in the usual manner. The very end of the rear portion of the car has a curved seat, adding to the seating capacity. Entrance to the car is through the rear one of the side doors, and exit through the front one. At the centre of the car inside the entrance way is the conductor's stand, with the usual p.a.y.e. equipment. Beyond the conductor, along the inner side of the car, and leading backwards, is the stair to the upper deck. The seats in this upper deck are located along the centre, back to back, the under side of the seat forming the head room for the lower deck centre aisle, the seating headway in the lower deck being reduced by the depth of the aisles of the upper deck. From the duplicate operation construction, there are two stairs, the one along the outside of the car being for exit, and vice versa, when operating in the other direction. The only push buttons on the upper deck are at the head of the stairs, so that the passenger must be prepared to descend before giving the signal, thereby not delaying the car, as from that point the conductor can observe the party descending.

Head room is economized to the utmost. The trolley harp is located in a depression in the roof, giving greater head room along the side passage ways.

The total seating capacity is 110, 56 up and 54 below, which with a total weight of car equipped of 38,700 lbs., gives the remarkably low dead weight per passenger of 352 lbs.



Floor Plan, Ottawa Electric Railway Cars.

Economy of Storage Battery Cars.—The Prussian State Railways, after an experience of many years in the use of storage battery cars have found that, without making any radical changes in the standard railway cars, storage battery propulsion may be applied successfully in respect of both operation and economy. The cost of operating the 200 cars of this type on these railways is reported to work out at only 1.75 cents per horse power per hour.

The Montreal and Southern Counties Ry. has equipped 10 of its cars with Tomlinson automatic air connecting couplers, manufactured by the Ohio Brass Co., for use on four car multiple unit control trains.

Answers to Questions on Electric Railway Topics.

Following are answers to questions in the American Electric Railway Association's question box sent in by officials of Canadian railways. In this lot all the answers are supplied by two of the Toronto Ry.'s staff:—

Single End Operation.—Does single end operation result in more wear on motors, trucks and wheels than double end, and if so, is the item sufficiently large to be taken into consideration in the installation of this method of operation?

W. R. McRae, Master Mechanic, Toronto Ry.—"Several hundred cars on this property are single end operated. There is no excessive wear on any part of the equipment, with this method of operation, where the cost of renewal or reversal of worn parts is not more than compensated for by the lesser number of parts required. Where it is possible to loop and Y cars at route terminals, I strongly recommend single end operation."

Drying Armatures and fields.—When armatures and fields become wet or damp, what is the cheapest effective way of drying them?

W. R. McRae, Master Mechanic, Toronto Ry.—"By drying in an electrically heated oven."

Sliding doors in interurban cars.—What is the most satisfactory an deconomival arrangement for a single sliding door, located between ladies' compartment and rear vestibule, or between ladies' compartment and smoker, in large interurban cars, so as to keep door either open or shut as the case may be, to avoid door sliding back and forth and slamming if car strikes curve or should lean to one side. The arrangement we desire is to be entirely automatic, and so arranged that no lock or latch is to be used, and such that door will not open or close too hard or tight, or too easy and loose.

W. R. McRae, Master Mechanic, Toronto Ry.—"The most satisfactory and economical arrangement for keeping a sliding door either open or closed is to recess the track at both ends to permit of roller dropping into recess sufficiently deep to prevent door moving on curves or turn outs."

Fare Registers and Fare Boxes.—When conductors are transferred from one car to another during their trick of duty, is it good practice to permit them to take the register with them, or is it better to keep the register on the car? In other words, should the register follow the car or the conductor?

F. L. Hubbard, Assistant to General Manager, Toronto Ry.—"We do not use a register, all the fares being collected by the conductor with a portable hand box. The box always follows the conductor, no matter where he goes."

Headlights.—What size incandescent lamp should be used in headlights for city service?

W. R. McRae, Master Mechanic, Toronto Ry.—"Sixteen candle power with white enamel reflectors and bull's eye lense."

Car Cleaning.—How can cars be best cleaned and kept clean? Is the vacuum process too costly for medium sized roads?

W. R. McRae, Master Mechanic, Toronto Ry.—"If varnish and color is in good condition, wash and chamois well. Use a good car cleaner. Clean car frequently. Vacuum process is not costly. Use compressed air from car compressor for both blowing out dust and vacuum cleaning."

Conductors' Deposits.—Is it proper practice to require a deposit from conductors before they are put to work, and if so, what is a proper deposit?

F. L. Hubbard, Assistant to General Manager, Toronto Ry.—"When a student conductor enters training he is required to furnish $10 with which to purchase tickets and to make change, also a uniform cap which costs $1.25, and he is not paid any wages during his training. When he is put at regular work the company furnishes him with $25, ticket and change money. We do not require a deposit and the only protection we have is the amount of money due a man for a period of five or six days while the pay is being made up. We have not had any abuse of this system. We do find, however, that desirable men, particularly married men, are deterred from entering the service because of the $10 and cap money they have to provide during training, and the fact that they receive no wages during that time. We prefer married men and it is significant that the percentage of married men accepted for motormen is nearly double that for conductors, which we believe is largely due to the fact that they are not required to put up any money during training period. We are seriously considering whether we should take a chance and furnish conductors in training with the $10 ticket and change money, with the probability that any abuse of the system would be more than off set by the better class of men we could obtain for the service."

Carnivals, etc.—Should carnivals and other large gatherings be encouraged by railway companies in view of the increased damage charges they bring about?

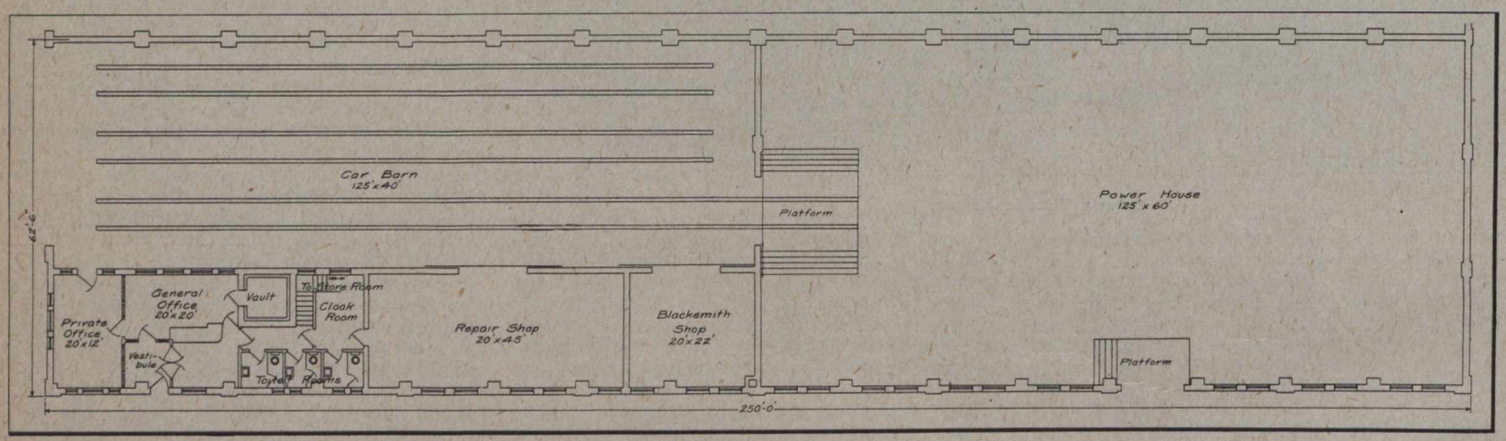
F. L. Hubbard, Assistant to General Manager, Toronto Ry.—"If this question means whether a company should offer inducements to secure carnivals, as a city company we do not think it should be done."

Moose Jaw Electric Railway Car Shops.

The accompanying plan shows part of the layout of the car shops at Moose Jaw, Sask., but does not give the complete layout, omitting a 5 track car barn addition, 125 ft. long, for storage, which has been added this year.

The buildings are of steel, brick and concrete construction throughout. The foundations are all of concrete, on which are built the brick walls, with the roof trussed by steel girders spanning the 62½ ft. width of the shop, these trusses being located at 15 ft. 5⅜ in. centres through the length of the shop. The roof members are composed of 8 in. I beams resting on the trusses.

The front portion of the building contains on one side the offices, the private office 20 by 12 ft., and the general office 20 ft. square. To the rear of these is the vault, cloak room and lavatories, all forming with the offices one main division of the building. To the rear of this section is the repair shop, 20 by 45 ft., connecting with the car barn by wide opening, with sliding fire doors. To the rear of the repair shop is the blacksmith shop. The repair shop has a 2 in. plank floor, but the blacksmith shop is concrete. Alongside these several divisions of the shop is the car barn section, 125 by 40 ft., containing three repair tracks. These tracks have a pit construction beneath, the tracks being supported on 8 by 10 in. beams on 8 in. square supports. Between top of rail and floor of pit, there is 4¾ ft. The clear height in this and the other shops is 20 ft. The store room for the shops is in a room over top of the offices, and approached by stairs in the cloak room. The heating of the shop rooms and offices is by means of two hot air ducts from the power house to the rear, one pipe running along each side wall of the car barn, with connections into the pit. Into the offices and other side rooms there are risers with deflecting heads. The pits contain catch basins for the draining off of the car barn section, the tile pipe running under the shop connecting with the external system.



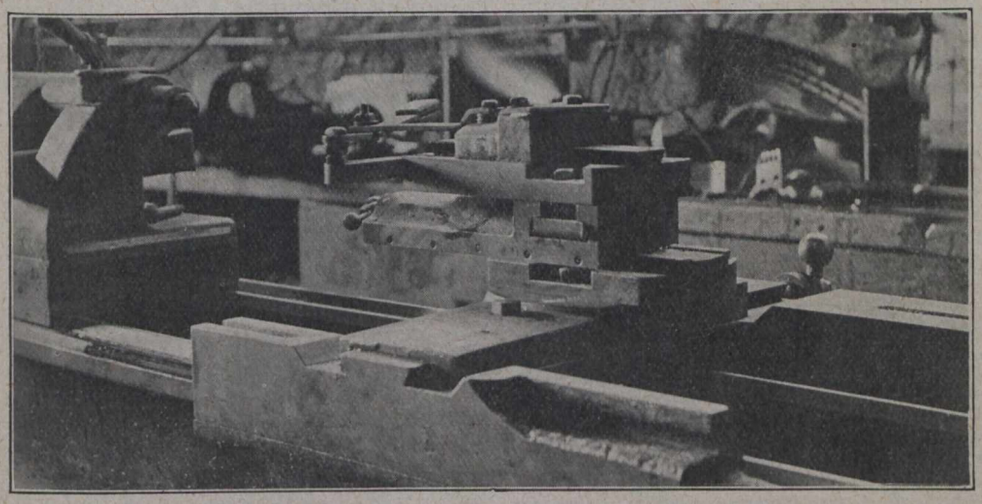
Layout of Moose Jaw Electric Railway Shops.

The power house in the 125 by 60 ft. section of the building to the rear, contains three Diesel oil engines. The two smaller units are each of 204 brake horse power, direct connected to Westinghouse 600 volt railway generators. The third unit is of 500 brake horse power, connected with a 600 volt interpole machine, which is connected up by means of a flexible coupling. The power house and its whole equipment were described in Canadian Railway and Marine World for June, 1912.

The operation of electric cars between Winnipeg and Selkirk, Man., on Sundays, was started Sept. 7.

Slotting Commutators at the Niagara, St. Catharines and Toronto Railway Shops.

The unequal wear of copper and mica insulation in electric commutators is one of the most fruitful causes of the shopping of cars. The hard mica, not wearing as rapidly as the copper segments, causes the latter to form a series of grooves, over which the brushes jump, giving rise to a great deal of sparking when the wear is at all noticeable. Arrangements for the removal of this surplus mica are made in nearly all shops, and as there appears to be no special tool in general use, local ingenuity is applied in making up such an appliance.



Lathe Attachment for Slotting Mica Fins from Commutators.

The device in use at the N. St. C. & T. Ry. shops, at St. Catharines, Ont., W. Pay, Master Mechanic, resembles in some particulars the special device in use at the Winnipeg Electric Ry. shops, described in these columns recently, the principal difference being that the N.St. C. & T.R. device can be applied to an engine lathe, and is not a separate and complete machine in itself.

As the accompanying illustration indicates, the slotting device consists of a small carriage attached to the lathe carriage on the tool head. The upper carriage is operated by the handle shown to the rear, which carries, back and forth, parallel to the centre line of the lathe, the narrow tool clamped to the top surface of this carriage. The armature to be slotted is placed between centres, the cutting tool moved up to operating position, and moved back and forth, the armature being revolved the necessary amount between cuts.

Quebec Railway, Light, Heat and Power Company's Annual Meeting.

At the annual meeting at Montreal, Sept. 9, the report for the year ended June 30 was presented by the President, Sir Rodolphe Forget. The gross earnings from operation were $1,524,200, compared with $1,415,825 in 1912, which after adding miscellaneous income $236,881, makes a total revenue from all sources of $1,761,082, an increase of $150,672 over the previous year. The operating and maintenance expenses were $895,180.61 against $734,925.35. Fixed charges and taxes were $792,100, leaving a net surplus of $73,881, which added to the surplus from last year's accounts makes a total surplus of $147,341. Subsidies received from the Dominion Government amounted to $27,641.60, and were applied to the cancellation of $30,000 bonds according to the trust agreement.

The President stated that $91,500 had been expended on maintenance during the year and that the various properties had been maintained at a high state of efficiency.

Questions by shareholders as to the status of the company's bonds, elicited the statement, that the original $10,000,000 bond issue of the Quebec Ry. proper, was secured by all the assets of the company, exclusive of the Quebec and Saguenay Ry., while the bonds issued against the latter have set apart for them the stock, bonds and other properties of the new line.

A revision of the bylaws was authorized, reducing the number of directors from nine to six, Hon. J. P. B. Casgrain, L. C. Marcoux and O. B. d'Aoust retiring.

The following board was elected for the current year,—President, Sir Rodolphe Forget; Vice President, L. C. Webster; other directors, J. N. Greenshields, Hon. Robert Mackay, P. Galibert and D. O L'Esperance.

Chatham, Wallaceburg and Lake Erie Railway Secured by Mackenzie-Mann Interests.

During the past two years or more there have been continual reports that the Mackenzie, Mann & Co. interests had secured control of the Chatham, Wallaceburg and Lake Erie Ry. The most recent report to this effect received full conformation at the annual meeting of the shareholders at Chatham, Ont., Sept. 3, when the following were elected directors:—D. B. Hanna, A. J. Mitchell, R. G. O. Thomson, F. H. Phippen, K.C., Toronto; D. A. Gordon, Wallaceburg; J. G. Kerr, Chatham. The new directors are with the exception of the Chatham and Wallaceburg representatives, connected with Mackenzie, Mann & Co. D. A. Gordon, who is M.P. for East Kent, has been president of the company for some time.

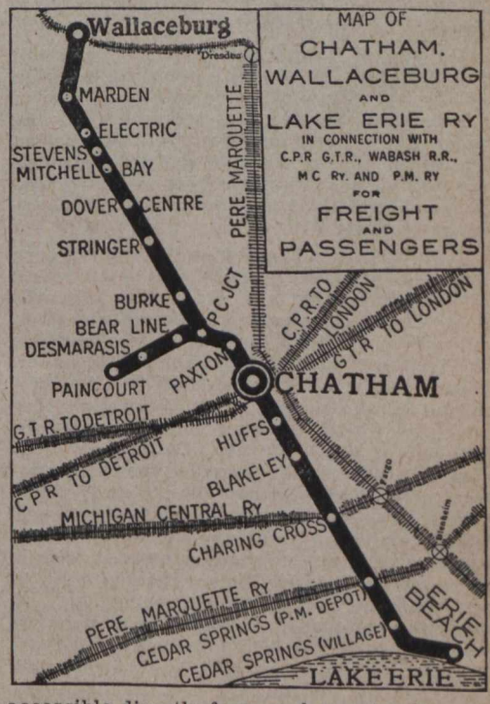
The Chatham, Wallaceburg and Lake Erie Ry. Co. as incorporated by the Dominion Parliament in 1903, to build a railway from Chatham to Wallaceburg; from Wallaceburg to Petrolea; from Chatham to near Rondeau; with branch lines to Dresden, and Blenheim, Ont. The first section of the line to be completed was from Chatham to Wallaceburg, and this was opened for traffic, Nov. 20, 1905. The section from Chatham to Lake Erie was completed in 1908, and with the completion of the subway in Chatham, through traffic between Wallaceburg and Lake Erie was inagurated, Aug. 20, 1908. The branch to Paincourt was built in 1909.

The C.W. and L.E. Ry. extends from Chatham to Wallaceburg, 18.44 miles; Chatham to Erie Beach, 14.41 miles, with a branch from Paincourt Jct. to Paincourt, 6.09 miles, altogether 38.94 miles. There are six miles of sidings and turnouts. The line gives connection with the C.P.R. and the G.T.R. at Chatham, with the Michigan Central Rd. at Charing Cross, and with the Pere Marquette Rd. at Cedar Springs, Chatham and Wallaceburg.

The company owned at June 30, 1912, 7 closed and 2 open passenger cars; 17 freight cars and 3 miscellaneous cars. For the year ended June 30, 1912, its passenger cars ran 224,481 miles, carrying 374,816 passengers, and its freight cars ran 39,270 miles carrying 71,347 tons. The financial statement for the year ended June 30, 1912, shows:—Gross earnings from operation, $117,492.00; operating expenses, $70,287.88; net earnings from operation, $42,204.12; deductions from income—taxes, $1,723.08; interest on funded debt, $34,194.00; interest on floating debt, $1,851.00; total, $37,768.08, leaving a net income of $9,436.04. This amount added to the surplus of $9,708.94 brought forward from 1910-11, made a total of $19,144.98 carried forward to 1912-13 account. The capital account at June 30, 1912, showed outstanding:—Common stock, $760,600; funded debt, $800,000; a total of $1,560,600, or $34,726 per mile of railway.

The local officials at Chatham are:—General Manager, Chief Engineer and Purchasing Agent, W. Norris; General Freight and Passenger Agent and Assistant Treasurer, J. E. Richards; Track Foreman, G. Lampman.

Smoking on New York Street Cars.—The Public Service Commission has directed all street railway corporations in the city of New York to prohibit smoking or the carrying of lighted cigars, cigarettes and pipes on the cars or the platforms of cars operated by them, except the open cars having running boards along the sides and having seats accessible directly from such running boards. On such cars smoking will be permitted on the four rear seats of each car, including the seats on the back platform. The order also prohibits smoking or carrying lighted cigars, etc., in the stations, station platforms, station stairways, waiting rooms, waiting cars or shelters. The companies are required to enforce these regulations and to post conspicuously in cars and stations, notices stating that such practices are prohibited.



Electric Railway Projects, Construction, Betterments, Etc.

British Columbia Electric Ry.—Negotiations are reported to be in progress with the Great Northern Ry. for the purchase of the abandoned right of way of the Cloverdale-Blaine line between Hazelmere and the International Boundary at Blaine. The proposed electric line will connect with the line projected by the Stone and Webster Corporation to Bellingham, Wash., and an extension may be built to the mouth of the Campbell River.

The track along Front St., New Westminster, is being raised to conform to the new city street grade. The new 40 car barn at New Westminster will be ready for use as soon as the new switch points and connections are put in place. The yards a little west of the car barns are practically completed. There have been 7.5 miles of track laid, which will give accommodation for 448 cars. (Sept., pg. 442.)

The Vancouver Island Power Co., which is a subsidiary of the British Columbia Electric Ry., has completed the construction of the dam on the Jordan River, in connection with its power plant. The plant originally developed 12,000 h.p., and with the additional storage area now provided additional units will be added to bring the power developed up to 32,000 h.p. Some of the additional units have already been installed. The steam auxiliary power plant at Brentwood Bay, which has a capacity of 8.000 h.p., will now be held as a reserve plant.

Buffalo, Lockport and Rochester Ry.—The Public Service Commission of the Second District of New York State had before it, Sept. 12, the proposals for the reorganization of the Buffalo and Lake Erie Traction Co., which involves the acquirement of the B.L. and R. Ry., and the Canadian American Power Corporation. The minority holders of the B. and L.E.T. Co. have organized to oppose the application. (Sept., pg. 442.)

Calgary Municipal Ry.—The ratepayers of Calgary, Alta., are to vote upon the question of the extension of the electric railway to Shaganappi Park. The promoters of the extension offer to pay for the construction of the line to Spruce Cliff and to guarantee the cost of operation for four years. There is considerable opposition to the proposal. (Sept., pg. 442.)

C.P.R. Electric Line—Hamilton to Niagara Falls.—Press reports state that at a meeting of the St. Catharines, Ont., City Council, Sept. 12, an agreement was drawn up which will be laid before the C.P.R. management at Montreal and, if agreeable, will be incorporated into a bylaw that will be submitted to the people of St. Catharines for approval, which it is expected will be before the end of this year. St. Catharines is to contribute $100,000 towards the construction of a bridge across the old Welland Canal. The company is to commence work within six months of the passage of the bylaw and have the line completed within two years, although it is expected that it will be constructed within one year. A maximum rate of 2c. a mile for passengers was agreed to. M. N. Todd, President, Galt, Preston and Hespeler St. Ry., represented the C.P.R. at the meeting and arranged the terms of the agreement. (Aug., pg. 395.)

Dunnville, Wellandport and Beamsville Electric Ry.—Press reports state that arrangements have been completed under which a further amount of bonds has been taken up, and that construction will be renewed at an early date. About 13 miles of grading is reported to have been completed, and ties have been laid, everything being ready for tracklaying. (June, pg. 286.)

Edmonton Interurban Ry.—The Board of Railway Commissioners has authorized the operation of cars across the Edmonton, Dunvegan and British Columbia Ry's. line for construction purposes only, pending the installation of an interlocking plant. It is proposed to operate gasoline electric cars over the line, and it is expected that the first section from Edmonton to St. Albert, Alta., will be opened for traffic at an early date. (Jan., pg. 39.)

Hamilton St. Ry.—An agreement was verbally reached, Sept. 10, with the Wentworth County Council under which the company was to be granted a franchise for the extension of its Main St. line from Kenilworth Ave. to the Bartonville line, but when the formal resolution approving of the same came up for consideration, Sept. 11, an amendment giving the franchise for a single line only was carried. Upon this the company withdrew the application. (June, pg. 286.)

London, Grand Bend and Stratford Ry.—Application is being made to the Ontario Legislature for the incorporation of a company with this title, to build a railway from London, northwesterly through the townships of London, Lobo, East Williams, West Williams, McGillivray and Stephen, including the village of Parkhill, to Grand Bend, thence easterly to Exeter and Stratford, and then westerly to London, and branch lines. Gray and Gray, Toronto, solicitors for applicants.

An office has been opened at Parkhill, by A. E. Beer and C. T. McAllister, representing the promoters, and engineering parties are reported to be going over the projected routes. Those interested in the project are said to have secured a large area of land at Grand Bend, and it is said they will develop it as a summer resort, with hotel, etc., under the title of the Huronic Beach Co. (See Stratford Ry., Sept., pg. 443.)

Medicine Hat, Alta.—We have been officially advised that owing to the difficulty in the way of securing materials it has been found impossible to complete the line for operation this fall. An arrangement has been made with the city council to defer the commencement of actual construction until April 1, 1914. (Aug., pg. 395.)

Melita, Man.—We are advised that the town has granted a franchise for a street railway in connection with a natural gas franchise. It is not expected that borings will be made for natural gas until the spring of 1914. At present there is not the least intention of going into the street railway business. R. E. Denny, Brandon, Man., is interested in the natural gas proposition. (Aug., pg. 395.)

Montreal and Southern Counties Ry.—Press reports state that much of the work on the roadbed for the extension to St. Cesaire, Que., has been completed; and that it is contemplated to extend the recently completed electrification of the Central Vermont Ry. branch from Richelieu to Marieville, Que., four miles. (Aug., pg. 395.)

Montreal Tramways Co.—The tracks on Papineau Ave. have been laid to Craig St., and a new route through that avenue was opened for traffic Sept. 8. A large amount of other work is being done on the other lines in the city, and steel is being delivered for the new lines and intersections. New intersections are being laid at Craig and Beaver Hall Sts. These extend 200 yards on either side, the rails weighing 116 lbs. to the yard. As soon as these are completed new intersections will be laid at St. Catherine and St. Lawrence Sts.; Craig and St. Lawrence Sts; St. Denis and Craig Sts.; St. Denis and St. Catherine Sts.; Windsor and St. Catherine Sts.; Windsor and St. James Sts.; St. James and McGill Sts. (Sept., pg. 442.)

Niagara, St. Catharines and Toronto Ry.—The Board of Railway Commissioners has approved of location plans of the extension of the line to the lake front on lot 12, con. 1, Grantham tp., Ont., 0.68 of a mile.

A contract is reported to have been let to Newman Bros., St. Catharines, Ont., for the erection of a transformer station in that town. (May, pg. 235.)

Niagara, Welland and Lake Erie Ry.—Work is progressing on the extension to Parkway Heights, and the West Main St. line is nearly completed. The line out East Main St. to Rosedale is being delayed on account of inability to get necessary interlocking apparatus where crossing is made over the G.T.R. Nothing has been done on the Danville extension so far. T. R. Cummings is Engineer. (Feb., pg. 90.)

Press reports stated recently that the company intended using storage battery cars. It appears that this was suggested at a town council meeting, but we are officially advised that the management, after investigating the cost of operating storage battery cars, came to the conclusion that with the cheap Niagara power which is locally available the trolley system is preferable. (June, pg. 286.)

Ontario West Shore Ry.—The Goderich, Ont., town council, has referred to a special committee the question of preparing evidence for submission to the Ontario Railway and Municipal Board, when the enquiry into the condition of the O.W.S. Ry. is again taken up. (Feb., pg. 90.)

Port Arthur and Fort William Electric Ry.—The Fort William, Ont., City Council has decided to have the extension of the line across the Kaministikwia River to Island 2 completed this year. (Sept., pg. 442.)

Sandwich, Windsor and Amherstburg Ry.—A second track is reported as being constructed on Wyandotte St., Windsor, Ont., from Ouellette Ave. to Mercer St. (Oct., 1912, pg. 521.)

Saskatoon Municipal Ry.—The Sutherland, Sask., Town Council, has passed a bylaw granting a franchise for the extension of the Saskatoon Municipal Ry. into Sutherland. The agreement stipulates that the line is to be completed by Jan. 1, 1914. As soon as this section is shown to be paying operating expenses and fixed charges, it is to be extended. The franchise is to extend for 20 years, and is to be renewed unless Sutherland decides to purchase the lines within its boundaries. (July, pg. 345.)

Three Rivers Tramway Co.—We are officially advised that it is not likely that any construction will be done on this projected electric railway before the spring of 1914. The company is still in the formative period, and nothing beyond preliminary surveys have been made. The principal officers are:—President, L. P. Normand; Secretary Treasurer, R. Bournival, Three Rivers, Que. (Aug., pg. 395.)

Toronto Suburban Ry.—Tracklaying is in progress on the line from Lambton to Guelph, Ont., between the C.P.R. at Cooksville and Meadowvale, but it is not expected to have any part of it in operation this year. D. McKenzie, who has been in charge of clearing the right of way into Guelph, is reported to have recently stated that grading operations would be started in that city at the beginning of October, and that it was expected to have the line completed and in operation to that point in the spring. Sir Wm. Mackenzie is reported as stating that the line will be completed to Berlin during 1914. It is not intended to build any further west than Berlin at present,

but arrangements will probably be made for building of branch lines to Waterloo and Galt. (Sept., pg. 443.)

Winnipeg Electric Ry.—The Board of Railway Commissioners has passed an order permitting the Winnipeg, Selkirk and Lake Winnipeg Ry.—a subsidiary of the W.E. Ry.—to operate its cars for construction purposes on the line to Stonewall, Man., across the C.P.R. Selkirk branch. This will enable construction to be proceeded with, and it is reported that track will be laid into Stonewall by Oct. 30. Application has been filed with the Board of Railway Commissioners for the construction of a subway, the C.P.R. consenting, under the C.P.R. at the point where the above crossing has been made. (Sept., pg. 443.)

New Cars for London Street Railway.

The London St. Ry. is having built by the Preston Car and Coach Co., 6 single truck, single end, p.a.y.e. city cars. They are to be mounted on Brill 21 E trucks, 8 ft. wheel base. The doors on the rear platform will be operated in conjunction with the folding steps by a system of leverage under the control of the conductor. The front vestibule door is to be operated in a like manner. The bodies are to be finished inside and outside in natural cherry. There will be 10 cross seats, 2 longitudinal and 3 stationary seats in each car, giving a total seating capacity of 32 passengers. There will be no bulkheads. The roof will be turtle back.

The under frames will be built entirely of steel, the outside members consisting of 15 by 3-16 in. steel plate reinforced at the lower edge with a 3 by 5 by ⅜ in. steel angle. Two sub sills of 6 I beams will extend continuously from end to end of car body, spaced at proper distances to receive the truck frame. This sub sill will be connected with the outside sill at short intervals by diagonal bracing. The crossings will be of 4 in. channel steeel. The end sills will be made up by rivetting two 3 by 5 by ⅜ in. back to back, and having a ⅜ by 9 in. steel plate sandwiched between them. The outside platform knees will be strong enough to carry the entire platform without having recourse to the use of any centre members. There will, however, be two 4 in. channels placed flatwise underneath the platform and extending continuously from the buffer channel to the end sill, then bent at an angle of about 60° outwards and rivetted to the 6 in. I beam sub sills. These members are for the purpose of taking thrust or draught.

Personal Paragraphs.

JOHN PEARSON, heretofore Assistant Superintendent, Hamilton St. Ry., has been appointed Superintendent, vice Duncan N. Miller, deceased.

DUNCAN McDONALD, President, Canadian Auto-bus Co., is expected to arrive in Montreal with the first consignment of busses from England early in October.

Mrs. Warburton, who died in St. Joseph's Hospital, London, Ont., Sept. 1, aged 84, was mother of W. N. WARBURTON, General Manager, London and Lake Erie Ry. and Transportation Co.

A. S. BALSDEN, chief electrician of the London and Lake Erie Ry. and Transportation Co., was accidentally electrocuted at the company's substation in St. Thomas, Ont., Aug. 28.

I. L. GODFREY has been appointed Comptroller, International Transit Co., and Trans St. Marys Traction Co., subsidiary companies of the Lake Superior Corporation, and E. B. BARBER has been appointed Assistant Comptroller of the some companies.

D. D. McEWEN has been appointed Roadmaster, London Street Ry., London, Ont. He came to Canada from Glasgow, Scotland, in 1911, where he had been in Caledonian Ry. service for about seven years.

Electric Railway Finance, Meetings, Etc.

Brandon Municipal Ry.—Receipts for July, $8,430; operating expenses, $4,430.

British Columbia Electric Ry. Gross earnings for July, $755,943; operating expenses, maintenance, etc., $549,947; net earnings $205,996, against $650,245 gross earnings; $468,277 operating expenses, maintenance, etc.; net earnings $181,968 for July, 1912. Owing to the practical completion of the hydro-electric installation of the Vancouver Power Co., a subsidiary concern, the income of subsidiary companies is now included with that of the railway, instead of estimating the net income, as heretofore.

Cape Breton Electric Co.—Gross earnings for July, $32,543.24; operating expenses and taxes, $17,615.56; net earnings, $14,927.68; interest charges, $4,891.67; balance, $10,036.01; bond sinking and improvement funds, $1,190; net balance, $8,846.01, against $33,115.85 gross earnings; $16,973.96 operating expenses and taxes; $16,141.89 net earnings; $4,495.83 interest charges; $11,646.06 balance; $1,206.67 bond sinking and improvement funds; $10,439.39 net balance, for July, 1912. The construction charges during July, were $14,279.79.

Grand Valley Ry.—J. L. Addison, St. George, Ont., on behalf of himself and other bondholders, has entered an action against A. J. Pattison, W. S. Dinnick, John Firstbrook and other directors of the company for loss occasioned by the alleged malfeasance of the defendants as directors, particularly in connection with the contract for the construction of the railway made with Dill & Co., and the issue and delivery from time to time of bonds to the amount of $3,285,000, and in respect of the improper issue of shares to the amount of $900,000. They also seek to recover $70,000 which they allege was improperly obtained by the directors and retained for their own use. An accounting by the directors of all their dealings with the company's assets is asked for.

Halifax Electric Tramways Co.—Application is being made to the Nova Scotia Public Utilities Commission for power to issue 6,000 additional shares of common stock par value $100 each. The company's representatives explained that the proceeds would be used to redeem $600,000 of bonds due in 1916, and the premium obtained on the stock would be used for extension and betterments to the line. The city of Halifax opposed the application, and the hearing was adjourned.

Hull Electric Co.—The annual meeting of shareholders was held Sept. 3, when the statement of affairs for the year ended June 30 was submitted. W. R. Baker, Secretary, C.P.R., was elected President, and E. W. Beatty, General Counsel, C.P.R., Vice President, for the current year.

Oshawa Ry.—The annual meeting of shareholders was held at Deseronto, Ont., Sept. 8. Following are the officers and directors for the current year,—President, E. W. Rathbun, Deseronto, Ont.; Secretary and Treasurer, H. W. Cooper, Gananoque, Ont.; Manager, J. F. Chapman, Gananoque, Ont.; other directors, D. A. Valleau, Oshawa, Ont., and B. R. Hepburn, M.P., Picton, Ont.

Port Arthur and Fort William Electric Ry.—Committees representing the City Councils of Port Arthur and Fort William, Ont., are discussing the details which have to be worked out, in view of each city taking over its own electric lines. The most important point to be settled is as to the operation of the line connecting the two cities.

Toronto Ry., Toronto and York Radial Ry., and allied companies.—Gross earnings for July, $811,966; operating expenses, maintenance, etc., $401,954; net earnings $410,012, against $712,456 gross earnings; $329,607 operating expenses, maintenance, etc.; $382,849 net earnings for July, 1912. Aggregate gross earnings for seven months ended July 31, $5,467,452; net earnings $2,659,445, against $4,725,175 aggregate gross earnings; $2,418,921 net earnings for same period 1912.

Winnipeg Electric Ry.—Gross earnings for July, $336,821; operating expenses, $183,689; net earnings, $153,132, against $315,362 gross earnings; $163,930 operating expenses; $151,432 net earnings for July, 1912. Aggregate gross earnings for seven months ended July 31, $2,309,195; net earnings $1,030,121, against $2,124,066 aggregate gross earnings; $992,561 net earnings for same period 1912.

Winnipeg Electric Ry.—Sir Wm. Mackenzie is reported to have stated in Toronto, on his return from England, Aug. 31, that what were known as the Reece interests had been taken over by the W.E. Ry. The Reece interests own a charter for the development and distribution of power in Manitoba, and a number of charters and franchises for building electric railways in the more thickly settled territory of the province round Winnipeg.

Electric Railway Notes.

The Dominion Power and Transmission Co. has received one freight car from the Preston Car and Coach Co.

A bylaw is being prepared by the London, Ont., City Council, providing for the operation of a Sunday car service on the London St. Ry. It is said that the ratepayers will be asked to vote thereon, Oct. 15.

The Edmonton Radial Ry. has received 10 steel underframe double truck single end pay-as-you-enter cars, from the Preston Car and Coach Co., making 28 delivered, out of an order of 35. The remainder will not be built until 1914.

The Cape Breton Electric Co. recently ordered three double truck, double ended, closed cars, 44 ft. 4 ins. long, equipped with Baldwin trucks, four 40 h.p. Canadian Westinghouse motors for each car, and Canadian Westinghouse air brakes.

The relatives of the late Duncan Miller, Superintendent, Hamilton St. Ry., are suing the Hamilton City Council, in connection with his death in an automobile accident, alleged to be due to the condition of the road. The council is to defend the suit.

The Nipissing Central Ry., which is operated in connection with the Timiskaming & Northern Ontario, will probably have 2 more cars added in the near future to its present equipment of 6, the matter being under consideration by the T. & N.O.R. Commission.

The Niagara, St. Catharines and Toronto Ry. has installed a derailing switch on the main line between Merritton and Thorold, Ont., where there is a steep grade, in order to prevent possibility of a collision in the event of cars breaking loose, as occurred recently.

The Edmonton, Alta., Radial Ry. employes are asking the city council to grant an increase of 2½c. an hour, and the matter is under consideration. The rates in force under the agreement, which expired Sept. 1, were: First six months, 27½c. an hour;

second six months, 30c.; second year, 35c.; after two years, 37½c.

The number of passengers carried on the British Columbia Electric Ry. cars in Victoria, during August, was 1,202,113, against 978,289 in Aug., 1912. The total passengers for the eight months ended Aug. 31, was 8,802,958, against 7,026,230 during the same period 1912.

During August, passenger traffic on the Berlin and Waterloo St. Ry. increased about 10.8% over the same month in 1912. The number of passengers carried was 99,236, the net profit for August amounting to $945.05. This increase occurred notwithstanding the fact that a temporary track is being operated on the side of the road, during double track construction.

The Guelph Radial Ry. has received one double end, double truck, pay-as-you-enter city car, from the Preston Car and Coach Co. It is mounted on standard truck with rolled steel wheels, Westinghouse 101B2 quadruple motor equipment, Westinghouse SM1 air brake, and the body is finished in natural cherry inside and out, Crouse-Hinds Imperial arc headlight, Providence fenders, and Root scrapers.

The Port Arthur and Fort William Electric Ry., which is now being operated by a joint commission appointed by the two cities, will be separated before the end of the year, each city operating its own section. Steps are being taken to arrange terms of interchange of passengers, and other matters that will arise owing to the separation. It is said that there will be no change in the general service, except that cars will probably be run at shorter intervals.

As a result of arbitration proceedings a two years agreement has been signed between the British Columbia Electric Ry. and its employes. The arbitrators by a majority declined to alter the existing schedule, but made certain recommendations as to alteration of hours, etc. A minority report recommended increases of from 1½ to 3½ cents an hour; together with a schedule for clerks and other employes, whom the majority report would not recognize. The reports were made public Aug. 28, and after some discussion, the company meeting the men on some minor points, an agreement was reached to run for two years, the existing pay schedule to rule.

New Cars for Montreal Tramways Company.

The Montreal Tramways Co. has ordered 25 motor cars and 25 trailer cars, to be built in the United States, for its St. Catherine St. line, on which the trailers will be run from early in the morning until late at night, the attaching and detaching being done at the car house. The travel on the St. Catherine St. line is very heavy, the average headway being a minute and a half. Passengers will enter the motor car by the rear end and the trailers by the front end, and there will be an exit aisle at each entrance platform, as well as at the motorman's end. Delivery of these cars is to be made in December.

Following are their principal dimensions: —seating capacity, 48; bolster centres, length, 21 ft.; length of body, 32¼ ft.; length over vestibule, 44¼ ft.; width over sills, 8¼ ft.; width over all, 8 ft. 4¾ in.; height, rail to sills, 2 ft. 3 13-16 in.; sill to trolley base, 8 ft. 10⅞ in. The body will be wood, with steel sheathing; interior trim, cherry; roof, plain arch; underframe, steel. Among the special equipment are the following:— cables, conduits and junction, boxes, gears and pinions, and motors, Westinghouse; couplers, Tomlinson; destination signs, Keystone; paint and varnish, Murphy.

Judgment Against the Brantford Street Railway Company.

An action brought by the City of Brantford against the Brantford St. Ry. Co., the Grand Valley Ry. Co., E. B. Stockdale, Receiver of the Grand Valley Ry. Co., the National Trust Co. and the Trusts and Guarantee Co., the two latter being respectively mortgagees to secure issues of bonds of the Brantford St. Ry. Co., and the Grand Valley Ry. Co., was tried at the Assizes at Brantford, Ont., in the third week of September. The action was brought for cancellation of the existing franchise, which was granted in 1902 for 50 years. A new franchise was granted in 1907, also for 50 years, which, however, was also to date from 1902. Among the grounds on which cancellation was asked were general failure to observe the contract with the city, non reconstruction of the east ward loop, failure to provide proper cars, not providing distinguishing lights on cars, and failure to pay the city for taxes and work done.

Chief Justice Meredith gave the defendants one month to elect whether judgment shall be entered for forfeiture of the franchise, or whether they will accept the terms imposed, viz., to take one year's time within which to comply with the terms of the contract with the city by completing and rebuilding the railway in the city, placing new rolling stock on it in accordance with the contract and paying up all moneys owing to the city. In any event, the defendants must pay $100 a month damages until they comply with these conditions and the cost of the suit. If they decline the terms, and accept the judgment for forfeiture, there is also judgment for $1,200 damages. W. T. Henderson, City Solicitor, of Brantford, acted for the city.

It came out at the trial that $1,700,000 of bonds had been issued, but it was not known whether they had been sold or simply pledged. They were issued for building a railway from Brantford to Woodstock, and from Brantford to Port Dover, which has not been done.

Advance in Fares on British Columbia Electric Railway.

Prior to making a change in fares on Sept. 18, R. H. Sperling, General Manager, made the following statement:—

"As is well known, there has been a steady increase in the cost of labor and supplies for some years past. Everything the company buys—labor, electrical equipment, rails, rolling stock and material of every kind—has grown in value until a proper relation no longer exists between the cost of a street car ride and the price paid for it. To the people at large the cost of practically every necessary commodity has also advanced, excepting only the street car ride, which has remained the same. On the other hand, the wages of all classes of labor, skilled and unskilled, have increased step by step with the cost of living. No such compensating advantage has come to the company, consequently the margin between operating cost and revenue earned has gradually decreased until the profit earned by the company on its investment is no longer adequate to induce the investor to put fresh capital—so necessary for the development of the territory served by the company—into the concern. Apart, however, from the viewpoint of obtaining additional capital, the company has not earned a reasonable profit on its operations during the past 18 months—certainly no such return as would induce local people to invest their savings in the enterprise.

"The company's investment in British Columbia amounts to approximately $45,000,000, consisting entirely of cash received from its stockholders, which is at present earning about 4½% per year. If the necessary further capital required for the adequate development of the territory served by the company is to be raised on reasonable terms, it is absolutely essential that the company's railway revenue should be increased.

"Although the necessity for abolishing commutation rates has been apparent for some time, we have repeatedly postponed action, hoping for an adjustment in economical conditions, which would render any change unnecessary. No such adjustment has come, and none is in sight. Therefore, to further delay setting the company's affairs in line with conditions as they now exist, and are certain to continue for some time, would be not only unfair to those who have furnished the money for our development, but dangerous and unsound from a financial standpoint.

"The situation which confronts us in British Columbia has been experienced generally along the Pacific coast, and in a number of cases elsewhere has been met by a return to the straight five cents fare. Our company, however, does not intend to go to this extreme, unless a still further increase in operating costs compels us. We propose, therefore, continuing a low rate ticket for workingmen, which will be sold in strips of 10—5 white and 5 green—at 40c. a strip, or 4c. a ride. The white tickets will be good only up to 8 a.m. The other half will be good at any time up to midnight, when the 'owl' rates will come into effect, where 'owl' cars are run. Apart from these tickets the fare will be 5c., but for the convenience of the public, blocks of tickets will be sold, 5 for 25c. School children's rates will remain as before.

The new rates will be effective on and after Sept. 18, and the tickets at present in force will not be sold after Sept. 17."

Winnipeg Electric Railway Power Plant. —Recent press reports stated that the W. E. R. Co. had decided to build a large power plant twelve miles farther down the Winnipeg River than the present plant and that a contract therefor had been let. We are officially advised that the reports are entirely without foundation. The company has been for some time looking for another power site, but nothing definite has been settled. No new site has been arranged for or engineers engaged, nor have any arrangements whatever been made for the erection of a new power plant. The reports stated that the power plant was to be built at the Grand Bonnet Falls, about 12 miles farther down the Winnipeg River than the company's present power plant is located, that the new plant was estimated to cost about $5,000,000, and that a contract had been let for its construction to J. G. White and Co., New York.

The Master Car and Locomotive Painters Association of the United States and Canada held its 44th annual convention at Ottawa, Ont., Sept. 9-12, when reports were received and a number of topics in which the association is interested, were discussed.

At a meeting of the Aylmer, Ont., Board of Trade, Sept. 14, a resolution was passed in favor of building an electric railway from that town to Pond Mill, on the London and Port Stanley Ry., in the event of that line being electrified.

Railway Route Map Approved.—The Minister of Railways and Canals, Aug. 23, approved the route map of the Glengarry and Stormont Ry. from the C.P.R., near St. Polycarpe Jct., to Cornwall, Ont., 28 miles.

Marine Department.

The New Government Dry Dock at Lauzon, Quebec.

Canadian Railway and Marine World for September contained a preliminary description of the Government drydock to be built at Lauzon, two miles east of Levis, Que., near the present Government drydock and nearly opposite the city of Quebec. A plan showing the location of the new drydock with regard to the present one, is given herewith. This shows the layout of the new drydock and the arrangement of docks, buildings and approach slip to be built in conjunction with it.

The dock will have the following dimensions: length from caisson stop to head wall, 1,150 ft.; width of entrance, 120 ft.; depth on sill at ordinary high water spring tides, 40 ft. It will be divided into two parts, 650 and 500 ft. respectively; the outer entrance will be closed by a steel rolling caisson, and a ship or floating caisson will close the inner entrance. The outer caisson will also fit the outer face of the outer sill, so as to facilitate repairs to the rolling caisson when required. The dock will be emptied by three centrifugal pumps, each having a capacity of 60,000 gals. a minute, with direct electric drive, power being derived from three turbo-generator sets receiving steam from 8 water tube boilers with a combined capacity of 3,600 h.p. The rolling caisson is to be operated by electrical means from the same source of power.

The site for the new drydock covers the section of the shore lying principally between the water lines of high and low spring tides, and will involve the making of filled land. For the proper carrying on of the work of construction, the portion of the site in the immediate vicinity of the drydock is to be completely enclosed during operations by the cofferdam shown in the plan. From this protected area, the water is to be constantly drawn off, in order that the work may be expeditiously proceeded with.

The dock walls, floor, portal walls of the outer and inner caissons, the culverts, pump wells, sumps and superstructures of the wharf and bulkhead, will be built of concrete, reinforcing being used in some instances.

The drydock will have a docking length of 1,150 ft., and the inner end, 650 ft. long, can be separated from this length by a floating caisson for the docking of smaller vessels. Most of the excavation for the drydock will be through solid rock, with the exception of a thin earth crust. The excavation is to be carried at the inner end of the dock to a depth of 28.5 ft. below the datum line, the latter being at the level of the low water spring tides. This excavation at the bottom will be 122 ft. wide, sloping up to ground level on a 1 to 2½ batter. From the inner end of the dock, the bottom will slope forward on a slope of 1 in 1,000, so that near the forward end, the cutting will be 29.5 ft. below datum.

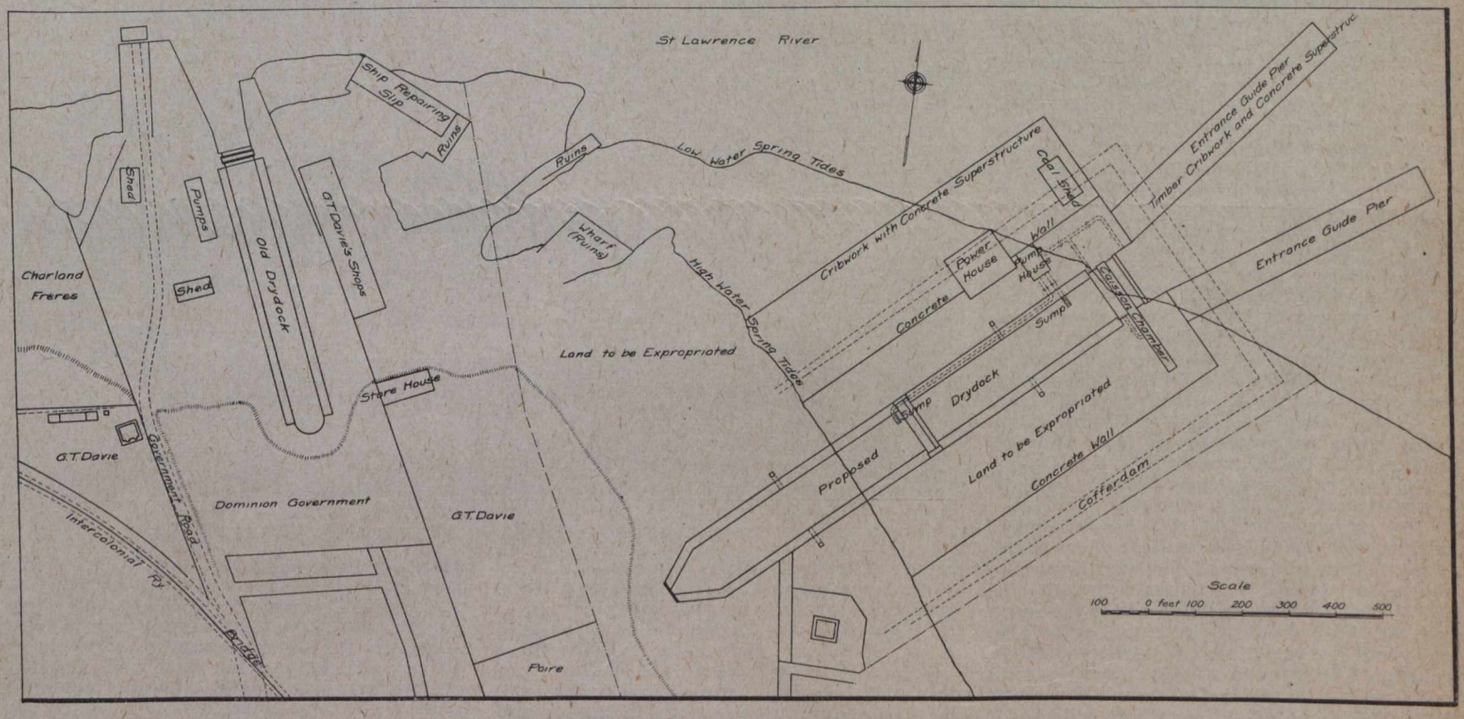
The side walls of the excavation will have the slope mentioned, but the concrete walls are to be stepped, giving an average wall thickness of concrete of about 5 ft. They are to be built in 30 ft. sections leaving ¾ in. expansion joints between. Each joint is to have a 1 in. V joint. The ends of the sections are to be moulded with a groove, the whole joint to be filled with grouting on completion.

The flooring of the dock will take the 1 in 1,000 slope of the excavation for drainage purposes. The concrete flooring will be 5 ft. thick, with a 6 in. slope from the centre to the sides, for draining to a 6 by 12 in. gutter along each side. Under the floor and at the back of the side walls, drains are to be provided leading to the pump sumps, so as to prevent any possible hydrostatic pressure that may be produced by the accumulation of water through seepage. The centre of the floor will be provided with three rows of granite blocks 18 ins. thick, the middle row being 4 ft. wide and level, and those on each side of this centre row, 3 ft. wide, and having the slope of the floor. The floor formation is to be in sections similar to the walls, to be grouted on completion.

At the end of each main section, on each side of the dock, 8 points in all, there will be stairs moulded in the concrete of the walls. These steps are to be 12 ins. wide., with a 12 in. rise. Centrally in each wall of both sections, at four points, there will be timber slides, which will be 8 by 12 ft. passages at right angles to the dock walls, sloping back at a sharp angle from the bottom of the dock to ground level. One side of each passage will be floored with granite slabs for the timber slides, and alongside the slide in the passage, will be a stairway to the surface, with 10½ in. tread and 12 in. rise.

The coping of all the altars will be granite blocks, 12 ins. thick and 3 ft. wide. Between the altars, there will be 8 galvanized iron ladders. The coping of the side and caisson chamber walls will also be of granite slabs. On each side of the dock, there will be 12 cast iron bollards, set in concrete blocks, and also located along the side walls, there will also be 9 capstans, but it is undecided as yet whether or not these will be electrically operated.

The keel blocks will be of cast iron in three pieces of a normal height of 4½ ft. The bilge block slides will be located every 16 ft. through the length of the dock. They are to be made of 3 in. white oak, 12 ins. wide. The bilge blocks will be of



New and Old Government Drydocks at Lauzon, Que.

pitch pine, provided with slide irons and oak slide blocks for clamping to the bilge block slides. The hauling chains are to be of ⅜ in. short link chain, two chains for each block.

The rolling caisson for the outer end of the drydock will measure 123 ft. by 19 ft. 11 ins. It will be made of mild steel, with the side plate rivetted to a steel frame, and the sides of the plates lapped and single rivetted, and the ends covered with butt plates double rivetted, with the bottom of a similar construction. It is designed to withstand a head of 45 ft. It is to be so ballasted that it will float to a depth of 23½ ft. with all the valves closed. At a height of 23 ft. from the bottom, there will be a watertight deck, on which the rising tide will be allowed to enter through side openings of such sectional area that the water covering will rise at the rate of 4 ft. an hour with the flood tide, thus preventing the caisson from floating. The openings in the sides will connect with the top of the deck with steel pipes provided with water tight valves. By closing these valves in winter or when the dock is not in operation, the water will not be allowed on this deck, and the lower part of the caisson will then be filled to counterbalance the flotation, valves in the lower portion being arranged for this purpose. Six water tight steel culverts of an approximate area of 10 sq. ft. each will pass through the caisson for filling the dock.

The water tight deck of this caisson will be of sufficient strength to support a water column of 22 ft. The chamber end of the caisson will have a built up steel drawbar with attached chain. This chain, passing over a pulley, will connect through a worm gearing to a motor drive. The bearing face of the inner side of the caisson will have a green heart timber fitted into angles for the bearing surface, and inside this timber, there will be a 1 in. steam pipe to thaw out the joint when required. The lower chamber of the caisson will also have steam pipe connection to keep it free of ice in the winter and when not in service. The top of the caisson will have a folding bridge with an apron of 4 in. pine standing on the level of the wall copings. Side railings on this bridge will be arranged to fold with the bridge when the caisson is moved back into its chamber. The caisson chamber will be covered over with 4 in. planking.

The caisson chamber will be of similar construction to the side walls, only vertical, 49½ ft. from the top of the wall coping to the roller altars. The chamber width will be 23 ft. On these roller altars on each side of the bottom of the chamber will be mounted in cast iron bearings at 8 ft. centres, 2 ft. flanged wheels, on which will bear medium hard steel strips on the lower face of the caisson. The whole will be of sufficient strength to support the caisson, when filled with ballast, without deflection. The edges of the caisson chamber will be finished with granite blocks.

For the 650 ft. inner end of the dock, there will be a floating caisson made sufficiently strong to withstand the same heads as the rolling caisson. It is to be built with water tight ballast, air and tidal chambers, and will contain enough ballast to be easily handled when afloat. There will be six filling culverts similar to those in the rolling caisson, operated electrically from above. Two centrifugal pumps with bronze impellers, each of a capacity of 5,000 gals. a minute against a 40 ft. head, operated by electric motors of 100 h.p., will be installed in the floating caisson for removing the water ballast from the scuttling tanks. The floating caisson will float on an even keel without any listing. The top deck will be 15 ft. wide and will serve as a bridge across the dock. The closing timbers will be of green heart timber, and will be placed on both sides of the caisson. This caisson will fit against shoulders in the wall of the dock nearly midway in its length. Beyond the outer end of the dock, there will be also similar shoulders, against which the floating caisson can be set when it is required to fix the rolling caisson.

The channel beyond the outer end of the dock is to be dredged to a depth of 30 ft. out into the river channel. On each side of this channel, there will be guide piers 600 by 75 ft., of timber construction with a concrete superstructure. The outer end of the piers will be 300 ft. apart.

Along the north side of the dock, there will be two sumps in the dock bottom, covered with iron grating. These will be located inside each of the caissons. From the inner one, beyond the floating caisson, there will be a 7 by 12 ft. tunnel leading back to near the outer caisson, turning at a right angle into the pump pit. From alongside this turn, the outer end sump will connect with a similar concrete culvert to the pump pit.

The pump house building will be 50 by 70 ft., over top of the pump pit. The pump pit will be built of concrete, on the outer wall of which there will be a ¾ in. coating of asphaltum to render the chamber damp proof. The floor of the pump pit is to be 41 ft. below ground level. The pump house over the pit will have walls of red brick 12 ft. high, with the inside finish of pressed brick. Inside the door of the building there will be a 10 by 12 ft. platform, leading down from which to the pump pit floor there will be a cast iron ladder with 9 in. treads and 7 in. risers. In the pump pit, there will be three 60,000 gal. per min. centrifugal pumps, with 58 in. suction and discharge pipes. Each of these pumps is to be operated by a 1000 h.p. d. c. motor. The pump pit will also contain two drain centrifugal pumps with 18 in. suction and discharge pipes, each direct connected to a 125 h.p. motor.

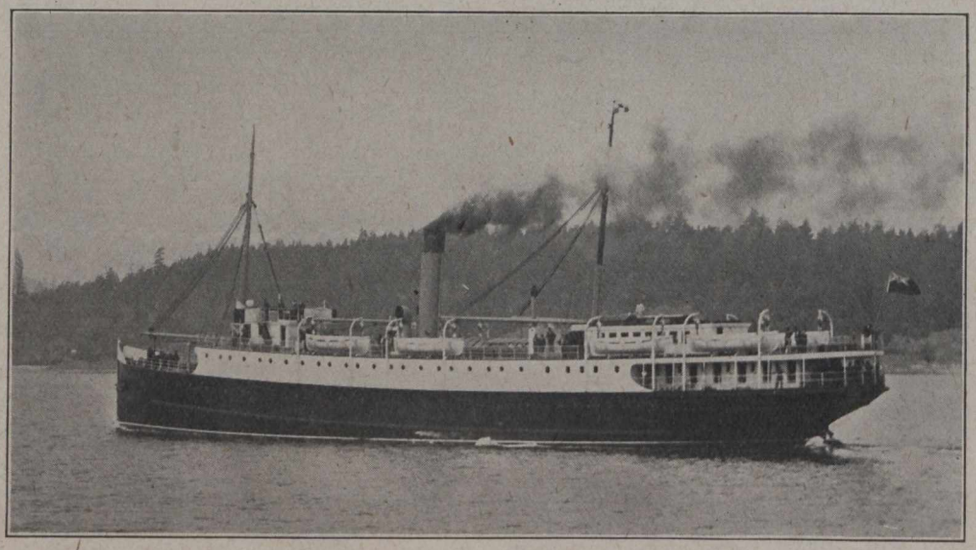
Alongside the pump house will be located the power house, 100 by 120 ft., divided into two rooms, each 50 by 120 ft. One of these will be the boiler room and the other the generator room. The walls of both, 25 ft. high, will be similar to the pump house construction, except that the walls of the generator room are to be glazed to a height of 6 ft. The generator equipment will comprise three generator sets, of 1,500, 750 and 300 k.w. each, supplying direct current at 550 volts. The motive power will be steam turbines. There is also to be a 100 k.w. 220 volt. d.c. generator for lighting, direct connected to a high speed vertical engine. The generator room will also contain all the switchboard and control apparatus for the electrical equipment.

The steam generating equipment will consist of a battery of eight water tube boilers, six of which will be 500 h.p., and the other two, 300 h.p. each, all arranged in batteries of two and provided with automatic stokers. In addition, there will be the usual equipment of feed pumps, heaters, etc. The power house chimney will be 180 ft. high, with an inside diameter of 12 ft., and 24 ft. outside diameter at the base. It will be built of red brick with an inner shell of fire brick. In the power house, there will be sections for a small store room, 8 by 12 ft., and closets and wash room.

The other buildings of the plant will include a coal shed on the edge of the outer end of the dock, 50 by 100 ft., with 14 ft. walls roofed over.

Canadian Pacific Railway s.s. Princess Maquinna.

The s.s. Princess Maquinna, built at Esquimalt for the British Columbia Coast Service, has been placed in service on the Vancouver Island west coast route in place of the s.s. Tees. She is considerably larger than the Tees, and is the largest one of the type built at Esquimalt. She is built of steel and is classed 100 A1 at Lloyd's. She has 62 staterooms, and dining room accommodation for 65 passengers, with large social hall and smoking room and considerable promenade space. She is equipped with triple expansion engines, and her boilers are arranged to burn oil fuel. In addition to other up to date equipment there is a complete electric light installation, and wireless telegraph apparatus. She was designed for a speed in open water of 12 knots an hour. Following are her chief dimensions:—Length between perpendiculars, 232½ ft.; length over all, 250 ft.; beam, 38 ft.; depth to main deck, 17 ft.; displacement loaded when drawing 14 ft. of water, 1,860 tons. Further descriptive details were given in Canadian Railway and Marine World for June.



Canadian Pacific Ry. s.s. Princess Maquinna.

Capt. Forster, of the C.P.R. s.s. Empress of Ireland, has been appointed Marine Superintendent for the company, at Liverpool, Eng. Capt. Turnbull, of the Mount Royal, has been promoted to the Empress of Ireland; Capt. Murray, of the Monmouth, to the Mount Royal; and Chief Officer O'Reilly, of the Empress of Ireland, to the command of the Monmouth.

Montreal Harbor Commission's Chairman Reports on Grain Transportation.

W. G. Ross, Chairman, Montreal Harbor Commission, visited Port Arthur and Fort William, Ont., recently, and has embodied a large amount of information which he gathered on the trip in a report on grain transportation, elevators, tariffs and grain freight rates which contains a large amount of valuable data.

Mr. Ross had a conference with Dr. R. Magill, Chief Grain Commissioner, of which he says:—"As to means of increasing the movement of grain through Canadian ports, with the present lake marine and elevators, Dr. Magill stated that the cancellation of the Canadian grain certificates on all grain once it crossed the boundary, for export via United States ports, might have for effect the desired result, but before recommending that such drastic action be taken, due consideration would have to be given to the effect of such cancellation upon the market. Notwithstanding the fact that Canadian grain is shipped through the U. S. in bond, upon its arrival at destination seeds not grown in Canada are found mixed with it, and yet it is sold to the European miller bearing the Canadian certificate. The cancellation of the certificate, as suggested, might mean that grain shipped via Canadian channels would command a higher price in the European market, but such an action might be a hardship on the exporter, unless our facilities, etc., enabled him to reach that market with his grain. This question is now receiving the consideration of the Grain Commissioners."

In reference to the grain traffic Mr. Ross says:—Grain exporters with whom the subject was discussed stated that the reasons the St. Lawrence route is not taking care of the entire grain traffic of the Canadian Northwest are because of insufficient Canadian lake vessels, storage capacity at lake, bay and sea ports, and ocean tonnage from Montreal.

"The following table shows that the great leak in the main artery of Canadian transportation is not only still existent, but is increasing. In 1912 44,519,182 bush. of wheat were not only shipped from Fort William and Port Arthur to U. S. lake ports, but all of it excepting 333,829 bush. was transported in U. S. vessels.

Year.	In Can. vessels to Can. lake ports.	In Can. vessels to U.S. ports.	In U. S. vessels to U.S. ports.
1908	37,359,463	1,944,179	14,087,978
1909	37,296,735	3,315,646	15,972,860
1910	38,271,487	1,844,153	16,640,800
1911	36,378,535	1,258,469	32,548,065
1912	53,217,861	333,829	44,185,353

"These records show that, whereas the wheat shipments from these lake ports to lower Canadian ports increased slightly over 40% during the last five years, the shipments to U. S. ports have increased 180% during the same period, and whereas in 1908 Canadian vessels shared to the extent of one-seventh in the carrying of the U. S. routed grain, in 1912 their share dropped to the one hundred and thirtieth part of it. Last year 44,519,182 bushels of wheat left Port Arthur and Fort William routed through U. S. channels and the Canadian marine lost its transportation to the U. S. lower ports, which rightly belongs to it, by its scarcity of vessels, a scarcity which a deep water channel to the sea would soon not only make adequate, but would divert to Montreal and other Canadian ports the greater portion of the grain trade which now seeks U. S. ports. Large wheat shipments to Buffalo last year were made notwithstanding the fact that owing to the large grain crop in the U. S., the port was from November continually congested, scores of steamers lying there waiting to be unloaded, a condition of affairs which compelled shipowners to charter for storage cargoes only, and which caused considerable grain to go via Canadian routes which would have gone to Buffalo but for the delay in unloading there.

"Just so long as a bushel of wheat is carried from Canadian lake ports to U. S. lake ports in U. S. vessels, the lake shipping of Canada is inadequate, and until Canada has a west-bound trade, capable of supporting and warranting the building of vessels on a par with U. S. boats, she cannot control the carrying trade from the Canadian upper lake ports. With the development of the package trade westbound on the lakes Canadian vessel owners built steamers to control it, and these carriers have been a factor in making Montreal a large grain shipping port, which can carry grain cheaper than the craft that only gets a one way cargo, and then only at the spasmodic movement of grain sent east which reaches its full volume in spring and fall seasons. Until Canada furnishes a deep water channel to Montreal to tap her eastern coal fields, and supplies heavy westbound freight, which is so essential to the development of the large carrying capacity lake steamers, equal in every respect to the large U. S. craft, and capable of coping with them in rates, the U. S. will control the bulk of the grain shipments.

"Elevator storage capacity is the great and immediate need at every Canadian port on the grain route. The Government last fall endeavored to provide additional storage at Fort William and Port Arthur by suspending the Canadian coastal laws with the object of preventing grain being sent to Duluth and Minneapolis for storage, and also divert it from the U. S. route to the seaboard by allowing U. S. vessels to load storage grain for delivery to Canadian lake ports in the spring, a plan which, however, failed, for the majority of the 39 U. S. vessels which took on grain during the winter delivered their cargoes at U. S. lake ports. Georgian Bay ports were also so congested last spring that vessel owners not only reluctantly chartered to these ports, but insisted upon the insertion of a special guarantee clause, or in other words, the payment of demurrage charges, 3 to 4 days being the average demurrage during May and June. Like congestion also occurred at Port Colborne and Kingston, as may be seen from the following telegrams posted on the Winnipeg Grain Exchange:—

"Port Colborne, June 4, 1912.

"Standard Shipping Co., Winnipeg:

"Yours received. Expect have space for one—possibly two—small vessels this week. Montreal badly congested. Steamers being delayed seriously there which affects us. Prospects very bad until end of next week unless you can supply some tonnage. Met Neebing and Hero.

"(Sgd.) FAWCETT, Supt.

"Standard Shipping Co., Winnipeg:

"Canadian discharged Prescott. Kingston blocked. Notify shippers re insurance.

"(Sgd.) FAWCETT, Supt.

"These telegrams resulted in an attempt to divert the following vessels to Buffalo:—The Neebing, Empress of Fort William Scottish Hero, and T. Daniels, containing 600,000 bushels of grain.

"Whatever congestion there actually was at Montreal at the above date might have been removed before any of these vessels could possibly reach Port Colborne. At any rate, remarks like this should have been confined to Port Colborne as they tend to divert grain to U. S. channels.

"In order to help our Canadian marine to handle our crops it is imperative that additional elevator storage should be provided at once so as to obtain during the short season of navigation the maximum results from our ports.

"That vessel owners are naturally anxious not to have any demurrage at Montreal is demonstrated by the verbal suggestion of Mr. Wolvin, of the Mutual and Canadian Interlake Lines,—that the Harbor Commissioners should lease to him 500,000 bush. capacity in the annex to elevator 1 or 2, for which he would be willing to pay the usual elevator rates and such additional operating cost as would guarantee a return of 4 or 4½% on the cost of the leased portion, or a similar arrangement, if it could be worked out, to what is done for the industries desiring wharves. this scheme's purpose being so that a regular schedule of sailings westward could be adopted for the season."

The Crown of Cordova's Collision With the Lady of Gaspe.

The collision between these two vessels in the St. Lawrence River on the night of July 28 was inquired into at Quebec in August by Commander H. St. G. Lindsay, R.D., R.N.R., Dominion Wreck Commissioner, assisted by Captains F. Nash and R. S. Clift, as assessors. The evidence showed that the vessels sailed from Montreal on the afternoon of July 28, the Crown of Cordova in water ballast bound to Quebec to load, and the Lady of Gaspe bound to Gulf ports, with freight and passengers, and continued in sight of each other after leaving Montreal, the Lady of Gaspe being ahead. On passing Three Rivers, the vessels appear to have been about a mile apart, and shortly after this the Lady of Gaspe, seeing that the Cape Magdeleine range lights were obscured by fog, and apparently having lost her bearings on this account, decided to anchor, which was done with the vessel's head still down stream, and also without any regard to the fact that the Crown of Cordova was astern, the result of this action being, the latter vessel, seeing that she was closing in on the stern light of the other, which was then on her starboard bow, immediately stopped her engines. It would appear that the speed of the Lady of Gaspe was such that the anchor when let go, with about 15 fathoms of chain, dragged for some time before it had any effect in swinging her, the helm remaining amidships, so that the Crown of Cordova not being aware that the Lady of Gaspe had anchored, made an attempt to pass her to the northward, or on her own starboard side; but as the Lady of Gaspe was then commencing to swing to the current, with her head to the northward, and opening up her port side, this action was not considered prudent, and as a collision was then seen to be inevitable, the engines of the Crown of Cordova were put full speed astern; but the two vessels came together, the Lady of Gaspe being struck at an angle nearly amidships by the stem of the other vessel. On the vessels clearing each other the Crown of Cordova anchored and sent her boats to assist in taking off the passengers and crew of the Lady of Gaspe, which vessel had been beached on the north shore. Both vessels received considerable damage, which necessitated their being put in dry dock for repairs. The evidence shows that after the collision, the Second Officer and several of the crew, and also several male passengers of the Lady of Gaspe were found to be on the forecastle head of the Crown of Cordova, having climbed on board when the vessels

were together, and there is nothing to show what their motive for going there was other than self preservation.

The court, in view of the evidence adduced, is unanimous in its opinion that the Lady of Gaspe is alone to blame for the casualty, inasmuch as she anchored in mid-channel without any regard to the fact that the Crown of Cordova was astern, and appears not to have even taken the trouble to look astern to find out where the other vessel was, nor did she use any of the sound signals prescribed by the Rules of the Road. The fact that the anchor was let go with the speed of the vessel almost unchecked, and with a three knot current astern, and that no effort was made to cant the ship either one way or another with the helm, shows a total lack of seamanship. The court severely criticizes the extraordinary absence of discipline on this vessel, carrying over 130 passengers. It appears that the Lady of Gaspe was being navigated by a man who was signed on the articles as wheelsman,—Elucipe Belanger,—who acted as pilot, lookout, and in charge generally; who steered his courses entirely by the buoys and range lights, and lost his bearings directly the fog and mist shut in the lights ahead, and who did not use the compass. The court therefore severely censures the Master, Cleophas Vezina, for his want of supervision, and in not having a proper watch kept, and lookout set, and properly organized boat stations in case of accidents; but as he took very prompt and proper action in putting his vessel on the bank when he found her sinking, and thereby probably saved the lives of many of the passengers, does not deal with his certificate. The court is of opinion that the cowardly conduct of Joseph Gauthier, the Second Officer of the Lady of Gaspe, in leaving his ship at the time of the accident, shows that he is not a fit and proper person to hold an officer's position. The court therefore cancels his mate's certificate, 5073. The court expresses its approval of the conduct of the master, officers and crew of the Crown of Cordova, and of the efficient manner in which the boats of that vessel were brought into use in the landing of the passengers of the Lady of Gaspe.

New Welland Ship Canal Construction.

The contract for the construction of section 3 of the Welland Ship Canal has been awarded by the Dominion Government to O'Brien and Doheny, Montreal. This section covers the heaviest portion of the whole route, and includes the erection of twin guard gates at Thorold, the single lock 7, the construction of a short stretch of canal below lock 7, and also of the three twin locks 6, 5 and 4 in flight, one flight for downward vessels, and the other for upbound vessels, thus saving long delays in the passage of vessels through the canal. These three locks overcome a descent of 139½ ft. The cutting from sec. 3 will be used in the construction of the breakwater in sec. 1, the Lake Ontario end, which is under contract to the Dominion Dredging Co. It is reported that the amount involved in the contract will approximate $9,500,000.

A full description of the new ship canal route was given in Canadian Railway and Marine World for July, and details of the locks in the September issue.

The number of ocean going steamships arriving in Montreal harbor during August, was 72, against 56 in August, 1912, and the total number of vessels arriving from the opening of navigation to the end of August, was 300, against 245 for the same period 1912.

Lake Shippers Clearance Association Annual Report.

At the annual meeting in Winnipeg, Aug. 28, the following report was presented:—"The operation during the last year has been very successful. We have handled 35,000,000 bushels more grain than last year and 87,000,000 more than the previous year, which is absolute proof that the association is of great benefit to both the vessel owners and shippers, and, further, that every exporting or shipping firm in the Winnipeg Grain Exchange are now members of this association.

"We again show a surplus over expenses. I would like to draw the attention of all the members present to how the surplus was accumulated during the present year, and to the remarks that I made at the last general meeting, 1912, in which I stated that the surplus during that year had been principally obtained from storage saved, and in looking over the financial statement this year you will see that the amount of fees received from the vessel owners and shippers is not enough to cover the running expenses of our association, and we show a deficit. We will be put to a larger expense this year as we have a private wire now betwen the Winnipeg and Fort William offices, and this wire is used by the vessel agents and shippers, and will no doubt be a great saving to them in their telegraph account. also it puts them in direct communication with the Fort William office, and our books are at all times open to the vessel agents to find out as to the loading of their boats and what dispatch they are getting, and in view of the above facts I cannot see how we can in any way reduce the charges that are now being paid by both the vessel owners and shippers. The money that we save on storage is money that entirely belongs to the shippers, and, in fact, it looks as if some of this money would have to be used to cover the operating expenses.

"Our fees for loading boats are based on the dispatch given the boat, and since our last annual meeting a conference was held between your board, representing the association, and representatives of the Dominion Marine Association, at which the basis of charges made for service rendered by this association to boats was completely changed. The Dominion Marine Association apparently felt that in some way the storage saved by this association in the course of its operation was saved at the expense of the boats, and notwithstanding assurances and evidence submitted by your board to the contrary, the marine representatives remained unconvinced. In urging the acceptance of the new schedule based on dispatch entirely, they pointed out that if it was accepted it would definitely clear up the only question at issue between the two associations and that the marine association would not be interested in any way in the question of storage or any surplus obtained by this association from that source. After considerable discussion, although it was felt that the change was a radical one, still as it was being considered as a final disposition of all questions at issue between the two associations, and disposed of any doubt in the minds of the marine interests regarding the question of surplus arising through storage saved by the clearing of documents, the schedule of the Dominion Marine Association was accepted and agreement entered into by the representatives of both associations covering same.

"We recommend that the entrance fee for membership be advanced to an amount commensurate with the increase in the reserve fund."

The Manager submitted the following report:—"I submit for your consideration, auditor's report and statement of the business for the year ended July 31. A ll the balances at the credit of the different firms have been confirmed. The actual warehouse receipts representing the grain held by the association have been confirmed by the elevator companies, and the accounts balanced to a pound, and all carefully checked by the auditors.

"During the past year, the association shipped 1,326 cargoes by vessel. The total quantity shipped of all kinds of grain amounted to 155,335,881 bush. out of the crop of 1912, as against 134,653,000 out of the crop of 1911, 62,065,000 out of the crop of 1910, and 74,440,000 out of the crop of 1909, the quantity shipped this year being over twice as much as the quantity shipped out of the 1909 crop. In addition to the quantity of grain actually shipped, the association handled transfers aggregating 13,698,977 bush. These figures show the appreciation by the trade of the advantage of using the association transfers, and are ample evidence of the advantage of delivering grain by transfer as against delivering actual warehouse receipts. This would be materially increased if the transfers were made deliverable on the option.

"In handling the crop of 1911, a considerable quantity had to be forwarded through Duluth, owing to congestion at the Canadian head of the lakes. The fact that the 1912 crop was a much larger one and the facilities at the Canadian lake ports not materially increased presented a problem that called forth the best efforts of all concerned in the forwarding of the crop. The Board of Grain Commissioners took the matter up energetically. The government was induced to spend a large sum of money in keeping the harbor open until late in the fall, and again in opening it early in the spring. Arrangements were made to have a large quantity of floating tonnage winter at the port available for winter storage, and arrangements also made under which United States boats would have the option of delivering their cargoes at Canadian ports in the spring. These arrangements were taken advantage of by the shippers, and this, combined with the extraordinary work done by the railway companies, resulted in a much smaller quantity of the 1912 crop being forwarded through Duluth than was forwarded of the crop of 1911, notwithstanding the fact that the 1912 crop was a much larger one.

"The facilities for handling the 1913 crop have been materially increased. New terminal elevators, and additions to those in operation a year ago will increase the storage capacity at the head of the lakes to over 40,000,000 bush. The railways have spent enormous sums of money increasing their terminals, rolling stock, etc., and consequently we are facing the problem of handling the present crop much better equipped than we have ever been before.

"The bulk of the grain handled last year was handled under the new schedule of boat charges agreed to between this association and the Dominion Marine Association, and the result shows that the average charge per cargo loaded was only $23.20, a very small charge indeed for the service rendered, when it is considered that a day saved to one of the large boats is worth as much as $1,000. However, since the new schedule has been adopted, we have not had a single complaint from a boat owner, which is a great source of satisfaction.

"Since the last annual meeting, the association has installed a private wire between our offices at Fort William and Winnipeg. This is proving a great advantage to the

boats as well as to the shippers. However, this wire will increase the expense of the association about $12,000 a year without any additional charge to the boats, and as the present fees barely cover the operating cost, this expense practically falls on the shippers' end of the association and may very materially effect any future surplus."

The balance sheet showed a surplus of $32,619.58 of income over expenditure. This surplus was obtained chiefly from storage saved, there being a deficit of $3,241.49 on the shipping account, the income thereon being commissions from shippers, $31,027.93; from vessels, $30,781.35; total, $61,809.28. Operating expenses on the same account were Winnipeg, $41,401.41; Fort William, $22,083.38; Duluth, $1,565.98; total, $65,050.77. Other sources of revenue on operating account returned:—Storage, $30,113.32; commission on warehouse receipts, $1,666.70; interest on bank balances, $4,081.05; total, $35,619.58.

STATEMENT OF SHIPMENTS.

	Season 1912-13. Bush.	Season 1911-12. Bush.
Wheat—		
Vessel	96,118,450.00	83,430,452.00
Rail	5,215,806.00	8,302,969.00
Duluth	1,142,206.00	4,023,454.00
Transfers	8,027,815.00	.....
Oats—		
Vessel	24,898,071.00	21,785,979.00
Rail	2,356,828.00	4,533,605.00
Duluth	969,773.00	4,271,543.00
Transfers	3,550,641.00	.....
Barley—		
Vessel	7,562,447.00	2,516,949.00
Rail	959,189.00	235,808.00
Duluth	117,511.00	447,446.00
Transfers	1,289,899.00	.....
Flax—		
Vessel	14,964,743.00	3,673,842.00
Rail	703,150.00	1,386,852.00
Duluth	427,707.00	43,539.00
Transfers	830,622.00	.....
Total—		
Vessel	143,543,711.00	111,407,222.00
Rail	9,234,973.00	14,459,234.00
Duluth	2,557,197.00	8,785,982.00
Transfers	13,698,977.00	.....
	169,034,858.00	134,652,438.00

Following are the directors for the current year:—President, Capel Tilt; Vice President, H. T. Stewart; other directors, A. K. Godfrey, R. M. Wolvin, C. C. Field; Treasurer, Jno. Fleming; Secretary, A. C. Ruttan.

Kenora-Fairmount Collision.

The Dominion Wreck Commissioner, Commander H. St. G. Lindsay, assisted by Capts. F. Nash and J. McGrath, as assessors, investigated the collision between the steamships Kenora and Fairmount, July 12, near the Lachine Canal entrance locks, the stern of the Fairmount being damaged by being hit by the Kenora, which, after glancing off the Fairmount, ran stem on into the dock wall, considerably damaging her stem.

The court found that the cause of the collision was admitted without question to be through a mistake made by the engineer on the Kenora in putting the engine full speed ahead instead of full speed astern, and the court was unanimously of opinion that if the order had been correctly executed, no collision would have occurred. There was nothing in the evidence to show what caused the serious mistake on the part of the engineer, and the Kenora was found to be, alone, to blame for the casualty. Both masters were exonerated from blame. The master of the Kenora having done all he could to avert the accident, he can in no way be held responsible for the mistake in the engine room, and the master of the Fairmount, seeing that he was handicapped by having a light vessel and being obliged to use his anchor to cant his vessel's head, owing to the direction of the wind, could not, under the circumstances, have done otherwise than he did to try and avoid the collision when he saw that it was inevitable. The court is of opinion that some special regulation is necessary to deal with cases of this description, so that each vessel may know which has the right of way into the canal locks, as it considers that the Rules of the Road do not extend to such cases.

The Prince Edward Island Car Ferry's Forward Propeller.

In the description in Canadian Railway and Marine World of September, of the car ferry steamship, which is being built at Newcastle upon Tyne, Eng., to run between Cape Tormentine, N.B., and Carleton Point, P.E.I., it was stated that a feature of the vessel which will be a new one on icebreaking steamships in Canada will be the forward screw, a feature which was first introduced in the Russian icebreaker Ermack. We were aware, however, that the Ermack had been altered, that she had returned to the Tyne, where her forepart was cut away completely, together with her propeller and its tube and that she had been fitted with a new bow, we communicated with Sir W. G. Armstrong, Whitworth & Co., who built the Ermack and who are building the P.E.I. car ferry and they have replied as follows:—

"The Ermack was originally built with a forward propeller, with a view to service in the Baltic, where it was found to be of considerable value in breaking up the pack ice which is always to be found there. After a certain amount of work in the Baltic, it was decided to attack the ice within the Arctic Circle, and on the first voyage in that part it was found that the bow propeller, useful though it was in the Baltic, was a positive hindrance to the vessel when attacking field ice, which often attained a thickness of 14 ft., and was of exceptional density and strength. It was, therefore, decided to take it off and alter the form of the bow.

"The car ferry is not, of course, intended for service amongst ice such as that encountered by the Ermack in the Arctic Circle, but will constantly have to face conditions which are more analogous to those of the Baltic Sea, where the bow propeller was found, not only in the Ermack, but in two later icebreakers—the Sampo and the Tarmo—to be of great value. Apart from this, the special manoeuvring which would be required in this vessel will make a forward propeller extremely useful, especially as we foresee circumstances in which, owing to the jam of ice in the landing ports, it may easily be that the two stern propellers are stopped, and the forward propeller will then be available to extricate the ship from her position and enable her to move out so as to attack the ice again.

"We have had experience of railway work amongst the ice on the large railway ferry steamship Baikal, which—as you are aware—carried the whole of the trains of the Siberian Railroad across the great inland lake, after which it was named, until the railway round the edge was completed. It is this experience upon which we have drawn in designing the car ferry."

The Dominion will be represented at the international conference to enquire into measures for the guarding of life at sea to be held in London, Eng., during November. The Department of Marine has been cooperating with the British Board of Trade in drawing up regulations for such purpose, and Canadian steamship lines have been asked as to what further safeguards ought to be adopted. These will form the chief topic for discussion at the forthcoming conference.

Atlantic and Pacific Ocean Marine.

The White Star-Dominion Line is reported to have ordered two additional vessels at Belfast, Ireland, for its Canadian service. It is stated that they will be 590 ft. long, and about 16,000 tons gross. This is larger than the Laurentic and Megantic which the company operates at present on that route.

The s.s. Devon, which sailed from Montreal, May 31, for New Zealand and Australian ports, is reported to have run ashore off Pencarrow Head, near Wellington, New Zealand, and to be considered as a total loss. She was built at Hebburn-on-Tyne, Eng., in 1897, her dimensions being, length 420 ft., breadth 54 ft., depth 28½ ft.

The New Zealand Line s.s. Whakatane, which recently grounded in the St. Lawrence, near where the Allan Line s.s. Bavarian was wrecked some years ago, was only slightly injured. She was docked at Levis for repairs, after which she proceeded to Montreal to load for New Zealand, and it was expected that she would be able to sail on her schedule date, Sept. 30.

The recent enquiry by the Dominion Wreck Commissioner, into the cause of the collision between the Elder-Dempster s.s. Bendu and a Dominion Government tug, has been adjourned sine die, owing to the difficulty of obtaining evidence, the captain in charge of the Bendu at the time of the collision having been replaced by another, and was therefore not available as a witness.

The Thomson Line s.s. Cairnross, which recently arrived at Montreal from Middlesbrough, Eng., has propelling machinery, which it is claimed is being used for the first time on a trading vessel. A turbine, such as is used on land in connection with dynamos, is connected to the single screw propeller, with the result that a saving of 15% is effected in the quantity of coal consumed. It is stated that the results have been entirely satisfactory.

Press reports from the Pacific coast state that the C.P.R. has placed a new wage schedule in force on the Transpacific steamships, averaging about $20 a month increase for the officers on its vessels. It is also stated that the bringing of the management of the Transpacific vessels under the one head with the Transatlantic ones, allows of transfers of officers when openings occur for promotion.

The Atlantic Transport Line is having built at Belfast, Ireland, a triple screw vessel, to be called the Minnekahda, which will be 620 ft. long, 66 ft. beam and 16,000 tons register. All outside rooms are to be equipped with hot and cold running water, and there will be an elaborate lounge and verandah cafe. She will make the voyage between London and New York in eight days, and is expected to be in service early in 1915.

The Dundee whaling steamship Scotia, which has been engaged in patrolling the northern Atlantic route, since the early party of the year, with the view of obtaining data as to breaking up of pack ice, and the movement of the ice floes, has been withdrawn from the service, the object for which it was engaged having been attained. It is stated that a lot of interesting and valuable information has been obtained, and the experiment has been a complete success.

It is announced that Pickford and Black, Limited, who have the contract for the mail steamship service between Canada and the West Indies, have chartered the Norwegian s.s. Uller for temporary purposes. The contract called for the addition of two fast steamships to the mail route by July 1, and efforts were made in Great Britain to charter the necessary vessels, but on ac-

count of the dearth of suitable tonnage at reasonable prices, the contractors were not successful.

In view of the remarks frequently made and quoted by interested parties, derogatory to the St. Lawrence route, it is interesting to note that in a report recently received in Montreal from the British Board of Trade, several matsers of British vessels, in giving evidence in an enquiry into the rules for the location and disposing of derelicts, stated that the system in vogue on the St. Lawrence, of communicating by wireless telegraphy with all stations and thence to vessels in port or in the vicinity, is the best that could be devised.

Press reports from Vancouver state that the Union Steamship Co., operating the mail steamship service between Canada and New Zealand and Australia, is to be reorganized with a capital of £3,000,000, divided into 3,000,000 shares of £1 each, and that the present company will be taken over, the new company assuming all liabilities, and paying the cost of winding up the present company and of forming the new one. The old name will be retained, the scheme merely being an increase of capital and an enlargement of powers.

On account of the anticipated increase in shipping into, and out of, Halifax, N.S., during the winter season, the transportation committee of the Board of Trade, recently applied to F. P. Gutelius, General Manager, Canadian Government Railways, to place temporary sheds, approaches, etc., on the no. 2 pier, at present under construction, so that two additional berths would be available at once. It is reported that this has been agreed to. About 370 ft. of the total 700 ft. of the pier has been completed, and the foundations of the sheds are finished.

H. Maitland Kersey, the recently appointed Manager in Chief of the C.P.R. Transatlantic and Transpacific Steamships, who was in Victoria recently in connection with the arrival of the s.s. Empress of Asia on her maiden trip from Great Britain, with a party of round the world by the C.P.R. tourists, stated that there was no truth in the report that the C.P.R. intended to dispose of the steamships Empress of India and Empress of Japan. They will remain on their present routes, at any rate, until it is seen to what extent transpacific travel is affected by the new vessels.

It is reported that the Donaldson Line has acquired from the Allan Line, its steamship service between Glasgow and Liverpool, and the River Plate, Monte Video and Buenos Ayres. It was announced some time ago that the Allan Line was to retire from the River Plate trade. This announcement, in conjunction with other happenings associated with the Allan Line, indicate that the anticipated control of the Allan Line by the C.P.R., will shortly be announced as an accomplished fact. In response to enquiries recently, Sir Thos. Shaughnessy is reported to have stated that an announcement of interest in this connection would shortly be made.

In our last issue, we stated that the French Line s.s. La Touraine, between Montreal and Havre, had discontinued the service, owing to lack of freight. It has been pointed out that this is liable to be misconstrued into meaning that the company has abandoned the service entirely. We have been advised that the item referred to is accurate in so far as stating that La Touraine will not return to Montreal this year. The regular monthly sailings between Quebec and Havre are being continued as during the past season, and the company has announced sailings for 1914, showing eight sailings from Quebec and three from Montreal, including La Touraine, during the St. Lawrence season. The company has no intention of abandoning its service on the St. Lawrence route.

Montreal press reports of Sept. 16, state that the scheme for establishing an express service between Great Britain and Australia, by way of Canada, would seem to be making rapid progress, as the contract for the construction of two 25 knot steamships has been awarded, and that work on the railway between Blacksod Bay and Collooney, Ireland, to link up the Irish railway system, was to be commenced in September. In Canada, the reports continue, a harbor is ultimately to be built at Cape Charles, on the southeast coast of Labrador, which will be the terminus of a new transcontinental railway, a very doubtful statement. At first, vessels will run from Blacksod Bay to Montreal in the summer, and to Halifax in the winter, and there will also be a connecting steamship service between Vancouver, or Prince Rupert, and New Zealand and Australia, so that it will be possible to reach Australia within three weeks of leaving London, Eng. The reports do not state to whom the contract for the two vessels has been awarded, nor by whom it has been awarded, and in view of the repeated rumors to the same effect, which have always been followed by denials of all those who could be intimately concerned, and also of the fact that it is extremely unlikely that any definite steps will be taken until, at least, British Government aid is assured, we would hesitate to place any reliance on the statement. A later report states that the contract for two vessels has been awarded provisionally to Swan, Hunter and Wigham Richardson, Wallsend-on-Tyne, Eng.

Maritime Provinces and Newfoundland.

The Dominion Government has awarded contracts for dredging at Cheticamp, N.S., to the Northern Dredging Co., and for an extension to the wharf at Hants Point, N.S., to the Standard Construction Co.

During the construction of an extension to the Souris East breakwater, P.E.I., the light heretofore exhibited from the lighthouse tower will be discontinued, and a temporary fixed red light will be maintained by the contractor, on the outer end of the work. On completion of the extension, the lighthouse tower will be moved to the outer end, and the light again placed in operation.

The lightship, maintained by the Department of Marine, on Lurcher Shoal, off Yarmouth, N.S., was to be removed from her station, Oct. 1, to undergo necessary repairs. During the absence of the lightship the station will be marked by a combined gas and whistling buoy, painted red and showing an occulting white light. It is expected that the vessel will be replaced early in November.

The dredge E. B. no. 1, owned by V. T. Bartram, Toronto, while on her way from Souris to Rustico, P.E.I., sank during a storm, about 12 miles from Rustico, becoming a total loss with her three scows. The crew were saved by the attendant tugs. The dredge was built in the U. S., her dimensions being, length 67 ft., breadth 26.5

List of Steam Vessels Registered in Canada during August, 1913.

No.	Name	Port of Registry	When and Where Built		Length	Breadth	Depth	Gross Tons	Reg. Tons	Engines, Etc.	Owner or Managing Owner
133834	Aurelie G.	Montreal	1912	Greenock, Scotland	79 9	22 1	11 4	137	9	54n.h.p. sc.	Sincennes-McNaughton Line Ltd., Montreal.
133935	Bellechasse	Ottawa	1912	Kingston, Ont.	142 2	27 0	12 0	417	216	118 " "	Minister of Marine and Fisheries, Ottawa.
99222	Corunna	Montreal	1891	Leith, Scotland	230 0	34 1	19 7	1269	792	99 " "	Corunna Shipping Co., Halifax, N.S.
133744	Mohawk Belle	Toronto	1913	South Portage, Ont.	94 0	19 5	7 5	167	103	12 " "	Huntsville, Lake of Bays and Lake Simcoe Navigation Co., Huntsville, Ont.
133885	Nasookin	Vancouver, B.C.	1913	Nelson, B.C.	200 0	40 0	8 0	1869	1035	101 " pa.	Canadian Pacific Ry. Co., Montreal.
95225	Nevada	Montreal	1890	Leith, Scotland	230 0	34 1	19 5	1276	794	99 " sc.	Nevada Shipping Co., Halifax, N.S.
133779	Orchard City	Victoria, B.C.	1912	Kelowna, B.C.	86 6	19 0	6 7	107	73	16 " "	Kelowna Saw Mill Co., Kelowna, B.C.

List of Sailing Vessels and Barges Registered in Canada during August, 1913.

No.	Name	Port of Registry	Rig	When and Where Built		Length	Breadth	Depth	Reg. Tons	Owner or Managing Owner
130513	Annie L. Warren	Weymouth, N.S.	Schr.	1913	Meteghan, N.S.	117 0	30 6	10 8	223	F. K. Warren, Halifax, N.S.
130765	Fallon Bros. No. 5	Kingston, Ont.	Dredge	1896	Prescott, Ont.	81 0	30 0	6 5	199	J. J. Fallon et al., J. O., Cornwall, Ont.
133910	M. & F. No. 7	Sorel, Que.	"	1902	Toronto	160 0	41 2	10 5	872	Minister of Marine and Fisheries, Ottawa.
133818	Mildred Baker	Lunenburg, N.S.	Schr.	1907	Tancook, N.S.	40 0	10 0	5 2	10	H. Baker, Lunenburg, N.S.
130346	P. D. No. 9	Charlottetown, P.E.I.	Dredge	1906	Toronto	90 0	36 0	8 0	368	Minister of Public Works, Ottawa.
130347	P. W. D. No. 10	" "	"	1871	Summerside, P.E.I.	81 0	24 0	7 2	244	" " " "
130348	P. W. D. No. 11	" "	"	1911	Pugwash, N.S.	64 7	24 9	6 2	192	" " " "
133745	Port Nelson	Toronto	"	1913	Toronto	180 0	43 0	9 9	887	Minister of Railways and Canals, Ottawa.
133977	Queensboro One	New Westminster, B.C.	Barge	1913	New Westminster	59 7	20 0	4 0	43	W. A. Gilley, New Westminster, B.C.
133978	Queensboro Two	" "	"	1913	" "	60 4	16 0	4 3	38	" " " "
133743	R. M. & S. Dredge 2	Toronto	Dredge	1913	Morrisburg, Ont.	87 2	31 5	7 1	210	Roger Miller & Sons, Toronto.
135777	Sadie No. 12	Victoria, B.C.	Barge	1913	Victoria, B.C.	90 0	32 0	8 0	183	Victoria Tug Co., Victoria, B.C.
133995	Supple Jack	Chatham, N.B.	Schr.	1910	Caraquet, N.B.	34 0	10 0	4 5	11	T. C. Russell, Shippigan, N.B.
131060	Thunder Bay	Port Arthur, Ont.	Barge	1895	Cleveland, O.	302 0	40 2	25 0	1951	J. Whalen, Port Arthur, Ont.

ft., depth 5.3 ft., tonnage 139 register. The loss was partly covered.

The Dominion Atlantic Ry. s.s. Prince Rupert, which has been operated in the Bay of Fundy service for several years, is reported to have been sold to a West Indies syndicate for a local West Indies service. She has been replaced by the turbine s.s. St. George, which was recently purchased in England by the C.P.R. for the service, a full description being given in Canadian Railway and Marine World for September.

The Public Works Department dredge P. W. D. 2, has been recently completed at St. John, N.B., and has left for the St. John River, where she will be operated for some time. She is 110 ft. long, 30 ft. beam and 3½ ft. draught. The equipment includes a 15 ins. suction pipe and 16 ins. discharge pipe, centrifugal pumps, triple expansion vertical engines supplied with steam by a Scotch marine boiler 10 by 12 ft., and 30 steel pontoons 30 by 10 ft. will carry the discharge pipe to the shore.

J. T. Ross, President, Quebec Steamship Co., is reported to have stated recently that the negotiations respecting the taking over of the company by Canada Transportation Lines, Ltd., had been completed, and all that remained to complete the deal was the turning over of the securities. The company owns the steamship Cascapedia, which runs between Montreal, Gaspe, Malbaie, Perce, Summerside, Charlottetown and Pictou, and it also operates a steamship service between New York and the West Indies, with the steamships Bermudian, Guiana, Parima and Korona, and during the summer season runs the s.s. Trinidad between Quebec and New York.

Province of Quebec Marine.

The Quebec Board of Trade has addressed a memorial to the Dominion Premier on the question of grain transportation and elevator storage capacity at the various Canadian ports.

It was reported that the level of water in the ship channel at Montreal, Sept. 12, was at the lowest point this season, season, the sounding showing 30 ft. 2 ins. The depth at the lock sill of the Lachine Canal was 14 ft. 10 ins.

The first section of the crib work, 200 by 55 ft., for the building of the new bulkhead pier in the St. Charles River, was sunk at the end of August. This is a portion of the improvement work being carried on in the Quebec harbor.

The Montreal Harbor Commissioners have filed plans at Ottawa for the construction of two freight sheds at a cost of $300,000. One of the sheds will be 275 by 106 ft., and the other, 485 by 112 ft., and each will be two stories high. Their location will be in secs. 24 and 25 of the Commissioners' wharves.

A London, Eng., press dispatch of Sept. 12, states that Canadian Vickers, Ltd., have placed an order with a Glasgow, Scotland, firm, for the construction of a large shipbuilding shed for Montreal, capable of accommodating a vessel 888 ft. long, and that orders have also been placed for ship building machine tools, etc.

The Gaspe Steam Ship Co., Ltd., has been incorporated under the Quebec Companies Act with $100,000 capital and office at Quebec, Que., to build, own and navigate steam and other vessels, and to carry on the business of common carrier, hotel keeper and general merchant. The incorporators are: Ed., F., J. A., and Emile Bouchard, vessel owners, and R. Plamondon, accountant, all of Quebec.

The Montreal Board of Control has made an appropriation of $1,500 for a report by a qualified person, on the proposal to operate municipal ferry steamboats to St. Helens Island. The contract for the existing service expires May 1, 1915, and the report now desired is to cover the type of vessels required, the probable location of docks, etc., and an estimate as to the cost of the whole scheme.

During the construction of an extension to the east pier at the upper entrance to the Soulanges Canal, by the Department of Railways and Canals, the Marine Department has placed a gas buoy, temporarily, off the outer end of the works. The extension runs out about 1,200 ft. from the present end of the east pier, and dredging is in progress north of the present channel at the upper entrance to the canal.

The Conservation Commission, which recently conducted an investigation into the proposal of the Long Sault Development Co. to dam the St. Lawrence River at Barnhart and Sheek Islands, for the development of electrical power, has reported against the proposal. It is stated that the proposed dam would cause a diversion of about 50% of the water from the main navigable channel between Barnhart Island and the U.S. mainland.

Ontario and the Great Lakes.

The Northern Navigation Co.'s s.s. Doric carried the first cargo of this year's grain crop, from the head of the lakes, consigned to Goderich.

The contract for the dredging of the channel between Goat Island and Little Current, Manitoulin Island, has been awarded to the Sault Dredging and Construction Co.

The Dominion Government has awarded the contract for the erection of a double track railway bridge over the Welland Canal, to the Hamilton Bridge Co., for $65,800.

The contract for the construction of the Severn Division of the Trent Valley Canal, has been awarded by the Dominion Government to the York Construction Co., for $130,278.

The s.s. Glenfoyle, which has recently been completed at Londonderry, Ireland, for the Great Lakes trade, is a sister vessel of the Glenmavis, a full description of which, with illustrations, was given in our last issue.

Depot Harbor Elevator Co., Ltd., has been incorporated under the Ontario Companies Act, with $40,000 capital and office at Toronto, to carry on an elevator, storage and warehouse business, and to deal generally in grain and grain products.

Complaint has been made in Buffalo, N.Y., as to the rates charged by the Buffalo and Fort Erie Ferry Co., and the matter has been referred to the International Joint Commission. It is claimed that while at Fort Erie the rate is 40 tickets for $1, single fares at 5c. have to be paid at the Buffalo end.

The large suction dredge Port Nelson, recently built by the Polson Iron Works, Toronto, for Dominion Government work in Hudson Bay, is on the last stage of her journey to Port Nelson, where she is expected to arrive about the middle of October. A heavy risk was assumed by the underwriters for her safe arrival.

Montreal daily papers, Sept. 4, announced that the Richelieu and Ontario Navigation Co. had acquired the s.s. C. A. Jaques, owned by the Jaques Transportation Co. of Ottawa, and operated by the Merchants Montreal line, under the management of G. E. Jaques and Co., Montreal. As an item of news, this is somewhat ancient, the details having been published fully in Canadian Railway and Marine World for June.

A press report from Port Arthur states that on the close of navigation the C.P.R. steamships Alberta and Athabasca will be docked there for the winter and extensive overhauling and general repairs undertaken during the winter. It is stated that both vessels will have new boilers and accessories and a number of improvements, at an approximate cost of $65,000.

The U.S. Lake Survey reports the levels of the Great lakes, in feet above tidewater, for August, as follows:—Superior, 602.74; Michigan and Huron, 581.24; Erie, 573.24; Ontario, 247.31. Compared with the average August levels for the past ten years, Superior was 0.03 ft. above; Michigan and Huron, 0.25 ft. above; Erie, 0.58 ft. above; and Ontario, 0.64 ft. above. It was anticipated that during September, Superior would rise 0.1 ft.; that Michigan and Huron would fall 0.1 ft., Erie 0.2 ft., and Ontario 0.4 ft.

The Dominion Government elevator at Port Arthur, which has recently been completed, was expected to handle its first grain shipments towards the end of September. The structure is of reinforced concrete throughout, except in the walls of the working house, where brick panelling has been used. The machinery will be operated by electricity, a separate motor having been installed for each machine. The normal loading capacity is about 75,000 bush. an hour for vessels. Twenty cars can be unloaded at one time, and the capacity is about 40 cars an hour.

The daily press is again busy with reports that the Canadian Northern Ry. is about to establish a freight and passenger steamship service on the Great Lakes, and it is now stated from Port Arthur that a contract will shortly be closed there for the construction of two passenger vessels for such service, each of which will be larger than any passenger vessel at present operating on the Great Lakes. As pointed out in previous issues of Canadian Railway and Marine World, a steamship service on the Great Lakes is a natural corollary of the completion of the transcontinental line, and no doubt, frequent anticipation will eventually produce the reality. In the meantime the advice to "wait and see," which has frequently been given in political circles, will apply.

The Keystone Transportation Co.'s s.s. Keystorm, which was wrecked in the St. Lawrence last year, and which is lying in deep water near Kingston, Ont., is to be raised. The vessel was abandoned to the underwriters, who have arranged with A. J. Lee, Westmount, Que., to undertake the salvage work. The position in which the vessel is lying, makes the work difficult, as her stern is in 102 ft. of water, and she is on her side. Compressed air is to be used to raise the vessel, and it is expected that as soon as she is buoyant, she can be moved in about three lengths into comparatively shallow water, where further work can be carried on under more favorable conditions. We are advised that the general salvage gear has been arranged for in Quebec, divers engaged in Halifax, N.S., and air locks and compressors will be obtained from New York.

On account of the completion of the deepening of the eastern half of the Ballard Reef channel in the Detroit River, and the commencement of the deepening of the western half, south of the junction with the Livingstone Channel, the buoys marking the improved channel for upbound vessels at Ballard Reef, have been moved about 250 ft. eastward, and upbound vessels now use the eastern half of the channel from Limekiln Crossing to the head of the reef. From

the junction with the Livingstone Channel north, the entire width of 600 ft. at Ballard Reef is in use by vessels. Upbound vessels in passing through the east half of the channel will be guided by the buoys and not by the Fort Malden range on the Canadian shore, the latter having been discontinued, temporarily, and upbound vessels are prohibited from meeting downbound vessels at the junction with the Livingstone Channel.

British Columbia and Pacific Coast Marine.

The contract for the construction of a snag boat for the Government has been awarded to the Coquitlam Shipbuilding Co., Port Coquitlam.

The G.T. Pacific Coast Steamship Co.'s s.s. Prince John will probably be taken off her route about the end of October, when she will be overhauled generally, and oil burning apparatus installed.

The Alberta Pacific Elevator Co. has purchased the Brown Howey Co.'s grain elevator at Vancouver, and it is announced that a considerable proportion of the new grain crop will be shipped by the Pacific route.

The Border Line Transportation Co.'s s.s. Despatch, running in conjunction with the s.s. Fulton, between Seattle, Tacoma, Victoria and Powell River, is to be remodelled so as to increase the freight carrying capacity.

The wreck of the Pacific Coast Steamship Co.'s s.s. Curacao, lying submerged off Warm Chuck, Alaska, has been sold to the Vancouver Dredging and Salvage Co., for $4,000, and arrangements also made for salving the cargo on a 75% basis.

Navigation Dredging Co., Ltd., has been incorporated under the British Columbia Companies Act, with $50,000 capital and office at Vancouver, to carry on a general dredging business, and to own and operate steam and other vessels, and act as common carrier.

The Public Works Department will shortly call for tenders for the construction of two piers for the outer harbor works at Victoria. It is also announced that the Department has sent its Purchasing Agent from Ottawa to Victoria, to arrange for the purchase of the site for the proposed Government dry dock at Esquimalt.

The G. T. Pacific Coast Steamship Co.'s s.s. Prince Albert was reported to have been in collision with the Canadian Fishing Co.'s s.s. Flamingo, early in September, in the Johnstone Strait. It was stated that the collision was not a serious one, both vessels being able to proceed without assistance, and with only minor damage.

The Dominion Government quarantine dock at Digby Island, off Prince Rupert, has been completed and handed over by the contractors, Naylor Bros. The contract price for the building was $60,000. It consists of two approaches, one being 910 ft. long, and the other about 700 ft. long, with a dock 500 ft. long by 40 ft. wide at the end.

The second vessel which the C.P.R. recently ordered at Port Arthur, Ont., for its British Columbia Lakes and River Service, has been completed, and is being taken apart and packed for shipment to Nelson, B.C., where she will be reassembled. She is a sister vessel of the Nasookin, details of which were published in Canadian Railway and Marine World for June.

A report from San Francisco states that the Great Northern Ry. intends to offer strenuous competition to the Southern Pacific Co. for the traffic that will result from the completion of the Panama Canal and the opening of the Panama-Pacific International Exposition in 1915. Two 25-knot turbine steamships are being built for the G.N.R. Co. at Philadelphia. With these ships it is expected that the trip from Portland, Ore., to San Francisco can be made in shorter time than by rail, since trains between the two cities must climb the high Siskiyou mountain range. If a traffic agreement between the Hill lines and the Pacific Navigation Co. is entered into, passengers could travel by sea from Portland, Ore., to Los Angeles, Cal., as rapidly as by rail.

A report from San Francisco states that the Great Northern Ry. intends to offer strenuous competition to the Southern Pacific Co. for the traffic that will result from the completion of the Panama Canal and the opening of the Panama-Pacific International Exposition in 1915. Two 25-knot turbine steamships are being built for the G.N.R. Co. at Philadelphia. With these ships it is expected that the trip from Portland, Ore., to San Francisco can be made in shorter time than by rail, since trains between the two cities must climb the high Siskiyou mountain range. If a traffic agreement between the Hill lines and the Pacific Navigation Co. is entered into, passengers could travel by sea from Portland, Ore., to Los Angeles, Cal., as rapidly as by rail.

Toronto Harbor Improvement Contracts.

The Toronto Harbor Commissioners have awarded the contract for dredging in the harbor to the Canadian Stewart Co., Montreal and Toronto, at 19½c a cubic yard, the total of the contract approximating $5,500,000. The work consists of the removal of about 31,000,000 cub. yds. of material, the borings indicate about 70% to be sand and gravel, and 30% a mixture of sand, silt and clay. It is a condition of the contract that each dredge employed in the work must be capable of handling, at least, 600 cub. yds.an hour at the maximum length of discharge. From the source of supply to the point of discharge the maximum distance is about 6,000 ft., the average length of delivery being about 4,000 ft. The direct line of discharge is preferred, but the work may be done in series, or by relays, and continuous operation by day and night will be carried on. The work is to be commenced about March, 1914, and it is estimated that it will take about eight years to complete. The other tenders were as follows: Tilbury Dock and Dredging Co., London, Eng., 24½c a cub. yd., $7,521,500; Sir John Jackson, Ltd., London, Eng., 20½c a cub. yd., $6,293,500; Pearce & Co., London, Eng., and New York, slightly over 20c a cub. yd., about $6,000,000; Sherman, Salter Co., New York, slightly over 20c a cub. yd. for a portion of the work.

The Dominion Public Works Department has awarded a contract for its portion of the improvement work in the harbor, comprising a sea wall from the eastern gap to Woodbine Ave., and a breakwater on the western section of the work to the Humber River, also to the Canadian Stewart Co., the amount of the contract being approximately $5,731,732.12, which is about 10½% below the original approximate estimate for the work.

A. M. Stewart, President, Canadian Stewart Co., stated in Toronto recently that a large plant will be required by his company in connection with the work to be undertaken, comprising four high power sand dredges, bucket dredges, pile drivers, scows, tugs and barges, and orders for such new plant as is required will be placed in Canada, a large portion being probably built in Toronto. He estimates that the plant when operating at full capacity, will deal with from four to five million cub. yds. a year, a large portion of the filling in in Ashbridge's Bay being done with material obtained about 6,000 ft. from the point of discharge. He estimates that work can be proceeded with during about 7½ months in each year, and that the Government portion of the work will be completed in about four years.

The Use of British Manufactures in Canadian Vessel Construction.

In reporting the recent awarding of a contract for the construction of a steamboat for the Department of Marine, the Toronto daily papers stated that a new regulation had just come into force to the effect that hereafter all vessels built in Canada for the Dominion Government must be composed wholly of British products, and gloomy pictures were drawn of the increased cost of construction, and delay in delivery of completed vessels, which would follow on the enforcement of this regulation.

In this connection, we have been officially advised that the Department of Marine has no knowledge of any regulation having been passed under which all vessels built in Canada must be composed wholly of British products, but that it invariably inserts in all contracts for the construction of vessels, that the vessel shall be built, as far as possible, of British or Canadian material, and with a view to seeing that this is done, one of the conditions of a contract is that before any orders are placed for any material whatsoever, the contractor must submit same to the Department for approval.

A Manufacturer's View of Shipbuilding in Canada.

In his address to the Canadian Manufacturers Association at its recent annual meeting in Halifax, N.S., the retiring President, R. S. Gourlay, of Toronto, said:—"The feasibility of building in Canada all or any of our vessels that shall constitute our contribution to the defence of the Empire is a matter which should be left for experts to decide. That we could build them goes without saying, were the question of cost to be left out of consideration. Certain it is, too, that we will never have in Canada naval shipyards worthy of the name unless we sometime make a beginning, and I am sure I am right in crediting you all with a desire to see our country possessed of such equipment at the earliest practicable date. In those industries with which I am familiar, however, the safe and logical development is usually from smaller to greater things, and for this reason I am constrained to believe that Canada would be wise to content itself with the building of smaller vessels and other work incident thereto as a commencement, leaving to the naval yards of England for the time being the task of providing the ships that shall proclaim us a nation."

Marine Diesel Engine Development.—Advocates of the application of the Diesel engine to large vessels, says Dr. L. K. Hirshberg, in Power, are endeavoring to curb to a degree the over enthusiasm of radical supporters, who are prone to claim too much for this type of engine on account of the success of such vessels as the Selandia. The short experience so far obtained with large oil engines on board ships (while eminently satisfactory and encouraging to the builders and owners), makes speculation difficult as yet; and the writer considers that further practical experience for a term of years must be had before accurate figures will be available as to reliability and upkeep.

Wireless Telegraphy on Canadian Inland Waters.

Canadian Railway and Marine World for June, contained details of the bill providing for the compulsory use of radiotelegraphy on Canadian vessels plying on inland waters, then passing through Parliament, in which some changes were subsequently made. Section 4 of the act is as follows:—

"From and after Jan. 1, 1914, no passenger steamer, whether registered in Canada or not,—(a) licensed to carry 50 or more persons, including passengers and crew, and going on any voyage which is or which includes a voyage of more than 200 nautical miles from one port or place to another port or place; or, (b) licensed to carry 250 or more persons, including passengers and crew, and going on any voyage which is or which includes a voyage of more than 90 nautical miles from one port or place to another port or place; or, (c) licensed to carry 500 or more persons, including passengers and crew, and going on any voyage which is or which includes a voyage of more than 20 nautical miles from one port or place to another port or place shall leave or attempt to leave any Canadian port unless such steamer is equipped with an efficient radiotelegraph apparatus, in good working order, capable of transmitting and receiving messages over a distance of at least 100 nautical miles by night and by day, and in charge of a person fully qualified to take charge of and operate such apparatus.

"2. The owner, master or other person in charge of any passenger steamer which leaves or attempts to leave any Canadian port contrary to the provisions of this section shall, on summary conviction, be liable to a fine not exceeding $1,000 and costs, and such fine and costs shall constitute a lien upon such passenger steamer.

"3. This section shall not apply to passenger steamers plying on the rivers of Canada, including the River St. Lawrence as far seaward as a line drawn from Father Point to Point Orient, or on the Northumberland Straits, or on the Georgian Bay, or on the lakes of Canada other than Lakes Ontario, Erie, Huron and Superior, and the provisions of paragraph (c) of subsec. 1 of this section shall not apply to steamers making voyages on Lakes Ontario, Erie, Huron and Superior, the regular route for which is not at any point more than seven miles from the shore.

"4. This section shall not apply to steamers calling at Canadian ports solely for the purpose of obtaining bunker coal or provisions for the use of such steamer, or through stress of weather, or for repairs."

The Richelieu and Ontario Navigation Co. has, through H. H. Gildersleeve, Manager, Western Lines, made representations, urging the exemption of the company's Niagara Line vessels, running between Toronto and Lewiston, N.Y., but, up to the present, without success. The vessels which it operates between Toronto and Hamilton, will, however, be exempt from the provisions of the act, as they are said to be never more than 7 miles from the shore.

Canadian Notices to Mariners.

The Department of Marine has issued the following:—

279. Aug. 13. Newfoundland, west coast, St. John Bay, Old Port au Choix, Querre Island, light established.

289. Aug. 14. Ontario, Bay of Quinte, Northport shoal, change in position of gas buoy.

281. Aug. 19. Ontario, River St. Lawrence, Brockville Narrows, east end, Skelton Island, light established, gas buoy withdrawn.

282. Aug. 19. United States of America, St. Clair River, Recors Point light established.

283. Aug. 21. Quebec, River St. Lawrence, Lake St. Francis, upper entrance to the Soulanges Canal, protection works under construction, gas buoy to be placed temporarily.

284. Aug. 21. Ontario, Lake Superior, Victoria Island, light improved.

285. Aug. 25. Nova Scotia, Bay of Fundy, Minas Basin, westward of Cheverie, buoy established.

286. Aug. 25. Prince Edward Island, east coast, extension to Souris east breakwater under construction, light not shown from lighthouse, temporary light.

287. Aug. 25. Prince Edward Island, north coast, St. Peter harbor, change in position of back range lighthouse.

288. Aug. 25. Newfoundland, southwest coast, Cape Ray, erratum in List of Lights.

289. Aug. 27. British Columbia, Sutil Channel, uncharted rock reported off Heriot Island.

290. Aug. 27. British Columbia, Seaforth Channel, uncharted rock northwest of Dall Patch.

291. Aug. 27. British Columbia, Observatory Inlet, Aiskew Island, gas lighted beacon established.

292. Aug. 29. British Columbia, Vancouver Island, southeast coast, Victoria harbor, intended change in position of Shoal Point beacon light.

293. Aug. 29. British Columbia, Dixon entrance, Queen Charlotte Islands, Langara Island, Langara Point, light and fog alarm established.

294. Sept. 2. Quebec, Gulf of St. Lawrence, Gaspe coast, Cape d'Espoir, fog alarm established.

295. Sept. 6. British Columbia, Strait of Georgia, sandheads off Fraser River, submarine bell to be established at lightship.

296. Sept. 6. British Columbia, Cordero Channel, name.

297. Sept. 6. British Columbia, Prince Rupert harbor, Parizeau Point, quarantine wharf.

298. Sept. 10. Ontario, Bay of Quinte, Foresters Island, gas buoy to be established.

299. Sept. 12. Nova Scotia, west coast, Yarmouth harbor, dredging.

300. Sept. 12. Nova Scotia, south coast, St. Mary River, Black Head, buoy established.

301. Sept. 12. Prince Edward Island, south coast, Hillsborough Bay, Pownell Bay, buoys established, change in character of buoys.

302. Sept. 12. Prince Edward Island, north coast, Palmer Inlet, buoys established.

303. New Brunswick, east coast, Northumberland Strait, Richibucto harbor entrance, buoy established.

304. Sept. 12. Newfoundland, east coast Bonavista Bay, Newman Sound, Happy Adventure, light established.

305. Sept. 12. Newfoundland, Notre Dame Bay, Bay of Exploits, Mill Point, light established.

306. Sept. 16. Quebec, Richelieu River, below St. Ours Lock, St. Roch range lights established.

307. Sept. 16. Quebec, Richelieu River, Beloeil station, light established on the upper pier above the railway swing bridge.

308. Sept. 16. Quebec, Richelieu River, change in position of Pointe a la Meule range lights.

Proposed Control of Ocean Freight Rates.

In connection with the recent mission undertaken by H. L. Drayton, Chief Railway Commissioner, on his visit to England, on the subject of a possible control of ocean freight rates between Europe and Canada, it is stated that a number of conferences took place with both Government and steamship officials, but no public statement has been made as to the views held on either side.

A steamship official is reported to have said that the discussion at Liverpool, with Mr. Drayton, had for its chief point, the establishment of arbitrary rates across the Atlantic, an object which, when fully explored, would be found to be practically unattainable. The steamship representatives showed that the high rate was due to the difficulty of securing sufficient cargo on the British side, and that it does not pay to send half loaded vessels westward to bring back Canadian grain.

It will be noted that a similar argument is used by W. G. Ross, Chairman, Montreal Harbor Commission, in his report on the grain transportation problem, which is given on another page in this issue.

Sault Ste. Marie Canals Traffic.

The following commerce passed through the Sault Ste. Marie Canals during August, 1913.

Articles			Canadian Canal	U. S. Canal	Total
Copper	Eastbound	Short tons	710	18,254	18,964
Grain	"	Bushels	5,262,309	3,949,611	9,211,920
Building stone	"	Short tons			
Flour	"	Barrels	268,763	1,168,601	1,437,364
Iron ore	"	Short tons	5,136,014	2,325,370	7,461,384
Pig iron	"	"		2,314	2,314
Lumber	"	M. ft. b.m.	3,102	102,064	105,166
Silver ore	"	Short tons			
Wheat	"	Bushels	4,283,378	2,553,235	6,836,613
General merchandise	"	Short tons	8,564	49,394	57,958
Passengers	"	Number	3,593	9,138	12,731
Coal, hard	Westbound	Short tons	75,350	308,497	383,847
Coal, soft	"	"	521,538	2,044,782	2,566,320
Flour	"	Barrels	400		400
Grain	"	Bushels			
Manufactured iron	"	Short tons	15,220	21,973	37,193
Iron ore	"	"	9,136		9,136
Salt	"	Barrels	15,120	98,016	113,136
General merchandise	"	Short tons	83,142	129,628	212,770
Passengers	"	Number	6,878	6,978	13,856
Summary.					
Vessel passages		Number	1,119	2,321	3,440
Registered tonnage		Net	3,516,537	4,516,816	8,033,353
Freight—Eastbound		Short tons	5,415,680	2,847,593	8,263,273
" —Westbound		"	706,586	2,519,583	3,226,169
Total freight		"	6,122,266	5,367,176	11,489,442

Shortening Time Between Halifax and Montreal.

The C.P.R. s.s. St. George, recently acquired from the Great Western Ry. of England, for the Bay of Fundy service, has been placed in regular service between St. John, N.B., and Digby, N.S., connecting with the C.P.R. express trains from and to Montreal at St. John, and with the Dominion Atlantic Ry. express trains from and to Halifax, at Digby. This makes the fastest regular schedule between Halifax and Montreal, the time occupied on this route, allowing for the difference between Atlantic and Eastern time, being 23 hrs. 30 mins. westbound, and 23 hrs. 35 mins. eastbound. The time occupied by the C.P.R. all rail route to St. John, thence over the Intercolonial to Halifax is 25 hrs. 30 mins. westbound, and 25 hrs. 35 mins. eastbound, and the Intercolonial Ry.'s time is 25 hrs. westbound, and 25 hrs. 30 mins. eastbound.

Jetty for the Fraser River at New Westminster.

The jetty which the Dominion Government is about to build on the north arm of the Fraser River, New Westminster, B.C., will extend from the dyke at the west end of McMillan Island for 22,300 ft. The channel will be 300 ft. wide and 10 ft. deep at low water, and will extend from mile 15, about opposite the inner end of the jetty through the sandheads to the Gulf of Georgia. The material dredged out of the channel will be deposited over the jetty to form a branch to the south. The jetty will consist of a single bulkhead starting on the dyke at McMillan Island, and extending to station 210. It will have a row of piles driven at least 10 ft. into the ground 8 ft. apart, capped by an 8x8 in. timber, at a height of 14 ft. above low water, and faced on the south side by 3 by 12 in. short piling. Brush mattresses, about 2 ft. thick, will be laid on each side of the bulkhead, to a width of three times the height of the bulkhead from the ground to the top of cap. The brush is to be wired with no. 6 galvanized telegraph wire. From station 210 to 223, a distance of 1,300 ft., the jetty is to be built in tiers of mattresses the top layer of which will not be less than 4 ft. thick and 20 ft. wide. The top and slopes are to be covered with loose rock equal to a weight of 100 lbs. per sq. ft. of mattress covered. The material dredged from the channel is to be deposited over the jetty to form a bank, as may be directed by the engineer in charge. The work is to be completed within 27 months after the signing of the contract.

Telephone Cable to Vancouver Island.

A 32 mile submarine telephone cable has recently been laid in the Gulf of Georgia between Vancouver Island and the British Columbia mainland. From a paper by E. P. La Belle and L. P. Crim, read before the American Institute of Electrical Engineers recently, it appears that this cable is to provide better facilities for Vancouver Island, with a speaking range from any point on the island to Vancouver and the other principal towns on the mainland.

In the cable are four conductors, each consisting of 13 small copper wires weighing together 300 lbs. per nautical mile. Around this is a soft iron wire (0.012 in. diam.) wound 70 turns per inch. This "loaded" conductor is covered with three coats of gutta-percha (300 lbs. per nautical mile). The four conductors are wound around a centre yarn with yarn worming between them. The whole is covered with brass tape, yarn and an armor of 15 galvanized steel wires (0.192 in. diam.). This is served with yarn, tarred and covered by two layers of yarn and preservative. The completed cable has a diameter of about 2 ins. and weighs 17,900 lbs. per nautical mile. The electrical circuit constants (for two conductors per nautical mile in place) are resistance 8 ohms, mutual capacity 0.175 microfarad, insulation resistance 460 megohms. The four wires are worked with a "phantom" circuit so that three simultaneous conversations are carried on. The phantom circuit, however, is much inferior to the two physical circuits through having an electrical capacity twice as great. Speech tests on the cable in place showed an equivalent of 8 miles of standard land cable (no. 12 paper insulated, lead covered) connected by a zero loop at each end, and of 5.75 miles with 12 miles of standard cable at each end to prevent reflection impulses.

This is the only cable of the kind in America. On account of the depth to which it had to be submerged (1,300 ft.), gutta-percha insulation was used, and on account of the excessive electrical capacity it was necessary for good speech transmission to balance this with added inductance or "loading." The continuous loading with iron wire was adopted in place of the insertion of regular Pupin coils at intervals on account of the depth of submersion and the ease of repair. The cable was laid in one day (June 16) between 4 a.m. and 7.30 p.m. The total cost is said to have been about $120,000.

COMPLETE HYDRAULIC EQUIPMENT
FOR
RAILWAY AND SHIP BUILDING PLANTS
Wheel Presses, Keel Plate Bending Presses, Riveters,
Shears, Presses, etc., etc.
Centrifugal Pumps, Pumping Engines, Gas Plants, Gas Power
Plants, Cast Iron Pipe, Hydrants, Valves & Fittings, etc., etc.
R. D. WOOD & CO.
PHILADELPHIA, Pa.


HEADLIGHTS - We Make Them
for OIL for Pyle ELECTRIC equipment or SPECIAL to Blue Print, and carry a large stock of standard headlight reflectors, burners, burner parts, felt wicks and chimneys.
The HIRAM L. PIPER CO., Limited
75-77-79 and 81 St. Remi Street, Montreal
Railway Catalogue No. 30, Marine Catalogue No. 21.
Mailed on Request.

NICKEL
THE CANADIAN COPPER COMPANY
NICKEL FOR NICKEL STEEL
THE INTERNATIONAL NICKEL CO.
WRITE US FOR PARTICULARS AND PRICES
General Offices: 43 Exchange Place, NEW YORK

J-M ASBESTOS & MAGNESIA RAILROAD SUPPLIES

Roofings	Locomotive Lagging	Pipe Coverings	Electrical Supplies
Shingles	Air Brake Cylinder	Smoke Jacks	Overhead Line Material
Packings	Packing Expander Ring	Asbestos Wood	Rail Bonds and Tools
Gaskets	Underground Conduit	Fibre Conduit	"Noark" Fuse Devices
Hair Felt	Leak-No Metallic Compound	Insulation	Waterproofing Materials
Cements	Fire Extinguishers	Metal Polish	Fuse, Service and Subway Boxes, etc., etc.

Write Nearest Branch for Catalog No. 252.
THE CANADIAN H. W. JOHNS-MANVILLE CO., LIMITED
Toronto, Ont. London, Ont. Montreal, Que. Winnipeg, Man. Vancouver, B.C.

LOCOMOTIVE FOR SALE.
FOR SALE—A locomotive, in first class order, just out of shops; ten wheeler; 54 tons; cylinders 17 x 24. Address P.O. Box 146, Quebec, P.Q.

It Pays to carry an advertisement in the CANADIAN RAILWAY AND MARINE WORLD every issue of the year because you obtain proportionately better Results

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 NATIONAL STEEL CAR CO., LTD., Hamilton, Ont., has opened offices at 301 Shaughnessy Building, Montreal, and has appointed George Condon as representative there.

AMERICAN LOCOMOTIVE CO. has issued bulletin 1015 giving particulars of a large number of switching locomotives it has built, with tabular comparisons and illustrations.

DETROIT LUBRICATOR CO. Otis Funderburk, formerly Michigan manager for the Rayfield carburetor, has been appointed Sales Manager of the carburetor division of the Detroit Lubricator Co., which is making and marketing the Stewart carburetor.

THE CANADIAN GENERAL ELECTRIC CO. is distributing two booklets issued by the General Electric Co., one "Electricity on the New York Central," describing the use of electric locomotives in the N.Y.C.'s. new terminal in New York, N.Y., and its approaches, the other dealing with Curtis steam turbines. The C.G.E. Co. has issued bulletin A 4035 on series luminous arc lamps.

THE NATIONAL STEEL CAR CO. states that it commenced shipping cars about Feb. 1 last, and that it has shipped about $1,500,000 worth of product. It has sufficient orders to keep it operating at full capacity until Jan. 1, 1914. The losses due to starting a new plant have been entirely wiped out, and the company has made a substantial profit. By the end of the fiscal year the company will have earned the full preferred dividend, and, barring strikes and unforseen contingencies, a comfortable amount on the common stock. The company is preparing to take orders for electric railway cars and passenger cars and is negotiating for some such orders. This will offset the possibility of slack trade in freight cars.

S. F. BOWSER & CO., INC., Fort Wayne, Ind., and Toronto, announce the appointment of A. D. Wyckoff as eastern railway representative in place of F. T. Hyndman, who has been appointed Superintendent of Motive Power and Cars, Wheeling and Lake Erie Rd. Mr. Wyckoff has been in Bowser & Co.'s service for a number of years as efficiency expert and has had a wide experience in designing equipment for the handling and storage of oils, as well as oil filtering and circulating systems for railways and manufacturing institutions. He is ready to answer questions pertaining to oil storage and distribution and will gladly co-operate with anyone in working out the best possible system for their needs.

THE AMERICAN LOCOMOTIVE CO.'S report for the year ended June 30 states that the gross earnings, $54,868,174.88, were the largest of any year in the company's history. The surplus available for dividends, after a charge for depreciation of $1,226,534.78, was $6,185,305.27, which has been exceeded only in the year ended June 30, 1907. The amount of unfilled locomotive orders on the books on July 1 was $17,156,388, compared with $14,450,000 at the beginning of the fiscal year. The volume of new orders taken during the year was well sustained

JAMES THOMSON, Pres. and Mang. Director. J. G. ALLAN, Vice-President. JAMES A. THOMSON, Secretary

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO. LIMITED

MANUFACTURERS OF

CAST IRON PIPE

3 inches to 60 inches diameter
FLEXIBLE AND FLANGE PIPE AND SPECIAL CASTINGS
FOR WATER, GAS, CULVERT AND SEWER
HAMILTON, ONT.

Marine Repairs

The Thermit Welding Process is quick, easy, and effective—and when applied to broken rudderframes, sternposts, or sternframes, will enable your vessel to return to service in two or three days, effecting a tremendous saving in dry dock charges.

There is nothing experimental about Thermit Welding. During the last few years we have executed many repairs for the principal steamship companies of the Atlantic and Pacific coasts and the Great Lakes, and every repair has been uniformly successful and our best advertisement.

Our process is sanctioned by the British Corporation for the Survey and Registry of Shipping, Glasgow.

If you are interested obtain our pamphlet No. 2544 and Reactions, which illustrate and describe many marine repairs and contain full information about the process. Every marine man should have one.

GOLDSCHMIDT THERMIT COMPANY
WILLIAM C. CUNTZ, Gen. Mgr.
103 Richmond St. W., Toronto, Ont.
329-333 Folsom Street, San Francisco
90 West Street, New York
7300 South Chicago Avenue, Chicago

THERMIT

THERMIT

New Lubricator Catalogue

The new Detroit Bullseye Locomotive Lubricator Catalogue tells all about Detroit Lubricators and Locomotive Specialties.

It explains the hydrostatic principle, the different features of design and construction of Detroit Lubricators with their resulting advantages. It contains complete instructions for operation, care and installation, with many valuable suggestions as to ways of getting best results from these lubricators.

This book also describes Detroit Air Cylinder Lubricators, Air Pump Lubricators, Balanced Throttle Valves, Boiler Valves and Transfer fillers, their uses and operation.

The Detroit Locomotive Lubricator Catalogue is a complete reference and text book. It is a mine of information, and should be in the hands of everyone interested in any way in the operation of locomotives.

One or more copies will be sent free upon request.

Write for Catalogue L-81.

CANADIAN DETROIT LUBRICATOR COMPANY, LTD.
WALKERVILLE, ONT.

Canadian Sales Agents:
Taylor & Arnold, Limited, Montreal

CRANES AND HOISTS

NORTHERN CRANE WORKS, Limited
Walkerville, Ontario

Car Closets

FLUSH OR DRY

DUNER CO. 101 S. CLINTON ST. CHICAGO

up to June, when there was a marked falling off, and there is now every indication of a reduction in the operations of the plants in the U.S. in the near future. With a view to keeping pace with the constantly growing market in Canada, which for some time has been more than the Montreal plant could meet, there was authorized an expenditure of $550,000 for extensions to that plant which, when completed about Jan., 1914, will increase its capacity to 35 locomotives a month, or about 40%.

Transportation Conventions in 1913.

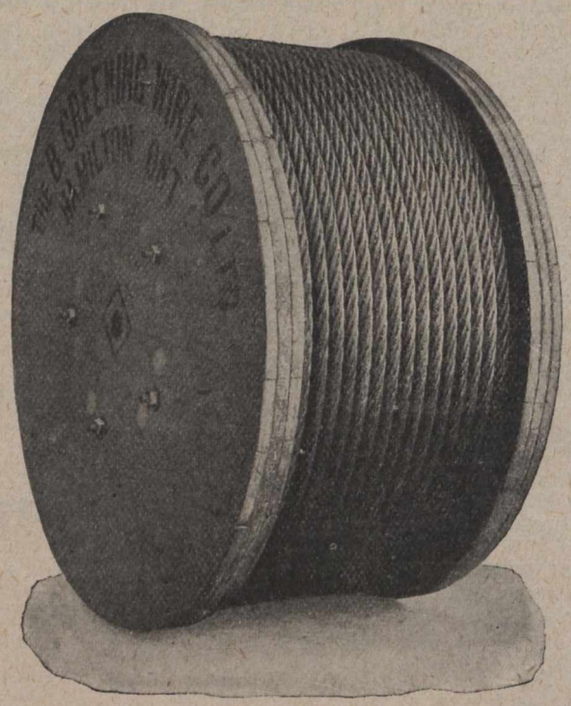
Oct. 8.—Association of Water Line Accounting Officers, Philadelphia, Pa.
Oct. 14.—Railway Signal Association, Nashville, Tenn.
Oct. 14, 15.—American Association of General Passenger and Ticket Agents, Philadelphia, Pa.
Oct. 14-17.—Railway Signal Association, Nashville, Tenn.
Oct. 15-17.—American Association of Railway Surgeons, Chicago, Ill.
Oct. 18-24.—Association of Railway Electrical Engineers, Chicago, Ill.
Oct. 21-24.—American Railway Bridge and Building Association, Montreal.
Oct. 23-25.—American Association of Dining Car Superintendents, Buffalo, N.Y.
Nov. 19.—American Railway Association, Chicago, Ill.

Transportation Associations, Clubs, Etc.

The names of persons given below are those of the secretaries.
Canadian Car Service Bureau. J. Reilly (acting), 401 St. Nicholas Building, Montreal.
Canadian Electric Railway Association, Acton Burrows, 70 Bond Street, Toronto.
Canadian Freight Association (Eastern Lines), G. C. Ransom, Canadian Express Building, Montreal.
Canadian Freight Association (Western Lines), W. E. Campbell, 502 Canada Building, Winnipeg.
Canadian Railway Club, J. Powell, St. Lambert, Que. Meetings at Montreal, 2nd Tuesday each month, 8.30 p.m., except June, July and August.
Canadian Society of Civil Engineers, C. H. McLeod, 176 Mansfield St. West, Montreal.
Canadian Ticket Agents' Association, E. de la Hooke, London, Ont.
Central Railway and Engineering Club of Canada. C. L. Worth, 409 Union Station, Toronto. Meetings at Toronto 3rd Tuesday each month, except June, July and August.
Dominion Marine Association, Counsel, F. King, Kingston, Ont.
Eastern Canadian Passenger Association, G. H. Webster, 54 Beaver Hall Hill, Montreal.
Engineers' Club of Montreal, R. W. H. Smith, 9 Beaver Hall Square, Montreal.
Engineers' Club of Toronto, R. B. Wolsey, 94 King St. West, Toronto.
Great Lakes and St. Lawrence River Rate Committee, Jas. Morrison, Montreal.
International Water Lines Passenger Association, M. R. Nelson, New York.
Niagara Frontier Summer Rate Committee, Jas. Morrison, Montreal.
Nova Scotia Society of Engineers, A. R. McCleave, Halifax, N.S.
Quebec Transportation Club, J. S. Blanchet, Quebec.
Ship Masters' Association of Canada, H. O. Jackson, 376 Huron St., Toronto.
Shipping Federation of Canada, T. Robb, 526 Board of Trade, Montreal.
Western Canada Railway Club, W. H. Rosevear, 25½ Princess St., Winnipeg. Meetings at Winnipeg 2nd Monday each month, except June, July and August.

Intoxicated Railway Employes.—W. J. Smith, a C.P.R. telegraph operator at Sortin, near Montreal, was on Sept. 4, sentenced to six months imprisonment, for being intoxicated whilst on duty, and on Sept. 5, A. L. Parent, a G.T.R. telegraph operator at the Montreal and Southern Counties Ry. Jct., near St. Lambert, was sentenced to nine months imprisonment for being intoxicated on duty, for threatening one of the company's detectives with an axe, and for damaging the instruments in the operating room. It was pointed out that the Criminal Code provides for a sentence of five years in the penitentiary, or a fine of $400, or both, in case of an operator being found under the influence of liquor whilst on duty.

WIRE ROPE



Ballast Plow Ropes
Wrecking Ropes
Switch Ropes
Derrick Ropes
Semaphore Strands
Wire Rope Fittings and Grease

MANUFACTURED BY
The B. GREENING WIRE CO., Limited
Hamilton, Ont. Montreal, Que.

WHITE STAR DOMINION LARGEST STEAMERS FROM CANADA

Summer Service—Montreal and Quebec to Liverpool

*Canada	Oct. 4, Nov. 1	*Teutonic	Oct. 18, Nov. 22
Megantic	Oct. 11, Nov. 8	Laurentic	Oct. 25, Nov. 22

* One Class Cabin (II) Sailings.

American
New York, Plymouth, Cherbourg, Southampton

Philadelphia	Oct. 3, 31	St. Paul	Oct. 17
New York	Oct. 10	St. Louis	Oct. 24

Atlantic Transport
New York—London Direct

Minneapolis	Oct. 4	Minnewaska	Oct. 18
Minnehaha	Oct. 11	Minnetonka	Oct. 25

Red Star
London, Paris, via Dover—Antwerp

Lapland	Oct. 8	Kroonland	Oct. 22
Vaderland	Oct. 15	Finland	Oct. 29

White Star
New York—Queenstown—Liverpool

Baltic	Oct. 2, 30	Celtic	Oct. 16
Adriatic	Oct. 9	Cedric	Oct. 23

New York, Plymouth, Cherbourg, Southampton

OLYMPIC	Oct. 4	Oceanic	Oct. 18
Majestic	Oct. 11	OLYMPIC	Oct. 25

Boston-Mediterranean

Cretic	Oct. 18	Canopic	Nov. 1

H. G. THORLEY, Passenger Agent, 41 King Street East, Toronto, Phone Main 954

"Anchor Packings"

The Summer goes and the Winter comes. It will soon be here. Why not guard against the troubles that it brings as much as possible. The winter means hard Service. Winter comes and Winter goes but we go on forever.

The Anchor Packing Co. of Canada
404 St. James Street Montreal