

Canadian Railway and Marine World.

August, 1913.

Canadian Northern Railway Mount Royal Tunnel.

By S. P. Brown, M. Am. Soc. C.E., Chief Engineer, Canadian Northern Montreal Tunnel and Terminal Co., Ltd.

The C.N.R. is now operating about 5,000 miles of track in Manitoba, Saskatchewan and Alberta, besides its Eastern lines. It also has about 2,500 miles under construction that when completed in 1914 will make it a transcontinental system, with Vancouver, on the Pacific, and Montreal as its main eastern distributing point. When this work is finished it will be important to have proper terminal facilities already prepared in the main eastern point, and, with this in view, the Canadian Northern Montreal Tunnel & Terminal Co., Ltd., was incorporated to make the necessary developments in and about the city of Montreal.

Montreal has a population of about 600,000 and is the main eastern seaport during the busiest part of the year. The business and financial part of the city is largely concentrated in a narrow strip of land between the St. Lawrence River and Mount Royal, which is already so congested that the residential section is gradually spreading up and down the river and around the mountain into Westmount and Outremont. Mount Royal forms a very positive barrier between the people living back of the mountain and the business portion of the city.

General Features of Project.

The natural location of the business centre of Montreal, between Mount Royal and the river, made the problem of entry at first appear complicated. To enter from either end of this strip meant a detour that was undesirable, and might have resulted in two separate stations for the eastbound and westbound traffic. A study of the topography and economic distribution of the city and island showed that a tunnel was the logical, as well as the economical, method of entry. It was found that the railways coming from the west could be brought from a convenient site for yards, shops, etc., near the Back River, to a junction point with the Quebec lines near the present Jacques Cartier Union Railway (G.T.R.) and thence at a very flat grade to a tunnel portal at its crossing with the C.P.R. belt line, about a mile from the Outremont yard. Thence the line will pass through a twin tunnel 3.25 miles long, down a 0.6% grade to a passenger terminal in the very centre of Montreal.

From the main passenger terminal the tracks may be extended across to the lower town on a viaduct at a level grade to connect with a viaduct along the harbor front, proposed by the Harbor Commissioners of Montreal, and a possible

bridge across the St. Lawrence River. Such an extension would also include in the commercial part of the town an elaborate freight distributing depot, a department to which the C.N.R. is giving most serious thought at present. In connection with this freight department, large sorting and transfer yards are being developed back of the mountain and east of the city, where most of its shunting and mechanical part of the freight transference will be accomplished.

Back of the mountain, in the broad, gently sloping country, including some of the most fertile farms in Eastern Canada, the C.N.R. saw an opportunity for the site of a new city. With this in view, the Canadian Northern Montreal Land Company, Ltd., was incorporated

the tunnel will bring the Mount Royal station within a very few minutes of the main passenger terminal in the city proper and trolley cars will tie the street car lines of the "model city" with those of Outremont and Montreal. A small freight yard near the west portal of the tunnel will serve for the delivery of local freight and express and for the manipulation of multiple unit trains during the rush hours. The entire terminal scheme is to be utilitarian from the Back River to the waterfront. The idea is to produce structures and developments that will be attractive to the eye and so designed and disposed as to be self supporting in themselves without the assistance of the ordinary railroad traffic.

Tunnel History.

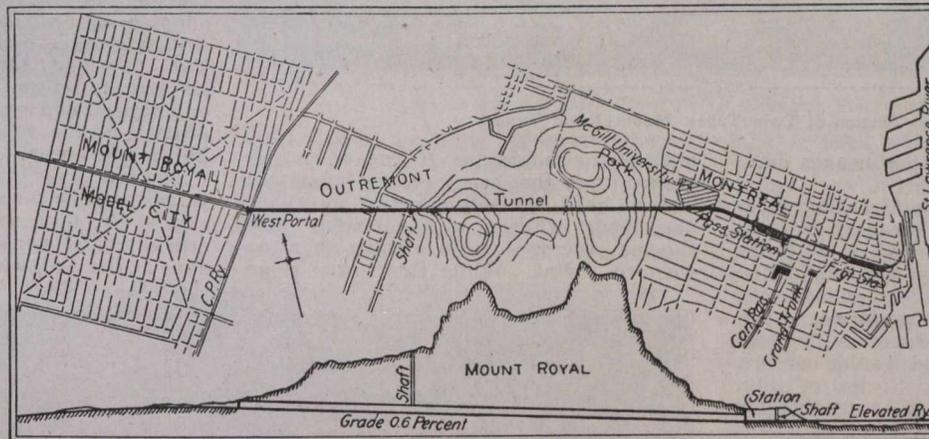
To the writer the most interesting part of the study of tunnels is its history. From the days of the cave man, through those of the Egyptians, Chaldeans, Romans and Europeans of modern times, the evolution has continued. The changes in the tunnel itself are small but the methods of excavation and construction have changed beyond recognition. The Lake Fucinus tunnel driven in the Abruzzi, during the reign of Claudius,

was 6 ft. high, 10 ft. wide, and $3\frac{1}{2}$ miles long. It took 11 years to build, and employed 30,000 men. To expedite this work some 40 shafts and inclines were sunk, some over 400 ft. deep.

As a comparison the present Mount Royal tunnel is practically the same length; the heading, however, is about 9 ft. high by 12 ft. wide, over 50% larger than the Lake Fucinus tunnel. It has one intermediate shaft about 240 ft. deep and another about 50 ft. deep at Dorchester St., which is at present acting as the eastern portal. The first heading was started on July 8, 1912, and since that time the shafts have been sunk and over 2 miles of heading driven on the tunnel line, besides more than $\frac{1}{4}$ mile at the shafts and in the terminal sites. The reason of this great difference in speed is method and equipment.

In the Lake Fucinus tunnel they used crowbars, chisels, picks, shovels, and possibly drills and saws with cutting edges of corundum. Most of the progress, however, was made by "fire setting," i.e., by building fires against the face of the heading until the rock was highly heated and then dashing cold water or acid, such as vinegar, on it to break the ground. Condemned criminals and prisoners were used in this work, as the death rate was terrific.

Compare this with modern tunnel prac-



Plan and Profile of Mount Royal Tunnel.

to purchase this farming country and develop it as part of the general scheme of financing.

The New Model City.

The city of Mount Royal, or as it is locally termed, the "model city," is laid out on a rectangular plan, with four diagonal boulevards radiating from the railway station, which forms the centre of the town site. There is also a meandering boulevard connecting a series of parks and playgrounds distributed over the city, in general midway between the central park and the station site and the city limits. The land, consisting of a gently sloping plane, makes the situation ideal for drainage and sanitation. The streets will be paved principally with asphalt and macadam, the stone for which will be taken from the tunnel excavation. Street car service and lighting have already been arranged for with local companies in Montreal, which assures excellent service, and through trolley connections with Outremont, Westmount and Montreal proper are contemplated. The lots are being sold under very rigid building restrictions, as it is desired to produce a quarter of town for the better class of people who are rapidly being crowded out of the more desirable parts of Montreal, as well as for the city's rapidly growing population. A short multiple unit train service through

tice using electricity, compressed air and high explosives, which, combined with highly perfected machinery and carefully systematized forces, produce speed and economy that would have seemed incredible even a couple of generations ago,

and the main volcanic intrusions.

Tunnel Location.

The location of the tunnel under Mount Royal was more or less established by the location of the passenger terminal in Montreal and the model city at the

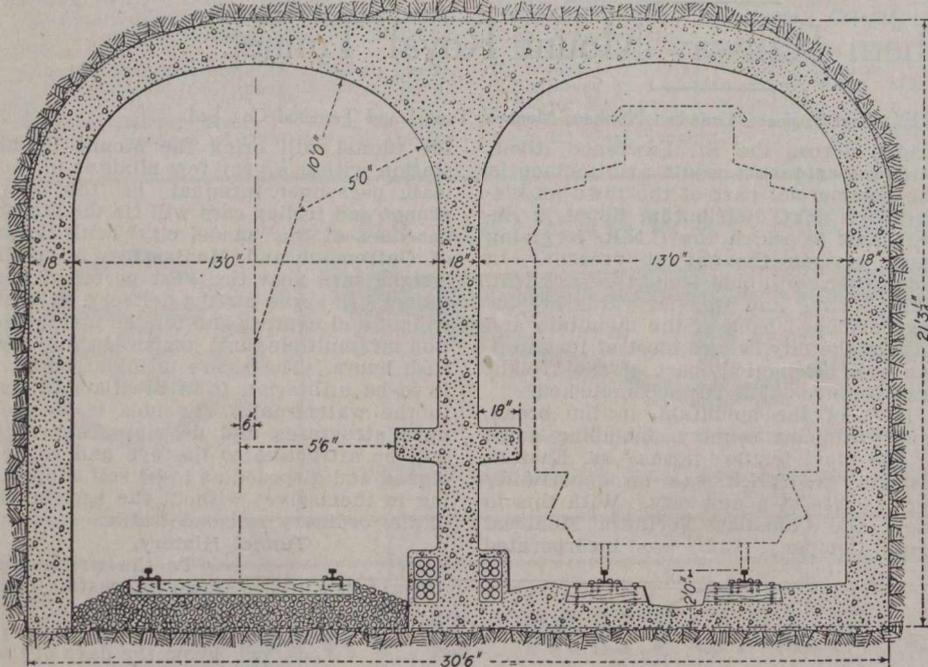
one possible between the two main objective points that could be devised to avoid surface obstructions and take advantage of the geological formation, as far as it is able to be anticipated. It is believed that while much of the breccia and part of the limestone will require masonry lining similar to that required in soft ground, much of the limestone, inclined as it is to the present tunnel line, will require only a centre wall for safe support; in the essexite no centre wall will be required except for ventilation and purposes of safety in case of derailment or accident. This gives, economically, an extremely good tunnel line, which, with the exception of one curve under the McGill University grounds, is all on a tangent and at only sufficient grade to insure proper drainage.

Tunnel Cross Section.

A twin tunnel cross section has been adopted for three main reasons—economy in excavation and construction, ease and economy in ventilation, and safety in case of accident or derailment. The outside wall clearance is coincident with the clearance for new structures in the New York Central terminal work in New York and in excess of the clearance of the Pennsylvania Lines East of Pittsburgh.

A high headroom, almost the same as that of the Detroit River tunnel, was adopted, on account of the probability of a high voltage overhead contact circuit. The flattened three centred arch was adopted to allow for the sway of the pantograph and on account of the stratification of the rock where much of the lining will occur.

The walkway is made narrow, so that people will be forced to pass along it in single file, thus avoiding the danger of crushing and panic. The normal clearance at the walkway edge is 2 in. greater



Cross Section of Twin Tubes, Mount Royal Tunnel.

and one realizes how the usages have changed.

When the obstacles confronting those early tunnel diggers, however, are considered, we can but be filled with the sincerest admiration for the confidence, courage and perseverance that made the accomplishment of such great works possible. Their immature systems, methods and appliances required genius to produce success, and the stories of their early struggles form far more thrilling romances that one can find in the most visionary novel of today.

Mount Royal Geology.

Mount Royal is an intrusion of igneous rock forced upward through the original bed of Trenton limestone. There have evidently been several stages of eruption or intrusion, as both the limestone and main igneous bodies are broken and cut by a multitude of dikes and sheets of different and varied character, and evidently of later origin.

The two principal rocks to be encountered on the present line are Trenton limestone, slightly tilted upward toward the mountain, and essexite, which is the main intrusion of igneous rock. The Trenton limestone, at a considerable depth, is quite hard and crystalline, and except where silicious or too much cut up by dikes is a very good tunneling rock. At the city end the limestone was very soft and rather blocky for the first 2,000 ft., with occasionally earth in the heading roof. As the cover increased the rock became harder and more cut by dikes. At present it is quite hard and becoming slightly crystalline, the dikes causing the only difficulty in the tunneling. The essexite is very hard, but aside from this as a good tunneling rock. The most difficult tunnel rock is a volcanic breccia, which when cut by dikes is so badly broken and blocky that it is extremely hard to drill, does not shoot well, and will require almost continuous masonry lining. This is especially common near the junction of the limestone

back of the mountain. It was, of course, known that the heart of the mountain was of hard, igneous essexite, as above described, which, with breccia, also showed outcroppings in a ridge near the western portal. While this lower ridge



Mount Royal Tunnel—Breakup, Showing Jumbo Timbers in Heading.

of hard rock and breccia could not have been avoided without seriously affecting the layout of the model city, a portion of the hard rock in the centres of the mountain could have been avoided had it been considered expedient.

The line finally adopted is the shortest

than that of the normal high passenger platform adopted in the terminal, which is somewhat greater than that allowed on the New York Central and Pennsylvania lines about New York. The walkway edge also coincides with clearance lines (outside of the platform) of the Penn-

sylvania Lines East of Pittsburgh, including the through lines between New York and Pittsburgh. Underneath the walkway is a continuous refuge niche, except at splicing chambers, where trackmen may sit on the duct bench at the bottom of the dividing wall and be absolutely protected from passing trains.

Excavation.

The method of excavation adopted is perhaps more European than American, although a close analysis would show it to be the resultant of several systems. In modern tunnel practice, lines of demarcation and sectionalism that were quite distinct only a comparatively few years ago are gradually becoming lost, so that an engineer is apt to select a combination of several systems which he considers wisest for his ground and structure. The things that stand out most sharply in all tunnels where great progress has been made and which are principally European in origin are: First, the opening heading is always comparatively small and usually in the bottom of the section; second, a horizontal bar is used to support the drills instead of columns; and, third, short rounds are drilled and shots are fired often. Every little economy in time is practised, and all delays, no matter how trifling, are analyzed and corrected, when possible. Workmen are given a bonus for extra progress above the specified minimum, and machinery, such as drill carriages, is used where it is found advantageous.

European engineers, like our Western miners, like to get under the muck, so that much of it falls into the cars by gravity instead of having to be lifted in. Sometimes this is accomplished by stopping, and sometimes by driving a top heading directly above the bottom heading. The one important point is to

rock, for by this method the heading can be driven on rapidly and the timbering work and full sized section developed with care and without hurry in many places simultaneously along the line.

A great many mechanical drilling, ex-

centre heading with break ups at intervals where the full sized tunnel section is developed. The heading is driven by the horizontal bar method. In one heading, where very hard rock is encountered, requiring extra heavy drills, a drill car-



Mount Royal Tunnel—West Portal, Crushing Plant and Tipple.

cavating and mucking apparatus have been devised, and in some cases they were found to work advantageously, but where the space is confined and delays serious, the laborer, with his pick and shovel, is usually employed. One man

riage is used with a mechanical muck carrier for loading the cars. In this drill carriage the drill bar is supported on a beam which can be extended 20 ft. ahead of the carriage over the muck pile and has also a vertical and lateral movement to accommodate the heading.

On the city end outside conditions are very disadvantageous. The city of Montreal has never had any previous experience in underground excavation, so that blasting that would be hardly noticeable in New York, for instance, is considered quite serious. For this reason under the city proper, where the cover was light, no blasting was allowed between 11 p.m. and 7 a.m.; the holes in the heading were reduced to 36 and 42 in. in depth, including the cut, and the powder was reduced to a mere "trace."

The effect of all this on heading progress was not so serious as might have been expected. While the holes were short, the rounds were fired so often that an average progress of about 17 ft. a day was maintained. In approaching the mountain, where 5 ft. cut holes could be used, the average progress was about 20 ft. per day.

Record Tunnel Progress.

During the month of May, just ended at this writing, as the rock cover had very much increased, shooting was allowed at night, which very much improved the heading progress. In this way, a total of 810 ft. of 8 x 12 ft. heading were driven in the 31 working days immediately following May 1. This, the writer believes, is the best tunneling record yet made in a hard rock heading.

A greater record than the above was made in the Loetschberg tunnel in Switzerland, where 1,013 ft. of 6.5 x 10 ft. heading were driven in one month through soft triassic limestone. An excellent record was also made last year in Arizona, where 799 ft. of 8 x 8 ft. heading were driven in 31 working days through granite porphyry sufficiently hard to drill well and in general stand without timbering. Neither of these



Mount Royal Tunnel—Heading. Observe Drills on Horizontal Bar and Water Attachment to Drills.

keep the bottom heading open for traffic at all times, so that the heading progress is never materially affected. The full size excavation can be carried on over jumbo timbers at as many places as necessary to keep up with the heading.

A bottom heading in bad ground, if possible, is even more desirable than in

can handle a good deal of muck in his shift, shoveling off slick sheets into low cars. At present muckers in the Mount Royal tunnel heading are handling 15 cu. yd. of muck per man per eight hour shift.

Bottom Heading Method.

The method of excavation adopted in the Mount Royal tunnel is a bottom

rocks can be creditably compared in hardness with the diked Trenton limestone now being excavated in the Mount Royal tunnel. However, as the rock encountered in the Loetschberg tunnel was sufficiently hard to require the use of air drills, that progress of 1,013 ft. will undoubtedly stand as a world's record for a long time, and certainly stands as a monument to good tools, good management, and good men.

The rock in the Dorchester St. heading of the Mount Royal tunnel, while not so hard as it is back of the mountain, is a very good Trenton limestone, which makes an excellent concrete stone, being sharp and not too high in lime. All stone coming from the tunnel is being crushed and what is not used by the company is being sold for massive and reinforced concrete, principally in Montreal.

The break ups, as they are called, where the full sized tunnel is excavated, are opened at as many intervals as desired. This excavation is extremely cheap and rapid. In one, break up about 200 cu. yds. are now being excavated per day with two shifts of drillers. Jumbo timbers are framed into the headings at the break ups, so that the heading traffic is never interfered with, and the bulk of the break up muck drops into the cars by gravity. It is to permit the use of a fairly broad gauge double track at these break ups that the Mount Royal headings are driven 8 to 10 ft. high by 12 ft. wide.

While so large a cross-section very materially reduces the progress of the headings driven each month, it very greatly increases the economy of further excavation and construction. Back of the mountain, where the very hard rock is encountered and the drill carriage is in use, the heading averages about 10 x 12.5 ft., and the May progress was 510 ft. in 27 working days. At the city end, where the record was made, it was permitted to reduce this to about 8 x 12 ft. in order to assist the progress. It is expected to remove most of the benches below the level of the jumbo timbers with a steam shovel.

consists of R. Byers, General Superintendent, West; E. Duffy, General Superintendent, East; W. C. Lancaster, Electrical and Mechanical Engineer; H. T. Fisher, Tunnel Engineer; H. D. Robinson, Engineer of Design, and J. C. K.

Stuart, First Assistant Engineer. The writer is managing engineer for Mackenzie, Mann & Co., Ltd., and Chief Engineer of the Canadian Northern Montreal Tunnel & Terminal Company, Ltd.—Engineering Record.

Hopper Bottom Grain and Coal Car Built for Canadian Pacific Railway.

Ever since grain has been handled in box cars, the construction of a suitable grain door has been one of the most difficult problems in car design, and up till recently it has remained the one unfinished part of the car. A satisfactory grain door is one that will hold grain as

out and as railroading as a whole is becoming more efficient and refined, there will be a demand for a higher degree of efficiency in the handling of grain. Working to this end, the Canadian Pacific Ry. has built 200 Burnett hopper bottom grain cars, shown in the

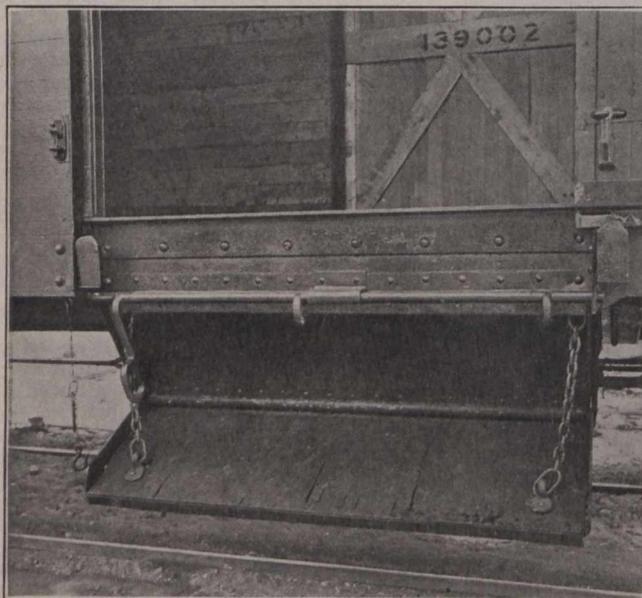


Hopper Bottom Grain and Coal Car for C.P.R.

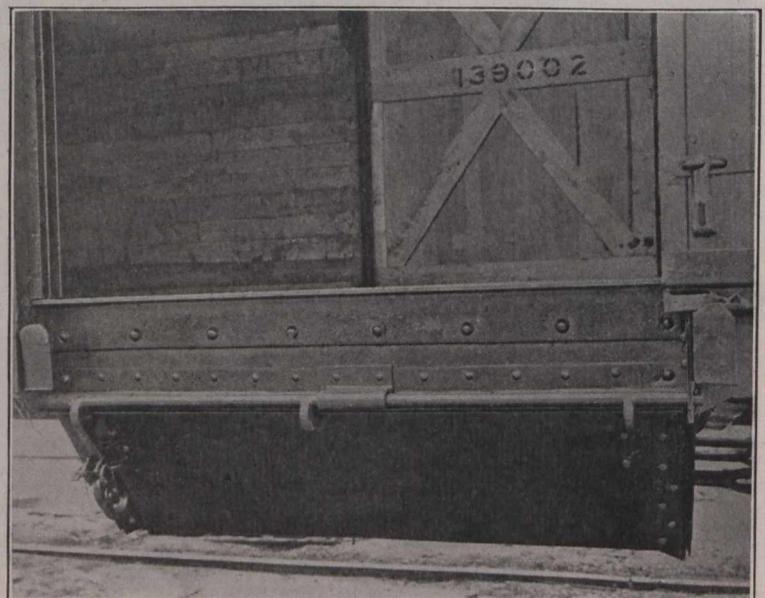
securely as any other part of the car body, is always there when required, will not be demolished in unloading, does not obstruct or decrease lading room when not in use, and is of reasonable first cost and low cost of maintenance. A grain car so constructed that

accompanying illustrations.

There are several new features in this hopper door. The hinge is made by interlocking the edge of the hopper door and floor, making a continuous hinge, which, instead of weakening the edge, strengthens it the same as would the ap-



Car With Steel Hopper Open.



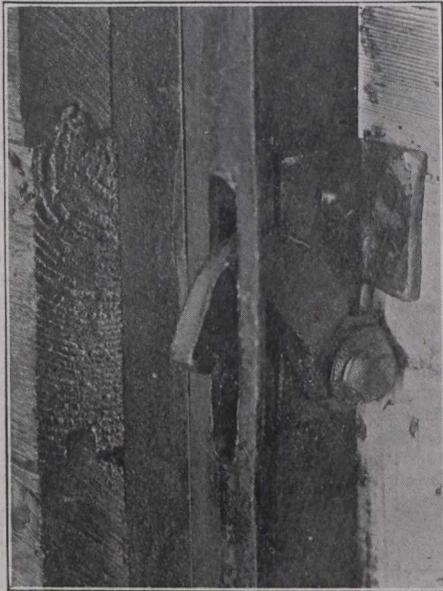
Car With Steel Hopper Closed.

As this work is being done by Mackenzie, Mann & Company, Ltd., who also represent the Canadian Northern Ry., every opportunity for economy may be taken advantage of. The job organization covering both design and construction

there will be no loss that would be detected, will appeal to all persons who are in close enough touch with the handling of grain to be familiar with the loss that there has always been, and as other problems in railroading are being worked

plication of an angle, and instead of the load having a tendency to open the joint as with all other hinges, the load tightens the joint. The hopper door also differs from hopper doors previously constructed, in that it is hinged at the bot-

tom and is almost vertical, and has no closing shaft, but is closed by hand, and secured by the shaft, on which are projections which engage the edge of the door at different points, holding it to a positively closed position. The ends of the hopper doors have flanges which shut into pockets or grooves formed by plates on the ends of the hopper. The whole



Grain Door Clasp.

construction of the hopper is so simple and strong that an inspection of the car convinces one that it is very unlikely that the hopper would ever become defective unless in a wreck, and the hopper not being subject to corrosion the same as open coal cars, should, barring wrecks, last the life of the car. The grain doors are formed by section of the floors at the doorway folding up against the door posts. As can be seen,

hauling other cars for coal. This refers more particularly to anthracite coal. In working this out, it seems that the solution of the grain door problem has been reached. In building, each hopper is filled with flaxseed and hammered, which is the most severe test possible, outside of water. They are all absolutely flaxseed tight.

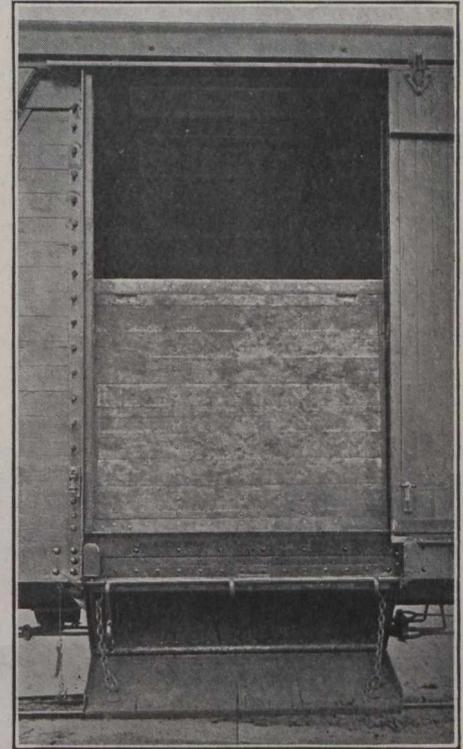
In dumping, the grain is thrown to the side, using the same elevator arrangement as the ordinary car. In dumping coal, it goes without saying that it is better to throw the load to the side rather than to the centre of the track and have the men crawl under for it. To unload a car of grain, the pin which holds the clamping shaft handle is driven out, which allows the hopper door to open and some 50% of the load runs out about as fast as the elevator can take it away, after which the floor door is unlatched and pushed down, and the remainder of the load brought out through the side door in the usual manner. This saves about one third of the time ordinarily taken to unload.

The arrangement increases the weight of the car about 800 lbs., compared with a car not fitted with grain door equipment, but when both cars are loaded with grain this difference is reduced the amount of the grain and fittings of the ordinary car.

The cost of maintenance of the ordinary grain door and fittings, including the usual nailing strips on the door posts, has been variously estimated at from \$6 a year up. Approximating the additional cost of hopper bottom and folding grain door at \$50 a car, the cost would be less with the hopper bottom car than with any kind of grain door that has been used in the past.

In addition to the saving on grain doors and fittings, it has been noted that where ordinary grain doors are used there is quite a force at elevators engaged in removing nails from the door posts and inside lining, etc., and getting the car ready for the load. This force of men

These cars are giving excellent satisfaction in service and are much sought for by the elevator men. The following are some of the advantages it would appear this car has over the ordinary car:—

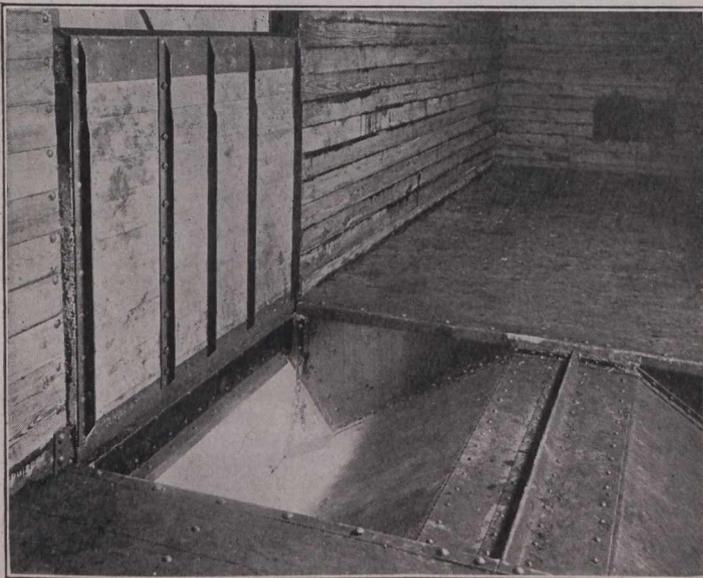


Grain and Coal Door Up, with Hopper Open.

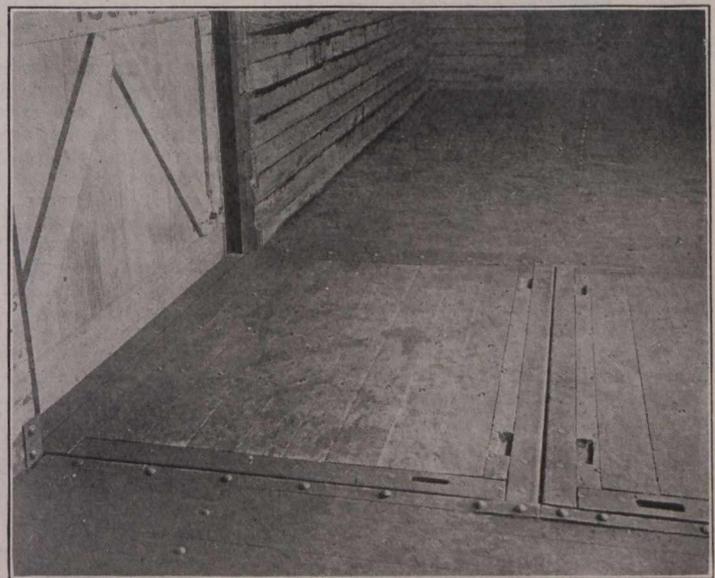
Combined first cost and maintenance less.

Car available for coal or any lading that can be dumped, as well as being absolutely the same for all other lading as the ordinary box car.

A most convenient grain door, which



Hoppers Open and Grain Door Up.



Interior of Car with Grain Doors Down.

these doors are thoroughly reinforced, are simple, and should not cost much more to maintain than the floor section at this point.

One of the principal reasons for working out this car was to secure a car suitable for coal in one direction and grain in the opposite direction, so as to avoid, to a large extent, empty mileage while

would be almost entirely done away with in the use of this hopper bottom car. Short sections of Z bars are applied on the inside of the door post, above the folding grain door, so that when lading would extend higher than the folding grain doors ordinary boards can be sawn off and dropped in to carry the load to any height desired.

does not waste grain the same as grain doors have in the past, all of the grain that is loaded into the car being delivered at the other end of the run.

In addition to the reduced cost of maintenance, it saves inconvenience, room and cost of handling temporary grain doors at elevators, and cost of shipping temporary grain doors back to

point of loading, also cost of force of men at loading points removing nails and fitting cars for grain.

Patents are being taken out by R. W.

Burnett, General Master Car Builder, C.P.R., Montreal. The car illustrated was built by the Canadian Car and Foundry Co.

Canadian Northern Railway Pacific Type Locomotives.

The Canadian Northern Ry. recently had delivered four Pacific type locomotives of the J-1-a class, the first of this type ever used by this road. They were built by the Montreal Locomotive Works, and were mentioned in Canadian Railway and Marine World at the time the order was placed. For the most part, the design is standard, but as there are some features differing from usual practice, they are here outlined. The general dimensions are as follows:—

Cylinders	23 x 28 ins.
Driving wheels	69 ins. diam.
Boiler—	
Diameter	62 ins. front, 70 ins. back.
Pressure	170 lbs. per sq. in.
Firebox	64¼ x 108 ins.
Tubes—	
Number	156 @ 2 ins.; 24 @ 5¾ ins.
Length	20 ft.
Wheel base—	
Locomotive	33 ft. 7 ins.
Driving wheel	13 ft.
Locomotive and tender	65 ft. 8½ ins.
Weight—	
Locomotive in working order	216,000 lbs.
Tender in working order	142,000 lbs.

the being so designed as to permit of this without the removal of the stand pipe. The tubes are of seamless steel, and the staybolts are of staybolt iron. Four rows of Tate flexible expansion stays are used on the firebox. In the firebox, there is a brick arch, supported on studs from the sides of the firebox.

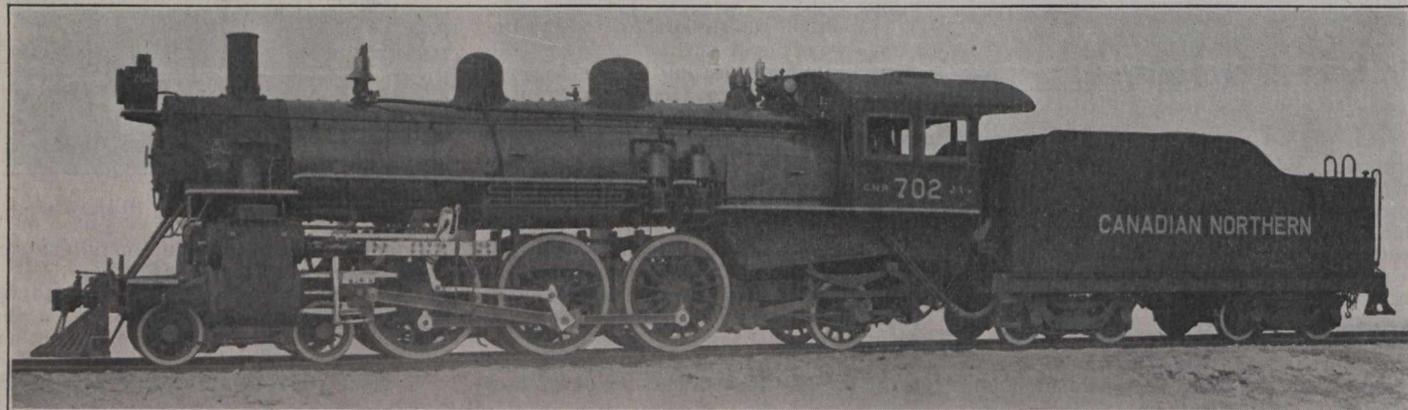
The front end arrangement of the locomotive is of the Master Mechanics' standard design, with double petticoat pipes. The superheater in this end is of the Schmidt fire tube type A, comprising 25 units running back through the 5¾ in. flues.

The cylinders are of the latest design, employing outside steam pipes running down from the superheater headers, a design that has met with general adoption within the last two years. Piston valves as is usual with superheated steam are employed. Over the valves is a by pass valve of what is generally termed the Pennsylvania type. It is claimed to be the best type in use ow-

The frames of the locomotive are cast Vanadium steel, to the front end of which is attached a cast steel bumper carrying a standard C.N.R. Sharon coupler. The pilot is of the C.N.R. standard, built up of oak, and fitted with an iron band shrunk on tightly.

The driving wheel centres are of cast steel, with bronze hub liners, and carrying supplementary counterbalance weights. The driving tires are of steel, 3½ ins. thick and 5½ ins. wide, and lipped on the outside to prevent their moving in. All six drivers are flanged. The axles are of hammered open hearth steel, with the main journals 9½ by 12 ins., and the others 9 by 12 ins. The driving boxes are of cast steel fitted with brasses, but with no babbitt in the bearings, and fitted with grease cellars. The springs of the spring system are of the Canadian Steel Foundries make.

The locomotive truck wheels are 33 ins. diameter, with cast steel spoke centres, with open hearth steel tires 3½ ins. thick by 5½ ins. wide, fitted with C.N.R. standard retaining rings rivetted in place. The axles are of hammered open-hearth steel, with journals 5½ by 12 ins. The trailing truck wheels are 45 ins. diameter, with 38 in. cast steel spoke pattern centres, and have iron tires 3½ ins. thick and 5½ ins. wide. The axles are



Canadian Northern Railway Pacific Type Locomotive, J-1-a Class.

Locomotive and tender, total	358,000 lbs.
On leading truck	41,100 lbs.
On drivers	136,400 lbs.
On trailing truck	38,500 lbs.
Fuel	Bituminous coal.
Heating surface—	
Tubes	2,296 sq. ft.
Fire box	180 sq. ft.
Total	2,476 sq. ft.
Grate area	48.2 sq. ft.
Maximum tractive power	31,100 lbs.
Factor of adhesion	4.38
Tender capacity—	
Coal	12 tons.
Water	6,000 Imp. galls.

The general arrangement presents nothing out of the ordinary, following pretty closely the lines of the Montreal Locomotive Works standard design in appearance. The principal point of variation in general design is in the arrangement of driving wheels. It will be noted that 69 in. wheels are called for, but the design has been worked out with the expectation of at some future date using 75 in. drivers, the wheel base being such as to permit of this rearrangement.

The boiler is of the extended wagon top design, possessing no features of consequence other than the manner of cross bracing of the steam space above the firebox by pin connected rods from side to side of the shell immediately over the fire sheet. This acts as a positive assurance against the boiler bulging outwards. The steam dome has a 20 in. opening in the top for entry in case of internal inspection, the throt-

ing to its positive action. Both the Baltimore and Ohio Rd., and the Pennsylvania Rd. use it as a standard. The cylinder cocks are of the double lift valve type. Instead of using a ball joint, with a ring at the mud ports in the bottom of the barrel, a 4 in. plug is used, and it is claimed that no trouble is experienced from leaking, and it is easier to remove and maintain. Both cylinders and valves are bushed. The piston valves are 14 ins. diameter.

The valve gear is of the Walschaert type, in one of the latest designs, comprising an outside slab frame for the outside link support, carried from the locomotive frame both front and rear. A light frame ladder is supplied on both sides of this supporting slab frame for internal inspection of the forward running gear and the oiling of the links. The valve stem is of the self centring type, supported directly from the valve chamber cover, and the front end of the piston rod is carried on a slipper in guides on the front end of the cylinder, both these features being recent practice.

The connecting and side rods are of open hearth steel, as are also the crank pins. The crank pin collars are secured by a lock nut and split pin through the crank pin, which is standard C.N.R. practice. All the grease cups are forged solid with the rods.

of hammered open hearth steel with journals 8 by 14 ins.

The cab is of the C.N.R. standard type, which can be renewed in parts in a simple manner. The runboards are of diamond surface steel plate with an angle iron edge. The sanders are piped to the front of the main drivers. The headlight has an 18 in. round case Ross type reflector, and a Pyle type E generator supplied with steam through copper pipes run under the lagging. Auxiliary lighting is from C.N.R. standard oil lamps.

The ashpan arrangement is of the C. N.R. standard, which was described in these columns recently. The firedoors are of the Franklin automatic type. The lagging on the boiler is H. W. Johns-Manville fire felt, 2 ins. thick. The jacketing is of no. 22 planished steel. The bell ringer is of the Taylor and Arnold type. There are three 3 in. open pops. The boiler feed is from a no. 10 Ohio injector on the left side and a no. 11 on the right. The bearing metals throughout are the Canadian Bronze Co.'s make. The steam heating is on the Gold system, and all the metallic connections are through flexible hose. All boiler fittings are connected to the boiler with the C. N.R. standard 12 threads per inch. The air signals are on the Westinghouse schedule L, and the air brakes are all Westinghouse, with two 9½ in. pumps

on the left side. A no. WM-2 and WD are applied to the locomotive truck and all the drivers, but with no braking on the trailing truck. All gauges have a double spring crank movement graduated to 300 lbs.

The tender tank and frame are of the C.N.R. standard construction described in these columns recently. The trucks are also of the standard C.N.R.

equalized pedestal type, with cast steel bolsters and Wood's roller side bearings. The truck wheels have 33 in. diameter cast steel plate centres with tires, 2 7/8 ins. thick and 5 1/2 ins. wide. The axles are of open hearth hammered steel with 5 1/2 by 10 in. journals.

We are indebted for the above information to A. L. Graburn, Mechanical Engineer, C.N.R.

three lamps, which are controlled separately by means of a switch box, secured to the poles on one side of the yard. The poles are 26 ft. high, and consist of a strut and brace made of 80 lb. rails, imbedded into a solid concrete foundation 6 ft. square by 6 ft. deep, the brace being secured to the foundation by means of a 1 1/2 in. foundation bolt. It was found that these poles were quite inexpensive and strong enough to withstand the enormous tension stresses of a span of 185 ft. The lamps are staggered throughout the yard and give an evenly distributed light of great brightness.

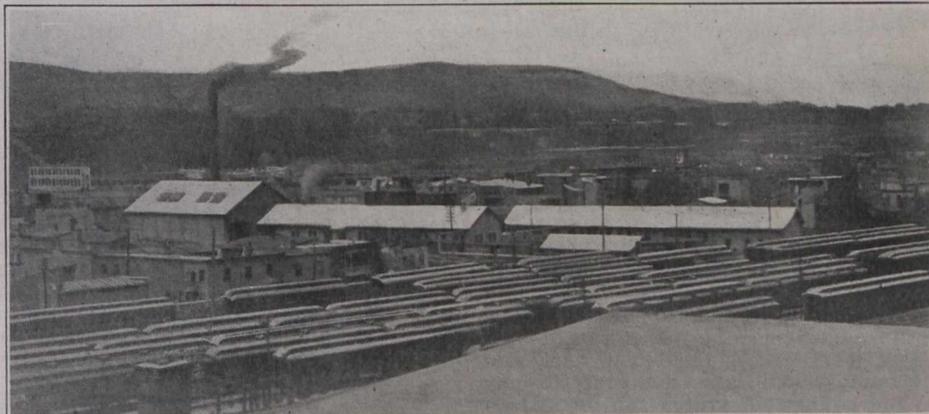
The steam and compressed air lines are carried overhead on trestles from the power house to the midways and St. Elizabeth St., respectively, whence they are carried under ground to supply each track with steam and compressed air. The steam main line starts with a 7 in. pipe at the boiler house,

Grand Trunk Railway New Passenger Car Yards at Montreal.

By A. Stoikowitz, Car Department, Grand Trunk Railway.

In order to keep steps with the enormously increased passenger traffic of the G.T.R. and with the advent of the G.T. Pacific Ry., it was found necessary to abandon the old facilities at Bonaventure station, Montreal, and to build a separate passenger car yard and cleaning plant for this purpose. This plant is constructed along highly efficient lines, great care having been taken to reduce the cost of operation to a minimum, and many mechanical devices have been substituted for hand labor wherever it was found advisable. The location, two miles west of Bonaventure station and adjoining the Turcot locomotive houses, is very ideal. The yard has a capacity of 180 cars, is 2,400 ft. long and extends from St. Marguerite St. to Cote St., Paul Road. It consists of 10 car tracks, spaced 16 ft. centres, and one repair track, the latter running next to the workshops from La Casse St. to St. Elizabeth St. Cleaning platforms are provided between all the tracks, 6 ft. wide by 10 ins. high, being entirely free from any obstructions, such as poles, etc. These platforms are tapered at St. Elizabeth St., and at two crossings or midways, which are 20 ft. wide, one of them being located directly opposite the workshops, the other halfway between St. Elizabeth St. and Cote St. Paul Road. By means of these crossings, and in connection with the lead tracks, the yard is subdivided into eight sections, which ar-

ft., throughout the yard; the main line being connected to the city sewers at three points. There are three independent water mains which supply the great amount of water used for cleaning purposes, one of them supplying the boiler room and workshops. All the

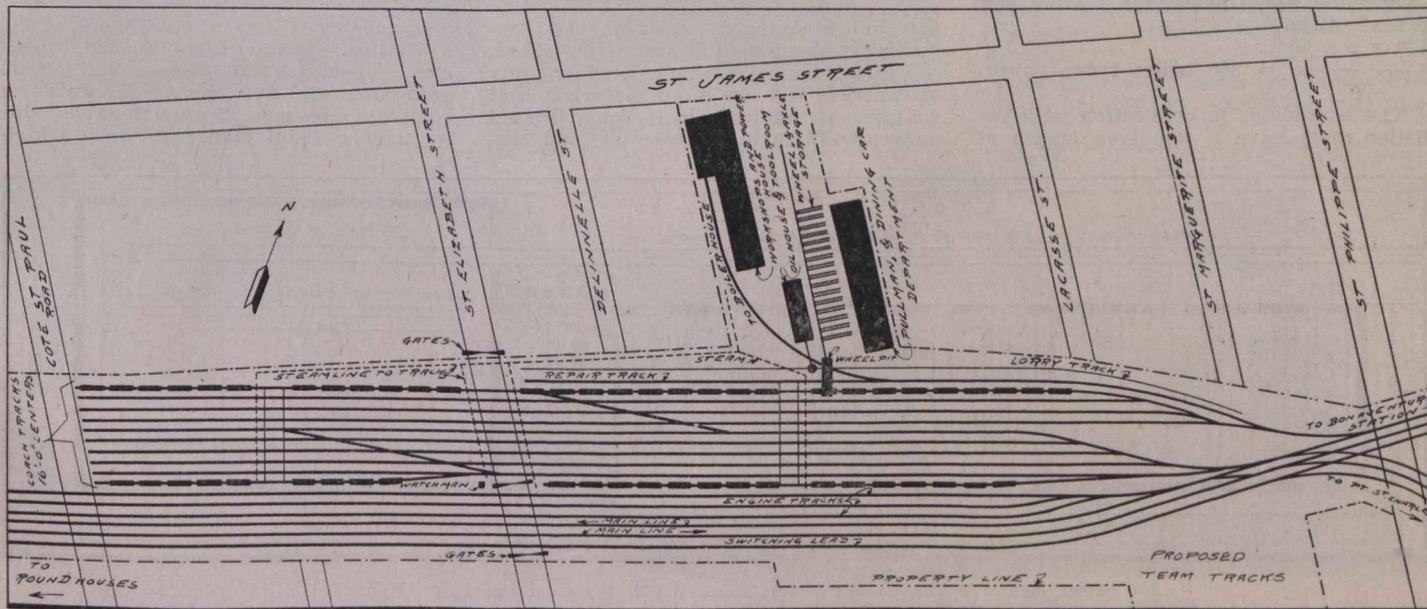


General View of G.T.R. Passenger Car Yards, Montreal.

platforms are provided with water outlets, 120 ft. apart; the pipes and fittings used being extra heavy.

Owing to the fact that day and night shifts have to be maintained for cleaning cars and making up trains, the lighting system has been made specially ef-

and graduates down to 3 1/2 ins. at its end, the four distributing mains under ground being controlled separately, graduate down to 2 ins. at the last outlets, where automatic steam traps discharge the condensation. The main line is of extra heavy pipe, covered with 2



Plan of Grand Trunk Ry. Passenger Car Yards at Montreal.

angement permits an increased output with the least possible handling of cars.

The drainage system consists of a 15 in. main line running through the centre of the yard, connecting 34 branch lines 8 ins. in diameter, and spaced 150

feet. It consists of 60 Westinghouse arc lights of 2,500 candle power, which are suspended 18 ft. above the tracks from 1/2 in. galvanized wire cables, crossing the tracks at 100 ft. intervals. Each cable has a span of 185 ft. and carries

in. asbestos sponge felted pipe covering and provided with expansion joints every 100 ft. The compressed air line carries a mean pressure of 80 lbs. per sq. in., starting with 4 ins. at the power house and graduating down to 3/4 in. at

its last outlet. Compressed air is used extensively for testing air brakes, cleaning seats and carpets, operating air hoists, wheel pit, etc.

The workshops, power house, etc., located in a separate yard in close proximity to the tracks as indicated in the general plan, are solid brick structures

soll-Sergeant duplex air compressor, with a capacity of 1,670 cu. ft. of free air per minute, at a pressure ranging from 70 to 100 lbs. a square inch, and also contains different switch board panels and a dynamo for charging batteries. The exhaust steam of the air compressor is utilized in winter for heat-

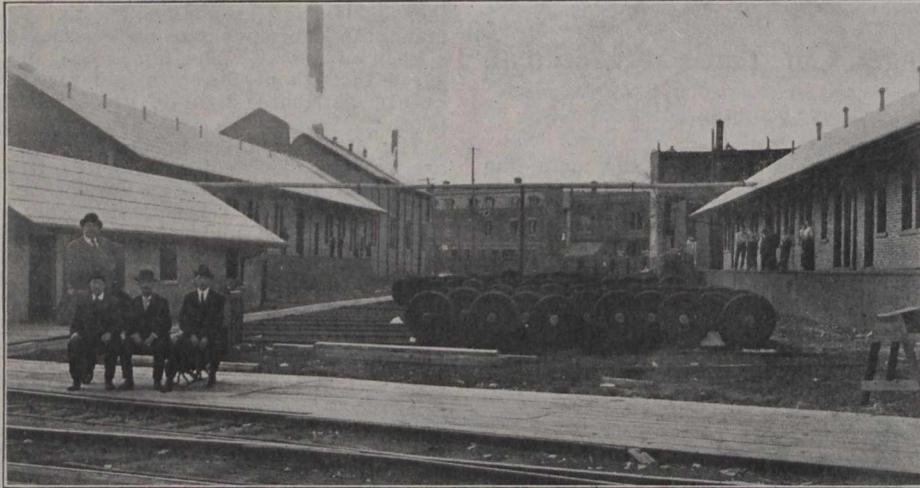
oil into buckets. A general tool room at one end of the oil house is for storing heavy tools of car repairers, etc.

A separate building accommodates the sleeping and dining car departments and storage rooms for hard coal, charcoal and ice. This building is 200 by 26 ft., sanitary in every respect and equipped to handle the greatest amount of business. The dining car department is thoroughly equipped with lockers, shelves, counters, etc., and an office with glass partitions, located to permit a perfect supervision; the storerooms have concrete floors, all the woodwork and lockers are painted white and enamelled. A refrigerator of an approved type, located in one of the store rooms, is 18 by 14 ft., having a separate compartment for dairy products. It is iced from the ice storage by means of an air hoist.

The sleeping car department consists of a jobbers' room, sewing room, linen sorting room, clean linen and storerooms, and an office and a dining room for cleaners. All the rooms are equipped with lockers, shelves and counters, the lockers in the clean linen room being painted white and enamelled.

The yard between the buildings is used for wheel and axle storage. Air hoists and runways for loading and unloading them are in course of construction, also a pneumatic wheelpit, which is automatic in its action.

A more efficient method than fumigation has been adopted for disinfecting the cars from time to time, which will be accomplished by the liquid spray method. Pure carbolic acid is used as



Yard in front of Workshops and Power House, G.T.R. Passenger Car Yards, Montreal.

with concrete basements. The boiler room is 90 by 60 ft., carrying five return flue steam boilers, having a combined capacity of 750 boiler h.p. There is room for three additional boilers for future enlargements. A separate elevated track enters the boiler room and inclined chutes take the coal directly to the boilers. A grated ash pit and an automatic conveyor dispose of the ashes into gondola cars.

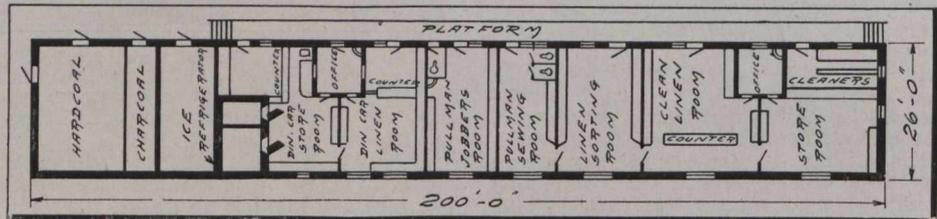
It is estimated that the number of cars to be heated will not exceed 120 at a time. Figuring the water of condensation to be approximately 70 lbs. per car and per one half hour preheating time at an outside temperature of zero, and allowing an evaporation of 30 lbs. water per horsepower hour, the necessary boiler horse power for heating purposes will be
120 x 2 x 70

30

= 560 boiler horse power.

The workshops in connection with the boiler room have a combined length of

ing the buildings, the condensation thereof being carried back to the boiler feed pumps. The basement underneath the workshops, being only 3 ft. beneath the yard level, is used as a blacksmith shop, cleaning and charging place for batteries, and as a storeroom for heavy

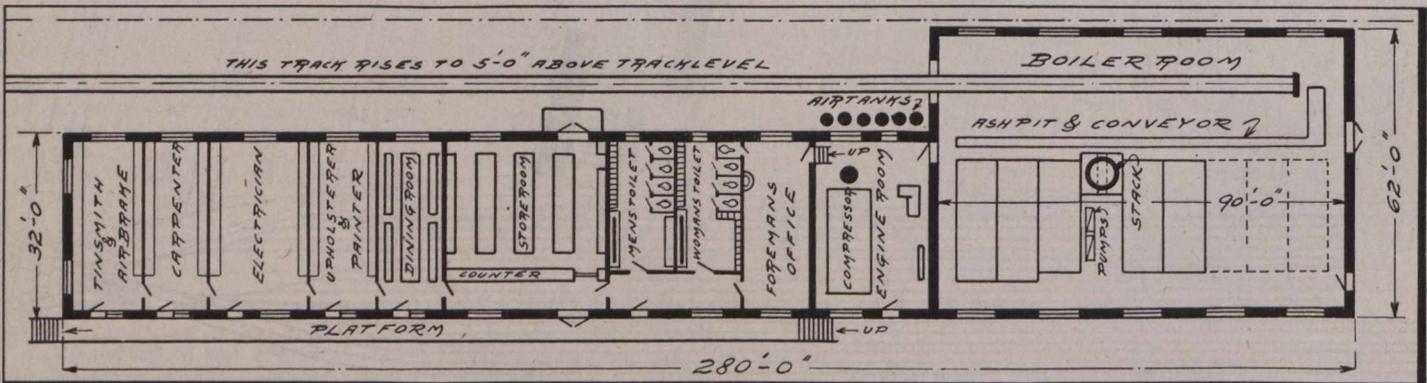


Floor Plan of Dining and Sleeping Car Departments, G.T.R. Passenger Car Yards.

and bulky material; an air hoist connecting same with the storeroom above.

The oil house is constructed entirely of concrete and fire proof materials, and contains an oil tank 30 ft. long, located underground in a concrete pit, and cov-

a disinfectant, with a co-efficient of 20, a dilution equivalent to 1 in 500. Practical experience has shown that 10,000 approximately five cents. There is a complete absence of objectionable odor by using a disinfectant with such a high



Floor Plan of Workshops and Power House, G.T.R. Passenger Car Yards, Montreal.

280 ft. by 62 ft., respectively, 32 ft. outside dimensions, and contain separate rooms for the electricians, carpenters, upholsterers, painters, tinsmiths and airbrake men, a dining room for the car cleaners, a big storeroom, offices, lavatories, and washrooms.

The engine room contains an Inger-

ered with a reinforced concrete floor. This tank is divided into four compartments and is capable of storing 2,950 galls. Galena oil, 1,680 galls. lamp oil, 1,060 galls. coal oil and 630 galls. of signal oil. It is equipped with gauges, safety valves and heating coils; compressed air being used to discharge the

co-efficient and the results obtained are highly satisfactory.

This plant was designed by the G.T.R. sq. ft. can be disinfected at a cost of Car Department under the direction of its Superintendent, Jas. Coleman, and the work was carried out by the Bridge and Building Department.

Canadian Pacific Railway Fire Fighting Cars.

A novel departure has been made by the C.P.R. in the construction of a couple of tank cars specially equipped for fire fighting. In general, they are of the standard M.C.B. tank car construction. Two cars have been built, as they are intended to operate in pairs. Apart from the end arrangement of the auxiliary equipment, they are identical in construction. Each car carries a tank of 8,428 imp. galls. capacity. On the end of one car there is a 7 x 10 in. duplex fire pump, using steam from the locomotive boiler. The corresponding end of the other car has a rack construction on which can be carried 6,000 ft. of 2½ in. fire hose.

The tanks are 92½ ins. diameter by 28 ft. long, made from 5/16 in. plate. Over the centre is the usual dome, 44 ins. diameter, inside of which is a 23 in. opening, a light metal ladder being provided inside for entry purposes. Inside the dome, there is a valve wheel, connected with a 6 in. valve in the bottom of the tank, with the usual outlet below. The centre sill of the car is built up of two 1½ in. 55 lb. channels, these comprising

contains a 6 in. T connection to the pumps. In both cars the connecting length has a globe valve.

The hose racks on the rack car are made up of 1 in. extra heavy piping, made into sectional openings, 27 ins. square. There are 16 of these openings, 40 ins.

dry Co., and are in service in the operating department, being located at Brownville Jct., Me.

Customs Regulations on the Importation of Foreign Repair Parts.—The importance of conforming to Customs regulations when shipping repair parts from U.S. lines into Canada is a most vital question with the store and car departments of the dif-



C.P.R. Fire Fighting Tank Car, With Duplex Pump.



Pump on Fire Fighting Tank Car.



Hose Rack on Fire Fighting Tank Car.

the absence of properly vouched for inferent Canadian lines, as, on account of voices accompanying the parts, they are usually held pending correspondence from the Canadian consignee to advise the U.S. consignor of the difficulty. In the meantime, the car is held on the bad order track, where it is not only freed from the per diem regulations, but also blocks up necessary home repairs. This subject has been treated in a thorough manner by L. E. Thomson, Storekeeper, Canadian Northern Ontario Ry., in a paper at the Railway Storekeepers' Association Convention in Chicago recently. In his paper, all the considerations involved in the resulting delay are dwelt upon, and the necessary procedure in forwarding the parts so as to avoid this delay is explained. It is to be hoped that the presentation of the paper will have the desired effect, as a proper following of the Customs regulations will mean a considerably increased repair track capacity for Canadian lines.

Sale of Return Tickets on Trains.—The Board of Railway Commissioners has

the whole longitudinal sill construction of the car, except for the reinforcements for the body bolsters over the truck. Draft gear is attached to the ends, housed in a pressed steel end sill. The car is designed for a weight capacity of 100,000 lbs., so standard 50 ton trucks are employed.

The tanks are placed a little further to one end than is usual, the platform space thus provided at the open end being used in the one case for the pump, and in the other for the hose racks. In both tanks, the suction is through a 6 in. pipe near the bottom and to one side of the centre line, forming a U bend, the open end of which drops down to within an inch of the bottom of the tank. The suction pipe, from the point it leaves the tank, passes along the side of the tank on the deck, to the open platform ends. In the rack, this terminates in a capped end, to which can be connected a short section of 6 in. rubber hose, supplied with the car, for connecting up with the pump car. In the pump car the connections are somewhat similar, with a capped end pipe, but this short length of pipe from the tank to the capped end



C.P.R. Fire Fighting Tank Car, With Hose Rack.

deep, in which the rolls of hose are placed on edge, in rolls up to 27 ins. diameter. The accommodation is for 6,000 ft., which can be connected up to the pump.

The two cars were built to the C.P.R. designs by the American Car and Foundry

Co., and are in service in the operating department, being located at Brownville Jct., Me.

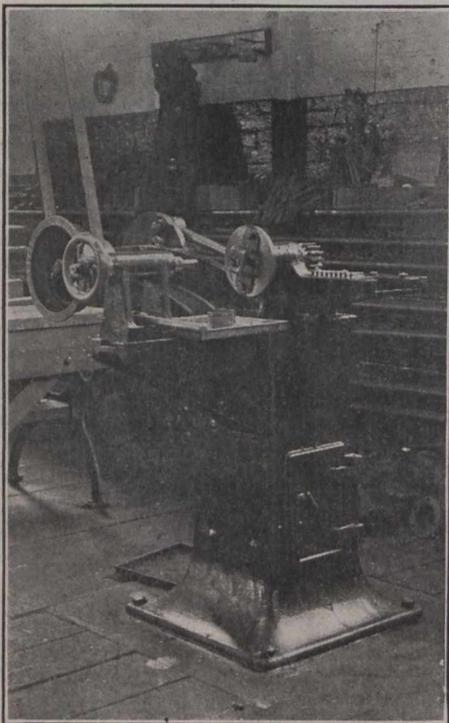
asked railway companies to state whether their conductors have instructions to sell round trip tickets to passengers boarding trains at flag stations, or at stations where no agents are on duty immediately before the departure of trains therefrom.

Railway Mechanical Methods and Devices.

Grinding In Machine at Grand Trunk Railway London Shops.

The air brake department of the G.T. R. London shops has a machine for grinding in valves such as angle cocks, etc., made to their own design. The construction is to be seen in the accompanying illustration. Others of the same design are said to be in use at other points on the system, no doubt copied from this.

The frame closely resembles that of a small vertical miller. To the rear, there is a 3 step cone pulley, carried on a shaft in bearings. There is a disc crank at the other end of this shaft at the furthest point to the rear in the machine, as shown by the illustration. This crank has a connecting rod attached to a short section of rack, guided in ways on the top of the machine frame as noted to the



Machine for Grinding in Valve Seats.

right. A pinion carried in a bearing to the left and above the rack, connects to a small faceplate on the front end of the pinion shaft.

A knee from the front of the machine frame has a channelled upper surface, carrying a light tailstock, the centre of which is in line with that of the faceplate right up to which it can be moved on its ways.

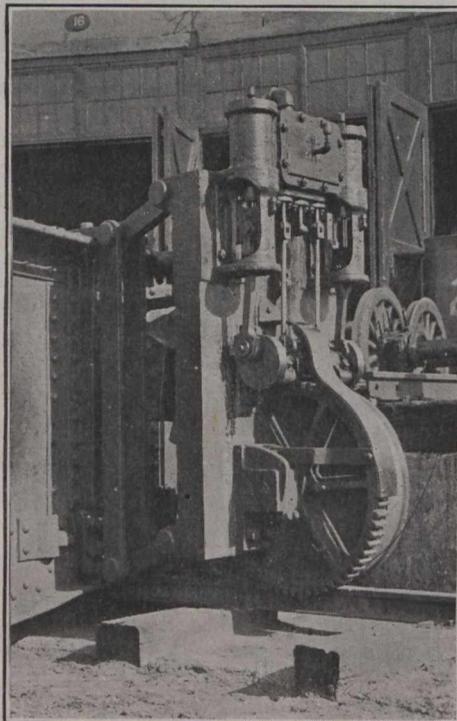
The valve to be ground to a seat is placed in the machine between the two centres, being driven from the faceplate. The seat, as in the case of an angle cock, is slipped over the valve stem, and held up to the work by the operator, there being no mechanical means of holding the cock, and alternately relieving the valve from the seat to allow the spreading of the oil and emery introduced at intervals by the operator.

The revolving crank disc at the rear causes a horizontal movement of the rack, which in turn revolves the pinion and faceplate through about $1\frac{1}{2}$ turns. This motion keeps constantly reversing, making an ideal grinding in movement.

Standard Turntable Motor on Grand Trunk Pacific Railway.

A standard type of turntable motor is being introduced along the G.T.P.R. The accompanying illustration of the installation at Rivers, Man., is typical.

The operating medium is compressed air. Twin cylinders, with the air chest between, connect through connecting rods of good length, with a crank shaft through disc cranks, the valves operating directly from this shaft in the usual manner. This crank shaft carries a small pinion, meshing with a large gear located on the inner side of the turntable rail. Integral with the large gear is a wheel of the same diameter, running on the turntable rail. Both wheel and gear are carried on a shaft carried in bearings on the frame to the rear.



Standard G.T.P.R. Turntable Motor.

The whole operating mechanism is carried on a frame, which is a heavy iron casting, held to the turntable by four links, giving free vertical movement to the weight and mechanism. The weight is of such proportions as to give sufficient adhesive force for the air motor to move the turntable around, even if the locomotive is not exactly centred.

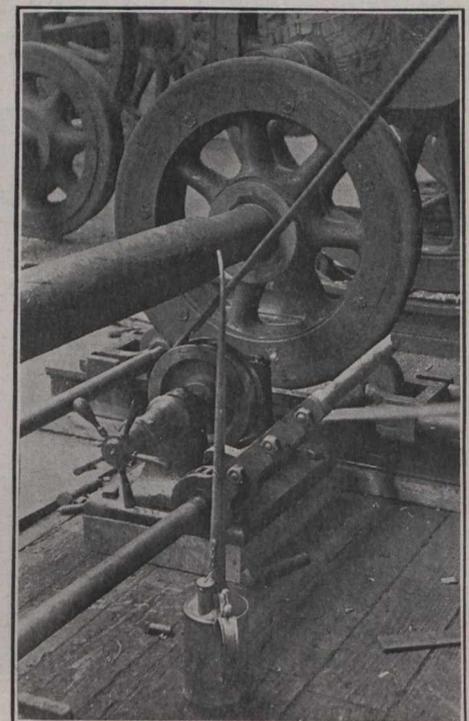
The particular advantage of this outside motor arrangement lies in the fact that the locomotive does not require to be so accurately spotted. When operated by hand power, the locomotive must be accurately centred. With a power mechanism attached directly to the turntable frame, the locomotive must be tilted slightly in that direction to obtain the necessary adhesion. With a mechanism flexibly connected in the manner in which this one is attached, such precautions are unnecessary.

The motor is operated from an air handle at either end of the turntable, a small operating shaft, along the top of one of the turntable girders, connecting the two handles.

Drilling Retaining Rings at Grand Trunk Railway Stratford Shops.

Of the large number of useful labor saving appliances in the G.T.R. machine shop at Stratford, Ont., the one illustrated herewith is one of the best. It is a machine for drilling out the old rivets that hold the retaining ring for the securing of the tire on the wheel centre. When the tire requires renewing, this ring must be removed, and the method generally adopted is to drill them out by some means.

The method here shown is simple, and the additional appliances required are limited. The wheels which require the removal of the rings, are mounted on rollers to raise the tread slightly above the ground, the common practice employed in the handling of locomotive driv-



Drilling Out Retaining Ring Rivets.

ing wheels. Secured to the floor, in line with the centre of the axle, at the level of the rivet to be removed, there is a drilling machine. Alteration for elevation is made in the wheels instead of in the drilling machine, the rollers having an attachment whereby they can be drawn close together or further apart by means of a right and left hand screw altering the location of the rollers, each side being regulated independently.

The frame of the drilling machine, secured to the floor on a block of wood, consists of a base carrying two upright bearings. In these bearings there is mounted a hollow spindle, driven by means of a belt from the line shaft above and to the right. The hollow spindle carries the drill spindle, on the outer end of which there is a drill socket for the reception of the drill. This drill spindle receives its lengthwise motion from a feed screw attached to the handwheel at the near end. The drill spindle is feathered in the hollow spindle, from which it receives its motion.

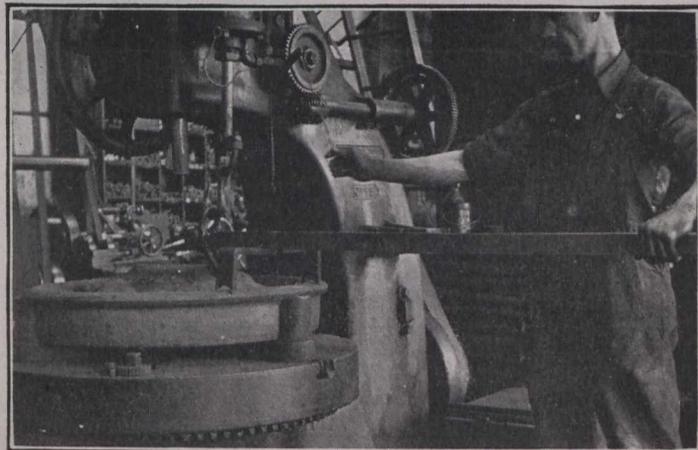
On the completion of each hole, the

wheels are moved around to the next position by means of the ratchet attachment in the foreground, connecting with one of the supporting wheels on each side. This, of course, can be turned in either direction.

A somewhat similar attachment to this one is in use for drilling the thrust brass holes of the large driving wheels. It operates in almost an identical manner, the difference being that the drill for the brasses is mounted on a V block, which rests on the axle, to which it is clamped. Power is obtained in this case as in the latter, from belting from the line shaft.

Car Wheel Boring Lift at Toronto, Hamilton and Buffalo Railway Shops.

The majority of car wheel boring machines have attached a small hoist for placing and removing car wheels for boring, this attachment usually being applied by the manufacturers. Some of the older makes of borers have no such attachment, and it is for these that the lift shown in the accompanying illustration will be found of value. In the T.H. & B.R. shops at Hamilton, Ont., W. T. Kuhn, Master Mechanic, it has been found that with its use, equally as quick entry and removal of the wheels is pos-



Car Wheel Borer Lift Hook Attached to Air Hoist.

sible as with the usual standard appliance.

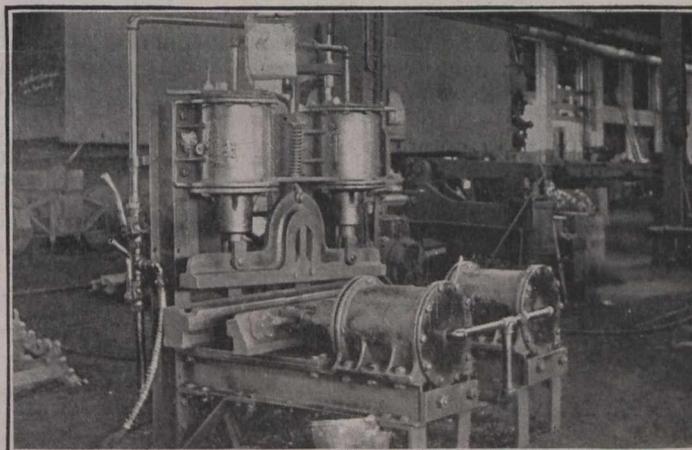
Were it not for the boring head of the machine, it would be a simple matter to use a hook arrangement through the centre bore, and lift the wheel into the mill. The construction of the machine makes necessary an eccentric lift. The T.H. & B. attachment makes this possible. On the inner end of a fulcrum rod, there is attached a small hook such as will pass in through one of the three wheel core holes and catch on the inner face. Above this hook is an eye, to which the hook of an air hoist is attached. The rod is fulcrumed a few inches back from the inner end on a U bridge, which bears on the flange of the tread. The leverage is such that while the lift is eccentric, a very light pressure on the outer end of the fulcrum rod will balance the wheel. The fulcrum rod serves a further purpose as a guide rod in directing the wheel into the faceplate jaws. The operation is clearly to be seen in the accompanying illustration.

A recent estimate of the saving in main line operation under electrification places the figure at 6.8%, based on a surplus of this amount over and above the payment of 5% on the actual cost of electrifying the line.

Straightening Brake Beams at Canadian Pacific Railway Winnipeg Shops.

The number of cars wrecked on the C.P.R. western lines is so great, owing to the extensive mileage over which it operates, as to require special provision to be made for the reclaiming of certain of the parts that are not placed beyond repair in a smash up. One part of the car equipment that is capable of reclamation is the steel brake beam, if of the I beam section as the majority are. In the company's Winnipeg shops, a special press of the form shown in the accompanying illustration has been rigged up for the special purpose of putting such brake beams back in service.

The device consists of a double vertical and horizontal frame, with two air brake cylinders mounted on the vertical part and two on the horizontal part, each pair so connected as to act in unison. The horizontal pair of cylinders carry on the end of their plungers, a die, slightly shorter than the width of a brake beam, and with a projecting flange that will fit into the channel of the I beam. This operates against a similar die, stationary on the frame. The vertical cylinders carry a flat die on the ends of their plungers, which will bear down on



Air Press for Straightening Brake Beams.

the top of the two lower dies, these latter forming the mating die for that cylinder.

The brake beams, as brought in from the road, are twisted in all sorts of shapes. They are first heated bodily to a working heat in an oil furnace, and then, with alternate workings under the dies of the press, and with sledge hammers on an anvil block, the I beam is finally brought back to shape. The final forming is accomplished by tightening down thoroughly in the press. Considerable dexterity is required to bend back the twisted bars in the press, first operating one or other of the pairs of cylinders, but the operator, through considerable experience in this kind of work, is very skilful in handling the beams through the operation.

Handling Boiler Plate at Canadian Northern Railway Shops.

Last year, a systematic means of handling boiler plate was evolved at the C.N. R. Winnipeg shops. Outside the building, adjoining the door nearest the boiler shop section of the locomotive shop, there were erected two parallel wooden walls, about 6 ft. apart, and 75 ft. long, against which the boiler plate can be pil-

ed in stacks, with about 5 piles in each of the four rows. Spanning these piling racks is a traveller, running on tracks just outside the outer rows of plates, which in all the piles stand on end. On the cross beam of the traveller is a small carriage with block and chain, at a height above the plate just sufficient to enable the latter to be lifted clear of the ground. The plates from each of the piles can be thus lifted and carried along to the door entering the building. To the end of the traveller tracks can be attached short lengths of rail, which enable the traveller to be brought along from the rack end over the shop track, which comes out through the door of the building. If a car be first spotted on the latter, and the traveller rails be laid out from the ends, the plates can be placed directly on the car, and run in the shop, where they can be picked up by the shop crane, and run down to the boiler department.

Tie Preservative Experiment.—To test the effectiveness of preservative treatment of ties, the Chicago, Milwaukee and St. Paul Rd. has laid a section of single track branch line, which is subject to fairly heavy traffic, with treated and untreated ties, both red oak and hard maple, the ties used by the road. Six

different preservatives are to be tried, 100 in a lot, of each kind of wood, which with 100 of each unpreserved makes a total of 1,400 ties under test. Half the ties are to be secured with screw spikes and flat tie plates, and the other half unprotected by tie plates and fastened with ordinary cut spikes. Most of the experimental track will be laid on a fill with a section in a cut. In order that the track may remain undisturbed as far as possible, new rails are to be laid with the ties.

More Permanent Creosoting.—The old problem of retaining the creosote in treated timbers seems to be solved in the new plan of applying the creosote with paraffin or stearic acid heated to the melting point. Of course the wood must be hot also. The mixture or solution of liquids penetrates to the heart of the timber, and on cooling the paraffin or stearic acid solidifies, holding the creosote permanently in the pores.

The Lehigh Valley Rd. has issued an order instructing conductors and trainmen in the event of delay to trains to advise passengers of the cause in order that they may change their plans accordingly if they see fit. The same order applies to ticket agents, who must advise prospective passengers when any delay on the line has occurred.

Grand Trunk Railway Mikado Locomotives.

The Grand Trunk Ry. has recently received 25 locomotives of the 2-8-2 class from the American Locomotive Co., and an order was placed with the same builders for 50 more of the same design.

Freight traffic on the G.T.R. has until recently been hauled mainly by Richmond compound consolidation type locomotives, which have a total weight, including the tender, of 349,800 pounds, and a tractive power of 34,000 lbs. The mikados have a total weight, including

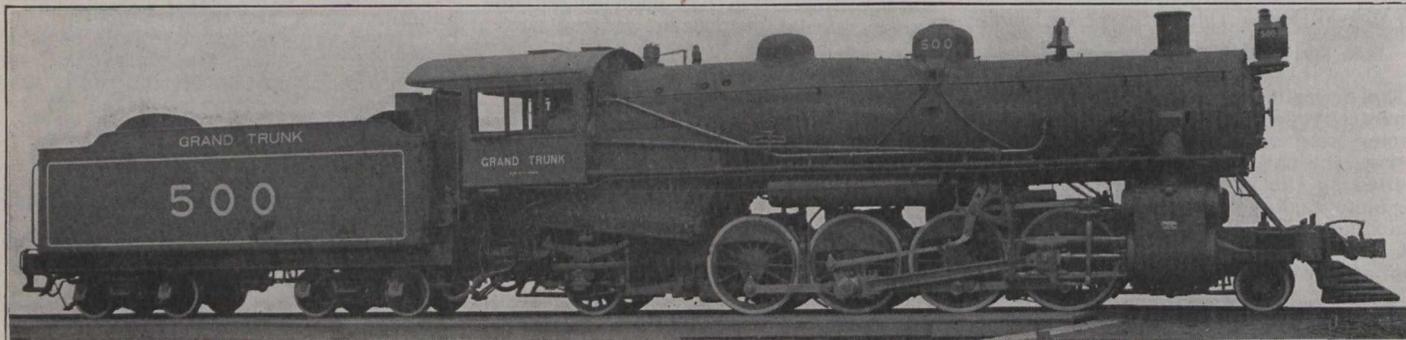
Nichols to Elsdon.....	168½	None	1700	2500	47%
Elsdon to Nichols.....	168½	For 5 miles	2000	2800	40%
Nichols to Port Huron.....	156½	None	2000	2800	40%

These runs are being made over this division with an average speed for the consolidations of 20 miles an hour, and for the mikados of 22 miles an hour. The consolidations are averaging 38,500 ton miles, and the mikados 60,000, an increase of 56%.

been included in this design are, outside steam pipes, screw reverse gear, self centring valve stem guides, the new guide for the extended piston rod, long main driving box, and the improved outside bearing radial trailing truck.

Following is a comparison of dimensions and ratios with that of the consolidations:—

Type.....	2-8-2	2-8-0
Weight on driving wheels, lbs.....	213,500	183,700
Weight on leading truck, lbs.....	26,000	25,700
Weight on trailing truck, lbs.....	43,500	.....
Weight, total of engine, lbs.....	283,000	209,400



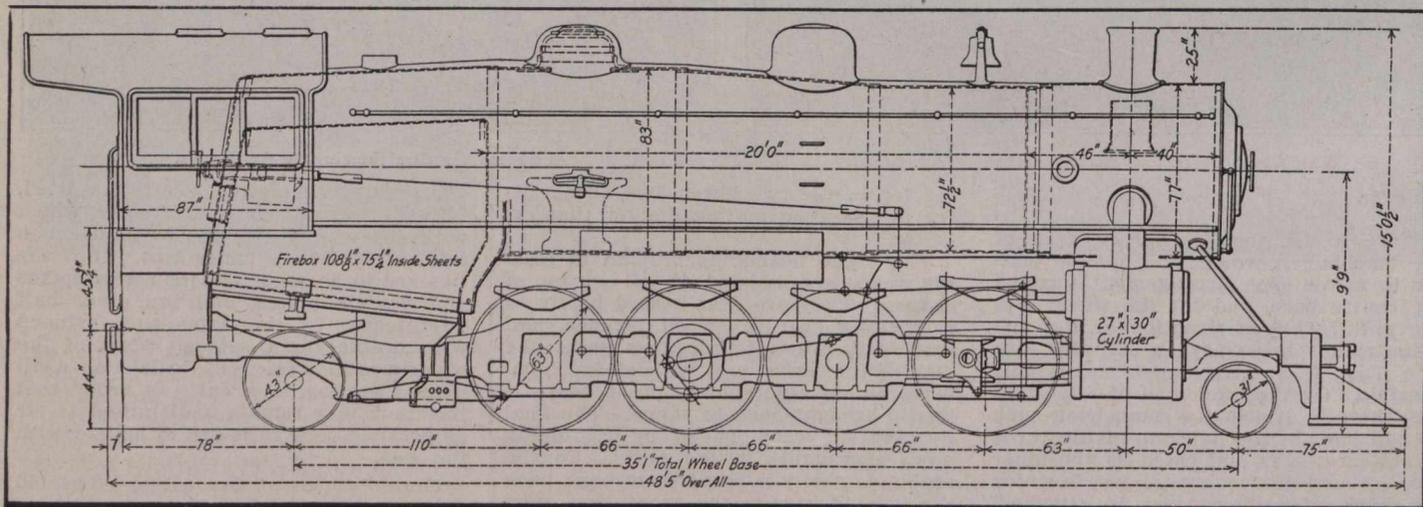
Grand Trunk Railway 2-8-2 Mikado Locomotive.

the tender, of 455,100 lbs., and a tractive power of 51,700 lbs. With an increase in weight of only 30%, an increase in tractive power of 52% is obtained. This is very important, as more power per pound of locomotive weight means more revenue from the same motive power investment.

The consolidations are saturated engines, and have a total heating surface of 2,952 sq. ft. The mikados have an equivalent heating surface (evaporating heating surface plus 1½ times the super-

heater design in general follows the standard of the builders. The boiler is of the extended wagon top type. It is 74 ins. in diameter outside at the front end, and 83 ins. in diameter outside at the largest course. The barrel is fitted with 240 two in. tubes, 20 ft. long, and a 32 unit, Schmidt type, top header superheater. The firebox is 108½ by 75¼ ins., and includes a firebrick arch, a pneumatic fire door, and a power operated grate shaker. This well proportioned boiler, equipped with fuel saving

Weight of tender, lbs.....	172,100	140,400
Wheel base, driving, ft. and ins.....	16-6	17-0
Wheel base, total of engine, ft. and ins.....	35-1	25-9
Wheel base, total of engine and tender, ft. and ins.....	67-4	57-3
Cylinders, diameter and stroke, ins.....	27x30	22½ .35x32
Valves, type.....	Piston	Piston
Valve gear.....	Walschaert	Stephenson
Wheels, diameter of driving, ins.....	63	63
Wheels, diameter of truck, ins.....	31	31



Elevation of Grand Trunk Ry. 2-8-2 Mikado Locomotive.

heating surface), of 4,776 sq. ft., an increase of 62% over the consolidations, with an increased grate area of only 11½%.

The mikados are doing their best work on the Western Division, which is made up of broken grades, which do not exceed 0.6%, except in one case, where a 5 mile 0.95% grade requires a helper service.

On the Western Division the following ratings have been put into effect:—

Miles	Helper	Consolidation	Mikado	Increase
Port Huron to Nichols.....	156½	None	2000	2800 40%

devices, should give great economy in operation.

An interesting feature is the arrangement of the throttle lever support. It combines the lever fulcrum and quadrant support in an integral casting. This means a saving in the number of parts and also a reduction in the number of holes in the back head. It is also universal, as the support fits around the stuffing box as a sleeve, and can be turned to any desired angle to bring the lever in a convenient position. It is also of great advantage as a means of passing obstacles on the back head.

Other interesting features which have

Wheels, diameter of trailing, ins.....	43	.....
Wheels, diameter of tend'r ins.....	34	34
Journals, driving main, ins.....	11x20	9½x12
Journals, driving others, ins.....	10x12	9x12
Journals, truck, ins.....	6½x12	6½x12
Journals, trailing, ins.....	8x14	.....
Journals, tender, ins.....	6x11	5½ x10
Boiler, type.....	Ex. wag-on top	Ex. wagon top
Boiler pressure, lbs.....	175	210
Boiler, outside diameter, front end.....	74	68-3-8
Boiler, outside diameter, back end.....	83	76
Firebox, length, ins.....	108-1-8	96-7-8
Firebox, width, ins.....	75¼	75¼
Tubes, number and diameter, ins.....	240-2	353-2

Flues, number and diameter, ins.	32-5-3-8	.....	ft.	757	.....
Tubes, length, ft. and ins.	20-0	15-0	Grate area, sq. ft.	56.5	50.6
Heating surface, tubes, sq. ft.	3398	2757	Water, capacity of tender, galls.	9000	7000
Heating surface, firebox, sq. ft.	215	168	Coal, capacity of tender, tons.	15	10
Heating surface, arch tubes, sq. ft.	27	27	Length over all engine and tender, ft. and ins.	78-2-7-8	67-4-3/4
Heating surface, total sq. ft.	3640	2952	Extreme width, ft. and ins.	10-4	10-0
Superheating surface, sq.			Extreme height, ft. and ins.	15-0 1/2	15-0
			Tractive power, maximum lbs.	51,700	33,970

Cross Ties Purchased by Railways in 1912.

The statistics in this bulletin are based on reports received from 51 steam railways and 36 electric railways operating in Canada in 1912. The total number of ties, 21,308,571, were valued at \$9,373,869. Part of these were imported, but the bulk of the ties used are cut in Canada. The imports of ties in 1912 were valued approximately at \$1,697,-

rack and use only the hardwoods. The use of imported hard pine has increased with the hardwoods and was used in making 3.1% of the ties purchased in 1912. Western larch formed 5.6% of the total number, over a million ties of this wood having been purchased.

The average value of ties, at the point of purchase, increased from 39 to 44

those cases where ties of a certain kind of wood are used in large numbers can the values given in the table be said to indicate the intrinsic value of the material.

Table 2 gives the details of ties purchased by steam railways in Canada in 1911 and 1912.

Steam railways in 1912 reported the purchase of 20,825,209 ties, this number forming 97.7% of the total for all Canada. The relative importance of each kind of wood and the average values in each case were approximately the same as those given in table 1, owing to the large proportion of the total used by these companies. The total is an increase of 7,025,227 ties, or 50.9% over 1911.

Steam railways paid an average price of 44 cents for their ties as compared with 50 cents paid by the electric railways. The steam railways paid less for every kind of wood used by both classes, with the exception of eastern spruce. These companies are usually closer to the source of supply, buy in greater quantities, and have better facilities for transporting their tie material than the electric roads. The steam railways used all the ties purchased in Canada in 1912 of the following kinds of wood:—Western larch, chestnut, beech, maple, birch, red pine and balsam fir.

It is interesting to note the increased use of hardwoods by steam railway companies. In 1911 woods such as oak, chestnut, beech, maple, birch, elm and black ash, together formed only 1.8% of the ties purchased. In 1912 this percentage increased to 6.7%, through increased purchases of 1,148,578 hardwood ties.

Table 3 gives the details of the purchases of tie material by the electric railways of Canada in 1911 and 1912.

Electric railways in Canada reported having purchased 483,362 cross-ties in 1912. This is a decrease of 18% from 1911, and, where the purchases of these railways in 1911 amounted to over 4% of the total, they formed less than 3% in 1912. As stated previously, the value of ties of every kind of wood used by both classes were greater in the case of steam railways, with the single exception of eastern spruce. The greater part

TABLE 1.

Kind of Wood	1911				1912			
	Number	Value	Average Value	Per Cent.	Number	Value	Average Value	Per Cent.
Total.....	14,389,224	\$5,540,769	\$0.39	100.0	21,308,571	\$9,373,869	\$0.44	100.0
Jack Pine.....	5,457,586	2,230,321	.41	37.9	7,783,034	3,417,238	.44	36.5
Cedar.....	1,433,395	577,427	.40	10.0	3,332,105	1,486,456	.45	15.6
Douglas Fir.....	1,947,662	740,548	.38	13.5	2,183,554	661,891	.30	10.2
Hemlock.....	1,674,047	590,878	.35	11.6	1,947,474	743,535	.38	9.1
Tamarack.....	1,389,897	438,280	.32	9.7	1,803,696	806,049	.45	8.5
Western Larch.....	1,194,779	514,013	.43	8.3	1,196,184	514,359	.43	5.6
Oak.....	149,747	121,215	.81	1.0	933,486	624,174	.67	4.4
Eastern Spruce.....	901,629	232,969	.26	6.3	835,121	330,854	.40	3.9
Hard Pine.....	444	491	1.11	(1)	658,096	434,840	.66	3.1
Chestnut.....	65,849	37,016	.56	0.5	266,082	157,225	.59	1.2
Beech.....	6,460	1,352	.21	(1)	103,583	70,220	.68	0.5
Western Cedar.....	59,072	25,057	.42	0.4	82,357	29,109	.35	0.4
Maple.....	13,891	2,908	.21	0.1	51,465	39,681	.77	0.2
White Pine.....	5,882	1,688	.29	(1)	44,408	15,348	.35	0.2
Birch.....	13,891	2,908	.21	0.1	37,943	22,605	.60	0.2
Red Pine.....	73,712	23,308	.32	0.5	26,646	12,673	.48	0.1
Balsam Fir.....					12,469	1,621	.13	0.1
Western Spruce.....					8,000	4,640	.58	(1)
Elm.....	222	95	.43	(1)	2,868	1,351	.47	(1)
Poplar.....	1,001	270	.27	(1)				
Black Ash.....	58	25	.43	(1)				

(1) Less than one-tenth of one per cent.

431, which would indicate that less than one fifth of the ties purchased in 1912 were imported.

Table 1 gives the number of ties purchased in 1911 and 1912, together with the total value, average value and per cent. distribution.

These were purchased in Canada in 1912 a total of 21,308,571 cross-ties, an increase in actual numbers of 6,919,347, or 48.1% over 1911. This increase took place on almost all the railways and was especially noticeable on transcontinental lines. Nineteen different kinds of wood were used, with jack pine still leading. The use of each material increased from 1911, with the exception of eastern spruce and red pine. Balsam fir and western spruce were added to the list of 1911, and poplar and black ash were dropped. The use of cedar ties has varied greatly from year to year. In 1908, 1909 and 1910, they headed the list, although the numbers purchased showed decreases each year. In 1911 cedar ties formed only 10% of the total and fell back to fourth place on the list. In 1912 their use increased by some 1,898,710 ties and this wood moved up to second place on the list, forming 15.6% of the total. Douglas fir has steadily increased in use since 1909, when data concerning its use was first obtained. Oak and the other five hardwoods—chestnut, beech, maple, birch and elm—have also increased remarkably. There seems to be a tendency on the part of the management of older established steam railways to reduce the use of soft, light material for cross-ties, especially where fast trains and heavy rolling stock are used. Some of the eastern roads have ceased to purchase cedar, pine, hemlock and tama-

cents in 1912. Increases are noted in the case of jackpine, cedar, hemlock, tamarack, eastern spruce, chestnut, beech, maple, white pine, birch, red pine, and elm. The increases in the value of beech, maple and birch were probably due to the fact that ties of these three materials were treated chemically in considerable numbers to prevent decay, and their cost is materially increased on this

TABLE 2.

Kind of Wood	1911				1912			
	Number	Value	Average Value	Per Cent.	Number	Value	Average Value	Per Cent.
Total.....	13,799,982	\$5,368,330	\$0.39	100.0	20,825,209	\$9,131,675	\$0.44	100.0
Jack Pine.....	5,433,086	2,219,521	.41	39.4	7,757,418	3,402,417	.44	37.3
Cedar.....	1,266,510	508,776	.40	9.2	3,172,629	1,398,774	.44	15.2
Douglas Fir.....	1,624,392	673,787	.41	11.8	2,026,624	593,859	.29	9.7
Hemlock.....	1,658,504	585,181	.35	12.0	1,894,711	720,109	.38	9.1
Tamarack.....	1,366,346	433,962	.32	9.9	1,772,151	786,853	.44	8.5
Western Larch.....	1,194,779	514,013	.43	8.7	1,196,184	514,359	.43	5.7
Oak.....	144,763	118,172	.82	1.0	930,561	621,783	.67	4.5
Eastern Spruce.....	896,814	231,752	.26	6.5	818,485	325,202	.40	3.9
Hard Pine.....	444	491	1.11	(1)	653,896	431,900	.66	3.1
Chestnut.....	64,549	36,416	.56	0.5	266,082	157,225	.59	1.3
Beech.....	6,460	1,352	.21	(1)	103,583	70,220	.68	0.5
Western Cedar.....	59,072	25,057	.42	0.4	57,357	16,234	.28	0.3
Maple.....	13,891	2,908	.21	0.1	51,465	39,681	.77	0.2
White Pine.....	3,488	716	.21	(1)	44,227	14,965	.34	0.2
Birch.....	13,891	2,908	.21	0.1	37,943	22,605	.60	0.2
Red Pine.....	51,712	12,928	.25	0.4	26,646	12,673	.48	0.1
Balsam Fir.....					12,469	1,621	.13	0.1
Elm.....	222	95	.43	(1)	2,778	1,195	.43	(1)
Poplar.....	1,001	270	.27	(1)				
Black Ash.....	58	25	.43	(1)				

(1) Less than one tenth of one per cent.

account. The decreases were in the values of Douglas fir, oak, hard pine, and western cedar. Western larch ties were purchased at the same price as in 1911. The values in all cases, being based on the cost at point of purchase, can never be considered to represent exactly the relative values of the different kinds of wood for cross-ties. So many variable factors enter into this cost that only in

of the material used by these companies was of the softer, lighter woods. Coniferous woods formed together 99.4% of the total. The only hardwoods used were oak and elm, and these together formed only 0.6% of the total. Imported hard pine, however, is used to a slight extent, and this material is in reality much harder than many of our native so-called hardwoods. Decreases in the num-

ber of ties purchased by electric railways are noticeable in the case of cedar, Douglas fir, oak and white pine, and these woods together form the bulk of the material used. Increases are seen in the use of hemlock, tamarack, jackpine and eastern spruce. Ties of western cedar, western spruce, hard pine and elm were reported for the first time in 1912. The use of red pine and chestnut was not reported by electric roads in 1911. These companies used all the western spruce ties reported in 1912.

Hose Wire Tightener at Grand Trunk Railway Port Huron Shops.

The workmen in the air brake department of the G.T.R. car shops at Port Huron, Mich., have made up a wire tightener for tightening up the wire on the ends of hose connections where the hose connects to the air coupling or nipple. Somewhat similar wire tighteners are in use in some shops for the same purpose, used particularly by wiremen in

for the hose tightening. Mounted on the screw there is a vise block made from $\frac{3}{8}$ in. square rod, with $\frac{3}{16}$ in. thumb screws in the ends bearing down on $\frac{5}{32}$ in. holes parallel with the central screw opening.

The U bent piece of wire is twisted around the hose end, and the loose ends slipped through the lower end of the U. The grooved swivel block is placed in the U end of the wire, and the loose ends slipped up through the holes in the vise block, and the thumb screws tightened down. Revolving the screw forces down the U and draws up the loose ends, thereby taking up the slack of the wire, finally drawing it up so as to tightly bind the hose end. The whole apparatus is then given a turn of 180 degs., and the loose ends cut off close up to the bend. This gives a splendid joint, and the workmen who have used it but a short time, giving up the old binding method in its stead, are very pronounced in its praise.

TABLE 3.

Kind of Wood	1911				1912			
	Number	Value	Average Value	Per Cent.	Number	Value	Average Value	Per Cent.
Total	589,242	\$172,439	\$0.29	100.0	483,362	\$242,195	\$0.50	100.0
Cedar.....	166,885	68,651	.41	28.3	159,476	87,681	.55	33.0
Douglas Fir.....	323,270	66,761	.21	54.9	156,930	68,032	.43	32.5
Hemlock.....	15,543	5,697	.37	2.5	52,763	23,426	.44	10.9
Tamarack.....	23,551	4,318	.18	4.0	31,545	19,196	.61	6.5
Jack Pine.....	24,500	10,800	.44	4.2	25,616	14,821	.58	5.3
Western Cedar.....	.....	.....	.....	.....	25,000	12,875	.51	5.2
Eastern Spruce.....	4,815	1,217	.25	0.8	16,636	5,652	.34	3.4
Western Spruce.....	.....	.....	.....	.....	8,000	4,640	.58	1.7
Hard Pine.....	.....	.....	.....	.....	4,200	2,940	.70	0.9
Oak.....	4,984	3,043	.61	0.8	2,925	2,391	.82	0.6
White Pine.....	2,394	972	.41	0.4	181	384	2.12	(1)
Elm.....	.....	.....	.....	.....	90	157	1.74	(1)
Red Pine.....	22,000	10,380	.47	3.7	.....	.....	.....	.....
Chestnut.....	1,300	600	.46	0.2	.....	.....	.....	.....

(1) Less than one-tenth of one per cent.

Canadian Pacific Railway Shops at McAdam Junction, N.B.

The C.P.R. is building an erecting shop and machine shop at McAdam Jct., N.B. The shops when completed will be 150 by 130 ft., comprising six stalls, one of which will be equipped with an electric locomotive lift. The construction will be entirely of concrete, reinforced where required, and finished with white cement. The erecting shop will form the high portion of the shops, extending to a height of 40 ft. with a flat roof supported on heavy purlins and steel trusses spanning about 70 ft. Running the whole length of the erecting shop there will be a five ton electric travelling crane equipped with all the necessary motors.

The machine shop will be 80 ft. across, with concrete walls, steel columns and beams, and mill construction roof, and when completed will be equipped with all the necessary tools and mechanical labor saving machines. In connection with the machine shop there will be a lavatory, tool room and foreman's office.

The erecting and machine shops will be heated by hot air, and the car repair shop by steam, and they will be electric lighted throughout. Work on the foundations is well advanced, Henry Post, of Woodstock, N.B., being the contractor.

There will also be a car repair yard and car shop built to facilitate the repairing of cars in the contiguous districts. The total cost of the whole work will be about \$100,000.

The use of powdered coal for fuel is receiving attention, and it is stated that one of the locomotive companies is spending \$50,000 in an endeavor to adopt it for locomotives. It is claimed for it that there is a saving of about one third through more perfect combustion, a saving by the abolition of ash pits and cleaning gangs, and a direct saving in the ability to cut off fire at will when standing in stations and sidings, as well as other minor savings. The flexibility of fire, with the absolute regulation of coal and air, is also emphasized, and in switchers and small locomotives, the services of a fireman might be dispensed with.

Just 100 years ago last June, the first practical locomotive propelled by steam power was produced by W. Bradley and T. Hackworth. This locomotive, which was for use on a colliery line, was named the "Puffing Billy," and is still to be seen in the South Kensington Museum, London, Eng.

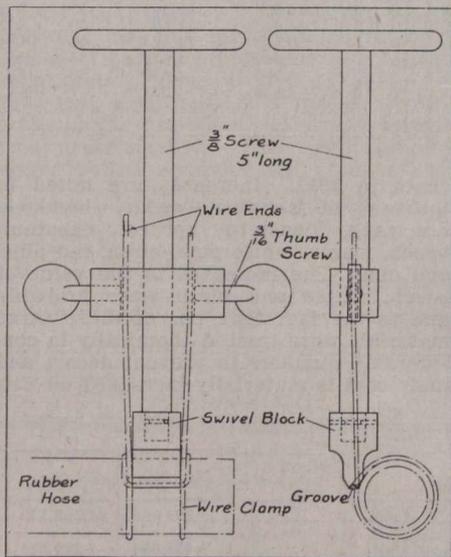
Many Canadian railway companies are beginning to realize the value of preserving at least a part of their tie material from decay and insect injury. The practice of chemical treatment of railway ties has been carried on by railways in the United States for some years with apparently satisfactory results. The practice in Canada is just beginning, but it is increasing rapidly, with the increasing cost of tie material and the constantly decreasing supply. In 1910 practically no treated ties were used by Canadian railways. In 1911 some 206,209 ties received chemical treatment before being placed in the roadbed. This number, while forming only 1.4% of the total number of ties used, was, nevertheless, an indication of the increase in this particular form of conservation. In 1912 a total of 1,818,189 ties were chemically treated. This number forms 8.5% of the total number of ties purchased. Steam railways used 1,789,189 of these treated ties, and electric railways used 20,000. The treated ties were mostly hardwoods, as it has been found more economical to treat the heavier, stronger woods than those which are liable to fail from mechanical wear before they have time to decay. The greatest actual saving by preservative treatment is found in the use of the so-called "inferior woods," provided that these are properly protected from mechanical wear. Until the price of the durable woods becomes excessive, the railway companies will not resort to expensive treatment of inferior woods, on account of this cost of protecting them from mechanical wear.

The foregoing bulletin was prepared by the Interior Department's Forestry Branch, R. H. Campbell, Director of Forestry.

A remarkably rapid piece of trestle building was recently completed jointly by the Pennsylvania and Lehigh Valley Railroads, when a double track trestle bridge across Newark Bay, which had been destroyed by fire, was completely rebuilt in 12 days. 2,857,059 ft. of timber were used, and 1,500 men were employed on the work. Rapid work was necessitated, as the trestle formed an important link in the New York freight connections for both roads.

the stringing of wire fences in the country. This design differs from such tighteners to a sufficient degree to make a description worth while.

In the majority of shops where hose is attached to its couplings, an air tight



Wire Tightener for Small Air Hose.

joint is made between the hose and coupling by binding the outside of the hose over the coupling with wire closely wound. This arrangement, while quite satisfactory as regards efficiency, is deficient from the standpoint of not being rapidly made up, the numerous windings all requiring time. The coupling which this tightener makes is in more or less common use. It consists of a U bent piece of wire wrapped around the hose with the two loose ends of the U bend passed through the U and drawn up tightly, these loose ends being then turned back and cut off.

On the lower end of a $\frac{3}{8}$ in. screw, there is a swivel block. The turned down end fits into a corresponding hole in the block, a pin through the latter passing tangent to the screw in an annular groove in the latter. There is a turning handle on the upper end of the screw. The lower face of the swivel block is grooved to fit the size of wire to be used

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.

19559. June 12.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to divert highway at mileage 94.15 from Glen Tay, so as to cross C.L.O. & W.R. and G.T.R. at mileage 94.41, and to cross same at grade.

19560. May 30.—Authorizing C.P.R. to build main line and sidings of its Island Subdivision, B.C., across Franklyn St., Lubock Square, and Fitzwilliam St., Nanaimo, B.C.

19561. June 12.—Amending order 18927, March 27, re road allowance of Alberta Government across C.P.R. between Secs. 7-24-25 and 12-24-26, w. 4 m.

19562. June 12.—Extending to July 19, time within which G.T.R. shall install electric bell at crossing of Clara St., near Glen Robertson Station, Ont.

19563. June 12.—Ordering Canadian Northern Ry. to rebuild shelter at Wroxton, Sask., to afford accommodation equal to standard third class station; to be completed by Sept. 15, and rescinding order 19201, May 3.

19564. June 11.—Ordering G.T.R. to employ night and day watchmen at crossing of Huronario St., Port Credit, Ont., maintenance to be paid, 80% by G.T.R. and 20% by Toronto Tp.

19565. June 12.—Approving location of C.N. Ontario Ry. station grounds at Galea, mileage 259.30 from Ottawa.

19566. June 12.—Extending to July 15, time within which Canadian Northern Ry. shall erect gates at crossing of Frederica and Edward Sts., Fort William, Ont.

19567. June 11.—Authorizing C.P.R. to build spur for Massey-Harris Co., Calgary, Alta.

19568. June 12.—Ordering Canadian Northern Ry. to install, within 60 days, an improved type of automatic electric bell at highway crossing between Lots 2 and 3, Con. 4, Station 2661, Scarborough Tp.

19569. June 11.—Authorizing C.P.R. to build Johnville ballast pit spur across public road at grade between Lot 27, r. 3, and Lot 27-D., r. 2, Eaton Tp., Que.

19570. June 13.—Re allowance to shippers who furnish slats for floors of refrigerator cars. This order is given in full on another page.

19571. June 12.—Ordering C.P.R. to build spur to east boundary of Canada Tile and Fireproofing Co.'s property; and ordering Canadian Northern Ry. to build spur to southern boundary of said property; spurs to be completed within three months.

19572. June 14.—Approving plan of proposed location of temporary chain hoist and raised rail, for unloading supplies in connection with St. Clair Ave. civic car lines near G.T.R. Davenport Station, Toronto.

19573. June 16.—Authorizing C.N. Ontario Ry. to build across Kathleen St., Sudbury; and within 60 days to install improved type of automatic electric bell there.

19574. June 16.—Authorizing Algoma Eastern Ry. to build Goat Island coal handling bridge on Goat Island docks, near Little Current, Ont.

19575. June 16.—Authorizing Esquimalt and Nanaimo Ry. to build bridge 27.8 over Coal Creek, on its Comox Extension, Vancouver Island, B.C.

19576. June 16.—Approving change in Campbellford, Lake Ontario and Western Ry. (C.P.R.) line in Lots 23, 24 and 25, Con. A, Haldimand Tp., Ont.

19577. June 12.—Authorizing C.P.R. to build extension across certain lands, streets and lanes in Edmonton, Alta.

19578. June 16.—Authorizing C.P.R. to build diversion of road allowance in n.e. ¼ of Sec. 19-17-24, w.p.m.; and to close portions within its right of way, mileage 44.47 at Kelloe, Bredenburg Subdivision, Man.

19579. June 16.—Authorizing G.T.R. to rebuild bridge 1¼ miles south of Hickson, Ont.

19580. June 12.—Authorizing G.T.R. to build siding for A. Davis and Son, Kingston, Ont.; siding and spur for Dominion Tire Co., Berlin, Ont., and 2 sidings for C. A. Scott, Toronto.

19583. June 16.—Approving clearance on G.T.R. plan for its new bonded freight house, Wellington St., Montreal.

19584. June 16.—Authorizing Canadian Northern Ry. to build spur across Avenue T, for City of Saskatoon, Sask.

19585. June 17.—Recommending to Governor General in Council for sanction agreement, of June 2, amalgamating Canadian Northern Ry. and C.N. Branch Lines Co.

19586. June 16.—Approving plans of Pennington drain under G.T.R., South Norwich Tp., G.T.R. to have option of doing work on its right

of way.

19587. June 17.—Approving location of G.T. Pacific Branch Lines Co.'s station at Cando, Sask.

19588. June 17.—Approving locations of G.T. Pacific Ry. stations, no. 1, mileage 1155.6, and no. 2, mileage 1147.2, west of Winnipeg, Cariboo District, B.C.

19589. June 16.—Approving location of G.T. Pacific Branch Lines Co.'s station at Fort Saskatchewan.

19590. June 17.—Authorizing G.T. Pacific Branch Lines Co. to carry traffic on its Biggar-Calgary Branch between Biggar, mileage 0, and Dodsland, mileage 48, Alta.; speed of trains not to exceed 20 miles an hour; and rescinding order 17850, Oct. 24, 1912.

19591. June 16.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build road diversion in Lot 25, Con. 1, Clarke Tp., at mileage 142.05 from Glen Tay.

19592. June 16.—Approving clearances on C.P.R. plan of its coaling plant in North Transcona yards, Man.

19593. June 17.—Authorizing C.P.R. to build bridge 103.7, near Foster Station, Sherbrooke Subdivision, Que.

19594. May 19.—Authorizing C.P.R. to build spur to Hastings Park, Vancouver, B.C.; to be completed within three months from date.

19595. June 16.—Authorizing C.P.R. to build new trackage in its North Transcona Yard, across City of Winnipeg's transmission line in Lot 58, Kildonan, Man.

19596. June 17.—Extending to Aug. 15, time within which C.P.R. shall install gates at North Vancouver Ferry, Columbia Ave., and G.T. Pacific Ry. team crossings, Vancouver, B.C.

19597. June 17.—Authorizing C.P.R. to build its ballast pit spur across 2 highways at grade between Lot 8, Con. 1, and Lot 8, Con. 2, and in Lot 9, Con. 2, Hinchinbrooke Tp., Ont.

19598. June 16.—Ordering Canadian Northern Ry. to build a third class station and two-car cattle pen at Decker, Man., to be completed by Sept. 15.

19599. June 16.—Ordering C.P.R. to move station off public road allowance to 300 ft. west; build crossing along existing highway at Franklin, Man.; and move grain elevators off highway; work to be completed within 60 days.

19600. June 17.—Authorizing Dominion Atlantic Ry. to build siding for Markland Fruit Co., Kingston, N.S.

19601. June 17.—Authorizing G.T.R. to build spurs for Pilkington Bros., Thorold Tp., Ont.

19602. June 17.—Authorizing C.P.R. to build spur for I. R. Johnston, Medicine Hat, Alta., to be completed within 3 months.

19603. June 17.—Authorizing Canadian Northern Ry. to build spur along lane through Blocks 21 and 31, across Isabella St., and along lane through Block 30, Saskatoon, Sask.

19604. June 12.—Ordering that all wires at Yonge St. and Avenue Rd., North Toronto, be placed underground, excepting Bell Telephone Co. long distance wires; each company to pay cost of moving its wires.

19605. June 16.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to operate work train service over C.N. Ontario Ry. crossing for 6 months, pending completion of interlocking plant; crossing to be protected by flagman maintained by C.L.O. & W.R.

19606. June 13.—Relieving C.P.R. from providing further protection at crossing of first highway east of Berthier Jct., Que.

19607. June 16.—Ordering C.P.R. forthwith to remove trees south of track and west of crossing at mileage 71.2, about 3 miles west of Pointe du Lac Station, Que.

19608. June 12.—Authorizing C.P.R. to build spur adjoining Neebing Ave., Fort William, Ont., from its main line, at mileage 3.14, and extending to 100 ft. south of Canadian Northern Ry. main line to connection with industrial spur.

19609. June 13.—Approving location of G.T.R. station at Rideau, Ont.

19610. June 11.—Authorizing C.N. Ontario Ry. to build across certain highways in Sudbury.

19611. June 18.—Approving location of G.T. Pacific Branch Lines Co. station on its Regina Boundary Branch, at Boundary Line, mileage 154.8, Sask.

19612. June 17.—Approving location G.T. Pacific Ry. station grounds through Charles Indian Reserve 1, mileage 317, Coast District, B.C.

19613. June 17.—Approving G.T. Pacific Branch Lines Co. site and station at Totzke, Sask.

19614. June 18.—Authorizing C.P.R. to build bridge 312 near Emsley Station, Ont.

19615. June 18.—Authorizing C.P.R. to revise grade of crossing on Sims St., Hallam Tp., Ont.

19616. June 18.—Approving plan of substructure of bridge 265, at mileage 46.80, District 13, Hamilton Division, G.T.R., Ont.

19617. June 18.—Authorizing Brantford Tp., Ont., to build Humberstone Ave. across Brantford and Hamilton Electric Ry.

19618. June 11.—Rescinding order 19277, May 26, re approval of G.T. Pacific Ry. station at Empire Ave., Neebing Tp., Ont.

station at St. Gregoire, Que., and rescinding order 17386, Aug. 28, 1912, in same connection.

19619. June 17.—Authorizing Hamilton St. Ry. to cross T.H. & B. Ry. at grade at Burlington St., Hamilton, Ont.

19620. June 12.—Approving location C.P.R. Suffield-Blackie Branch from Sec. 9-13-17, westerly to Sec. 13-19-27, w. 4 m., mileage 58.29 to 149.9, Alta.; and authorizing the crossing of 89 highways, mileage 58.29 to 149.9, and the diversion and closing of certain highways.

19621. June 19.—Authorizing C.P.R. to build bridge 65.4, near Addington Station, Ont.

19622. June 19.—Recommending to Governor in Council for sanction indenture of lease between Campbellford, Lake Ontario and Western Ry. and C.P.R.

19623. June 19.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build across road allowance between Lot 35, Con. 1, Hamilton Tp., and Lot 1, Con. 1, Hope Tp., mileage 124.83 from Glen Tay; and rescinding order 17163, Aug. 1, 1912, in so far as it authorizes said crossing.

19624. June 18.—Ordering that speed of G.T.R. trains, operated across Wellington St., just north of Aurora Station, Ont., is not to exceed 10 miles an hour, and that all switching movements be flagged.

19625. June 19.—Extending to July 17, time within which G.T.R. install bell at crossing of Main St., Thorndale, Ont., as required by order 18887, Mar. 17.

19626. June 19.—Authorizing G.T.R. to build siding for Galt Stove & Furnace Co., Galt, Ont., within 3 months from date.

19627. June 18.—Approving location of G.T. Pacific Branch Lines Co.'s station at Lett, Sask.

19628. June 18.—Approving revised location of G.T. Pacific Branch Lines Co. Biggar-Calgary Branch and station in w. ½ Sec. 29-33-18, w. 3 m., Saskatoon District, Sask.

19629. June 17.—Authorizing C.N. Quebec Ry. to build across public road in St. Eustache, and reserving question of protection to be provided.

19630. June 17.—Authorizing Canadian Northern Ry. to build spur for Manitoba Gypsum Co., Winnipeg, within 3 months from date.

19631. June 18.—Authorizing Canadian Northern Ry. to divert River Road, near Victoria Bridge, Calgary, Alta., and take necessary land for same; and to maintain diversion for one year.

19632. June 19.—Extending to Sept. 1, time within which C.N. Ontario Ry. shall install gates at crossing of Bridge St., Yarker, as required by order 17739, Oct. 4.

19633. June 18.—Authorizing G. R. Duncan, Fort William, Ont., to build siding in McIntyre Tp., across Waterloo St., Port Arthur, to C.N.R. right of way, C.N.R. to build remainder.

19634. June 19.—Authorizing New York Central and Hudson River Rd. to build spur for Howard Smith Paper Mills, Beauharnois, Que., within 3 months from date.

19635. June 19.—Authorizing C.P.R. to build road diversion at mileage 36 from Golden, B.C., and close portion of present road allowance within its right of way.

19636. June 20.—Authorizing C.P.R. to build spur for Canadian Lumber Yards, Moose Jaw, Sask.

19637. June 20.—Authorizing C.P.R. to open for traffic portion of its Edmonton Subdivision from Strathcona to Jasper Ave., Edmonton, including high level bridge over North Saskatchewan River, provided speed of trains does not exceed 12 miles an hour across the bridge.

19638. June 20.—Ordering that C.P.R. crossing of Rue Plinguet, St. Boniface, Man., be protected by watchman between 7 a.m. and 7 p.m.

19639. June 19.—Approving location of C.P.R. double track from Islington, mileage 10, to Guelph Jct., mileage 39.1, London Subdivision, Ont.

19640, 19641. June 19.—Authorizing C.P.R. to build road diversion at mileage 33.47 from Golden, B.C., and close portion of road allowance within its right of way; and to build road diversions at mileage 31.2 and 35.6 from Golden, B.C.

19642. June 20.—Authorizing G.T.R. to build siding for S. McCord, Toronto.

19643. June 16.—Approving location 10 G.T. Pacific Branch Lines Co. stations in Cariboo District, B.C.

19644. June 19.—Approving location of Kettle Valley Ry. from mileage 0 to 20, Hydraulic Summit to Penticon, B.C.

19645. June 18.—Authorizing Algoma Eastern Ry. to build dock at Goat Island, near Little Current, Ont.

19646. May 16.—Authorizing C.P.R. to operate interlocking plant at Batiscan River Bridge, Quebec Subdivision, at mileage 102.5, on condition that when a distant semaphore is at "Caution," all trains stop at that semaphore until it is cleared, as well as at the home semaphore.

19647. June 14.—Extending to Aug. 15, time within which C.P.R. shall install electric bell at highway crossing at Glen Major flag station, Ont.

19648. June 20.—Amending order 19571, June 12, re building of Canada Tile and Fireproofing Co.'s spur by C.P.R. and Canadian Northern Ry.

19649. June 18.—Authorizing C.P.R. to build road diversion and to carry its Swift Current Northwesterly Branch across same at grade at mileage 40.84 from Swift Current, Sask.

19650. June 20.—Ordering C.P.R., within 90

days, to install improved type of automatic electric bell at crossing of March Road, 6.4 miles west of Ottawa, Ont.; 20% to be paid out of the railway grade crossing fund.

19651. June 20.—Approving Campbellford, Lake Ontario and Western Ry. (C.P.R.) revised location from mileage 75.45 to 77.45, and location from mileage 77.75 to 79.5, from Glen Tay, Ont.

19652. June 20.—Extending to July 31, time within which C.P.R. shall install gates at crossing of Lake Shore Road by G.T.R. and C.P.R. at Vaudreuil, Que.

19653. June 18.—Amending order 18419 re crossing of 17th Ave. East, Calgary, Alta., by G.T. Pacific Branch Lines Co.

19654. June 20.—Authorizing C.P.R. to build extension to spur for Dearborn Chemical Co., West Toronto.

19655. June 21.—Authorizing C.P.R. to build bridges, 29.0, between Maberly and Ungave Stations; 13.4, near Perth Station; and 67.8, near Addington Station, Ont.

19656. June 19.—Approving location of Canadian Northern Ry. station at Onoway, Alta.

19657. June 21.—Authorizing C.N. Ontario Ry. to build bridge over Raimbault Creek, St. Laurent Parish, Que., mileage 48 from Hawkesbury.

19658. June 12.—Authorizing City of Edmonton, Alta., to build Shand Ave. across Canadian Northern Ry.

19659. June 20.—Approving location of Canadian Northern Ry. station at Ardath, Sask.

19660. June 23.—Authorizing G.T. Pacific Ry. to build undercrossing at mileage 681.8 west of Winnipeg, North Alberta District.

19661. June 23.—Rescinding orders 16981 and 17785, July 9 and Oct. 17, 1912, respectively, re branch for Crushed Stone and Gravel Co., Winnipeg.

19662. June 21.—Authorizing C.P.R. to build spur for City of Medicine Hat, Alta.

19663. June 21.—Amending order 18736, Feb. 19, to provide that gates at crossing of Montcalm St., St. Boniface, Man., be installed by C.P.R. within 60 days from date.

19664. June 21.—Authorizing C.P.R. to build two spurs across 15th St. East, and lands adjoining, on north side of its right of way; a crossover between same and subspur in land adjoining 15th St. East on its east side.

19665 to 19667. June 24.—Authorizing C.P.R. to operate trains through junction and over crossings at Breslay, Mile End and South Junction, Que., without first being brought to a stop.

19668. June 24.—Authorizing City of Hamilton, Ont., to extend Primrose Ave. across T.H. & B.R. spur.

19669, 19670. June 24.—Authorizing C.P.R. to operate trains over interlocking plant at swing bridges over Trent Canal, near Talbot, and at Couchiching Narrows, near Athery, Ont., without first being brought to a stop.

19671. June 24.—Extending to Dec. 31, time within which C.P.R. shall complete branch line for Provincial Reformatory, Guelph Tp., Ont., as required by order 17075, July 19, 1912.

19672. June 21.—Ordering that speed of all trains passing over crossing of Archabail St., St. Boniface, Man., be limited to 4 miles an hour; and regulating placing of cars in the vicinity.

19673. June 23.—Authorizing G.T.R. to build siding for Collie-Cockerill Manufacturing Co., Whitechurch Tp., Ont.

19674. June 24.—Amending order 19536, June 10, re C.P.R. service between Ottawa and Prescott, Ont.

19675. June 25.—Approving proposed alterations in Campbellford, Lake Ontario and Western Ry. (C.P.R.) so as to include within its right of way approved by order 19196, portion of Lot 18, Con. 3, South Sherbrooke, Ont.

19676. June 25.—Authorizing C.P.R. to build switching lead to yard at Smiths Falls, Ont., across road allowance between Cons. 3 and 4, Montague Tp., at mileage 133.0 from Montreal Jct.

19677. June 25.—Authorizing C.P.R. to build bridge 05.6 over North River, Muskoka Subdivision, Ont.

19678. June 25.—Authorizing C.P.R. to build bridge 1.1, Hamilton Subdivision, Ont.

19679. June 25.—Amending order 19489, June 7, by substituting Pense for Belle Plain, re C.P.R. double track, Moose Jaw Subdivision, Sask.

19680. June 24.—Authorizing C.N. Ontario Ry. to divert public road between Lots 5 and 6, Con. 3, York Tp., and to build across same, carrying highway over track.

19681. June 21.—Ordering Canadian Northern Ontario Ry. to build farm crossing for E. Good on Lot 5, Con. 6, Nepean Tp.

19682. June 21.—Amending order 19227, May 9, re diversion of Grand Valley Ry. by Lake Erie and Northern Ry. in North Dumfries Tp., Ont.

19683. June 23.—Approving location of G.T.R. 19684. June 21.—Ordering that Central Ontario Ry. schedule train 3, leaving Trenton at 1.45 p.m., to arrive at Central Ontario Jct., to connect with C.P.R. 17 due at 3.13 p.m.

19685. June 24.—Ordering Quebec Oriental Ry., not later than Dec. 31, to add 2 new locomotives capable of carrying at least 160 lbs. steam pressure to the square inch, and if, after hydrostatic tests, boilers of its present locomotives be found incapable of carrying such steam pressure,

it shall purchase at least four additional boilers for its 17 x 24 in. class of locomotives capable of carrying such pressure.

19686. June 25.—Authorizing Canadian Northern Ry. to build highway across its track at McGee Townsite, in N.W. ¼ Sec. 19-29-16, w. 3 m., Sask.

19687. June 25.—Amending order 18048, Nov. 11, 1912, re building of subway by C.P.R. in North Norfolk municipality, Man.

19688. June 21.—Dismissing Toronto, Hamilton and Buffalo Ry. application to build stand-pipe immediately west of John St., Hamilton, Ont.

19689. June 25.—Authorizing Toronto Suburban Ry. to build across C.P.R. Goderich Branch, and spur into Prison Farm, in Lot 2, Cons. 1 and 2, Guelph Tp.; and rescinding order 19171, May 5, 1909.

19690. June 25.—Ordering C.N. Quebec Ry. to build raceway, etc., under its track on approved location at the Jacques-Cartier River, Lots 79 and 80, Les Ecureuil's Parish.

19691. June 25.—Authorizing G.T.R. and C.P.R. to operate trains over crossing on Weston Road, Toronto, without first being brought to a stop.

19692. June 23.—Authorizing clearances at C.P.R. shops, Ogden, Alta.

19693. June 25.—Ordering Brockville, Westport and North Western Ry. to renew ties on bridges just east of Lynn Station, just west of Lynn Station, at Corbett's Creek new stringers under rails, and over Rideau Canal at Newboro; renew at least 30,000 ties on its line; whole line to be ballasted, and highway crossings be made to conform to Standard Regulations of Board; work to be completed by Nov. 1.

19694. June 26.—Authorizing G.T.R. to build branch line and spur for Beaver Companies, Thorold Tp., Ont.

19695. June 26.—Extending to Aug. 1, time within which G.T. Pacific Ry. shall complete work of opening in fill at Cameron Bay, near Prince Rupert, B.C.

19696. June 25.—Ordering G.T.R., within 90 days, to install electric bell at crossing of John St., Port Hope, Ont., and thereafter maintain same.

19697. June 26.—Authorizing Montreal and Southern Counties Ry. to run trains with passengers, baggage, express and other traffic over Central Vermont Ry. between east end of its Southwark Yards, St. Lambert, and Richelieu, Que., 12 miles; and to use C.V.R. passenger and freight stations, yards, and other facilities.

19698. June 26.—Amending order 18997, Apr. 8, re C.P.R. spur at mileage 41 from Crownst, B.C.

19699. June 26.—Authorizing C.P.R., pending installation interlocking plant, to operate trains over G.T.R. crossing at Tecumseth St., Toronto, on signals from switchmen; interlocking plant to be installed by Aug. 20.

19700. June 26.—Authorizing Ansley Coal Co. to connect its Ansley spur line with city's spur line, Medicine Hat, Alta.

19701. June 26.—Authorizing C.P.R. to build 2 spurs for Canada Malting Co., Calgary, Alta.

19702. June 27.—Approving one way fares shown on page 4 of Montreal and Southern Counties Ry. Local Passenger Tariff, C.R.C. 3, as maximum tolls to be charged between Montreal and Richelieu and intermediate stations in Quebec.

19703. June 27.—Authorizing C.P.R. to build extension to siding between its right of way and Caron Ave., Windsor, Ont.

19704. June 30.—Authorizing London St. Ry. and C.P.R. to operate over crossing at Adelaide St., London, pending installation of half interlocking plant, to be installed not later than July 15; cars to be flagged by day and night watchmen, appointed by C.P.R., and paid by London St. Ry.

19705. June 27.—Ordering C.P.R. to build crossing where it crosses Hall St., Renfrew, Ont.

19706. May 16.—Authorizing G.T.P. Branch Lines Co. to build its Brandon Branch across highways at mileage 12.14, between Secs. 3 and 10, Tp. 11, r. 17, and at mileage 12.76, between Secs. 3 and 4, Tp. 11, r. 17, w. 1 m.

19707. June 26.—Ordering that watchmen at north side of G.T.R. crossing of Cherry St., Toronto, Ont., be retained until 7 p.m.

19708. June 28.—Ordering that, upon R. V. MacCosham, Edmonton, Alta., undertaking to comply with standard spur conditions of City of Edmonton, Canadian Northern Ry. build spur from Lots 122 and 123, through lane dividing Block 8, to Lots 108 and 137.

19709. May 30.—Establishing express collection and delivery limits in Portage la Prairie, Man.; and rescinding order 14882, Sept. 15, 1911.

19710. June 27.—Postponing, until Aug. 1, the effective date of the modifications of rule 7, G.T.R. Special Freight Tariff, C.R.C. E.2374, I.C.C. 1660, in Supplements 5 and 3, respectively, and of Rule 33, C.P.R. Local Freight Tariff, C.R.C. E.2141, I.C.C. E.1288, in Supplements 9 and 6, respectively.

19711. June 30.—Amending order 19546, June 10, re crossing of Toronto, Hamilton and Buffalo Ry. by Hamilton St. Ry.

19712. June 30.—Ordering Great Northern Ry. to put into force on shipments of ore in carloads from Salmo to Nelson, B.C., following additional rates:—\$1.10 per net ton when valuation does not exceed \$15 per ton, \$1.15 per net

ton when valuation does not exceed \$20 per ton; rates to be effective within 30 days from date.

19713. June 27.—Ordering Canadian Northern Ry. to move crossing south of south switch, in northerly direction, 60 ft. from south switch, and grade road from crossing to loading platform, to satisfaction of the Board's Engineer.

19714. June 30.—Authorizing G.T.R. to rebuild bridge 99 over public road at milepost 161.10, 2.90 miles east of Midland, Ont.

19715. June 30.—Approving revised location of G.T. Pacific Branch Lines Co. station at Euthilda, Sask.

19716. June 30.—Authorizing C.P.R. to use subway across Main St., Kenora, Ont.

19717. June 28.—Authorizing C.P.R. to build bridges, 22.3, near Peterboro station; 21.8, near Botulf station, and 19.4, near Sutton station, Ont.

19718. June 27.—Authorizing G.T. Pacific Branch Lines Co. to operate trains over crossing of C.P.R. Arcola Branch at Griffin, Sask., without first being brought to a stop.

19719. June 30.—Ordering C.P.R., within 60 days, to move stock pens at Shelburne to west side of its tracks; pens to be long enough for not less than four cars, and each pen to have gate opening to loading platform; upper deck loading chutes to be provided for sheep or hogs at each end of pens.

19720. June 30.—Authorizing C.P.R. to build spur for Cockshutt Flow Co., Calgary, Alta.

19721. June 30.—Relieving C.P.R. from providing further protection at highway crossing at mileage 22.79 from St. Martin's Jct., Que.

19722. June 30.—Authorizing Toronto, Hamilton and Buffalo Ry. to build spur for J. McInnes, Hamilton, Ont.

19723. June 27.—Dismissing Eustis Mining Co.'s application for order amending Canadian Car Service Rules to provide for five days' free time at Sorel, Que., on copper-sulphur ore shipments for transfer to vessels.

19724. June 30.—Authorizing C.P.R. to build spur for Wells & Emerson, Port Arthur.

19725. June 30.—Approving proposed change in location of C.P.R. siding for William Davies Co., Front St. and Esplanade Ave., Toronto.

19726. June 30.—Approving revised locations of portions of C.P.R. Shuswap Subdivision, mileages 0 to 25, Revelstoke to Taft, B.C.; authorizing it to revise grade of line and highway crossings, and to build double track at grade across 9 highways between mileage 0 and 25.

19727. July 2.—Extending to Aug. 31, time within which C.P.R. shall complete spur adjoining Neebing Ave., Fort William, Ont.

19728. June 30.—Approving change in location of C.P.R. station at Farm Point, Hull Tp., Que.

19729. July 2.—Amending order 18161, Nov. 29, 1912, re C.P.R. revised location for 24.74 miles in Alberta.

19730. July 3.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to operate over crossing of G.T.R. in Whitty, Ont., for construction purposes only, for six months; crossing to be protected by watchman appointed by G.T.R., and paid by C.L.O. & W. Ry.

19731. July 3.—Authorizing Winnipeg, Selkirk and Lake Winnipeg Ry., to cross, for construction purposes only, until Oct. 31, the C.P.R. Selkirk Branch.

19732. June 21.—Approving revision in location of C.P.R., from mileage 102.70, southwestward, to mileage 103.39, from Revelstoke, B.C.; revision in grade of line and crossings, as shown on plan; and authorizing building of double track across 7 highways, between mileage 96 and 131.55; after diversion at mileage 102.92 and grade crossing are completed, C.P.R. may close portion of present road allowance within its right of way.

19733. July 2.—Approving change in location of C.P.R. station at Salmon Arm, B.C.

19734. July 2.—Authorizing C.P.R. to build bridge 52.3 over Salmon River, near Ardendale Station, Ont.

19735. July 2.—Authorizing C.P.R. to build ballast pit spur across road allowance at grade at mileage 54 from Wynyard, Sask.

19736. July 2.—Authorizing C.P.R. to use bridges over Kaministikwia and McKellar Rivers, Fort William, Ont.

19737. July 2.—Authorizing C.P.R. to build road diversion in n.w. ¼ Sec. 4-3-22, w.p.m., Man., and to close portion of present road allowance to be diverted, and rescinding order 15833, Jan. 24, 1912, in same connection.

19738. June 30.—Ordering G.T. Pacific Ry. to adjust freight charges on sand received at Edmonton over its line since June 21, 1912, to basis of 2,600 lbs. per cubic yard; and to arrange that freight charges be collected on this basis until its track scale is drained and corrected, or is removed and reinstalled, not later, in either case, than Nov. 1.

19739. July 3.—Authorizing C.P.R. to build spur to coal mines at Bienfait, Sask., at grade across road allowance between Secs. 9 and 16-2-6.

19740. July 3.—Authorizing C.P.R. to operate over interlocking plant on Hull Electric Ry., Ottawa, without first stopping.

19741. July 3.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.), to build ballast pit spur by a bridge across G.T.R. at mileage 89.9, Murray Tp.

19742. July 3.—Approving revised plan showing foot subway to be built by G.T.R., at Jacobs Ladder Stairway, Port Hope, Ont.

19743. July 2.—Approving proposed connection of Canadian Northern Ry. and National Transcontinental Ry., at St. Boniface, Man.

19744. July 3.—Ordering Canadian Northern Ry. to appoint caretaker at Hymers, Ont., to keep waiting room clean and heated, see that freight is properly housed and freightshed kept locked, key to be kept convenient for persons coming for goods between 8 a.m. and 6 p.m.; station waiting room and outside of building to be painted, freightshed doors put in condition so that they can be locked, platform to be repaired, and portable stock loading chute be installed; all to be carried out by Aug. 15.

19745. July 2.—Approving revised location of portion of Campbellford, Lake Ontario and Western Ry. (C.P.R.) from mileage 119 to 119.66, and location of station to north of Park St., Cobourg, Ont., at mileage 119.72, from Glen Tay.

19746. July 4.—Authorizing C.P.R. to build diversions of road allowances at mileage 94.28 from Weyburn, Sask., and to build its Weyburn-Lethbridge Branch at grade across same.

19747, 19748. July 4.—Approving C.N. Quebec Ry. location through Chilton and Lussier Tps., mileage 36.52 to 57.49, and through Chertsey and Rawdon Tps., mileage 16.87 to 36.52 from St. Jacques Junction.

19749. June 28.—Approving schedules of Dominion, Canadian Northern, Canadian, and Great Northern, Express Cos. The details are given on another page under "Among the Express Companies."

19750. July 5.—Approving proposed change in location of C.P.R. station at Khedive, Sask.

19751. July 4.—Approving revised location of Burrard Inlet Tunnel and Bridge Co.'s line from station highwater mark, north shore Burrard Inlet, to station 174 + 88.7; and rescinding order 505, June 13, 1905.

19752. June 30.—Approving G.T.R. revised plan of subway on Peter St., Port Hope, Ont.; and rescinding order 19105, April 22, in so far as it approves subway there.

19753. July 5.—Authorizing C.P.R. to build extension to spur for R. H. Smith, Etobicoke Tp.

19754. July 4.—Amending order 2119, Nov. 28, 1906, re crossing of G.T.R. by C.P.R. on the Don improvement, Toronto.

19755. July 4.—Ordering Salisbury and Albert Ry. to put guard rails on all bridges on its line, 50 ft., or over, in length, work to be completed by Aug. 20.

19756. July 2.—Ordering C.N. Ontario Ry. within 90 days to install improved type of illuminated electric bell at crossing of Sidney St., Trenton, Ont.

19757. July 7.—Authorizing C.P.R. to open for traffic portion of Kootenay Central Ry. between mileage 0 and 41, Golden to Spillimachee, B.C.

19758. July 7.—Authorizing C.P.R. to build bridges 10.7 near Asphodel station, and 30.8 near Kendry station, Ont.

19759. July 4.—Authorizing Hamilton St. Ry. to cross at grade, Toronto, Hamilton and Buffalo Ry., serving Steel Co. of Canada, between Broken Front and First Concessions, Hamilton, Ont.

19760. July 5.—Extending to July 31, time within which G.T.R. install gates at crossing of Lake Shore Road, Vaudreuil, Que.

19761. July 5.—Authorizing C.P.R. to build spur lines for P. Burns & Co., Calgary, Alta.

19762. July 8.—Extending to July 20, time within which C.P.R. install gates at Bartlett Ave., Toronto, Ont., as required by order 18698, Feb. 12.

19763. July 4.—Approving revised location G.T.R. connecting track, with Toronto, Hamilton and Buffalo Ry., serving Steel Co. of Canada, Hamilton, Ont.

19764. July 4.—Authorizing Toronto, Hamilton and Buffalo Ry. to build two spurs in Hamilton, crossing Hamilton Radial Electric Ry., and Burlington St., for Steel Co. of Canada, to be completed within three months.

19765. July 7.—Extending, to Sept. 30, time within which C.P.R. install gates at Osler Ave., North Toronto, Ont., as required by order 19229, May 10.

19766. July 7.—Extending, to Dec. 31, time within which C.P.R. complete spur for Dominion Bridge Co., at Islington, Ont., as authorized by order 18998, Apr. 5.

19767. July 4.—Authorizing C.P.R. to cross, at grade, with a side track on its Saskatoon Subdivision, Sask., certain lanes and streets in Saskatoon.

19768. July 5.—Authorizing Vancouver, Victoria and Eastern Ry. and Navigation Co. to build three spurs from its main line, in Block 82, District Lot 264 A, connecting lines, opposite Block 3, District Lot 200 A, Vancouver, B.C., completed within three months.

19769. July 3.—Ordering Quebec Oriental Ry. to ballast its line, from Metapedia to New Carlisle, with complete lift of 6 ins. of ballast; fencing, gates, wooden culverts, and all decayed portions of trestles be renewed, work to be completed by Dec. 31.

19770. July 5.—Authorizing G.T.R. to build siding for British Canadian Cannery, Grantham Tp., Ont.

19771. July 7.—Approving Canadian Northern

Ry. plans of standard stations 8, 5, and 4, for its Eastern Lines, and its standard fourth and fifth class station buildings.

19772. July 8.—Authorizing Vancouver, Victoria and Eastern Ry. and Navigation Co. to build across Phillips Ave., Burnaby Municipality, B.C.

19773. July 5.—Authorizing C.P.R. to build branch from spur to Canadian Ingersoll-Rand Co.'s no. 4 siding, Sherbrooke, Que.

19774, 19775. July 5.—Authorizing C.P.R. to build extension to spurs for A. Snyder & Co., Portage la Prairie, Man., and for B. S. Spaulding, Medicine Hat, Alta.

19776. July 8.—Relieving C.P.R. of speed limitations on its line between mileage 75.85 and 112.00, Weyburn-Lethbridge Branch.

19777. July 8.—Authorizing C.P.R. to make two connections with the Otis Staples Logging Ry., at mileage 15.15, near Kimberly, B.C.

19778. July 10.—Authorizing C.P.R. to build at grade a siding track across roadway between Lots 3 and 4, Con. 1, Sandford Tp., Ont.

19779. July 10.—Authorizing C.P.R. to build additional track across 14 highways, mileage 35.8 to 47.9, from Brandon, Man.; after diversion at mileage 46.46 is made and grade crossing built, it may close portion of road allowance diverted within its right of way.

19780. July 10.—Dismissing L. J. Chevrier's application to reopen matter of C.P.R. taking certain lands in Rigaud Village, Que.; and order 18721, Feb. 13.

19781. July 10.—Amending order 19603, June 17, authorizing Canadian Northern Ry. to build spurs in Saskatoon, Sask.

19782. July 8.—Authorizing Canadian Northern Ry. to build additional track across Main St., Humboldt, Sask.

19783. July 5.—Extending, to July 31, time for installing interlocking plant by C.N. Ontario Ry. at crossing of C.P.R. and G.T.R., near Ottawa, as provided by order 11386, Aug. 6, 1910.

19784. July 9.—Ordering C.N. Ontario Ry. to build cattle passes, with 5½ ft. clearance, at T. McLaughlin's farm on Lots 24 and 25, Con. B, Westmeath Tp.

19785. July 7.—Authorizing C.N. Ontario Ry. to build bridge across Little Sturgeon River, Beaucauge Tp., mileage 243.5 from Ottawa.

19786. July 10.—Approving proposed Supplement 1 to Canadian Classification 16, as finally revised and submitted by Canadian Freight Association, to become effective Aug. 20.

19787. July 10.—Approving Essex Terminal Ry. location from its line on Lot 59, Con. 1, to Turkey Creek, Sandwich West Tp., Ont.

19788. July 10.—Authorizing G.T.R. to build siding for Silicate Brick Co., Ottawa.

19789. July 11.—Authorizing G.T.R. to build siding for Dominion Cannery, Ltd., East Sandwich Tp., Ont.

19790, 19791. July 11, 10.—Ordering G.T.R. and C.P.R., respectively, forthwith, to employ watchmen at crossing on road from Beaconsfield to Ste. Genevieve, Que., from 8 a.m. to 7 p.m., until Oct. 15, and thereafter from May 15 to Oct. 15, each and every year until further order; one third of cost to be paid by municipality.

19792. July 11.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build across road allowance at mileage 153.76 from Glen Tay, Ont.

19793. July 12.—Approving revised location of portion of C.P.R. Thompson Subdivision, from mileage 6.76, to 7.72; and from mileage 8.46, to 8.67, from Kamloops, B.C.; and to build additional track at grade across Third and Second Aves., Kamloops, and road allowances in Sec. 12-20-18, w. 6 m.; Lot 435, and Lot 346, P.G.S., r. 18.

19794. July 10.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build across 4 highways, at mileage 79, 79.04, 79.19, and 79.61 from Glen Tay, Ont.

19795. July 11.—Authorizing C.P.R. to build bridge across Red River, on its Kildonan cutoff, near Winnipeg, and rescinding order 18618, Feb. 3.

19796. July 16.—Amending order 19644, June 19, re approval of Kettle Valley Ry. location between Hydraulic Summit and Penticton, B.C.

19797. July 15.—Authorizing C.P.R. to divert road and cross same at grade in Sec. 7-12-23, w. 3 m., Sask., and close portion of road allowance within its right of way.

19798. July 16.—Authorizing Saskatchewan Government to carry Third St. East across Canadian Northern Ry., at Service Townsite, Sask.

19799. July 11.—Approving British America Express Co.'s Standard Tariff C.R.C. 12.

19800. July 17.—Amending order 16998, July 13, 1912, re C.P.R. spur near Longue Point, Que.

19801. July 17.—Authorizing C.N. Ontario Ry. to build across public road between Lots 13 and 14, Con. 1, Pembroke Tp., by bridge, provided that proper road be left for J. A. Gourlay, between road at right angles to road to be crossed, and Muskrat River.

19802. July 17.—Approving C.N. Ontario Ry. revised location through unsurveyed territory, Aloma District, mileage 198.26 to 201.66.

19803. July 17.—Authorizing South Hull Tp., Que., to build crossing over C.P.R. at mileage 9.7 from Aylmer.

19804. July 17.—Authorizing C.P.R. to build

additional track at grade across 15 highways, mileage 1 to 15.38, from Broadview, Moose Jaw Subdivision, Sask.

19805. July 17.—Approving C.P.R. revised location as built, from mileage 74.46 to 88.56, Mountain Subdivision, B.C.

19806. July 11.—Authorizing G.T. Pacific Ry. to build spur across Canadian Northern Ry. between Edmonton Portland Cement Co.'s spur and C.N. Alberta Ry., in n.e. ¼ Sec. 6-53-19, w. 5 m., North Alberta District, crossing to be protected by a diamond in C.N.R., and by watchmen; and such crossing to be temporary until C.N.R. commence to operate the line, when order shall be rescinded, cost of diamond and watchmen to be paid by G.T.P. Ry.

19807. July 17.—Authorizing G.T. Pacific Ry. to build spur for Edmonton Portland Cement Co., in Sec. 1-53-19, w. 5 m., Alta., to be completed within three months.

19808. July 15.—Approving G.T.R. plan showing proposed automatic block installation on Victoria Jubilee Bridge, Montreal, carrying automatic block district from east end of Point St. Charles across bridge to St. Lambert and connecting it with the interlocking plant at St. Lambert Jct.

19809. July 17.—Authorizing C.P.R. to build spur for Watson & Todd, Ltd., Ottawa.

19810, 19811. July 18.—Extending, to Sept. 15, time within which G.T. Pacific Ry. install interlocking plant at crossing by its stock yard spur, of Canadian Northern Ry., St. Boniface, Man., as required by order 16930, June 29, 1912; and also for installation of interlocking plant at crossing of Port Arthur and Fort William Electric Ry., at Syndicate Ave., Fort William, Ont., as required by order 17657, Sept. 24, 1912.

19812. July 18.—Authorizing C.P.R. to rebuild bridge 18.1, near Inglewood Station, Ont.

19813. July 17.—Authorizing Canadian Northern Ry. to extend spur for Twin City Coal Co., across Sixth St. East, Edmonton, Alta.

19814. July 17.—Approving location of C.P. R. Port Moody and North Shore Branch, from station 182+70, to ferry dock, east side of North Arm; and from Roche Point, where car ferry is shown on plan, to Hendrie Ave.

19815. July 17.—Authorizing City of Regina, Sask., to build its municipal railway at grade across C.P.R. Arcola Branch and spur at Winnipeg St., between Ninth and Tenth Aves.

19816. July 18.—Authorizing Hamilton St. Ry. to build across Oliver Chilled Plow Works of Canada's spur, on Gilkison St., opposite McKinsty St., Hamilton, Ont.

19817. July 17.—Approving location of G.T. Pacific Branch Lines Co.'s stations at Erith, Weald, McLeod River, Embarras, and Minehead, Alta.

19818. July 18.—Approving G.T. Pacific Branch Lines Co.'s station site and station at Charlton, Bear's Head, and The Lean Man Indian Reserves, 110 and 11, Battleford Branch, Sask.

19819. July 18.—Approving location of Algoma Eastern Ry. station at Little Current, Ont.

19820. July 17.—Approving location of G.T. Pacific Ry. stations at Petry, Empire Ave., Kelly, Yonde, and Alcona, Ont.

19821. July 17.—Approving locations of C.P. R. stations at Verwood, Mayronne, Aneroid, Kincaid, Landscape, and Hazenmore, Sask.

19822. July 18.—Ordering G.T.R. to build crossing between Lots 5 and 6, Con. 7, Fitzroy Tp., mileage 160, near Carp, Ont.; easterly line of proposed road to be 60 ft. clear of westerly end of culvert.

19823. July 17.—Authorizing Niagara, St. Catharines and Toronto Ry. to build spur along King and John Sts., Niagara-on-the-Lake, to connect same with Michigan Central Rd. siding, and to cross Regent St., to be completed within three months.

19824. July 11.—Authorizing City of Medicine Hat, Alta., to build subway on Esplanade St., to be completed within six months from date.

19825. July 11.—Approving revised location of portions of C.P.R. as built from mileage 18.27 from Brandon, Man., westerly to mileage 35.69; and from mileage 115 to 124; and authorizing building of additional track across 26 highways and diversion of road, in Sec. 27-9-23, w.p.m., portion of road allowance within its right of way to be closed.

19826. July 18.—Authorizing C.P.R. to use bridge 109.7, over Pitt River, Cascade Subdivision, B.C.; speed of trains over bridge limited to 6 miles an hour.

19827. July 11.—Authorizing C.P.R. to build road diversion at Suffield, Alta., and close portion of present road allowance within its right of way.

19828. July 11.—Authorizing C.P.R. to build branch line for S. E. Stewart, Saskatoon, Sask.

19829. July 18.—Authorizing C.P.R. to build double track of main line across Municipal Roads D.G.S. 66, 67, 86, 87, and 93, Kildonan Parish, Man.

19830. July 14.—Ordering that all switching movements on the two G.T.R. sidings which parallel the main line, be flagged over crossing of Barrett St., Port Hope, Ont.

General Order 107, July 4.—Rules and regulations governing fire guarding by railways under the Board's jurisdiction; and rescinding order 16570, May 22, 1912.

Railway Development

Projected Lines, Surveys, Construction, Betterments, Etc.

The Algoma Eastern Ry. Co. has been authorized by the Board of Railway Commissioners to build a dock at Goat Island, near Little Current, Ont., with a coal handling bridge thereon. (July, pg. 331.)

The Athabasca and Grande Prairie Ry. which it is proposed to build, would open up what are known as the Hoppe coal fields in the Smoky River Valley of Alberta. They are said to contain anthracite of good quality. Preliminary surveys have been made, and press reports state that application is about to be made for approval of the plans, with a view of asking the Dominion Government to aid in the construction of the line by a cash subsidy and a guarantee of bonds. (July, pg. 331.)

Brockville, Westport and Northwestern Ry.—The Board of Railway Commissioners has ordered the company to renew ties on several bridges, to place new stringers under rails, to renew at least 30,000 ties on the whole line, to ballast the whole line, and to make the highway crossings conform to the Board's standard regulations, the work to be completed by Nov. 1.

Buctouche Ry. and Transportation Co.—The Minister of Railways has approved location plan for the projected extension from Richibucto to Loggieville, N.B., 47 miles; but he has refused to approve of plans for a line from Painsee Jet. to Cape Tormentine, N.B., 42 miles. (July, pg. 331.)

Central Ry. of Canada.—An injunction has been granted by a Quebec court, preventing the company from going on with the construction of the line, either on its own account or through contractors other than C. J. Wills and Sons. This firm has a general contract for building the line from Montreal to Midland, Ont., and has done considerable work. There have been some differences between the contracting firm and the company as to financing, which have been made the subject of action. The company claimed that the contractors were not proceeding with the work at a fast enough rate and proposed to put an end to the contract, and to let the work to another firm. The court held that the contractors were doing all they had agreed to do; that they were entitled to payment for the work already done, and that the company was not justified in attempting to get other contractors. (July, pg. 331.)

Edmonton, Dunvegan and British Columbia Ry.—J. D. McArthur, President, is reported to have recently stated at Edmonton, Alta., that the first section of this line from Edmonton to Mirror Landing on the Athabasca River will be opened for traffic in the fall. (May, pg. 219.)

Essex Terminal Ry.—The Board of Railway Commissioners has approved location plans for an extension of the line from lot 59, con. 1, to Turkey Creek, both in the Sandwich West township, Ont. Press reports state that surveys are being made for an extension of the line to Amherstburg, but the company's officials state that there is no present intention of extending the line there. (April, pg. 168.)

Esquimalt and Nanaimo Ry.—We are officially advised that the expenditures authorized on this line for this year

amount to \$1,461,630, distributed as follows:—Main line bridges, \$164,000; track, \$77,000; buildings, \$26,000; transfer slip, etc., \$44,630; terminals at Victoria, \$250,000; construction of new branches, \$900,000. Most of this work is in progress.

The 10 stall locomotive house under construction on the new terminals being laid out on the Songhees Reserve, Victoria, B.C., was expected to be completed July 30. A permit has been granted for the erection of a one story brick car repair shop, 52 by 152 ft., to cost \$15,000, for which E. R. Dee is the contractor.

Plans for the building of a new passenger station, freight shed and yards, at Nanaimo, are being prepared, and local reports state that work on the new buildings will be started immediately.

A passenger train service was put in operation over the Cowichan Branch, June 18. This branch leaves the main line between Duncan and Somenos, and passes two stations—Tansor and Sahtlam—before reaching Cowichan Lake. It has been operated for freight purposes for a year.

H. E. Beasley, General Superintendent, completed an inspection of the lines in operation and under construction, July 7. He reports that track laying and ballasting on the extension from McBride Jet. to French Creek have been completed. The bridge over French Creek is practically completed, and it was expected to resume track laying on the extension towards the Qualicum River a few days after his visit.

An engineering party in charge of H. Schupp, is reported to have started out from Victoria, July 1, to make surveys for a line from Campbell River, towards the northeast end of Vancouver Island, about 150 miles. (July, pg. 331.)

Hartland and Miramichi Ry.—The New Brunswick Legislature has granted an extension of time for the building of the line from Hartland, Carleton County, to a point on the G.T. Pacific Ry., authorized to be built in 1910. E. A. Britton, D. H. Lamont, S. S. Miller, M. L. Hayward, H. A. Smith, are provisional directors. (July, 1912, pg. 547.)

Kettle Valley Lines.—The Board of Railway Commissioners has approved of location plans for this line from Hydraulic Summit, to Penticton, B.C., 20 miles.

A. McCullough, Chief Engineer, is reported to have stated, July 3, that over 3,000 men are employed on the sections of this line under construction, together with two steam shovels. Sixty miles of track have been laid south of Merritt, and 30 miles of track north from Midway. More than half the grading on the 180 miles intervening between the end of track on the two sections is done. It is expected to let contracts for the 54 miles between Otter Summit and Hope, which is to be built by the K. V. L. and used jointly with the Vancouver, Victoria and Eastern Ry. (July, pg. 331.)

Lake Erie and Northern Ry.—Grading is reported to have been completed between Waterford and Bloomsburg, Ont., and the construction of the bridge at Waterford, which is estimated to cost \$65,000, has been started. Considerable work is also reported to have been done in the vicinity of Galt, on the section of the line north of Brantford. A map showing the route of the line through

Brantford was filed with the city authorities July 5. It shows a route from Lorne bridge to the city limits at Eagle Place.

W. P. Kellett, General Manager, is reported to have stated, July 4, that it is expected to have the line opened from Brantford to Galt, by Oct. 1, and the section from Brantford to Port Dover, by June 1914. The line is being built to steam railway standards, but the story that it is to be exclusively a steam railway has no foundation in fact, as electricity will be the motive power used ultimately, though it may be operated by steam for a time at first. (July, pg. 331.)

Medicine Hat, Alta.—R. O. Sweezy, General Manager, Montreal Engineering Works, stated in Medicine Hat, Alta., that the coal carrying spur line, known as the Ansley spur line, will probably be electrified in the near future and operated in connection with the electric railway which his company is arranging to build in that city. (Jan., pg. 19.)

Minneapolis, St. Paul and Sault Ste. Marie Ry.—U.S. press reports state that the company has engineering parties west of Conrad, Mont., finishing up the uncompleted portion of Plaza extension survey. It is not expected, however, that any construction will be done this year. The reports further state that grading is being done in Sheridan County, in the northeastern part of Montana, and that tenders have been invited for the grading of a stretch of line south of the International Boundary to Barre, Valley County. It is said that this line is to be extended to a junction with the Alberta Ry. and Irrigation Co.'s line, terminating at Sweet Grass, which is now owned by the C.P.R. (April, pg. 169.)

New Brunswick Coal, Iron and Clay Co.—The New Brunswick Legislature has incorporated a company with this title, having power, among other things, to build railways or tramways to connect its properties with the C.P.R., and with shipping points on the St. John River, "but shall not be bound to operate such railways or tramways as a common carrier." The provisional directors are:—T. Bell, S. A. Payne, St. John, N. B.; H. W. Binning, Fredericton, N.B.; J. D. Mitchell, Lincoln, N.B.; J. W. Wilson, Welsford, N.B.

Northern New Brunswick and Seaboard Ry.—A contract under the act granting aid to certain railways, has been entered into by the Dominion Government with the company for the building of a line from the Drummond Mines at Austin Brook to the Intercolonial Ry. where it intersects the branch line from Bathurst station to Bathurst Harbor, N.S., 16.9 miles. This line has been operated for a couple of years, but the subsidy was only made available last session. (July, pg. 332.)

Pacific Great Eastern Ry.—A start was made with the construction of the 14 miles of line to connect North Vancouver with Howe Sound, B.C., July 1. It is expected that this will be completed and the line opened by July 1, 1914. At Howe Sound connection will be made with the Howe Sound and Northern Ry., which has been acquired by the P.G.E. Ry. From the terminus of that line construction is being pushed as far as Lillooet, and work is also in progress thence to the Fraser River. A subcontract on this latter section has been let to Rankin & Co. Orders have been placed in the U.S. for 20,000 tons of steel rails for the line, and the first shipment will be made from New York early in August. (July, pg. 332.)

Quebec Oriental Ry.—The Board of Railway Commissioners has ordered that this line be ballasted from Matapedia to New Carlisle, Que., with a complete lift of 6 ins. of ballast, and that fencing, gates, wooden culverts and all decayed portions of trestles be renewed, the whole work of be completed by Dec. 31.

Salisbury and Albert Ry.—An order has been issued by the Board of Railway Commissioners directing the company to put guard rails on all its bridges, 50 ft. long or over, by Aug. 20. (Jan., 1912, pg. 23.)

Timiskaming and Northern Ontario Ry.—Although no definite announcement has been made either by the Ontario Government or the T. and N.O.R. Commission, it is stated that the amount of the subsidy voted by the Dominion Parliament will be utilized for the reduction of gradients and the improvement of the line from North Bay to Liskeard, Ont., 113 miles. This was the line laid out by the late Ontario Government as a pioneer railway, consequently the gradients are high and the line winds about considerably. The extension northerly to Cochrane, the junction with the National Transcontinental Ry., was built to a higher standard, and, with the traffic now passing over the line an improvement on the original section, with a view of reducing operating expenses, is deemed advisable. The surveys for this have been completed, and the right of way for the necessary diversions is said to have been secured. Some details of the revision work to be undertaken were given on pg. 595 of our issue of Dec., 1912.

The grading of the branch from Iroquois Jct. to Iroquois Falls is reported to have been completed, and tracklaying is in progress. (July, pg. 332.)

Toronto, Hamilton and Buffalo Ry.—The Hamilton, Ont., City Council was notified July 8, that the company declined to join with the G.T.R. and the Canadian Northern Ry. in the suggested plans for a joint route and a union station, and that no inducement could be held out to get it to agree. The company desires to elevate its tracks along Hunter St., while the city authorities are in favor of depressing them. The proposals for a joint line were made in the hope that a compromise might be arranged. The Mayor advocates that application be made to the Board of Railway Commissioners for an order to compel the removal of the tracks from Hunter St., and to join with the G.T.R. and the C.N.R. in a common entrance along the G.T.R. cut for all railways.

The City Engineer, in a report to the Mayor, July 11, pointed out the advantages of the proposed joint route. So far as it affects the T.H. and B.R. its adoption would mean the building of about two miles of line on a 0.64 gradient. The City Engineer was instructed to prepare complete plans, and the City Solicitor is preparing the city's case for presentation to the Board of Railway Commissioners. (July, pg. 333.)

Association of Transportation and Car Accounting Officers.—At the recent summer meeting at Charlevoix, Mich., the following officers were elected for the current year:—President, F. Price, Superintendent of Passenger Service, G.T.R., Montreal; First Vice President, J. M. O'Day; Second Vice President, J. T. King; Secretary, G. P. Conard, New York; Treasurer, F. M. Luce. It was decided to hold the winter meeting at Galveston, Tex., Dec. 9 and 10.

Canadian Railways and Forestry Work.

Among those who took part in the Canadian Forestry Association's meeting at Winnipeg recently were George Bury, Vice President, C.P.R., Winnipeg, and J. S. Dennis, Assistant to the President, C.P.R., and head of the company's department of Natural Resources, Calgary, Alta.

Mr. Bury, in a paper which, owing to his unavoidable absence, was read by a delegate, dealt with the subject of "The Railways and Forest Protection." In this paper he pointed out that outside the Government, the C.P.R. had probably made the most elaborate study of the preservation of forests of any organization in the world. The company was carrying out on the forest tracts it owned, the system of caring, guarding and patrolling followed in the privately owned forests of Germany. This study and care of forests by the company was being made with a twofold purpose: to estimate the amount of traffic that may be derived from year to year in the territory adjacent to the line, and what production can be made from the timber and still preserve it to such an extent that in a hundred years the production will be so advanced that the revenue from the territory will be as great or greater than it is at present. The paper then went on to point out all that had been done by the railways to minimize the danger of fire from their locomotives, but there was still much to be done before all the dangers were eliminated. Saw-mills, logging railways, camps, and other possible sources of danger must be regulated, and this could only be done by the adoption of a better system of patrolling. It had been estimated that the revenue derived by a railway from the production of one acre of heavily timbered land is equal to the accumulated traffic of an acre of agricultural land for 80 years.

Mr. Dennis addressed the convention on "Why the Railways Are Interested in Forestry." There were, he said, three reasons: (1) Because they were interested in all the great national questions which stand for the development of the country in which they had so much at stake; (2) because the railways were practically the greatest consumers of forest products in the Dominion; and (3) because lumber products formed a very large portion of their traffic. The railways used about five billion feet of lumber in the shape of wood for ties, bridges, fences, etc. There were in place on the C.P.R. western lines about 30,000,000 ties, the no. 1 ties consisting of 42 ft. each board measure. Then the railways required about 10% of the total of five billion feet to maintain what they had. Then there was the timber required for the extensions being made. The railways were therefore very practically interested in forestry. Were it not for the lumber traffic there would not be railways in certain districts. The original line had been built for the lumber traffic, and in certain districts it was to the continuance of this traffic by forest protection and reproduction that the company would have to look for a continuance of traffic. The railways were also interested in forestry from the standpoint of protection of the water supply. The C.P.R. was specially interested in forest protection on the eastern slope of the Rocky Mountains, because it was from thence that the supply of water would be drawn for the irrigation

projects in Alberta, upon which the company was expending \$20,000,000. In conclusion, Mr. Dennis said there was no question that was more readily listened to than the question of forestry expenditure for protection from fire along the line; for examination of the timber areas adjacent to the line, and for the purpose of getting timber requirements according to the intelligent forestry methods. He had no doubt that the other railway companies were doing their share of the work also, though perhaps the C.P.R. had the advantage of being a little farther on in the game. The railways felt that the work being done by the association was important, and would be pleased at all times to do their share in attaining the objects which the association had in view.

The Transportation Interests of Anticosti Island.

A short time ago the Montreal and Quebec Boards of Trade paid a visit to Anticosti Island, in the Gulf of St. Lawrence, which is owned by H. Menier, of Paris, France, making the trip on the R. and O. N. Co.'s steambot Saguenay. The Quebec Chronicle, in an article on the trip, made the following references to the transportation interests:—

"The double deck pier, stretching 4,000 feet into the deep water of Ellis Bay, was first examined. This magnificent dock, constructed in the most solid manner, can be classed with any Government work of its kind in Canada and must have cost a vast sum, and yet it was built without Government aid and entirely of timber and materials found on the spot. The railway runs the entire length of the dock, and about midway runs up an incline to an upper level, where the pulpwood and other goods intended for shipment are automatically discharged into iron pockets and thence directly into the hatches of the steamers awaiting cargo, thus entirely saving all manual labor and ensuring rapid dispatch.

"On the arrival of the party, an ocean steamer, the Thyra Menier, was taking a cargo of rossed pulp wood in this manner, trains of cars running from the mill to the dock to keep the vessel supplied. All the Menier steamers are of British register and consequently fly the British flag.

"A train then carried the visitors to the end of the Anticosti Ry., which has 18 miles of main line and 9 miles of branch—27 miles in all. The railway is most substantially built, with substantial roadbed, steel rails of 55 and 70 lbs. to the yard, and well ballasted with the best of ballast, taken from gravel pits, where steam shovels were excavating ballast of a quality to make any railroad man happy. M. Menier has wisely made the railway of standard gauge, foreseeing the possibility of connecting it with the railway systems of the continent by means of a car ferry to Gaspé, only 50 miles distant. All along the railway are vast quantities of pulp wood awaiting shipment to the mill, where it is cut into short lengths and rossed or barked. About 35,000 cords of wood were made during the past winter, and a fleet of steamers is now busy carrying this wood, as fast as it passes through the barking mill, to the United States."

The Quebec Central Ry. has received two ten wheel locomotives from Canadian Locomotive Co.

Canadian Pacific Railway Construction, Betterments, Etc.

Atlantic Division.—The new locomotive house and machine shops under construction at McAdam Jct. are fully described on another page of this issue. H. Post, the general contractor, is reported to have sublet portions of the work as follows:—Masonry, Wm. Stevens, Woodstock, N.B.; roofing, J. E. Wilson, St. John, N.B.; lumber, Murray and Gregory, St. John.

Eastern Division.—Local press reports state that plans are being prepared by the C.P.R. for an electric railway between Lennoxville and Coaticook, Que., at an estimated cost of \$500,000.

The Board of Railway Commissioners has refused the company permission to close Charlemagne St., Maisonneuve, as a part of some improvements which it is proposed to effect there, and it is said that a bridge will be built to carry the line across the street.

Campbellford, Lake Ontario and Western Ry.—The Board of Railway Commissioners has recommended the sanctioning by the Governor-in-Council of a lease of this line, now under construction from Glen Tay to near Agincourt, Ont., to the C.P.R.

Track has been laid on the Agincourt-Whitby section of the line, and a train was run over it July 4. Construction between Whitby and Oshawa is being pushed forward, and it is expected to have it completed at an early date. The remainder of the line to Glen Tay is almost finished, and it is expected to have the entire 183 miles in operation in the fall.

Ontario Division.—Press reports state that plans are being made for the building of a second track from near Lindsay station to the junction at the eastern end of the town, and the building of a cement wall along the Scugog River, beside the line.

Tenders are under consideration for the substructure of a subway at Yonge St., Toronto, in connection with the North Toronto grade separation work. B. Ripley is engineer in charge.

The Board of Railway Commissioners has approved of location of second track from near Islington to Guelph Jct., 29.1 miles. The contract for this work is being carried out by Johnson and Girouard, Ottawa, who have sublet portions of the grading to local men. The bridge work is nearly completed between the starting point west of Islington to Cooksville, and preparations for tracklaying between these points are being made. The work between Cooksville and Streetsville is rather heavier, but is well forward, as is also the grading from Streetsville to Guelph Jct.

Manitoba Division.—We are officially advised that the C.P.R. has let a contract to the John S. Metcalf Co., Ltd., Montreal, for extensive alterations at the Steel River house at Elevator D, Fort William, Ont., at an estimated cost of \$45,000.

The construction of the double track bridge across the Red River in Kildonan, on the Bergen cutoff, is being rapidly pushed forward. The substructure, which consists of seven piers and two abutments, is being put in by the Foundation Co. These rest either on hardpan, or solid rock, in some cases the concrete rests on the arch, and in others on the piles, the concrete in all cases being carried 15 ft. below the bed of the river. The

superstructure will be erected by the Dominion Bridge Co.

Saskatchewan Division.—J. G. Taylor, General Superintendent, is reported to have stated, July 4, that steel has been laid on the second track work to mileage 97 west of Regina; ties are in position on the 12 miles west of Chaplin, and grading is completed westerly to seven miles east of Swift Current. It is expected to have the second track completed into Swift Current by Sept. 30.

Tenders are under consideration for trenching, pipelaying and backfilling 3.3 miles of a 10 in. wooden pipe line at Weyburn, Sask. T. Martin is Division Engineer, Moose Jaw, Sask.

Alberta Division.—The C.P.R.'s new land maps show a line from Saskatoon, Sask., crossing the Moose Jaw-Macklin line at Mildred, practically paralleling the Canadian Northern Ry. Goose Lake line, and connecting with the C.P.R. Swift Current-Bassano line at Empress, Alta.

Press reports state that plans are being prepared with a view to carrying out further improvements at Calgary station in the near future.

Press reports state that it is intended to carry the line from Weyburn, Sask., which is to connect with the Alberta Ry. and Irrigation Co.'s line at Stirling, westerly from the latter point, to a junction with the Crowsnest branch at Pincher.

The Board of Railway Commissioners has approved of location plans of the Suffield-Blackie branch from mileage 58.29 to 149.9.

In granting an order for the operation of traffic on the newly completed line from Strathcona to Jasper Ave., Edmonton, Alta., the Board of Railway Commissioners has limited the speed of the trains to 12 miles an hour when crossing the high level bridge over the North Saskatchewan River.

Calgary-Vancouver Second Track Work.—We are officially advised that a contract has been let to Foley Bros., Welch and Stewart for the construction of a tunnel five miles long under the Selkirk Mountains, B.C. George Bury, Vice President, is reported to have said in a recent interview: "The tunnel will be on a tangent and 1% grade, and when completed will be electrified so that trains will move through it by electricity instead of steam. The tunnel will come out of the Selkirk mountains on the west end about where the loop now is. The building of this tunnel will do away with 4.5 miles of snow sheds, will reduce the distance 4.5 miles, and will make the grade over the Selkirks 514 ft. less than it is at present. That is, the difference in the elevation of the tracks at Rogers Pass and of the tunnel will be 514 ft. To build the tunnel it is necessary to construct a new track on each side of it. The total length of the new track which will have to be constructed is 14½ miles, which, adding the tunnel, five miles, will make the distance of the tunnel and the new grade revision 19½ miles as against 24 miles by the present line. With the construction of this tunnel there will not be more than six miles of 2% gradient through the mountains."

The contractors have got a large quantity of their plant on the site, and expected to start work on the new tracks and approach cuts by July 30. A. C.

Dennis, who is in charge, is reported to have stated that the first work would be the building of five miles of track, leading to the approaches. The tunnel will be driven from both sides by shifts working continuously night and day. It is expected to complete the boring in three years, and to have it in operation six months afterwards. A good deal, however, will depend upon the character of the rock and the quantity of water encountered.

The contractors for the three sections of second track work between Revelstoke and Taft, 24 miles; Westmore to Kamloops, 25 miles, and Kamloops westerly for nine miles, are, we are officially advised, Grant Smith & Co. and McDonnell, Ltd., Pacific Buildings, Vancouver, B.C.

Kootenay Central Ry.—The Board of Railway Commissioners has authorized the C.P.R. to open for traffic the section of the K.C.R. from Golden to Spillimacheen, B.C., 41 miles. A section from Colvalli, the junction point with C.P.R. Crowsnest branch, has been in operation for 23 miles for some time. The gap of about 100 miles between the terminal points of the two sections is under construction.

Pacific Division.—The Winch dock, having a frontage of 200 ft. on Burrard Inlet, was taken over by the C.P.R. July 1. It is proposed to build shed on it at once. (July, pg. 334.)

Dominion Government Railway to Hudson Bay

The line from the junction with the Canadian Northern Ry. at Pas, Man., over the bridge across the Saskatchewan River, has been laid with 80 lb. steel, and several side tracks have been laid on both sides of the bridge to facilitate construction work. The filling in of the trestle approaches to the bridge is being proceeded with. Track has been laid for some 15 miles beyond the bridge, but no ballasting has been done. This work is being pushed forward and it is expected that track will be laid to Thicket Portage, 185 miles, this year.

The locomotive house to be erected at Pas will at first consist of one unit of 12 stalls, but plans have been prepared for its ultimate enlargement to 44 stalls. Boiler shops, machine shops and other buildings will be located adjoining the locomotive house.

The resignation of H. T. Hazen, M. Can. Soc. C.E., from the position of engineer in charge of the terminal on Hudson Bay, will go into effect about the middle of August, when he expects to return from Port Nelson, for which place he sailed from Halifax, N.S., on the s.s. Bonaventure on July 2. The s.s. Bellaventure also sailed from Halifax, June 30, both vessels carrying men, plant and supplies to Fort Nelson. (July, pg. 337.)

Trunks as Freight.—The Board of Railway Commissioners has ordered that trunks be accepted by railway companies as freight, when securely corded. The Canadian Freight Association opposed the order on the ground that it would lead to objectionable traffic, that trunks were not accepted in any freight classification, and that they should not be accepted by Canadian railways unless they were boxed, had steel bands, or were wired to prevent possible pilfering, for which railway companies would be responsible.

Railway Finance, Meetings, Etc.

Canadian Pacific Ry.—As some misconception may have arisen as to an issue of stock by the company, it has been officially announced that application was made to the Government last August, for permission to issue \$75,000,000 stock, but consent has not yet been given, and that application is still before the Government. When consent is obtained, the directors may, or may not, issue that amount. Regarding the \$60,000,000 of stock, now being taken up in lieu of the consolidated debenture stock, which was issued by the shareholders' authority, it is stated that three fifths is already paid up. The Government's consent to this issue was not necessary.

A London, Eng., cable, July 18, states that \$20,000,000 of the \$35,000,000 of C.P.R. mortgage bonds had been presented for redemption at that date.

Canadian Pacific Ry.—The company paid off in London, Eng., July 1, \$35,000,000 of outstanding 5% mortgage bonds, two years ahead of the time they were due for redemption. There are now no mortgage bonds outstanding on the C.P.R. lines, but there are some small amounts outstanding on lines acquired by the company and amalgamated with it. Sir Thomas Shaughnessy, President, is quoted as stating that the company's indebtedness, consists of about \$165,000,000 of debentures, and the common stock.

In connection with press reports that the C.P.R. contemplated the issuing of a further \$60,000,000 of common stock early in 1914, Sir Thomas Shaughnessy stated July 9:—"No new issue of common stock is contemplated, because the proceeds of any such issue could not be utilized to advantage, ample provision having already been made for the company's money requirements for a long time to come."

Grand Trunk Pacific Ry.—At a special meeting of shareholders at Montreal, July 16, a bylaw was passed authorizing the issue of \$15,000,000 debentures under the provisions of the Grand Trunk Pacific Act passed at the last session of the Dominion Parliament.

Grand Trunk Ry.—A cablegram to the Montreal Star, July 14, stated that the latest effort to secure control of the G. T. R. and have the headquarters in Canada had failed, a speculative group which had been working for that end for some time having got out of its depth, and that many options would not be exercised.

International Ry. of New Brunswick.—Press reports state that negotiations are in progress on the part of the Dominion Government and the C.P.R., for acquiring this line. The I.R. of N.B., which is practically owned by Thomas Malcolm, extends from Campbellton to St. Leonards, N.B., 104 miles. It has a charter to build a bridge across the Restigouche River and connect with the Intercolonial Ry. and the Quebec Oriental Ry. at Matapedia, Que.; and also the building of a bridge across the St. John River to give connection between the terminus at St. Leonards, and the U.S. lines at Van Buren, Me.

Montreal and Vermont Jct. Ry.—Following are the directors for the current year,—President, E. J. Chamberlin; Vice President, G. C. Jones; Auditor, W. G. Crabbe; Secretary and Treasurer, A. H. Gilmour; Assistant Secretary and Treasurer, W. H. Chaffee; other directors, E. C. Smith and C. W. Wilkes. The Manag-

ing Directors are, E. J. Chamberlin, W. Wainwright and G. C. Jones.

Napierville Jct. Ry.—Following are the directors for the current year,—President, L. F. Loree; Vice Presidents, C. S. Sims and W. H. Williams; Secretary, L. J. Beique; other directors, G. T. Hartt, F. L. Beique, F. A. Beique, and R. Adair.

Quebec Oriental Ry.—Meetings of the holders of 5% first mortgage gold bonds and of 5% second mortgage bonds of the Matapedia section of the company's line will be held in London, Eng., Aug. 13, to increase the amount of the issue of 5% prior lien mortgage gold bonds on the section from £50,000 to £100,000.

Temiscouata Ry.—Net earnings, for April, \$9,710; for May, \$4,969; aggregate for 11 months ended May 31, \$61,889.

White Pass and Yukon Route.—Earnings from Jan. 1 to June 14, \$272,751, against \$223,074 for the same period 1912.

Great Northern Railway Lines in Canada.

Vancouver, Victoria and Eastern Ry. and Navigation Co.—J. H. Kennedy, Chief Engineer, is reported to have stated, June 30, that satisfactory progress was being made with construction on the section of the line between Coalmount and Otter Summit. Four steam shovels and a large force of men were at work. This section will connect with the joint section to Hope, which is to be built by the Kettle Valley Lines.

Victoria and Sidney Ry.—F. Van Sant, Superintendent, is reported to have stated recently that the work of improving the roadbed will be put in hand at an early date. The line will be regraded in part, and rails will be laid, and additional ballast added at an cost of \$100,000. New turntables are being built at Victoria and Sidney, to handle a gasoline electric car which will shortly be added to the rolling stock. (May, pg. 224.)

Enlargement of Angus Shops, Canadian Pacific Railway

The following extensive additions are being made to the Angus Shops, Montreal, the percentages given in connection with some of the works showing the amount of work completed to July 16 as advised us officially:—

Steel passenger and freight car shops, comprising material shops, 182 by 100 ft., and 209 by 100 ft.; passenger car shop 202½ by 110 ft.; freight car shop 405 by 72 ft.; transfer table 80 by 75 ft. 80% done; bolt and nut shop, 420 by 60 ft. 25% done; new shipping platform for wheel foundry 100 by 72 ft.; extension to scrap platform and shed 60 by 50 ft.; extension to pattern storage, 60 by 50 ft.; addition to car ovens, 3 new ovens; extension to locomotive shops, 594 by 80 ft.; 20% done; addition to tube rack; extension to office building, 80 by 75 ft.; extension of power house, 20 by 62 ft. 11 ins.; 30% done; extension of upholstering shop, 80 by 75 ft., 30% done; extension to frog shop, finished.

Canadian Northern Ry. Elevators.—We are officially advised that there is nothing in the press report that the Canadian Northern Ry. is to erect a series of grain elevators between Port Arthur and Winnipeg, and that beyond the recent addition of 2,500,000 bush. to its elevator capacity at Port Arthur, nothing is at present being done in the matter of grain storage.

Grand Trunk Railway Betterments, Construction, Etc.

Southern New England Ry.—An application was made to a court at Boston, Mass., recently for the appointment of a receiver for the company. The applicant, J. Marsch, of Chicago, Ill., stated that he had expended \$1,500,000 on carrying out his construction contract, on account of which he had received \$500,000. A considerable portion of the balance had accumulated through the stoppage of the work. The question of the court's jurisdiction was raised, among other points, and the hearing of the application was adjourned.

Central Vermont Ry.—A contract is reported to have been let to J. E. Cashman, Burlington, Vt., for the construction of a concrete arch and viaduct over the C.V.R. tracks and the river at Winooski. The structure will have a total length of 278 ft. 8 ins., including a 93 ft. arch over the river.

Montreal Track Elevation Plans.—The Montreal City Council decided, July 14, to consult with the Board of Railway Commissioners with a view of seeing what steps could be taken to compel the company to proceed with the work of elevating the tracks from Bonaventure station. The work is estimated to cost \$10,000,000, towards which the city is authorized by the Quebec Legislature to contribute \$2,000,000.

Proposed New Line to Ottawa.—Press reports state that negotiations are in progress for obtaining running rights over the Ottawa and New York Ry., from Cornwall to Ottawa, Ont. The object aimed at is to secure a shorter route than is at present available between Toronto and Ottawa. (July, pg. 337.)

Station and Yard Improvements at Stratford.—G. A. Mitchell, Superintendent of Bridges and Buildings, was in Stratford, Ont., July 16, completing arrangements for the erection of a new station. Foundation work was started at the Shakespeare St. site two years ago, but was stopped pending the settlement of some difficulties. Since then the plans have been somewhat altered, and the new building will be a larger structure than was previously intended. The yard accommodation is to be rearranged, to meet the altered conditions at the station.

Tests on Locomotive Fireboxes.—As the result of a series of tests, it has been shown that, 1, the outwardly inclined water leg is the most desirable as far as the water circulation is concerned; 2, the direction of rolling of the sheet affects its ability to withstand the strains imposed in service, and that the direction of rolling should be specified; 3, the relative values of the different steels to withstand these strains are in the order of nickel, acid and basic; 4, the lowest specification carbon content and tensile strength requirement should be asked for and accepted; and, 5, the single piece firebox as now applied is a mistake.

Reports indicate that the use of lignite as a locomotive fuel is increasing in the northwestern portion of the United States. This is due to the high cost of good coal, and the proximity to large areas of lignite. The latter gives very good results when briquetted, as the heating value is increased, and the rapid deterioration incidental to raw lignite when stored, is largely decreased. The heat value of briquetted lignite is about 9,000 b.t.u.

Canadian Northern Railway Construction, Betterments, Etc.

Quebec and Lake St. John Ry.—The old machine and other workshops at the rear of the Q. and L. St. J. Ry. station, St. Andrew St., Quebec, have been demolished, and the site is being laid out as additional yard room. The new tracks to be laid will give accommodation for 120 cars.

Canadian Northern Quebec Ry.—Press reports state that in connection with the rumored extension of the line easterly from Quebec to the Labrador coast, it is intended to build a line from Quebec to Sherbrooke, connecting with the line of the Boston and Maine Rd., which terminates there.

Canadian Northern Montreal Tunnel and Terminal Co.—Reviewing the work completed during the twelve months that have elapsed since the tunnel work was started, S. P. Brown is reported to have said, July 8:—"On July 8, 1912, the first shovelful of earth was removed, the work starting at the western portal. On July 31 the shaft at Maplewood avenue was commenced and driven downward for 240 ft. On Aug. 3 workmen commenced to dig the Dorchester St. shaft. Since then the western portal has been linked with the Maplewood avenue shaft and the tunnel driven further cityward until the men are working somewhere beneath the centre of the cemetery. A continuous boring, 7,350 ft. long, has been completed. From Dorchester St. also rapid progress has been made. A distance of 1,400 ft. has been completed in the terminal site between Cathcart and Latour streets. From Cathcart St. mountainward 3,700 ft. is the length of the hole to date, and the workmen are blasting almost directly under the high level reservoir. Nine feet by 12 are the dimensions of the excavation now being made, but in many places 'breakups' have been made. That is, the preliminary boring has been extended to its full height and width. 1,800 ft. have been completed in this manner and have attained the dimensions of the completed tunnel, 30 by 21½ ft. We expect to have the tunnel pierced from portal to portal by the middle of Jan., 1914, and by the end of Oct., 1914, the base will be extended to its full dimensions and the tunnel practically completed."

Canadian Northern Ontario Ry.—The Dominion Government entered into a contract, June 13, with the C. N. O. R. for the building of a line from Toronto to Ottawa, 250 miles; under the terms of the act passed last session to aid in the construction of this and other lines. Work on this line is rapidly approaching completion.

The question of the proposed tunnel in North Toronto came before the Board of Railway Commissioners at Toronto, July 15. Considerable opposition was manifested, and the hearing was adjourned.

Montreal-Ottawa-Port Arthur Line.—Sir Donald Mann, Vice President, in an interview July 4, is reported to have said that the greater part of this line would be completed by the close of navigation. The section from Montreal to Hawkesbury is being finished up; the Hawkesbury-Ottawa section is in operation. A 15 stall locomotive house is to be erected at Rideau Jet., the point of junction of the Ottawa-Port Arthur line with the Ottawa-Toronto line; these buildings will be erect-

ed in the triangle made by the convergence of the two lines. The line is under construction from this point to the junction with the line running northerly from Toronto, but this section will not be completed until next year. Track has been laid for 150 miles westerly from near Sudbury, and for 127 miles easterly from Port Arthur, on the remaining section of the line, and gangs are laying steel to connect the two sections. These gangs are working easterly from the Port Arthur end, westerly from the Sudbury end, and in both directions from Obo, the point of junction with the Algoma Central and Hudson Bay Ry. A sub contract for tracklaying has been let to Robertson Bros. Seven ballast trains are being operated. It is expected to have the track laid and the ballasting completed so that the line may be put in operation in the fall. The buildings on the line are being erected by the Imperial Construction Co., Toronto, J. H. Montgomery, Manager. There will be divisional buildings at four points, together with 82 stations, and 82 tool houses.

Under the act passed last session of the Dominion Parliament the Government has entered into a contract with the Canadian Northern Ontario Ry., for the building of the line from Ottawa to Port Arthur, Ont., 910 miles.

Canadian Northern Ry.—In an interview at Toronto, July 8, Sir William Mackenzie is reported to have said that as soon as the Company's transcontinental line was put in operation, attention would be given to the building of a second track from Port Arthur to Winnipeg.

The St. Boniface, Man., City Council, July 14, approved plans for the erection of a new station on Des Meurons St., near Provencher Ave., to cost \$35,000.

It is reported that about nine miles of grading is required to complete the branch line from Prince Albert to Battleford, Sask., which it is expected to finish this year.

Satisfactory progress is being made on the construction on the extension which will give a direct line from Saskatoon, Sask., to Calgary, Alta. Track has been laid to Anderson Creek, where an 11 span bridge, 1,000 ft. long, is being built. As soon as this is completed tracklaying will be resumed. The ballasting gang is following the tracklayers closely. Station buildings, tool houses, etc., are being erected.

Tenders have been asked for the erection of a station at South Edmonton, to cost about \$40,000. The yard accommodation at Edmonton is being added to; the new tracks will give space for 1,000 cars.

A contract has been entered into by the Dominion Government with the Canadian Northern Alberta Ry. for the building of the branch line from Edmonton to the boundary of British Columbia at Yellowhead Pass, 280 miles.

Canadian Northern Pacific Ry.—R. Twohy of Twohy Bros., sub contractors, is reported to have stated recently that he expects to have grading along the North Thompson River completed in October, to a connection with the construction proceeding westerly. The point where these sections are expected to join is at the Albreda summit, 40 miles southwest of Tete Jaune. At the

end of June there was only a stretch of 30 miles, between the point reached by the Twohy gangs, and that reached from Tete Jaune by the gangs employed by Palmer Brothers and Hemming, the sub contractors working westerly.

Location plans for the branch line through the town of Vernon, have been approved by the British Columbia Government.

It was expected to have tracklaying completed on the Lulu Island branch, July 30, so as to have it in operation early in August.

The necessary bonds have been deposited with the City of Vancouver under the False Creek reclamation agreement; the Dominion Government has granted permission to fill in the centre of the creek, and final steps are being taken by the City Council to hand over the property to the Company. Speaking at a public meeting in Vancouver, recently, the Premier said he had been advised that the proceeds of the \$10,000,000 of terminal bonds guaranteed by the B. C. Legislature, were available for the immediate starting of this work of reclamation.

Vancouver Island Lines.—The Premier in a recent speech at Vancouver, stated that he had been advised that the section of the line on Vancouver Island, extending from Victoria to Alberni, would be turned over to the operating department early in 1914.

Tenders are under consideration for the building of the following lines: From Victoria to Deadman's River, five miles; and from Regina Ave., Victoria, to Union Bay, Saanich peninsula, 15.85 miles. The work to be done includes clearing, grubbing, grading, bridges, trestles, culverts, masonry and fencing. (July, pg. 335.)

Dominion Railway Subsidy Agreements.

The Dominion Government has entered into agreements with the following companies, granting aid for the construction of lines, as mentioned:—

Canadian Northern Alberta Ry.—June 23—from Edmonton, Alta., to British Columbia boundary, at, or in, the Yellowhead Pass, 280 miles.

Canadian Northern Ontario Ry.—June 23—from Ottawa to Port Arthur, 910 miles; and from Toronto to Ottawa, 250 miles.

Northern New Brunswick and Seaboard Ry.—July 5—from Drummond Mines, at Austin Brook, to Intercolonial Ry. where it intersects branch line from Bathurst station to Bathurst harbor, N.B., 16.9 miles.

Canadian Car Service Bureau.—At the annual meeting in Montreal, July 10, the following members were elected to the Executive Board:—Canadian Pacific Ry., Central Vermont Ry., Grand Trunk Ry., Quebec Central Ry., and Toronto, Hamilton and Buffalo Ry. The officers are J. E. Duval, Manager, Montreal; J. Reilly, Assistant Manager, Montreal, and W. J. Collins, Assistant Manager, Toronto.

The C.P.R. English Staff's Annual Sports were held at Acton, June 28, when the various events were keenly contested by members of the staffs of the various English offices. The challenge cup, presented by G. McL. Brown, European Manager, for the inter-office competition, was won from London by the Liverpool staff, and handed over to F. W. Forster, Agent, there.

Mainly About Transportation People.

W. H. D'ARCY, General Claims Agent, Western Lines, C.P.R., Winnipeg, is spending a vacation in Europe.

SIR WILLIAM MACKENZIE left Toronto, July 15, for England, sailing from Quebec by the s.s. Royal Edward, July 16.

SIR THOS. G. SHAUGHNESSY returned to Montreal, July 17, after spending a short holiday at his summer home at St. Andrews, N.B.

GRANT HALL, General Manager, Western Lines, C.P.R., Winnipeg, whose illness was reported in our last issue, has recovered and returned to his office.

J. H. BANNEN, formerly agent and operator, Don Station, C.P.R., Toronto, has entered the hotel business, having recently purchased the Lambton House, Lambton, Ont.

GEORGE BURY, Vice President, C.P.R., addressed the Canadian Forestry Association Convention, at Winnipeg, July 9, on the railways and forest protection.

D. N. MILLER, Superintendent, Hamilton St. Ry., Hamilton, Ont., was instantly killed on July 23, when his automobile went over a steep bank in the dark.

M. McDONALD, heretofore Vice President and General Manager, Maine Central Rd., has been appointed President, Boston and Maine Rd. and Maine Central Rd., vice C. S. Mellen, resigned.

F. PRICE, Superintendent of Passenger Service, G.T.R., Montreal, has been elected President of the Association of Transportation and Car Accounting Officers for the current year.

SCOTT GRIFFIN, European Manager, Canadian Northern Ry., and Canadian Northern Steamships Ltd., London, Eng., and Mrs. Griffin, arrived in Canada, July 9, for the remainder of the summer.

Count Jacques de Lesseps, and the Countess, a daughter of SIR WILLIAM MACKENZIE, with their two sons, arrived in Canada for the summer, July 9. It is said that they will make their home in Canada.

SIR THOMAS TAIT, President, Fredericton and Grand Lake Coal and Ry. Co., was in Toronto, July 19, to attend the funeral of his brother-in-law, Major Cockburn, V.C., who was killed by a kick from a horse, on his ranch near Maple Creek, Sask.

W. M. FLYNN, station agent, Prince Edward Island Ry., Cardigan, was presented with a gold headed cane and a pipe and case, by a number of local residents, July 3, on his removal to Georgetown, where he has been transferred to a similar position.

GEORGE STEPHEN, General Freight Agent, Canadian Northern Ry., Winnipeg, was born at Montreal, July 5, 1876, and not in 1870, as stated in Canadian Railway and Marine World for July, under "Birthdays of Transportation Men in July."

J. S. PLAYFAIR, one of the founders of the Muskoka Navigation Co., whose death was mentioned in our last issue, left an estate of \$109,192. Three sons, one of whom is Jas. Playfair, Vice President and Managing Director, Richelieu and Ontario Navigation Co., are executors.

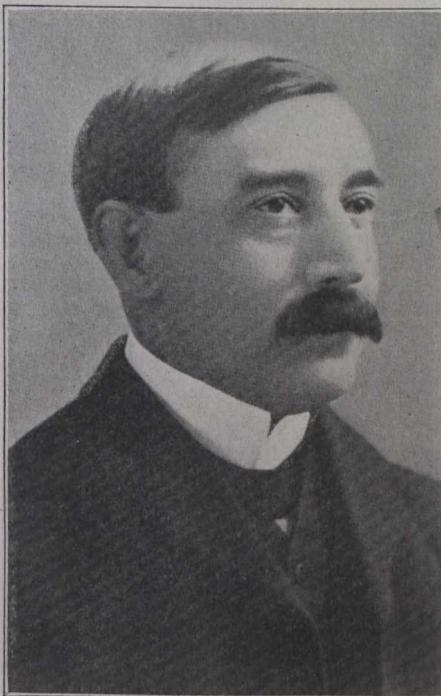
C. S. MELLEN, President, New York, New Haven and Hartford Rd., Boston and Maine, Rd., and Maine Central Rd., re-

signed the presidency of the latter two companies, early in July, in order to devote his time to the affairs of the first named. On July 17, he resigned his position on the N.Y., N.H. & H. Rd.

ALFRED PRICE, General Superintendent, Alberta Division, C.P.R., was entertained to dinner, at Calgary, July 8, prior to his leaving for his new position at Montreal, by the local Y.M.C.A. and the Round Table Club, and presented with a loving cup, and a set of Browning's works, as an appreciation of his work connected with the association.

C. J. O'DOHERTY, who has been appointed Storekeeper, G.T.R., Ottawa, was born there, July 28, 1878, and entered railway service Oct. 1, 1895, since when he has been, to Dec., 1898, clerk, Motive Power Department, Canada Atlantic Ry., Ottawa; Jan. 1, 1899, to May 31, 1913, chief clerk, Stores Department, G.T.R., Ottawa.

J. B. LAMBKIN, formerly Assistant



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

General Passenger Agent, Intercolonial Ry., Halifax, N.S., has been appointed a Government agent in connection with the carrying out of the recently enacted laws relating to white slavery. He acts under the direction of the Chief of Dominion Police, with headquarters at Montreal.

RT. HON. ALFRED LYTTLETON, K.C., M.P., who died in London, Eng., July 4, was, with the late P. S. Archibald, of Moncton, N.B., a member of the board of arbitration appointed in 1904, to deal with the disputes between the Newfoundland Government and the Reid Newfoundland Co., arising out of the construction and operation of the railway in that colony.

W. G. BARNWELL, who was recently appointed Assistant Freight Traffic Manager, Atchison, Topeka and Santa Fe Rd., Coast Lines, San Francisco, Cal., was born at Danville, Que., Apr. 13, 1865, and commenced railway work in 1881 as agent and clerk in the office of Auditor of

Freight Accounts, Canada Atlantic Ry. Since 1884 all his railway service has been in the U. S.

G. A. AIRD, General Agent, Freight Department, Atchison, Topeka and Santa Fe Ry., who died at Chicago, Ill., July 15, and who was buried in Toronto, the funeral taking place from his brother's house (John Aird, Assistant General Manager, Canadian Bank of Commerce), was the younger son of the late Wm. Aird, who was Mechanical Foreman of the old Northern Ry. at Toronto.

A. C. O'NEIL, who has been appointed Travelling Freight Agent, G.T.R., London, Ont., was born at Point Edward, Ont., Nov. 30, 1886, and entered G.T.R. service, July 15, 1904, since when he has been, to Mar. 15, 1909, clerk at Point Edward and Sarnia Tunnel, Ont.; Mar. 15, 1909, to Nov. 1, 1912, cashier at same points; Nov. 1, 1912, to May 1, 1913, chief clerk and General Agent, same points.

JAMES CONMEE, ex-M.P., of Port Arthur, Ont., who died at Prescott, Arizona, July 23, after a long illness, was one of the early contractors on the C.P.R. main transcontinental line, having had several contracts along the north shore of Lake Superior, in connection with which he had protracted litigation with the company. He also had contracts on the Canadian Northern Ry., and the Algoma Central and Hudson Bay Ry.

R. G. McNEILLIE, who has been appointed Assistant General Passenger Agent, Western Lines, C.P.R., Winnipeg, was born at Lindsay, Ont., July 1, 1883, and entered C.P.R. service, Oct. 1, 1901, since when he has been, to April 25, 1906, stenographer and clerk, General Passenger Department, Winnipeg; April 25, 1906, to Oct. 20, 1909, chief clerk, General Passenger Department, Winnipeg; Oct. 20, 1909, to April 15, 1910, District Passenger Agent, Nelson, B.C.; April 15, 1910, to July 1, 1913, District Passenger Agent, Calgary, Alta.

A. A. GOODCHILD, who has been appointed General Storekeeper, Lines East of Fort William, Ont., C.P.R., Montreal, was born in London, Eng., June 3, 1866, came to Canada, June, 1886, and entered railway service, July, 1886, since when he has been, to Jan. 1, 1888, in Audit Department, G.T.R.; Jan. 1, 1888, to Oct. 2, 1899, in Comptroller's office, C.P.R.; Oct. 2, 1899, to Jan., 1900, Assistant Auditor of Disbursements, C.P.R.; Jan., 1900, to Dec. 28, 1904, Auditor of Statistics, C.P.R.; Dec. 28, 1904, to July 1, 1913, Auditor of Stores and Mechanical Accounts, C.P.R.; July 1 to 16, 1913, acting General Storekeeper, Lines East of Fort William, Ont., C.P.R., Montreal.

H. H. MELANSON, whose appointment as acting General Passenger Agent, Intercolonial Ry. and Prince Edward Island Ry., Moncton, N.B., was mentioned in our last issue, was born at Scadoué, N.B., Mar. 99, 1872, and entered Intercolonial Ry. service, Nov. 18, 1889, since when he has been, to Aug., 1892, clerk in Mechanical Department; Aug., 1892, to Dec., 1899, clerk in Passenger Department; Dec., 1899, to Mar., 1901, chief clerk, Passenger Department; Mar., 1901, to May, 1903, General Baggage Agent; May, 1903, to Nov., 1909, chief clerk, Passenger Department; Nov., 1909, to May, 1913, Assistant General Passenger Agent, all at Moncton, N.B.

R. G. McNEILLIE, who has been appointed Assistant General Passenger Agent, Western Lines, C.P.R., Winnipeg, was born at Lindsay, Ont., July 1, 1883, and entered C.P.R. service Oct. 1, 1901, since when he has held various positions

in the Passenger Department, Winnipeg, and was from 1907 to Oct. 20, 1909, chief clerk, General Passenger Agent's office; Oct. 20, 1909, to Apr., 1910, District Passenger Agent, Nelson, B.C.; Apr., 1910, to July, 1913, District Passenger Agent, Calgary, Alta. Prior to his leaving Calgary, July 8, the local staff presented him with a walrus suit case and a fitted club bag, also a silver mesh-purse for Mrs. McNeillie.

D. T. MAIN, who has been appointed Master Mechanic, British Columbia Division, C.P.R., Vancouver, and whose portrait appears in this issue, was born at Kirkintilloch, Scotland, and came to Canada in 1903, when he entered Mackenzie, Mann & Co.'s service as draughtsman, and in 1904 transferred to C.P.R. service, and was, from 1907 to Mar., 1908, Locomotive Foreman, Minnedosa, Man.; Mar., 1908, to Mar., 1910, Locomotive Foreman, Cranbrook, B.C.; Mar., 1910, to Jan., 1912, District Master Mechanic, District 1, British Columbia Division, Nelson; Jan., 1912, to June 30, 1913, Master Mechanic, Saskatchewan Division, Moose Jaw.

W. B. SMITH, Managing Director of the Dominion Transport Co., Montreal, has been appointed a Justice of the Peace there. He has been connected with the railway cartage business since the opening of the Great Western Ry. between Hamilton and London, Ont., first with Hendrie and Shedden, continuing with the Shedden Co., then the Montreal Cartage Co., later with a cartage company in connection with the Quebec, Montreal, Ottawa and Western Ry., now part of the C.P.R., and since the formation of the Dominion Transport Co., 25 years ago, he has been General Manager, and latterly Managing Director of that company, which conducts the cartage business of the C.P.R.

A. E. ROSEVEAR, who has been appointed General Freight Agent, G. T. Pacific Ry. and G. T. Pacific Coast Steamship Co., Winnipeg, was born at Montreal, Feb. 20, 1863, and entered G.T.R. service in 1879, since when he has been, to 1885, clerk in General Superintendent's office, Montreal; 1885 to 1890, stenographer to General Manager; 1890 to 1892, accountant, G.T.R. West Shore Fast Freight Line, Chicago, Ill., and Detroit, Mich.; 1892 to 1898, accountant, Reading Despatch Line, Detroit, Mich.; Oct. 1, 1898, to Apr., 1908, Freight Claims Agent, G.T.R., Montreal; Apr. 20, 1908, to Oct., 1912, Assistant General Freight Agent, Montreal; Oct., 1912, to June 28, 1913, Assistant to the Vice President (Traffic), Montreal.

G. H. EATON, Assistant Master Car Builder, Western Lines, C.P.R., Winnipeg, who died there, June 30, and whose portrait appears in this issue, was born in Staffordshire, Eng., June 9, 1830, and entered railway service in 1876, since when he had been, to 1879, carpenter, Brockville and Ottawa Ry., Brockville, Ont.; 1879, carpenter, G.T.R., Toronto; 1879 to 1884, Credit Valley Ry., Toronto; 1884 to 1887, yard foreman of repairs and cleaning, C.P.R., Toronto; 1887 to 1888, Shop Foreman, C.P.R., Toronto; 1888 to 1893, Car Foreman, C.P.R., Toronto; 1893 to 1897, General Car Foreman, C.P.R., Hochelaga Shops, Montreal; 1897 to Aug., 1905, General Car Foreman, C.P.R., Farnham, Que., and from Aug., 1905, Assistant Master Car Builder, Western Lines, C.P.R., Winnipeg.

L. O. ARMSTRONG, who has been appointed Colonization Agent, Department of Natural Resources, C.P.R., Montreal,

was born at Manor House de Lanaudiere, Maskinonge Co., Que., and entered railway service in May, 1868, with the Ohio and Mississippi Rd. He was, from July, 1880, to July, 1881, Land Commissioner, Manitoba and South Western Ry., Winnipeg; and on the acquirement of that line by the C.P.R. in 1881, he was appointed Right of Way Agent, C.P.R., under A. B. Stickney, General Superintendent, Winnipeg. Since Dec., 1883, he has occupied the positions of Colonization Agent, Colonization and Tourist Agent, Colonization and Industrial Agent, and on the formation of the Department of Natural Resources, he was attached to that department, with office at Montreal.

C. E. DEWEY, who has been appointed Freight Traffic Manager, G.T.R., Montreal, was born at Cheshunt, Eng., Oct. 2, 1873, and entered G.T.R. service, Nov., 1888, since when he has been, to Apr., 1896, clerk, Toronto; Apr., 1896, to Aug., 1897, chief clerk to Division Freight Agent, Stratford, Ont.; Aug., 1897, to Aug., 1899, chief clerk to Division Freight Agent, Hamilton, Ont.; Aug., 1899, to July, 1902, Division Freight Agent, Strat-



C. A. Hayes,
General Traffic Manager, Canadian Government
Railways.

ford, Ont.; July, 1902, to July, 1907, Division Freight Agent, Toronto; July, 1907, to Apr., 1908, Assistant General Freight Agent, Montreal; Apr., 1908, to May 1, 1911, General Freight Agent, Central Vermont Ry., St. Albans, Vt.; May 1, 1911, to June 28, 1913, General Freight Agent, G.T. Pacific Ry. and G.T. Pacific Coast Steamship Co., Winnipeg.

M. J. POWER, General Storekeeper, C.P.R., Montreal, died there, July 4, after 14 weeks illness due to internal trouble. He was buried July 7, when the whole Stores Department was closed for an hour. He was born at Montreal, June 19, 1877, and entered C.P.R. service Mar. 16, 1891, since when he had been, to Nov., 1893, office boy, etc., General Passenger Department, Montreal; Nov., 1893, to May, 1897, stenographer, same department; May, 1897, to June, 1898, secretary to General Passenger Agent, Montreal; June, 1898, to Aug., 1901, secretary to Passenger Traffic Manager, Montreal; Aug., 1901, to July, 1908, secretary

to the President; July, 1908, to July, 29, 1912, chief clerk and private secretary to the President; July 29, 1912, to the time of his death, General Storekeeper, Montreal.

H. DARLING, whose appointment as Locomotive Foreman, G.T. Pacific Ry., Nicholl, B.C., was mentioned in our last issue, was born in Northumberland, Eng., July 27, 1873, and entered railway service July, 1890, since when he has been, to July, 1905, fitters' assistant and locomotive fireman, London and North Western Ry., St. Helens and Garston, Eng.; Jan. 15, 1906, to May 4, 1907, machinist, G.T.R., Turcot roundhouse, Montreal; May 15, 1907, to Aug. 4, 1909, machinist, G.T.R. erecting shops, Montreal; Aug., 17, 1909, to Sept. 10, 1911, machinist, G.T. Pacific Ry., Rivers, Man., and Wainwright, Alta.; Dec. 4, 1911, to Jan. 20, 1912, machinist, Foley, Welch and Stewart, G.T.P.R. Contractors, Prince Rupert, B.C.; Jan. 22, 1912, to May, 1913, machinist, G. T. Pacific Ry., Prince Rupert, B.C.

C. MURPHY, who has been appointed General Superintendent, Manitoba Division, C.P.R., Winnipeg, and whose portrait appears in this issue, was born at Prescott, Ont., Nov. 20, 1865, and entered C.P.R. service in 1883, since when he has been, to 1885, operator; 1885 to 1890, chief operator and dispatcher; 1890 to 1899, Chief Dispatcher, Ottawa; 1899 to June, 1900, acting Superintendent, and June, 1900 to 1902, Superintendent Chapleau, Ont.; 1902 to Nov., 1903, Superintendent North Bay, Ont.; Nov., 1903, to Feb., 1908, Superintendent, District 2, Ontario Division; Feb., to June, 1908, relieving General Superintendent, at North Bay, Ont., and Montreal; June, 1908, to Sept. 30, 1910, General Superintendent, Eastern Division, Montreal; Sept. 30, 1910, to July 15, 1913, General Superintendent of Transportation, Eastern Lines, Montreal.

R. A. GAMBLE, who has been appointed General Yardmaster, C.P.R., Winnipeg, was born at Dublin, Ireland, Mar. 1, 1876, and entered C.P.R. service Feb. 1, 1901, since when he has been, to May 15, 1903, checker, Winnipeg; May 15, 1903, to Feb. 11, 1904, chief night yard clerk, Winnipeg; Feb. 11, 1904, to Oct. 15, 1906, chief clerk to General Yardmaster, Winnipeg; Oct. 15, 1906, to Sept. 11, 1907, Assistant Yardmaster, Winnipeg; Sept. 11 to Nov. 25, 1907, Night Yardmaster, Winnipeg; Nov. 25, 1907, to Jan. 26, 1908, chief clerk, Car Service Department, Western Lines, Winnipeg; Jan. 26, 1908, to Apr. 1, 1910, Inspector, Refrigerator Service, Western Lines, Winnipeg; Apr. 1, 1910, to May 1, 1911, Fuel Agent, Alberta Division, Calgary; May 1, 1911, to July 1, 1912, Car Service and Fuel Agent, Saskatchewan Division, Moose Jaw; July 1, 1912, to July 1, 1913, Assistant General Yardmaster, Winnipeg. Prior to entering railway service, he was engaged in water transportation service, in various capacities, from deck hand to chief mate.

D. C. COLEMAN, who has been appointed General Superintendent, Alberta Division, C.P.R., Calgary, was born at Carleton Place, Ont., July 9, 1879, and entered C.P.R. service, Nov., 1899, since when he has been, to Jan., 1900, stenographer, Assistant Engineer's office, Fort William, Ont.; Jan. to July, 1900, secretary to Superintendent, Fort William, Ont.; July to Sept., 1900, secretary to General Superintendent, Winnipeg; Sept., 1900, to Feb., 1901, secretary to Superintendent, Fort William, Ont.; Feb. to Mar., 1901, secretary to Superintendent, Cranbrook, B.C.; Mar., 1901, to May, 1902, chief clerk, Superintendent's office,

Cranbrook, B.C.; June 1, 1902, to Apr., 1903, chief clerk, General Superintendent's office, Lake Superior Division, North Bay, Ont.; Apr., 1903, to Feb., 1904, General Superintendent's accountant, Lake Superior Division, North Bay, Ont.; Feb., 1904, to Mar., 1907, chief clerk, General Superintendent's office, Central Division, Winnipeg; Mar. to June, 1907, chief clerk, Assistant General Manager's office, Western Lines, Winnipeg; June, 1907, to Nov. 30, 1908, Superintendent, District 3, Pacific Division, Nelson, B.C.; Nov. 30, 1908, to Feb. 14, 1912, Superintendent of Car Service, Western Lines, Winnipeg; Feb. 14 to Mar. 25, 1912, acting General Superintendent, Manitoba Division, Winnipeg; Mar. 25 to Apr. 1, Superintendent of Car Service, Western Lines, Winnipeg; Apr. 1 to July 15, General Superintendent, Manitoba Division, Winnipeg.

ALFRED PRICE, who has been appointed Assistant General Manager, Eastern Lines, C.P.R., Montreal, was born at Toronto, Dec. 6, 1861, and entered railway service, Sept., 1879, since when he has been, to 1881, operator, messenger and clerk, Credit Valley Ry.; 1881 to 1882, car accountant, same road, Toronto. He remained with the C.P.R. when it took over the Credit Valley Ry. in 1882, since when he has been, to 1884, operator and relief dispatcher, Toronto; 1884 to July, 1888, dispatcher, Toronto; July, 1888 to May, 1896, car distributor, Toronto; May, 1896 to Aug., 1898, car distributor and Chief Dispatcher, Toronto; Aug., 1898, to May, 1901, Superintendent, Toronto; May, 1901, to Sept., 1902, Superintendent, Districts 8 and 9, Toronto; Sept., 1902 to May, 1903, Superintendent, Districts 10 and 11, Toronto; May, 1903 to 1905, Superintendent, Fort William, Ont.; 1905 to Feb., 1907, Superintendent of Transportation, Western Lines, Winnipeg; Feb. to Dec., 1907, General Superintendent, Central Division, Winnipeg; Dec., 1907, appointed General Superintendent, Western Division, Calgary, Alta., and in July, 1910, when the Western Lines were reorganized into four, instead of three, grand divisions, he was appointed General Superintendent, Alberta Division, Calgary.

Birthdays of Transportation Men in August.

Many happy returns of the day to:—
 V. T. Bartram, ex-Purchasing Agent, Timiskaming and Northern Ontario Ry., now of Toronto, born at Ottawa, Aug. 2, 1880.
 W. E. Bishop, ex-General Agent, Niagara Navigation Co., Hamilton, Ont., born at Brantford, Ont., Aug. 10, 1868.
 J. F. Chapman, Manager, Thousand Islands Ry., and Oshawa Ry., Gananoque, Ont., born at Frankford, Hastings Co., Ont., Aug. 25, 1863.
 A. E. H. Chesley, General Accountant, Dominion Atlantic Ry., Kentville, N.S., born near Annapolis Royal, N.S., Aug. 27, 1877.
 A. B. Chown, Travelling Passenger Agent, G.T.R., Pittsburgh, Pa., born at Belleville, Ont., Aug. 4, 1887.
 C. H. N. Connell, Engineer Maintenance of Way, Canadian Northern Quebec and Quebec and Lake St. John Rys., Quebec, born at Woodstock, N.B., Aug. 26, 1876.
 F. Barlow Cumberland, ex-Vice President, Niagara Navigation Co., Port Hope, Ont., born at Portsmouth, Eng., Aug. 5, 1846.
 E. L. Desjardins, Assistant Superin-

tendent, Montreal and Ste. Flavie District, Intercolonial Ry., Riviere du Loup, Que., born at St. Jean Port Joli, Que., Aug. 1, 1859.

F. L. Ellingwood, Superintendent Building Construction, C.P.R., Montreal, born at Eastport, Me., Aug. 6, 1863.

G. H. Ham, Publicity Department, C.P.R., Montreal, born at Trenton, Ont., Aug. 23, 1847.

W. P. Hinton, General Passenger Agent, G.T.P.R., Winnipeg, born at Hintonburg, Ont., Aug. 30, 1871.

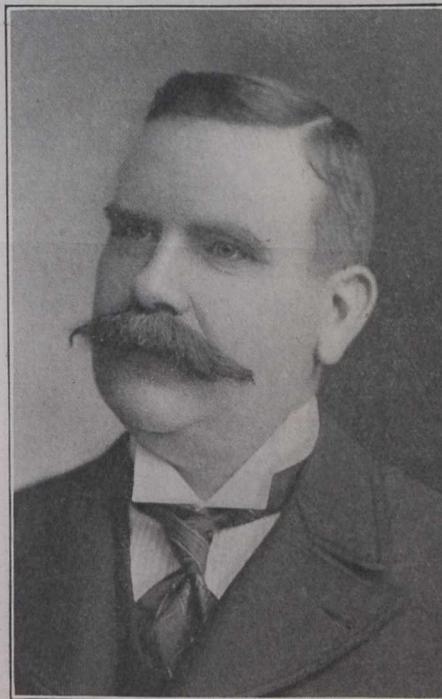
R. Kerr, ex-Passenger Traffic Manager, C.P.R., born at Toronto, Aug., 1845.

E. Lait, General Yardmaster, Winnipeg Joint Terminals, born at Toronto, Aug. 23, 1889.

J. D. McDonald, Assistant General Passenger Agent, G.T.R., Chicago, Ill., born at Toronto, Aug. 27, 1855.

T. McHattie, Master Mechanic, Eastern Division, G.T.R., Montreal, born at Dufftown, Banffshire, Scotland, Aug. 8, 1854.

M. K. McQuarrie, Resident Engineer, District 1, British Columbia Division,



The Late G. H. Eaton.

C.P.R., Revelstoke, born at Sault Ste. Marie, Ont., Aug. 17, 1884.

J. A. Marsh, Trainmaster, British Columbia Electric Ry., New Westminster, B.C., born at Dresden, Ont., Aug. 16, 1876.

J. M. Maver, Contracting Freight Agent, Northern Pacific Ry., Montreal, born at Toronto, Aug. 9, 1884.

W. J. Meakin, Locomotive Foreman, C.P.R., Castor, Alta., born at Toronto, Aug. 22, 1869.

C. Montgomery, Master Mechanic, Pere Marquette Rd., St. Thomas, Ont., born near London, Ont., Aug. 29, 1860.

W. E. Mullins, General Manager, Costa Rica Division, United Fruit Co., San Jose, Costa Rica, born at Stratford, Ont., Aug. 13, 1870.

F. H. Phippen, K.C., General Counsel, C.N.R., Toronto, born at Belleville, Ont., Aug. 26, 1862.

W. M. Porteous, Freight Agent, C.P.R., St. Louis, Mo., born at Edinburgh, Scotland, Aug. 3, 1857.

J. F. Richardson, Superintendent Telegraphs, British Columbia Division C.P.R.,

Vancouver, born at Granby, Que., Aug. 23, 1861.

W. G. Ross, Chairman Montreal Harbor Commissioners, born at Montreal, Aug. 6, 1873.

W. Le B. Ross, Local Treasurer, G.T. Pacific Ry., Winnipeg, born at Ottawa, Ont., Aug. 9, 1868.

Major Salt, Car Foreman, C.P.R., Toronto, born at Lichfield, Eng., Aug. 12, 1859.

F. C. Salter, European Traffic Manager, G.T.R., and Canadian Ex. Co., London, Eng., born at Sarnia, Ont., Aug. 31, 1863.

C. R. Scoles, General Manager, Quebec Oriental Ry., New Carlisle, Que., born at Grantham, Lincoln, Eng., Aug. 27, 1856.

S. A. Simpson, Superintendent, Sleeping, Dining and Parlor Cars and News Service, Alberta Division, C.P.R., Calgary, born at Toronto, Aug. 22, 1880.

W. Stitt, General Passenger Agent, C.P.R., Eastern Lines, Montreal, born in Kirkcudbrightshire, Scotland, Aug. 3, 1855.

J. F. Sweeting, Industrial Agent, Natural Resources Department, C.P.R., Calgary, Alta., born at Worthing, Eng., Aug. 20, 1872.

W. F. Taylor, General Storekeeper, Intercolonial Ry., Moncton, N.B., born at Hillsboro, N.B., Aug. 20, 1855.

R. L. Thompson, ex-District Passenger Agent, C.P.R., Toronto, born at Montreal, Aug. 17, 1873.

Capt. F. J. Thomson, s.s. Royal George, Canadian Northern Steamships, Ltd., born in Cheshire, Eng., Aug. 20, 1876.

F. E. Warren, Division Car Foreman, Ontario Division, C.P.R., West Toronto, Ont., born at Chelsea, Que., Aug. 29, 1872.

W. B. Way, Superintendent District 1, Eastern Division, C.P.R., Farnham, Que., born at Bowmanville, Ont., Aug. 22, 1867.

E. H. Williams, Locomotive Foreman, Canadian Northern Ry., Brandon, Man., born at West Toronto, Ont., Aug. 26, 1844.

Railway Route Maps Approved.

The Minister of Railways approved the following railway route maps, July 2:—
 Canadian Northern Ry., revision of Regina-Red Deer line from Tp. 26, r. 23, w. 3 m., to Alsask, 42.92 miles.

Canadian Pacific Ry., from Snowflake westerly, 9.1 miles; and Lake Winnipeg extension of West Selkirk Branch, from Gimli north, 26 miles.

Grand Trunk Pacific Ry., Prince Rupert westerly from mileage 2.25 to 3.23.

Moncton and Northumberland Strait Ry., from Richibucto to Loggieville, about 40 miles.

Canadian Irrigation Association at Lethbridge, Alta.—The seventh annual meeting of this association will be held at Lethbridge, Alta., Aug. 5, 6 and 7. The pioneer irrigation system on a large scale in Western Canada was started in 1900 in connection with what afterwards became the Alberta Ry. and Irrigation Co., now owned by the C.P.R. This was known as the Lethbridge system; it operates 250 miles of canals and ditches. J. S. Dennis, Calgary, Assistant to the President, C.P.R., is Vice President and Chairman of the executive committee of the association. Among those who will speak at the meetings will be L. O. Armstrong, Colonization Agent, C.P.R., and J. G. Rutherford, Superintendent of Agriculture and Animal Industry, C.P.R.

Transportation Appointments Throughout Canada.

Allan Line Steamship Co.—G. E. BUNTING, heretofore Travelling Agent, Toronto, has been appointed General Western Freight Agent, Allan Line Steamship Co., and Manager, Allan and Co., General Agents, Passenger Department, same line, at Chicago, Ill., vice E. Francis, retired. Office, 127 North Dearborn St.

Canadian Government Railways.—C. A. HAYES, heretofore Freight Traffic Manager, G. T. R., Montreal, has been appointed General Traffic Manager, Canadian Government Railways, vice E. Tiffin, assigned to other duties in Toronto. Office, Moncton, N. B.

S. L. SHANNON, heretofore Comptroller and Treasurer, Intercolonial Ry., has been appointed Comptroller and Treasurer, Canadian Government Railways. Office, Moncton, N. B.

C. B. BROWN, A.M. Can. Soc. C.E., heretofore Principal Assistant Engineer, Eastern Lines, C. P. R., Montreal, has been appointed Chief Engineer, Intercolonial Ry., and Prince Edward Island Ry., as reported in our last issue. Office, Moncton, N. B.

Canadian Northern Ry.—F. J. CREIGHTON has been appointed Travelling Passenger Agent, Winnipeg, vice A. I. Daniels, transferred.

A. I. DANIELS, heretofore Travelling Passenger Agent at Winnipeg, has been appointed City Ticket Agent at Regina, Sask.

J. W. EATON, heretofore Assistant Station Master at Winnipeg, has been appointed Station Master at Edmonton, Alta.

D. G. MADILL has been appointed station ticket agent at Edmonton, Alta.

Canadian Pacific Ry.—A. PRICE, heretofore General Superintendent, Alberta Division, Calgary, has been appointed Assistant General Manager, Eastern Lines. Office, Montreal. This is a new position.

A. A. GOODCHILD, heretofore Auditor of Stores and Mechanical Accounts, has been appointed General Storekeeper, Lines East of Fort William, Ont., vice M. J. Power, deceased. Office, Montreal.

J. W. ORROCK, heretofore Division Engineer, North Bay, Ont., has been appointed Principal Assistant Engineer, Eastern Lines, reporting to the Assistant Chief Engineer, vice C. B. Brown, resigned to enter Canadian Government Railways service. Office, Montreal.

M. A. FULLINGTON, heretofore Assistant Division Engineer, Eastern Division, Montreal, has been appointed Assistant Engineer, Eastern Lines, Montreal.

F. M. RUTTER, heretofore Resident Engineer, Toronto, has been appointed Assistant Division Engineer, Eastern Division, Montreal, vice M. A. Fullington, promoted.

B. S. JENKINS, heretofore General Superintendent of Telegraphs, Western Lines, Winnipeg, will it is reported, be appointed to a new position in the Telegraph Department, at Montreal.

L. O. ARMSTRONG, Colonization Agent, Department of Natural Resources, Montreal, has been appointed to give lectures throughout Canada and the U. S. on the opportunities existing in the Dominion. The lectures will be illustrated by cinematograph views of actual scenes in the Western Provinces, and of the development of the Dominion's natural resources in both Eastern and Western Provinces.

D. M. EWART, heretofore assistant to Resident Engineer, Ottawa, has been appointed Resident Engineer, Toronto, vice F. M. Rutter, promoted.

F. J. BLAINE, heretofore rate clerk, Assistant Passenger Traffic Manager's office, Winnipeg, has been appointed District Passenger Agent, Fort William-Port Arthur District. Office, Fort William, Ont. This is a new position.

W. BLENNERHASSETT, heretofore locomotive driver, Fort William, Ont., has been appointed acting District Master Mechanic, District 1, Manitoba Division, vice W. W. Webster, transferred. Office, Kenora, Ont.

JOHN McMILLAN, heretofore Superintendent of Telegraphs, Manitoba Division, Winnipeg, has been appointed General Superintendent of Telegraphs, Western Lines, vice B. S. Jenkins, assigned to other duties. Office, Winnipeg.

C. MURPHY, heretofore General Sup-



C. Murphy,
General Superintendent, Manitoba Division, Canadian Pacific Railway.

erintendent of Transportation, Eastern Lines, Montreal, has been appointed General Superintendent, Manitoba Division, vice D. C. Coleman, transferred. Office, Winnipeg. The position of General Superintendent of Transportation, Eastern Lines, has been abolished.

A. C. SHAW, heretofore Assistant General Passenger Agent, Western Lines, Winnipeg, has been appointed General Passenger Agent, Western Lines, vice C. B. Foster, promoted. Office, Winnipeg.

R. G. McNEILLIE, heretofore District Passenger Agent, Calgary, Alta., has been appointed Assistant General Passenger Agent, Western Lines, vice A. C. Shaw, promoted. Office, Winnipeg.

F. STEPHENS has been appointed acting General Claims Agent, Western Lines, during the absence of W. H. D'Arcy in Europe. Office, Winnipeg.

T. G. ARMSTRONG, heretofore General Foreman, Winnipeg, has been appointed Assistant Master Car Builder, Western Lines, vice G. H. Eaton, deceased. Office, Winnipeg.

E. M. PAYNE, heretofore Inspector of Telegraphs, Manitoba Division, has been appointed Superintendent of Telegraphs, Manitoba Division, vice J. McMillan, promoted.

D. ENGLAND, heretofore General Yardmaster, Winnipeg, has been appointed acting Trainmaster, there, vice P. F. Weisbrod, transferred, temporarily.

R. A. GAMBLE, heretofore Assistant General Yardmaster, has been appointed General Yardmaster, at Winnipeg, vice D. England, promoted.

J. G. STONE has been appointed Assistant General Yardmaster at Winnipeg, vice R. A. Gamble, promoted.

J. W. DAWSON, heretofore chief clerk to District Passenger Agent, Calgary, Alta., has been appointed chief clerk, Passenger Department, Winnipeg, vice R. Dawson, promoted.

M. J. SCOTT, heretofore District Master Mechanic, District 1, British Columbia Division, Revelstoke, has been appointed Master Mechanic, Saskatchewan Division, vice D. T. Main, transferred. Office, Moose Jaw.

D. C. COLEMAN, heretofore General Superintendent Manitoba Division, Winnipeg, has been appointed General Superintendent, Alberta Division, vice A. Price, promoted. Office, Calgary.

J. G. RUTHERFORD, C. M. G., heretofore Superintendent of Animal Husbandry, has been appointed Superintendent of Agriculture and Animal Industry, Department of Natural Resources. Office, Calgary, Alta.

W. J. ELLIOTT, heretofore Superintendent of Agriculture, Department of Natural Resources, Calgary, Alta., having been appointed Principal of the Agricultural College of Olds, Alta., the duties have been merged with those of Animal Husbandry, as mentioned in the previous paragraph.

P. F. WEISBROD, heretofore Trainmaster, Winnipeg, has been appointed acting Superintendent, Calgary Terminals, Alberta Division, vice C. S. Maharg, on leave of absence.

R. DAWSON, heretofore chief clerk, Passenger Department, Winnipeg, has been appointed District Passenger Agent, Calgary, Alta., vice R. G. McNeillie, promoted.

J. J. ANDERSON, heretofore Travelling Passenger Agent, Toronto, has been appointed District Baggage Agent, Alberta Division, vice W. E. Allinson, transferred. Office, Calgary.

C. H. BOWES, heretofore chief clerk to General Passenger Agent, Vancouver, B. C., has been appointed Assistant General Passenger Agent, Lines West of Revelstoke, B. C. Office, Vancouver, B. C. This is a new position.

D. T. MAIN, heretofore Master Mechanic, Saskatchewan Division, Moose Jaw, has been appointed Master Mechanic, British Columbia Division, vice S. Phipps, retired. Office, Vancouver.

Central Vermont Ry. — JOHN McCRAW, heretofore acting Superintendent, Southern Division, has been appointed Superintendent, and the position of acting Superintendent has been abolished. Office, New London, Conn.

W. BIBBY, heretofore Roadmaster, Grand Trunk Ry., Allandale, Ont., has been appointed Assistant General Roadmaster, C. V. R. Office, St. Albans, Vt.

Delaware and Hudson Co.—JAMES FITZSIMONS, heretofore General Eastern Freight Agent, Albany, N. Y., has been appointed General Canadian Freight and Passenger Agent. Office, Montreal.

Grand Trunk Pacific Coast Steamship Co.—See Grand Trunk Pacific Ry.

Grand Trunk Pacific Ry.—A. E. ROSEVEAR, heretofore Assistant to the Vice President, G. T. R. and G. T. P. R. (Traffic), Montreal, has been appointed General Freight Agent, G. T. P. R. and G. T. P. Coast Steamship Co., with territory Port Arthur, Ont., and west, vice C. E. Dewey, promoted to G. T. R. service. Office, Winnipeg.

F. R. PORTER, heretofore Division Freight Agent, Edmonton, Alta., has been appointed Assistant General Freight Agent, vice R. J. Foreman, transferred to G.T.R. service. Office, Winnipeg.

F. G. ADAMS, heretofore Commercial Agent, Regina, Sask., has been appointed Division Freight Agent, Edmonton, Alta., vice F. R. Porter, promoted.

ALBERT DAVIDSON has been appointed General Agent in charge of Passenger and Freight Traffic in Western British Columbia, north of Rivers Inlet, including Queen Charlotte Islands, G.T.P.R. and G.T.P. Coast Steamship Co., vice A. E. McMaster, promoted. Office, Prince Rupert.

A. E. McMASTER, heretofore General Agent, Prince Rupert, B.C., has been appointed Commercial Agent, Regina, Sask., vice F. G. Adams, promoted.

The following agents have been appointed,—Elie, Man., A. Fullum; Ingelow, Man., J. A. Babin; Quinton, Sask., P. D. Hamilton; South Saskatoon, Sask., H. A. Murphy; Landis, Sask., G. H. LeGallais; Dandurand, Alta., E. B. Elgood; Tete Jaune, B. C., J. L. Strong; Battleford, Sask., J. P. Gillis.

Grand Trunk Ry.—C. E. DEWEY, heretofore General Freight Agent, G. T. P. R. and G. T. P. Steamship Co., Winnipeg, has been appointed Freight Traffic Manager, G. T. R., vice C. A. Hayes, resigned to enter other service. Office Montreal.

R. J. FOREMAN, heretofore Assistant General Freight Agent, G. T. Pacific Ry., Winnipeg, has been appointed Assistant to the Vice President (Traffic), G. T. R. and G. T. P. R., vice A. E. Rosevear, transferred to G. T. P. R. service. Office, Montreal.

W. C. CHISHOLM, K.C., formerly City Solicitor for Toronto, has been appointed General Solicitor, G.T.R. Office, Montreal.

A. E. BECKETT, Solicitor, will, as heretofore, take charge of such matters arising in the Province of Quebec, as may be assigned to him.

W. E. FOSTER, heretofore Assistant Solicitor, Montreal, has been appointed Solicitor, and will take charge of such matters arising in the Province of Ontario, as may be assigned to him.

J. H. FARRAR, heretofore chief clerk to Storekeeper, Montreal, has been appointed Storekeeper, there, vice H. Clarke, retired under the pension rules.

C. J. O'DOHERTY, heretofore chief clerk to Storekeeper, Ottawa, has been appointed Storekeeper, there, vice E. J. McVeigh, promoted.

A. C. O'NEIL, heretofore chief clerk to General Agent, Sarnia, Ont., has been appointed Travelling Freight Agent, London, Ont.

The following agents have been appointed,—Noyan Jct., Que., P. W. Marier; Beaverton, Ont., J. G. Holman; Goodwood, Ont., W. T. Byam; Sutton, Ont., R. G. Winters; Trout Creek, Ont., I. B. Musselman; Terra Cotta, and Cheltenham, Ont., F. J. Jones; Tottenham, Ont., H. J. Quinlan; Glen Huron and Nottawa, Ont., F. C. Prosser; Thamesville, Ont., J. W. Miller; Walkerville and Windsor,

Ont., A. R. Huston; Bridgeburg, Fort Erie, Ont., and Black Rock, N. Y., S. V. Beck; Dunnville, Ont., S. Young; Norwich, Ont., F. W. Lee; Milverton, Ont., J. C. Cunningham; Dalkeith, Ont., R. J. Hardy; Admaston, Ont., E. J. Pepper; Eganville, Ont., J. P. Smith; Kallaloe, Ont., H. W. Lora; Brighton, Ont., (outside), A. Mark.

Intercolonial Ry.—DONALD McDONALD, heretofore Superintendent, Montreal and Ste. Flavie District, Levis, Que., is reported to have been appointed District Passenger Agent at Montreal.

R. COLCLOUGH, heretofore Assistant Superintendent, Moncton, N. B., has been appointed Superintendent, Montreal and Ste. Flavie District, vice D. McDonald, transferred. Office, Levis, Que.

Napierville Jct. Ry.—See Quebec, Montreal and Southern Ry.

Prince Edward Island Ry.—See Canadian Government Railways.

Quebec, Montreal and Southern Ry.—JAMES FITZSIMONS, heretofore General Eastern Freight Agent, Delaware and



D. T. Main, Master Mechanic, British Columbia Division, Canadian Pacific Railway.

Hudson Co., Albany, N. Y., has been appointed General Manager, Q. M. & S. R. and Napierville Jct. Ry. Office, Montreal.

Southern New England Ry.—H. C. ESTEP, Engineer of Construction, having resigned to enter another company's service, the position has been abolished.

H. A. PHELPS has been appointed Division Engineer, vice T. I. Ellis, resigned. Office, Providence, R.I.

The Board of Railway Commissioners has passed an order requiring the Quebec Oriental Ry. to add to its equipment by Dec. 31, two new locomotives capable of carrying at least 160 lbs. steam pressure to the square inch, and also if, after hydrostatic tests, the boilers of its present locomotives be found incapable of carrying similar steam pressure, it shall purchase at least four additional boilers for its 17 by 24 in. class of locomotives, capable of carrying such pressure.

Canadian Northern Railway Earnings, Etc.

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

	Gross Earnings	Expenses	Net Earnings	Increase
July	\$1,829,700	\$1,335,100	\$494,600	\$133,000
Aug.	1,745,800	1,375,000	270,800	56,100
Sept.	1,671,500	1,248,000	423,500	4,100
Oct.	2,351,200	1,645,900	705,300	24,000
Nov.	2,509,700	1,631,900	877,800	212,600
Dec.	2,132,000	1,551,000	581,000	77,200
Jan.	1,513,400	1,243,200	270,200	46,500
Feb.	1,398,700	1,130,200	268,500	30,900
Mar.	1,685,900	1,254,400	431,500	4,700
Apr.	1,745,300	1,242,200	503,100	100,000
May	2,218,400	1,638,200	580,200	122,100
	\$20,801,600	\$15,295,100	\$5,506,500	\$812,100
Incr.	\$3,032,500	\$2,220,400	\$812,100	.....

Average mileage operated during 1913, 4,297, against 3,851 in the previous year.

Approximate earnings for June, \$2,178,200, against \$1,769,500 for June, 1912.

Canadian Pacific Railway Earnings, Etc.

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

	Gross Earnings	Expenses	Net Earnings	Increase or Decrease
July	\$12,052,398.58	\$7,604,221.68	\$4,448,176.90	\$745,148.5
Aug.	12,251,715.87	7,533,790.21	4,717,925.66	642,354.65
Sept.	11,579,733.88	7,329,430.13	4,250,303.85	332,857.05
Oct.	13,000,337.80	7,909,510.61	5,090,827.19	379,782.44
Nov.	12,362,666.42	8,104,527.38	4,258,139.04	270,772.55
Dec.	12,219,278.72	7,823,559.21	4,395,719.51	289,989.25
Jan.	9,679,607.39	8,017,233.61	1,662,373.78	579,516.08
Feb.	9,747,685.55	7,227,616.21	2,520,069.34	136,202.67
Mar.	11,111,892.78	7,256,475.89	3,855,416.89	137,015.78
Apr.	11,750,913.45	7,805,835.90	3,945,077.55	x170,674.24
May	11,904,979.02	8,400,949.16	3,504,029.86	176,485.37
	\$127,721,269.56	\$85,103,149.99	\$42,618,119.57	\$3,166,479.43
Incr.	\$15,713,125.53	\$12,546,646.10	\$3,166,479.43	.....

x Decrease.

Approximate earnings for June, \$11,187,000, against \$10,848,000 for June, 1912.

Commencing with July 1, the mileage under operation was increased to 11,565.

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 May, as compared with those for same period in 1912:—

	1913.	1912.
Earnings	\$3,867,600	\$3,366,300
Expenses	2,668,400	2,359,300
Net earnings	\$1,199,200	\$1,007,000

	1913.	1912.
Earnings	\$212,600	\$202,100
Expenses	222,000	204,400
Deficit	\$9,400	\$2,300

	1913.	1912.
Earnings	\$635,900	\$557,400
Expenses	598,000	441,300
Net earnings	\$37,900	\$116,100

	1913.	1912.
Earnings	\$197,900	\$177,500
Expenses	247,450	173,600
Net earnings	x\$49,550	\$3,900

x Deficit.

Approximate earnings for June, \$5,048,541, against \$4,453,475 for June, 1912.

The mileage in operation during the year, was 4,533, the same as the previous year.

TRAFFIC RECEIPTS OF THE SYSTEM.

	1913	1912	Increase
G.T.R.	\$21,218,906	\$18,605,290	\$2,613,607
C.A.R.	1,451,877	1,046,130	105,747
G.T.W.R.	3,642,800	3,202,444	440,356
D.G.H. & M.R.	1,143,189	1,017,870	125,310
Totals	\$27,156,781	\$23,871,752	\$3,285,029

Grand Trunk Pacific Railway Earnings.

The earnings of the Prairie Section and Lake Superior Branch for June, were \$504,065, and the aggregate earnings for six months ended June 30, were \$2,659,678.

The Victoria and Sidney Ry., a subsidiary of the Great Northern Ry. (U.S.), is reported to have acquired a gas electric car, for operation between Victoria and Sidney, B.C.

The Canadian Pacific Railway High Level Bridge at Edmonton.

The accompanying illustration shows the bridge recently completed by the C.P.R. over the North Saskatchewan River between Edmonton and South Edmonton, Alta. It is a steel span structure 2,500 ft. long from face to face of bal- last walls of the end abutments. This distance is made up of three 288 ft. centre spans across the river, 10 tower spans each from 30 to 50 ft. long, and 14 open spans each from 30 to 100 ft. long. The main spans over the river are supported on concrete piers which measure approximately 115 ft. from the base of rail to the footing, the latter in one instance extending to a depth of approximately 40 ft. below the river surface. The approach trestles on each bank are carried on concrete pedestals built up on concrete piling.

The bridge is to carry steam and elec-

Buildings on the Campbellford, Lake Ontario and Western Railway.

The contract for the erection of all the buildings on this new line from Glen Tay to Agincourt, Ont., which is being built for the C.P.R., has been let to the John S. Metcalf Co., Ltd., Montreal, as stated in our last issue. It is intended to have all the buildings completed and the line opened for traffic this year.

The buildings to be erected at Trenton, the divisional point, include, station class A, 23 by 89 ft.; standard no. 1 freight shed, 40 by 128 ft.; standard no. 1 enclosed tank of 40,000 gals. capacity; standard no. 2 single tool house, 10 by 14 ft.; 80 ft. turntable; standard no. 4 store and oil house, 30 by 30 ft.; 12 stall locomotive house; machine and boiler house; two track coaling plant, 32 by 50 ft.; two track sand house, 44 by 12 ft.; two track ash pit, 35 by 39 ft.; ice house, 30 by 300 ft.; and 10 in. stand pipe. Stand-

ft. The station at Parham will be of a special plan.

Standard no. 1 enclosed water tanks will be built at Crow Lake, Wilkinson, Roblin, Colborne, Cobourg, Newtonville, Bowmanville, Agincourt, and Whitby.

Standard no. 1 freight sheds, 40 by 128 ft., will be built of wood on concrete foundations at Belleville, Brighton, Cobourg, Port Hope, Bowmanville, Oshawa and Whitby.

The other buildings consist of single and double tool houses, and other structures.

Eastern Railway Companies Cancel Cartage Tariffs.

The railway companies operating east of Port Arthur have announced that they have decided to cancel all cartage agreements under which they have heretofore delivered freight at consignees' warehouses, and that on and after Oct.



Canadian Pacific Railway High Level Bridge at Edmonton Alta.

tric railway and vehicular traffic. The railway deck on the top of the structure carries three tracks, one for C.P.R. trains and the other two for electric railway service. The roadway deck is located 20 ft. below the railway tracks, and consists of a reinforced concrete roadway 23 ft. wide, paved with wood, in addition to which there are two side paths 8 ft. wide supported on cantilever brackets.

The highways and electric line approach the bridge from Saskatchewan Ave., on the Edmonton side, and from Anthony St. on the South Edmonton side. The C.P.R. tracks on the Edmonton side are carried across Victoria and MacKay Aves. on reinforced concrete structures, and across Saskatchewan and Jasper Aves. on steel structures. On the South Edmonton side Anthony St. is carried over the railway tracks on a reinforced concrete bridge.

The Dominion Parliament voted the C.P.R. as lessees of the Calgary and Edmonton Ry., a subsidy of 15% of the cost of the bridge.

ard station A plan is similar to the new station at West Toronto, built of brick on concrete foundations, with slate roof and interior finish of natural wood.

The passenger stations at Cobourg and Oshawa will be of the standard plan B, similar to the new station at Orillia, Ont., 28 by 109 ft., of brick on concrete foundations; with slate roofs, and finished on the inside with natural wood. Those at Brighton, Port Hope, Bowmanville and Whitby will be of the standard plan C, similar to the station at Listowel, Ont., 20 by 77 ft. 6 in., of brick on concrete foundations, with slate roof, and interior finish of natural wood.

Standard no. 2 stations will be built at Colborne, Newtonville and Newcastle. These are of wood on concrete foundations, 24 by 91 ft. Standard no. 5 stations will be built at Glen Tay, Christie Lake, Crow Lake, Wilkinson, Roblin, Lonsdale, Shannonville, Grafton and Cherrywood. These are of wood on concrete foundations, and vary in dimensions from 21½ by 67 ft., to 21½ by 77

1 shippers and consignees must make their own arrangements for the cartage of their freight.

Under the present arrangements the railway companies have agreements with certain cartage companies, under which the freight is carted at a fixed schedule of rates, and the railways charge a general rate of 50c a ton, with a minimum of 15c for small or single shipments. The railway companies claim that they have been paying out more for cartage than they have been collecting, and there have also been numerous complaints that the system discriminated in favor of large places against smaller ones which have no cartage system. It is stated that an application will probably be made to the Board of Railway Commissioners in the matter, so that the views of the shippers may be stated as to the effect of the change on general business conditions. Over 20 places, including the principal cities and terminal points, will be affected.

**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.

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.

SUBSCRIPTION PRICES, INCLUDING POSTAGE:
TORONTO AND WEST TORONTO POSTAL DELIVERY, \$1.25 a year.

To other places in CANADA, and to NEW-FOUNDLAND 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, AUGUST, 1913.

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National Transcontinental Railway Construction.

D. MacPherson, Assistant to Chairman, N.T.R. Commission, is reported to have stated on his return from a recent trip of inspection over the line that the only remaining gap where rails are not laid is one of 53 miles between Cochrane, Ont., and Heaney Jct., Que., and that this will be done by the fall. There is no reason, he added, why the whole line could not be ready for operation by the fall of 1914.

R. W. Leonard, Chairman of the Commission, arrived in Cochrane, Ont., July 9, where he met M. Donaldson, Vice President, Grand Trunk Pacific Ry., and started on a trip of inspection over the line west to Winnipeg. The work of finishing up the line between Cochrane and Superior Jct. has been in progress for some time, and it was expected that as the result of this inspection a regular passenger service would be arranged.

Tenders are under consideration for the construction of a car ferry slip at Levis, Que., and for dredging for the same.

The proposed contract between the Commission and the city of Quebec for the construction of workshops at St. Malo, was submitted to the City Council July 11. (July, pg. 336.)

Grand Trunk Pacific Railway Construction.

Work on the main line is reported to be progressing satisfactorily. Track has been laid to 1,137 miles west of Winnipeg, or about 380 miles from Trout Creek, B.C., to which point the track laying gang has worked eastward from Prince Rupert. An additional track laying equipment has been sent to work westwards. Work has been started by the Bates-Rogers Construction Co., Chicago, Ill., on the bridge across the Fraser River at Fort George. Application is being made to the Minister of Railways for the approval of route plan for an extension of the line at Prince Rupert round the north shore of Kaien Island and along the Shawlwan passage, 3.5 miles.

G. T. P. Branch Lines.—The Board of Railway Commissioners has authorized the opening for traffic of the Biggar-Calgary branch, from Biggar to Dodsland, Alta., 48 miles, at a speed of 20 miles an hour, rescinding the order of Oct. 24, 1911. Track laying has been completed on this branch to mileage 63, and grading has been completed to the Saskatchewan-Alberta boundary, mileage 105.

It is expected to lay steel during this year on the Young-Prince Albert branch, from Wakaw, the present track end, to Prince Albert; and to lay some track on the Cutknife branch.

Tracklaying has been completed on the Tofield-Calgary branch, and it is expected to have the line ballasted and ready for operation right through by Sept. 1. (July, pg. 336.)

Railway Rolling Stock Notes.

The Canadian Northern Ry. has ordered five electric lighted first class cars, from Canadian Car and Foundry Co.

The Intercolonial Ry. has ordered 20 box baggage cars and 10 vans from its Moncton shops, and has received 8 vans from its Moncton shops, 1 Hart convert-

ible car, built by the Canadian Car and Foundry Co., from the Hart-Otis Car Co., and 1 freight locomotive from Canadian Allis-Chalmers, Ltd.

It is anticipated that delivery of the 2,000 steel underframe box cars which the G.T.R. recently ordered from the Eastern Car Co., will be commenced during August.

The Timiskaming and Northern Ontario Ry. has ordered two complete steel passenger trains, to be built by the Pullman Co., Chicago, Ill., for delivery next year.

The Canadian Car and Foundry Co. has received orders from the Canadian Northern Ry. for five first class passenger cars, and from F. H. Hopkins and Co. for one 30 ton Lidgerwood car.

The Kettle Valley Ry. has ordered one Rodger double plough distributing car, from Hart-Otis Car Co. Following are the chief dimensions:—

Capacity	30 tons.
Length over end sills	32 ft.
Width over side sills	8 ft. 9 ins.
Height from rail to floor	4 ft. 1 1/4 ins.
Truck centres	23 ft. 8 ins.
Wheel base of truck	5 ft. 2 ins.

The Grand Trunk Pacific Ry. has received 10 colonist cars, nos. 3043 to 3052; 2 pay cars, nos. 4106 and 4107; one mail car, no. 110; 7 mail and express cars, nos. 117 to 123, and 5 sleeping cars, from Canadian Car and Foundry Co. The sleeping cars are named, Canterbury, Calcutta, Cardiff, Cape Colony and Cambridge.

The Canadian Northern Ry., between June 14 and July 15, received the following additions to rolling stock:—200 box cars, from Canadian Car and Foundry Co.; 200 flat cars, from Crossen Car Co.; 50 Hart cars, from Hart-Otis Car Co.; 40 refrigerator cars, from Mount Vernon Car Co.; 180 box cars, from Nova Scotia Car Works; 5 consolidation locomotives, from Canadian Locomotive Co.; and 2 consolidation locomotives, from Canadian Allis-Chalmers, Ltd.

The Algoma Steel Corporation has ordered 19 special Otis type all steel general service cars, from the Hart-Otis Car Co. These cars will be built by the Canadian Car and Foundry Co., and will be specially and heavily constructed to take care of the hard service for which they are intended. Following are the principal dimensions:—

Capacity	100,000 lbs.
Length over end sills	38 ft. 9 ins.
Length inside	36 ft. 9 1/2 ins.
Width overall	9 ft. 1 1/4 ins.
Width inside	9 ft. 6 ins.
Height	5 ft.
Height from rail	9 ft. 4-13/16 ins.
No. of doors on each side	6

Pacific Coast Claims Agents.—The annual meeting of this association, representative of the claims agents of the steam and electric railways operating on the Pacific Coast, was held at Vancouver, B.C., July 10 to 12. The British Columbia Electric Ry. Co. entertained the members of the association and their wives in various ways during the visit, terminating at a banquet at which A. E. Beck, the company's Claims Director, presided. The officers were elected:—President, J. H. Handlon, San Francisco, Cal.; First Vice President, T. J. Aston, Spokane, Wash.; Second Vice President, A. M. Lee, Seattle, Wash.; Third Vice President, G. N. Smith, Portland, Ore.; Secretary-Treasurer, E. H. Odell. The nominating committee placed the name of Mr. Beck, of the B.C.E.R. Co., before the convention, but he declined on the ground of not being in the centre of business for the Pacific Coast.

Extensions and Alterations at C. P. R. Winnipeg Station and Hotel.

The accompanying illustration shows the C.P.R. station and Royal Alexandra Hotel at Winnipeg as they will be when the alterations and extensions now being made are completed. These alterations and extensions will largely change the appearance of the existing buildings. The improvements being made will be an addition to the hotel which will add 184 rooms, not 474 as stated in daily press reports, to its accommodation; a new six story building will replace the present baggage room and Dominion Express Co.'s offices; there will be considerable extensions to the present station and waiting rooms, and in the train shed the tracks will be raised six feet, and the Main St. subway is to be raised to a corresponding height and widened to permit of the installation of two additional tracks.

The internal improvements to the hotel will give two additional elevators for baggage; and additional elevators for guests; the addition of a ball room 100 by 40 ft.; a banquet room of similar dimensions, and 10 private dining rooms.

The station accommodation will be rearranged so as to provide special waiting rooms for immigrants; a complete rearrangement of the space allotted for the handling and checking of baggage, and the construction of a subway with

(26) Declaring that the word "railway" in the preceding sections shall include "any steam or electric railway, street railway or tramway."

(27) Provides that "upon the application of not less than 50 owners of real estate in any district in which a street railway is being operated, or of an adjoining district asking for an order of the Board for the extension of the said railway," the Board may, after an inquiry, make such order as the public interests may require.

(28) For refusing or neglecting to obey such order a penalty of \$25 a day is provided, which may be enforced under the terms of sec. 6, chap. 55, 1 Geo. V.

Intercolonial Railway Betterments and Extensions.

Following the return to Ottawa of the Minister of Railways from his recent trip of inspection over the Intercolonial Ry., press reports stated that important plans for the improvement of the line had been decided on. These were said to involve the building of a second track from Moncton, N.B., to Halifax, N.S., where new deep water terminals are to be built, and the improvement of the entire line in respect of gradients and curvature. We have been officially advised that these reports are merely newspaper talk.

A short description of the new terminals was given on pg. 264 of our June issue.

In connection with the new deep water terminal plans F. W. Cowie, who advised the Government on the matter, said that after consultation with various authorities it was decided that it was necessary to provide accommodation for nine ocean going vessels at once; for nine additional vessels in about three or four years, and for a further nine vessels after the opening of the Quebec bridge, with a corresponding increase in the railway accommodation at the same time. Having these requirements as a guide all possible locations were considered and it was finally decided to adopt George's Island Bay as the site for the new terminals. With an excellent approach through Fairview to the harbor site from a railway point of view, it was then necessary to lay out as most suitable, in consideration of the physical features of the location, the type and design of harbor development which has been decided upon. It was found that a union station could be located within half a mile of the centre of the city, with excellent streets leading from the station to all city points. It was found that by building a bulkhead wharf along the narrower waterfront 2,000 feet of bulkhead quay could be provided so as to give the very best possible harbor accommodation.

The most important construction work going on is the building of the line from



Canadian Pacific Railway Station and Royal Alexandra Hotel, Winnipeg, as They Will Appear When Extensions Contracted for Are Completed.

connecting stairways between the hotel and the station.

The work is being carried out by Westinghouse, Church, Kerr and Co., whose local representative is E. J. Brinkherhoff. F. Lee, Principal Assistant Engineer, is in charge for the C.P.R.

The New Brunswick Public Utilities Commission Act.

The powers of the Public Utilities Board appointed in 1910, have been extended by the New Brunswick Legislature. The new sections of the act are 23 to 27 inclusive, and provide as follows:—

(23) Authorizing the Board to make orders for the joining of the tracks of two or more railways chartered by the New Brunswick Legislature and entering any municipality where necessary for the proper interchange of traffic, and providing penalties for neglecting to obey the order.

(24) Granting similar power in case of the intersection of a line chartered by the New Brunswick Legislature with a line chartered by the Dominion Parliament.

(25) Authorizing the Board to act in conjunction with the Board of Railway Commissioners in applications under Dec. 24.

In a recent interview F. P. Gutelius, General Manager, said the aim of the present management was to create a 0.6% gradient on the line right through to Halifax and Sydney, and that the change to this gradient would be effected at the rate of about 100 miles of line a year. Following up this report we are officially advised that surveys are now being made for grade revision on the Cape Breton line, from Point Tupper to Sydney, 91 miles, and that the surveys have been so far completed that it appears that a gradient of 0.6% will be secured in both directions. It is also proposed to build a second track from Levis to Chaudiere Jct., Que., nine miles, and a diversion from Derby Jct., to Nelson, N.B., which will shorten the line into Fredericton by about three miles.

We are officially advised that a contract has been let to the Cook Construction Co., of Sudbury, and Andrew Wheaton, of Amherst, N.S., for the building of a double track line from Rockingham to the new ocean terminals at Halifax, N.S. The estimated cost of this work is \$1,500,000, and it is to be completed within two years. This piece of line will be about five miles long and will be known for bookkeeping purposes as the Halifax Terminal Ry. The construction will involve a good deal of excavation, the material from which will be used in filling on the work at the new deep water dock.

Dartmouth to Upper Musquodoboit, 67 miles. The maximum gradient is generally 1%, but there is one stretch of 7,000 ft. where the gradient is 1.20%. With the exception of one curve of eight degrees, the maximum curvature is six degrees; all curves sharper than two degrees were spiralled before grading commenced. There are 36 steel structures, and one steel viaduct. The viaduct consists of one span of 70 ft. and two of 40 ft. each, while the dimensions of the bridges are as follows:—Two of 125 ft. each, one of 115 ft., one of 75 ft., three of 60 ft. each, three of 40 ft. each, one of 30 ft., one of 20 ft., and 24 of 17 ft. each. We are officially advised that 75% of the grading and 50% of the masonry has been completed and that 10 miles of track has been laid. It is expected to have 50 miles of track laid by the end of the year, and to have the line completed during 1914. The general contract was let to M. P. and J. T. Davis, Quebec, who sublet the entire work to Cavicchi and Pegano. W. A. Hendry, A.M. Can. Soc. C.E., is engineer in charge of construction. (July, pg. 334.)

A contract for the construction of the first unit of the Davidson and Smith elevator at Fort William, has been let to the Barnett and McQueen Co. for \$358,000. It is stated that work will be started at once

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:—

Interswitching at Belleville, Ont.

19481. June 2. Re application of City of Belleville, Ont., and The Graham Co., Ltd., for an order directing the Grand Trunk and Canadian Northern Ontario Railway Companies to furnish interswitching facilities between their respective railways at Belleville. It is ordered that the tracks of the C.N.O.R. and G.T.R. Companies at Belleville be so connected as to provide for the reasonable receiving, forwarding, delivering, and interswitching of traffic between their respective railways; the C.N.O.R. Co. to file, within 15 days from date, plans showing proposed connection and interchange tracks, located on the south side of Wharf St., leading from the said Company's tracks to the Canada Steel Co.'s plant, and connecting with the G.T.R. tracks leading to the said plant near George St.; and that the work be proceeded with, and proper facilities afforded for the receiving, forwarding, delivering, and interswitching of traffic between the said railways, within 30 days after the approval of the plans by the Board, upon the city consenting to tracks being laid on Wharf St. The apportionment of cost of said work is reserved.

Terminal Charges at Kelowna, B.C.

19497. May 15. Re application of Kelowna Board of Trade for an order directing the C.P.R. to discontinue the charge of \$1 made by it on all incoming and outgoing cars delivered from and taken to its car barges. It is ordered that the application be dismissed.

Extension of Cartage Limits at London.

19539. June 9. Re application of the City of London, Ont., for certain extensions to the area in the city within which the railway companies undertake the collection and delivery of freight at the tolls published in their special tariffs of cartage charges. It is ordered that the eastern limit of the area within which the railway companies undertake the cartage of freight in London, at the toll therefor published and filed, be extended to, and including, Ashland Ave.; and that the southern limit of the area be extended so as to include Adelaide St. south of the River Thames to Terrace St. and Terrace St. westwardly, to, and including, the factory of the Richards-Wilcox Canadian Co.; the said eastern extension to be made within 10 days from the issuance of this order, and the said southern extension immediately upon the completion of a permanent pavement thereon.

Slats for Refrigerator Cars.

19570. June 13. Re order 18825, Mar. 5, 1913, made upon the application of the Fruit Growers' Association of Ontario, for an order directing railway companies, inter alia, to furnish refrigerator cars equipped with rack or slatted floors, so as to ensure free circulation of cold or warm air, and to reimburse the cost of such rack or slatted floors when they have to be furnished by the shippers themselves; and directing, with respect to that part of the application, that the Grand Trunk, Grand Trunk Pacific, Canadian Pacific, and Canadian Northern Railway Companies notify the Board, not later than April 15, 1913, what number of their, and each of their, refrigerator cars in service are supplied with slatted floors, and what number are not. Upon

the information having been furnished in compliance with the order, and the reading of the report of the Chief Traffic Officer of the Board, it is ordered that where shippers furnish slats for the floors of refrigerator cars not equipped with permanent slatted or double floors, or for the floors of box cars tendered to and accepted by shippers in lieu of refrigerator cars, for the carriage of fresh fruits, railway companies of Canada shall allow the shipper \$3 a car for the slatting; the shipper to be permitted to deduct the allowance from the freight charges payable by him upon the shipment in such car in which the slatting has been furnished; the shipper's receipt for the amount allowed to be given the railway company's agent at the forwarding station, and to be accepted by him as so much cash in the prepayment of the freight charges on such car.

Ore Rates in British Columbia.

19712. June 30. Re application of Hudson Bay Mining Company, Salmo, B.C., complaining of the rate on ore from Salmo to Nelson charged by Great Northern Railway, as compared with the rate charged by C.P.R. from Nelson to Trail; and that the G.N.R. insists on a shipping valuation of \$100. It is ordered that G.N.R. put into force on shipments of ore, in carloads, from Salmo to Nelson, the following additional rates, viz., \$1.10 a net ton when the valuation does not exceed \$15 a ton, \$1.15 a net ton when the valuation does not exceed \$20 a ton. The said additional rates to be made effective within 30 days from date of this order.

Modification of Rules.

19710. June 27. Re order 18564, Jan. 25, 1913, directing that the effective date of the modification of rule 7 of G.T.R. Special Freight Tariff, C.R.C., no. E. 2374, I.C.C. no. 1660, contained in supplements 5 and 3 thereto, and the modification of rule 33 of the C.P.R. Local Freight Tariff, C.R.C. no. E. 2141, I.C.C. no. E. 1288, contained in supplements 9 and 6 thereto, be postponed pending a hearing of the matter at the sittings of the Board to be held in Toronto, Feb. 7, 1913. At the hearing at the said Toronto sittings, the effective date of the said modification was further postponed until July, 1, 1913, to enable the companies to furnish the Chief Traffic Officer of the Board with further material. And upon the recommendation of the Chief Traffic Officer it is ordered that the effective date of the modification of the rules be further postponed until Aug. 1, 1913.

Transportation of Explosives.

General order 105. May 22. Re general order 100, Jan. 16, 1913, approving regulations for the transportation of explosives by railway companies; and the application on behalf of the railway companies to amend the regulations to provide, under certain conditions, for the haulage of explosives in mixed trains. It is ordered that par. 1666 (1), and the unnumbered par. between pars. 1683 and 1684, pages 23 and 27, respectively, of the regulations, be amended to provide that railway companies, but only on such lines, or portions of lines, on which solid freight trains are not operated, be permitted to carry explosives, the carriage of which is not forbidden by the general order 100, and in accordance with the regulations therein contained, in quantities not exceeding 500 lbs. in any mixed train; the explosives to be contained in but one car, and said car to be so placed in the train that not less than 5 freight cars are between it and the passenger car or cars.

Readjustment of Lumber Tariffs.

In May the C.P.R. appealed to the Governor in Council against the Board of Railway Commissioners' order directing it, the Canadian Northern Ry., and the Grand Trunk Pacific Ry. to adjust lumber tariffs, the application for the order having been made by the Mountain Lumber Association. Since the appeal was lodged conferences have taken place between the parties interested, which have resulted in the Association withdrawing its complaint and the railway companies issuing tariffs which are satisfactory to the Board.

Among the Express Companies.

F. M. Smith, heretofore route agent, Canadian Ex. Co., Winnipeg, has been appointed agent there, vice F. Norman, promoted.

F. Norman, heretofore agent, Canadian Ex. Co., Winnipeg, has been appointed Superintendent, Northwestern Division, vice N. J. Ross, transferred to Montreal Office, Winnipeg.

N. J. Ross, heretofore Superintendent, Northwestern Division, Canadian Ex. Co., Winnipeg, has been appointed Superintendent, Eastern Division, Montreal, vice P. A. Paterson, resigned.

N. J. Ross, who has been appointed Superintendent, Eastern Division, Canadian Ex. Co., Montreal, entered Canadian Ex. Co.'s service in 1885 at Orillia, Ont. He was appointed Superintendent at Montreal in 1907, and in 1908 was transferred to Winnipeg to establish the company's system over the Grand Trunk Pacific Ry.

The Board of Railway Commissioners has approved the Dominion Ex. Co.'s Schedules, B, C.R.C. 4345, to supersede C.R.C. 2583; C, C.R.C. 4346, to supersede C.R.C. 2584, and D, C.R.C. 4347, to supersede C.R.C. 2585, approved by order 14418, July 19, 1911; the Canadian Northern Ex. Co.'s schedule B, C.R.C. 791 to supersede C.R.C. 725, approved by order 14418, July 19, 1911; the Canadian Ex. Co.'s schedule B, C.R.C. 1514, to supersede C.R.C. 1364, and C, C.R.C. 1515, to supersede C.R.C. 1365, approved by order 14413, July 19, 1911, and the Great Northern Ex. Co.'s schedules A and B, C.R.C. 298, to supersede C.R.C. 270, approved by order 14417, July 19, 1911.

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

	Acres.
Alberta Central Ry.	27.74
Canadian Northern Alberta Ry.	135.77
Canadian Northern Ry.	81.73
Canadian Northwestern Ry.	25.50
Canadian Pacific Ry.	171.74
Grand Trunk Pacific Branch Lines Co.	67.26
Qu' Appelle, Long Lake and Saskatchewan Rd. and Steamboat Co.	28.83
Total	538.57

The Projected Round the World All Red Route.—A London cablegram of July 15, states that a contract has been signed for the building of a railway from Collooney to Black Sod Bay, County Mayo, Ireland, and for the construction of harbor works at that point. This is part of the project for an all British round the world route, and will be linked up with the Canadian railway system by a steamship service, which the promoters say will make the trip in three and a half days.

The Grand Trunk Ry. Co. has over 60,000 shareholders.

Electric Railway Department.

Electric Locomotives for British Columbia Electric Railway Freight Service.

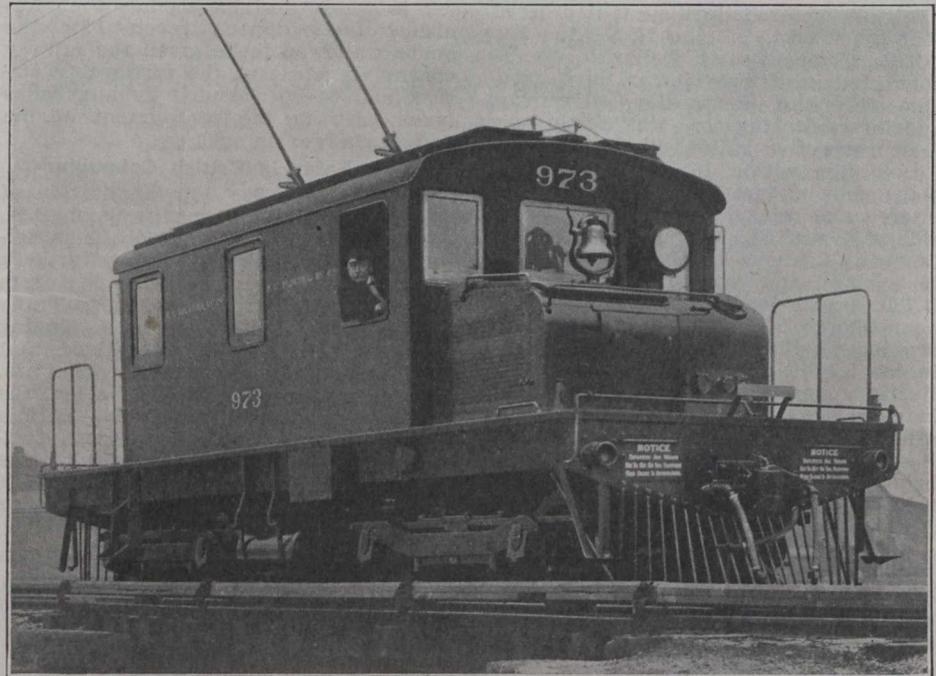
The B.C. Electric Ry. Co. has recently received five 50 ton electric locomotives for freight service, which are similar to some 60 ton ones built recently for the Southern Pacific Co. They are standard gauge, and are of the double truck type, with a central cab of the steeple type. This type of locomotive, because of its flexibility and simplicity of construction, is said to be proving very successful in freight, switching and industrial service, where severe operating conditions are frequently met.

Each locomotive is equipped with four Westinghouse 308-D-3 box frame commutating pole 600-1200 volt railway motors, and Westinghouse type hb unit switch control. The 308-D-3 commutating pole motors are adapted to subway, elevated and trunk line railway service. Since this motor is high powered and of the commutating pole type, heavy loads can be handled without encountering motor troubles that are incident to such conditions. The 308-D-3 motor is well adapted where 1,200 volt direct current operation is desired, and for such service two motors are permanently connected in series. The box frame construction is claimed to have decided advantages, on account of its solid mechanical construction and the alignment of all parts. The commutating pole feature of this motor is claimed to make it operate reliably and economically, as heavy overloads can be handled safely and a large range of over voltage is permissible without serious consequences, which is incident to such heavy service in which this equipment operates.

The mechanical features of the motors are of interest. The frame is a one piece steel casting with large openings bored out at each end to admit the armature

truck suspension bar, carries the weight of the motor except that part carried by the axles. Safety suspension lugs provided as an additional safeguard are so arranged that should the main sus-

through a bottom connection, reaches the waste in the waste pocket. The oil then filters up to the bearing by capillary attraction, leaving all dirt at the bottom under the waste. The reservoir has am-

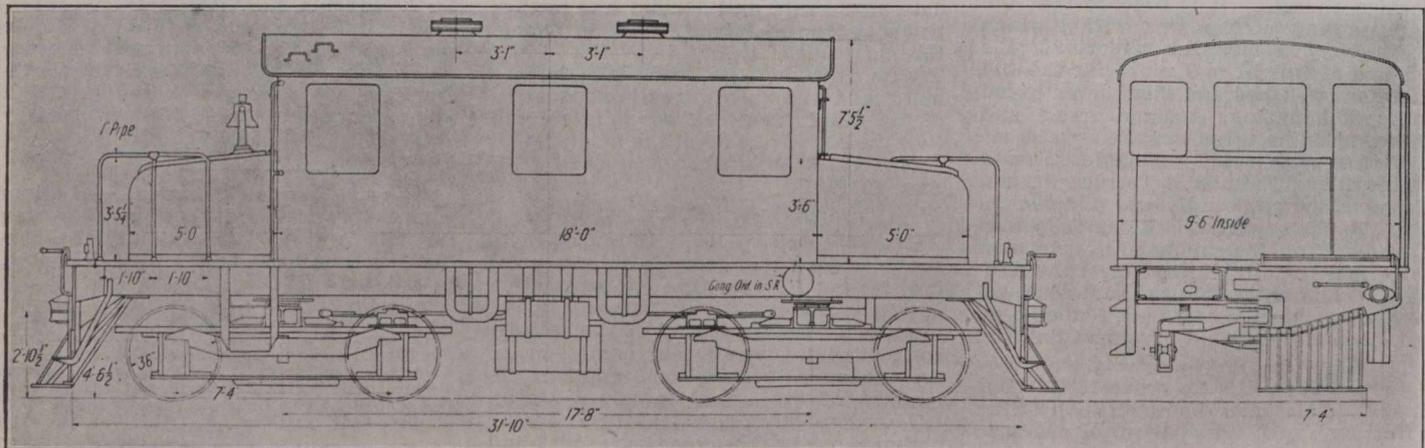


Fifty Ton Electric Locomotive for British Columbia Electric Railway.

pension lug break the motor would drop but a fraction of an inch on to the truck suspension bar, causing no trouble. Axle bearing dust guards are provided, which consist of sheet steel casings arranged

ple capacity and is so located in the bearing housings as to be easily emptied and cleaned.

The Westinghouse unit switch control used is similar to the control used by



Side and End Elevations, Electric Locomotive, British Columbia Electric Railway.

bearing housings and for taking out the armature.

The weight of the motor on the axle is carried almost entirely by a solid bracket, which extends over the axle. The split of the axle caps is such that the weight of the motor is taken off the axle cap bolts, thus greatly reducing troubles at this point. This type of motor is, it is claimed, easily handled in the shop where travelling cranes are available. The frame has a large lug or nose cast on it which, by means of a

between the axle bearing housings. The dust guards effectively protect the axle bearings against the entrance of dust and dirt and thereby increase the life of the bearings, gears and axles.

At each inspection of the bearing construction it is possible to gauge the oil by means of a chamber provided for this purpose, which results in economy in oil. Each housing consists of three chambers, an oil reservoir, a waste pocket, and an overflow pocket. Oil is poured into the oil reservoir and then,

many electric railways and electrified steam roads. It is claimed that it is especially adapted to locomotive service, where currents of high value are to be handled and broken, for, due to the inherent construction of the unit switch, there is positive action in the making and breaking of circuits carrying heavy currents, and due to the high pressure between contacts made possible by closing all switches by compressed air, no overheating or burning is experienced. It is also claimed to be simple and accessible

for inspection, reliable in operation, and economical to maintain.

The control equipment consists of the following principal apparatus:—2 master controllers, 2 switch groups, 2 reversers, 1 series parallel switch, 1 line switch, 1 control resistor, 2 hand operated change over switches, 2 sets of storage batteries (10 cells, each set giving 20 volts). All of the above pieces of apparatus are enclosed in a wire cage supported by an angle iron frame work in the centre of the locomotive cab.

The grid resistors are mounted in the roof of the locomotive cab over the unit switch apparatus, in a portion framed off and ventilated through the roof by two ventilators. Each of the two master controllers have three running notches on 600 volts and two on 1,200 volts. An interesting item of this equipment is a series parallel switch, which is controlled by a single pole double throw knife switch at either end of the cab. On 1,200 volts the connections are so arranged on the change over switch that the series parallel switch is in the 1,200 volt position, connecting two motors in

tus to facilitate ease of inspection and maintenance. By the control equipment being centrally located, it is accessible from all four sides. This is a distinct advantage to operating companies, since ease of inspection assists in reducing the maintenance.

Two Westinghouse dynamotor compressors are used to furnish compressed air for the brakes and control, a blower fan attached to the dynamotor shaft furnishes the air for ventilating the main motors. One of these is mounted under each end hood. The dynamotor runs continuously, but the air compressor does not run all of the time, it being stopped by a governor throwing the friction clutch out between the dynamotor and compressor. The dynamotor compressor supplies 600 volt current for the lights. A steel air duct built into the frame of the dynamotor compressor delivers air for ventilation to points directly over each motor where by means of canvas ducts the air is conducted to the motors. Two dynamotor switches are furnished, one for each dynamotor. Two transfer switches are used for transferring the

braced transversely, midway between the truck centres. The end bumpers consist of steel plates 1 in. thick, to which the coupler pockets are bolted. The couplers are of the M. C. B. type, placed at standard height (34½ ins.) above the rail.

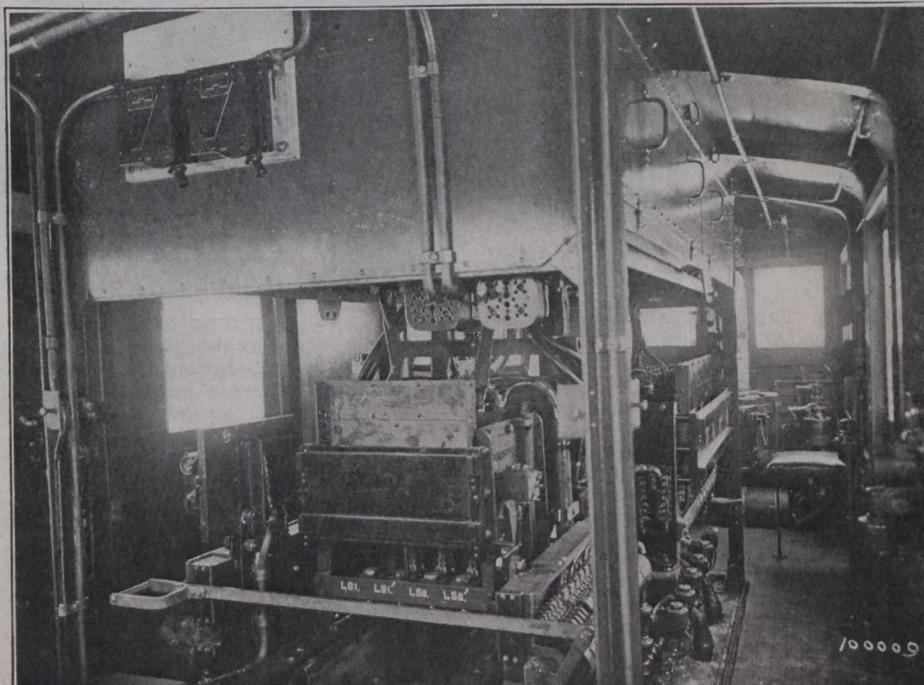
The cab is of steel, arranged for double end operation. It is provided with end doors, and careful attention has been given to such details as hand holds, steps and cab windows. A sloping hood is placed at each end of the locomotive. The floor of the cab is of steel plate, covered with hardwood matched flooring.

The equipment includes air and hand brakes on all wheels, air sanders, a pilot and head light at each end, a bell gong and air whistle.

These locomotives are designed to negotiate curves of 40 ft. radius when running without trailing loads. Their principal dimensions are as follows:—

Wheel base, rigid	7 ft. 4 ins.—total, 25 ft.
Driving wheels, diameter	36 ins.
Journals	5 x 9 ins.
Width, over all	10 ft.
Height of top of cab	12 ft.
Length between coupler knuckles	35 ft.
Weight	100,000 lbs.

The electric apparatus was built by the Westinghouse Co., and the mechanical parts by the Baldwin Locomotive Works.



Cab Interior, Electric Locomotive, British Columbia Electric Railway.

series regardless of the position of the knife switch.

On 600 volts, the connections on the change over switch are so altered on changing over to the 600 volt position that the motors of each pair, by means of the series parallel switch, may be thrown either two in series or two in parallel, where in the 1,200 volt position the motors are two in series only. This is of particular advantage on 600 volts in accelerating heavy loads. The motors are first connected four in series until the train is started. The controller is then returned to the "off" position, and the series parallel switch thrown to connect the motors of each pair in parallel. The master controller is then operated to connect in "series parallel" and finally in "parallel." In changing over from 1,200 volts to 600 volts, the resistances are paralleled, and also the dynamotor circuits are adjusted for 600 volts. This is all done by the two change over switches.

On these locomotives particular care has been taken in arranging the appara-

lighting load from one dynamotor and the cab lights on the other.

All wiring is put in conduit. A complete type EL combined straight and automatic air brake equipment, with two D3 compressors, each having a displacement capacity of 35 cu. ft. of free air per minute, is included in the equipment for each locomotive.

The trucks are of the equalized pedestal type, with rolled steel side frames and angle iron end frames. They have rigid centres, the bolsters secured directly to the side frames. The bolsters are of cast steel. The truck is kept square by heavy cast steel gusset plates, which are bolted to both side frames and bolster. The springs are half elliptic, and of such length (44 ins.) as to insure easy riding qualities. The wheels are steel tired, with cast iron spoke centres.

The frame is composed of four 13 in. longitudinal channels. These are strongly braced transversely, above the truck bolsters, by means of plate stays, which are riveted to the channels, frame bolster and floor plating. The channels are also

Attempt by Board of Health to Regulate Street Railways in Toronto.

On the recommendation of C. J. Hastings, M.D., Medical Officer of Health for the city of Toronto and executive officer of the Local Board of Health, the Board has passed the following regulations:—

"From and after the approval of these regulations, all companies or corporations operating street passenger cars or vehicles constructed and used for the purpose of carrying passengers, whether propelled by horse, electricity, or cable power, are prohibited from hauling, carrying or conveying in any car at any one time a greater number of passengers than is equal to 1 2-5 times the proper seating capacity thereof, with the addition of five passengers on the rear platform of each car; and said railway companies or corporations are further prohibited from carrying any passengers between the seats of the open summer cars.

"None of the said street cars or vehicles shall be furnished with cushions, on the seats or backs, made of any material that cannot be readily cleaned and disinfected, and all cars shall be so constructed as to provide for and secure efficient ventilation and heating at all times, to the satisfaction of the Medical Officer of Health. A Fahrenheit thermometer shall be hung in the centre of each and every car.

"Each and every street passenger car used for the transportation of passengers shall, on the days on which it is used for such purposes, be carefully and thoroughly washed and cleansed on the inside, and all cushions and upholstery thoroughly cleansed by means of a vacuum cleaner.

"All straps or hangers on any of the aforesaid cars shall be composed of or covered with celluloid, or a similar non-absorptive material, and must be regularly cleaned, as ordered by the Medical Officer of Health."

The Master Car and Locomotive Painters' Association will hold its annual convention at Ottawa, Ont., Sep. 9 to 12.

Electrification of the Canadian Pacific Railway Rossland Subdivision.

In Canadian Railway and Marine World for May, 1912, mention was made of the contemplated electrification of the C.P. R. Rossland subdivision, in British Columbia, as a means of determining the suitability of electrification for main line operation on the company's line on the B.C. Division, this branch having been selected as an excellent trial portion for this purpose, owing to the heavy nature of the line. At that time, both the alternating and direct current systems were under consideration, and it was only recently that it was decided by the C.P.R. management to adopt the d.c. as best adapted to its requirements.

The section to be electrified runs from Rossland to Castlegar Jct., the junction with the Boundary subdivision. From Smelter Jct. to the end of the section at Rossland, 10.6 miles, is one long continuous grade. The length of the Rossland subdivision is 29.3 miles, which with sidings and yard track mounts up to a total trackage of 43 miles, all laid with 80 lb. rails. From Castlegar Jct. to Smelter Jct., 18.7 miles, there is a ruling gradient of 2.2%, except for a short distance at China Creek hill, where it is 4%. From Smelter Jct. to Rossland is the heavy portion of the line, with a 4.8% ruling gradient, averaging 4% over the section, and a maximum curvature of 20°. One mine switch on this line has a 26° curvature. All grades and curves are compensated.

There is a fairly heavy tonnage to be handled over both portions of the line. The average daily tonnage from Castlegar Jct. to Smelter Jct. (the junction point for Trail, two miles distant on a branch) is 2,489 tons, of which 2,349 are freight. In the opposite direction the figures are 1,039 tons, of which 899 are freight. From Rossland to Smelter Jct. there are 2,110 tons, of which 1,970 are freight; and in the opposite direction 1,910 tons, 1,770 tons being freight. This traffic is now being handled by five locomotives; two of 115% capacity or 23,000 lbs. tractive power, two of 180% or 36,000 lbs., and one of 120% or 24,000 lbs.

The motive power installation will consist of four, and possibly a greater number of, 75 ton electric locomotives with the following general dimensions:—

Weight of locomotive, total	150,000 lbs.
Weight of locomotive, on drivers	150,000 lbs.
Weight per axle	37,500 lbs.
Wheel base, total	26 ft. 10 ins.
Wheel base, rigid	9 ft.
Driving wheels, diameter	44 ins.
Journals	7 by 13 ins.
Length, over knuckles	38 ft.
Length, over cab	32 ft.
Height, trolley depressed	13 ft. 6 ins.
Height, over cab	12 ft. 6 ins.
Width, over all	10 ft.

The locomotives will have four pairs of driving wheels, with no trailing or leading trucks. To each pair of drivers will be geared a GE239 1,100 volt 185 ampere motor, of 270 h.p. each. The impressed voltage will be 2,400, and for slow speed operation, the motors will be operated in series, with series parallel for high speed operation. The operating equipment will be such that three locomotives can be operated in multiple. The trucks on which the motors will be mounted will be articulated, and will negotiate a minimum curvature of a radius of 280 ft., or a curve of 20 degrees. The instantaneous tractive effort will be 45,000 lbs., based on a 30% coefficient of adhesion. The maximum speed on the level with a train of 925 tons will be 21 miles an hour. The

coasting speed will be 40 miles an hour.

Power will be obtained from the West Kootenay Power and Light Co. at a pressure of 60,000 volts, which will be stepped down to the 2,400 volt line pressure at substations, the locations of which have not yet been determined. The overhead construction will be catenary.

It was announced recently by George Bury, Vice President, C.P.R., in charge of Western Lines, at Winnipeg, that the locomotives, machinery, etc., will be supplied by Canadian General Electric Co., the details in connection with which are being worked out by H. H. Vaughan, Assistant to the Vice President, Montreal.

Montreal Tramways Mutual Benefit Association.

The report for the year ended April 30, 1913, gives the following summary of relief work done, as compared with the preceding year:—

	1912-13	1911-12
Members disabled through sickness or injury	1,205	1,173
Visits made by physicians to disabled members	695	626
Consultations given by physicians to disabled members	7,690	7,587
Prescriptions issued	5,769	5,811
Paid for sickness and injury	\$10,065.60	\$10,274.10
Paid for medicine	\$1,840.95	\$1,725.95
Paid for pensions	\$408.50	\$354.50
Paid for withdrawals	\$508.82	\$296.31
Paid for death and burial insurance	\$7,083.34	\$12,533.35

Fourteen members died during the year and two had their benefits commuted. The ninth annual picnic netted a profit of \$9,590.29. The Montreal Tramways Co. gave a special Christmas donation of \$4,000, making the total contributions received from the company \$18,318.71, which, added to fees and dues received from members, viz., \$15,651.00, the proceeds of the picnic, and the interest on investments and bank deposits amounting to \$15,506.52, made a total revenue for the year of \$50,476.23, and the expenses being \$28,795.42, left a surplus of \$21,680.81.

Since the Association's organization the following amounts have been paid in benefits:—

Death and burial claims	\$67,642.78
Sickness and injury benefits	83,765.25
Medicine	14,647.79
Medical attendance	19,982.46
Pensions	1,754.50
Refunds	1,089.32

Total \$189,292.10

The initiation fee for members is \$1, and the monthly fee, 50 cents, which secure the following benefits:—

In cases of disablement after the first 6 days, 60 cents a day for 90 days, and 30 cents a day for the next 90 days; free medical attendance; free medicine; 20% discount on all medicines, etc., required by members of the family; a life insurance policy of \$500 and \$50 towards cost of funeral expenses; a pension when superannuated and too old to work; members leaving service after 5 years membership are entitled to a refund of one third of fees and dues paid in by them, less amount received in benefits; members leaving service after 10 years membership are entitled to a refund of two thirds of fees and dues paid in, less amount received in benefits.

The principal officers of the Association are:—President, J. E. Hutcheson, General Manager, Montreal Tramways Co.; Secretary-Treasurer, Patrick Dube, Secretary-Treasurer, Montreal Tramways Co.

Wheel Guards on Montreal Tramways Company's Cars.

Some little time since the Montreal Tramways Co. applied to the Quebec Public Utilities Commission to suspend its order of Nov. 18, 1910, special direction No. 4, in regard to single truck cars until a compensating device could be thoroughly tested. The committee accordingly directed that tests should be made under direction of A. Fregon, who reported the results of a number of tests from which he concluded that the compensating device could be effectively used in connection with the H. & B. wheel guard upon single truck cars, and that the same would be advantageous for further protection to the public in the operation of the company's system.

The commission then ordered that all single truck cars in use upon the company's system shall be forthwith equipped with the H. & B. wheel guard and trip gate, with the compensating device, reported upon, to operate with the trip gate so as to overcome the difficulty from oscillation in the use of this class of car. The company shall report each month the number of single truck cars in use and the number so in use thus equipped, such equipment to proceed with all possible diligence.

The order respecting the abolition of single truck cars is not to be considered as in any wise modified by this order, but such abolition shall proceed as directed by order of Nov. 18, 1910.

Regina Municipal Railway Notes.

Some weeks ago the ratepayers voted in favor of the operation of the railway on Sundays, the vote being 473 for, 82 against. The Sunday service was inaugurated June 22, when about 9,000 passengers were carried, the revenue being about \$400.

A shipment of 8 double truck p.a.y.e semi convertible cars has been received from Preston Car and Coach Co., which makes the total rolling stock, 18 double truck and 6 single truck cars. Following are the principal dimensions of the new cars:—

Length of car body	28 ft.
Length of front vestibule (outside)	5 ft.
Length of rear vestibule (outside)	7 ft.
Projection of bumpers	6 ins.
Length of car over bumpers	41 ft.
Width of car over side sheathing	8 ft. 4 ins.
Width of car inside	7 ft. 8 ins.
Height of car from bottom of sills	8 ft. 8 ins.
Width of front vestibule door	30 ins.
Width of rear vestibule door	48 ins.

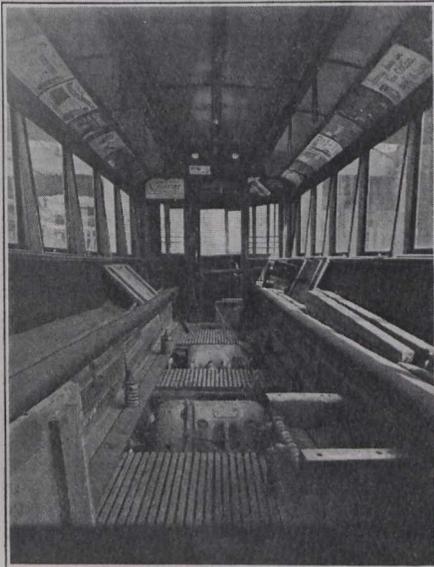
A Regina correspondent wrote us recently that there was a possibility that workmen's special tickets would be done away with, as it was believed that few availed themselves of the opportunity the cheap fare affords for going home to dinner. We are officially advised that the management has no such intention. These tickets are sold at 8 for 25 cents. They are good from 6 to 8 a.m.; 10.30 a.m. to 1.30 p.m.; and 5 to 7 p.m.

Following are particulars of revenue and passengers carried for 10 weeks up to June 21, when the line was operated 6 days a week. Sunday operation commenced June 22:—

Week ended	Revenue.	Passengers.
April 19	\$2,705.45	68,104
" " 26	2,779.75	68,616
" " May 3	2,938.55	71,860
" " 10	2,893.90	70,715
" " 17	2,989.10	71,825
" " 24	3,081.15	76,055
" " 31	3,022.20	74,277
" " June 7	3,027.75	72,524
" " 14	3,391.55	82,167
" " 21	3,613.40	87,155

Tractor Emergency Car on Dominion Power and Transmission Co.'s Line.

During the past spring a portion of this company's line on the Radial Division, including the portion of the city service that operates to the industrial area in the east end of Hamilton, was flooded by the high water of Lake Ontario. This short section of possibly a quarter mile follows a narrow shore inlet, over which pass two steam railway lines. To obtain the necessary clearance under these



Motor Suspension for Operation Through Water Covered Tracks.

two bridges, it was necessary for the electric line tracks to be set near the water level, and in consequence the high water flooded the line.

Operation through this section of the line was made impossible to the regular equipment, from the presence of the water, and in order to carry on the service with as little interruption as possible, an old car was partially converted to act as a tractor for trailer cars through this section, the passengers being transferred at both ends of the short run to the regular cars. Passing the regular cars, with the motors low set as in the normal installation, would lead to numerous burnouts.

The arrangement of the tractor car is shown in the accompanying illustration. It was an old single truck motor car, carrying two motors, which are normally suspended from the truck framing at the casing end and on the axle on the pinion side. In the makeshift arrangement adopted, both motors were disconnected from their rear frame support, and swung up through the floor about the axle support. Along the floor of the car, in front of the side seats, were placed lengths of 3 in. angles, from which the frame of the motor casing was supported by bolts on each side, bearing on small coiled springs. A flexible spring motor suspension was thus obtained, and the motors raised far enough to be clear of water up to about 15 ins. deep.

Citizens of Sydney, N.S., are urging on the Reid Newfoundland Co. the desirability of making its Canadian steamship terminal at Sydney, instead of North Sydney, as at present. It is not likely that such a change will be made, in the near future at any rate.

Betterments and Extensions on the Cape Breton Electric Company's System.

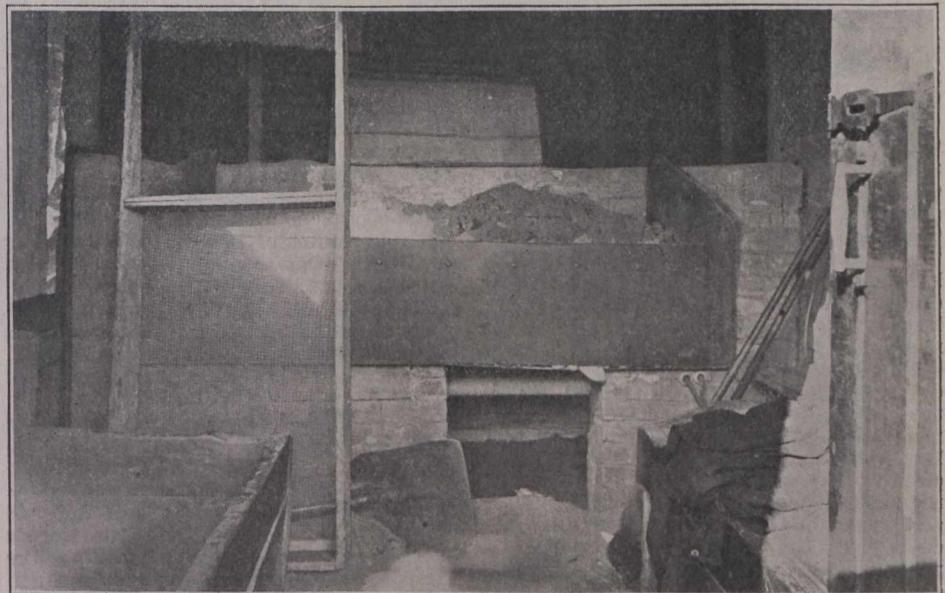
We are officially advised that the following works are being carried out during this season:—Building a two story addition to the present warehouse and freight shed at Sydney; constructing an extension to the car houses at Sydney thereby increasing its capacity 50%—included in this will be a new paint shop and special facilities for more easily handling truck repairs; reconstruction of switch board in power house at Sydney; construction of a 22,000 volt 3 phase transmission line from Sydney power house to Reserve Jct., on the interurban line, with the erection of reinforced concrete substation, in which will be installed at present one 300 k.w. motor generating set for supplying current to the Glace Bay Division—this substation will do away with the operation of the present steam station at Dominion no. 4, and will necessitate the installation on the Sydney end of the line of a bank of 2,250 k.v.a. step up transformers. Oil switches will also be installed in the high tension room of the Sydney power station on this new line, and on the present North Sydney transmission line as well; a telephone despatching system will be installed on the Glace Bay Division; a double track will be built on Townsend St., Sydney, from the car house to Terrace St., with two sidings on the pier line to allow a more frequent schedule to be operated thereon, and two complete supply dry pipe automatic sprinkler systems will be installed in the present Sydney car house and extension. Other minor items include the purchase of shop machinery, railway feeders and overhead ground returns. Much of the work has already been done, and orders

Judgment Against the Grand Valley Railway.

The case of Allen vs. Grand Valley Ry. Co., et al., was heard in the Trial Court at Toronto, June 30. This was an action by a firm of steel manufacturers at Sheffield, Eng., to recover moneys claimed as balance due for goods supplied to defendant company for use in construction of the railway, and payment of which plaintiffs claim defendants, M. A. Verner, of Pittsburgh, Pa., the President, and W. S. Dinnick, of Toronto, the Vice President, guaranteed. Mr. Justice Kelly gave the following judgment:—“My opinion is that the sureties were not discharged from liability. I find that the period of credit dating from the delivery of the goods had expired at the time the action was begun and that, therefore, these proceedings were not premature. No evidence was submitted to substantiate claims set up in defendant's counter claim. Judgment for plaintiffs for \$12,041.91 and interest as claimed and costs, and dismissing defendant company's counter claim with costs.” A stay of 30 days was granted.

Sand Drying Plant on Niagara, St. Catharines and Toronto Railway.

At this company's shops in St. Catharines, Ont., there is a complete sand drying plant, housed in a small frame building adjoining the main line, near the main shop building. The size of the plant is shown by the accompanying illustration, which includes practically the whole interior. The sand drying apparatus consists of a shell of brick work, raised about a foot above the ground, into which the wet sand is placed. In the hollow chamber



Electrically Heated Sand Drying Plant.

have been placed for all the machinery and material necessary for the completion of the work. E. L. Milliken, Sydney, N.S., is Manager. (July, pg. 334.)

A Car Foreman's Opinion.—B. Bunton, Car Foreman, Grand Trunk Ry., Belleville, Ont., writes: “I cannot be without Canadian Railway and Marine World, as I find it very instructive as well as interesting, and I shall have great pleasure in renewing my subscription when it becomes due.”

formed by the brick walls under the sheet metal sand box, there are electrical heating coils. These are built up of wrought iron piping, covered with asbestos, and on which resistance wire is wound. These coils may be seen through the front opening, immediately beneath the sand box. The electrical connections are on the extreme right of the box. In the left foreground, beside the door, is the storage box, into which the dried sand is shovelled. This arrangement is due to W. H. Horton, Engineer of Equipment.

The Medicine Hat Electric Railway.

As previously stated in these columns the electric railway to be built in Medicine Hat, Alta., will be constructed by the Montreal Engineering Co., Ltd., which will complete it and put it in operation before turning it over to Medicine Hat Tramways, Ltd., which will probably have a Dominion charter. This has been the Montreal Engineering Co.'s practice in the past in regard to Porto Rico Railways Co., Camaguey Co. (Cuba), Trinidad Electric Co., etc.

We are officially advised that it is proposed to build 11 miles of track within 15 months, but the location of only a portion of this has so far been announced by the city council. It is hoped to have 3 or 4 miles in operation by Dec. 1, but this depends on the delivery of electrical machinery and rails. The line will be laid with 72 lbs. 6 in. Loraine T. rails. laid with 72 lbs. 6 in. Loraine T rails. vertible, double end control, closed vestibule.

The Ansley spur, which is being built by the city council to connect with an adjacent coal mine, will be electrified and will be maintained and operated by the company under agreement with the city. The company's charter empowers it to carry freight during restricted hours, and an electric locomotive will probably be ordered of a box car type, suitable for carrying building material and other freight to other parts of the city.

The company will not build a power house at first, but will buy power from the city, delivered at 2,200 volts, three phase, 60 cycle, a.c. at 1 cent. per k.w. hour. Later, when the population increases and the company wishes to operate a power house of its own the city will supply natural gas at 5 cents per 1,000 ft.

Motor Bus Traffic in England.

In connection with the recent application of interests allied with the London General Omnibus Co. to the Toronto City Council for an exclusive franchise for the operation of motor busses in the city, the following taken from the evidence of the Managing Director of that company, before a Select Committee of the House of Commons, in London, Eng., might be interesting, as showing the trend of motor bus traffic.

He stated that his company had 32 different types of bus, and in the latest types the laden weight had been reduced from 5 to 3½ tons, and the vehicles were less noisy than formerly. The influence of the police had been very useful, their regulations becoming more and more stringent, thus developing a highly efficient bus. He had had considerable experience in Canada and the U.S. in connection with tramway operation, and in that connection he believed that compared with the early days of electric operation accidents had become rarer, owing to familiarity and the adoption of safety appliances, together with greater care on the part of the public and employes, and he considered that the same would follow on the development of the motor bus. As to the operation of the busses, he stated that they had working agreements with all the tramway companies in London, except the municipal lines, and he considered that the ideal state of things would be that the whole of the busses and tramways should be

under one control, not with the idea of creating a monopoly of the traffic, but to lessen danger to the public caused by competition due to multiple control. There were 107 fatal accidents in 1911, and 150 in 1912, but in proportion to the number of vehicles operated, the number of passengers carried, and the mileage, in 1912 the fatalities were less than when compared with the figures of 1911.

Proposed Electrification of the London and Port Stanley Railway.

A. Eastman, General Manager, Windsor, Essex and Lake Shore Rapid Ry., submitted a report, July 14, to the Mayor of London, Ont., dealing with the "estimated amount of earnings and operating expenses of the L. & P. S. Ry., if electrified with ample equipment, terminals and sidings provided, and roadbed put in first class condition." He understood that the cost of doing this work had been estimated at \$640,000, which he considered ample. He suggested the provision of terminals at London and St. Thomas, and additions to the terminals at Port Stanley. The rolling stock should consist of 6 passenger motor cars equipped for train operation, with at least 10 trailer cars and 4 electric locomotives, each capable of hauling a 300 ton train.

The estimate of earnings appended should be reached during the second year's operations, and should continue to show an average increase of about 10% a year for the next four years, and possibly after that an annual increase of about 6%. The total earnings he estimated at \$210,000, made up as follows:—Passenger revenue, \$100,000; freight revenue, \$80,000; trackage and terminal rights, \$20,000; miscellaneous income, \$10,000. The operating expenses he placed at \$131,245; and taxes at \$3,700, leaving a surplus of \$75,055 available for interest on investment, depreciation or profit. The proportion of operating expenses to gross income shows 62%. On the basis of these figures the estimated earnings per car mile are 22.27 cents; estimated earnings per car hour, \$5.70.

Another report has been prepared for certain citizens by A. N. Warfield, formerly promoter of the People's Railways at Berlin, Ont., which estimates that operation by steam will produce an annual deficit of \$33,444.05; operation by a combination of steam and a storage battery system a profit of \$17,667.86; and operation by electricity a profit of \$33,034.64.

According to the city year book the bond issue of 1903 amounts to \$1,332,854; the amount due the city for interest is \$234,992.61; and the capital stock cost \$442,340. The first cost of the railway in 1854 was \$765,311. The line is at present operated under lease by the Pere Marquette Rd., on a rental and percentage basis which brings in the city about \$18,000 a year. This lease expires in 1914, and it is in connection with negotiations for its renewal that the matter of the electrification of the line is being discussed.

London St. Ry.—Gross earnings for June, \$29,440.48; expenses, \$20,308.01; net earnings, \$9,132.44; deductions, \$2,526.80; net income, \$6,605.64. Aggregate gross earnings for six months ended June 30, \$157,874.45; expenses, \$114,094.41; net earnings, \$43,825.04; deductions, \$14,526.84; net income, \$29,298.20.

Electric Railway Finance, Meetings, Etc.

Brandon Municipal Ry.—Receipts for the first month of operation ended June 30:—Cash fares, \$1,613; tickets sold, \$1,776.06; average daily receipts, \$135.56; average daily operating cost, \$105, interest and sinking fund charges not calculated. Passengers carried, 71,919.

British Columbia Electric Ry.—Gross earnings for May, \$566,128; operating expenses, \$365,401; net operating earnings, \$200,727; renewal funds, \$51,620; net earnings, \$149,107; approximate income from investments, \$35,000; net income, \$184,107; against \$491,826 gross earnings; \$313,469 operating expenses; \$178,357 net operating earnings; \$37,935 renewal funds; \$140,422 net earnings; \$25,000 approximate income from investments; \$165,422 net income for May, 1912. Aggregate gross earnings for 11 months ended May 31, \$6,269,123; net earnings, \$2,117,280; against \$5,251,343 aggregate gross earnings; \$1,836,830 net earnings for same period, 1911-12.

Cape Breton Electric Co.—Gross earnings for May, \$29,989.33; operating expenses and taxes, \$19,115.26; net operating earnings, \$10,874.17; interest charges, \$4,891.67; balance, \$5,982.50; bond sinking and improvement funds, \$1,190; net balance, \$4,792.50, against \$28,577.95 gross earnings; \$16,192.34 operating expenses and taxes; \$12,385.61 net operating earnings; \$4,495.83 interest charges; \$7,889.78 balance; \$1,206.66 bond sinking and improvement funds; \$6,683.12 net balance, for May, 1912. Construction charges for May, \$3,297.32.

Nelson St. Ry.—A novel situation has arisen at Nelson, B.C., in connection with the proposal to pass a bylaw guaranteeing the company's bonds to the extent of \$40,000. Practically the entire stock of the company is owned by citizens, and four out of the six aldermen are among the shareholders. One of the two non shareholding aldermen is opposed to the passing of the bylaw, and if the shareholding aldermen cannot legally vote, the question arises how the popular feeling may be given effect to, without loss of time.

Saskatoon Municipal Ry.—Total receipts for May, \$14,094.80, an increase of about \$180 over April. Total mileage for the month, 55,481; average receipts per car mile, 25.41c.; average passengers per car mile, 5.69; operating expenses per car mile, 25.405c.

Toronto Ry., Toronto and York Radial Ry., and allied companies.—Gross earnings for May, \$811,872; operating expenses, maintenance, etc., \$418,415; net earnings, \$393,457, against \$693,015 gross earnings; \$342,545 operating expenses, maintenance, etc.; \$350,470 net earnings, for May, 1912. Aggregate gross earnings for five months ended May 31, \$3,840,280; net earnings, \$1,839,564, against \$3,315,739 aggregate gross earnings; \$1,696,457 net earnings for same period, 1912.

Winnipeg Electric Ry.—Gross earnings for May, \$326,827; operating expenses, \$180,275; net earnings, \$146,552; against \$298,743 gross earnings; \$162,364 operating expenses; \$136,379 net earnings for May, 1912. Aggregate gross earnings for five months ended May 31, \$1,651,336; net earnings, \$729,221, against \$1,508,300 aggregate gross earnings; \$690,817 net earnings for same period, 1912.

The Belt Line Ry.'s horse cars along Tenth Avenue, New York, N.Y., are to be replaced by storage battery cars.

Electric Railway Projects, Construction, Betterments, Etc.

Brandon Municipal Ry.—The Brandon, Man., City Council has decided to extend the present lines, which have only recently been completed, on several streets. A. Antonisen, is Superintendent (July, pg. 344.)

British Columbia Electric Ry.—The last spike of the suburban line along the Saanich Peninsula, connecting Victoria with Deep Bay, 23 miles, was driven by the Premier June 18. A car service was placed in operation June 19. (July, pg. 344.)

The Coquitlam City Council has endorsed the proposal to build a tram line from New Westminster to Port Coquitlam, and a committee is arranging plans and terms with the B. C. E. Ry.

C.P.R. Electric Line—Hamilton to Niagara Falls.—Press reports state that the C.P.R. will build an electric line from Hamilton, Ont., to Niagara Falls, via St. Catharines, and that M. N. Todd, who is President of the Galt, Preston and Hespeler St. Ry., and a director of the Lake Erie and Northern Ry., which is under construction from Galt to Brantford, on the way to Port Dover, and both of which lines are closely allied to the C.P.R., was in St. Catharines, July 21, interviewing the City Council in regard to the matter.

The Dominion Ry. and Plaster Co. was organized under Nova Scotia laws in 1908, the promoters and officials being all practically Cape Breton men. The company proposed to build an electric road from Sydney to East Bay, 13 miles, and to develop a water power for generating electricity. It was intended to use the line mainly for freight purposes, carrying limestone, etc., to the steel works at Sydney. Beyond preliminary surveys, nothing has been done, and it is not thought likely that anything material will be done in the way of construction for the present. (July, pg. 334.)

The Edmonton, Stony Plains and Wabamun Ry Co., which was incorporated in March last, with an authorized capital of \$750,000, proposes to build an electric railway from Edmonton to Lake Wabamun, Alta., via Stony Plains, 40 miles. About \$60,000 of the capital is reported to have been subscribed locally, and negotiations are in progress for placing a bond issue. The project is regarded favorably, but some doubt is expressed as to whether, in the present state of the money market, a bond issue could be satisfactorily placed. (July, pg. 344.)

Forest Hill Electric Ry.—A draft of the proposed agreement with the York Township Council for the building of an electric line from Forest Hill Road, easterly, 2.5 miles north of Eglinton Ave., north of Toronto, has been under consideration. The agreement provides that construction is to be started, as soon as the plans have been approved, and that \$50,000 is to be expended within a year. At a meeting of the York Township Council, in Toronto, July 9, it was resolved that, subject to a proper agreement being entered into, the council approves of the building of the line. The agreement is not to be submitted to the ratepayers for approval, but to the Ontario Government. (June, pg. 286.)

Lake Erie and Northern Ry.—See under Railway Development, in earlier portion of paper.

London and Lake Erie Ry. and Transportation Co.—The refitting of the steam power house at London, Ont., was com-

pleted July 5, to ensure the continuance of car service in the event of any accident to the Hydro-Electric power system which has been interrupted rather frequently of late. (Aug., 1912, pg. 421.)

Medicine Hat, Alta.—R. O. Sweezy, General Manager, Montreal Engineering Co., which has secured the franchise for building an electric railway in Medicine Hat, Alta., has been in the city arranging for construction. He stated that orders have been placed in the U. S. for steel rails for August delivery, and that construction is to be started at once on the unpaved streets, working towards the centre of the city. Orders have been placed for a number of single and double truck cars, and for an electric locomotive for switching. It is expected that the car barns and power station will be erected near the Ogilvie flour mills. It is expected that the line will be ready for operation by the end of the year. Mr. Sweezy stated that there was a prospect of the Ansley spur line being electrified and operated by the company, and that was partly the reason why the electric locomotive had been ordered. (July, pg. 344.)

Melita, Man.—Press reports state that a franchise for the building of an electric railway in Melita, Man., has been granted to R. E. Denny & Co., 32 Ninth St., Brandon, Man.

Montreal.—A project for the construction of an underground tramway service in the city has been submitted to the Montreal City Council by F. S. Williamson, M. Can. Soc. C. E. The plans show 12.50 miles of double track lines, and the estimated cost is \$20,000,000.

Montreal and Southern Counties Ry.—The Board of Railway Commissioners has authorized the company to operate its cars, carrying passengers, baggage, express and other traffic over the Central Vermont Ry., between the east end of its Southwark yards, St. Lambert and Richelieu, Que., 12 miles, and to use the C.V.R. passenger and freight stations, yards and other facilities. The line was opened for traffic June 28, a through service being given from McGill St., Montreal, to Richelieu. (July, pg. 344.)

Montreal Tramways Co.—Work was started June 23, laying down the new loops and extensions recommended in the engineer's report approved by the City Council June 17. A report was presented to the City Council July 10, showing the work in progress, and stating that it was expected to have it so far completed that the new routes recommended would be in operation by July 31. (July, pg. 344.)

Morrisburg and Ottawa Ry.—Tenders are being asked for the building of 10 miles of line from Ottawa in the direction of Morrisburg, Ont. We are officially advised that this section will terminate at South Gloucester, the intermediate points being:—Billings Bridge, Gatesville, Ridgemount, Ellwood, Henderson Corners, and Lebrun.

The directors and officers are:—President, J. G. Kilt, Ottawa; Vice President, R. J. Biggar, Ottawa East, Ont.; Secretary-Treasurer, R. A. Bishop, Ottawa; other directors:—Jas. Oliver, W. T. Stroder, R. E. Reardon, A. H. Caplan, J. W. P. Bogar. (July, pg. 344.)

Nipissing Central Ry.—The work on the spur line to the wharf at Haileybury, Ont., has been completed, and some parts of the line in the town have been raised,

in order to ensure the easier running of cars. (June, pg. 344.)

Ontario Hydro-Electric Commission's Proposed Electric Ry.—Press reports state that considerable progress has been made with surveys for the projected electric railway from Toronto to Port Perry, Ont., to be built in connection with the Ontario Hydro-Electric Commission's power plant. F. S. Gaby, Chief Engineer of the Commission, recently stated that engineers were looking over the engineering features of the route, and the revenue possibilities of the district, through which the line, 45 miles in length, would run, and that report would be presented to the Commission in due course. (July, pg. 345.)

Ottawa and St. Lawrence Electric Ry.—A bylaw granting a 25 year franchise to the company, with a right of way on certain streets in the town, has been approved by the ratepayers of Morrisburg, Ont. The lines to be built under the franchise are to be completed by Dec. 31, 1914. (July, pg. 345.)

Quebec Rapid Transit Co.—The Dominion Parliament has incorporated a company with this title to build a system of radial lines from Quebec serving Limoliou, Beaufort, Charlesbourg, Riviere Jaune, Lake St. Charles, Indian Lorette, St. Foy, Cap Rouge, Montcalmville, St. Gregoire, St. Anne de Beaupre, and the Isle of Orleans. Nothing appears to have been done in the way of arranging for construction. While the company is authorized to use steam or any other motive power, it is said that the lines, if built, will be operated by electricity. A. Taschereau, Quebec, is interested. (Jan., pg. 21.)

Regina Municipal Ry.—The City Council has under consideration plans for the extension of the city car line into the C.P.R. annex, crossing the G.T. Pacific Ry. at Thirteenth St. The line is also being extended on Young St., to the new power house on Winnipeg and Twentieth Streets. Orders have been placed for supplies for new construction as follows: Steel rails, \$12,000; ties, \$1,690; cement, \$11,000; steel poles, \$2,100; trolley wire, \$352.40; overhead construction, \$592.60. (July, pg. 345.)

Stratford Electric Ry.—We are officially advised that this proposition is dead so far as the franchise given to interests allied with Mackenzie, Mann and Co., are concerned. The Ontario Government desires to have a clause in the franchise providing for the use of current from the Provincial Hydro-Electric Commission, if terms and conditions are equal to those which can be obtained elsewhere or otherwise. Therefore, Sir Wm. Mackenzie would not accept the franchise and build under it. (July, pg. 345.)

Three Rivers Tramway Co.—We were officially advised, July 15, that construction would start in a few days thereafter, it being the intention to build about seven miles of line on the following streets:—St. Roch, St. Philippe, St. Antoine, Notre Dame, Ste. Cecile, St. Paul, St. Maurice, Champflour, Ste. Marie, Niverville, Royale, Des Forges, and also outside of the city to the Cap de la Madeleine. The authorized capital is \$500,000, of which \$400,000 has been subscribed. The officers are:—President, L. P. Normand; Secretary Treasurer, R. Bournival, Three Rivers, Que.

Toronto Suburban Ry.—A bylaw has been passed by Toronto City Council calling on the company to build and put in operation by Jan. 1, 1914, a line on

Jane St., from Bloor to Annette St.

The town of Weston has asked the company to remove its tracks from the west side to the centre of Main St., from Church St. to the northern boundary of the town.

In connection with the extension to Guelph, a siding has been run on to the right of way at Cooksville, and ties and other materials are being distributed westerly. Grading is completed westerly from Cooksville for several miles, and is well advanced right on to Guelph. Easterly from Cooksville grading is practically finished to near the crossing of the Humber River. (July, pg. 345.)

Winnipeg Electric Ry.—We are officially advised that the company has under construction eight miles of single track on various lines in Winnipeg and St. Boniface, and six miles of suburban track in St. Vital and Fort Garry, Man. Wilford Phillips, Winnipeg is Manager.

We are officially advised that the branch line to Stonewall, Man., which is being built under the Winnipeg, Selkirk and Lake Winnipeg Ry. Co.'s charter, is under construction between Middlechurch and Stony Mountain. It is expected to have the line in operation as far as Stony Mountain by the end of the year. (July, pg. 345.)

Electric Railway Notes.

A Sunday car service was started on the Regina Municipal Ry., Regina, Sask., June 29.

The Halifax Electric Tramway Co. has ordered six box cars, 21 ft. bodies, from the Nova Scotia Car Works.

The Dominion Power and Transmission Co. has received one suburban car from the Preston Car and Coach Co.

The Montreal Tramways Co. put in force July 1, a new rule prohibiting smoking by passengers on the cars.

The Brandon, Man., City Council has authorized the purchasing of ten trailer cars from the Winnipeg Electric Ry. for the Brandon Municipal Ry.

The Regina Municipal Ry. has received five single ended p.a.y.e. city cars, mounted on 21-E trucks, with 8 ft. wheel base, each equipped with Westinghouse 101 B2 motors, double equipment, from the Preston Car and Coach Co.

The Edmonton Radial Ry. has received six single ended, double truck, p.a.y.e. city cars, mounted on O-50 trucks, and equipped with Westinghouse 101 B2 motors, quadruple equipment, from the Preston Car and Coach Co. These are a portion of an order for 35 cars, placed with the company, by the City of Edmonton, Alta, for its municipal railway

The freight shed of the interurban lines of the Dominion Power and Transmission Co., at the corner of Catharine and Main streets, Hamilton, Ont., were destroyed by fire, July 6, the loss being estimated at \$75,000. Five freight cars, an auto truck and other stock were destroyed. The sheds belonged to the Hamilton, Grimsby and Beamsville Ry., one of the D.P. and T. Co. subsidiaries.

With reference to a paragraph in our last issue regarding the proposed change in color of painting of the Ottawa Electric Ry. cars, we are officially advised that the cars have always been painted red and green, but as it has been found that red is a perishable color, the 20 cars mentioned will be painted all green, and if this is a success, it is probable that all the company's double truck cars will be painted that color only.

The city of Saskatoon, Sask., has awarded contracts, as follows, for material for its municipal electric railway:—copper rail bonds, Canadian General Electric Co.; trolley wire, Eugene F. Phillips Electrical Works; continuous rail joint, Rail Joint Co. of Canada; clinch and splicing ears, Northern Electric and Manufacturing Co.; wood strain insulators, straight line hangers, trolley frogs and trolley guards, Ohio Brass Co.

The ratepayers of Selkirk, Man., by a majority of 367 to 40 have decided in favor of the operation of electric railway cars within the municipality on Sundays. Cars are now in operation from Winnipeg to Parkdale; the municipality of St. Andrews voted in favor of Sunday traffic recently, and the Selkirk vote will enable the Winnipeg, Selkirk and Lake Winnipeg Ry., a subsidiary of the Winnipeg Electric Ry., to operate cars over its whole main line on Sundays.

In dealing with possible acquirements of street railways by municipalities, it is quite evident that in some quarters a few millions on one side or the other is of no particular consequence. Canada, a weekly paper published in London, Eng., recently stated that the purchase price of the Toronto Ry., and the properties allied therewith, which the city of Toronto proposes to take over, is "now stated to be \$428,000,000." The price of the stock on the market did not appear to be affected by this announcement.

Personal Paragraphs.

The St. Thomas, Ont., City Council has appointed MISS E. MAXWELL at Secretary-Treasurer of the St. Thomas St. Ry. at \$35 a month.

T. BLUNDELL BROWN, and E. Maes Harvey, directors of the British Columbia Electric Ry., arrived in Vancouver, July 5, from London, Eng., for an inspection of the company's various properties in the province.

HAROLD F. COOK, who was recently appointed Assistant to the President, Ottawa, Rideau Lakes and Kingston Ry., Ottawa, was born at Croydon, Eng., June 13, 1888. He attended a four years course in civil and mechanical engineering at the Central Technical College, London, Eng., taking his degree in 1909. From June, 1909, to Sept., 1910, he spent some time in aeroplane designing, and also as assistant manager, Bell's Asbestos Co., London, resigning in order to obtain workshop experience, which was done, from Sept., 1910, to Mar., 1913, at the Royal Arsenal, Woolwich.

Canadian Electrical Association.—At the annual meeting in Toronto recently the following electric railway officials were elected to office:—President, D. R. Street, Secretary Treasurer, Moose Jaw Electric Ry. Co.; Managing Committee—A. A. Dion, President, Moose Jaw Electric Ry. Co.; H. G. Matthews, General Manager, Quebec Railway, Light, Heat and Power Co.; E. L. Milliken, Manager, Cape Breton Electric Co.; R. H. Sperling, General Manager, British Columbia Electric Ry.

A Master Mechanic's Opinion.—T. Fraser, Master Mechanic, Algoma Central and Hudson Bay Ry., and Algoma Eastern Ry., writes Canadian Railway and Marine World as follows:—"Enclosed is express order to pay for my renewal subscription to your valuable magazine. I wish it every prosperity and continuous success."

Telegraph, Telephone and Cable Matters.

A. W. Bell has been appointed agent, Great North Western Telegraph Co., at Midland, Ont., vice Miss Switzer, resigned.

The New York Central and Hudson River Rd. is installing telephone dispatching circuits on its Adirondack Division, from Utica, N.Y., to Adirondack Jct., Que., the dispatcher being located at Utica.

E. M. Payne, heretofore Inspector of Telegraphs, Manitoba Division, C.P.R., Winnipeg, has been appointed Superintendent of Telegraphs, Manitoba Division, C.P.R., Winnipeg, vice J. McMillan, promoted.

The telephone cable which has been laid between Vancouver and Vancouver Island, B.C., is 35 miles long, and at one point on the route the water is 1,356 ft. deep. The cost of laying it is given as \$20,000, and the cable was made in England at a cost of over \$100,000.

The Newfoundland Government, it is announced, will erect about 250 miles of telegraph line along the coast during this year, and will also establish a telephone system in St. Johns and other outlying places, as well as build three wireless telegraph stations in Labrador.

John McMillan, heretofore Superintendent of Telegraphs, Manitoba Division, C.P.R., Winnipeg, has been appointed General Superintendent of Telegraphs, Western Lines, C.P.R., with office at Winnipeg, vice B. S. Jenkins, who has been assigned to other duties in the east.

The Great North Western Telegraph Co. has reopened its offices at Clifton House, Niagara Falls; Crystal Beach, Petawawa Camp, Port Cockburn, Queens Royal Hotel, Niagara on the Lake; Royal Muskoka Hotel, Ont.; Abenakis Springs, Chaudiere Basin, Manoir Richelieu, Pointe a Pic, Paspebiac, Que., for the season.

The following appointments in the Grand Trunk Pacific Telegraph Co.'s service have been made recently:—R. M. Hicks, heretofore city manager, Saskatoon, Sask., has been appointed city manager at Edmonton, Alta., vice W. G. M. Corregan, resigned; J. D. Edgett, heretofore night manager at Winnipeg, has been appointed city manager at Saskatoon, Sask., vice R. M. Hicks, transferred; A. J. Hoag has been appointed night manager at Winnipeg, vice J. D. Edgett, promoted; E. H. Hiscock has been appointed electrical inspector at Edmonton, Alta.

The Dominion Telegraph Co.'s report for the year ended June 30, shows assets of \$1,309,702.94, and liabilities of \$1,017,180.93, with a balance to credit of profit and loss account of \$292,522.01. Payment of the guaranteed 6% interest on the capital stock has been paid regularly, quarterly in advance, for the past 34 years. The property is leased to the Western Union Telegraph Co. for 99 years, from July 1, 1879. The officers and directors for the current year are: President, T. Swinyard; Vice President, Sir Henry M. Pellatt; Secretary and Treasurer, F. Roper; other directors, B. Brooks, T. F. Clark, R. C. Clowry, Aemilius Jarvis, C. O'Reilly and A. G. Ramsay.

The Port Arthur and Fort William Electric Ry. created a record for one day's business, July 1, when it carried 32,000 passengers.

Marine Department.

Grain Shipping Facilities in Montreal Harbor.

The illustrations on this and the following page show the grain shipping facilities, etc., in Montreal harbor. At the extreme left of the panoramic view is shown the 1,100,000 bush. steel elevator, marine tower and shipping galleries built for the Grand Trunk Ry. A 665,000 bush. reinforced concrete storage addition to this plant is being built.

vator, and designed and equipped the gallery system for the Harbor Commissioners' two elevators. They are now building the 1,500,000 bush. addition to the Harbor Commissioners' elevator no. 2.

Proposed Weir in the Niagara River.

The International Waterways Commission has, through the President, recommended to the United States Congress the construction of a weir in the Niagara

purposes at Niagara Falls had considerably reduced the level of Lake Erie.

Electrically Propelled Vessels for the Great Lakes.

The recent launching of the Montreal Transportation Co.'s electrically propelled vessel Tynemount, at Newcastle-on-Tyne, Eng., will to a great extent settle the question as to how far electricity can be utilized in the propulsion



Grain Shipping Facilities at Montreal (Continued below.)

The elevator next at the right is the 1,000,000 bush. steel structure, with two marine towers, owned and operated by the Harbor Commissioners. Since the photograph was taken, construction has been started on a 1,500,000 bush. reinforced concrete addition to this elevator.

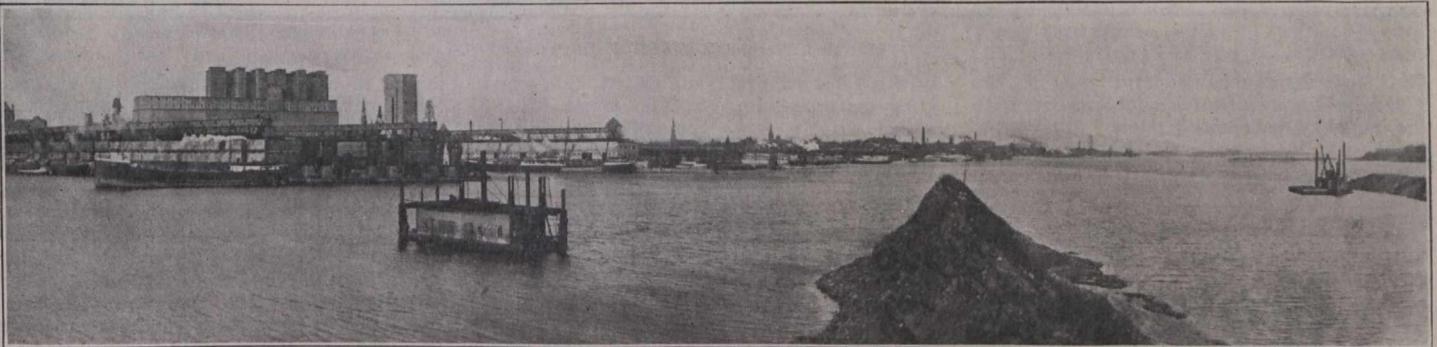
The largest elevator in the illustration is the 2,600,000 bush. reinforced concrete elevator no. 2 of the Harbor Commissioners. Its steel marine tower, with two unloading legs, is seen above the end of one of the piers. This elevator was completed in 1912.

The G.T.R. elevator, with 1,400 ft. of shipping conveyor galleries, serves two steamer berths.

River, to raise the level of Lake Erie. The commission stated the value of the proposed work to Lake Erie ports could hardly be estimated and that it would result in extensive improvements to harbors and docks.

The cost of the weir and consequent works to avoid damage to property is estimated at \$3,500,000. The commission recommended its location at Grill Creek on the U.S. shore and Hog Island on the Canadian, just above Welland River. The dam would raise the level of the Niagara 3 ft. for a distance of 1½ miles. The commission suggested the construction of a levee to prevent dam-

of heavy cargo vessels, and as to what economy can be effected, both in cargo space, and in operation on the Great Lakes. The propelling machinery of the Tynemount is a combination of a Diesel engine and electric motor, the latter being direct connected to the propeller, and this is the first time that the principle has been applied to, what may be termed, an ocean going vessel. Certain conditions of operation on the Great Lakes, and especially through the canals, make it necessary to have the largest coarse pitch propeller which can be driven by an ordinary triple expansion engine at about 80 revolutions a min-



Grain Shipping Facilities at Montreal (Continued from above.)

The Harbor Commissioners' elevators no. 1 and no. 2 are interconnected to serve 19 vessel berths. The shipping galleries are 2 1-3 miles long and contain 10½ miles of rubber belting.

With the completion of the above, grain can be handled in Montreal harbor as follows:—Receiving from cars, 625 cars in 10 hours; receiving from lake vessels, 82,000 bush. per hour; shipping to ocean vessels, 180,000 bush. per hour; total storage capacity, 6,865,000 bush.

The panoramic view photograph and the plan from which the illustrations were made were furnished by John S. Metcalf Co., Ltd., Montreal, who built the Harbor Commissioners' elevator no. 2 and the G.T.R. ele-

age to adjoining property.

At low water the level of Lake Erie would be raised 0.51 ft. at extreme low stage, 0.39 ft. at mean, and 0.11 ft. at extreme flood stage. The commission reported that the plan would raise the mean level of Lake St. Clair 0.23 ft. and that of Lake Huron 0.09 ft.

The commission also reported that the weir would eliminate any injurious effect upon the Lake Erie level of diversion of waters at Niagara Falls for water power purposes, and would reduce the range of oscillation on Lake Erie 4½%.

The report pointed out that diversion of water to the Chicago Drainage Canal, to the Erie Canal and for power plant

ute. Diesel engines run at about 400 revolutions a minute, but in the system in use on the Tynemount this speed can be reduced, as between the engine and the propeller, by means of the electric transmission. The whole system, especially for lake navigation, is yet in its very early stages, and any movement will be watched with considerable interest by those concerned. There are quite a number of experienced navigators on the Great Lakes who are firmly of the opinion that the reciprocating engine is the only one for safe navigation through the numerous locks connecting the Great Lakes up to the present, and are content to wait for further develop-

ments before committing themselves to the adoption of a system which they consider is more or less of an experiment.

Stranding of the s.s. Wabana.

Following is the text of the judgment of the Dominion Wreck Commissioner, Commander H. St. G. Lindsay, concurred in by Capt. F. Nash and J. Westcott, as nautical assessors, resulting from the investigation into the stranding of the Dominion Coal Co.'s s.s. Wabana, off Chlorydorme Point, in the Gulf of St. Lawrence, June 9, while en route from Sydney, N.S., to Montreal.

The court is unanimous in its opinion that the casualty was entirely due to the total disregard of the master's orders, and a lack of judgment on the part of the first officer, P. Fitzsimons, in allowing the vessel to approach too close to land, without either calling the master, or making any attempt to haul out into safety, and therefore suspends his master's certificate of competency for six months. The court, although quite satisfied that no blame should be attached to the master, would point out that the practice, which appears to be a common one with vessels navigating the

soda. Upon cooling, there is obtained a transparent mass somewhat resembling glycerine soap, and it has sufficient cohesion to allow of making it into square shaped bricks. These are easy to handle, as they are not brittle nor do they cause dust. Such blocks have a slow and very regular combustion owing to their uniformity of structure. The weather does not seem to affect them, and they always remain clear. Even boiling water is said to have no effect on the bricks. The heat production from them is such that a ton of solidified petroleum serves instead of 2½ tons of coal. The great saving of space on shipboard is evident, and another point is the great all-round economy realized for producing an equal amount of steam. Some British naval engineers studied the question and concluded that for a single trip of a Cunard liner from England to New York and return the lowest figure for the saving would be \$60,000. They also reported the following points in favor of the new fuel:—

1. No appreciable modification of the furnaces or bunkers is needed.
2. The bricks burn very well in open furnaces.
3. They have a very high calorific power.
4. No inflammable gas is given off under the action of heat in the furnace.
5. They burn slowly without running of liquid, nor is there any crackling or explosion. No ash is left.
6. Their regular shape facilitates stor-

the highest point of the compartment, whichever of these is the greatest.

If peak tanks or other deep tanks are used for carrying liquid fuel the riveting of these should be as required in the case of vessels carrying petroleum in bulk. The strengthening of these compartments must be to the committee's satisfaction.

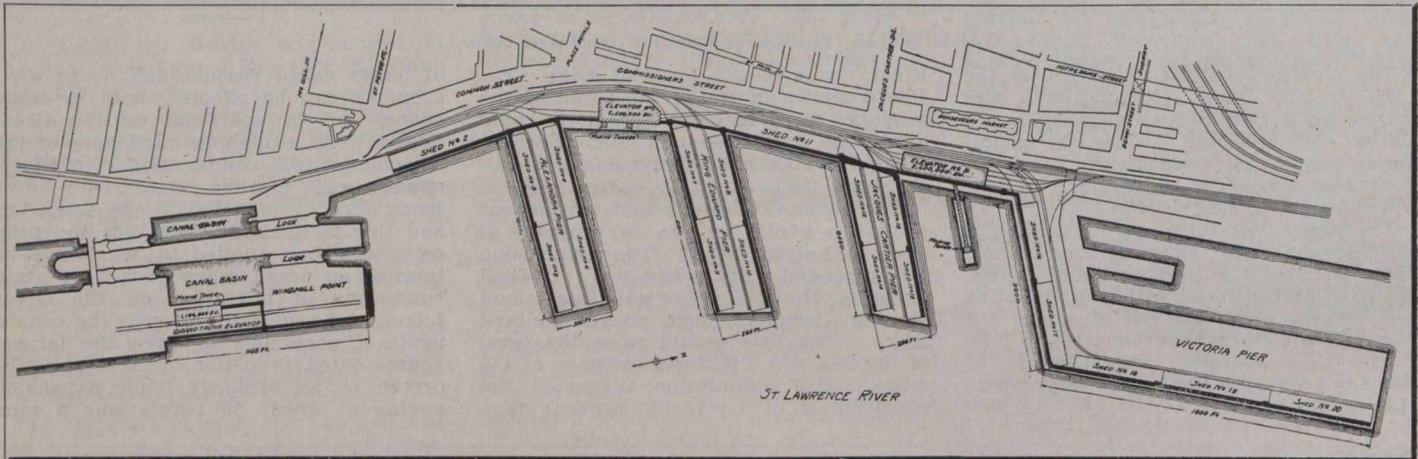
Each compartment must be fitted with an air pipe, to be always open, discharging above the upper deck.

Efficient means must be provided by wells and sparring or lining to prevent any leakage from any of the oil compartments from coming into contact with cargo or into the ordinary engine room bilges.

If double bottoms under holds are used for carrying liquid fuel, the ceiling must be laid on transverse battens, leaving at least 2 ins. air space between the ceiling and tank top and permitting free drainage from the tank top into the limbers.

The pumping arrangements of the oil fuel compartments and their wells must be absolutely distinct from those of other parts of the vessel and must be submitted for approval.

If it is intended to sometimes carry oil and sometimes water ballast in the various compartments of the double bottom the valves controlling the connections between these compartments and the ballast donkey



Montreal Harbor Terminal Facilities.

Gulf, of approaching land within the 1½ mile limit, is not in accordance with the rules of safe navigation.

Solid Oil as Marine Fuel.

The question of a solid fuel for ocean liners in the shape of solidified petroleum is being taken up in Europe, and the outlook for this kind of fuel seems promising. Tests have been made in many countries with spray fuel burners, but when it came to actually applying these on shipboard an obstacle arose, as the new method would lead to a radical transformation of the existing apparatus. Not only are special oil burners needed for the furnaces, as well as regulating appliances, but the devices for loading the liquid combustible on board would need to be changed. Besides, great storage tanks are needed for the liquid, and the action of the latter upon the walls of the tanks would be strongly felt when the vessel is rolling at sea. It was decided recently at a meeting of shipowners at London to go into the production of solidified petroleum bricks on a large scale. These are obtained without any great chemical manipulation. The crude oil is boiled and to it is added a certain amount of stearic acid with an alcoholic solution of caustic ing, and there is no space lost. 7. The

bricks harden with time and reach a great crushing resistance. 8. The range of the vessel will be much increased, which is a capital point for war vessels. From another point of view, it is held that the navigation companies will be more inclined to increase the speed of the ocean liners, since they are able to obtain high steam pressure at a much less cost for fuel than before. On the whole, the new method appears to be a promising one, and a great success is predicted for the solidified petroleum, owing to its low price, and its adoption may prove to be rapid in the near future, for liquid petroleum would only be able to replace coal in a gradual way, owing to the great cost of changing over furnaces and bunkers.

Lloyd's Rules for Burning and Carrying Liquid Fuel.

In vessels fitted for burning liquid fuel, the record "Fitted for Liquid Fuel" will be made in the Register Book.

The compartments for carrying oil fuel must be strengthened to efficiently withstand the pressure of the oil when only partly filled and in a seaway. They must be tested by a head of water extending to the highest point of the filling pipes or 12 ft. above the load line, or 12 ft. above

pump, and also those controlling the suction of the special oil pump, must be so arranged that the suction for each separate compartment cannot be connected at the same time to both pumps.

No wood fittings or bearers are to be fitted in the stokehold spaces.

Where oil fuel compartments are at the sides of, or above, or below the boilers, special insulation is to be fitted where necessary to protect them from the heat from the boilers, their smoke boxes, casings, etc.

If the fuel is sprayed by steam, means are to be provided to make up for the fresh water used for this purpose.

If the oil fuel is heated by a steam coil the condensed water should not be taken directly to the condensers but should be led into a tank or an open funnel mouth, and thence led to the hot well or feed tank.

The above arrangements are applicable only to the case of oil fuel, the flash point of which as determined by Abel's close test does not fall below 150° Fahrenheit.

The Meaford Elevator Co.'s elevator, with about 100,000 bush. of grain in transit to J. Richardson and Son, Ltd., Kingston, was destroyed by fire, July 9. The loss is partly covered by insurance.

Atlantic and Pacific Ocean Marine.

The Union Navigation Co., Ltd., H. J. Donnelly, Secretary, has changed its head office from Toronto to Montreal.

The depth of the St. Lawrence ship channel, on July 1, was 31 ft. 11 ins., compared with 31 ft. 5 ins. at the same date last year.

The Union Steamship Co., of New Zealand, which holds the contract for the Canada-Australia mails, has chartered the British s.s. Canada Cape for the Vancouver run, as an extra vessel, next fall.

From the commencement of the St. Lawrence navigation season to June 30, 271 ocean going vessels, with a tonnage of 898,651, entered Montreal harbor, an increase of 44 vessels and 257,396 tonnage over the the same period in 1912.

A Pacific Coast report states that the Great Northern Steamship Co.'s s.s. Minnesota, which runs between Seattle, Wash., and Orient ports, will shortly make Victoria, B.C., a regular port of call.

It has been held in the British Courts that the conditions as printed on the passenger tickets, issued by the White Star Line, which have recently come under review, during claims for damage and loss occasioned by the wreck of the s.s. Titanic, are illegal.

A. Piers, Manager, C.P.R. Steamship Lines, Liverpool, Eng., has arranged for two additional hammocks in the Lancashire and National Sea Training Home for Boys, at Liverpool, to be known as Empress Hammocks. They will be supported by the officers and crews of the C.P.R. steamships Empress of Britain and Empress of Ireland.

A press dispatch from London, Eng., states that a contract has been signed for the construction of a railway and harbor on the west coast of Ireland in connection with the all red route scheme. The railway, it is said, will run from Collooney to Blacksod Bay, County Mayo, from which port vessels will run to Halifax, N.S., in 3½ days.

Quebec press reports state that it is probable that the Hamburg-American Line will commence a steamship service on the St. Lawrence route in the near future, making its port on the east end of the Isle of Orleans, and connecting with the city of Quebec by a bridge across the river between the Falls and the Island. It is stated that the company has an option on about 10,000 acres of land, or has made the purchase, and a final decision is expected shortly.

An English press dispatch states that the s.s. St. George, recently purchased from the Great Western Ry. of England, by the C.P.R., for service between Digby, N.S., and St. John, N.B., as mentioned in our last issue, will be towed across the Atlantic, by the Liverpool steam tug Blackcock, as it appears it is not possible to bunker her sufficiently for the trip. She will, however, have a full crew on board, and will be fully coaled in case she is separated from the tug in bad weather. It is said to be somewhat new for a fully powered and large steamer to be towed across the ocean while not being disabled in any way.

Maritime Provinces and Newfoundland.

Steamship owners in Nova Scotia have granted increases of pay at various rates to all marine engineers in their employ.

It is reported that a suitable site has been selected for the construction of a vessel repairing dock at Burin, Nfld., and that negotiations for its purchase are being pushed, so that the company interested in the project may proceed with the work immediately.

We are officially advised that press reports as to the possible construction by the Dominion Government of "a great shipyard capable of permitting the construction of small cruisers and other war vessels" at Charlottetown, P.E.I., are without any foundation in fact.

Consumers Coal Co., Ltd., has been incorporated in New Brunswick, with a capital of \$49,000 and office at St. John, to deal in coal and other fuel, and also to carry on a general navigation and carrying business, and to own and operate vessels, elevators, warehouses, etc.

The Dominion Coal Co.'s s.s. Cacouna collided with the schooner Sarah A. Townsend, July 11, the latter being so badly damaged that she was abandoned. She was later towed to Cape Traverse, where her cargo of lumber was discharged. The Cacouna proceeded to Charlottetown, P.E.I., for temporary repairs.

The Dominion Government hydrographic steamship Acadia arrived at Halifax, N.S., from Newcastle, Eng., July 8. It is announced that she will be placed in service as soon as possible, and proceed to Hudson Bay, for hydrographic and survey work in connection with the proposed harbor and terminal work there.

A survey of the Dominion Coal Co.'s s.s. Wabana showed that she was more seriously damaged in her recent accident than was surmised. The bottom is badly set up on both sides for about 200 ft., and about 130 plates and topsides are leaking, in addition to a certain amount of damage to her machinery. She is insured for about £48,000.

At a meeting of the North Sydney Board of Trade recently, it was stated that the Reid Newfoundland Co. had made complaint of the amount of pilotage and harbor dues it was compelled to pay on vessels entering North Sydney harbor, and figures were quoted showing that the company is taxed about \$1,100 a year for harbor dues, and \$12.50 a day pilot dues, which was considerably in advance of what it would have to pay if Sydney were made its Canadian terminal. A committee was formed to interview the Harbor and Pilot Commissioners, with a view to having the charges decreased. A movement is on foot in Sydney to urge the Reid Newfoundland Co. to change its terminal to Sydney, but it is not likely that such a change will be made, at any rate for the present.

The Cape Breton Electric Co. is having a ferry boat built for its service between Sydney and North Sydney, N.S. She is being built at Portland, Me., of white oak frames and timbers and planked with hard pine. Ample provision will be made for carrying freight, the entire lower deck forward being enclosed for the purpose, and will be sufficient for carrying teams and automobiles. On completion the hull will be towed to Yarmouth, N.S., where the machinery, now being made there, will be installed. The propelling machinery will consist of triple expansion engine with cylinders 12, 19 and 30 dia., by 30 ins. stroke, supplied with steam by a two furnace Scotch marine boiler at a working pressure of 160 lbs. Complete electric lighting equip-

ment will also be supplied. It is expected that the boat will be completed and ready for service about the middle of December.

Province of Quebec Marine.

The U.S. s.s. Wallula was recently seized at the Lachine Canal, for non payment of towage dues.

The Department of Marine has established a series of five buoys to mark the channel leading to the floating dry dock in Montreal harbor.

The Montreal, Valleyfield and Soulanges Navigation Co., Ltd., has registered its head office at 404a St. Joseph St., Lachine.

The Quebec Harbor Commission has received three switching locomotives from the Montreal Locomotive Works. Details of these were given in a previous issue.

The Dominion Government s.s. Dollard, for use in the St. Lawrence lighthouse and buoy service, has been delivered to the Marine Department by the builders. She has been equipped with a wireless telegraph installation.

Work is in progress on the crib work for a wharf 4,000 ft. long at Quebec, which is to be used in connection with the National Transcontinental Ry., and for the car ferry connecting the north and south shores, which is expected to arrive at Quebec next spring.

It is announced in Montreal that the Harbor Commissioners will undertake the extension of all piers in the harbor, at an approximate cost of \$1,000,000. It is estimated that about 250 ft. will be added to each pier at the west end, with the possible exception of Victoria pier, thus giving accommodation for eight more vessels.

A. Johnston, Deputy Minister of Marine, and a number of the Department's officials, accompanied the members of the Lighthouse Board, on an inspection of the lights in the St. Lawrence ship channel, July 9 to 11. Complaints had been made by pilots between Montreal and Quebec that the red lights on the route were ineffective, and it was suggested that white lights should be used instead, but after the official inspection it was announced that the present system of red lights would be continued.

W. G. Ross, Chairman, and Farquhar Robertson, of the Montreal Harbor Commission, had a conference with the Minister of Marine, July 11, concerning the proposed acquisition of certain lands on the Lachine Canal and the harbor front near the G.T.R. elevator. The Commission wants to extend the harbor facilities and provide extra accommodation, and according to the terms of the leases under which the land is held the Government can, if the property is required for Government purposes, give the lessees two months notice of its intention to take over the land.

Ontario and the Great Lakes.

The Richelieu and Ontario Navigation Co. was fined \$200 in each of seven cases, at Toronto recently, for selling intoxicating liquors on its passenger vessels.

The Canadian Towing and Wrecking Co., Ltd., has increased its capital stock from \$100,000 to \$200,000 by the issue of 1,000 new shares.

The steamboat City of Montreal, which was formerly owned by the Montreal and Lake Erie Steamship Co., and which, as

announced in our last issue, was recently acquired by J. H. Hall, Ottawa, has had its name changed to Westerman.

The large grain elevator at Point Edward, in which the G.T.R. is chiefly interested, was destroyed by fire, July 7, together with about 72,000 bush. of grain. The elevator was built in 1904. The loss is estimated at \$350,000.

An Ottawa press report states that the formation of a co-operative steamship company, to operate a line of steamships between Montreal and the head of the lakes, is being considered by a number of large wholesalers in eastern and western Canada.

The contractors' plant which was utilized some time ago in connection with the building of the Newmarket Canal, and which has been lying idle for nearly two years, has been removed, any further work on the project having been abandoned by the Government.

The Department of Public Works will receive, to Aug. 25, tenders for the construction of a sea wall, breakwater, ship channel and retaining wall, in connection with the scheme of general harbor improvement and development being carried on at Toronto.

The city of Fort William, which has been arranging for the construction of three tunnels under the rivers surrounding the city, is negotiating with the Dominion Government for permission to proceed with the work, as the Government controls all navigable streams.

The Marine Department will receive tenders to Aug. 22 for a single screw steel steamboat for the lighthouse service. The principal dimensions will be: length between perpendiculars, 155 ft.; length over all, 164½ ft.; breadth moulded, 30 ft.; depth moulded, 13 ft.

The Canada Interlake Line s.s. A. E. Ames ran ashore at Salmon Point, about 40 miles west of Kingston, July 4. She was released July 9, and discharged her grain cargo at Kingston. As the Kingston dock was engaged and booked ahead, the A. E. Ames had to go to a U.S. dock for repairs to her hull.

The small steam tug W. H. Price, owned by J. H. Daball, Parry Sound, was burnt there, June 29, and sank where it is not possible to raise her. She was built at Collingwood in 1903, and was screw driven by engine of 2 n.h.p. Her dimensions were:—Length, 38 ft.; breadth, 10 ft.; depth, 4.6 ft.; tonnage, 13 gross, 9 register.

The National Steamship Co., Ltd., has been incorporated under the Dominion Companies Act, with \$2,000,000 capital, and office at Toronto, to carry on a general navigation business, and to own and operate vessels of every description. The incorporators are: Cawthra Mulock, G. F. Perry, J. B. Foote, E. H. Laschinger and M. Stobie, Toronto.

The results of the Canada Interlake Line's motor vessel Fordonian's first trip to the head of the Great Lakes are reported to be entirely successful, an average speed of 11½ miles an hour having been made. It is stated that the company is considering the question of ordering another similar vessel for the same route.

The steamboat Pontiac, at one time owned by the Prescott and Ogdensburg Ferry Co., and latterly by J. Smith, Toronto, was destroyed by fire at Toronto, July 6. It is stated that it was the work of an incendiary, a similar attempt having been made last year. About three months ago she sank at her moor-

ings and had only recently been raised and repaired prior to again entering service.

The Pembroke Transportation Co., Ltd., which was recently incorporated under the Dominion Companies Act, with \$40,000 capital, and office at Pembroke, Ont., has purchased the steamboat Victoria, formerly owned by the Pembroke Navigation Co., and has had it overhauled, remodelled and renamed Oiseau. W. A., W. L., and J. C. Hunter, Pembroke, are chiefly interested in the company.

The dredging, which was started last year, of the slip to the Government elevator at Fort William, is being proceeded with, with the intention of completing the whole contract as soon as possible. The work also covers the opening of the channel to the Canadian Northern Ry. coal dock, dredging the approaches to the dry dock, and the slip to the shear legs at Bare Point. The contract is for \$122,460, and is held by W. E. Phinn.

The U.S. Lake Survey reports the levels of the Great Lakes in feet above tide-water, for June, as follows:—Superior, 602.31; Michigan and Huron, 561.20; Erie, 573.83; Ontario, 248.02. As compared with the average June levels of the past ten years, Superior was 0.05 ft. below; Michigan and Huron, 0.19 ft. above; Erie, 0.90 ft. above, and Ontario, 1.04 ft. above. It was anticipated that during July Superior would rise about 0.2 ft., Michigan, Huron and Erie, 0.1 ft., and Ontario remain stationary.

Ottawa press dispatches state that the Railway and Canals Department has let the contract for the first section of the new Welland Ship Canal, which covers about three miles and includes the pier works at the Lake Ontario entrance and lock 1, to the Dominion Dredging Co. for about \$3,000,000, and that construction will be started at once. The engineering staff is reported to be at work on specifications for sections 2 and 3, and it is said that tenders will be invited for them in the near future.

The C.P.R. s.s. Athabasca stranded near Flower Pot Island, at the entrance to Georgian Bay, July 6, during a dense fog. As she is equipped with wireless telegraph she soon had the assistance of her sister vessel the Assiniboia, from Port McNicoll, and also a tug and lighter from Owen Sound. After transferring the passengers and lightering a portion of the cargo she floated off and proceeded to Port McNicoll under her own steam, and without apparent damage.

The Ontario and Quebec Navigation Co. has appointed the following officers for its vessels for the current season. In the first column is given the name of the vessel, the second and third columns giving the names of the captains and chief engineers, respectively:—

Aberdeen	..... A. Hudrins	..... W. J. Young.
Aletha	..... D. B. Christie	..
Alexandria	..... I. Rinfret	..... T. Milne.
Brockville	..... A. McLeod	..... A. J. Ramsay.
Fairfax	..... T. L. Vandusen	..... D. S. La Rue.
Geronia	..... M. Heffernan	..... J. D. Andrews.
Lloyd S. Porter	..... T. Heffernan	..... S. Thurston.
Varuna	..... J. Rathbun	..... J. Walker.
Water Lily	..... M. N. Palmatier	..... R. Davis.

Manitoba, Saskatchewan and Alberta.

The Department of Marine has issued a chart of the Red River, from Winnipeg to Lake Winnipeg.

It is announced that the river and lake traffic with Selkirk, Man., judging by

number of vessels and by freight tonnage, shows an increase over last season of approximately a third.

A press report from Regina, Sask., states that the C.P.R. will place a pleasure steamboat in operation on Long Lake, by June, 1914, and that it will erect a summer hotel and resort in the vicinity.

British Columbia and Pacific Coast Marine.

The C.P.R. s.s. Joan has been taken off her route to the Gulf Islands, and taken to Victoria for general repairs to her hull and machinery.

The s.s. Colusa recently arrived at Victoria and Vancouver on her first trip in connection with the new steamship service between Puget Sound ports and Buenos Ayres, South America.

The Dominion Government is making the necessary preparations for a survey of the proposed site for the dry dock to be built at Esquimalt, at an estimated cost of \$3,000,000.

The Minister of Marine is visiting Vancouver and the Pacific coast, during which he will inspect various Government works in progress at various points, and will probably visit ports in Yukon.

The Alaska Steamship Co.'s s.s. Dolphin ran ashore near Alert Bay, B.C., June 29, on her first trip for the season to southeastern Alaska ports. The passengers were transferred to the C.P.R. s.s. Princess May, and proceeded on their journey.

The Department of Public Works received tenders to July 23 for dredging in the Pitt River. It is provided that only dredges owned and registered in Canada must be used on the work, which must be commenced within thirty days of the awarding of the contract.

The G.T. Pacific Coast Steamship Co.'s s.s. Prince Albert, which was taken off her route during June, in order that the damages sustained by her striking the docks at Port Simpson might be repaired, was replaced in service, between Victoria, Queen Charlotte Islands and Prince Rupert, July 10.

The Skagway Steamship Co., Seattle, Wash., has been registered under the British Columbia Companies Act to carry on its business in the Province, with J. H. Lawson, Jr., Vancouver, as its attorney. It has a capital of \$20,000, and power to carry on a navigation business and other incidental businesses, excepting the construction and operation of railways.

W. P. Hinton, General Passenger Agent, G.T. Pacific Ry., Winnipeg, is reported to have stated recently, in connection with the suggested G.T.P. Coast Steamship Co.'s steamship service to San Francisco, that while it cannot be said that such a service will not be inaugurated at a future date, nothing is being done at the present time toward such a service.

The Mayor of New Westminster drove the first pile of the first unit of the New Westminster harbor improvement scheme, July 3, when it was announced that within a few weeks a contract would be let for the dredging of a deep waterway up the Fraser River to Port Coquitlam. It is hoped that this channel will be completed in time for the maiden sailing of the vessel, now under construction at Port Coquitlam, and which it is hoped to launch within the next month or two, to the West Indies.

Ice Breaking Steamship for the St. Lawrence River.

The Minister of Marine and Fisheries has decided to order another ice breaking steamship for the St. Lawrence River, of which the following are the approximate dimensions:—Length, 275 ft.; breadth, 57½ ft.; depth, 30 ft.; draught, mean, 20 ft.; indicated horse power, 8,000.

The general structure will be of great strength. The framing amidships and approaching the ends forward and aft will be of heavy channel section about 12 ins. deep, spaced about 18 ins. apart. At the extreme ends the spacing will be reduced to 15 ins. The complete transverse framing will be bound inside in every way practicable, in order to form a complete structure in itself independent of the outer plating. The outer or shell plating will be of Siemens Martin ship steel. At the ice breaking water line of the vessel, and running fore and aft for the complete length, a special ice belt will be fitted, 10 ft. deep, having a thickness of 1 1-8 ins. at the stem, reduced to 1 in. at the stern. Forward in the bow, and from the bottom of the ice belt to the keel plate, the plating will for a considerable distance aft be 1 1-8 in. and 1 in. thick respectively. Special provision will be made for protecting the rudder during ice breaking operations.

The watertight subdivision will be complete, and the strengthening of the vessel, particularly forward, will be accomplished in such a manner as experience has shown from vessels at present in service and generally in accordance with the largest European ice breakers. It is proposed to make the form forward similar to that of the Russian ice breaker Ermack, which has proved so successful in ice work, and the beam proposed, which should not be reduced, will be such that ample curvature will be given to the lines, longitudinally and vertically, in order that the minimum of surface may be presented to any ice pressure. The present St. Lawrence ice breakers are defective in this respect.

The machinery will consist of two sets of triple expansion engines having working parts varying from 25 to 50 per cent. in excess of the ordinary practice. The indicated horse power of 8,000 on a 12 hours trial will be developed in 8 Scotch boilers, having a working pressure of 180 lbs. per sq. in., and working under

natural draught, and the location of these will be such that full benefit will be derived as a crushing load, should the vessel be driven on to heavy ice, such as is met with at Cap Rouge. Special arrangements will be made in the engine room for large ballast pumps capable of transferring large bodies of water from the after to the forward peak tanks and vice versa.

With a vessel of the above particulars, the ordinary sheet ice formed in the river from 12 to 30 ins. thick will present no difficulties, while the packed ice formed in certain parts of the river, particularly at Cap Rouge, should, with the displacement and power developed, be successfully coped with.

A first class, modern wrecking equipment will be installed on the vessel, and will consist of powerful pumps, etc., but the details have not yet been worked out.

The whole plans are well in hand and every effort is being made to hasten their completion, so that tenders for construction may be invited as early as possible.

New Vessels for Canadian Pacific Railway British Columbia Coast Service.

As stated in Canadian Railway and Marine World for June and July, the C.P.R. has ordered to be built at Dumbarton, Scotland, two steamships to run between Vancouver, B.C., Seattle, Wash., and Victoria, B.C., in what is called the company's triangle service. They are to be built to the British Corporation highest class for awning deck steamships, with freeboard. They are to have cruiser sterns, and will be 395 ft. long over all, 54 ft. broad, and 28 ft. deep to the awning deck. They are to have five decks, viz.: boat, promenade, awning, main and orlop, with deck house on the boat deck. They are to be fitted for oil fuel, and will have double bottoms. There will be 13 transverse bulkheads to the main deck and two longitudinal bulkheads at sides of boiler space, with three large oil tanks on each side of the ship. There will be two watertight bulkheads from the main to the awning decks, and the general design is such that if any two compartments are open to the sea when the ship is in a fully loaded condition, she should still remain afloat.

The general arrangement will be similar to the Princess Charlotte and other of the company's ships. All of the decks, with the exception of the boat deck, will be continuous steel decks. There will be 16 seamless life boats and one working boat, and the general equipment will comply with Canadian regulations for 2,000 passengers in the triangular service.

The public rooms will be handsomely finished in hardwood and furnished luxuriously. There will be sleeping accommodation for about 440 first class passengers, with numerous cabins de luxe, bath rooms, etc. The smoking room will be on the boat deck, and there will be a verandah cafe. The dining room will be on the main deck aft, and will seat about 175 people. Arrangements will be made for tables of various sizes. The room will be lighted by patent 21 in. semi elliptical port lights. The galleys and pantries will be fitted up with all the latest appliances, and ample provision is made for ventilation. A refrigerating plant will be provided, sufficient to take care of the ship's stores.

The ships will be steered by telemotor steam steering gear, and the rudder will be of the spade type and balanced. The motive power will consist of 10 Babcock and Wilcox boilers, arranged for forced draught on the closed stokehold system. There will be three stokeholds and three funnels. Turbine machinery of the latest type will be used for driving the ship. Impulse wheels will be used on the go-astern turbines, and the aggregate horse power will be in the neighborhood of 13,500. All the auxiliary machinery will be of the very latest type, 4 feed pumps, any two of which can supply the boilers at full power. Uniflex condensers of the latest type will be used, also air pumps, evaporators, etc. Three electric engines will be provided, any two of which could carry the full load of 1,500 lights, in addition to electric heaters, motors, fans, searchlight, etc. The speed guaranteed is 22½ knots an hour.

The vessels are to be delivered in the winter of 1914, and it is the intention to provide with them a service in the spring of 1915 which will be superior to anything heretofore undertaken on the Pacific coast.

We are indebted for the foregoing particulars to J. W. Troup, Manager, B.C. Coast Steamship Service, C.P.R.

List of Steam Vessels Registered in Canada during June, 1913.

No.	Name	Port of Registry	When and Where Built		Length	Breadth	Depth	Gross Tons	Reg. Tons	Engines, Etc.	Owner or Managing Owner
131090	Jas. Carruthers	Toronto	1913	Collingwood, Ont.	550 0	58 2	26 7	7362	5606	217 n.h.p. sc.	St. Lawrence and Chicago Steam Nav. Co., Toronto
131016	Margaret A. Hackett.	Quebec, Que.	1912	Quebec, Que.	99 3	24 0	9 2	192	83	56	Quebec Transportation and Forwarding Company, Quebec, Que.
133791	Onajag	Port Stanley, Ont.	1913	Port Stanley, Ont.	77 0	18 3	7 7	51	35	13½	W. H. McPherson, M.O., Port Stanley, Ont.
133769	Princess Maquinna.	Victoria, B.C.	1913	Victoria, B.C.	232 5	38 0	14 5	1777	979	145	Canadian Pacific Ry. Co., Montreal.

List of Sailing Vessels and Barges Registered in Canada during June, 1913.

No.	Name	Port of Registry	Rig	When and Where Built		Length	Breadth	Depth	Reg. Tons	Owner or Managing Owner
131059	A. I. Perry	Port Arthur, Ont.	Barge	1904	Duluth, Minn.	100 0	26 0	7 5	178	R. Vigars, Port Arthur, Ont.
133812	David C. Ritcey	Lunenburg, N.S.	Schr.	1913	Liverpool, N.S.	124 6	32 0	11 4	234	D. C. Ritcey, M.O., Riverport, N.S.
133832	G. D. No. 2	Montreal	Barge	1913	Grenville, Que.	122 8	24 0	7 6	202	G. Dansereau, Grenville, Que.
133833	G. D. No. 3	"	"	1913	"	88 7	21 3	6 5	98	"
133810	Granite	Lunenburg, N.S.	Schr.	1913	Lunenburg, N.S.	104 2	25 8	10 5	92	W. Richard, LaHave, N.S.
133811	J. N. Rafuse	"	"	1913	LaHave, N.S.	113 4	28 3	11 6	212	J. N. Rafuse, M.O., LaHave, N.S.
130874	Robson	New Westminster, B.C.	Dredge	1901	Portland, Ore.	133 0	29 0	6 0	464	Pacific Dredging Co., Vancouver, B.C.
126058	Thos. H. Cahoon	Midland, Ont.	Schr.	1881	E. Saginaw, Mich.	170 0	30 0	10 0	410	E. F. Burke, Midland, Ont.
133666	Village Leaf	Halifax, N.S.	"	1913	Mahone Bay, N.S.	75 8	22 6	9 3	78	A. Lapierre, et al, Gran Desert, N.S.

New River Steamboats for White Pass and Yukon Route.

The two new steamboats which the White Pass and Yukon Route has added to its fleet, for service between Dawson, Yukon, and Fairbanks, Alaska, as mentioned in Canadian Railway and Marine World for April, are now on their route, the steamboat Alaska having sailed from White Horse, on her maiden trip of 1,500 miles, to Fairbanks, June 14, and the Yukon following two days later.

The vessels were set up and measured at Seattle, Wash., and then knocked down, shipped to White Horse, Yukon, and put together there. They have saloon and boat decks, with 32 passenger rooms and accommodation for officers. The saloon deck is laid out with large and commodious observation room forward, dining saloon amidships and smoking room and buffet, aft. The propelling machinery consists of sternwheel engines with cylinders 16 ins. diam., by 72 ins. stroke, supplied with steam by local marine boilers. They draw 20 ins. of water with all equipment and stores on board. The first trip, in each case, was from White Horse, but, as mentioned, the regular route is between Dawson and Fairbanks, about 1,000 miles. The vessels are registered in the U.S., and the company, at the time they were launched, had contracts covering 5,000 tons of freight for conveyance by them. Following are the chief dimensions:—Length, 164.8 ft.; beam, 35.3 ft.; depth of hold, 5.9 ft.; tonnage, gross 765, net 503.

Stranding of the s.s. Kenora.

The Dominion Wreck Commissioner, Commander H. St. G. Lindsay, assisted by Capt. F. Nash and J. McGrath as nautical assessors, held an enquiry recently into the causes of the stranding of the Canadian Lake Transportation Co.'s s.s. Kenora, in Lake St. Louis, June 5. The Kenora sailed from Montreal for Port Arthur, June 4, and after clearing the Upper Lachine canal lock, proceeded to the ship channel, but owing to the smoke from her funnel obscuring the Lachine range lights, she did not maintain her proper course, the strong cross current carrying her to the south side of the channel, where she grounded, doing considerable damage to her bottom. The court is of opinion that the stranding can only be attributed to the smoke obscuring the range lights astern, and exonerates the master and pilot from all blame, and it considers the circumstances so peculiar and unusual that it is unable to make any suggestion that would be likely to help vessels under similar conditions.

Obstructions to Rainy River Navigation.

The Rainy River Navigation Co. was the plaintiff in two actions in which judgment was given in the Trial Court at Toronto, July 16. In the case against the Ontario and Minnesota Power Co., plaintiff claimed \$50,000 damages for obstruction of flow of water alleged to be caused by defendant's dam across Rainy River, above the falls. In giving judgment for plaintiff for \$540 and costs Judge Britton said: "With some hesitation I have come to the conclusion that the defendants did so interfere with the natural flow of the water from above

International Falls into Rainy River as to cause damage to the plaintiff by preventing the running of the Agwinde during part of the season of 1911. Some of the damages claimed by plaintiff has not been proved and are too remote." Thirty days stay of proceedings was granted.

In the other case, against the Watrous Island Boom Co., plaintiff claimed \$10,000 damages, alleged to have been sustained by plaintiff through obstruction to navigation by a boom of logs stretched across Rainy River at Hannaford Bar. Judge Britton gave the following judgment: "There must be give and take. In this case defendants' servants made the openings within a reasonable time and gave the plaintiff reasonable facility in navigating the steamer. The plaintiff's claim in this action is quite inconsistent with the claim in the other, where damages are at least in part sought for detention of the same vessel, covering the same period, because of keeping back the water necessary for navigation purposes. The action should be dismissed with costs. Thirty days stay."

Stranding of the s.s. Majestic.

Following is the text of the judgment of the Dominion Wreck Commissioner, Commander H. St. G. Lindsay, concurred in by Capt. F. Nash and J. McGrath, as nautical assessors, in the stranding of the Northern Navigation Co.'s s.s. Majestic, at the time operated by the Richelieu and Ontario Navigation Co. in Lake St. Louis, June 4. The court is of opinion that the master of the Majestic was not justified in accepting the two blast signals from the tug St. Louis, while leaving the Upper Lachine lock and proceeding toward the ship channel, and he therefore committed an error of judgment, and the court considers he should have slowed down and allowed the tug and tow to clear the cut, or have gone ahead and gone to westward of the tow before it came from the cut. The court also considers that the master of the tug was not justified in making the two blast signal, as he apparently made no attempt to keep his tow up on the north side of the cut until it was too late to avoid the accident, and he could, with perfect safety

to his tug and tow, have kept on the south side of the channel. It therefore censures both masters and recommends that more care be exercised in future when navigating in narrow waters and especially where cross currents exist.

Government Dry Dock for Levis, Que.

During last year the Dominion Government called for tenders for the construction, within four years, of a dry dock in the Port of Quebec, on a site to be decided by the Government. The work was to be undertaken as a private enterprise, and operated under certain conditions, the Government agreeing to pay a subsidy of 3½% for 35 years on approximately \$5,000,000. Surveys of various suggested sites within the port, eventually resulted in the one at St. Joseph de Levis, on the south side of the river, opposite Quebec, being chosen. No satisfactory tenders were received for the undertaking of the work, no tender being submitted in accordance with the terms offered by the Government. It was later decided to take up the question as a Government work, and the contract has been awarded to M. P. and J. T. Davis, Ottawa, at \$2,721,116. The dimensions of the dock, which will be a graving dock, and not of the floating type, as at Montreal, will be, approximately, usable length, 1,150 ft.; clear width at entrance, 120 ft.; depth over sill and keel blocks at ordinary high water spring tide, 40 ft. at least. The dock will be built in two compartments.

The Canadian Northern Ry. elevator at Brandon, Man., was destroyed by fire, July 16.

The Alberni Canal Transportation Co., Ltd., has been incorporated under the British Columbia Companies Act, with \$20,000 capital, and office at Victoria, to acquire the steamboat College Widow, and to acquire and operate other vessels, and carry on a general transportation business. The College Widow was built at Victoria in 1910, and is screw driven with engine of 10 n.h.p. Her dimensions are:—Length, 54.2 ft.; breadth, 15.2 ft.; depth, 7.5 ft.; tonnage, 46 gross, 23 register.

Sault Ste. Marie Canals Traffic.

The following commerce passed through the Sault Ste. Marie Canals during June, 1913.

ARTICLES	CANADIAN CANAL	U. S. CANAL	TOTAL
Copper.....Eastbound.....Short tons.....		14,622	14,622
Grain.....".....Bushels.....	4,402,246	6,227,737	10,629,983
Building stone.....".....Short tons.....		273	273
Flour.....".....Barrels.....	222,000	861,160	1,083,160
Iron ore.....".....Short tons.....	5,172,615	2,772,643	7,945,258
Pig iron.....".....".....		4,906	4,906
Lumber.....".....M. ft. b. m.....	2,885	85,440	88,325
Silver ore.....".....Short tons.....			
Wheat.....".....Bushels.....	7,010,586	4,503,098	11,513,684
General merchandise.....".....Short tons.....	10,706	47,617	58,323
Passengers.....".....Number.....	2,886	2,905	5,791
Coal, hard.....Westbound.....Short tons.....	89,833	288,036	377,869
Coal, soft.....".....".....	558,301	2,043,001	2,601,302
Flour.....".....Barrels.....		163	163
Grain.....".....Bushels.....			
Manufactured iron.....".....Short tons.....	15,742	34,007	49,749
Iron ore.....".....".....	17,192		17,192
Salt.....".....Barrels.....	3,920	80,264	84,184
General merchandise.....".....Short tons.....	82,539	116,524	199,063
Passengers.....".....Number.....	4,016	1,690	5,706
Summary.			
Vessel passages.....Number.....	1,084	2,329	3,413
Registered tonnage.....Net.....	3,844,306	4,796,136	8,640,442
Freight—Eastbound.....Short tons.....	5,515,007	3,340,814	8,855,821
" — Westbound.....".....	764,167	2,493,625	3,257,792
Total freight.....".....	6,279,174	5,834,439	12,113,613

The Lloyd S. Porter's Damage to the Welland Canal.

W. H. Sullivan, A.M. Can. Soc. C.E., Superintending Engineer, Welland Canal, has furnished the following particulars of the accident which occurred on Sunday, June 8, about 5 a.m., when all four gates of lock 1, at Port Dalhousie, were carried out and traffic was interrupted for about 36 hours:—

The steamboat Lloyd S. Porter, of the Ontario and Quebec Navigation Co., upbound, had just finished laying up two barges and was proceeding to tie up along the east approach wall about 200 yards below the lock, to await the preparation of the lock to receive her. In the meantime, the Neepawah, also upbound, was about midway in the level between locks 1 and 2. The upper gates were still open and the water in the lock at the level of the upper reach. The engineer of the Porter, misunderstanding the captain's signal to reverse, gave her speed ahead. When she was about 50 ft. from the lower gates, the engines were finally reversed, too late. She struck the west gate a blow sufficient to unmiter the gates. The lift at this lock is 14 ft. and the rush of water tore the two lower gates from their anchorages and they became firmly wedged, one above the other, between the lock walls. The sudden rush of water from the reach above also carried out the upper gates down through the lock and over the two lower gates into the harbor below. The captain of the Neepawah, which was approaching lock 2, became aware of what had happened, and, giving his vessel full speed ahead, succeeded in making lock 2 before the water had lowered enough to ground his boat or for the current to carry her back toward lock 1.

The reaches between locks 1 and 2 of both the old and new canals are connected, and, had it not been for the very large pondage thus afforded, the Neepawah would have been unable to get safely in lock 2 and the accident would have been much more serious.

The pondage above lock 1 is so great that it took fully 12 hours for the water above lock 1 to get down to Lake Ontario level. This also delayed the commencement of making repairs and the resuming of traffic after the repairs had been made.

Four spare gates were put in and navigation resumed about 6 p.m. Monday, June 9. The damage was estimated at about \$6,000. The Porter received very small injury, her rudder being slightly damaged.

Loss of the s.s. Gerald Turnbull.

An enquiry into the loss of the British s.s. Gerald Turnbull, on the Gannet Dry Ledge, in the Bay of Fundy, May 10, was held recently by the Dominion Wreck Commissioner, Commander H. St. G. Lindsay, assisted by Capt. N. Hall and J. W. Harrison, as nautical assessors. The vessel was on her maiden voyage, and was apparently in good order and condition, well equipped and apparently navigated in a proper and seamanlike manner. The court, after hearing the evidence, failed to find any reason for the master, Alex. Willison, mistaking the lighthouse on Seal Island for that on Brier Island, as the distance between the two is about 50 miles, and considered that if he had taken soundings after sighting

the Seal Island light, and taken into consideration the course and distance he had made between the two buoys, on the southwest ledge off Cape Sable, and the second buoy, which appears to have been the Blonde Rock buoy, he would have found out his mistake in ample time to avoid the casualty. After passing Seal Island, and seeing the fishermen and lobster buoys, he ought to have been on his guard, and apparently he was so over confident as to the vessel's position that he did not use the ordinary prudence necessary for safe navigation. The court suspended the master's certificate for six months. The court also criticized the evident want of a large scale chart on the vessel, as the one which the master used was not safe and proper for the navigation of a vessel in such dangerous waters.

Reversal of the s.s. Bellona Judgment.

A British court, according to reports, has returned the certificate of J. Cunningham, master of the s.s. Bellona, which was suspended in Dec., 1912, for three months by the Dominion Wreck Commissioner, and whose judgment was concurred in by two experienced navigators, as nautical assessors.

In each of the three cases, which have recently been dealt with in this manner, the master was below at the time of the accident, so that it would appear, at first sight, that the reasons for the return of the certificates were one and the same in each case, viz., that, being below, the master was not responsible. This was practically the reason given by the Judge of the Admiralty Court, in the case of the Bengore Head, mentioned in our last issue, but in the other two cases, the reasons have not been stated.

As we have pointed out in previous issues the matter is perfectly clear so far as the Dominion Courts are concerned, that the master is responsible for everything that may happen in the course of navigation, even though a pilot be on board, the latter being there merely in an advisory capacity on account of his local knowledge. If there is anything in the British act, or general practice, covering this point, it would perhaps be as well for the matter to be set right forthwith.

For several years a dead set has been made by a number of interested British and U.S. papers on the St. Lawrence route and its difficulties have been magnified considerably, and yet the conduct of certain ships' masters, with whom is supposed to rest the responsibility for the safety of their passengers and vessels, in spending the period of what they assert to be most difficult and dangerous navigation, below, and leaving their vessel in charge of the pilot and another officer, who, though qualified, may not be sufficiently experienced, is condoned.

We have no desire to convey the impression that the route is without difficulties or dangers, but the many improvements and aids to navigation which have been provided by the Dominion Government during the past few years, have minimized these to a very great extent, and the number of vessels which have been navigating the entire route for years without accident, is sufficient proof that with ordinary care and judgment, the natural concomitants of good seamanship, the navigation of the waterway from the open sea to Montreal is as safe as any other similar channel in the world.

Examination of Water Levels on the St. Lawrence River.

As previously announced in Canadian Railway and Marine World, Prof. E. E. Haskell, Dean of the School of Engineering, Cornell University, Ithica, N.Y.; W. J. Stewart, Chief Geographer of the Naval Service Department, Ottawa; and V. W. Forneret, Superintending Engineer of the St. Lawrence River Ship Channel, have been appointed a board to investigate and report to the Minister of Marine on the whole question of the water levels of the St. Lawrence at and below Montreal.

The Minister's report, on which the order in council appointing the board was passed states that Prof. Haskell is universally regarded as one of the foremost experts on this continent on all questions relating to water levels. He is to be paid \$25 a day, in addition to travelling and living expenses, during the time he is actually engaged in Canada as a member of the Board.

The Loss of the Ship Freia.

The enquiry into the loss of the Norwegian ship Freia, at Sunday Point, Yarmouth, N.S., May 30, was enquired into recently by the Dominion Wreck Commissioner, Commander H. St. G. Lindsay, assisted by Capt. Neil Hall and J. W. Harrison as nautical assessors. This vessel, having taken on her cargo of lumber at Yarmouth, was towed outside the harbor and anchored, with two mates and a seaman aboard. It appears to be the practice at this port to anchor vessels outside the harbor after loading and while waiting for a complete crew. Members of the crew were taken on board from time to time, and on May 29 there were 13 on board. Later, heavy seas arose, and the vessel dragged at her anchors, toward the shore. Unsuccessful attempts to cut away the masts and rigging to ease the ship were made, and she struck on the rocks and disappeared in 15 minutes, the crew being successful in getting on to the rocks. The court was of opinion that everything possible was done under the circumstances to save the vessel, and no blame was attributed to anyone, but considered that the custom of the port in sending vessels into the open with no crew aboard and no sails bent, and leaving them exposed for days to bad weather and strong currents with poor holding ground, is open to criticism.

Dangerous Goods in Public Harbors.—

An order in council recently passed for regulating the storing of dangerous goods within the limits of any public harbor, when such goods are not intended for shipment on any vessel, provides that no explosive, inflammable or dangerous goods of any kind may be kept on any pier, or in any bulk scow or floating stage in any harbor without the written permission of the harbor master, under penalty of \$100 for each offence. The harbor master may decide, subject to appeal to the Department of Marine, what goods are included under these regulations, and may order their removal whenever permission has or has not been granted.

A passenger on the Quebec and Lake St. John Ry., who refused to give up his ticket recently, on the ground that there was not an available seat on the train, and who was subsequently put off, is suing the company for \$1,000.

The Absorption of Canada Interlake Line, Limited.

A. E. Ames & Co., brokers, Toronto, issued the following circular to the preferred shareholders of Canada Interlake Line, Ltd., at the end of June:—

"By an agreement dated June 20, which has the approval of the directors of Canada Interlake Line, Ltd., W. Grant Morden, of London, Eng., and J. P. Steedman, of Hamilton, Ont., have agreed to purchase from the shareholders of Canada Interlake Line, Ltd., their holdings of preferred shares, also their holdings of common shares received as a bonus at the time they subscribed for the preferred, if they still retain such common shares, as follows:—

"The purchase price for preferred shares, carrying with them the bonus of 15% of common shares, shall be \$107.50 for each preferred share together with accrued dividends thereon to date of payment. Such shareholders as so desire shall have the privilege, instead of taking cash, of exchanging their holdings for the same number of cumulative 7% preferred shares as they now hold, and 25% thereof in common shares of Canada Transportation Lines, Ltd. (the company recently formed to take over the Richelieu and Ontario Navigation Co., Canada Interlake Line, and several other navigation companies).

"The purchase price for preferred shares, in respect of which the bonus of common shares cannot be delivered, or in the purchase of which no bonus of common shares was received, shall be \$100 for each preferred share, together with accrued dividends thereon to date of payment. Such shareholders as so desire shall have the privilege, instead of taking cash, of exchanging their holdings for the same number of cumulative 7% preferred shares as they now hold and 10% thereof in common shares of Canada Transportation Lines, Ltd.

"The terms of the agreement further provide:—That shareholders resident in Canada should deposit their stock with the Prudential Trust Co., Toronto, not later than July 10, and those resident outside of Canada not later than July 21. That the stock so deposited shall be held by the Trust Co. in escrow subject to the terms of the agreement and that the Trust Co. will issue a deposit receipt therefor. That the purchase or exchange, as the case may be, shall be completed on or before Aug. 15, and if not then completed the stock shall be returned by the Trust Co.

"While security holders are free to exercise their choice, we are of the opinion that the exchange of securities will work out to their advantage."

Accompanying the foregoing circular was one from M. J. Haney, President, and J. W. Norcross, Managing Director, Canada Interlake Line, Ltd., which said in part:—"The propositions submitted to you for the exchange or sale of your stock have been sent out after being carefully considered and heartily approved by your directors. We have studied the prospects and possibilities of the Canada Transportation Lines, Ltd., and are confident that the net earnings of the new company will make its securities very attractive. We feel warranted in recommending you to accept the stock of the Canada Transportation Lines in exchange for the stock you now hold in this company. Please note that the preferred shares carry a bonus of 10% common stock."

Canadian Notices to Mariners.

The Department of Marine has issued the following:—

194. June 17. New Brunswick, south coast, Bay of Fundy, off Deadman Head, buoy to be established.

195. June 17. Nova Scotia, southwest coast, Barrington Bay, Congress Shoal, can buoy replaced by bell buoy.

196. June 17. Nova Scotia, south coast, Sambro harbor, buoys established.

197. June 17. Quebec, River St. Lawrence, ship channel between Quebec and Montreal, middle ground below St. Antoine, gas buoy placed.

198. June 17. Quebec, Richelieu River, off de Bleury Creek, buoys established.

199. June 17. Quebec, River St. Lawrence below Montreal, Repentigny, temporary front range light.

200. June 17. England, west coast, Milford Haven, East Pennar Point, alteration to color of light on pier.

201. June 18. New Brunswick, Bay of Fundy, west of Whitehead Island, Whitehead Ledge, buoys established.

202. June 1-8. New Brunswick, east coast, Northumberland Strait, Chockfish River, light established.

203. June 18. Quebec, River St. Lawrence above Quebec, Pointe aux Trembles en bas, light established on wharf.

204. June 21. Quebec, Ottawa River, Fort William, pole light discontinued, lighthouse established on Government wharf.

205. June 21. Ontario, Bay of Quinte, approach to Deseronto, buoys established.

206. June 21. Ontario, Detroit River, Livingstone Channel, float light established.

207. June 21. Ontario, Lake Huron, Goderich, temporary light on south breakwater discontinued.

208. June 21. Manitoba, Red River, chart Winnipeg to Lake Winnipeg issued.

209. June 21. Quebec, Montreal harbor, channel to dry dock, buoys established.

210. June 21, Quebec, River St. Lawrence, Montreal harbor, St. Lambert shoal, buoy established.

211. June 25. Nova Scotia, south coast, Liverpool Bay, Coffin Island, lighthouse destroyed by fire, temporary light.

212. June 25. Prince Edward Island, south coast, Hillsborough Bay, wreck.

213. June 25. Prince Edward Island, south coast, Hillsborough Bay, Haszard Point, day marks on range lighthouses.

214. June 25. Prince Edward Island, south coast, Hillsborough Bay, Charlottetown harbor, color of Brighton Beach range lighthouses.

215. June 25. New Brunswick, Chaleur Bay, Caraquet harbor, buoys established.

216. June 26. Quebec, River St. Lawrence, Lake St. Louis, changes in buoyage.

217. June 26. Ontario, Lake Erie, Long Point Bay, wreck marked by buoy.

218. June 26. Ontario, Lake Erie, Pelee Passage, southeast shoal lightship, additional particulars of lights.

219. June 26. Ontario, Lake Superior, Thunder Bay, Fort William, Mission Channel entrance, buoys to be established, range lights to be established.

220. June 30. British Columbia, Vancouver Island, southeast coast, Esquimalt

harbor, Extent of Whale Rock, buoy to be changed in position.

221. June 30. United States of America, Washington, Puget Sound, Alki Point light station, characteristic of light changed, fog signal established.

222. July 3. New Brunswick, St. John River, Scotchtown, buoys established.

223. July 3. New Brunswick, east coast, St. Louis Gully, buoy established.

224. July 3. Nova Scotia, south coast, Halifax approach, Chebucto Head, date fog alarm is to be changed to telephone.

225. July 3. Prince Edward Island, north coast, Cascumpeque harbor, Alberton, change in position of range lights.

226. July 3. Quebec, River St. Lawrence, Les Mechins, pole light on wharf.

227. July 5. Quebec, River St. Lawrence, Lake St. Louis, buoys established southward of Dorval and Pointe Claire lighthouses.

228. July 5. Ontario, River St. Lawrence, Thousand Islands, gas buoy established near northwest extremity of Georgina Island.

229. July 5. Ontario, Lake Ontario, Presqu'île Bay, change in color of Brighton back range light.

230. July 5. Ontario, Georgian Bay, west side, Lionhead harbor, light pole replaced by tower.

231. July 5. Manitoba, Red River, Selkirk, lights established on wharf.

232. July 5. United States of America, St. Clair River, St. Clair Flats Canal, light established.

233. July 5. United States of America, Lake Superior, Apostle Islands, Outer Island light, characteristic changed, intensity increased.

234. July 7. Quebec, Saguenay River, below Passe Pierre Islets, light established.

235. July 7. Quebec, Saguenay River, Ile St. Louis, light established.

236. July 7. Quebec, Saguenay River, Trinity Bay, light established.

237. July 9. Ontario, Georgian Bay, east side, Waubuno Channel, Gull Rock, day beacon erected.

238. July 9. Ontario, Georgian Bay, east side, approach to Parry Sound, Black Rock, day beacon rebuilt.

239. July 9. Ontario, Georgian Bay, east side, approach to Parry Sound, Twin Rock, day beacon rebuilt.

240. July 9. United States of America, Lake Ontario, east end, Gallow Shoal, change in position of gas buoy.

241. July 9. United States of America, St. Clair River, Marine City Shoal, gas buoy established.

242. July 9. United States of America, St. Clair River, Stag Island, gas buoy established.

243. July 9. United States of America, Lake Huron, Detour Passage, Crab Island Shoal, gas buoy established.

244. July 11. British Columbia, Cardero channel, Greene Point rapids, Griffiths Island, gas lighted beacon established.

245. July 11. British Columbia, Brown Passage, Tree Nob group, Triple Island, gas lighted beacon established.

246. July 12. Nova Scotia, west coast, Yarmouth Sound, middle ground north-eastward of Juhns Cove, buoy established.

247. July 12. New Brunswick, east coast, Shippigan Gully, change in position of back range light.

248. July 12. Quebec, River St. Lawrence, eastward of Orleans Island, gas buoys placed temporarily for dredging purposes.

Telegraph, Telephone and Cable Matters.

The Western Union Telegraph Co. has decided to build an enlarged and permanent cable station at Bay Roberts, Nfld., for the accommodation of its trans-Atlantic cables. It will also build a number of modern dwellings for its staff there.

A New Westminster press report states that the Dominion Government telegraph line to Queen Charlotte Islands, an appropriation for which was included in the estimates at the last session of the Dominion Parliament, will be taken in hand at once and rushed through at the earliest possible moment.

A Montreal press dispatch states that the C.P.R. is pushing the completion of the largest contract for the erection of telegraph wires that has been carried out in the Dominion in a short time. It is stated that 4,775 miles of new wires will be strung during the next five months, and the work is now proceeding, although all the contracts have not been let.

The British Government is arranging the details of an agreement for the erection of a series of wireless telegraph stations throughout the Empire, a prior agreement with the Marconi Wireless Telegraph Co. having been cancelled. It is the intention to inspect other systems before coming to a definite decision on the matter, but it is anticipated that a new agreement will be made with the Marconi Company for the carrying out of the work.

It is announced that the Universal Radio Syndicate, Ltd., London, Eng., has acquired about 57 acres of land at Newcastle, N.B., for the erection of a wireless telegraph station, in connection with the system which it intends operating across the Atlantic Ocean, by agreement with the Dominion Government, as mentioned in our last issue. It is also stated that the contract for the building and installation has been let to a Montreal firm, and that the steel tower, 500 ft. high, is being built in England.

It is reported that the Dominion Government will probably erect a wireless telegraph station on Mount Royal, Montreal, to consist of two wooden masts, each 180 ft. high, placed 450 ft. apart, and an operating station house 40 by 20 ft. Application has been made to the city to reserve land, 800 by 200 ft., for the purpose. The station will have sufficient power to enable communication to be made with Quebec, on the east, and Kingston, on the west, and will form one of a series of similar stations connecting Port Arthur, at the head of the lakes, with the Belle Isle Strait.

Book Reviews.

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

THE PROPERTIES OF SATURATED and Superheated Ammonia Vapour.—By G. A. Goodenough and W. E. Mosher. 94 pages, 6x9 ins. 12 illustrations. University of Illinois Engineering Experiment Station, Urbana, Ill. 50 cts.

This latest bulletin, no. 66, from the experiment station is a highly technical book, full of elaborate thermodynamic deductions. Numerous tables of properties are included in the manner usual in tables of steam properties. The method of deducing the results obtained is outlined and explained.

STEAM CONSUMPTION OF LOCOMOTIVE Engines from the Indicator Diagrams.—By J. P. Clayton. 77 pages, 6x9 ins., 19 illustrations and 16 tables. University of Illinois Engineering Experiment Station, Urbana, Ill. 40 cts.

This is bulletin no. 65 of the experiment station. In it is developed and illustrated the application of the logarithmic diagram to locomotive engines, which shows that the steam consumption of locomotives can be determined from the indicator diagrams alone to within 4 per cent. of the actual consumption as measured on the test plant. The developed information is based on information and data derived from tests made both by the Pennsylvania Rd. and Purdue University, the data from these tests being included in an appendix to the book.

THE MANUAL OF STATISTICS, Stock Exchange Hand Book, 1913. 35th annual issue, 1,104 pages, 5½x7½ ins. Manual of Statistics Co., New York. \$5.

This work presents a complete digest of all necessary and available information for investors and all interested in the financial and other markets of the northern half of the continent. There have been many changes in the organization of various railways during the past year, while a considerable number of new industrial companies have been brought into public notice during the same period. The manual presents in concise form the organization, finances and position of all the leading steam and electric railways and industrial concerns in Canada and the United States, and gives a review of the market price of the various securities on representative exchanges. The information regarding Canadian steam and electric railways and industrial companies appears to be up to date and reliable.

APPLIED METHODS OF SCIENTIFIC Management.—By F. A. Parkhurst. 325 pages, 6x9 ins., 57 illustrations. J. Wiley & Sons, New York. \$2.

A great deal has been said in recent years about scientific management, particularly in its application to railways. A large portion of this has been purely theory and, in consequence, its enemies have discovered weak spots which they have used as capital in their arguments. In this work by Mr. Parkhurst, the whole exposition of scientific management is based on actual observations in the plant of the Ferracute Machine Co., Bridgeton, N.J., which is a remarkable example of what this new system will do for a plant. The production of the plant has been considerably increased, and the wages have also been increased, but the unit cost of production, through the use of the system, has been decreased, making a considerably greater net profit. Throughout the work, while scientific management in all its factory phases is outlined, the basis of the book is the system as applied to this plant. The book first deals with the organization of the company, outlining how a preliminary investigation of any plant should be made, with the form of organization and its record. Chap. 2 covers the functions of the sales department and the counting room, engineering room and draughting room. Chap. 3, the planning department and its function, with the relation of the superintendent and different shop officials to it. Chap. 4 is on the routing of the work through the shop, dealing with the duties of all those who are responsible for its path. Chap.

5 covers the organization of the stores department. Chap. 6 deals with the advisability and methods of standardizing tools and methods. Chap. 7 deals in detail with time studies, while chap. 8 gives the course of a typical order through the several channels and officials in its course through the shop. The foregoing chapters all appeared as part of a serial article in *Industrial Engineering*, but owing to the nature of their reception it was decided to reproduce them in book form. In this book, the original articles have been added to by the addition of an appendix, going into more detail and covering parts that were untouched in the original articles. The book is one that is well worth the study of all shop men and those who are responsible for production work.

Transportation Conventions in 1913.

- Aug.—Travelling Engineers' Association, Chicago, Ill.
- Aug. 12-15.—Railway Gardening Association, Nashville, Tenn.
- Aug. 18.—International Railroad Master Blacksmiths' Association, Richmond, Va.
- Sept. 8-12.—Roadmasters' and Maintenance of Way Association, Chicago, Ill.
- Sept. 9-12.—Master Car and Locomotive Painters' Association of U.S. and Canada, Ottawa, Ont.
- Sept. 25.—Eastern Association of Car Service Officers, New York.
- 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. 21-23.—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. E. Duval, 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.

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.

CANADIAN ALLIS-CHALMERS, LTD., has issued bulletin 42 on Blaisdell compressors. An illustration is given of enclosed frame 22 x 14 x 18 duplex belt driven compressors installed at the Mount Royal tunnel's west portal by Mackenzie, Mann & Co.

W. E. JENKINSON has been appointed railway representative for S. F. Bowser & Co., Inc., covering the territory vacated by E. F. G. Meisinger. In addition, he will take over the Southwestern and Pacific Coast territory. He will cover the states from Texas to Oregon.

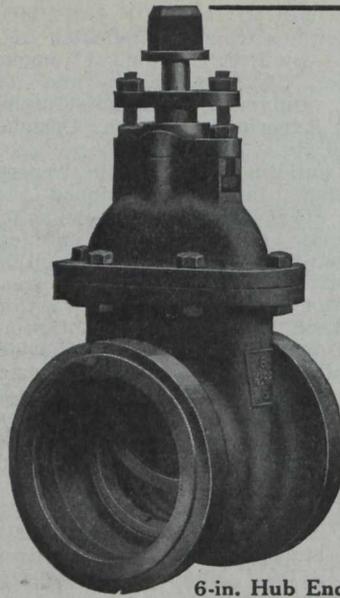
M. BEATTY & SONS LTD., Welland, Ont., has appointed H. W. Petrie Ltd., Toronto, as representative in Toronto, Hamilton, and adjacent territory. H. W. Petrie Ltd. will carry in Toronto a complete stock of standard size hoisting engines, clam shell buckets, centrifugal pumps, derrick irons, etc., so that orders may be promptly filled.

THE AMERICAN VANADIUM CO. reports that during the past year Canadian Steel Foundries Ltd. has gone quite extensively into the manufacture of vanadium cast steel. Within the past few months it has completed orders for vanadium cast steel frames for the Canadian Pacific and Grand Trunk Railways. Tests of nine frames for the former gave:—Elastic limit, lbs. per sq. in., 44,500; tensile strength, lbs. per sq. in., 78,000; elongation in 2 in., per cent., 27; reduction of area, per cent., 44.

DETROIT LUBRICATOR CO. has issued a new Detroit bullseye locomotive lubricator catalogue of 56 pages of information regarding locomotive lubricators and other locomotives specialties which is really a small text and reference book. The principle of the hydrostatic lubricator, the different features of design and resulting advantages of Detroit lubricators, complete instructions for installation, operation and care are fully covered. Air cylinder lubricators, air pump lubricators, balanced throttle valves, boiler valves and transfer fillers are also extensively treated.

THE PEDLAR PEOPLE LIMITED, Oshawa, Ont., announces a number of additions to its staff in consequence of the death of G. H. Pedlar. W. R. Geikie, formerly manager of the company's Toronto branch, and manager of various branches of the Dominion Bank, has been appointed managing director. W. Loach, formerly of Canada Foundries Ltd., Toronto, has been appointed to the operating department. A. T. Enlow, who has been placed in general charge of sales and advertising, has been connected with the manufacture and sale of steel in the United States for 20 years. W. H. Hall and F. L. Mason remain on the staff.

CANADIAN GENERAL ELECTRIC Co., Ltd., has issued bulletin A 4110 on cloth pinions, a form of machine element which is offered for a wide variety of applications in mechanical transmis-



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NEW PATTERN

Iron Body Gate Valves

are of the most modern and approved design.

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Interchangeable Parts
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THE CANADIAN H. W. JOHNS-MANVILLE CO., LIMITED
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sion of power where, on account of noise, or for other reasons, the meshing of metallic pinions with metallic gears is impracticable or undesirable. The refinements that have been made for the purpose of increasing the efficiency of machinery have, in many instances, involved an increase of the speed of working parts to a point resulting in excessive noise in operation of gearing, and have led to the substitution of various non metallic materials for steel or iron in one or more elements in gear trains. Rawhide, paper and other materials have been extensively used with certain measures of success, but it is claimed nothing of the kind in any respect approaching the effectiveness of these cloth pinions has heretofore been produced.

Winnipeg Union Stockyards.—The new stockyards at St. Boniface, Man., work on which was started May, 1912, are practically completed, and are to be opened at an early date. The fenced area is 25 acres in extent, divided into three blocks, for cattle, sheep and pigs, respectively, accommodation being provided for 15,000 head. The buildings are of the most modern type, and provision has been made for the building of a public abattoir at a future date.



TENDERS

TENDERS, addressed to the undersigned at Ottawa, and endorsed on the envelope "Tender for Steamer," will be received up to noon of the Twenty-eighth day of August, 1913, for the construction of a single screw steel steamer of the following leading dimensions—
 Length between perpendiculars ..155 feet
 Length over all164 feet 6 inch.
 Breadth moulded 30 feet.
 Depth moulded 13 feet.
 to be delivered at the Dominion Lighthouse Depot, Prescott, Ont.

All tenders must be made with the distinct understanding that the steamer must be built in Canada.

Plans, tender forms and specifications of this steamer can be seen at the office of the Purchasing Agent of the Marine and Fisheries Department, Ottawa, at the offices of the collectors of Customs, Toronto, Collingwood and Port Arthur, and at the Agencies of the Department of Marine and Fisheries at Montreal, Quebec, St. John, Halifax and Charlottetown.

Plans, tender forms and specifications can be procured upon application from the Purchasing and Contract Agent, Ottawa.

The tender form is embodied in the specification.

Each tender must be accompanied by an accepted cheque on a chartered Canadian Bank equal to 10% of the whole amount of the tender, which cheque will be forfeited if the successful tenderer declines to enter into the contract prepared by the Department or fails to complete the steamer in accordance with the contract.

Cheques accompanying unsuccessful tenders will be returned.

The Department does not bind itself to accept the lowest or any tender.

Newspapers copying this advertisement without authority from this Department will not be paid.

ALEX. JOHNSTON,
 Deputy Minister of Marine & Fisheries.
 Department of Marine & Fisheries,
 44325
 Ottawa, 21st June, 1913.

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3 inches to 60 inches diameter
 FLEXIBLE AND FLANGE PIPE AND SPECIAL CASTINGS
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Is the reason why we make our Replacers out of the **BEST STEEL PLATE** instead of cast metal. The distance from caboose to head end of train is getting longer, and when a man carries a pair of our Replacers that distance he is not all used up, but ready to rerail his car or locomotive.

The pair this man is carrying is our Standard No. 1, made of 9-16 plate, weight 164 lbs. per pair, and guaranteed to carry 200 tons.

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Do not fool yourself. If you want efficiency and quick service give your men a tool they can handle, that will do the work and that pleases them.

SEND FOR CIRCULAR SHOWING USERS. 70,000 PAIR IN SERVICE.

The Alexander Car Replacer Manufacturing Co.
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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:
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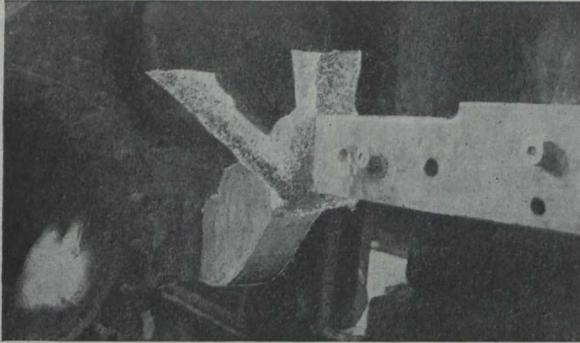
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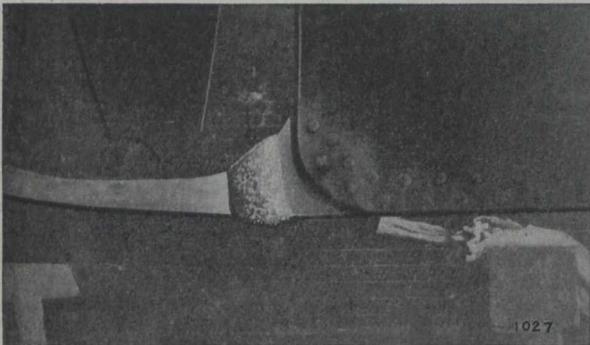
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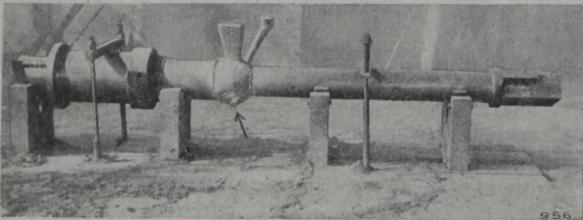
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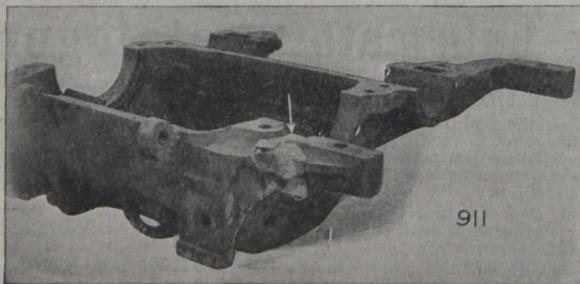
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These sections can be repaired with Thermit in a few hours, thus keeping your equipment in almost constant service and reducing your scrap pile to a minimum. Our pamphlet No. 2459 should be in the hands of every street railway repair man.

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Thermit welded Compromise Joints will wear and give very satisfactory service. All kinds of rail sections in making up compromise joints can be welded together without the use of fish plates or bonds. Our new Thermit Insert Rail Joint will be of interest to every Maintenance Engineer, and our pamphlet No. 1259, together with other rail-welding literature, will be sent to those interested.



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