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Canadian Northern Railway Locomotive and Car Shops at Winnipeg.

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The inception and marvellous development of the Canadian Northern Ry. system within the last fifteen years is a matter familiar to all, and yet none can stop to ponder over the fact without marvelling at the stupendous character of the undertaking, and the success which has attended the development from the very beginning, due to the tireless energy of the two promoters and the able body of men they have been able to gather about them. To meet this rapid growth the rolling

ping of the rolling stock, this being kept in repair and in service in the best manner possible under the circumstances, at the terminal points and in small and inadequate shops, moderately equipped, located close to the present Winnipeg Fort Garry station.

Realizing that proper provision must be made for this very important part of a railway's many ramifications, large central shops were planned in 1908, taking concrete form in the present large and well-designed shops at Fort Rouge, a southern

time of erection, being shown, for large extensions—in some cases doubling the capacity—have been and are being made to several of the buildings. A study of the plan will show the manner in which this policy was carried out; each instance will be noted in due course as the description of the individual buildings progresses. Under the guidance of S. J. Hungerford, Superintendent of Rolling Stock, and A. H. Eager, Superintendent of Shops, with the staff of foremen, the original plans

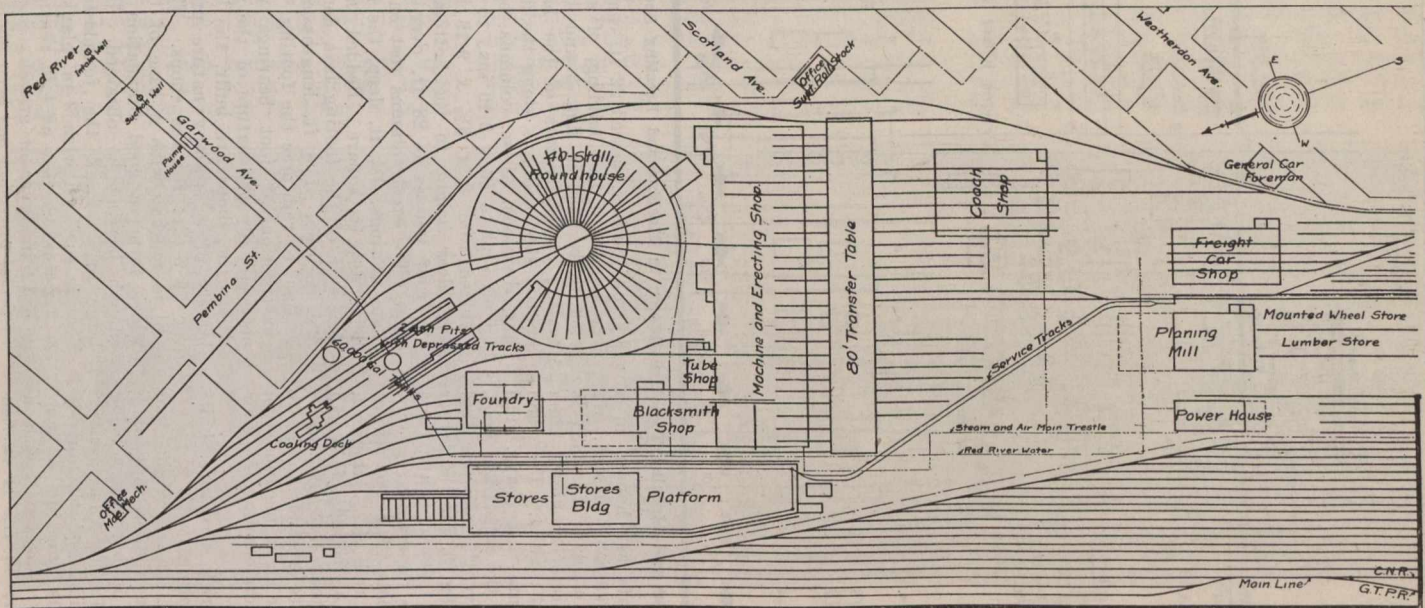


Fig. 1. Section 1.—Layout of C.N.R. Fort Rouge Shops—North End.

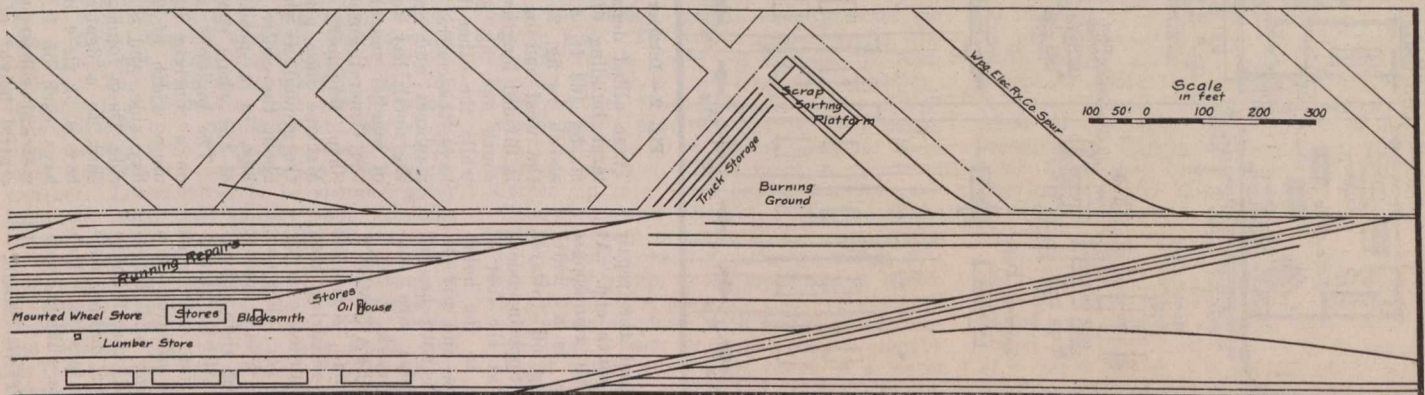


Fig. 1. Section 2.—Layout of C.N.R. Fort Rouge Shops—South End.

stock has grown apace—in fact, at a much more rapid rate, as the volume of traffic developed has increased much more rapidly than the mileage, great as that has been—so that to-day, the number of locomotives and cars to be cared for has reached a very large number, especially when the newness of the road is considered.

For the first decade so much attention was concentrated on the extension of the railway mileage that but little thought was given to the proper handling and shop-

ping of the rolling stock, this being kept in repair and in service in the best manner possible under the circumstances, at the terminal points and in small and inadequate shops, moderately equipped, located close to the present Winnipeg Fort Garry station.

With characteristic foresight ample provision was made for the future extension of the various units comprising the shops; and the wisdom of that provision is, even at the present time, just three years from

are being pushed forward and improved upon, so that the shops are now the equal of any of similar size in this country, and probably elsewhere.

The shops cover a considerable tract of ground on the main line, slightly over a mile southwest of Fort Garry station. On the north, the grounds extend from near the point where the line crosses Pembina street, to Kylemore avenue on the south, a distance of more than three-quarters of a mile, the buildings being for the most

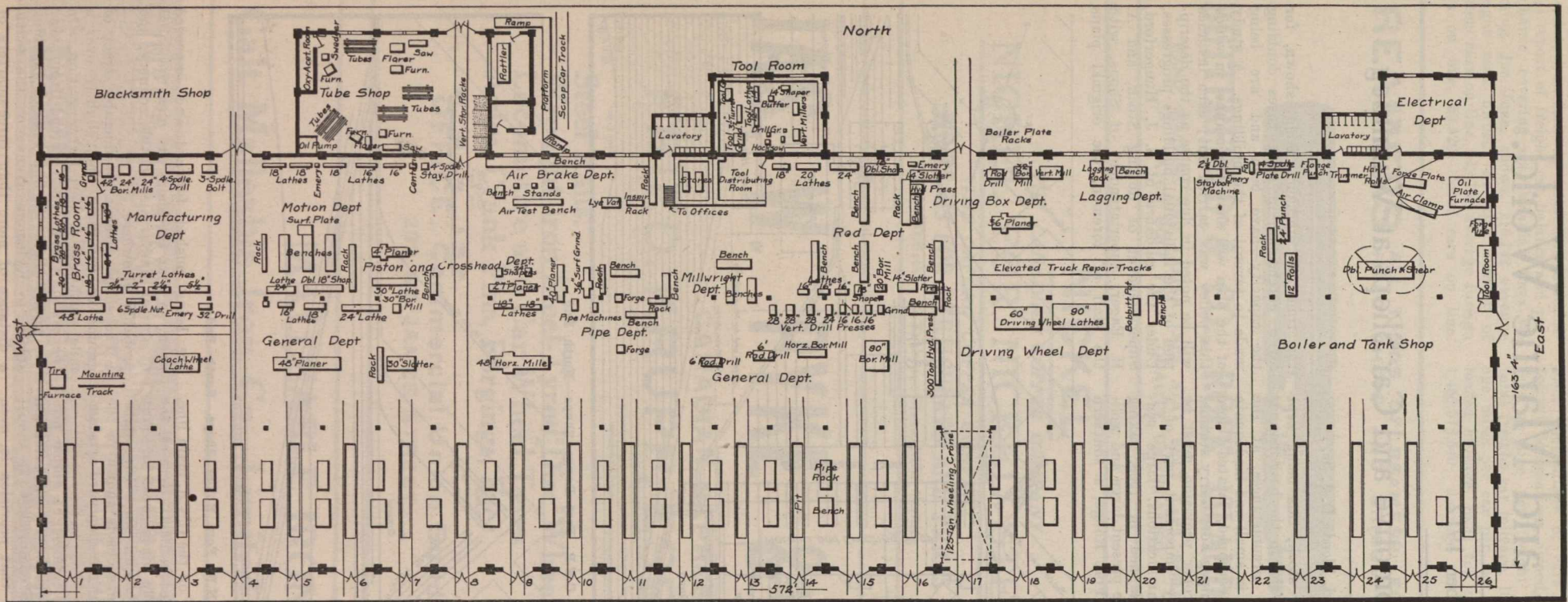


Fig. 2.—Interior Layout and Machine Tool Distribution in Machine and Erecting Shop.

part near the north end and the repair yard and rip tracks at the south end. At the widest point, across the roundhouse and machine shop, there is a width of about 800 ft., narrowing off towards each end. The office of the Superintendent of Rolling Stock is located at the foot of Scotland avenue, convenient to the buildings of both the locomotive and car departments, by which means both he and the Superintendent of Shops are constantly in touch with the work.

THE LOCOMOTIVE DEPARTMENT, D. Galloway, General Foreman, comprises all the shops handling and repairing such motive power as has been turned over by the operating department for shopping. The main buildings in the group consist of the machine and erecting shop, blacksmith shop and foundry. All the buildings have close communication with each other, the machine shop and erecting shop under one roof, the machine and blacksmith shops connected, and the foundry close in the rear of the latter, making connection in the rigorous winters to which this part of the country is subject, particularly easy.

MACHINE AND ERECTING SHOP.—

These allied departments are housed in a large building of conventional design, 572 ft. by 163 ft. 4 ins., a plan of which is shown in fig. 2, and interior views from the west end in figs. 3 and 4. The shop is divided lengthwise into three bays. The south one, fig. 4, is the erecting floor, while the other two are the machine tool bays, the central one, fig. 3, for the larger machines and general departments, and the north bay for the department groups of smaller machine tools. The offices of the General Foreman, and of A. Hopkirk, Shop Engineer, and A. Hough, Foreman Machine Shop, are located a few feet above the ground, as shown to the left in fig. 5, about the centre of the light machine tool bay, in a position commanding a view of the whole shop.

The building is a brick structure, built on a concrete step footing, with a maximum width of 9½ ft. on the light tool bay side, and 8 ft. on the erecting shop side, these foundations in both cases being sunk to a depth of 6½ ft. The central bay is 51 ft. 4 ins. wide, and the outside bays each 55 ft. 4 ins., making a symmetrical construction. The roof, with a central height of about 40 ft., is carried

by roof girders, spaced 22 ft. centres, down the length of the building, of a construction to be seen in figs. 3 and 4, the ends resting on abutments of the brick walls, and on steel columns along the lines of the bay divisions, these columns being built up of a plate 16 x 9-16 ins., to which are rivetted four 6 x 3½ x 9-16 in. angles. The clear height to the bottom chord of the roof trusses is 28 ft. over the whole shop. The steel columns rest on step concrete footings, 6½ ft. deep, the lower face being 8¾ ft. square. Bedded in the bottom step of the footing is a double layer, five in each, of 8 ft. lengths of old rail section, to reinforce the footing. This solid construction of foot bearings was made necessary by the nature of the ground on which the shops are built, the land being largely of a swampy nature prior to its use as a site for the shops. The surface soil is mucky, with a base of thick clay, which forms a good foundation if a wide enough bearing be obtained. Hence the large area of all the foundations. The floor is surfaced with 3 in. planks, secured to 4 x 6 in. sleepers at 4 ft. centres, bedded in a 12 in. layer of gravel.

Special provision has been made for heat-

ing. The original plans called for hot air heating, with fans located at three points along the north wall in lean-to buildings. This plan was changed to the use of steam heat. Steam at 125 lbs. pressure is brought from the power house on an elevated trestle, entering the erecting shops near the roof level at the southwest corner of the building. Here is located a large reducing valve to provide the low pressure of the heating system. Along the north wall and the two end walls, there are banked 34 coils of 2 in. pipe, in separate units between each of the windows and doors. On the south wall, where the large locomotive entry doors are located, special provision was made by increasing the banking of pipes around the buttresses to 52 coils of the same size, as shown along the right wall in fig. 4. This arrangement, with 3 or 4 lbs. of steam, has been found ample to keep the shops quite comfortable in winter, the extra coils on the south side quickly bringing the shop back to normal when locally chilled by the spotting of a locomotive on a pit.

A 6 in. main, carried alongside the steam main on the trestle, supplies air for the shop, a pipe with double connection at the

lower end being attached to each column, providing ample hose connections for all purposes. Electric power is supplied from the power house on poles above the steam and air trestle, in both direct and alternating current, the former for the individual drive and the latter for the group constant speed drive. The groups have induction motors, and the larger individual drive machines have direct current motors supplying a variable speed control in the motor itself.

The shop has large windows on all sides, which, with the 12 x 70 ft. skylights in each 22 ft. section, produces a well lighted interior. All windows are cleaned at frequent intervals, so that the light inside is but slightly less than that out of doors. Artificial illumination is obtained from Cooper-Hewitt mercury arc lights, suspended from the bottom chords of the roof trusses. Down the central bay, these are located alternately one and two per truss, with one suspended centrally from each truss in the side bays. Mercury arcs, while not providing a natural light, give a bright, penetrating illumination that is restful to the eyes, and with the close spacing provided, the shop is well lighted for all purposes.

The erecting shop contains 26 pits, approached from the south through large swing doors from an 80 ft. transfer table,

motive wheeling crane, capable of lifting the heaviest locomotive on the system. The balance of this erecting shop bay is equipped with three 1½ ton travelling hand cranes at a rail level of 20½ ft., carried on a built up girder of 30 x ¾ in. plate and four 6 x 3½ x ¾ in. angles. Two of these cranes are located west, and the other east, of the wheeling crane which obstructs the passage of the hand cranes either side of that point. In addition, at each column, other than the ones on each side of the wheeling crane, there are 13 ft. jib cranes, constructed of 8 in. channels, as will be noticed on the left in fig. 4. The majority of these cranes have but recently been installed, the original shop construction only providing for one jib at every alternate post, the one crane serving two pits. Consequent delays are now overcome.

A 4 ft. suction fan is located up in a skylight over the row of columns, driven by a 15 h.p. induction motor, and connecting to a 20 in. suction pipe running the length of the shop over the columns; 14 in. pipes branch vertically downward over each pit track, the lower end carrying a telescopic smoke jack, which can be pulled down over the locomotive smoke stack for the firing up test. These jacks are counter weighted so as to slide up out of the way when not required. For the firing up test

the wheeling crane, where after loosening the gear and pedestal caps, the locomotive is lifted bodily. The forward end is lifted by a looped steel hawser suspended from the front hoist placed under the smokebox, and the rear end is raised by a cross bar suspended from links from the cross arm of the rear hoist placed under the rear end of the frame. The cross bar is kept near the door between pits 17 and 18, on strips of bar iron secured to the floor. Rollers are placed under the cross bar, and it is rolled across the pit tracks on the bar iron rails, the ends being there slipped into the slits in the suspended link ends. On the locomotive being raised, the drivers and truck left resting on the rail are rolled across into the centre bay, carrying their boxes. A small 4 wheel truck is run in from the rear and placed under the forward end of the frame, and a pair of mounted wheels placed under blocks of wood bearing up under the rear pedestal cap, placed back in position for this purpose. On these supporting wheels, the locomotive is lowered, run out on the transfer table, and spotted on the pit provided.

Tenders are handled on pits 20 to 26, and also on the extended ends of the through tracks 21 and 22. On these several tracks the tenders are placed by the transfer table in the same manner. The lighter

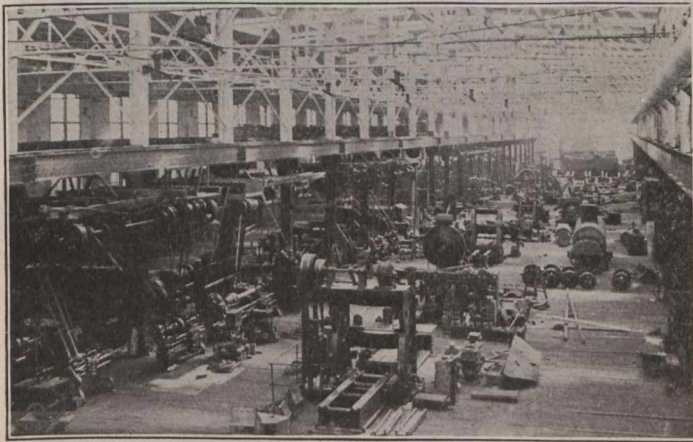


Fig. 3.—Central Bay of Machine Shop, Looking East.

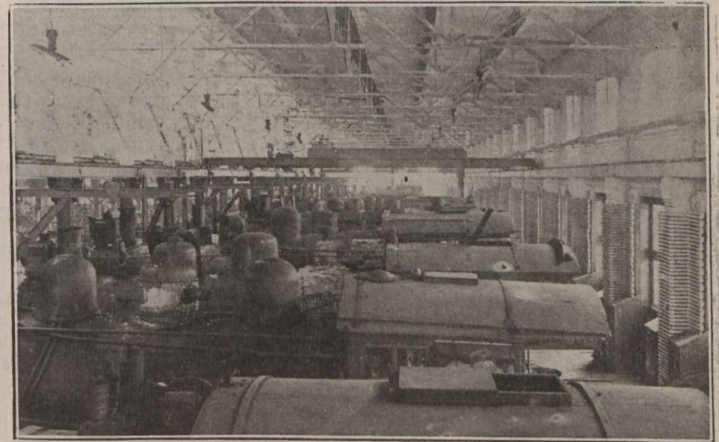


Fig. 4.—Erecting Shop Bay, Looking East.

electrically operated. This transfer table has a windlass with a long cable, which when passed over a sheaf in the forward end of the pit, spots the locomotive where desired. The same attachment is used for drawing the locomotive out of the shop. This reduces to a minimum the period of time necessary to keep the doors open, a most important consideration in severe weather. Locomotives to be shopped enter from the north end of the shop grounds, running on the transfer table in its easterly position over the track passing along the rear of the roundhouse. This track is a through running one, the full length of the grounds, making approach from either end equally feasible. On the south side of the transfer table, as shown in fig. 1, there are several blind storage tracks for spotting locomotives before and after shopping when conditions are such that removal is inconvenient.

The pits, 37 ft. long, are constructed of concrete, and are located slightly nearer the central bay than the south wall, leaving a wide passageway back of the locomotives along that wall. The pit bottoms slope to the south, cast iron drain pipes leading from that end, connecting with a 10 in. tile pipe which empties into the city sewer passing across the grounds in line with Scotland avenue.

Pit 17 has a stationary 125 ton loco-

the locomotive is pinch barred forward until the smoke stack is directly under the smoke jack. The smoke drawn up by the exhaust fan is blown out through the roof, leaving the shop free from the objectionable smoke frequently found in shops where such a provision has not been made.

All but pits 20 to 26 are used for locomotive erection. The erection work is divided up into three gangs, and for each of the gangs, at a central point on one of the columns, there is mounted a steam driven water pump, consisting of a steam end of a 9½ in. air pump, to the lower end of which, in place of the air end, there is attached a 4 in. water pump with water connections therefrom. Each pit in the gang is thereby placed within convenient range of a water connection for giving the boiler a hydrostatic pressure test.

Between each pit there is a work bench, equipped with two vises, and at the north end of the bench, a double sided cast iron pipe rack for carrying the boiler fittings while dismounting. The rack is of ample size to accommodate all the fittings, leaving the floor around the pits entirely unhampered, and clear for the passage of the workmen from point to point around the locomotive.

The practice of this place, when a locomotive is shopped for heavy repairs, is to first spot the locomotive on pit 17 under

repairs are handled on the pits adjoining the locomotive pits, and the heavier ones on the pits at the east end and on the north end of tracks 21 and 22, all these tracks adjoining the boiler and tank shop in the northeast corner of the building, the whole of the shop east of track 19 being occupied by the boiler and tank department. The east four sections of the central bay are the boiler erection floor, fig. 6, where the boilers are handled when requiring heavy repairs.

This department is well equipped for a shop of the size, and has even built boilers complete when required. Near the corner, butting up against the end wall, there is an oil operated furnace about 12 ft. square, of a size designed to handle standard boiler plates. To the left front of the furnace there is a 12 ft. air operated flanging clamp, and between it and the wall is located a large flanging plate. An open forge fire for flange work adjoins the oil furnace along the wall. This battery of flanging equipment is provided with a 22 ft. jib crane swinging from the first wall buttress. The open space in front of this group is the lay off floor.

Alongside the centre bay columns, and to the south of the lay off floor, there is a double punch and shear with a 40 in. throat gap. Each one of the pair is equipped with a 10 ft. jib pivoted centrally on the top,

of the frame, for the handling of the stock while being worked. Powerful 12 ft. plate rolls, capable of handling the heaviest boiler plate, face the lay out floor on the west. The vertical movement of the upper roll is power operated through a 15 h.p. d.c. motor, and the rolling, through a 25 h.p. d.c. motor. Alongside is a 24 in. gap punch driven by a 15 h.p. d.c. motor, the plate for which is handled by an 8 ft. jib. To the rear of this machine and the rolls, and adjoining the through tender tracks, there is a tender storage rack for the convenient location of such tender parts as coiled

is elevated on 18 in. pedestals, for the more convenient approach of mechanics repairing it or dismantling the parts.

To the north of the truck repair tracks, along the wall, is the lagging department, with flat topped sheet working table, and a lagging rack adjoining.

As before mentioned, the driving wheels from the wheeling pit are run across into the main bay. From here, they take either one of two courses, depending on whether retiring or only returning is necessary. If tiring is necessitated, the wheels are run straight across into the north bay, where

ings are trued down. This completed, the set of wheels is mounted in a row across the central bay against the through tender track of section 21, where planks are mounted on low trestles, as in fig. 8, under each journal, at a convenient height for the slipping on of the driving wheel brasses for fitting, these having at this stage arrived from the driving box department. On completion of the fitting, the boxes are mounted on the journals, and the finished wheels set to one side on the wheel floor for the rewheeling of the locomotive under the wheeling crane by a reversal of

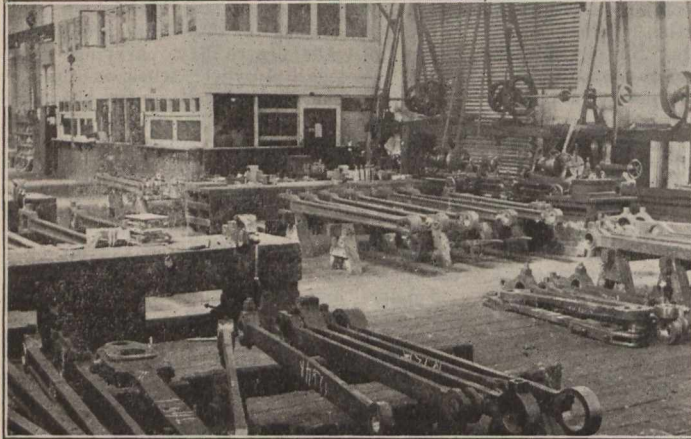


Fig. 5.—Rod Department and Tool Distributing Room.

springs, truck columns, etc.

Along the north wall from the east are 8 ft. hand rolls, a plate trimmer with 10 in. circular shears and a horizontal flange punch driven by a 15 h.p. d.c. motor and equipped with a 15 ft. jib. Adjoining, in a 15 h.p. group drive, there is a 4 spindle plate drill, a 3½ ft. fan for the flange fire, a double 18 in. emery, and a double 2½ in. staybolt threader, completing the equipment of the boiler and tank departments, with the exception of a small forge fire between pits 23 and 24 on the other side of the shop.

the several pairs of wheels are mounted in a row on trestles over the through tracks, and the worn out tires removed by heating with a band pipe in the conventional manner. In this position, new tires are mounted by the same means, the wheels then retracing their steps to the central bay, from which point the steps are the same as for wheels that only require returning.

The wheels are picked up by the central crane and placed in a row, fig. 8, in the direction of the shop length, on the driving wheel floor, which adjoins the through

the former procedure.

Immediately to the west of the wheeling track there is a 300 ton hydraulic press for mounting or removing crank pins and axles when these operations are required. Behind this press is located a 90 in. boring mill, used for the most part on driving wheel work, boring and turning wheels and tires.

The driving box department is located on each side of the north door of the through driving wheel track. In this department, from west to east, there are an hydraulic press, 14 in. slotter with 6 ft. jib attached,



Fig. 6.—Boiler and Tank Shop Floor.

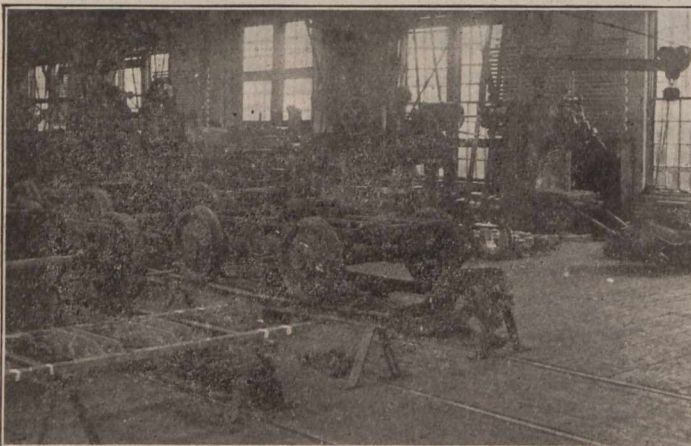


Fig. 7.—Locomotive and Tender Truck Department.

The tool room for the local supply of air hammers, snaps, beading tools, and all tools required for boiler work, is located against the east wall, beside the big end door. The foreman's office adjoins.

Both locomotive and tender trucks are handled on the two longitudinal tracks, fig. 7, just north of the line of columns separating the main and north bays. These truck tracks extend from the through track of 21 to the through track of 17, the tender trucks being handled from track 21 to the cross tracks, and the locomotive trucks from track 17. A 25 ft. section of the truck tracks in section 19

track immediately to the east. The first step is the removal of the driving boxes, and after cleaning, their disposition in the driving box department for renewal and repair. The wheels are then in turn placed in the 90 in. driving wheel lathe for the turning, from which on completion they are removed and placed on end on supports for the pouring of new babbit thrust bearings, which are renewed on both ends of a pair, the babbiting department for all work being located close at hand to the east of the driving wheel lathes. They are then mounted in the 60 in. driving wheel lathe, where the journals and thrust bear-

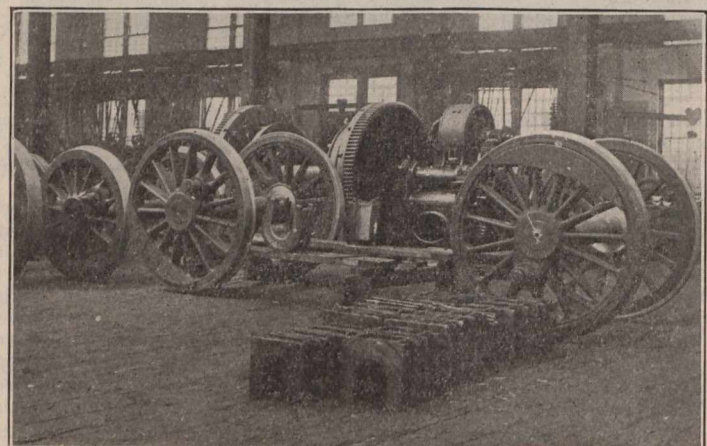


Fig. 8.—Driving Wheel Department.

7 ft. radial drill, 32 in. boring mill, vertical miller with 10 ft. jib and a 36 in. planer with 8 ft. jib. The first two are on the end of the side rod group drive, the drill, boring mill and vertical miller on a 15 h.p. group drive, and the planer on an individual 10 h.p. drive.

The driving boxes as removed from the wheels on the driving wheel floor, are there cleaned and then trucked to the hydraulic press, where the brasses are forced out. New brasses are machined on the 14 in. slotter to fit and then removed to the press for forcing into place. These two machines, it will be noticed, are adja-

cent to each other. The assembled box is then moved over to the 7 ft. radial drill, for the drilling of oil and plug holes, the plugs being here fitted. Passing on to the vertical miller, the brass is bored out to fit the journal, the box being then ready for the 3 ft. planer, where the shoe and wedge fits are planed. The boxes thus make a belt line, entering the west end of the department and working around to the east, and then back to the driving wheel department for mounting.

The rod department, fig. 5, is located directly to the west of the driving wheel department, and contains a hydraulic press, 14 in. slotter, 20 in. boring mill, 18 in. shaper, 18 in. emery, 18 in. double rod shaper, and a 24, 20 and an 18 in. engine lathe in the distribution shown in figs. 2 and 5. The wall group is on a group drive. With a passage in the centre of the bay through the department, there are three vise benches, two north and one south of the passage. Between these benches, parallel to the passage so that the ends are near the benches, the rods are mounted on low trestles in a convenient position for fitting.

The rods as they come initially from the wheeling crane pit, which it will be noted, is conveniently located to the rod department by means of the cross track, where they are removed from the locomotive, have

walls, and in a central rack, providing for the accommodation of a wide range of stores. The tool distributing room will be described later, in connection with the tool room itself.

The air brake department, fig. 9, occupies the north wall in the next three sections. At the east end of the department are two racks for the accommodation of air brake fittings and inspirators, lubricators and parts, all of which are here repaired. In the main part of the air brake department (left foreground in fig. 9), there is a lye vat, steam heated, for the complete immersion of greasy compressors or their parts.

Parallel with the wall bench are four pedestals carrying a face plate, free to revolve in a vertical plane. To these face plates, compressors are secured, the revolving feature making all parts equally accessible to the mechanic. The bench to the south of these stands carries an air brake testing outfit, and at one end, a gauge tester. The end of the air brake department adjoining the door is set apart for the repair of water pumps, for the most part gasoline, which are sent in from all parts of the system.

The piston and crosshead department, left background in fig. 9, occupies that portion of the shop in sections 6 to 9, alongside the row of columns. It contains a 30 in. en-

following machines:—4 spindle vertical stay-bolt drill, lathe centering machine, two 16 in. lathes, 18 in. lathe, 16 in. grinder and two 18 in. lathes, all on a 15 h.p. group drive. In the same department, along the line of columns, there is a double 18 in. shaper, 24 in. lathe and a radius link grinder attached to the centre bay side of a column. The centre of the department contains three vise benches, with a surface plate at the end of the centre one. Beyond the east bench is a rack for carrying such motion work parts as motion pins, valve glands, cups, springs, etc.

The manufacturing department occupies that portion of the north bay to the west of the through track in section 4, up to the last section which is partitioned off by a screen for the brass department. It is the practice in these shops to make standard and have them stocked for the general stores department, drawing from there for all parts of the system as well as for the local shop when required. It is in this department, called the manufacturing department, that all stock work is made up.

In the north west corner of the department, there are three vertical boring mills; the first, a 42 in., works steadily on piston and valve rings; the second, a 24 in., on motion work such as valve bushings, etc.; the third, a 24 in., on general stock work. Adjoining, there is a 4 spindle drill, used

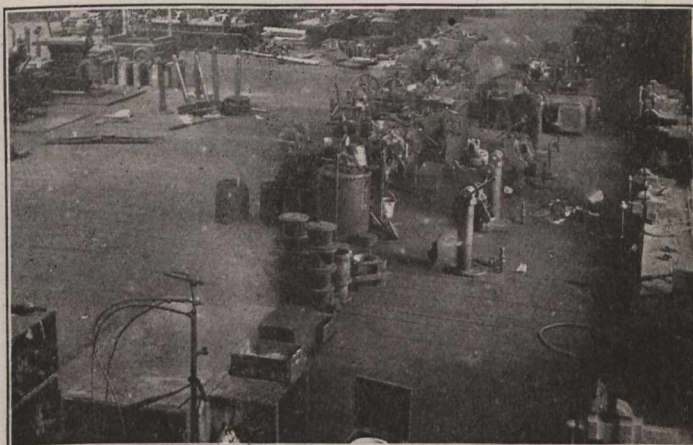


Fig. 9.—Air Brake Department; Piston Department on Left.

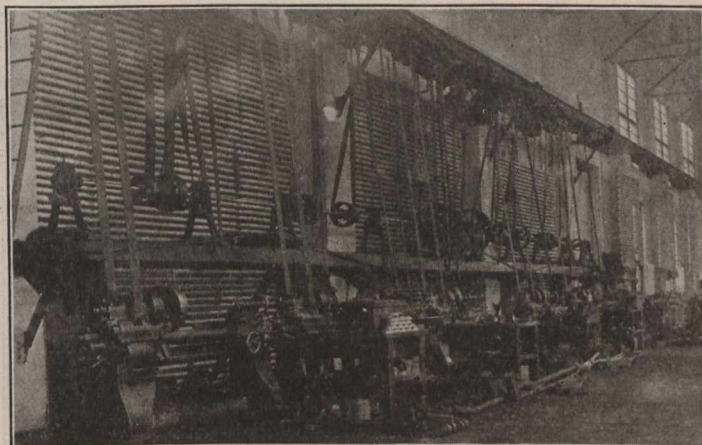


Fig. 10.—Part of Motion Work Department.

the brasses removed under the hydraulic press, and then passed on for further fitting. The 20 in. boring mill is employed principally in boring brasses, and the 18 in. shaper in surfacing them. The 18 in. shaper along the row of columns is used in making shims, pads, etc. The other machine tool equipment is used for miscellaneous rod work.

The group of four benches in sections 12 and 13 of the north bay is for the millwrights and carpenters, where all the repairs to cabs, running boards and pilots are made.

Next adjoining this department, in section 11 and extending out into the centre bay, is the pipe fitters' department. This is equipped with two power pipe machines, two small open forges for copper pipe and other bent work, work benches fitted with ordinary and pipe vises, and a pipe rack at the west side, facing the central bay. For bending pipe, there is a lead lined block mounted on a pedestal in the floor.

About the centre of the north wall, in the background of fig. 5, are located the tool distributing and the petty stores rooms, over which are the offices of the shop officials as mentioned before, commanding a view of the whole shop. The petty stores room contains such minor stores as are in constant demand in the shop, and is well arranged with pockets on the rear and side

engine lathe with 10 h.p. drive, operating steadily on piston rods; a 4 ft. planer for crossheads, but also planing slippers, balance plates, steam chest covers and similar work; and a 30 in. boring mill for piston heads and cylinder covers. Adjoining a column, there is a bench for fitting, and attached to the column there is a jig for the mounting of pistons and piston rods, and holding them securely together while the piston rod nut is being tightened on. The crosshead work is handled across the through track in section 18, where there is a 27 in. and a 40 in. planer and two 24 in. shapers. It will be noted that the piston and crosshead department is almost centrally opposite the erecting shop, where the pistons and crossheads are removed from the locomotives, as against the removal of the rods under the wheeling crane.

All of sections 4 and 5, in the north bay, parts, that are used in quantities, in batches are occupied by the motion department. Nearly all the machinery here is small, for most of the motion work is of a light nature. All the motion work is made or repaired here with the exception of the eccentric sheaves and straps, which are produced in the 32 in. boring mill in the driving box department, and the surface grinding on the 36 in. surface grinder to the east of the piston and crosshead department. From east to west on the wall, as in fig. 10, are the

for the most part in drilling coupler pockets, arch bars and similar bulldozer forgings. Alongside this, there is a 3 spindle 2 in. bolt machine for rough stock bolts. These last two machines are close to the blacksmith shop door, from which the stock to be worked is received. These machines are on a 20 h.p. group drive. Along the brass room wall are two lathes, one 18 in., and the other 24 in., for general stock work.

To the north of the columns, there is a battery of four turret lathes for the stock production of bolts, studs, pins, hexagon head bolts, etc. This battery contains a 2 in., two 2 1/4 in., and a 5 1/4 in. machines. The latter is for use on larger stock such as wrist pins, crank pins; knuckle pins and brake hanger pins. To the south of the row of columns and in the same department are a 32 in. drill, double 18 in. emery wheels and a 6 spindle nut tapper, these together with the turrets being on a 35 h.p. group drive.

All the machine tools in the central bay, fig. 3, other than the ones especially excepted in the foregoing, are in what is usually termed the general department, where all work that cannot be well classified into various departments is handled. From the driving wheel department adjoining the tender shop west ward, there are the following machines in groups and singly: Grindstone, three 16 in. vertical

drills, three 16 in. lathes, a 24 in. vertical drill, and three 28 in. vertical drills, all on a 20 h.p. group drive; medium sized horizontal boring mill with $3\frac{1}{4}$ h.p. drive; two 6 ft. radial drills; 48 in. horizontal rod milling machine for side and main rods, keyways, and sometimes shoes and wedges; two 18 in. lathes, 18 in. emery, 30 in. slotter with 13 h.p. motor; 48 in. planer with 15 h.p. motor (has shoe rack to the rear of slotter with classified shelves with numbers and classes of locomotives marked thereon); 24 in. lathe, 18 in. lathe, and 16 in. lathe; coach wheel lathe; and 48 in. lathe.

The tender wheels are handled at the west end of the centre bay, to the west of the coach wheel lathe, where the tires are turned. An oil furnace, built up of fire brick, has been constructed at the wall for the heating of the tires in batches of six. Leading down the shop, from this furnace are a couple of elevated tracks at a level of about 2 ft. above the ground and about 4 ft. apart. The axles rest on these rails, with the ends projecting beyond the rail on each side, the heated tire being slipped over the supported wheel centres from each end. The open space each side of the wheel tracks provides wheel storage. The wheels to be turned enter from the end door and are mounted in the coach wheel lathe, turned and then run further on into the shop, where the crane picks them up

constantly employed keeping the tools in shape. The shelves, being open on both sides, are equally accessible to the operator and tool room attendant. At the side of the tool grinder, there is a board of sample tools for the guidance of the operator.

Further along the west wall, there is a $3\frac{1}{2}$ in. turret lathe, followed by a no. 2 B. & S. tool grinder with a 12 in. swing. It is used for grinding taps, reamers, special tools, and air motor and hammer parts. Back of these two machines are two tool lathes, a 12 in. and a 14 in., employed principally on such work as special taps and reamers. All these machines are on a 15 h.p. group drive through jack shafts attached to the ceiling.

Next to the machine shop wall is a small power hack saw, with a patent drill grinder alongside. On the opposite side of the room is a general service double grinder and buffer. Back of this is located a 14 in. shaper, and alongside a large vertical miller for heavy tool work, and a second miller of smaller size for small tool work.

The bench in the southeast corner is used for air motor and hammer repairs, and on a rack on the south wall is carried a full line of these parts. A similar rack carrying threading machine dies for all the different makes in use but one, adjoins this last rack. A full line of tool milling cutters is carried on a board attached to the east

erecting shop pits, are placed in trucks in the main bay of the machine shop, the whole truck being then picked up by the travelling crane and carried down the shop to the track that runs across the machine shop into the tube shop. The tubes are either stored on end in the racks on the east wall of the tube shop just inside the door of the shop, until required, or if the rattler is ready, they are pushed along on the truck and spotted opposite the rattler, into which they are dropped through a slit in the side of the wall about 6 ft. above the ground. After the necessary rattling, they are dropped out through a lower slit on the tube shop floor, from which position they are picked up and piled on trestles in the middle of the floor to the west of the through track. They are then heated in the oil furnace adjoining, and the heated bad end sawed off in the hot saw along the north wall, the end being flared in the same heat by an air operated press alongside. Each tube, on the completion of these two operations, is piled on trestles to the west of this last machine, the ends lying in the same direction as before.

From a pile of safe ends along the west wall, one is slipped into the flared end of the tube, and the two parts heated in the oil furnace adjoining, followed by welding together in the rotary swedging machine alongside. On the completion of this oper-

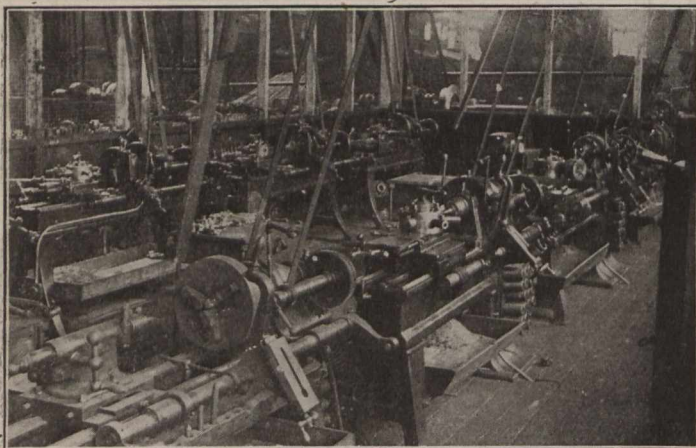


Fig. 11.—Brass Room Lathes.

and carries them to the tender department at the opposite end of the shop.

The brass room, fig. 11, is the screened off section at the west end of the north bay. Along the wall, there is a work bench, with two rows of machines paralleling the wall. The south machine of the west row is a 20 in. turret; the next two, 20 in. brass lathes, and the remaining six all 16 in. brass lathes. There is also a 16 in. emery beside the brass room door. These machines are all on a 10 h.p. motor group drive.

The tool room, fig. 12, J. A. Wright, Foreman, is located in a lean-to building, 44 by $31\frac{1}{2}$ ft. wide, on the north side of the building near the centre. It is well equipped with a line of light machine tools, putting the shop in a position to handle a wide range of tools, both in the making and repairing. Between the tool distributing room and the tool room itself, there is an archway, about two-thirds of which has been built up with shelving, open from both sides for the storage of all sizes and shapes of lathe and planer tools. A large stock of all sizes and shapes of tools is here stored and classified according to size and shapes on the different shelves. Inside the entrance way and back of this series of shelves (left background in fig. 12) is located a no. 1 Sellers tool grinder, where an operator is

wall, close to the two millers.

The range of tool work undertaken is extensive, including not only the threading dies mentioned, but also special taps, standard taps for hurry-up jobs, special hobs, punches and dies, boiler tools, boiler snaps, drill, sockets, ratchet, jigs of all kinds, some motor and air hammer parts, and a wide range of special tools.

The tool-distributing room (background in fig. 5) is entered from the east side, with the delivery counter along the south side. Planer and lathe tools are kept in the rack to the rear, large and special reamers in shelves along the west wall, fine reamers and taps in drawers under the delivery counter. Air hose in rolls is stored on shelves in the door corner, and in the centre are kept the machine oil tanks with the waste boxes behind. Here are also stored the portable gas tanks and torches, the whole room being well arranged for the quick distribution of the tools, delivered on the usual check system.

The tube shop is housed in a building 75 by 45 ft., adjoining the machine shop to the north. In a lean-to structure on the east of this building, the tube rattler is housed, the driving motor being situated in the divided off south end of the room, entered from the outside, freeing the motor from the injurious dust of the rattler. The tubes, as removed from the boilers on the

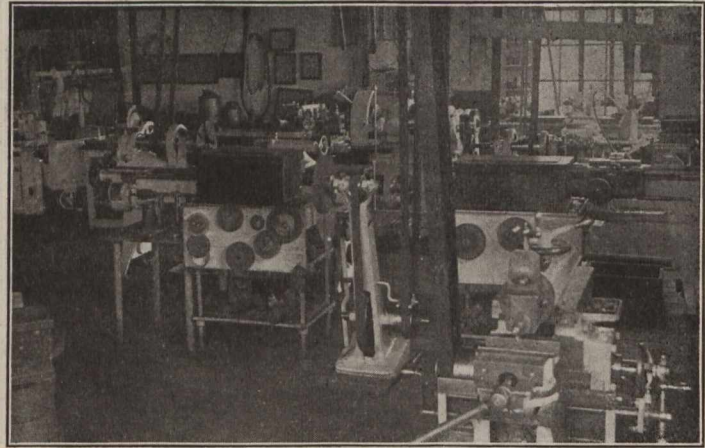


Fig. 12.—Tool Room Arrangement.

ation, the tubes are piled on trestles to the south of this point, at an angle to the southwest corner.

Here the safe ends are again heated in an oil furnace, and that end drawn down in an air operated machine, the tubes then passing on to the trestle pile to the east, the flared ends pointing in that direction. The opposite end is then heated in the fourth oil furnace, and the tube sawed off to length in the hot saw adjoining. The tubes thus completed are stacked on end in the vertical racks in the corner, ready for removal to the erecting shop. It will be noticed that the tubes follow a continuous forward path without a single retrograde movement.

Along the side of the rattler room, there is a track on which two flat cars are kept spotted. Between the wall and the cars, there is a platform at the car level, approached by a ramp from the tube shop door. One car is for the reception of ashes, etc., and the other for the sawed off bad ends, simplifying the removal of these waste products, as produced, to the ash pile and scrap bins, the shop being almost automatically kept free of all unnecessary encumbrances. On both sides of the through tube shop track, in the yard beyond, there are storage piles of new tubes.

A concrete pit in the southeast corner of the tube shop, from which it is railed

off, contains a vacuum pump for taking care of the water returns from the heating system of the machine and adjacent shops, the hot water instead of discharging into the sewers, being pumped to the round-house nearby for boiler filling, an economical innovation. On a ledge in the same pit, there is a 4 x 4 x 4 in. oil pump for handling the oil system of the locomotive shops. At present, there are a couple of tubular tanks to the north of the tube shop for the oil storage, but these are being replaced by two 10,000 gal. tanks to be located away from the building on concrete foundations. The oil from the tank cars is discharged into these tanks, draining from the latter to the pump. This in turn forces the oil to small storage tanks at various points in the buildings. One is located in the northwest corner of the machine shop, for the boiler plate furnace, another in the tube shop for the four furnaces there, and a third in the blacksmith shop for the furnaces in that department.

The oxy acetylene plant is also located in the tube shop, in a small room in the northwest corner. Acetylene is generated at the Fort Garry station for train lighting purposes, and to save a duplication of plants, 12 gas tanks are employed for the transportation of the gas in bulk from the station for shop use, the gas being delivered in pressure tanks 15 ins. in diameter by 4 ft. long at a pressure of about 150 lbs. Oxygen is generated in the room in a small heated retort containing potash and manganese, the oxygen passing through three cleansing barrels, the first and last of which contain water and the intermediate one caustic soda, before entering a gas tank 4 ft. in diameter by 6 ft. high. From this, the oxygen is drawn off into a 4 3/4 x 2 1/4 x 5 in. compressor, delivering the gas into gas tanks, of which there are six, at a pressure of 300 lbs. These several tanks with torches, etc., comprise the portable oxy acetylene welding outfit.

The electrical department is housed in a small building adjoining the northeast corner of the machine shop. The equipment is small, comprising principally a couple of winding machines for the repair of motors. All the electrical shop equipment is cared for in this department, necessary repair parts being also stored here in a small store room set aside for the purpose.

The principal part of the machine and erecting shop equipment was furnished by the following firms:—Jno. Bertram and Sons Co., Dundas, Ont.; Canada Machinery Corporation, Galt, Ont.; Geo. Richards and Co., Manchester, Eng.; Prentiss Tool and Supply Co., New York; F. E. Reed Co., Worcester, Mass.; Wm. Sellers and Co., Philadelphia, Pa.; Alf. Herbert, Ltd., Coventry, Eng.; Brown and Sharpe Co., Providence, R.I.; Pratt and Whitney Co., of Canada, Dundas, Ont.; Quincy, Manchester and Sargent Co., New York; W. P. Davis Machine Co., Rochester, N.Y.; R. K. Le Blond Machine Tool Co., Cincinnati, O.; Flather and Co., Nashua, N.H.; Westinghouse Air Brake Co., Pittsburgh, Pa.; Springfield Mfg. Co., Bridgeport, Conn.; C. Redman and Sons, Halifax, Eng.; Lodge and Shipley Machine Tool Co., Cincinnati, O.; Foote-Burt Co., Cleveland, O.; Diamond Machine Co., Providence, R.I.; Bullard Machine Tool Co., Bridgeport, Conn.; Niles-Bement-Pond Co., New York; Gisholt Machine Co., Madison, Wis.; Warner and Swasey Co., Cleveland, O.; Drees Machine Tool Co., Cincinnati, O.; Stevens Co., Galt, Ont.; Jones and Lamson Machine Co., Springfield, Vt.; Acme Machinery Co., Cleveland, O.; H. G. Hammett, Troy, N.Y.; R. McDougall Co., Galt, Ont.; Loew Mfg. Co., Cleveland, O.; F. Pratt and Co., Halifax, Eng.; Bauß Machine Tool Co., Springfield, Mass.; Sibley Machine Tool Co.,

South Bend, Ind.; Francis Hyde and Sons, Montreal; and Whiting Foundry Supply Co., Chicago, Ill.

THE BLACKSMITH SHOP, fig. 13, J. Kiepler, Foreman, is a structure 144 by 100 ft., similar in design to the machine and erecting shop, with similar methods of lighting and heating, forming a 3 bay wing running north from the west end of the machine shop, with which it communicates through a swing door in the east bay, a standard gauge track passing from the machine shop into the blacksmith shop a few feet, with a through service track the length of the blacksmith shop, and extending about half way across the machine shop, for the movement of forgings to the latter shop for finishing. The bays are each 33 ft. 4 ins. wide, the walls resting on 4 ft. 8 in. wide footings at a depth of 6 ft. The columns, built up of two 8 in. channels and two 10 x 1/4 in. plates, are carried on 5 ft. square concrete footings at a similar depth. The roof is carried on 20 in. I beams, with a clear height at the sides of 20 ft. Each

shop. A double connection for the steam hammer exhaust exists. Normally, the exhaust is direct to the sewer, but in winter, the other connection draws the exhaust steam off into the heating system, supplementing the supply from the reducing valve, effecting a considerable saving.

Along the east wall (left side of fig. 14), there is a row of nine 3 1/2 ft. diameter and 26 ins. high open forges, each supplied with a small anvil and employed on small general smith work. Down the centre of the shop, there is also a double row of 11 similar open forges, equipped in the same manner and operating on the same class of work. Both the pressure and exhaust fans for all the open forges, driven by a 75 h.p. motor, are located in the upper story of a small room in the northeast corner of the shop. The pressure is obtained from a 3 1/2 ft. centrifugal fan with a 15 in. delivery pipe running down under the ground, branches running along the rear of each row of forges with a 3 in. delivery pipe to each. Each forge has a cone hood with an 8 in. suction

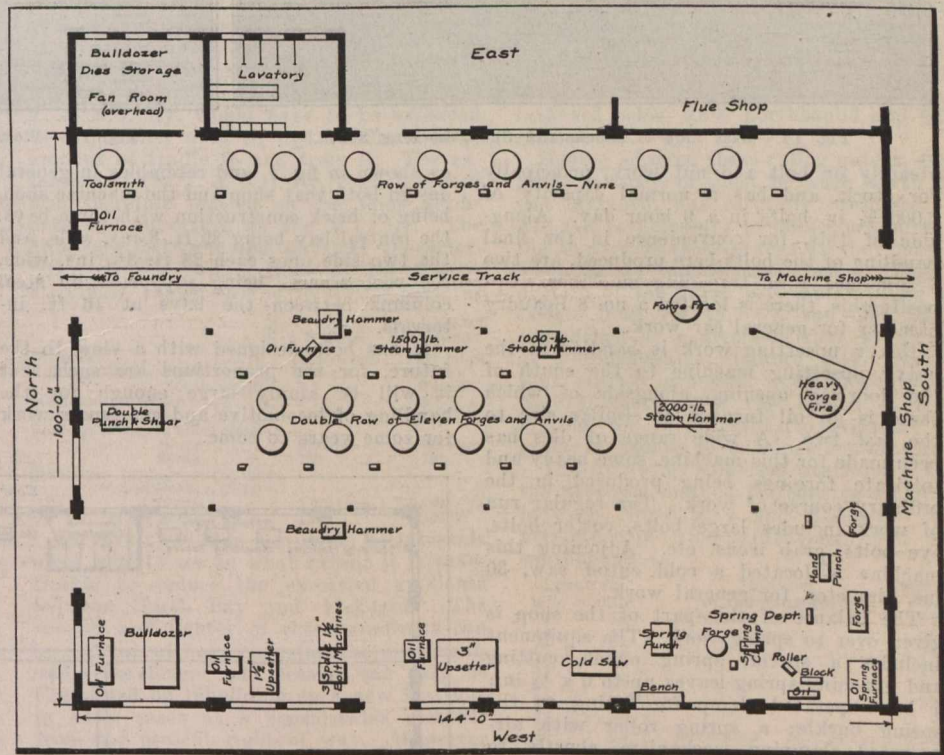


Fig. 13.—Interior Layout and Machine Distribution in Blacksmith Shop.

section has a 48 x 12 ft. skylight. The floor is of cinder.

The heaviest forging work is handled just inside the blacksmith shop, to the west of the machine shop door, shown in the background of fig. 14, an 18 ft. jib from the first column handling such heavy work as frames, etc., between a large open forge fire and a 2,000 lb. hammer. In the next section west, alongside the service track, there is another open forge fire to serve a 1,000 lb. steam hammer in the next section for lighter forgings. A 1,500 lb. hammer in the next section is used for general forge work. A steam pipe from an elbow at the heating system reducing valve in the roof of the southwest corner of the machine shop, connects with a receiver in the blacksmith shop, from which the steam hammer supply is drawn, the supply being steadier than if drawn directly from the main. Trouble from condensation in the pipes affecting the operation of the steam hammers is also reduced, a steam trap being attached to the lower end of the receiver, the drip being drawn off to the vacuum pump in the southwest corner of the tube

pipe leading up to a common suction pipe over each row in the roof trusses, enlarging to a 4 ft. diameter on entering an 8 ft. exhaust fan in the fan room, the fan discharging through the roof. The shop is thus kept remarkably free from smoke. The forge coal is stored in bins paralleling the shop on the east side, approached from the shop through the door on the east side. The coal is unloaded from a track running alongside.

In the fan room corner of the shop, there is a small forge fire for the tool blacksmith, with a small oil furnace to one side for tool tempering.

To the east of the double row of forges, there is a no. 6 Beauty hammer, provided with a 4 ft. wide oil furnace, used principally on general car work.

In the centre of the north end, a double punch and shear with a capacity for 6 x 2 in. stock, is used for general blacksmith stock work, principally on cutting up bolt stock, and cutting up bolts that are made double ended in the upsetting machine for convenience in handling.

Bulldozer work is handled in the north-

west corner, where there is located a 20 in. stroke bulldozer having a ram 6 ft. wide and 1 ft. deep. This has an oil furnace 9 ft. wide and 3 ft. deep, butting on the end wall. The numerous bulldozer forms are stored in the ground floor room of the fan building. Adjoining the bulldozer, there is a 1½ in. upsetting machine to the right in fig. 15 with an oil furnace similar to that for the bulldozer. This upsetter is employed

The equipment of the blacksmith shop was furnished by the following firms:—Jno. Bertram and Sons Co., Dundas, Ont.; Bell, Buffalo, N.Y.; Beaudry and Co., Boston, Mass.; Acme Machinery Co., Cleveland, O.; Clifton-Waddell, Johnstone, Scotland; Jno. Evans, Philadelphia, Pa.

THE FOUNDRY, A. Knight, Foreman, is located in a building 129¾ by 100 ft., directly to the north of the blacksmith shop,

convenience, the balance being permanently stored in the stores building.

Along the east wall, in the northeast corner of the building, are located the moulding machines for the stock production of parts required in large numbers. In the same row are three match plate moulding tables, where a large portion of the duplicate moulding work is handled. Another table to the south of the lavatory is em-

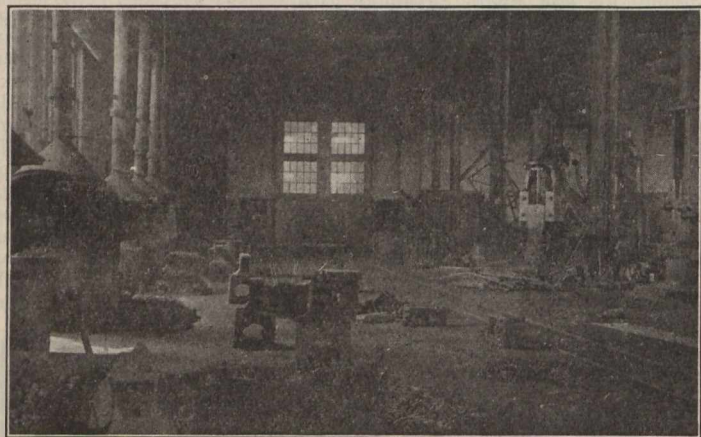


Fig. 14.—East Side of Blacksmith Shop, Looking South.

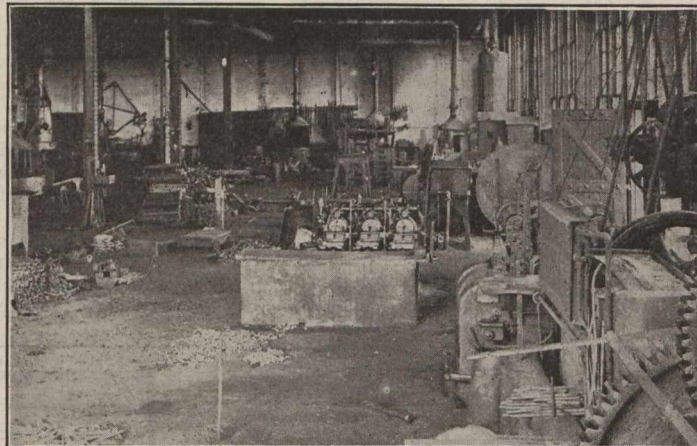


Fig. 15.—West Side of Blacksmith Shop, Looking South.

steadily on bolt and nut work, principally for stock, and has a normal capacity of 6,000 ¾ in. bolts in a 9 hour day. Alongside of this, for convenience in the final handling of the bolts here produced, are two 3 spindle 1½ in. threading machines. Opposite this, there is located a no. 8 Beaudry hammer for general car work.

Heavy upsetting work is handled in the heavy upsetting machine to the south of the doorway opening, alongside of which there is an oil furnace of similar size to the last two. A wide range of dies has been made for this machine, some heavy and intricate forgings being produced in the ordinary course of work. The regular run of work includes large bolts, cotter bolts, eye bolts, grab irons, etc. Adjoining this machine is located a cold cutoff saw, 30 ins. diameter, for general work.

The balance of this part of the shop is given over to spring work. The equipment includes a special spring punch, cutting and punching spring leaves up to 6 x ½ in.; a hand-operated clamp for fitting on the spring buckle; a spring roller with air-operated clamping mechanism, shortly to be replaced by a machine that not only clamps down the upper roll by air, but will also turn the upper roll, passing the spring leaf through; a spring leaf surface block; a spring leaf oil bath; and a spring oil furnace in the corner. This equipment is shortly to be supplemented by a buckle press. Adjoining the spring furnace, there is a small open forge with anvil for general spring work. There is also a small hand punch. This department has a capacity on the average of ten 14 leaf springs of 5 x 7-16 in. stock per day.

The oil for this shop is stored in a tank located in a central skylight, from which it feeds by gravity to the several oil furnaces.

The present capacity of the blacksmith shop has become taxed to such an extent that a 4 section addition to the north of the building is being erected, increasing the shop length by 96 ft., all as shown by the dotted lines to the north in the plan, fig. 1.

The end wall has been knocked out to make the shop open throughout. The machine and forge arrangements will be altered by this addition, but the general disposition will be along the order of the plan as at present in use.

as shown in fig. 1, and resembles in general design both that shop and the machine shop, being of brick construction with three bays, the central bay being 39 ft. 8 ins. wide, and the two side ones each 28 ft. 8½ ins. wide, the roof trusses being supported by steel columns between the bays at 16 ft. intervals.

It has been designed with a view to the future, for the proportions are such that it will be amply large enough for the handling of locomotive and car repair work for some years to come.

ployed on general work.

In the east bay, it will be noticed that there is an industrial track for the handling of flasks, sand, patterns, etc., connecting at the centre with a similar track down the west side of the centre bay, through a central cross track, with turntables at each end.

Occupying the two central sections of the west bay, the cupola is located in a large room, designed for the accommodation of a second cupola, which may possibly be installed at a future date. The present cu-

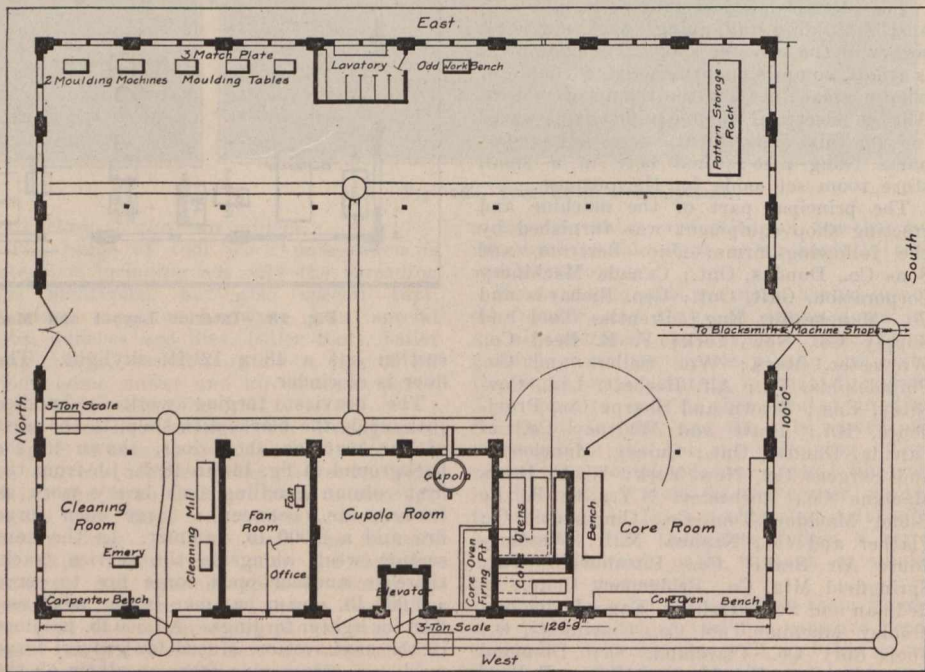


Fig. 16.—Interior Layout and Arrangement of Foundry.

The central and east bays form the large moulding floor, this space being practically clear except for the lavatory similar to the ones in the other shops, in the third section from the north on the east side, and a pattern storage rack filling the whole end section in the southeast corner of the building. In this rack, all patterns in more or less constant use are stored for the sake of

the cupola is 46 ins. diameter, with a capacity of about 6 tons. The clear ground space in the cupola room provides ample space for the cupola room attendant in his work of lining the ladles and crucibles. The cupola tap is into the central bay, pouring on a line over the top of the service track along that wall. Ladles up to 4 tons capacity are in use, although the larger size castings

made here rarely require more than the 1/2 and 1 1/2 ton sizes. While in many cases the industrial track would be found of great service, it has been found that under ordinary circumstances the 10 ton electric crane down the centre bay is more useful in the handling of the ladles to and from the moulds, more especially as all the heavy work is handled in the central bay, and the light or hand ladle work in the east bay. In consequence, the service track in the building has fallen in disuse.

An air-operated elevator to the cupola charging floor, opens to the outside in the west wall, and is served by a service track along that wall. Parallel with the service track, there is a standard gauge track, as may be noticed in fig. 1, on which the scrap and pig iron is brought in car lots and piled on the ground on the side opposite to the foundry, from which it is drawn as required, and either run on the elevator in the small service cars, or what is more generally done, on wheelbarrows. Scrap iron is used for the most part, with an addition of from 10% to 20% of pig, depending on the class of work for which the casting is being made.

A small room adjoining the cupola room to the north contains the cupola fan, and the foreman's office in the southwest corner. In the section to the south of the cupola room there are two core drying ovens, both fired from a pit in that corner of the cupola room. The larger one opens to the centre bay, and has a 7 ft. gauge car running out into that bay for the reception of the larger cores. It is served by a 15 ft. jib crane, swinging from an adjoining column. To the rear of this oven, opening to the south, is located the smaller oven, with shelves ranged along both sides for cores of smaller size.

The core room occupies the south two sections of the west bay, and is equipped with a vibratory sand sifter and a small core machine. The sides are lined with core benches, and behind the north bench there is a small core rack. For the baking of these small cores for bolt holes, etc., there is a small oven on the east wall. With the exception of this part of the foundry, which is paved with concrete, the floor is of the usual moulding sand formation.

The casting cleaning room is the northwest corner of the building, and contains a large and small tumbling mill, as well as benches for the chipping of the larger castings. There is also a double 18-in. emery wheel for cleaning room purposes. The west wall of this room is set aside for the foundry carpenters. A service track runs across this room, connecting at the ends through turntables with the inside and outside systems of trackage.

Coke and core and moulding sands are stored in a corrugated metal building, 100 by 30 ft., to the north of the foundry, as noted in fig. 1. This is divided into three rooms, 50, 25 and 25 ft. in length, holding respectively coke, core sand and moulding sand. These supplies are drawn off from the west side of the building.

A yard track approaches the central doors on the north of the building, and on this track, close to the building, a flat car is kept spotted, as at the tube shop door, for the loading of the slag and clinker directly on removal from the cupola and core oven.

A service track leads from the south door of the building, a continuation of the service track through the blacksmith and machine shops. All castings are forwarded to the latter shop over this line. A cross track at the south end of the foundry, with turntables at each end, connects this through track with that along the west side of the building. This connection is of considerable value to the machine shop in facilitating the removal of cast iron scrap to the foundry.

dry pile. The smaller castings from the cleaning room are also brought along to the machine shop over this route instead of through the front door of the foundry.

A large proportion of the castings made up are for stock purposes, and are stored on the stores department platform. These stock castings are piled in the cleaning room until a sufficient quantity to fill a box car has accumulated, when a car is run along opposite the cleaning room door on the standard track, and when filled, it is re-

moved by the yard engine to the stores platform, minimizing trucking.

The system of heating the foundry is similar to that in use in the machine shop, a series of seven 1 1/2 in. coils of pipe passing along all four sides. The lighting is different, the flaming arc being used, suspended from the lower chord of the roof trusses.

The foundry equipment was supplied by the Whiting Foundry Equipment Co., Chicago, Ill. (To be continued.)

Grade Reduction on the Timiskaming and Northern Ontario Railway.

In the report of the T. & N.O.R. Commissioners, recently issued, one of the more important matters discussed is the proposal to reduce the gradients on the first section of the line, from North Bay to Liskeard, 112.6 miles. This is dealt with in detail by S. B. Clement, M. Can. Soc. C.E., Chief Engineer, and Superintendent of Maintenance. He points out that the line from North Bay to Liskeard was located as a colonization railway, and placed under construction before the National Transcontinental Ry. was projected. When the latter line was laid out, it was seen that the T. & N.O. Ry. would have to be extended to a junction with it, and handle a large amount of traffic to and from it. The extension of the T. & N.O. Ry. from Liskeard was therefore located on the same gradients and curvature as the N.T. Ry. The difference between the physical characteristics of the two sections of the line is strikingly shown in the following table:—

	North Bay to New Liskeard.	New Liskeard to Cochrane.
Distance.....	112.6 miles	140.0 miles
Ruling gradient—North bound..	1.45 p.c.	0.5 p.c.
South bound..	1.2 p.c.	0.4 p.c.
Maximum curvature.....	6°	4°
Curvature per mile.....	83'18"	27'56"
Tonnage rating (10 wheel class)—		
North.....	560 tons	1,460 tons
South.....	700 "	1,710 "
Maximum tonnage rating (new consolidation class)—		
North.....	1,070 tons	2,700 "
South.....	1,290 "	3,160 "

Surveys have been carried on at intervals since 1906 to see to what extent it is practicable to reduce the excessive gradients between North Bay and Liskeard. The shorter and lighter of these gradients can be reduced without changing the alignment, while the longer and heavier can only be eliminated by rebuilding on a new location, in some cases at a considerable distance from the present right of way. Wherever these diversions are necessary actual locations have been made and estimates of cost prepared.

The most striking feature of the profile of this section of the line is what is known as the Merrick Summit. The elevation of the North Bay yards at the junction with the C.P.R. is 652 ft. above sea level, and from Riddle north for about 25 miles the general elevation of the country is approximately 1,000 ft. above sea level. The intervening Merrick summit, with an elevation of 1,300 ft. above sea level, is the most serious obstacle to be overcome. In the original location, this summit was crossed by deflecting several miles to the east from North Bay, following the rugged shores of Four Mile creek and the North river to the summit. After an exhaustive examination of the country on both sides of the right of way, it was found that a lower grade from North Bay could be obtained by following Duchesnay creek and the summit could be crossed at an elevation of about 1,170 ft., or about 130 ft. lower than the present summit, connecting with the present line at mileage 35, just north of Riddle. If at all possible it is desirable that the ruling grades on the first division

should not exceed those on the second division, but it is a physical impossibility to obtain a 0.5% grade north from North Bay. This diversion, North Bay to Riddle, has been located with maximum curvature of 4°, and with maximum grades of 0.8% northbound and 0.6% southbound, all compensated for curvature. The diversion gives the lowest grade that can be obtained from North Bay without swinging the line far to the west to the Sturgeon river valley. With this diversion as a key to the situation it will be unprofitable to attempt to lower the grades between Riddle and Liskeard below 0.8% northbound and 0.6% southbound.

Having adopted these ruling grades, every grade in excess of them, between North Bay and Liskeard, was carefully examined. It will not be necessary to reduce a number of the shorter of these grades as they may be operated as momentum grades. The reduction of the grade between Liskeard and Cobalt from 1% to 0.6% can only be accomplished by a diversion that would pass at a considerable distance from the present station grounds, at Haileybury and New Liskeard. For this reason, it is advisable, for the present, to overcome this grade by means of a helper engine service.

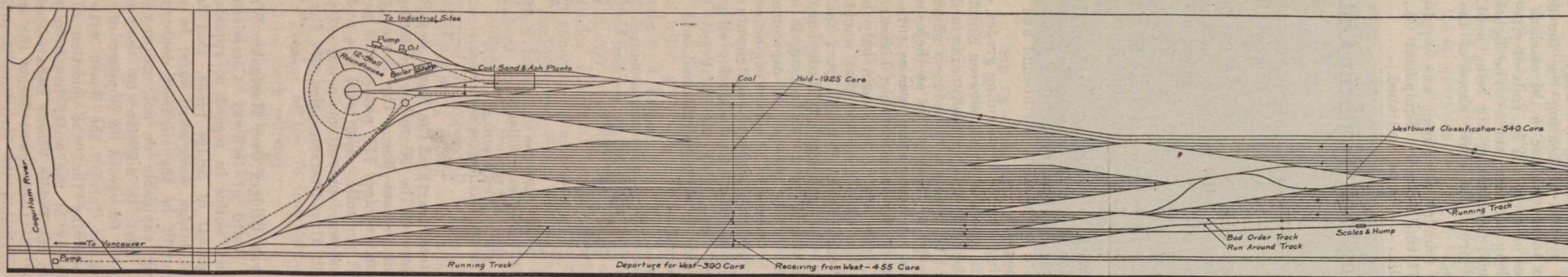
The following summary statements show the proposed method of reducing all grades between North Bay and Liskeard to a maximum of 0.8% northbound and 0.6% southbound:—

Location, mile to mile	Method of reducing grade.	Estimated Cost.
2. 35.	Diversion	\$1,482,500
40. 41.2	Train filling	50,120
47.9 48.5	"	25,610
51.7 52.5	"	11,000
57.8 59.	"	39,100
60.4 61.8	"	33,280
62.5 63.3	"	9,200
66.7 73.2	Diversion	367,675
74.5 75.3	Train filling	16,225
90. 94.	Diversion	220,000
100. 100.5	Train filling	8,400
101. 112.	Helper engine service.	
Total		\$2,263,110

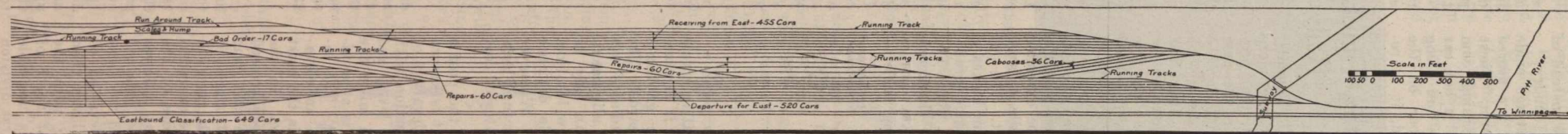
The total length of the North Bay-Riddle diversion will be 30 miles, replacing 33 miles of present line. The curvature on diversion averages 71°, and on the present line 93° per mile. The total rise and fall is as follows:—present main line—rise, 747 ft.; fall, 374; diversion—rise, 634 ft.; fall, 258.

Railway Bridges Over Navigable Waters.
—The Board of Railway Commissioners has given notice in regard to applications for approval of bridge plans, that in all cases of bridge work over water in which there might be the slightest doubt as to it being navigable or not, railway companies must, in addition to the papers heretofore forwarded in support of their applications, furnish the Board with evidence showing that the question of the navigability of the water has been taken up with the Public Works Department and that, if the Department deems the waters to be navigable, the structure is satisfac-

Canadian Pacific Railway Terminal Yards at Coquitlam, B.C.



C.P.R. Terminal Yards at Coquitlam, B.C.—West End of Yards.



C.P.R. Terminal Yards at Coquitlam, B.C.—East End of Yards.

The C.P.R., as noted in previous issues of Canadian Railway and Marine World, has under construction at Coquitlam, B.C., a large terminal yard for the handling of freight originating in and directed towards Vancouver. It is of the double hump type, and has a total capacity in excess of 5,000 cars. The general layout of the yards is shown in the accompanying plan.

Coquitlam is to be made the big terminal point on the Pacific coast for the arrangement and distribution of the freight traffic in and out of Vancouver, from which it is distant about 18 miles on the main line. In consequence of the big demand which will undoubtedly be made on it immediately on completion from the constantly increasing traffic, the terminal had of necessity to be made of large proportions. Between the two approaches, the distance is something over two miles, a good estimate of the extent of the project.

The terminal yards may roughly be divided into eight different systems of trackage: Receiving from the east, departure for the east, repair yards, eastbound classification, westbound classification, receiving from the west, departure for the west, and holding yards.

The main line along this section of the C.P.R. is double tracked. From the east, the westbound traffic is diverted to a siding just after crossing the Pitt river, which is having a heavy double track bridge constructed across it as a part of the terminal

scheme. From a ladder track, the incoming traffic from the east is received into the northerly yard at the east end of the terminal, which contains seven tracks 2,900 ft. long, with a capacity of 455 cars.

From this receiving yard, the cars are drawn off through a similar ladder track to that on the other end to the westbound hump, which conforms to the American Railway Association's standard; the hump for traffic in the reverse direction is similar to it. Both humps have a run-around track for solid through trains that have not to be broken up for classification at the hump. The westbound classification yard, into which the cars descend from the hump, has a double ladder approach, and contains 27 tracks 1,000 ft. long, with a capacity of 540 cars.

The bulk of the traffic is westbound, and in consequence, a large storage capacity for Pacific coast freight is required. The westbound classification yard thus has two outlets, the one from the south into the westbound departure yard, and the other into the storage or holding yard. A track leading out at about the centre of the classification yard discharging ladder makes approach for all tracks to the south of that outlet equally open to the westbound departure and the holding yards.

The westbound departure tracks are nine in number, each 2,950 ft. long, with a capacity of 390 cars. The holding yard has 37 tracks, each about 2,200 ft. long, with the

large holding capacity of 1,925 cars. To the latter yard, there are two entry tracks, with double ladders to each, and at the opposite end, there are also two departure tracks, one with a double ladder and the other with a single. These departure tracks converge to a siding on the main line, of sufficient length to hold 65 cars clear of switches, freeing the yard of trains ready to depart but awaiting orders.

The westbound traffic is received into a yard containing seven tracks, each 2,900 ft. long, like the reverse direction yard, with a capacity of 455 cars. From here, the trains are drawn off to the westbound hump, located directly south of the westbound classification yard, which is similar to the reverse direction hump.

The eastbound classification yard contains 20 tracks, with a capacity of 649 cars, the length of the yard being 2,300 ft. overall, approached at either end by a double ladder.

The eastbound departure track holds 520 cars on eight tracks, each 2,950 ft. long, both ends having a single ladder approach, leading off to the siding which runs on to the main line.

The repair track capacity of the terminal is for 120 cars in two yards, each yard containing four tracks, each 850 ft. long. These repair yards are located between the westbound receiving yard and the eastbound departure yard. These yards are approached by freight moving in either direction, for

both of which they are equally convenient. In addition to these two repair yards, there is a bad order track adjoining each of the yards, to which the cars requiring repairs can be shunted awaiting removal to the repair yards.

Four tracks with a total capacity of 36 cars are run from the westerly end of the westbound receiving yard to the running track along the north side of the eastbound departure yard, for the reception of cabooses. These are removed from the trains as they arrive from the west, shunted to these tracks, and are in a position to be as easily shunted to the rear end of the eastbound departure yard, along the running track. No provision for cabooses is made at the west end of the terminal, as the traffic from that point into Vancouver does not require the use of a yard car.

At the northwest corner of the terminal yards a 12 stall roundhouse is under construction, to be equipped with the usual divisional shop facilities. Provision is being made for the extension of the roundhouse to 48 stalls, when the demand arises. The coaling station and the ash and sand plants are situated north of the holding yard, directly east of the roundhouse, which is to be approached from the east. Coal cars for the coaling dock are accommodated on the four tracks to the east of the coaling dock.

Incoming locomotives from the east, after dropping their trains in the incoming yard,

come out at the west end of the yard, and proceed to the roundhouse along the north-erly of the two through running tracks to the north of all the trackage. Similarly, locomotives to depart easterly, leave the roundhouse along the other track, coming down through the yards on a running track to the east end of the outbound yard, where the train is picked up.

The yard tracks throughout the body of

the yard are 12 ft., centre to centre; the running and ladder tracks are 16 ft., centre to centre, from parallel tracks; the repair yard tracks are alternately 16 and 24 ft. centre to centre.

The plans for these yards were prepared in the office of J. G. Sullivan, Chief Engineer Western Lines, in the early part of this year.

A Talk to Ticket Agents.

By A. E. Duff, District Passenger Agent, Grand Trunk Railway, Toronto.

The following paper was read at the Canadian Ticket Agents Association's annual meeting at Ottawa recently:

As the majority of you are older both in years and ticket work than I am, I doubt if there is anything I can say in connection with passenger work that you do not already know. However, I will speak as if you were all ticket agents in my territory, on a few subjects that are constantly under my observation, viz.:—filing tariffs and circulars; displaying advertising matter, public time tables, etc.; newspaper advertising; through ticketing and exchange orders; ticketing children; soliciting travel.

THE FILING OF TARIFFS AND CIRCULARS in such a manner that they can be readily referred to is most important. It is annoying to a passenger whose time is limited, or who is leaving on a train due in a few minutes, to watch an agent look through several tariff binders or circular books for the fare, and this can be avoided if agents familiarize themselves with the various tariffs and circulars by checking them over frequently with the list sent out by the general passenger agent, so that when asked for a fare they will know at once what tariff it is in and where that tariff is.

J. A. Mackenzie, City Passenger and Ticket Agent, G.T.R., at Woodstock, Ont., has the best filing system I have seen, and I am sure those of you who have seen it will agree with me. I will not attempt to describe it any more than to say that the tariffs and circulars are placed in drawers in almost the same manner that correspondence is kept in a vertical filing cabinet, a separate pocket for each tariff and circular, with the name at the top so that it can be seen at a glance. I would suggest that any agent who is not satisfied with the system he is using, get particulars of this system from Mr. Mackenzie, who I am sure will be pleased to give it.

An agent who has spent some time looking for a fare, and then quotes as if he was not sure it was correct, does not inspire confidence, and I have known of cases where traffic has been lost on that account. Passengers contemplating a trip usually make a tour of the ticket offices for fares and information and the agent who can reply without hesitation generally secures the business.

A proper filing system also reduces the number of requests to the district or general passenger agent for fares and other conditions, and as these requests are usually sent by wire it will relieve the already overburdened wires.

DISPLAYING ADVERTISING MATTER, Public Time Tables, etc.—Posters advertising reduced fares for certain events should be displayed promptly on the authorized date; failure to do this may result in loss of revenue. Suppose the ticket offices of two competitive lines are adjacent, one displays a poster quoting reduced fares to a certain point and the other does not, is it not natural that passengers who intend to take advantage of the reduced fares will enter the office advertising them?

These posters should be removed promptly after the last date that tickets are on sale. As far as possible such advertising matter should be placed in suitable frames, as the practice of hanging posters, etc., on walls or in windows is not attractive.

Public time tables should be placed in the frames provided for that purpose, in hotels and other public places, as soon as received. Time tables usually contain important changes in the schedule of trains. It is most desirable that the public be made aware of such changes as quickly as possible, and the most effective way of doing this is by displaying the time tables promptly. Agents who do not receive time tables concurrent with a change of time,

A RAILWAY OFFICIAL'S APPRECIATION OF RELIABLE INFORMATION.

J. O. Walsh, Superintendent, Motive Power and Operation, Anticosti Island Railway, writes:

"Enclosed please find postal note for \$2, for two years' subscription for your very valuable publication. Canadian Railway and Marine World is an old friend and I wish to be sure of it for the next two years. No railway man in Canada knows better how reliable your publication is."

should notify their district passenger agent immediately.

Steamship posters, giving sailing dates of the various steamships should be kept in the frames provided by the steamship companies, and not hung loosely. A poster out of date is as useless as a fifth wheel to a wagon.

NEWSPAPER ADVERTISING.—Advertisements appearing in the newspapers should be carefully checked to see that the fares, dates, time limits, etc., are correct. Agents can render mutual assistance by suggesting advertisements that would be most suitable to their district. I have seen railways advertise their service to a certain point, when the trend of travel from the city in which the advertisement appeared, was to points in an opposite direction. This was no doubt caused by the individual who prepared it not being familiar with conditions in that district. All items appearing in the press, whether complimentary or otherwise to the railways, should be sent promptly to the district or general passenger agent with any remarks that seem pertinent.

THROUGH TICKETING AND EXCHANGE ORDERS.—Unfortunately it is necessary to use exchange orders at small offices where the sale of foreign tickets is not large. These orders have to be exchanged en route, and are therefore the cause of more or less inconvenience to the passenger for several reasons, although I will only mention three, viz.:—

1. In some cases the passenger is obliged

to leave the train during the time allowed for changing locomotives at some terminal point and rush to the ticket office to have his order exchanged; he is uneasy, fearful that the train will pull out without him. If he has a wife and family on board, they pass through the same state of anxiety.

2. If the order is to be exchanged at a large office, say, Toronto, even if there is ample time between trains, it is not unusual during the summer season to find a long line of tourists ahead with orders calling for round trip tickets to the Pacific coast that take some time to prepare and the result is a long delay.

3. If the order calls for a return ticket, it sometimes happens that the exchange clerk omits to return the portion reading from the station the order is exchanged at to starting point, and the error is not noticed until the passenger presents the ticket at his final destination to have his baggage checked on the return trip, with the result that baggage is checked only to the station where the order was exchanged, and on arrival there the passenger has to visit the exchange office in the hope of finding his ticket. If he is not successful he must purchase another ticket to his home, recheck his baggage and file application for refund.

Endeavor in all cases to ticket your passenger through to actual destination or nearest point thereto authorized in your tariff.

If you have not the required coupon ticket in stock, and time will permit, send an exchange order, or write to your district passenger agent, specifying the route desired and the proper coupon ticket will be furnished. Be careful in quoting through fares, but at the same time do not be fearful about making a mistake to the extent that you suggest ticketing to some intermediate common point and have the passenger repurchase, as there is the almost certainty that it will cost him more money, and there is the possibility, at least in some instances, of the company you represent getting a shorter haul than need be.

TICKETING CHILDREN.—I assume that every ticket agent here has been asked at some time or other by parents or guardian if their boy or girl can travel free. Always explain what the rules are regarding the transportation of children. Every time you persuade parents to purchase proper tickets for their children, you prevent the possibility of a dispute and unpleasantness on the train with the conductor, who has no option but to collect the proper fare. It is well to remember that two half fares are equal to one full fare.

SOLICITING TRAVEL.—Additional traffic can be stimulated by systematic solicitation. Practically every agent knows where business may be found, but very few I find have any particular system of soliciting. I would suggest that each agent prepare a list of the various labor bureaus, steamship agents, contractors, business houses, etc., in his vicinity, and make a practice of calling on them periodically, leaving a folder or two each time, keep a record of the date of each visit, and the business secured or expected, and I am sure that at the end of six months the results will surprise you.

In conclusion, I may say that helpful suggestions are always appreciated.

Appropriations sufficient to eliminate many grade crossings within the limits of greater New York are about to be asked for by the Public Service Commission. The total sum necessary to carry out this programme will be about \$6,000,000, it is said, and the commission has made the first move by a preliminary request for \$1,500,000 for 1913.

Railway Mechanical Methods and Devices.

Handling Tender Truck Repairs at C.P.R. Winnipeg Shops.

In these shops the department for the repair of locomotive trucks is well laid out for convenience in the handling of the work. Through the centre of the truck repair department there is a cross track, the full width of the light machine tool bay of the locomotive shop.

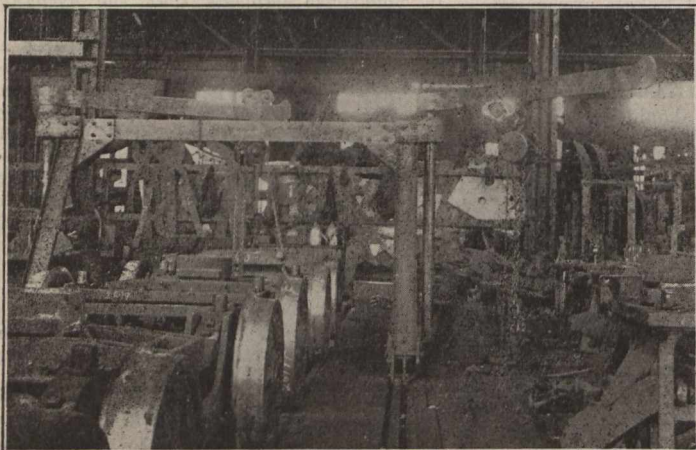
Paralleling this through track, with a

An old coach air brake cylinder is buried under the floor in front of the machine, the plunger extending through the floor. A hook at the upper end of the plunger makes a loose connection with the front of the hinged loop, so that the loop can be raised. The upper end of the stroke is so set that the upper surface of the loop is at the level of the lathe opening.

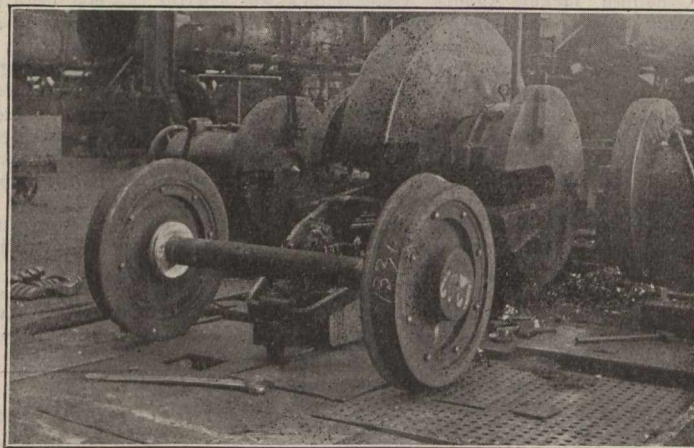
The coach wheel lathe is near one end of the shop, near the end door, through which the mounted wheels are rolled on

Wood Lathe Caliper Device at Grand Trunk Railway London Shops.

A wood lathe in the carpenter shop of the G.T.R. car shops, at London, Ont., has a calipering attachment applied by W. H. Butler, the operator, which is shown in the accompanying illustration. In general, it resembles the calipering attachment to be found on all modern coach wheel lathes.



Small Bridge Crane for Truck Repairs.



Attachment for Rapidly Mounting Wheels in Coach Wheel Lathe.

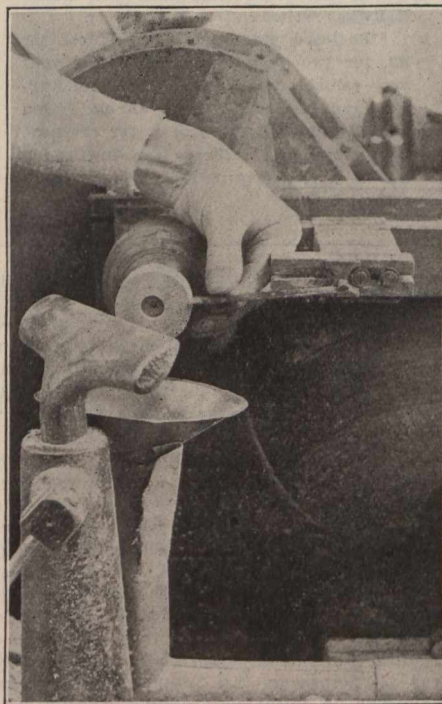
track on each side, is a wider gauge track—about 8-ft. gauge—on which a small bridge crane operates, as shown in the accompanying illustration. The end legs of the bridge are composed of channel sections, set at an angle to each other, joining at the top, and braced halfway down and at the bottom, double flanged wheels at the outer ends of the bottom bracing supporting the structure, permitting it to be moved from one position to another. As will be noted in the foreground, the bridge can be clamped in position by the attachment, which consists of a couple of pieces of bar, clamped together by a single bolt. The cross member of the bridge is a flat bar section, as the only strain to which it is subject is one of tension.

From each end of the bridge a jib crane, with a radius of about 7 ft., has a free arc of movement of nearly a full circle. They are supported by heavy vertical rods secured in bearings at top and bottom of the side members of the bridge.

On each jib arm a block and chain is provided, by means of which any part of the truck may be removed at will to the floor alongside, or on to an awaiting truck. This relieves the overhead cranes, and is at the same time more convenient, making it possible for a double gang to operate without interference. It has the added advantage of being movable to the job, or to the point most convenient to it.

Mounting Passenger Car Wheels in Lathe at Canadian Northern Railway Shops.

An attachment is in use at the C.N.R. Winnipeg shops for the easy mounting of passenger car wheels in the car wheel lathe. Attached to the front of the lathe there is a looped section of bar iron, hinged thereto, the upper face at the inner end being at the level of the lathe face cut-out, through which the axles roll into position in the lathe in the usual manner.



Wood Lathe Caliper Device.

a track into position, a few feet in front of the lathe. Here they are turned around a quarter turn on a small sunken floor jack, lowered, and then run forward until the axle strikes the loop. Turning on the air raises the outer end of the loop, making it only necessary to roll the wheels along on the axles into the lathe.

A practice of leaving a portion of station water tanks beneath the spout pipe as a reservoir in which sediment in the water supply may settle and get drawn out without passing into the locomotive tank, is finding its way into favor.

Back of the lathe spindle, there is a projecting lug of wood, extending to just beyond a line at right angles to the lathe centre. Across the face of this lug, there is a movable wooden member, carrying a hinged piece of thin sheet iron, as indicated in the operator's hand. For duplicate work in quantities, the operator turns down the first piece to the proper diameter, and then sets the movable piece up towards the job being turned, until the strip of iron when raised in a horizontal position will just scrape the wood when raised and lowered by the operator in the manner shown.

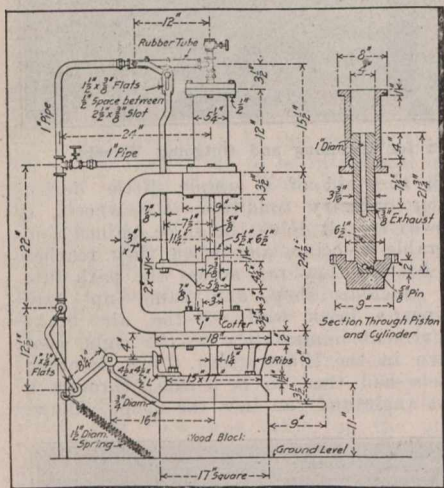
In operation, the operator, after placing the rough block to be turned down in the lathe, swings the caliper leg over so as to rest on the job, and after the several passes of the cutting tool along the rest, sufficient material will have been removed to let the leg drop, advising the operator automatically of the fact that the stock has been removed to the proper diameter. The finishing of the stock to the final shape on the face and corners is then a simple task. The job shown in the lathe is that of making small wooden handles such as are found on boiler water gauges. These are screwed on the end of an arbor screw, turned to diameter by the use of the caliper gauge, and then shaped.

Incidental to this method of turning up work, attention is drawn to the system of air draft. A suction funnel is located directly beneath the cutting tool, the horizontal section of the suction pipe being telescoped so as to be useful in all positions, for all diameters of work being turned. A suction pipe along the wall at the rear of the lathe connects to this pipe across the ways of the lathe. This rear pipe has a long opening in the front, a corresponding sleeve on the end of the cross pipe covers this opening, so that the suction connection may be adjusted to different positions along the lathe bed. The movement is now within about 6 or 7 ins., but could be extended to the full length of the lathe bed.

Air Hammer at Grand Trunk Pacific Railway Shops.

The G.T.P.R. shops at Rivers, Man., operate under conditions peculiarly their own, for the motive power repairs of a system that already extends over upwards of 2,000 miles and is rapidly increasing in both mileage and volume of traffic, are all handled at this point, which has only been equipped as a divisional point, with only the small buildings to be found at such a point on a line that has no branch lines emanating from the divisional point. The equipment of the shop has of course been increased beyond that contemplated for the divisional shop, but at the same time, the equipment added has only been that absolutely necessary to carry on the work. In consequence, considerable ingenuity on the part of the different foremen has been necessitated to handle the motive power repairs with the machines at their disposal.

In the blacksmith shop, one of the most essential of all the tools found in the usual railway repair shop was missing, viz., a steam hammer. The foreman, S. Lewis, realized that one must be had, and not seeing one coming in the usual channel, set about making one, the hammer shown



Air Hammer Made of Scrap Material.

in the accompanying illustration being the result.

All the parts that enter into the construction are taken from the scrap pile, and represent old parts from locomotives. The frame of the hammer is an old locomotive drawbar, with the ends bent around parallel to each other; the base is an old locomotive buffer centre casting, with the drawbar bolted thereto and the whole standing on a wooden block; the cylinder at the top is the end of a locomotive axle, turned with flange and bored out parallel the full length. It will thus be seen that the major portion of the hammer parts are such as may be found on almost any shop scrap pile. The plunger rod is almost the full diameter of the cylinder, with a forged block at the lower end for the hammer head.

To the upper and lower ends of the cylinder, there are air connections, leading from a common air pipe up the rear of the machine, in which there is a valve operated by a treadle extending around the wood base for the convenience of the operator. Once the air is turned on by the pressing of this treadle, the hammer continues automatically, stopping on the release of the foot treadle.

The manner of the automatic operation is as follows: Through the centre of the plunger rod, there is a 1 in. hole, near the lower end of which a radial $\frac{3}{8}$ in. hole com-

municates with the outside. A rod fastened to the rear of the hammer head, connects with an air valve in the pipe connection to the upper end of the cylinder, the upper end of the rod being slotted, for reasons to be explained. With the hammer in its lower position, the upper end valve is held closed. On pressing the foot treadle, the air enters the annular space around the bottom of the cylinder, the exposed surface being slightly more than sufficient to raise the dead weight of the hammer. On rising, the upper end air valve remains closed until the plunger has travelled the length of the slot, when the valve commences to open; and by the time the plunger is at the upper end of its stroke, the air is on full, forcing the hammer down smartly, adding impetus to the hammer above that given it by gravity. The downward plunge is against the force of the air acting under the hammer, but the latter is so slight as to be negligible.

As the hammer descends, the $\frac{3}{8}$ in. opening in the side of the plunger rod becomes exposed below the bottom of the cylinder, the pressure relieving itself from the upper end of the plunger almost instantly by the escape through this hole. As the plunger still further descends the slotted rod at the rear closes the valve at the top. After striking, the operation repeats itself automatically.

The stroke of the hammer is $6\frac{1}{2}$ ins., and the air pressure is normally 70 lbs. Any refinements in the intensity of the force at which the hammer descends may be simply regulated by the foot treadle. From the fact that the stroke is so short, it is not possible to work very heavy material, but it is a common practice to weld pieces up to $1\frac{1}{2}$ in. diameter.

Birthdays of Transportation Men in December.

Many happy returns of the day to:—

E. T. Agate, M. Can. Soc. C.E., District Engineer, Canadian Northern Ontario Ry. Sudbury-Port Arthur Line, Sudbury, born at Pittsford, N.Y., Dec. 7, 1874.

E. Alexander, Assistant Secretary, C.P.R., Montreal, born in Yorkshire, Eng., Dec. 8, 1862.

J. H. Barber, Engineering Department, C.P.R., Montreal, born at Cobourg, Ont., Dec. 20, 1856.

H. E. Bissell, Right of Way and Claims Agent, Grand Trunk Pacific Ry., Winnipeg, born near Noyan, Que., Dec. 31, 1867.

N. E. Brooks, Division Engineer, C.P.R., Calgary, Alta., born at Sherbrooke, Que., Dec. 25, 1866.

Harold Browning, steamship agent, etc., Windsor, Ont., born at Stamford, Lincolnshire, Eng., Dec. 2, 1864.

T. C. Burpee, Engineer of Maintenance of Way, Intercolonial Ry., Moncton, N.B., born at Sheffield, N.B., Dec. 11, 1852.

W. W. Butler, Vice President, Canadian Car and Foundry Co., Montreal, born at Danville, Ohio, Dec. 9, 1862.

M. M. Campbell, C.E., Building Inspector, G.T.R., Montreal, born at Bridgeton, N.B., Dec. 17, 1879.

J. A. Carroll, Road Foreman of Locomotives, District 1, Canadian Northern Ry., Rainy River Ont., born at Chilton, Wis., Dec. 14, 1865.

A. H. Chave, Purchasing Agent and Assistant to First Vice President, Canadian Car and Foundry Co., Montreal, born at Williamsbridge, N.Y., Dec. 26, 1872.

J. E. Entwistle, acting Superintendent, District 2, Western division, Canadian Northern Ry., Saskatoon, Sask., born at Streetsville, Ont., Dec. 1, 1859.

H. H. Gildersleeve, Manager, Northern Navigation Co., Sarnia, Ont., born at Kingston, Ont., Dec. 15, 1865.

W. H. Gardiner, City Freight Agent, C.P.R., and District Freight Agent, Esquimalt and Nanaimo Ry., Victoria, B.C., born there Dec. 6, 1859.

A. S. Goodeve, member Board of Railway Commissioners for Canada, born at Guelph, Ont., Dec. 15, 1860.

A. J. Gorrie, ex-General Superintendent, Canadian Northern Quebec Ry., now Receiver, Quebec and Lake St. John Ry., Quebec, born at Raith, Kirkcaldy, Scotland, Dec. 10, 1868.

W. H. Grant, Manager of Construction, Mackenzie, Mann and Co., Ltd., Toronto, born at Acton, Ont., Dec. 8, 1858.

F. P. Gutelius, M. Can. Soc. C.E., ex-General Superintendent, Eastern Division, C.P.R., Montreal, born at Mifflinburg, Pa., Dec. 21, 1864.

D. B. Hanna, Third Vice President, Canadian Northern Ry., Toronto, born at Thornliebank, Scotland, Dec. 20, 1858.

S. P. Howard, ex-General Freight Agent, Eastern and Lake Superior Divisions, C.P.R., Montreal, born there, Dec. 30, 1865.

A. J. Isbester, Assistant District Engineer, Port Arthur district, Canadian Northern Ry., Port Arthur, Ont., born at Ottawa, Dec. 18, 1879.

R. Johnson, Locomotive Foreman, C.P.R., White River, Ont., born at Quebec, Que., Dec. 24, 1863.

B. B. Kelliher, Chief Engineer, Grand Trunk Pacific Ry., Winnipeg, born in Ireland, Dec. 26, 1862.

J. T. McGrath, ex-Superintendent of Motive Power and Equipment, Chicago and Alton Rd., Bloomington, Ill., born at Toronto, Dec. 6, 1869.

A. T. McKean, City Freight Agent, C.P.R., Winnipeg, born at St. John, N.B., Dec. 18, 1886.

L. Macdonald, Division Freight Agent, G.T.R., Toronto, born at Montreal, Dec. 10, 1871.

J. Niblock, ex-Superintendent, C.P.R., Victoria, B.C., born in York county, Ont., Dec. 21, 1849.

A. Price, General Superintendent, Alberta Division, C.P.R., Calgary, born at Toronto, Dec. 6, 1861.

G. D. Robinson, Assistant Export and Import Freight Agent, C.P.R., Toronto, born at St. John, N.B., Dec. 7, 1877.

C. Schreiber, C.M.G., Consulting Engineer, Department of Railways and Canals, Ottawa, Ont., born at Bradwell, Essex, Eng., Dec. 14, 1831.

F. P. Smith, Secretary, Richelieu and Ontario Navigation Co., Montreal, born there, Dec. 23, 1873.

C. E. E. Ussher, Passenger Traffic Manager, C.P.R., Montreal, born at Niagara Falls, Ont., Dec. 29, 1857.

H. H. Vaughan, Assistant to Vice President, C.P.R., Montreal, born at Forest Hill, Essex, Eng., Dec. 26, 1868.

R. C. Vaughan, Assistant to Third Vice President, Canadian Northern Ry., Toronto, born there, Dec. 1, 1883.

W. Wood, Locomotive Foreman, C.P.R., Megantic, Que., born at Montreal, Dec. 6, 1863.

A Laundry Car has been introduced on the Russian government railways for the use of the Imperial troops. The car is 9 ft. 10 $\frac{1}{2}$ ins. wide and 13 $\frac{3}{4}$ ft. high outside at centre from rail, and is built according to the Russian standard 5-ft. gauge. The equipment includes steam boiler, condensing tank, feed pump, injector, steam engine, cold and hot water tanks, soda cleansing medium, washing machine, draining box, centrifugal dryers, mangle, fans, ventilator, and disinfector, together with ironing board, with heaters at the finishing end, the central portion being used for drying and storing the linen.

Handling Wheels at Grand Trunk Railway Port Huron Car Shops.

A handy method of handling and storing mounted car wheels from the time they arrive to the time they are ready to depart, has been developed at the G.T.R. car shops, Port Huron, Mich., the idea held in mind throughout being to so place the wheels in their journey through the repair shop as to minimize as much as possible the shifting about required, and at the same time make the arrangement as simple in operation as compatible with the arrangement

travel. The hoist thus requires only a short hose. The crane girders serve a double purpose, being used for the carrying of the electric power wires across between the shops. The power house is located in the background to the left, in fig. 1.

Both old and new mounted wheels are stored on the platform shown in fig. 2, alongside the coach shop. The near track is for the storage of old and used up wheels, while the other is for newly

end. Two tracks on the ground, in line with those on the platform, lead up to the end of the platform, and from flat cars on these tracks the mounted wheels are unloaded by rolling across the gap between the end of the car and the platform on boards. The storage tracks are thus filled from either end.

From the storage on the near track they are drawn off as required to the machine shop for dismounting and remounting with new wheels. The door to the machine shop is directly to the right in fig. 2, and to bring the wheels down the slope and switch them around into the machine shop with very little labor, has been accomplished

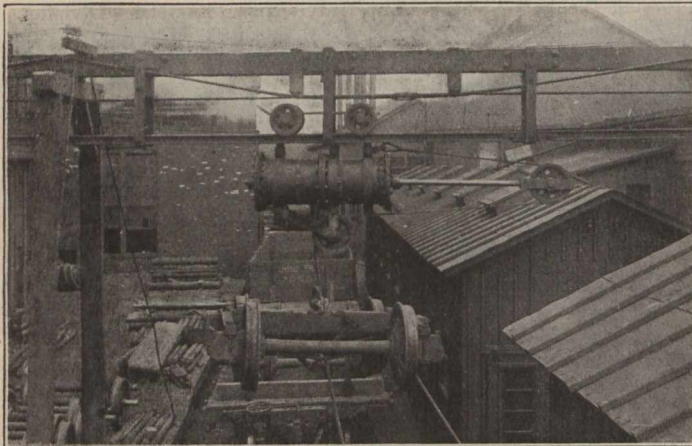


Fig. 1.—Air Hoist for Conveying Wheels between Shops.

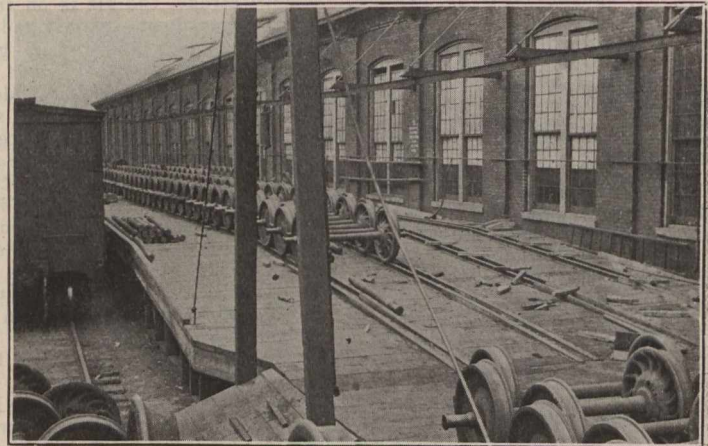


Fig. 2.—Storage Platform for Incoming and Outgoing Wheels.

possible in the limited space that can be utilized.

The machine shop and coach shop are in the same building, the parts being in line with each other. Similarly situated, with an intervening passage way, is the freight car shop, parallel to the other two. Consequently, all communication between the freight and machine shops is across the intervening gap.

For transportation purposes between the

mounted wheels which are ready to be taken away.

The sources from which old wheels are obtained is twofold. They are either dismounted from trucks in the freight shop, or they come in from the terminal points along the line, where renewal stores are maintained from which to fit up the trucks anew. When the wheels come from the freight car shop, they are brought across on the hoist just mentioned and deposited

with the aid of a simple little device. Under ordinary conditions the wheels, if allowed to roll down the slope, gained considerable velocity, and when they reached the bottom they ran across the path into the machine shop, and came up hard against a brick wall of the air brake department immediately to the right (not shown in the illustration). The mounted wheels had then to be turned through a right angle and run into the shop. Allow-

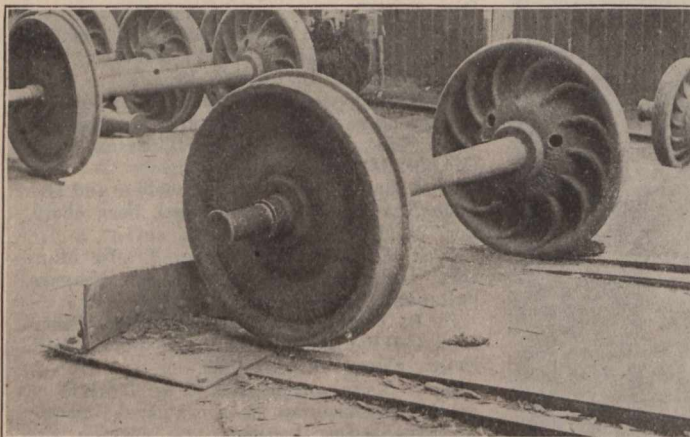
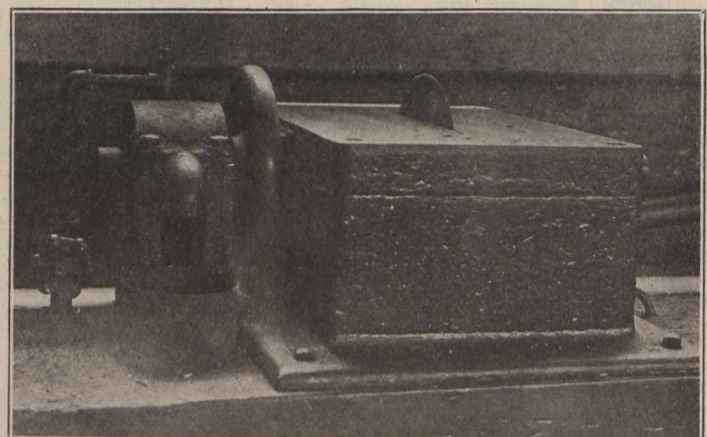


Fig. 3.—Device for Switching Wheels into Machine Shop.



Air Driven Saw for Cutting Babbit.

two shops there is a single track overhead craneway, constructed of timber work, leading from within one shop to within the other, and supplied with an air hoist as shown in fig. 1. This hoist is constructed of a couple of old cylinders placed end for end, the cylinders being mounted horizontally, with the cable so mounted as to give a 2 to 1 movement, the cylinders being large enough to lift the largest trucks with ease under normal air conditions. Trucks and wheels are lifted bodily by this hoist and carried across to the shop required. To each of the uprights of the crane posts, there is an air connection from the shop, to which the hose from the hoist is attached for operation in any position along the

in the foreground in fig. 2, the two posts shown being two of the crane uprights. They are lowered on to the platform in the direction in which the wheels to the right in the immediate foreground are placed, and run up the incline on the interlocking tracks to the left. A great number of the mounted wheels come in from outside points as mentioned, generally on flat cars, and provision is made for the ready unloading on to this same track.

It will be noticed that the platform is at the level of the flooring of a car, as shown by the box car to the left. The far end of the platform drops off abruptly, like the edge of the platform alongside of the box car, and does not slope off as at this

ing the wheels to run down the slope unattended like this had serious objections, as the brick wall suffered materially from the impact of the sharp edges of the wheels. Likewise, blocking the wheels down the slope had objections from the fact that too much labor was involved, as the wheels are so heavy as to require at least two to handle. This led to the use of the wrinkle mentioned, and which is shown swung out of position just beyond the right wheels of the batch in the immediate foreground in fig. 2.

This device, located in its proper position, is shown in fig. 3. It consists of a small square sheet of boiler plate, to which is rivetted a piece of angle bent to a quarter

of a circle, with a piece of plate rivetted to the upturned leg of the angle, projecting to the height indicated. This turning plate, pinned at the near corner to the platform decking, can be swung back to the left out of the way, but when in operation it is swung to the right into the position shown, directly in line with the inner pair of tracks. The inner wheel of the pair allowed to descend the slope of the platform unattended, strikes this obstruction to its forward movement very forcibly, the inner wheel being stopped, the momentum carrying the outer wheel a quarter turn to the left, when the operator at the proper moment giving the inner wheel a push off, the remaining momentum is sufficient to carry the wheels on into the machine shop.

In the machine shop they undergo the usual course of dismantling in the hydraulic press, and, if necessary, the journals are turned down, and finally, new wheels are mounted. They are then brought out over the same path to the tracks along the wall in fig. 2. They can either be run up the slope on to these tracks, or else picked up by the small overhead travelling crane, and run along to be placed with the batch of the particular size to which they belong. The air hoist on this runway has a very short air connection, as it will be noticed that at short intervals along the wall there are air connections from an air main suspended from the wall.

The principal use for this travelling crane is in the picking out of a required wheel from the long line of wheels stored there, and carrying it to this end for transfer to the freight car to be introduced into a truck in that shop. Similarly, it is used for carrying the mounted wheel along to the far end of the platform, where the receiving flat cars are located.

The facilities for unloading and storing axles is also shown in this illustration, fig. 2. There is considerable clear space to the left of the storage tracks on the platform, on which axles are unloaded from cars on the track adjoining. They are also stored to the rear of the point from which this view was made, on the platform, as indicated in fig. 1, where they can also be unloaded from the same track to a lower level.

Babbit Saw at Grand Trunk Railway Stratford Shops.

A very handy saw for cutting up piston packing rings, and other babbitt and composition articles, in use in the G.T.R. shops at Stratford, Ont., in the babbitting department, is shown on page 600.

In the centre of a small cast iron table, about 12 by 15 ins., there is a slot with a saw projecting through. This is driven from a small air motor on the left of the table, the motor being of the turbine type with blades on which the air impinges. To maintain the saw at a uniform speed and prevent fluctuations, there is an intervening flywheel. This saw is a most useful addition to any shop.

A saw of the same kind is in use in the pipe department for cutting off copper pipe and similar purposes.

The Bishop Construction Co., Montreal, has been placed in liquidation, and the Superior Court has appointed J. A. McDavis and D. C. Raymond as joint liquidators. The immediate cause of the order was judgment on a note for \$688, but previous to this judgment for \$15,000 had been given by default in other actions. The company had a contract on the Quebec and Saguenay Ry.

Stone Ballast From the Crusher to the Track.

The question of stone ballast is an extremely important one with the maintenance of way department of the principal railway. On railways where it can be procured, the ballast is either crushed by the railway or purchased from private parties. A thorough discussion of the kind of ballast, equipment for handling it, methods and amount necessary for making good track is considered timely, and your committee beg to submit the following:—

Rock ballast should be made from hard, tough, durable trap, flint, or limestone rock, or other hard stone, acceptable to the chief engineer or engineer of maintenance of way.

The stone should be broken to cubes, the maximum of which will pass through a 2½ in. ring and the minimum of which will not pass through a 1½ in. ring. The crushed stone should be free from screenings, dirt and rubbish.

Ballast can be handled in side dump cars with flat bottoms, or coal cars, but the Rodger ballast, Hart convertible cars, or any of similar type of ballast car on the market will secure very good results. Ballast after being unloaded should be handled with a spreader, the Rodger ballast plow giving very good results.

The track should be prepared for ballast by digging out all the old ballast down to the bottom of the ties, and rounded up to ½ in. above bottom of ties in centre. This

A MASTER CAR BUILDER'S OPINION.

John L. Hodgson, Master Car Builder, Western Division, Grand Trunk Ry., Port Huron, Mich., writes:—

"I am very glad indeed to be a subscriber to Canadian Railway and Marine World, for the information it contains is very interesting. I look forward each month to its receipt, and enjoy reading it."

will keep ties from running together until track is filled with stone. This should be levelled off at end of ties.

All decayed ties should be removed and replaced with new ones. Ties should be properly spaced and track put to gauge and all spikes driven down so that ties will be tight up to rail. Then crushed stone ballast should be unloaded to fill up between the ties in centre of track. This will help keep track in line and prevent ties from bunching. Eight or 12 ins. of stone ballast should be placed under ties if possible and a minimum depth of 4 ins. should be maintained.

In raising track on a 9 in. raise, the track can be put up in one lift if a large force of men can be secured. Ordinarily the track is put up in two lifts. In raising in one lift the foreman in charge will soon learn by practice how many rails a train of 15 or 20, fifty ton cars will raise to the required height. The number of rails are counted off and sufficient ballast is unloaded and ploughed out. Four men are started making places for jacks. One end of the sight board is placed on stake and board leveled. Four jacks are used; two one-half rail ahead of others, the first pair raising the track about half the required height. No tamping is required with these jacks, as the stone runs under the track by its own weight. The second pair of jacks raise the track to the required height. A force of 20 men should follow behind, whose particular work is to tamp and these should be followed by a foreman and eight men to keep the track in perfect line. The

first half of the day should be given to raising the track, the balance of the day being devoted to tamping and lining.

Where two lifts are made, the ties should be tamped with shovels their entire length. After the second lift, the ties should be tamped with tamping picks or bars, the tamping extending from ends of ties to 12 ins. on inside of rail. Particular attention should be paid to tamping under the rail but the centre of the ties should not be tamped.

In dressing up single track with ballast, the ballast should be filled in at least within 1 in. of top of ties and should slope from ends of ties to edge of ballast shoulder. This shoulder should not be less than 4 ft. from gauge line of outside rail to the edge of shoulder.

Double track should be dressed in the same way, stone in centre ditch being level with stone in track. When the track is bonded for electric signals, it is very desirable that the stone be kept below base of rail. The track, after being raised, should be left from four to six days before dressing up.

In handling 600 to 1,000 yards of stone daily and giving track 9 to 12 ins. of raise, the force employed largely depends on the amount of traffic handled, and the views of the maintenance of way officials. A force of 40 to 50 men should be used in the work. A force organized as follows will give excellent results:—1 chief foreman. 1 assistant foreman to raise track. 1 assistant foreman to line track. 2 men flagging. 4 men digging out for jacks. 13 men on jacks, (4 digging holes, 8 on jacks, 1 with levelboard). 20 men tamping. 8 men lining. 1 water boy (or more if necessary).

In the discussion on the foregoing report a very general objection developed against the large sizes of stone ballast recommended, viz., from 1½ in. to 2½ ins., except that one member of the committee favored ½ in. to 1¾ in. It was decided to change the recommendation, giving a smaller maximum size and a very much smaller minimum size, viz., from ½ in. to 2 ins.

Railway Route Maps Approved by Minister of Railways.

The Dominion Minister of Railways has approved of the following route maps:—

Alberta, Peace River and Eastern Ry., Oct. 15, from Cochrane, Alta., to Edmonton and Peace River, about 475 miles.

Canadian Northern Ontario Ry., Sept. 30, revisions on Sudbury-Port Arthur line, 30.9 miles.

Canadian Northern Quebec Ry., Sept. 30, Huberdeau westward 12 miles.

Sept. 30, Rawdon to St. Donat, 42 miles.

Canadian Northern Ry., Sept. 30, revision of Thunderhill branch, 53 miles.

Sept. 30, revision of Humboldt-Calgary line, 30.9 miles.

Sept. 30, Bienfait to Estevan, 9 miles.

Canadian Pacific Ry., Sept. 30, Bergen, Man., northeasterly, 9.92 miles.

Erie, London and Tillsonburg Ry., Sept. 30, from London to Aylmer, about 19 miles.

Grand Trunk Pacific Branch Lines Co., Oct. 15, extension of Moose Jaw northwest branch from Central Butte across the South Saskatchewan river, about 45 miles.

Manitoba and Northwestern Ry. (C.P.R.), Sept. 30, grade revisions between Minnedosa and Bredenbury, about 35 miles.

Montreal and Southern Counties Ry., Oct. 15, extension through Greenfield Park municipality, about 2¼ miles.

Toronto Eastern Ry., Sept. 30, Pickering westerly, about 12 miles.

Motor Car Under Test on Schomberg and Aurora Railway.

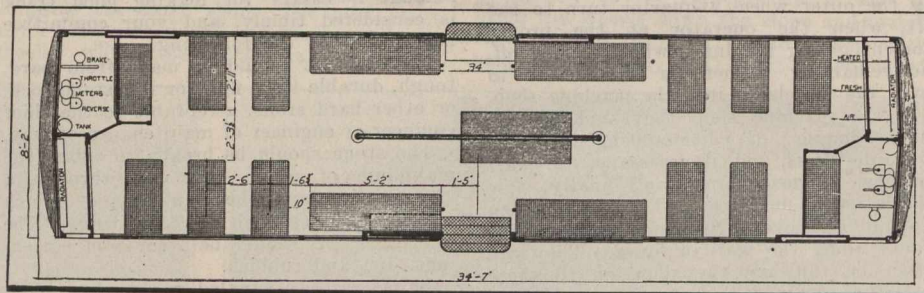
A short description of a motor car under test on the Schomberg and Aurora Ry., a division of the Toronto and York Radial Ry., operated by steam, appeared in Canadian Railway and Marine World, for September. Since then, further information has been obtained.

The accompanying illustrations show the construction of the car. The truck is of a unique design, built up entirely of plate and structural shapes, a construction that is said to give the maximum strength for a given weight, lightening the construction materially. The wheel base is 120 ins., with 33 in. chilled cast wheels mounted on 4 in. axles. The journals operate in ball-bearing journal boxes, and are so arranged that the wheels and axles may readily be taken from the truck.

The motive power is a small gasoline engine, directly connected to a generator, the combined unit being supported from a frame supported from the truck on a spring suspension in such a manner that but little of the shock and impact of the truck is imparted to the motive power. The gasoline motor group contains a battery of four 4 cycle $5\frac{1}{2}$ x $6\frac{1}{2}$ in. cylinders, developing 36 h.p. at 600 r.p.m. This unit is directly connected to a 20 k.w. compound wound

centre of each side frame steady the car and keep it level.

The general dimensions of the car body are 34 ft. 7 ins. over all length; 8 ft. 2 ins. and 7 ft. 9 ins., outside and inside widths; and total height above rail of 11 ft. 8 ins. The total weight is about 13 tons, with a seating capacity of 38, giving a small unit dead weight of car per passenger. Experi-



Interior Arrangement of Gasoline Electric Car.

ence has demonstrated that it is possible to carry as many as 125.

The car is of the side entrance type, double ended with a symmetrical arrange-

ment of the interior fittings. Inside the doors on each side are longitudinal seats, the balance being cross seats. The motor-man's cabin is at the right hand side in the direction of operation. Here, the operation of the motors is controlled, cranking being

performed electrically by means of storage batteries, which are also used for illumination. The interior of the car gives little evidence of the nature of the power utilized, only the tops of the engine cylinders projecting through the car floor into a narrow wooden cage about 8 ins. high, arched by a longitudinal hand rail at a convenient height. The heat of the hot jacket water from the engine is utilized for the heating of the car. Filling the balance of the car ends not occupied by the motorman's cabin, there is a radiator similar in construction to that found on automobiles, through which air from the outside is drawn in and heated. A sliding curtain in the end regulates the

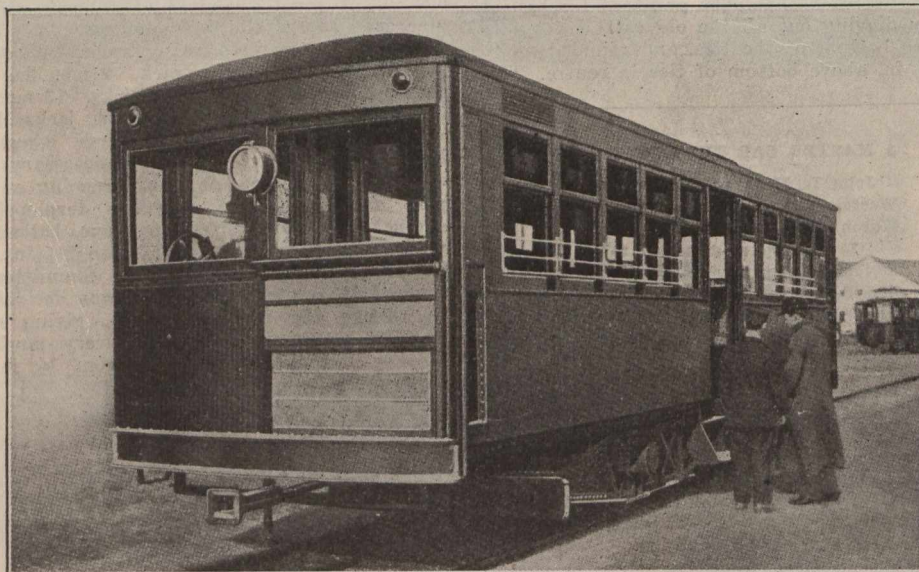
amount of air to be drawn in, as determined by the weather conditions. In hot weather, provisions are made for deflecting the current of hot air, and discharging it outside.

The braking consists of a rack and pinion, the rack operating a vertical plunger in an oil cylinder, the oil from the latter being forced into the brake cylinders, one of which is mounted on each side of the car frame, the plungers bearing directly on the wheel.

The consumption of gasoline is said to be a gallon for from four to six miles of operation under normal conditions.

The car was under test from Oct. 3 until on into November, making two round trips per day between Schomberg and Aurora, a distance of 15 miles, or a daily running of 60 miles. All the passenger traffic was handled by this one car. Daily observations have shown the economy of operation claimed for it, the fuel and oil averaging about 4 cents a mile. While giving satisfactory service, it was considered that better operation could be obtained on lines with less steep gradients. On this line, the maximum is $4\frac{1}{2}\%$. The conclusions drawn were that the most satisfactory service could be produced on branch lines with grades not exceeding 2%, and for that service the car is well adapted.

In addition to the tests on the Schomberg and Aurora Ry., a trial trip under more satisfactory conditions was made as far north as Gamebridge on the Canadian Northern Ontario Ry., on which it was learned that, on the level, the car could produce a speed of from 40 to 42 miles per hour, and could generate as much as 32 k.w.

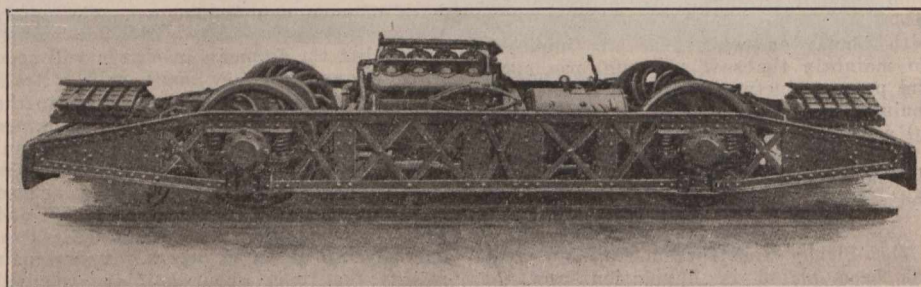


Gasoline Electric Car under Test on Schomberg and Aurora Ry.

differential pole generator. This comprises the power station of the car. To each axle there is geared in the usual manner a 25 h.p. compound wound motor, provided with a heavy series winding. These motors have a direct flexible connection from the generator, dispensing with the resistances and controllers. The connection between the generator and motors is such that as soon as the engine is accelerated, the shunt fields of the motors are pre-energized before the armature circuits of the motors are closed, giving a cushioning effect to the motors without the use of resistance and at the same time providing against the operator's misuse. The control of the car is entirely through the engine speeding up the latter to increase the car speed, and cutting off gasoline for coasting, eliminating standby losses.

The underframing of the car is also of steel of the same general construction as that of the car truck. It has a four point support on the frame. Nests of semi-elliptical springs at each end provide the main support for the car body, giving to the latter an easy movement, while at the same time lighter semi-elliptical springs at the

ment of the interior fittings. Inside the doors on each side are longitudinal seats, the balance being cross seats. The motor-man's cabin is at the right hand side in the direction of operation. Here, the operation of the motors is controlled, cranking being



Truck of Gasoline Electric Car.

performed electrically by means of storage batteries, which are also used for illumination. The interior of the car gives little evidence of the nature of the power utilized, only the tops of the engine cylinders projecting through the car floor into a narrow

from the 20 k.w. generator. On the run from Galt to Toronto over the Grand Trunk Ry., when being delivered for the test, the trip was said to have been made in 2 hours, with the speed running up as high as 44 miles an hour.

This car was built in York, Pa., and was imported by the Preston Car and Coach Co., which has bought the manufacturing rights for Canada. The builders are truck manufacturers, not car builders, and it is probable that the body will have to be considerably changed in future construction, to meet Canadian conditions.

On the conclusion of the test on the Schomber and Aurora Ry. and C.N.O. Ry. the car was taken back to Preston, Ont.

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:—

Pressed Brick Rates.

17781. Oct. 16. Re order 17552, Sept. 21, directing, inter alia, the G.T.R. to restore the proportion, viz., 88c. per ton, of the joint rate of \$1.60 per ton charged on pressed brick from Bradford, Pa., to Windsor, Ont., within 45 days from date of order; and the application of the G.T.R. for a rehearing of the matter, and postponing the effective date of the order. It is ordered that the effective date of the order be postponed to such date as the Board, after a rehearing, shall determine.

Pulp Wood Rates to United States.

17826. Oct. 23.—Re application of International Paper Co. and others, under sec. 323 of the Railway Act, for an order disallowing tariffs of Canadian Pacific, Grand Trunk, Canadian Northern Quebec, and Temiscouata railway companies, increasing rate on pulpwood from the provinces of Ontario, Quebec and New Brunswick to eastern United States points, effective Sept. 1 and 2, and reinstating the present rates. Upon its being represented to the railway companies that the going into effect of the said tariffs on Sept. 1 would be prejudicial to Canadian shippers of pulpwood, who had entered into contracts based on the lower rate, the companies voluntarily extended the effective date of the said tariffs until Nov. 1, and upon the hearing of the application it is ordered that the said tariffs be suspended until Feb. 4, 1913.

Embargoes Against Traffic.

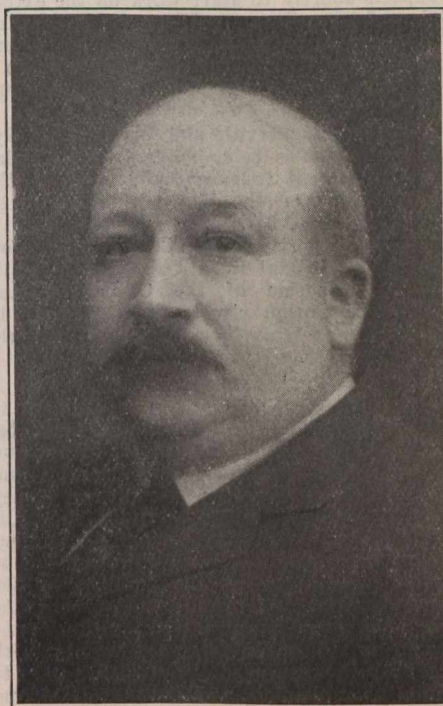
General Order 95. Nov. 2.—Re circular 87, calling upon railway companies to show cause why an order should not go prohibiting them from issuing an embargo against any traffic for a period longer than four days, without first giving the Board at least ten days' previous notice of intention to issue such embargo, and the reason why such embargo is to be issued: It is ordered that whenever a railway company, subject to the Board's jurisdiction, issues an embargo against any traffic, it shall, within 48 hours thereafter, file with the Board a copy of such embargo, with a statement of the conditions rendering such embargo necessary, the action required to remove such conditions, and the probable time such embargo will be continued. And when such embargo is withdrawn or cancelled, the company shall forthwith file with the Board a copy of such withdrawal or cancellation.

Riding on Locomotive Pilots.—The Board of Railway Commissioners has, from time to time, received returns of a number of accidents resulting in serious, and, sometimes fatal injuries to employes through riding on locomotive pilots, and has requested railway companies to issue instructions that this practice, except when switching in yards, must be discontinued under penalty of being disciplined.

The Death of A. Lichtenhein.

The news of the death of A. Lichtenhein, the Galena-Signal Oil Co.'s contracting agent for Canada, at his home, the Poplars, New Rochelle, N.Y., on Oct. 31, came as a sad shock to his large body of friends, particularly among railway officials, from one end of the Dominion to the other, for as stated in the last issue of Canadian Railway and Marine World, he was believed to be satisfactorily recovering.

On Oct. 13 he complained of a pain in his abdomen. The family doctor diagnosed it as appendicitis, and on the following day Dr. Brewer, chief surgeon of the Roosevelt hospital, New York, operated on him. A slight attack of peritonitis followed, but he recovered from that, and as the wound healed perfectly there appeared to be every hope that he would pull through. But thromboses developed in the veins of the right arm, accompanied by septic poisoning, probably caused by the gangrene thrown



The Late A. Lichtenhein.

into the blood from the appendix before its removal, and in spite of everything that could be done by four physicians, two of whom stayed continuously in the house, he succumbed.

He was born in New York city, Jan. 15, 1855, being one of a family of 11 children. His father died when he was two years old. He graduated from the high school at 13, and started work as runner in a bank. Then he became bookkeeper for a furrier, and while at that met Wm. Illsley, who induced him to try selling paint for Illsley, Doubleday & Co. Shortly afterwards he formed a partnership with J. L. Mott and the late A. W. Mott, as Dreker & Co., oil merchants, and succeeded in getting considerable Canadian business, putting their lubricating oils on several of the railway lines. But in the hard times of 1893 they found it advisable to sell out to the Galena Oil Co., and he became its contracting agent for Canada. In 1897 he was sent to Great Britain to introduce the Galena oils, and after being there about two years, re-crossed the Atlantic and again took charge of the Canadian business, as the sole contracting agent, and made a great success of it. He married in 1883 Miss Frank

Rogers, daughter of A. J. Rogers, who survives him, together with a daughter and a son.

"Lich," as he was affectionately termed by a host of warm personal friends among railway officials and others, was a most lovable character, kindly, generous, hospitable, even tempered, and always good natured. His devotion to his family was intense, their photographs were always in evidence in his rooms at the Windsor hotel, in Montreal, where he had his business headquarters, or wherever he might be staying, and not even a shooting or fishing trip, fond as he was of those sports, could keep him long away from them. He had a keen sense of appreciation of the beautiful, displaying this perhaps most particularly in regard to flowers, and when at home at New Rochelle in the summer, spent most of his time in his garden. He was also very fond of outdoor life generally, and was an ardent golfer.

The Galena-Signal Oil Co. sent out the following intimation:—"With profound sorrow we announce the death of Mr. A. Lichtenhein, on Thursday, the thirty-first day of October, at his home in New Rochelle, N.Y. His loyal and efficient services with this company for a period of over seventeen years speak more eloquently than words of his worth. His memory will be ever living in the hearts of his associates and his many friends."

Victoria and Sidney Railway Company

This company, which operates on Vancouver Island, and is a subsidiary of the Great Northern Ry., had gross earnings for the year ended June 30 of \$59,713.63; operating expenses, \$50,972.50; net earnings, \$8,786.13.

The Victoria Terminal Ry. and Ferry Co.'s gross earnings were \$5,236.51; operating expenses, \$3,072.69; net earnings, \$2,163.82.

The following are the directors and officers of both companies for the current year:—President, A. H. MacNeill, Vancouver, B.C.; Vice-President, L. C. Gilman, Seattle, Wash.; Sec.-Treas., A. M. Thomas, Seattle; Superintendent, A. F. Van Sant, Victoria, B.C.; other director, F. V. Brown, Seattle.

The question of the settlement of financial differences between the company and the city of Victoria is still under discussion.

Press reports state that an arrangement is being made under which the Canadian Northern Pacific Ry. will acquire the line, together with running rights on the mainland from Port Guichon, the landing point of the car ferry, and Vancouver.

Dominion Railway Subsidy Agreements.

The Dominion government has entered into subsidy agreements with the following companies for the construction of railways:—

Great Northern Mining and Ry. Co.—Sept. 12, from Little river through Belle Marche, to Eastern harbor, N.S., 3 miles.

Algoma Central and Hudson Bay Ry.—Sept. 27, from Sault Ste. Marie to the C.P.R. between White river and Dalton station, Ont., 200 miles.

Quebec Central Ry.—Sept. 25, from 30 miles from St. George, St. Justine parish, to Ste. Sabine parish, Que., 1.34 miles.

The Ontario Railway and Municipal Board's offices have been removed to the legislative buildings, Queen's Park, Toronto, from the Manning Chambers, Queen street west.

Railway Development.

Projected Lines, Surveys, Construction, Betterments, Etc.

Alberta, Peace River and Eastern Ry.—The Minister of Railways has approved of route map for this railway from Cochrane, Alta., to Edmonton and Peace river, 475 miles.

We are officially advised that it is proposed to start construction work at once on the section of the line between Duffield, Alta., about 40 miles west of Edmonton on the Grand Trunk Pacific Ry., to Peace River Landing, a distance of about 25 miles, and a branch line into Edmonton. The location plans for this portion of the line are practically completed and will be submitted to the Board of Railway Commissioners for approval at an early date. Arrangements are being made for the necessary plant and supplies and for the placing of construction contracts. It is expected to have this section of the line completed within two years.

Following are the officers and directors:—President, Lord Farrer, London, Eng.; Vice President, H. Muskett King, London, Eng., and Montreal; other directors:—Lord Vivian, London, Eng.; Hon. G. G. Wilson, York, Eng.; J. M. Synge, London, Eng.; F. Houlder, London, Eng.; F. W. Thompson, London, Eng.; F. A. Coehius, Baarn, Holland; E. G. Rykert, Montreal; Secretary and Treasurer, B. Maxfield, Edmonton, Alta.; Chief Engineer, J. H. Williams, M.I.C.E., Edmonton, Alta. (Aug., pg. 411.)

Algoa Central and Hudson Bay Ry.—The Algoa Central Terminals Co. has been incorporated under the Dominion Companies' Act to acquire land, lay out terminals, provide station and other buildings, and carry on various businesses in connection therewith. The capital is fixed at \$100,000, and the office is at Sault Ste. Marie, Ont. The provisional directors are connected with the Lake Superior Corporation's legal office. (Nov., pg. 557.)

Algoa Eastern Ry.—The Algoa Eastern Terminals Co. has been incorporated under the Dominion Companies' Act, for similar objects and with similar powers to the Algoa Central Terminals Co. The capital is also \$100,000; the office is at Sault Ste. Marie, Ont., and the provisional directors are the same as the A.C.T. Co.

Application is being made to the Dominion Parliament to extend the time for the completion of the Sudbury-Little Current section of the line. (Nov., pg. 557.)

We are advised that a contract has been let to the Foundation Co., Montreal, for the sub-structure of a bridge from Goat island to Manitoulin island, at Little Current, Ont. The work will consist of four piers and two abutments carried down to rock. The maximum depth of water is about 28 ft. The piers will be constructed by the open caisson method.

All Red Line Ry.—Application is being made to the Dominion Parliament to incorporate a company with this title to build a railway from the eastern boundary of Quebec province to Winnipeg, and branch lines into Quebec city, Montreal, Ottawa, Fort William or Port Arthur. Bicknell, Bain, Strathy and Mackelcan, Toronto, are solicitors for applicants.

Alma and Jonquieres Ry.—The Quebec Legislature is being asked to incorporate a company with this title to build the following lines of railway:—from Hebertville on the Quebec and Lake St. John Ry. northerly to Lake St. John between Grande Discharge and Petite Discharge, Que., 20 miles; from St. Joseph d'Alma easterly to Jonquieres, 30 miles. Cannon and Parent,

Quebec, are solicitors for applicants.

Athabaska Northern Ry.—Application is being made to the Dominion Parliament to declare the company's corporate powers to be in full force and to extend the time within which the line from Edmonton to Athabaska Landing, Alta., authorized to be built by the statutes of 1905 may be constructed. Smith, Markey, Skinner, Pugsley and Hyde, Montreal, are solicitors for applicants.

British Columbia and Alaska Ry.—Press reports from Fort George, B.C., Nov. 11, state that engineers have, after some months' work, completed the location of this projected railway to Summit lake, near there, and have suspended work for the season. (Jan., pg. 21.)

Cape Breton Coal, Iron and Ry. Co.—H. Mayhew, President, is reported as recently stating in Sydney, N.S., that the company expects shortly to start work on the extension of its railway to Mira, where shipping piers are to be built. The present line extends from the collieries at Broughton to a junction with the Sydney and Louisburg Ry.

Cariboo, Barkerville and Willow river Ry.—Application is being made to the Dominion parliament to extend the time for the construction of the line authorized to be built by chap. 64 of the statutes of 1911, and to authorize the building of the following additional lines: From Barkerville to the junction of the Clearwater and North Thompson rivers; from about 17 miles from the northerly terminus easterly to Bear river, about 20 miles.

Central Ry. of Canada.—Application is being made to the Dominion Parliament to confirm transfers and agreements made between the company and the following companies:—Ottawa River Ry., Central Counties Ry., Great Eastern Ry., Ottawa Valley Ry., Carrillon and Grenville Ry., and Ottawa River Navigation Co., and to amalgamate them with the C. Ry. of Canada; to extend the time for the building of the various lines authorized; to increase the company's bonding powers; to authorize the company to enter into agreements with other railway companies named, and to build the following additional lines:—from Laval county to Lake St. Mary, Argenteuil county, Que.; from the main line to St. Scholastique, Two Mountains county, Que.; through Hochelaga, Chambly, Verecheres and St. Hyacinthe counties to St. Rosche, on the Intercolonial Ry.; from the last named line through La Prairie and Napierville to the Intercolonial Ry. in the county of St. Johns; from Orillia to Goderich, Ont., connecting in Perth county with the line already authorized to be built to Port Stanley, Ont. (Nov., pg. 557.)

The Board of Railway Commissioners has approved location plans for the company's line in Montreal, mileage 0 to 5, on condition that the grade crossing at St. Michels road be eliminated.

Dominion Atlantic Ry.—In an interview at Montreal, Oct. 30, Sir Thos. Shaughnessy is reported to have said that all the bridges on the line are being renewed as fast as possible. The track will be relaid with heavier rails, and everything will be brought up to C.P.R. standards. He expects that the entire work will be completed within two years. He could make no statement as to the company's entrance into Halifax. At present the D.A. Ry. operates the Windsor branch of the Intercolonial Ry. under an agreement, thus securing an entrance to Halifax. (Nov., pg. 557.)

Dominion North Western Ry.—Application is being made to the Dominion parliament to incorporate a company with this title to build a railway from Regina, Sask., westward to Tuxford on the C.P.R., thence to Red Deer, Alta., with a branch through Battleford, Sask., to Fort McKay. M. J. O'Connor, Ottawa, is solicitor for applicants.

Edmonton, Dunvegan and British Columbia Ry.—Tracklaying is reported to have been started on the section of the line from Edmonton to Athabaska Landing, Alta., 120 miles. The rails for this section are about all delivered, and a contract for the last 100,000 ties required is reported let to Bell and McPhee. (Nov., pg. 557.)

Erie, London and Tillsonburg Ry.—The Minister of Railways has approved a route map of the section of this projected railway between London and Aylmer, Ont., 19 miles. (Nov., pg. 557.)

Esquimalt and Nanaimo Ry.—A contract is reported to have been let to Moore and Pethick, Victoria, for the grading of the Comox extension from the Big Qualicum river for 19.29 miles. This is the final contract on the extension from McBride Jet., along the east coast of Vancouver Island, to Courtenay in the Comox valley, 45 miles. Grading has been practically completed on 15 miles out of McBride Jet., and on 10 miles southerly from Courtenay. (Nov., pg. 557.)

Ha Ha Bay Ry.—See Roberval and Saguenay Ry. (Oct., pg. 501.)

Gananoque to Elgin, Ont.—The question of the construction of a railway from Gananoque to a junction with the Canadian Northern Ontario Ry. at Elgin, Ont., is under consideration, and a syndicate headed by J. C. Judd, Morton, Ont., has been formed to have surveys made.

Huron and Ontario Ry.—Application is being made to the Dominion Parliament to extend the time within which the company may build the lines authorized by the statutes of 1911, and previous acts referred to therein. T. H. Kilgore, Toronto, is Secretary. (June, 1911, pg. 555.)

Intercolonial Ry.—Speaking at Halifax, N.S., Oct. 30, the Minister of Railways is reported to have stated that it is the intention of the Dominion Government to build new railway and ocean terminals about two miles south of the present terminals. The new docks are to extend for a mile and a half from the lumber yard to Point Pleasant park, and will consist of six piers each 1,250 by 300 ft., with one bulkhead landing pier 2,000 ft. long. This pier will have on it the immigration buildings, and will be used for landing passengers from the ocean liners. The immigration buildings and a grain elevator will also be located on it. At the other docks there will be accommodation for 30 ocean going steamers. The new terminals will be approached by a double track line which will branch from the main line at the Three Mile House, extend southerly through the low divide between Bedford Basin and the north-west arm, finally reaching the terminals under the lower end of Young avenue. The streets in the residential part of the city will be carried over the line by bridges. A new union station will be erected at the end of Hollis street, just north of the docks. The plans also include the raising of the breakwater at the lighthouse so as to give quiet water inside.

The Minister of Railways is reported to have informed a Truro, N.S., deputation, Oct. 30, that arrangements had been made to have an engineer go to Stewiacke as soon as possible to run a trial survey for the suggested line from Truro to Deane, and make an estimate of the probable cost of construction, and of the possible traffic. (Nov., pg. 557.)

Kettle Valley Lines.—A contract is reported let to W. Bouthron, Grand Forks, B.C., for the erection of station and other buildings on the Penticton section.

The line is under construction out of Penticton through the Okanagan valley. The work in the vicinity of Naramorta is reported to be very heavy, as it includes an 1,800 ft. and a 200 ft. tunnel, a lot of rock cutting and a switchback. (Nov., pg. 558.)

The Dominion parliament is being asked to pass an act authorizing the company to enter into an agreement with the C.P.R.; extending the time for the construction of the lines authorized to be built, and giving power to build the following additional lines:—From near Summer's creek to various mining camps about 15 miles southwest to Princeton, B.C.; from Vernon southward through Kelowna to near Penticton, B.C.; from the terminus of the branch authorized by sec. 2h, chap. 101 of the statutes of 1911 to the Otter summit about 30 miles south of Merritt, and from near Tulameen for about 50 miles up the Tulameen valley.

The Board of Railway Commissioners has authorized the opening for traffic of the portion of the line from Merritt, B.C., easterly for 29 miles.

The Spokane and British Columbia Ry., which is the section of these lines in the United States, proposes to build an extension to Spokane, Wash. It is reported that surveys are being made, and that construction will be started as soon as these are completed. The K.V. lines have recently come under the control of the C.P.R.

L'Avenir and Melbourne Ry.—Application is being made to the Quebec Legislature to amend the charter by changing its name and extending the time within which the line authorized to be built may be constructed. B. E. Reid, G. H. Bogie and J. Laferty are interested. Berque, Berque and Berque are solicitors for the company, and the additional applicants named. (June, pg. 300.)

Little Nation Ry.—The Quebec Legislature is being asked to extend the time within which the lines authorized to be built by the act of 1907, as amended by the act of 1910, may be constructed. (June, pg. 300.)

Michigan Central Rd.—Press reports state that it has been decided to proceed with the erection of a new machine shop and the power house at St. Thomas, Ont., in the spring. (Oct., pg. 502.)

Montreal Manufacturer's Terminal.—Application is being made to the Dominion Government to incorporate a company with this title to lay out a terminal property on the St. Lawrence river, between Notre Dame street east and the river front, near Longue Pointe, Montreal. The company proposes to lay out the property on the lines of the Bush terminal at Brooklyn, N.Y.

North Ry.—A number of the engineers engaged on the survey of this projected railway from Montreal to the mouth of the Nottaway river on James Bay, have returned to Montreal, while E. A. Evans, M. Can. Soc. C.E., who represented the Quebec Government on the party which was surveying the bay end, returned to Quebec Oct. 25. It was expected to complete location plans for the line from the Nottaway river mouth to the crossing of the National Transcontinental Ry. at Bell river. The engineers are reported to have stated that only in a few instances will there be a maximum gradient of 0.25% eastbound, and that there are no difficulties in the way of construction. It is stated that contracts will be let for the building of this division by Jan. 1, and that the specifications will call for its completion by Oct. 1, 1914. The location of the route from Montreal to Bell river presents more difficulties, and it is

not expected that the location surveys will be completed until the spring. The route from Bell river as far south as Grand Victoria has been located and it is reported that construction on this section will be started simultaneously with that north of Bell river. (Nov., pg. 558.)

Northern Territorial Ry.—It is reported that two engineering parties are in the field north of Edmonton, Alta., making preliminary surveys for this projected railway. H. G. N. Neville, who is Chief Engineer, is expected to return to Edmonton in the spring. (Aug., pg. 412.)

Pacific and Hudson Bay Ry.—Press reports state that J. M. Ralston has returned to Bella Coola, B.C., after having completed a preliminary survey of the projected line as far as Fort Dunvegan. The line decided upon is said to be from Bella Coola to Fort Fraser, where it will cross the Grand Trunk Pacific Ry., thence to Fort St. James, to Fort McLeod, through the Pine river pass and down the Pine river to Fort Dunvegan. In all, the route as surveyed covers some 480 miles. (Oct., pg. 502.)

Pacific Great Eastern Ry.—We have been officially advised that P. Welch has been awarded the contract for the building of this railway, and that he has started work at Lillooet, B.C. As a consequence he has resigned office as Vice President. His successor in that office has not yet been appointed. A. Kellett, the contractor's superintendent at Lillooet, is reported to be arranging for the letting of subcontracts on the line northwesterly.

The property of the Howe Sound and Northern Ry. was taken over by the P.G.E. Ry., Nov. 9. The purchase, we are officially advised, includes all the constructed line, about 12 miles, rolling stock, surveys for extensions, good will, and all assets of every description. The miscellaneous assets include 3,000 ft. of waterfront at the head of Howe sound, and the unsold portion, approximately one half of the townsite of Newport, belonging to the Howe Sound Development Co. The purchase of this line simplifies the construction of the P.G.E. Ry. between Vancouver and Lillooet. The route maps for this section of the line are being considered by the Provincial Minister of Railways. E. White has been placed in charge of the contractor's office at Vancouver, and will have charge of construction between that point and Lillooet. (Nov., pg. 558.)

The Pacific Great Eastern Development Co. has been incorporated under the British Columbia Companies' Act to develop lands and other resources along the route of the P.G.E. Ry. The capital is fixed at \$250,000, and the provisional directors are:—T. Foley, P. Welch, J. W. Stewart and D. A. Tate.

Peace River Great Western Ry.—Edmonton, Alta., press reports state that the charter of this company has been acquired by French financial interests, and the Provincial Secretary is reported as stating that plans have been filed and that construction will be started in the spring. The line is projected from Edmonton northwesterly to the west end of Lesser Slave Lake, on to the Peace River Crossing, thence to Dunvegan. (Feb., 1911, pg. 113.)

Quebec Central Ry.—We are officially advised that the 1.34 miles of line from a point 30 miles from St. George to St. Sabine, for which a contract under the Dominion act granting subsidies in aid of certain railways was recently entered into, is an extension of the Chaudiere Valley-Cobans extension. The piece of line has been built, and has been in operation since Jan. 2, 1911. (June, pg. 301.)

Quebec Rapid Transit Ry.—The Dominion Parliament is being asked to incorporate a company with this title to build a railway

from Quebec easterly to St. Gregorie de Montmorency, northwesterly to Lake St. Charles; southerly to Cap Rouge, and thence easterly to Quebec, being a belt line through the county of Quebec, with branch lines, and to operate vessels in connection therewith, the line to be operated by steam, electricity or any other power. A. Tasheureau, Quebec, is solicitor for applicants.

Quebec, Portland and International Short Line Ry.—Application is being made to the Dominion parliament to incorporate a company with this title to build a railway from La Patrie, Que., to the International boundary line, thence along the valley of the North river to a junction with the Maine Central Rd., or the C.P.R. in Eaton township. Pringle, Thompson and Burgess, Ottawa, are solicitors for applicants.

Roberval and Saguenay Ry.—The Quebec legislature is being asked to pass an act changing the name to La Compagnie de Chemin de Fer Le Nord; authorizing the building of branches; authorizing the acquisition of the Ha Ha Bay Ry., charters, lines and property, together with power to extend this line from the Chicoutimi Pulp Co.'s mills to the confluence of the Riviere du Moulin with the Saguenay river; and fixing the amount of bonds to be issued. (May, pg. 240.)

Simcoe, Grey and Bruce Ry.—Application is being made to the Dominion parliament to extend the time within which this projected line may be built. B. Allen, Owen Sound, Ont., is Secretary. (June, pg. 302.)

Timiskaming and Northern Ontario Ry.—Track is reported to have been laid on the Elk lake branch to Jean Baptiste river, 12 miles. The bridge across the river has been completed and track is being laid on to the Montreal river, 10 miles. The bridge over this river is in course of erection, and it is expected to have it completed so that track can be laid into Elk Lake city by Dec. 31. (Nov., pg. 558.)

J. L. Englehart, Chairman of the Commission, is reported as stating that 20 miles of track have been laid on the Elk Lake branch, leaving 10 miles yet to be laid. The piers and cofferdam for the bridge over the Montreal river have been completed, and the steel work is being assembled.

The Ontario Government survey party returned to Cochrane, Nov. 5, after having completed the preliminary survey for the projected extension of the line to Hudson bay. The party, which was headed by W. R. Maher, has laid out a road to Moose Factory, at which point surveys have been made for a harbor by J. E. McMillan. The reports are being prepared for the government, but it is not expected that anything will be done in the way of construction for some time. (Nov., pg. 558.)

Western Dominion Ry.—A meeting of shareholders of the Alberta Pacific Ry. was held at Pincher Creek, Alta., Nov. 2, for the purpose of approving the sale of the company's property to the W.D. Ry. Co. The A.P. Ry. Co. was incorporated by the Alberta legislature, and the W.D. Ry. Co. has a Dominion charter and is controlled by the same interests. Recent Calgary press reports state that the W.D. Ry. Co. is a subsidiary of the Chicago, Milwaukee and St. Paul Rd. (Nov., pg. 559.)

Wetaskiwin, Yellowhead and Revelstoke Ry.—Application is being made to the Dominion parliament to incorporate a company with this title to build a railway from Wetaskiwin, Alta., westerly to the Saskatchewan river, thence following the Brazeau river valley to its headquarters, then along the Rocky river valley to the Yellowhead, thence westerly and southwesterly along the valleys of the Caure and Columbia rivers to Revelstoke; B.C. Loggie and Manley, Wetaskiwin, Alta., are solicitors for applicants.

Transportation Appointments Throughout Canada.

Allan Steamship Line.—H. F. BRADLEY, heretofore Assistant Passenger Manager, has been appointed Passenger Manager, vice G. H. Hannah, retired. Office, Montreal.

Bangor and Aroostook Rd.—ARTHUR HOLLAND has been elected President, vice F. W. Cram, resigned. Office, Bangor, Me. The office of General Assistant, formerly held by W. F. Cram, has been abolished.

Canadian Northern Ontario Ry.—Press reports state that W. A. BROWN, Superintendent Canadian Northern Ry. at Edmonton, Alta., is to be transferred to a similar position on the C.N.O.R. at Toronto. Up to Nov. 25 this had not been officially confirmed.

Canadian Northern Ry.—F. W. HARGRAVE, heretofore chief clerk to Purchasing Agent, has been appointed Assistant Purchasing Agent. Office, Winnipeg.

C. J. WILSON has been appointed Superintendent, district 3. Office, Winnipeg. Former district 3 is now designated as district 4 and remains under the jurisdiction of W. E. Roberts, Superintendent, Brandon, Man.

Canadian Northern Steamships, Ltd.—In consequence of the running aground of the s.s. Royal George near Quebec and the necessity of laying her off for repairs, considerable reductions have been made in the company's staff at various points. The position of General Agent at Montreal, heretofore held by J. H. HOSEASON, and that of Travelling Immigration Agent, heretofore held by J. F. SOUTHALL, have been abolished.

Canadian Pacific Ry.—H. C. GROUT, heretofore Superintendent, district 1, Atlantic division, Brownville Jet., Me., has been appointed Assistant General Superintendent, Atlantic division. Office, St. John, N.B.

N. R. DES BRISAY, Travelling Freight Agent for the maritime provinces, with headquarters at St. John, N.B., has resigned. No successor has yet been appointed.

H. FRAWLEY, heretofore Locomotive Foreman, Ottawa, Ont., has been appointed Locomotive Foreman, Farnham, Que., vice H. A. Amy, transferred to Schreiber, Ont.

C. HENDERSON, heretofore conductor, has been appointed Trainmaster, district 2, Atlantic division. Office, Aroostook junction, N.B.

H. IRWIN, M. Can. Soc. C.E., heretofore Right of Way and Lease Agent, has been appointed Consulting Right of Way and Lease Agent. Office, Montreal.

F. TAYLOR, M. Can. Soc. C.E., heretofore Division Engineer, Eastern division, has been appointed Right of Way and Lease Agent, vice H. Irwin. Office, Montreal.

E. J. BOSWELL, A.M. Can. Soc. C.E., has been appointed Assistant Right of Way and Lease Agent. Office, Montreal.

F. W. COOPER, A.M. Can. Soc. C.E., heretofore Assistant Engineer, has been appointed Division Engineer, Eastern division, vice F. Taylor. Office, Montreal.

S. B. McCONNELL, heretofore Assistant Division Engineer, has been appointed Assistant Engineer, vice F. W. Cooper. Office, Montreal.

T. BELL, heretofore chief clerk, Advertising Dept., has been appointed Assistant General Advertising Agent. Office, Montreal.

G. R. B. WATT has been appointed chief clerk, Advertising Dept., vice T. Bell.

J. WILKINSON, heretofore Locomotive Foreman, Hochelaga, Montreal, has been appointed Locomotive Foreman, Outremont, Montreal, vice R. H. McDonald, transferred.

R. H. McDONALD, heretofore Locomotive Foreman, Outremont, Montreal, has been ap-

pointed Locomotive Foreman, Ottawa, Ont., vice H. Frawley.

V. T. BROUGHTON has been appointed Resident Engineer at Chapleau, Ont., vice S. W. Shackell, resigned.

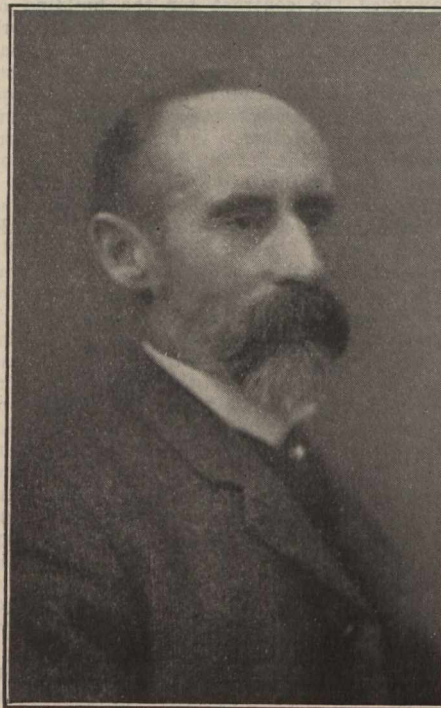
H. A. AMY, heretofore Locomotive Foreman, Farnham, Que., has been appointed Locomotive Foreman, Schreiber, Ont., vice J. F. Gildea, transferred.

R. ANDREWS, heretofore Agent, Sleeping, Dining and Parlor Cars and News Service, Calgary, has been appointed Assistant Superintendent same department. Office, Calgary, Alta.

J. H. McNEILL, heretofore Inspector, Sleeping, Dining and Parlor Cars and News Service, has been appointed Agent same department, Calgary, Alta., vice R. Andrews, promoted.

T. H. HORTON has been appointed Storekeeper, Crowsnest, B.C. This is a new position.

A. E. BENNETTS, heretofore Locomotive Foreman, Kamloops, B.C., has been appointed Locomotive Foreman, Eholt, B.C., vice A. W. Clark, transferred.



H. Irwin, M. Can. Soc. C.E., Consulting Right of Way and Lease Agent, C.P.R.

T. KILPATRICK, Superintendent district 1, British Columbia division, Revelstoke, is reported to have resigned.

A. W. CLARK, heretofore Locomotive Foreman, Eholt, B.C., has been appointed Locomotive Foreman, Kamloops, B.C., vice A. E. Bennetts, transferred.

R. HOWARD, heretofore Yardmaster, Vancouver, has been appointed Trainmaster, in charge of train service, etc., on double track between Hammond and Ruby Creek. Headquarters, Agassiz, B.C.

Chicago, St. Paul, Minneapolis and Omaha Ry.—G. A. LEE, heretofore General Agent, Winnipeg, has been appointed Assistant General Passenger Agent, Minneapolis, Minn.

H. M. MCGINNIS, heretofore Travelling Agent, Vancouver, has been appointed General Agent, Winnipeg, vice G. A. Lee, promoted.

Delaware and Hudson Co.—D. B. HORN has been appointed Assistant Manager Dining Service Department, the office of Superintendent of Dining Service having been abolished. Office, Albany, N.Y.

M. J. HAGADORN has been appointed Commissary Agent, vice D. B. Horn. Office, Plattsburg, N.Y.

Grand Trunk Pacific Ry.—R. J. DALLAS has been appointed Trainmaster, 1st, 2nd, 3rd districts and Yorkton Branch. Office, Melville, Sask.

Grand Trunk Ry.—A. E. ROSEVEAR, heretofore Assistant General Freight Agent, has been appointed Assistant to Vice President J. E. Dalrymple, in charge of freight and passenger traffic, with the title of Assistant to Vice President. Office, Montreal.

C. A. DUNHAM, heretofore Signal Engineer, Great Northern Ry., has been appointed Signal Engineer, G.T.R. Office, Montreal.

W. H. PATTON, heretofore Signal Engineer, Toronto, has been appointed Supervisor of Signals. Office, Toronto.

A press report states that J. B. GANT, heretofore Inspector of Bridges, Illinois Central Rd., has been appointed to a similar position with the G.T.R. at Montreal.

A. D. McCARTHY has been appointed Trainmaster, 4th district and Montreal Terminals. Headquarters, Montreal. The General Yardmaster and Freight Agent, Montreal Terminals, will report to Assistant Superintendent, as heretofore.

N. FOY, heretofore conductor, has been appointed station master, Bonaventure station, Montreal. He will have jurisdiction over all train, yard, enginemen and other employes.

W. R. GERMAIN has been appointed assistant station master, Bonaventure station, Montreal.

G. A. STOKES, heretofore General Yardmaster, Toronto, has been appointed Acting Terminal Superintendent, Toronto, vice W. H. Farrell, assigned to other duties.

R. MUIRHEAD, heretofore Assistant Yardmaster, Toronto Terminals, has been appointed General Yardmaster, succeeding G. A. Stokes, promoted. Office, Toronto.

W. C. SEALY, heretofore General Foreman, Toronto shops, has been appointed Assistant Master Mechanic, Middle and Southern divisions. Office, Toronto.

G. M. WILSON, heretofore in charge of installation of machinery for power house, central station, Ottawa, has been appointed General Foreman, Toronto shops, vice W. C. Sealy, promoted.

W. HALL, heretofore Rule Instructor, Sarnia, Ont., has been appointed Assistant Trainmaster, Hamilton, Ont., vice L. Harold, assigned to other duties.

W. LANG, heretofore Night Car Distributor, London, Ont., has been appointed Car Distributor, Stratford, Ont., vice J. E. Van Kuren.

H. A. WELCH has been appointed Night Car Distributor, London, Ont., vice W. Lang.

E. R. VREELAND has been appointed depot master, Brush street station, Detroit, Mich., vice A. J. Donohue, deceased.

Intercolonial Ry.—A. DUNN, heretofore trick dispatcher, Moncton, N.B., has been appointed Chief Dispatcher, Sydney, N.S., vice H. V. Musgrave, Acting Chief Dispatcher.

K. STEWART, heretofore trick dispatcher, New Glasgow, N.S., has been appointed Chief Dispatcher there.

W. B. MACKENZIE, M. Can. Soc. C.E., heretofore Chief Engineer, has been appointed Right of Way and Lease Agent. The position of Chief Engineer has been abolished.

R. COLCLOUGH, heretofore Assistant Superintendent, Halifax and St. John district, has been appointed Assistant to the General Superintendent. Office, Moncton, N.B.

H. B. FLEMING, heretofore Chief Dispatcher, Moncton, N.B., has been appointed

Assistant Superintendent, Halifax and St. John District. Office, Moncton, N.B.

W. E. BARNES, heretofore acting Master Mechanic, Moncton, N.B., has been appointed Master Mechanic there.

H. W. SHARP has been appointed acting Master Mechanic, Riviere du Loup, Que., vice T. Ryan, assigned to other duties.

Michigan Central Rd.—E. C. KEENAN has been appointed General Superintendent Telegraph Office, Chicago, Ill.

Minneapolis, St. Paul and Sault Ste. Marie Ry.—R. KIRKWOOD has been appointed acting Auditor, vice R. Toombs, deceased. Office, Minneapolis, Minn.

National Transcontinental Ry.—W. B. Cronk, heretofore Superintendent of Transportation, Winnipeg, has been appointed General Superintendent. Office, Ottawa.

E. P. CRONK has been appointed Superintendent New Brunswick division, N.T.R. Office, Edmunston, N.B.

New York Central and Hudson River Rd.—J. P. DALY, heretofore General Freight and Passenger Agent, Ottawa and New York Ry., has been appointed chief clerk to Division Freight Agent, N.Y.C. & H.R.R., Buffalo, N.Y.

Ottawa and New York Ry.—G. H. CLARK, heretofore Division Freight Agent, New York Central and Hudson River Rd., Utica, N.Y., has been appointed General Freight and Passenger Agent, O. & N.Y.R., vice J. P. Daly.

W. L. GRENIER has been appointed Commercial Agent at Salt Lake, Utah, for the

O. & N.Y.R., as well as other New York Central lines, vice K. O. Keyes, resigned.

Pacific Great Eastern Ry.—A press report states that A. H. SPERRY, heretofore Assistant General Freight and Passenger Agent, Spokane International Railway, has been appointed in charge of the Pacific Great Eastern, with office at Newport, B.C.

Pere Marquette Rd.—C. B. WILKIE, heretofore locomotive engineer, has been appointed Road Foreman of Engines, Canadian division. Office, Port Huron, Mich.

A press report states that W. K. Tasker, Superintendent Buffalo Division, has had his office removed from Port Huron, Mich., to St. Thomas, Ont.

W. H. ROURKE, heretofore Master Car Builder, has been appointed Chief Inspector Car Department. Office, Grand Rapids, Mich.

Sydney and Louisburg Ry.—D. H. McDOUGALL, heretofore Assistant General Manager, Dominion Coal Co., which owns the S. & L. Ry., has been appointed General Manager, vice M. J. Butler, resigned.

Wabash Rd.—G. C. KNICKERBOCKER, heretofore Travelling Freight Agent, Buffalo, N.Y., has been appointed Division Freight and Passenger Agent, Danville, Ill., vice W. A. Sprott, deceased.

R. A. BROWN, heretofore Contracting Freight Agent, Minneapolis, Minn., has been appointed Travelling Freight Agent, Buffalo, N.Y., vice G. C. Knickerbocker, promoted. He will report to J. J. Mossmann, General Agent, Buffalo.

Mainly About Transportation People.

SIR THOS. TAIT has taken an apartment in the Linton, at Montreal.

N. CURRY, President, Canadian Car and Foundry Co., has been appointed a Senator.

J. A. McKEE, President, Western Steamship Co., Toronto, died there suddenly Nov. 18.

G. M. BOSWORTH, Vice President, C.P.R., and Mrs. Bosworth, arrived in England early in November.

A. H. MORRILL, M. Am. Soc. C.E., has been appointed Engineer of Construction, Boston & Maine Rd.

E. H. FITZHUGH, President, Central Vermont Ry., denied, Nov. 17, press reports that he was about to resign.

H. J. FULLER, President, Canadian-Fairbanks-Morse Co., Ltd., has been elected a director of the National Trust Co.

W. M. RAMSAY, insurance broker, who died in Montreal Nov. 13, aged 78, was a director of the Montreal Warehousing Co.

C. A. GRISCOM, chairman of the board of directors of the International Mercantile Marine Co., died at Philadelphia, Pa., Nov. 10.

SAMUEL REA, heretofore Vice President, Pennsylvania Rd., has been elected President, vice J. McCrea, resigned on account of age.

SIR WM. C. VAN HORNE arrived in Winnipeg Nov. 11, visited his farm at Selkirk on the following day, and returned east Nov. 13.

W. E. STAVERT, formerly of the Bank of Montreal, has been elected President, Alaska Northern Ry., vice O. G. Labert, resigned.

D. McLEOD VINCE, D.C.L., K.C., Chairman of the New Brunswick Public Utilities Commission, died at Woodstock, N.B., Nov. 25, aged 64.

Miss Gladys Wainwright, daughter of W. WAINWRIGHT, Vice-President G.T.R. & G.T.P.R., is one of the season's debutantes in Montreal.

SIR WM. WHYTE has been elected Pre-

sident of the Winnipeg St. Andrew's Society, and occupied the chair at the annual meeting Nov. 14.

R. CROASDELL, Publicity Agent, Canadian Northern Ry., Toronto, is recovering from the effects of a recent serious operation.

Mrs. Holt, wife of T. G. HOLT, Executive Agent, Canadian Northern Ry., Vancouver, B.C., has returned home after a lengthened trip to Great Britain.

JAS. LEITCH, K.C., heretofore Chairman of the Ontario Railway and Municipal Board, has been appointed a Judge of the High Court of Ontario.

CAPT. MURRAY, of the C.P.R. steamship Empress of Britain, was presented with a silver service by the members of the victualling department Nov. 11.

P. H. HUME, civil engineer, who was associated with Mr. Connolly in the new wharf construction at St. John, N.B., died there, after a lengthened illness, Nov. 1.

Mrs. J. C. O'Donahoe, who died at Ottawa Nov. 12, was mother of J. V. O'DONAHOE, assistant to the General Manager, Richelieu and Ontario Navigation Co., Montreal.

T. E. DUNNE, formerly Intercolonial Ry. ticket agent at Pictou, N.S., and son of B. J. Dunne, Inspector of Police, Intercolonial Ry., died at Parkland, Alta., recently.

M. J. BUTLER, M. Can. Soc. C.E., formerly Deputy Minister of Railways and Canals, has resigned the general management of the Dominion Steel Corporation at Sydney, N.S.

W. H. CUMMINGS, who has been in charge of the Grand Trunk Ry. exhibit at the Crystal Palace in England during the last two seasons, returned to Canada early in November.

D. McINTYRE, K.C., Kingston, Ont., has been appointed chairman of the Ontario Railway and Municipal Board in succession to Jas. Leitch, K.C., appointed a judge of the Ontario High Court.

MOTT SAWYER, formerly Superintendent, Bellingham Bay and British Columbia Rd., has been appointed Superintendent of Construction, Chicago, Milwaukee and Puget Sound, Ry., at Lewiston, Mont.

LORD STRATHCONA has been given the Royal Society of Arts medal for services in improving railway communication, in developing Canadian resources and commerce, and for services to the Empire in general.

P. CLARKE, Vice-President, Westholme Lumber Co., which carried out several contracts for what is now the Canadian North Eastern Ry., at Port Stewart, B.C., died at Seattle, Wash., Nov. 4, aged 47.

M. CAIN, for 55 years baggage agent at Newmarket, Ont., first with the old Northern Ry., and subsequently with its successor, the G.T.R., died there Nov. 16, aged 65. He retired from active service in 1903.

SIR EDWARD CLOUSTON, who died in Montreal, Nov. 23, was formerly President Montreal Rolling Mills and also a director of the Alberta Railway and Irrigation Co. and the Cumberland Railway and Coal Co.

The Winnipeg Free Press, of Oct. 30, says that thirty years ago, viz., Oct. 30, 1882, M. J. HANEY, M. Can. Soc. C.E., now of Toronto, resigned the superintendency of the C.P.R.'s Pembina and Rat Portage divisions.

The Montreal Star recalls the fact that on Nov. 1, 1882, SIR THOS. G. SHAUGHNESSY arrived in Montreal to take up the duties of the position of General Purchasing Agent of the C.P.R., of which he is now President.

C. A. BOWMAN, of the engineering staff of the Department of Railways and Canals, Ottawa, was presented with a gold watch by the staff, Nov. 7, prior to leaving for a trip to Great Britain, where he will spend the winter.

GEO. LEE, who has been General Agent for the Chicago Northwestern Rd. in Winnipeg for some time, was presented with a gold watch and chain, Oct. 29, on his removal to Minneapolis, Minn., to another position in the company's service.

JOHN HALSTEAD, Division Freight Agent, C.P.R., Calgary, Alta., was married at Edmonton, Oct. 30, to Miss M. E. Riley, daughter of the late T. Riley, of Hounsfield Lodge, Calgary. Mr. and Mrs. Halstead spent their honeymoon in California.

CAPT. M. IRONSIDES, a well known lake mariner, died in the marine hospital, Goderich, Nov. 10, from bloodpoisoning, resulting from one of his legs being squeezed in a winch cable while his vessel was passing through the Sault Ste. Marie canal recently.

J. GAULT KINGSMILL, son of the late Nichol Kingsmill, K.C., formerly Canadian Solicitor, Michigan Central Rd., was married in Toronto, Nov. 10, to Miss Beatrice Tate, daughter of the late R. F. Tate, M. Can. Soc. C.E., of Mackenzie, Mann & Co.'s staff.

W. ROBINSON, who has been Travelling Passenger Agent, Grand Trunk Ry., with headquarters at Pittsburg, Pa., since June 1, 1906, died there of pneumonia early in November and was buried at Niagara Falls. He was formerly in the Intercolonial Ry. service.

W. A. HARRIS, station agent for the Intercolonial Ry. and the Dominion Atlantic Ry. at Windsor Jet., N.S., died there Nov. 14. He had been in the employ of the Dominion Government railways for 40 years, for 32 of which he was agent at Windsor Jet.

THOMAS BELL, who has been appointed Assistant General Advertising Agent, Canadian Pacific Ry., has been in the company's service since 1895, when he started as office

boy. He will relieve the General Advertising Agent of much of the company's exhibition work.

R. T. WHEELER, M. Am. Soc. C.E., heretofore Engineer of Construction, New York, New Haven and Hartford Rd., and Boston and Maine Rd., and Chief Engineer of the Boston Terminal Co., Boston, Mass., has been appointed Chief Engineer, Maine Central Rd., at Portland, Me.

A. H. SPERRY, who resigned his position as Assistant General Freight and Passenger Agent, Spokane International Ry., recently to enter the Pacific and Great Eastern Ry.'s service in British Columbia, was entertained at a farewell dinner by railway men in Spokane, Wash.

The death, on Nov. 8, of REUBEN WELLS, for many years Superintendent of the Rogers Locomotive Works, at Paterson, N.J., removes another one of the group of men who had most to do with the development of American locomotive engineering during the '80's and '90's. He was 83 years old.

PAUL SEUROT, M. Can. Soc. C.E., M. Am. Soc. C.E., chief engineer in Montreal for Jacobs and Davies, Inc., consulting engineers, New York and London, Eng., has been awarded a Telford premium of the Institution of Civil Engineers of Great Britain for a paper published in its proceedings for 1911-1912.

W. McILROY was presented with a purse of gold and a gold locket by the members of the Peterboro Club, and a gold watch fob by the members of the Belmont Club, on his recent transfer from the position of C.P.R. town ticket agent at Peterboro, Ont., to that of C.P.R. city ticket agent at Hamilton, Ont.

C. B. CONGER, Treasurer, and one of the founders of the Travelling Engineers' Association, and its first President, having presided over the convention at Chicago in 1893; at Denver, Col., in 1894; at Pittsburgh, Pa., in 1895; at Minneapolis, Minn., in 1896, and Chicago in 1897, died on October 29, aged 65.

R. W. SHEPHERD, for 35 years manager of the Ottawa River Navigation Co., died suddenly in the Queen's Hotel, Montreal, Nov. 8. He entered the company's employ on leaving school, and succeeded his father as manager, from which position he retired about three years ago. H. Shepherd, a railway contractor in Alberta, is a son.

W. D. TRUMP, formerly General Superintendent, Pere Marquette Rd., has been appointed Manager, Detroit Terminal Rd., at Detroit, Mich. The Detroit Terminal is owned by the Grand Trunk, Michigan Central and Lake Shore and Michigan Southern lines. It was previously operated jointly, but is now under separate management.

P. LYALL, President of P. Lyall and Sons, Limited, Montreal, died in that city Nov. 14, aged 70. His firm built a number of office buildings, hotels, etc., for the C.P.R., the sheds for the Montreal Harbor Board, this latter involving the expenditure of about \$5,000,000, and the Fort Garry station, Winnipeg, for the Canadian Northern Ry.

J. M. MAVER, who has been appointed Contracting Agent, Northern Pacific Ry., Montreal, was born in Toronto, Aug. 9, 1884. His railway service includes eight years with G.T.R. in freight claims, division freight and General Freight Agent's offices in Montreal, and two years soliciting freight agent, Canadian Interlake Line, Montreal.

BARON FURNESS, better known as Sir Christopher Furness, who died in London, Eng., Nov. 11, was head of Furness, Withy and Co., owners of the Furness line of

steamships trading to Maritime province ports, and managers of the Manchester Liners, trading to Montreal, and was honorary President of the Richelieu and Ontario Navigation Co.

WALTER LINDLEY, who died at Hove, Eng., Oct. 22, aged 79, was intimately connected with Canada for many years as Secretary of the old Great Western Ry., and as predecessor of H. H. Norman in the Secretaryship of the G.T.R. Co. in London. Afterwards he was for many years on the directorate of the English Association of American Bond and Shareholders.

W. CORBETT, Travelling Passenger Agent, C.P.R., was on the special troop train which had a head on collision with the Toronto-Detroit express at Streetsville Jet., Ont., Oct. 28. He was on the platform between the baggage car and the first passenger car in which so many casualties occurred, and was thrown against the baggage car and pinned down, but was rescued with very slight injuries.

J. P. DALY, General Freight and Passenger Agent, Ottawa and New York Ry.



Frank W. Cooper, A.M. Can. Soc. C.E., Division Engineer, Eastern Division, Canadian Pacific Railway.

and New York and Ottawa Ry., was presented with a silver salver by the office staff, a gold signet ring by the station agents, and gold ring, locket and chain by the locomotive engineers and trainmen on the company's lines, Nov. 1, on the occasion of his transfer to Buffalo, N.Y., to another position in the New York Central and Hudson River Rd. Co.'s service.

D. M. McINTYRE, K.C., for the past 15 years city solicitor of Kingston, Ont., who has been appointed Chairman Ontario Railway and Municipal Board, was born at Kingston about 55 years ago. He was at one time an alderman of that city and mayor in 1892 and 1893. He was Vice President of the Ontario Municipal Association in 1905-6. He was an unsuccessful candidate on two occasions for the House of Commons and also on two occasions for the Ontario Legislature.

W. E. BELCHER, C.P.R. travelling grain inspector, Winnipeg, was found dead in bed in an hotel at Weyburn, Sask., which town he was visiting on business, Nov. 8. He went west as agent for the C.P.R. at

Portage la Prairie in 1880, but returned to Toronto in 1889, as freight agent for the Northern Pacific Ry., and was afterwards in that company's service in Detroit. He was father of F. P. Belcher, vessel agent, Winnipeg, and formerly connected with the Northern Navigation Co.

G. R. B. WATT, who has been appointed chief clerk, General Advertising Agent's office, Canadian Pacific Ry., Montreal, was at one time in the Highland Ry. Co.'s service at Nairn and Inverness, Scotland. He came to Canada in 1901, since when he has been consecutively, 1901 to 1905, billing clerk, freight office, C.P.R., Ottawa; 1905 to 1907, in city passenger office, Ottawa; 1907 to November, 1912, in General Advertising Agent's office, Montreal, in charge of compilation of public time tables. Entire service with C.P.R.

EDWARD MOHUN, M. Can. Soc. C.E., who died in Victoria, B.C., Oct. 23, aged 74, had resided in British Columbia since 1863. Among other works on which he was engaged were the surveys for the Wellington and Departure Bay Ry. on Vancouver island; divisional engineer on surveys for the Dominion Government projected railway routes through the Eagle and Yellowhead passes in 1871-72. From 1873 he has been principally engaged in private practise, and in 1898 entered the Provincial Government service.

J. E. PINAULT, who has been appointed Superintendent Canada and Gulf Terminal Ry., St. Flavie, Que., was born at Rimouski, Que., June 24, 1884, and was educated at Rimouski College, St. Joseph, N.B., and Chatham, Ont. He entered transportation service Dec. 1, 1900, since when he has been consecutively, Dec. 1, 1900, to Jan. 21, 1902, in track department, Intercolonial Ry.; Jan. 22, 1902, to Sept. 26, 1904, in mechanical department I.R.C.; Sept. 27, 1904, to Oct. 9, 1912, in operating department, I.R.C.; Oct. 10, 1912, appointed Superintendent Canada and Gulf Terminal Ry.

E. PENNINGTON, President, Minneapolis, St. Paul and Sault Ste. Marie Ry., is stated to be the heir to the title and estates of Baron Muncaster. There is an Irish barony created in 1783 and a United Kingdom barony of Muncaster, created in 1898. This latter title will become extinct on the death of the present holder, whose family name is Josselyn Francis Pennington. E. Pennington is reported as stating that he knows all about the matter, that his niece has visited Lord Muncaster, and that there is no doubt that he is the heir.

THE HON. FRANK COCHRANE, Minister of Railways and Canals; Sir Thos. G. Shaughnessy, President, C.P.R.; Sir Wm. Mackenzie, President, Canadian Northern Ry.; Sir Donald Mann, Vice-President, Canadian Northern Ry.; E. J. Chamberlin, President, G.T.R. and G.T.P.R.; D. McNicoll, Vice President, C.P.R., and W. Wainwright, Vice-President, G.T.R. and G.T.P.R., have been appointed honorary colonels under the provisions of the Dominion Militia Act. They will serve on an advisory transportation committee of the Militia Department.

A. E. ROSEVEAR, who has been appointed Assistant to the Vice President, Grand Trunk Ry. (traffic department), entered G.T.R. service in 1879, since when he has been consecutively: 1880 to 1885, clerk, 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 April, 1908, Freight Claims Agent, Montreal; April, 1908, to Oct., 1912, Assistant General Freight Agent, Montreal. Entire service with G.T.R.

That the Lemieux act, providing for the nomination of a board of conciliation to inquire into disputes between employer and employe is constitutional, and that consequently a board named to look into certain differences between the Montreal St. Ry. and a few of its employes was regularly and legally appointed, is the tenor of a judgment given in Montreal recently by Justice Lafontaine in a case which has been occupying the attention of the Superior Court off and on for the past two years. The appointment of the board was attacked by the company on the ground that the act, in virtue of which the Minister of Labor appointed the board, was unconstitutional.

G. M. WILSON, who has been appointed General Foreman Shops, G.T.R., Toronto, was born in Belfast, Ireland, Oct. 5, 1867. He was employed as a machinist on the construction of the G.T.R. St. Clair tunnel in 1889 and 1890, and was then employed by the Jenks Shipbuilding Co., Port Huron, Mich., for a short time. He entered G.T.R. service Nov. 11, 1890, as machinist at Fort Gratiot, Mich., and has since been expert machinist and machine shop foreman. He laid out and supervised the installation of the entire machinery equipment of the G.T.R.'s main shops at Battle Creek, Mich., and just prior to his present appointment supervised the installation of the power plant at the union station and at the Chateau Laurier, Ottawa.

F. W. COOPER, who has been appointed Division Engineer, Eastern Division, C.P.R., Montreal, was born at London, Ont., Feb. 16, 1880, and was educated at the London Collegiate Institute and the School of Applied Science, McGill University, Montreal. He entered railway service in 1901, since when he has been consecutively, 1901 to 1903, on preliminary location, construction and office work with the Algoma Central and Hudson Bay Ry., Sault Ste. Marie, Ont.; 1903 to 1904, transitman C.P.R., London, Ont.; Jan., 1904, to Oct., 1905, Assistant Resident Engineer C.P.R., Toronto; Oct., 1905, to Feb. 1908, Resident Engineer, C.P.R., London, Ont.; Feb., 1908, to Dec., 1909, Resident Engineer, C.P.R., Toronto, Ont.; Dec., 1909, to Nov., 1911, Resident Engineer, C.P.R., London, Ont.; Nov., 1911, to March, 1912, Resident Engineer, C.P.R., Montreal; March, 1912, to Nov., 1912, Assistant Engineer, Maintenance of Way Department, C.P.R., Montreal.

C. A. DUNHAM, who has been appointed Signal Engineer, Grand Trunk Ry., was born in Hamilton, Ont., Oct. 20, 1866. He was educated in Ontario public schools, at night schools in Chicago, and by correspondence courses in engineering. He entered railway service in 1894, since when he has been consecutively:—1884 to April, 1886, helper, mechanical department, Chicago, Burlington and Quincy Rd., Chicago, Ill.; April, 1886, to 1887, in bridge department, New York, Chicago and St. Louis Rd.; in 1887 for three months with U.S. Rolling Stock Co., Hegewisch, Ill.; Sept., 1887, to Jan., 1890, with Grant Bros., railway contractors; Jan., 1890, to Sept., 1892, locomotive fireman and brakeman, Chicago, Burlington and Quincy Rd.; Sept., 1892, to March, 1896, with Union Switch and Signal Co., and National Switch and Signal Co.; March, 1896, to 1899, Inspector of Signals, Illinois Central Rd.; 1899 to June, 1905, Signal Engineer, Illinois Central Rd.; June, 1905, to Nov., 1912, Signal Engineer, Great Northern Ry.

HENRY IRWIN, B.A., M. Can. Soc. C. E., L.C.E., D.L.S., Q.L.S., who has been appointed Consulting Right of Way and Lease Agent C.P.R., Montreal, was born at Newgrove, county Down, Ireland, Oct. 27, 1847. He was educated at private schools until

1863, at the Royal school, Dungannon from 1863 to 1866, and from 1866 to 1871 at Trinity College, Dublin, where he graduated in arts and in civil engineering, being second in his class and obtaining honors in two divisions. His subsequent career follows:—1872 to 1874, assistant to county engineer of Antrim; 1874 to 1887 with J. Nielle, Q.L.S., Montreal, rising from chairman to principal assistant and manager; 1886, became a Dominion Land Surveyor and Quebec Land Surveyor; 1887 to Feb. 1, 1904, Assistant Engineer and Provincial Land Surveyor, Canadian Pacific Ry.; Feb. 1, 1904, to Oct. 31, 1912, Right of Way and Lease Agent. In 1890 he won the Pennsylvania University's prize of \$400 for essay on construction and maintenance of macadamized roads in an open competition.

Motor Service, Limited, is being organized, according to press reports, in Montreal, with a capital of \$500,000, to make a specialty of handling freight in the city by motor truck. D. McDonald, formerly General Manager, Montreal Tramways Co., and M. J. Kennedy, formerly General Freight Agent, Montreal Tramways Co., are said to be interested in the new company.

Railway Manager Wanted for New Zealand—Applications are invited for the position of General Manager of the New Zealand Government Railways. Salary £3,000 a year; term of appointment five years; passage of appointed candidate and family paid. Candidates must be well versed in operating a railway system in all its branches, particularly in passenger and goods traffic. Further particulars and forms of application may be obtained from the High Commissioner for New Zealand, 13 Victoria street, London, S.W., Eng.

Protection for Car Repairers.—The Board of Railway Commissioners has issued a circular stating that its attention has been called to several accidents which have recently taken place wherein car repairers have met with serious injury while working on repair tracks, and that all railway companies subject to the Board's jurisdiction will at the sittings to be held in Ottawa on Dec. 3 be called upon to speak to the question of providing more efficient protection to car repairers working on repair tracks. The companies are asked to be prepared with suggestions and for a general discussion of the question.

National Transcontinental Ry. Operation.—The portion of the eastern section from Moncton to Edmunston, N.B., which has been completed, not having been applied for by the Grand Trunk Pacific Ry., for operating purposes, the N.T.R. Commission started a service on it Nov. 20. Trains leave Moncton Mondays, Wednesdays and Fridays at 7 a.m., arriving at Edmunston at 7 p.m. The return trips are made on Tuesdays, Thursdays and Saturdays leaving Edmunston at 7 a.m., and arriving at Moncton at 7 p.m. W. B. Cronk, heretofore Superintendent of Transportation at Winnipeg, has been appointed General Superintendent in charge of operation, with office at Ottawa. E. P. Cronk has been appointed Superintendent at Edmunston.

Securing of Trucks to Car Bodies. The Board of Railway Commissioners has issued a circular stating that its officers are of the opinion that the number of persons killed and injured in accidents due to derailments, head on and rear end collisions, would be very much reduced, if the trucks of the cars were so attached to the body that the body could not leave the truck in case of such accidents. The Board asks railway companies to give the matter serious consideration, so that, when it is spoken to at an early sitting, a decision can be arrived at.

It is rumored that the Grand Trunk Ry. is contemplating such an installation on the branch between Galt and Elmira, Ont., for which purpose the tests on the Schomberg and Aurora Ry. prove that the car is well adapted

Premiums for Maintenance of Way.—The Pennsylvania Rd. made its annual award recently of \$5,400 in premiums for the maintenance of sections of roadbed in the best condition during the past year. To insure the premiums being awarded upon accurate data, a committee of maintenance of way officers went over the line every month during the year in a car attached to one of the regular high speed trains. This special committee was composed of the Chief Engineer of Maintenance of Way as Chairman, the Engineer of Maintenance of Way, the Assistant to the General Manager, and the superintendents of the Manhattan and Central divisions. The first premium was \$1,200, of which \$800 went to the supervisor and \$400 to the assistant supervisor having the best line and surface between New York and Pittsburgh and Philadelphia and Washington. The other prizes were four premiums of \$800 each, \$600 for the supervisor and \$200 for the assistant, for the best line and surface on a main line superintendent's division between New York and Pittsburgh and Philadelphia and Washington. A special improvement premium of \$1,000, \$700 to the supervisor and \$300 to the assistant, was given for the greatest improvement made in line and surface on the main line between New York and Pittsburgh and Philadelphia and Washington.

The shippers' section of the Saskatoon, Sask., board of trade has decided to appoint a traffic officer.

The Minneapolis, St. Paul & Sault Ste. Marie Ry. is said to have ordered 65,000 tons of steel rails.

The Canadian Northern Telegraph Co. has opened offices at Decker, Grays, and Grosse Isle, Man., and at Macrorie and St. Gregor, Sask.

The C.P.R. freight traffic department moved into its new quarters at the enlarged Windsor street station, Montreal, Nov. 9.

G. Marconi, inventor of wireless telegraphy, has lost an eye as the result of a motor accident, and it is stated that the sight of the other is also threatened.

The new combined land rates for wireless telegraph messages which were decided upon during the national wireless conference in June, are to be put in effect in Canada by the C.P.R. Telegraphs and the G.N.W. Telegraph Co., Dec. 1.

Moncton press despatches state that the divisional system of accounting has been adopted on the Intercolonial Ry., and that the officials in charge are:—Truro, N.S., —Hallisey; New Glasgow, N.S., E. B. Hagarty; Campbellton, N.B., F. J. King; Levis, Que., —Belanger.

The total delay by troubles in electrical apparatus last year on the 33 electric locomotives operating in the New York terminal district of the Pennsylvania Rd. amounted to only 13 minutes. The total mileage run of these locomotives was 900,000, including a mileage of 56,000 for a single one of them.

The International Brotherhood of Railway Maintenance of Way Employes has decided to hold its bi annual convention in Winnipeg, in Nov., 1914. The officers for the current year include:—H. Irwin, Portage la Prairie, Man., Vice President; W. H. Noysie, Toronto, and G. Seal, Portage la Prairie, members of the executive committee.

Railway Rolling Stock Notes.

The Dominion Coal Co. has ordered 50 fifteen ton wood hopper cars from the Canadian Car & Foundry Co.

The Quebec Oriental Ry. has ordered a snow plow from the Canadian Car and Foundry Co.

The Grand Trunk Pacific Ry. has ordered 10 second class cars from the Canadian Car and Foundry Co.

The Grand Trunk Pacific Ry. has received 3 consolidation locomotives from the Canadian Locomotive Co.

The Canadian Northern Ry. has ordered 650 box cars, 60,000 capacity, from the Canadian Car and Foundry Co.

The Crossen Car Co., between Oct. 13 and Nov. 13, delivered 60 box cars, 60,000 lbs. capacity, to the Canadian Northern Ry.

The Intercolonial Ry. has ordered the following rolling stock:—100 wooden box cars, 60,000 lbs. capacity, from Nova Scotia Car Works; 1 snow plow from Wendell and McDuffie.

The G.T.R. has received the following additions to rolling stock:—62 refrigerator cars, 456 box cars, from Canadian Car and Foundry Co.; 5 box cars, 153 automobile cars, from Western Steel Car and Foundry Co.

The Kootenay and Alberta Ry. has bought a locomotive and a second hand passenger and baggage car from the C.P.R. This is the only rolling stock it will require, as the coal cars for the traffic from the mines will be furnished by the C.P.R.

The British Columbia Electric Ry. has ordered from the Hart-Otis Car Co. six all steel Otis type cars, similar to those supplied last year, the approximate dimensions over all being:—Length, 28 ft.; height, 8 ft. 4½ ins.; capacity, 750 cu. ft.

The C.P.R., between Oct. 14 and Nov. 14, ordered the following rolling stock—2 colonist cars, 1 second class car, 4 freight refrigerator cars, 14 stock cars, 8 vans and 66 flat cars, to be built at its Angus shops, Montreal; 13 dining cars from the Pullman Co.

The C.P.R., between Oct. 14 and Nov. 14, received the following rolling stock—1 P1 locomotive, 7 W3 locomotives, 2 D4 locomotives, 8 baggage and express cars, 3 first class cars, 2 suburban cars, 44 vans, 39 flat cars, 659 box cars, from its Angus shops, Montreal; 472 box cars, from Canadian Car and Foundry Co.; 28 N3 locomotives from Montreal Locomotive Works; 25 D10 locomotives from American Locomotive Co.; 657 box cars from Standard Steel Car Co.; 930 box cars from Western Steel Car and Foundry Co.

The Canadian Car and Foundry Co. made the following deliveries between Oct. 15 and Nov. 15:—Canadian Northern Ry., 6 first class cars, 67 thirty ton box cars, Canadian Pacific Ry., 312 steel frame 40 ton box cars without woodwork, 725 steel frame 40 ton box cars complete, Grand Trunk Ry., 419 thirty ton steel underframe box cars, 70 thirty ton refrigerator cars, International Ry. of New Brunswick, 20 logging cars, Timiskaming and Northern Ontario Ry., 4 steel underframe cars, Canadian Steel Foundries, 6 core oven cars, Montreal Tramways Co., 3 steel electric car bodies.

The Minneapolis, St. Paul and Sault St. Marie Ry. is said to have ordered 10 mikado freight locomotives from the American Locomotive Co. They will be equipped with superheaters.

The Duluth, South Shore and Atlantic has ordered 400 ore cars from the American Car and Foundry Co.

Stoppage of Grand Trunk Construction in New England

It was officially announced by G.T.R. officials in Montreal, Nov. 10, that work on the extensions of the Central Vermont Ry. into Boston, Mass., and to Providence, R.I., which are being built by the Southern New England Ry., have been temporarily suspended, owing to the unsettled condition of the British money market. The contractors on the line being built from Palmer, Mass., southeasterly to Providence, on which about \$1,500,000 has already been spent, ceased work on Nov. 10, and about 2,300 men were thrown out of employment. It was expected to have had this extension completed by the end of 1913, and the extension into Boston completed in the following year.

Press reports from Boston state that negotiations are in progress with the New York, New Haven and Hartford Rd. for such rights as will enable the G.T.R. and Central Vermont Ry. to reach Boston and Providence over that company's lines. Vice President Bryans, of the N.Y., N.H. and H. Rd., is reported as stating that an agreement has been reached for the joint use of the C.V.R. tracks between Windsor and White River Jet., Vt., and that the Boston and Maine Rd., a subsidiary of the N.Y., N.H. and H. Rd., had withdrawn its petition for the building of a line from Claremont to Lebanon, N.H., paralleling the C.V.R. He further stated that no other agreement had been made, although negotiations for a general traffic agreement had been going on all summer. These negotiations, President Mellen is reported as stating, if completed, would give the G.T.R. and its subsidiary, the C.V.R., access to all N.Y., N.H. and H. Rd. points, and the latter line access to the C.V.R. and G.T.R. lines.

An official statement was made by E. J. Chamberlin, President, G.T.R., Nov. 13, to the effect that there is no change in the C.V.R. policy relative to the New England connections. The negotiations as to traffic arrangements have not progressed far enough to determine whether such arrangements can be made as would be satisfactory to all parties interested. Should any arrangements be finally agreed to they will be such as will fully protect the interests of all friends of the G.T.R. in New England. It was subsequently stated that a tentative agreement had been made for such a traffic agreement, and that it was to run for 25 years.

The press reports state also that the agreement provides that the extensions to Providence and Boston are to be stopped and eventually abandoned. The attention of the United States Attorney General has been called to the matter, and it is stated that proceedings may be taken to prevent any such agreement being entered into on the ground that it would be a restraint of trade. The official notifications that such an enquiry would be held were served Nov. 19, and the investigation will take place at Washington.

It was further reported in Boston, Nov. 12, that the stoppage of work was brought about without any consultation with C.V.R. officials, and that as a result the resignation of E. H. Fitzhugh, President, might be expected. Subsequently Mr. Fitzhugh stated that there was no foundation for this statement.

A bill has been filed with the clerk of the Legislature of the State of Massachusetts providing for the purchase by the Commonwealth of the Boston and Maine Rd. lines.

Telephone Train Dispatching on the Grand Trunk Pacific Railway.

We are officially advised that the G.T.P.R. is erecting wires for telephone service on the following divisions:—

Division	Miles.
Lake Superior Division—	
Fort William to Superior Jet.	200
Prairie Division—	
Winnipeg to Melville	285
Melville to Regina	100
Mountain Division—	
Edmonton to Tete Jaune	310
Prince Rupert to Hazelton	180
Alberta coal branch	65

1,140
Of the above 555 miles is in operation and the additional 585 miles is expected to be complete and available for service by Jan. 1. The apparatus adopted as standard is the Northern Electric 102B selector set and the swinging type transmitter arm, manufactured by the Northern Electric & Mfg. Co., Montreal.

On the Lake Superior division, Fort William to Graham, Ont., the dispatcher will be located at Graham. Fourteen stations will be equipped to start with, and all trains will be supplied with portable train sets and line poles.

A complete telephone service, operated by ordinary telephone methods and instruments, has been installed on the following branch lines:

Line	Miles.
Melville-Canora	55
Regina-Boundary	85
Regina-Moose Jaw	40
Young-Prince Albert	75
Oban-Battleford	50
Tofield-Calgary	175

480
A. B. Smith, Manager of Telegraphs, G.T.P.R., is in charge of the work.

Mechanical Conventions at Atlantic City.
—The American Railway Master Mechanics' Association will meet at Atlantic City, N.J., June 11 to 13 next, and the Master Car Builders' Association will meet there June 16 to 18.



SEALED TENDERS addressed to the undersigned and marked on the envelope "Tender for Cape Croker Timber," will be received until noon on Thursday, the 5th day of December next, for four hundred thousand feet of timber comprising Maple, Beech, Elm, Basswood, Ash, and Hemlock, being about 50 per cent. Maple, 20 per cent. Basswood, 12 per cent. Beech, 10 per cent. Elm and 8 per cent. Ash and Hemlock, which the Indians of Cape Croker are to take out during the ensuing winter and deliver on the shore of Lake Huron at convenient points for shipment.

Tenderers should state the prices they will pay for the different kinds of timber per M. feet, B. M., over and above Crown dues, as stated hereunder.

An accepted cheque on any Canadian Chartered Bank for \$400.00, made payable to the order of the undersigned, should accompany each tender, which in the event of failure to carry out the undertaking will be forfeited to the Department.

The highest or any tender will not necessarily be accepted, and cheques sent by unsuccessful tenderers will be returned.

Reasonable advances should be made to the Indians as the work progresses, if required, and sworn returns of measurements must be made by an Ontario licensed culler.

Any further information desired can be obtained on application to Mr. A. J. Duncan, Indian Agent, Cape Croker, or to the undersigned.

The Crown dues payable to the Department on this timber are as follows:—
Maple and Elm \$4.00 per M. ft., B.M.
Beech and Basswood . . . \$3.00 per M. ft., B.M.
Hemlock \$1.00 and Ash, \$2.00 per M. ft., B.M.

The unauthorized publication of this advertisement will not be paid for.
J. D. McLEAN,
Asst. Deputy and Secretary,
Department of Indian Affairs,
—31451. Ottawa, November 18, 1912.

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TORONTO, CANADA, DECEMBER, 1912

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Relations of Railway Employes to Public.

George Bury, Vice President and General Manager, Western Lines, C.P.R., has issued the following circular to employes:—

The manager of a baseball club at the height of his career conceived the idea of securing a team made up of players from other clubs who had made the highest individual average in their respective positions. He secured them at great cost. As a playing organization it was a failure; from an absence of team work, each player looking solely to his own average. It takes good team work to produce results on a railway as it does in a ball club. Good team work is necessary if we are to hold our present traffic and attract an increasing volume to the road. We can only do so by efficiency and by satisfying the shipping and travelling public.

If there is one unfortunate habit that men in railway service lapse into, it is that of dismissing responsibility by feeling that it belongs to someone else. We cannot obtain results by minimizing the importance of complaints and dismissing them by simply relegating them to some other branch of the service or placing the responsibility on some junior and letting it end there. Everyone connected with our service is expected to use his best efforts in the harmonious working of the system, and co-operate with those surrounding him, considering himself part of the machinery of our organization and endeavoring to increase its effectiveness every way in his power.

Agents, ticket clerks, conductors, baggage-men, checkers, passenger trainmen, and all others whose duties bring them into close touch with the public, by painstaking and uniform courtesy cannot fail to create a favorable impression. Due to the wonderful growth of our country, a large percentage of the people on our trains are unused to travel, having come from foreign lands to seek home in the west, frequently with small means. Little attentions paid to these people and others will come back in many ways. A kind word and a little extra attention will soon establish a lasting impression.

In most places the company's agent is its sole representative in the town where he is located. The estimate put upon the agent by his fellow citizens is the measure of the company's standing in that district. Agents and those who represent the company in various capacities should strive to be a part of the community in which they live, on good terms with their fellow townsmen and sharing the feelings of those with whom they are doing business, making representations which will enable us to meet the wishes of the public, on whom the company's success depends.

Try not to keep people waiting who have business to transact. Make them feel they are welcome and that their business is your concern.

Every employe has certain responsibilities and a sphere of usefulness, and we should all work with the one end in view of making our service such that we will hold and attract patrons.

Railway Finance, Meetings, Etc.

Alberta Railway and Irrigation Co.—Following are the directors and officers elected for the current year:—President, Sir Thos. G. Shaughnessy; Vice-President, G. Bury; other directors, A. R. Creelman, D. McNicoll, L. G. Ogden; Secretary, H. C. Oswald.

Chicago Great Western Rd.—E. J. Chamberlin, President, G.T.R., is reported as stating that the company has not even thought of acquiring the C.G.W. Rd., which

recent press reports stated had been purchased in order that a connection might be made between the G.T.R. at Chicago and the G.T. Pacific Ry.

Dominion Atlantic Ry.—Approximate passenger earnings for October, \$48,006.03; freight earnings, \$77,774.97; total earnings, \$125,781, against \$169,600 total earnings for October, 1911.

Edmonton, Dunvegan and British Columbia Ry.—A prospectus was issued by Lloyds Bank, Ltd., in London, Eng., recently, offering at 94½ £700,000, the mortgage debenture stock of the E.D. & B.C. R. Co., the principal and interest being unconditionally guaranteed by the province of Alberta, the stock being part of an issue of \$7,000,000 authorized to be made, which represents a bonded indebtedness at the rate of \$20,000 a mile.

Grand Trunk Pacific Branch Lines Co.—There has been deposited with the Secretary of State at Ottawa a trust deed made between the G.T.P.B.L. Co., the National Trust Co., and the Province of Alberta securing an issue of 4% sterling bonds guaranteed by the province.

Grand Trunk Ry.—Application is being made to the Dominion Parliament for authority to issue a further amount of £200,000 of G.T. consolidated debenture stock.

Blair & Co., New York, are offering \$3,360,000 4½% equipment notes, series B, dated Nov. 1, 1912, due semi-annually beginning May 1, 1913. These notes are issued in part payment for 100 locomotives, 2,000 box cars and 50 tank cars.

Great Northern Ry.—The report for the year ended June 30 shows net earnings of \$28,535,271, against \$23,657,241 in 1911. There was a balance available for dividends of \$21,654,255, equal to 10.31% earned on the capital stock, as compared with 8.34% earned last year.

Peré Marquette Rd.—An appeal is being made against the recent decision of the United States district court authorizing the issue of \$3,500,000 of receivers' certificates.

Temiscouata Ry.—The annual meeting of shareholders and registered bondholders was held at Quebec recently. The accounts and General Manager's report for year ended June 30 were submitted. The net earnings showed an increase over the preceding year and operating expenses a decrease. After meeting fixed charges, interest and redemption fund for prior lien bonds, a dividend was declared on the consolidated mortgage income bonds and an appropriation provided for betterments to the property.

Following are the directors and officers for the current year:—President, J. H. Walsh; Vice-President, E. O. Grundy; other directors, A. H. Cook, K.C.; F. Murphy, K.C.; A. Laurie and W. N. Campbell; Secretary and General Manager, G. G. Grundy.

Railway Lands Patented.—Letters patent were issued during September covering railway lands in Manitoba, Saskatchewan, Alberta, British Columbia and Yukon for the following number of acres:

Calgary and Edmonton Ry. Co.	1,121.00
Canadian Northern Ry. Co.	3,129.25
Canadian Pacific Ry. Co., grants	133.20
Qu'Appelle, Long Lake and Saskatchewan Rd. and Steamboat Co.	3,048.91

7,432.36
Norton Griffiths Dredging Co., Ltd., has been incorporated under the Dominion Companies Act, with \$1,250,000 capital, and office at Montreal, to carry out general dredging and contracting work in Canadian rivers and harbors, and to develop waterway systems. The chief work which the company will undertake for the present is in connection with the large development works in Courtenay bay, St. John, N.B.

Grand Trunk Railway's Semi-Annual Meeting.

The semi annual meeting was held in London, Eng., Oct. 24, when the report for the half year ended June 30 was presented as follows:—The following summary shows a comparison of the half year's revenue account with that of the half year ended June 30, 1911:—

1911.		1912.	
£3,561,182	Gross Receipts.....	£3,834,328	1 9
2,628,205	Working expenses, being at the rate of 72.85%, as compared with 73.81% in 1911.....	2,793,285	19 0
932,977	Net traffic receipts.....	1,041,042	2 9
Cr. 22,431	Balance of income from rentals, outside operations, and car mileage.....	33,504	9 5
995,408	Total net revenue.....	1,074,546	13 4
16,013	Amount received from International Bridge Co.....	16,012	16 7
6,507	Interest on bonds Centrai Vermont Ry.....	6,506	14 3
62,510	Interest on securities of controlled lines and on St. Clair tunnel bonds acquired by issue of G. T. 4% debenture stock.....	70,775	16 9
51,937	Balance of general interest account.....	51,232	2 7
£1,092,375	Net revenue receipts.....	£1,152,065	3 6

Following are the net revenue charges for the half-year, compared with the corresponding period:

1911.		1912.	
£ 77,603	Rents, leased lines.....	£ 77,603	0 9
539,850	Interest on debenture stocks and bonds of the company.....	571,641	16 0
30,481	Interest on debenture stock and bonds of lines consolidated with the G.T. Co.....	9,230	2 10
41,758	Canada Atlantic Ry. deficiency.....	52,805	7 3
39,686	Detroit, Grand Haven and Milwaukee Ry. deficiency.....	50,680	7 8
£ 729,378	Leaving a surplus of.....	£761,960	14 6
362,997		390,104	9 0
£1,092,375		£1,152,065	3 6

Adding the balance of £6,830 18s. 7d. at credit of net revenue account on Dec. 31, 1911, to the above surplus for the past half year, the total amount available for dividend is £396,935 7s. 7d., from which the directors recommend the payment of the following dividends, viz:—

Half-year on 4% guaranteed stock...	£239,775	18 1
Half-year on first preference stock...	85,420	15 0
Half-year on second preference stock...	63,210	0 4
	£388,406	13 5

leaving a balance of £8,528 14s. 2d. to be carried forward to next half year's account.

Following is a comparison of receipts for the half years ended June 30, 1912 and 1911:—

Description of Receipts	1911		1912	
	£	Increase	£	Increase
Passengers	944,570	91,186	1,035,756	91,186
Mails and express	155,666	5,593	162,249	5,593
Freight and live stock	2,347,954	148,246	2,496,200	148,246
Other receipts	112,002	28,121	140,123	28,121
	3,561,182	273,146	3,834,328	273,146
Passengers carried.....	5,530,072		5,438,841	359,156
Average fare per passenger.....	63.85		68.54	111.0
Tons freight and live stock.....	9,388,829		9,059,269	338,560
Average rate per ton.....	33.81		42.26	35d.
Tons carried one mile.....	1,779,753.53		1,685,756.384	123,996.551
Earnings per train-mile.....	89.75d.		82.33d.	7.42d.

The average rate per ton per mile on the entire freight business was 0.68 of a cent, compared with 0.69 of a cent in the corresponding half year.

The working expenses, excluding taxes, were £2,748,575, or 71.68% of the gross receipts, compared with £2,580,641, or 72.47%; an increase in amount, but a decrease in the proportion to the gross receipts of 0.79%.

Following is a comparison of revenue expenditure, including taxes, for the half years ended June 30, 1912 and 1911:—

	1911		1912	
	Decrease	Increase	Decrease	Increase
Maintenance of way and structures	£ 48,263	£ 395,713	£ 317,450	£ 605,637
Maintenance of equipment	5,222	600,415	118,043	1,568,289
Traffic expenses	3,102	114,947	1,568,289	109,149
Conducting transportation	195,247	1,373,042	109,149	44,711
General Expenses	12,625	96,524	109,149	44,711
Taxes	2,853	97,546	109,149	44,711
Total	£165,080	£2,628,205	£2,733,285	£72,85
Percentage of gross receipts	4.62d.	73.81	72.85	65.38d.
Expenditure per train-mile	0.96	60.76d.	65.38d.	

The train mileage compares with that for the half year ended June 30, 1911, as follows:—

	1911		1912	
	Decrease	Increase	Decrease	Increase
Passenger	269,110	162,504	4,395,917	5,601,582
Freight	20,994		5,870,692	255,907
Mixed trains			10,253,403	
Total	127,600	10,381,006	10,253,403	

The gross receipts for the half year show an increase of £273,146, or 7.61%; the working expenses, including taxes, an increase of £165,080, or 6.28%; and the train mileage a decrease of 127,600, or 1.23%.

The total charges to capital account for the half year were £998,582 15s. 7d. Of this £216,438 7s. 2d. was for the acquisition of Ottawa Terminal Ry. first mortgage bonds, £94,912 8s. 1d. for the acquisition of Lachine, Jacques Cartier and Maisonneuve Ry. bonds, and £80,970 17s. 1d. for discount and commission on 4% debenture stock and 4% guaranteed stock sold during the half year.

The expenditure on capital account in respect of new works, new rolling stock and land purchased was as follows:—

New works.....	£ 85,934	s. 4	d. 0
New rolling stock.....	651	7	5
Land purchased.....	519,675	11	10
	£606,261	3	3

No additions to rolling stock at the expense of capital were made during the half year. Three engines were sold; 7 Pacific type passenger engines, 5 first class cars, 5 baggage cars, and 1 snowplough were built in the company's shops, and 20 switch engines, 44 first class cars, 23 baggage cars, and 74 steel underframe box cars were purchased on revenue account.

CANADA ATLANTIC RAILWAY.

The following are the results of the half year's working of the Canada Atlantic Ry. compared with corresponding period of 1911:—

1911.		1912.	
£205,069	Gross receipts.....	£222,441	
188,098	Working expenses.....	208,671	
16,971	Net traffic receipts.....	13,770	
7,025	Balance of income from rentals,		

outside operations and car mileage.....	Dr. 821
£ 23,996	Total net revenue.....
	£ 12,949

The interest charges for the half year were £65,754, against £65,753, so that there was a net revenue deficiency of £52,805, compared with £41,757 in 1911. The number of passengers carried was against 833,704 in 1911, an increase, of and the passenger receipts, including mails and express receipts, were £46,267, against £44,185, an increase of 4.71%. The quantity of freight moved was 876,250 tons, against 833,704 in 1911, an increase, or 5.10%; the receipts from freight traffic were £156,948, against £144,928, an increase of 8.29%.

GRAND TRUNK WESTERN RAILWAY.

Following are the results of the half year's working compared with corresponding period of 1911:—

1911.		1912.	
£ 661,759	Gross receipts.....	£ 661,834	
549,482	Working expenses.....	547,993	
112,277	Net traffic receipts.....	113,841	
Dr. 53,263	Balance of income from rentals, outside operations and car mileage.....	Dr. 50,319	
£ 59,014	Total net revenue.....	£ 63,522	

The net revenue charges for the half year were £92,187, so that there was a net revenue deficiency for the half year of £28,665, and deducting therefrom the credit balance at Dec. 31, 1911, of £12,521, there remains a net revenue debit of £16,144 at June 30, which amount is carried forward to the current year. The number of passengers carried was 986,012, against 995,116, a decrease of 0.91%; and the passenger train receipts, including mails and express, were £214,306, against £202,176, an increase of 6%. The quantity of freight moved was 1,823,508 tons, against 1,941,374, a decrease of 6.07%, and the receipts from this traffic were £429,610, against £444,898 in 1911, a decrease of 3.44%.

DETROIT, GRAND HAVEN AND MILWAUKEE RAILWAY.

Following are the results of the half year's working of the Detroit, Grand Haven and Milwaukee Ry., compared with corresponding period of 1911:—

1911.		1912.	
£ 205,050	Gross receipts.....	£ 214,957	
189,230	Working expenses.....	206,723	
15,820	Net traffic receipts.....	8,234	
Dr. 18,524	Balance of income from rentals, outside operations, and car mileage.....	Dr. 21,933	
Dr. £2,704	Total net revenue.....	Dr. £13,698	

The net revenue charges for the half year were £36,981, against the same amount in 1911, so that there was a net revenue deficiency of £50,680, as compared with £39,685 for the corresponding period of 1911. The number of passengers carried was 383,248, against 373,757, an increase of 2.54%; and the passenger receipts, including mails and express, were £59,502, against £55,511, an increase of 7.19%. The quantity of freight moved was 1,201,323 tons, against 1,192,105 in 1911, an increase of 0.77%; and the receipts from freight traffic were £134,525, against £129,825 in 1911, an increase of 3.62%.

GRAND TRUNK PACIFIC RAILWAY.

As was expected at the date of the last report, the line has been laid to Tete Jaune Cache, 60 miles west of the summit in the Yellowhead pass, on the western slope of the Rocky mountains, and 1,100 miles west of Winnipeg. It is hoped that grading will be completed to the second crossing of the Fraser river, a further distance of 120 miles, before the end of the year. From Prince Rupert, on the Pacific coast, the line has been laid eastward as far as South Hazel-

ton, 180 miles, and it is expected to complete the line to the Bulkley summit, 275 miles from Prince Rupert, next spring. There is still a deficiency of labor on all work under construction.

RECEIPTS		1912.	
	£	s.	d.
Freight	2,594,612	19	8
Less—			
Cartage, &c.	57,206	5	1
International bridge tolls	17,333	19	11
St. Clair tunnel tolls	23,872	10	0
	98,412	15	0
	2,496,200	4	8
Passenger	1,043,608	2	6
Less—			
International bridge tolls	1,021	15	4
St. Clair tunnel tolls	6,830	11	0
	7,852	6	4
	1,035,755	16	2
Mail and Express	162,248	17	9
Other revenue from transportation	92,123	9	9
Revenue from operations other than transportation	47,999	13	5
	3,834,328	1	9
EXPENDITURE			
Maintenance of way and structures, 9.6%	347,450	2	6
Maintenance of equipment, 15.79%	605,637	8	9
Traffic expenses, 3.08%	118,049	4	11
Conducting transportation 40.90%	1,568,289	0	3
General expenses, 2.85%	109,148	17	0
Total operating expenses, 71.68%	2,748,574	13	5
Taxes, 1.17%	44,711	5	7
	2,793,285	19	0
Cr. Net income from rentals	Cr. 76,647	6	6
	2,716,638	12	6
Dr. Dining car service balance	Cr. 32	3	9
	2,716,606	8	9
Dr. Hire of equipment balance	Dr. 110,183	19	8
	2,826,790	8	5
Balance to net income account	1,007,537	13	4
	3,834,328	1	9

REPORTS OF OFFICIALS.

The Chief Engineer, H. R. Safford, reports that the expenditure for maintenance of the property was \$234,822.33 less than for the corresponding period in 1911.

The Superintendent of Motive Power, W. D. Robb, reports expenditure, mileage, etc., as follows:—

Half-year ended	Total Expenditure	Train Mileage	Rate of Expense per Mile		
			Train	Engine	Car
June, 1912	\$5,403,368	\$10,253,406	52.70	38.61	3.28
June, 1911	4,894,198	10,132,184	48.30	36.99	3.04

An increase in expenditure of \$509,170, or 10.40%, compared with an increase in train mileage of 121,222, or 1.20%.

Average number of cars moved per train	Passenger Freight Mixed		
	Trains	Trains	Trains
And for corresponding period	4.8	25.3	6.8
	4.7	24.6	6.9

During the half year 3 engines were sold, and 3 scrapped, leaving at the end of the half year 2 old light capacity engines set aside to be scrapped. Seven Pacific type passenger engines were constructed at the company's works, Montreal, and 20 switch engines were purchased and put into service during the half year. The actual stock at June 30 was 992 engines, against the official figure of 803.

The comparative cost of repairs per train, engine and car mile is given at the head of the next column.

A. W. Smithers, Chairman of the Board, who presided at the meeting, paid a warm tribute to the late C. M. Hays, and showed how the property had improved under his management. He referred to his visit to Canada during the past summer, to the excellent crop results, and to the want of labor for construction on the G.T.P.R. He

All repairing charges, including shop machinery, tools, marine equipment, &c.	1911		1912	
	Cents	13-11	Cents	14-08
		10-04		10-32
		0-83		0-88
Repairs and Renewals of Locomotives	1911		1912	
	Cents	11-48	Cents	12-24
		8-79		8-97
		0-72		0-76

The Superintendent Car Department, J. Coleman, reports expenditure, mileage, etc., as follows:

Total cost of repairs and renewals	Total miles run by cars		Cost per mile	
	Passenger	Freight	Car	Train
June, 1912	21,615,333	143,083,546	164,698,879	0-836
June, 1911	20,447,399	140,523,639	160,971,038	1-014
	\$1,542,086			15-05
	1,632,423			16-11

hoped on Jan. 1 next to commence the weekly publication of earnings on the prairie sections of the G.T.P.R. and on the Lake Superior branch, and he hoped that the earnings would show up in quite a satisfactory manner.

In referring to the changes consequent on Mr. Hays' death, Mr. Smithers said:—I visited Canada in May last to make new arrangements, and was fortunate in inducing Mr. Chamberlin to become his successor. Mr. Chamberlin had been Vice President and General Manager of the G.T. Pacific Ry. since 1908. He has had a life long experience in railway work, especially construction, and is well acquainted with the G.T. system. He recommended the appointment of Mr. Donaldson as his successor as Vice President and General Manager of the G.T. Pacific. Mr. Donaldson has been in charge of the Ottawa division of the G.T.R. for some years, with headquarters at Ottawa, and is now in charge of the G.T. Pacific, with headquarters at Winnipeg. Mr. Kelley is now Mr. Chamberlin's right hand man on the G.T. system as Vice President in charge of transportation, maintenance and construction. He was Chief Engineer of the company until last year, and I have every confidence that Mr. Chamberlin will find in him a valuable assistant. When all these arrangements were being made I received valuable assistance from Vice President Wainwright, who has served the company faithfully for 50 years, and who at my request acted as President in the interim caused by Mr. Hays' death, and I have great pleasure in thus acknowledging to you, and thanking him for his long and faithful service.

The American Railway Association's executive committee has appointed a commission to investigate and punish cases of misuse of freight cars which was provided for in per diem rule 19, adopted at the meeting in New York last May. This commission may impose fines at its discretion, the minimum being \$2 for each wrongful diversion; the intent of the rule being, evidently, that the commission shall make examples of persistent misuse by one road of the cars of another.

The Cumberland Ry. and Coal Co. has been ordered by the Board of Railway Commissioners to equip its cars with automatic couplers and air brakes within 18 months.

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.	1,745,500	1,375,000	370,500	56,100
Sept.	1,671,500	1,248,000	423,500	4,100
	\$5,247,000	\$3,958,100	\$1,288,900	\$193,200
Incr.	\$ 774,100	\$ 580,900	\$193,200

Approximate earnings for Oct., \$2,351,200, against \$2,028,900 for Oct., 1911.

The mileage in operation during Sept. was 4,297, against 3,716 in Sept., 1911.

Canadian Pacific Railway Earnings, Etc.

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

	Gross Earnings	Expenses	Net Earnings	Increase
July	\$12,052,398.58	\$7,604,221.68	\$4,448,176.90	\$745,148.57
Aug.	12,251,715.87	7,533,790.21	4,717,925.66	642,354.65
Sept.	11,579,733.98	7,329,430.13	4,250,303.85	332,857.05
	\$35,883,848.43	22,467,442.02	\$13,416,405.41	\$1,720,306.27
Incr.	5,751,040.9	4,030,680.63	1,720,359.27

Approximate earnings for Oct., \$12,960,000, against \$11,113,000 for Oct., 1911.

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 Sept., as compared with those for Sept., 1911:—

	1912.	1911.
Earnings	\$3,706,800	\$3,458,600
Expenses	2,607,600	2,476,200
Net earnings	\$1,099,200	\$ 982,400
Canada Atlantic Railway.		
	1912.	1911.
Earnings	\$ 217,900	\$ 184,400
Expenses	202,700	156,700
Net earnings	\$ 15,200	\$ 27,700
Grand Trunk Western Railway.		
	1912.	1911.
Earnings	\$ 613,000	\$ 560,000
Expenses	478,300	431,600
Net earnings	\$ 134,700	\$ 128,400
Detroit, Grand Haven and Milwaukee Railway.		
	1912.	1911.
Earnings	\$ 221,600	\$ 206,500
Expenses	211,400	149,500
Net earnings	\$ 10,200	\$ 57,000

Approximate earnings for Oct., \$4,901,954, and for week ended Nov. 7, \$1,061,984, against \$4,468,718 and \$956,818 for same periods, 1911.

TRAFFIC RECEIPTS OF THE SYSTEM.

Aggregate from July 1 to October 31:—	1911		Increase
	1911	1911	
G.T.R.	\$15,133,376	13,793,485	1,339,891
C.A.R.	855,466	757,544	97,922
G.T.W.R.	2,426,762	2,265,116	161,646
D.G.H. & M.R.	853,914	799,003	54,911
Totals	19,269,518	17,615,148	1,654,370

Key Harbor Coal and Ore Shipments. The Canadian Ontario Ry. has started to take in coal at Key Harbor, Georgian bay, which is 220 miles north of Toronto, at the end of a six mile branch from the Toronto-Sudbury line. Only about 10,000 tons will be taken in this season, but it will undoubtedly become a large coal handling point in the near future. At present the coal is taken direct from vessel to cars by means of locomotive cranes, and is being stored adjacent to the main line at Key Jct., six miles from the harbor. With the development of the harbor, no doubt coal storage will be arranged for there. The steamboat Kirby, which arrived Nov. 1, was the first coal carrier to reach the harbor. The ore dock adjoins the coal dock and the Kirby took back to Cleveland a load of Moose mountain iron ore. It is expected that the carrying of coal up and ore down will develop into a large trade and make a most economical operation.

Orders by the Board of Railway Commissioners.

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

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

17786. Sept. 17.—Defining express delivery limits in Halifax, N.S.

17787. Oct. 18.—Authorizing G.T.P. Branch Lines Co. to carry traffic over its Alberta coal branch from Bickerdike, Alta., mileage 0 to 36.6.

17788. Oct. 17.—Ordering Atlantic, Quebec and Western Ry. to build crossings, culverts and drains where required along its line.

17789. Oct. 18.—Approving Niagara, St. Catharines and Toronto Ry. location in St. Catharines, Ont., from Welland avenue, just south of G.T.R., to Welland canal crossing, mileage 0 to 0.75.

17790. Oct. 18.—Authorizing C.N. Ontario Ry. to build across Bartlett, Osler, Dufferin, Hamburg and St. Clair avenues, overhead, and Geary and Salem avenues, Toronto, by overhead structure and diversion.

17791. Oct. 18.—Authorizing G. T. P. Branch Lines Co. to build spur for Monarch Lumber Co., Regina, Sask.

17792. Oct. 19.—Amending order 17738, Oct. 8, by substituting Davidson for Davies.

17793. Oct. 18.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build across road allowance at mileage 41.45, Camden tp., Ont.

17794, 17795. Oct. 18.—Authorizing C.N. Ontario Ry. to build overhead across Weston road, Toronto, and across Montgomery road, Etobicoke tp., Ont.

17796. Oct. 18.—Approving Campbellford, Lake Ontario and Western Ry. (C.P.R.) plan of undercrossing at mileage 169.48, Pickering tp., Ont.

17797. Oct. 17.—Approving Vancouver, Victoria and Eastern Ry. (G.N.R.) plan showing additional land required for accommodation of slopes and bridges over Sumas river, B.C.

17798. Oct. 19.—Approving C.N. Ontario Ry. location through unsurveyed territory in Thunder Bay district, mileage 398 to 413 from Sudbury Jct.

17799. Oct. 19.—Approving G.T. Pacific Ry. station and site at Tete Jaune Cache, B.C.

17800. Oct. 17.—Approving James Bay and Eastern Ry. location of station grounds at Pointe Bleue, Que.

17801. Oct. 18.—Authorizing Niagara, St. Catharines and Toronto Ry. to cross G.T.R. on Welland avenue, St. Catharines, Ont.

17802. Oct. 12.—Authorizing Canadian Northern Ry. to build bridge across Atikokan river at mileage 139.9.

17803. Oct. 18.—Approving C.N. Ontario Ry. revised location through Nelson tp., up east side of Flamoro tp., mileage 31.54 to 37.50 from Toronto.

17804. Oct. 19.—Authorizing C.P.R. to build spur for Robertson Gravel Co., Waxford tp., Que.

17805. Oct. 16.—Authorizing C.P.R. to move station on lot 2, con. 5, to lot 2, con. 3, at Ingersoll Jct., Ont.

17806. Oct. 18.—Ordering G.T.R. to build farm crossing for J. E. Rosger, lot 7, con. 10, Ellice tp., Ont.

17807. Oct. 11.—Authorizing Canadian Northern Ry. to build bridge across Kashabowie river, on main line east, mileage 80.7.

17808. Oct. 19.—Ordering C.P.R. to fence its right of way at Duck Cove, N.B., on south side of D. R. Jack's west line to 100 feet east of Mrs. De Soyres' gate.

17809. Oct. 19.—Authorizing C.P.R. to build extension to Guelph Stove Works siding, Guelph, Ont.

17810. Oct. 21.—Approving Canadian Northern Ry. location through Estevan, Sask., mileage 8.02 to 8.98.

17811. Oct. 21.—Authorizing C.N. Ontario Ry. to build across concession road between cons. 10 and 11, Chisholm tp., station 47.53.

17812. Oct. 22.—Authorizing C.P.R. to operate trains, without their first being brought to a stop, over westbound second track where same crosses C.N.R., Birds Hill branch, mileage 119.18, near Woods, Man.

17813. Oct. 19.—Approving White Pass and Yukon Route, joint passenger tariff of tolls, supplement 1 to C.R.C. 6.

17814. Oct. 21.—Ordering C.N. Ontario Ry. to build farm crossing for G. Boyce, Nepean tp., Ont.

17815. Oct. 22.—Appointing Commissioner McLean to examine, under oath, any witness resident or at present in Canada, produced to give evidence material to complaint of Blind River Board of Trade and London Rolling Mill Co., alleging that G.T.R. and C.P.R. unjustly discriminate against Blind River, Ont., on shipments of bar iron.

17816. Oct. 21.—Authorizing C.N. Ontario Ry. to build across six highways in Chisholm tp.

17817. Oct. 22.—Authorizing, temporarily, G.T.P. Branch Lines Co. to carry traffic over its Oban-Battleford branch, mileage 0 to 48.5.

17818. Oct. 21.—Authorizing C.P.R. to take, for construction of team yard, certain lands in civic Delorimier ward, Montreal.

17819. Oct. 22.—Authorizing C.P.R. to cross at grade, Pelham avenue, West Toronto, Ont.

17820. Oct. 22.—Approving Canadian Northern Ry. location through tps. 35-38, rgs. 8-14, w. 2 m., Sask., mileage 93.85 to 135.52.

17821. Oct. 21.—Approving location Vancouver, Victoria and Eastern Ry. double track between mileposts 146.841 and 153.619.

17822. Oct. 21.—Authorizing C.P.R. to take, for constructing team delivery yard, lands fronting on Mance street and Esplanade avenue, in Laurier ward, Montreal.

17823. Oct. 22.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build across six highways, mileage 161.13 to 164.42.

17824. Oct. 21.—Approving C.N. Ontario Ry. location through Hochelaga county, Que., mileage 55.23 to 59.42.

17825. Oct. 22.—Authorizing C.P.R. to build spur for Paquette and Gauthier at St. Martin Jct., Que.

17826. Oct. 23.—Suspending, until Feb. 4, 1913, tariffs of C.P.R., G.T.R., C.N. Quebec and Temiscouata railways, increasing rate on shipments of pulpwood.

17827. Oct. 24.—Authorizing G.T. Pacific Ry. to build branch from mileage 788.21 from Winnipeg, to Humberstone coal mine; and rescinding order 16654, May 29.

17828, 17829. Oct. 22.—Authorizing G.T.R. to build sidings at Ridgeway, and for MacDonald Thresher Co., Stratford, Ont.

17830. Oct. 22.—Authorizing G.T. Pacific Branch Lines Co. to build its Biggar-Calgary branch across highway between sec. 23, tp. 31, r. 1, w. 4 m., mileage 104.06, Saskatoon district, Sask.

17831. Oct. 23.—Authorizing G.T. Pacific Ry. to carry freight traffic on its Tofield-Calgary branch between Trochu, mileage 121.4, and Belseker, mileage 162.6.

17832. Oct. 23.—Authorizing C.P.R. to open for traffic its second track from mileage 42.46, at Highlands, to mileage 43.91, at south switch, Que.

17833. Oct. 23.—Authorizing C.P.R. to build spur for Canadian Fairbanks-Morse Co., Winnipeg.

17834. Oct. 23.—Approving location C. N. Ontario Ry. station grounds at Callander.

17835. Oct. 23.—Authorizing C. N. Ontario Ry. to build across public road between cons A and B, Westmeath tp.

17836-17837. Oct. 23, 22.—Authorizing G. T. R. to build sidings and spurs for Shortreed Lumber Co., Kearney, Ont., and Canadian Rumley Co., Toronto.

17838. Oct. 23.—Authorizing G. T. Pacific Branch Lines Co. to build its Prince Albert branch across highway between secs. 6 and 7, tp. 46, r. 26, w. 2 m., mileage 91.8, Saskatoon district, Sask.

17839. Oct. 23.—Authorizing G.T. Pacific Branch Lines Co. to build its Calgary-Boundary branch over Diamond Coal Co.'s spur in n.e. ¼ sec. 21, tp. 9, r. 22, w. 4 m., overhead.

17840. Oct. 14.—Authorizing city of Vancouver, B.C., to build Hastings, Pender, Keefer and Harris streets across Vancouver, Victoria and Eastern Ry. overhead.

17841. Oct. 1.—Approving revised location C. N. Ontario Ry. through unsurveyed territory, Algoma district, mileage 280.5 to 290.6.

17842. Oct. 23.—Relieving C.P.R. from providing further protection at Main street crossing, Chesterville, Ont.

17843. Oct. 24.—Authorizing C.P.R. to build across 12 highways in Manitoba and Saskatchewan, mileage 31.27 to 65.3.

17844. Oct. 24.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build bridge across highway at mileage 95.25, Brighton tp., Ont.

17845. Oct. 24.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build bridge across road between lots 28 and 29, con. 2, Whitty tp., Ont., mileage 164.42.

17846. Oct. 23.—Approving plan of structural work of Canadian Northern Ry. bridge over C.P.R. secondary canal B, in sec. 9, tp. 25, r. 26, w. 4 m., Alberta.

17847. Oct. 24.—Extending, until July 1, 1913, time within which C.P.R. may operate its Manitou Lake branch from its Pheasant Hills branch, in sec. 6, tp. 40, r. 1, w. 3 m., to sec. 32, tp. 43, r. 21, w. 3 m., mileage 0 to 27.8, between Wilkie and Cutknife, Sask.

17848. Oct. 23.—Requiring Esquimalt and Nanaimo Ry. to appoint permanent agent at Cowichan, B.C.

17849. Oct. 24.—Authorizing C.P.R. to construct third track, south of its present tracks, across Jacques-Cartier Union Ry. Co., on lot cadastral no. 908, Lachine parish, Que.

17850. Oct. 24.—Authorizing G. T. P. Branch Lines Co., temporarily, to carry traffic over its Biggar-Calgary branch from Biggar to no. 1 siding, 7.1 miles.

17851. Oct. 24.—Authorizing C.P.R. to build spur for John Irwin Co., Calgary, Alta.

17852. Oct. 25.—Authorizing C.P.R. to carry freight, temporarily, on its Lacombe easterly branch, from Coronation to Consort, Alta., 32 miles.

17853. Oct. 24.—Authorizing C.P.R. to build spur for Canadian Milk Products, near Belmont station, Ont.

17854. Oct. 25.—Authorizing C.P.R. to cross, for construction purposes only, G. T. R., Toronto Ry. tracks, and John street, Toronto, crossings when in operation to be protected by watchmen.

17855. Oct. 25.—Authorizing C.P.R. to build subway at east end of Coquitlam yard, B.C.

17856. Oct. 25.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build bridge over road in Camden tp., Ont.

17857. Oct. 25.—Authorizing G.T.R. to build siding for J. Johnson in Vespra tp., Ont.

17858. Oct. 24.—Authorizing G. T. P. Branch Lines Co. to operate trains, without being brought to a stop, over C.P.R. Pheasant Hills branch, in n.e. ¼ sec. 36, tp. 36, r. 16, w. 3 m., Saskatoon district, Sask.

17859. Oct. 22.—Approving location C. N. Ontario Ry. station grounds at Twin Elm, Nepean tp., Ont.

17860. Oct. 24.—Authorizing town of Pointe aux Trembles, Que., to extend Desnoyers avenue across C. N. Quebec Ry.

17861. Oct. 28.—Directing G. T. Pacific Ry. to build farm crossing for J. McArthur, of Pasqua, Sask.

17862. Oct. 19.—Authorizing C. N. Ontario Ry. to build across Sault au Recollet road, Montreal, overhead.

17863. Oct. 26.—Authorizing C.P.R. to build spur for St. Lawrence Bridge Co., crossing main spur and connecting with G.T.R. spur in Lachine parish, Que.

17864, 17865. Oct. 26.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build bridge across highway at mileage 141.27, Clarke tp., and across Marmora street, Trenton, Ont.

17866. Oct. 19.—Refusing application of residents in and around Tete Jaune Cache, B.C., for order directing G. T. Pacific Ry. to build station between mileposts 49 and 50.

17867. Oct. 30.—Refusing application of residents of Erickson, B.C., for order directing C.P.R. to remove loading platform to another location.

17868. Oct. 30.—Authorizing C. P. R., temporarily, to build spur for Anthes Foundry Co., Winnipeg.

17869. Oct. 24.—Directing C. P. R. to build spur from main line east of Neebing avenue, Fort William, Ont., to 100 feet south of C.N.R., passing under C.N.R. by subway; and directing C.N.R. to raise its railway at least 13 feet, so as to carry it over Neebing avenue, and the proposed branch line; and construct temporary structure across Neebing avenue; and rescinding orders 17281 and 17740, Aug. 13 and Oct. 11.

17870. Oct. 25.—Directing Cumberland Ry. and Coal Co. to equip its cars with automatic couplers and air brakes, within 12 months from date.

Electric Railway Department.

Montreal Tramways Company's Track Construction and Methods of Cost Keeping.

By J. D. Evans, Chief Engineer and Superintendent of Construction.

The city of Montreal is situated on an island about 32 miles long and 10 miles wide, surrounded by the St. Lawrence river on the southerly and easterly side, and the Riviere des Prairies on the northerly and westerly side, and consists for the most part of plateau, except for Mount Royal, which rises to a height of 750 ft. above the river.

The city nearly surrounds the mountain, which, of course, makes some of the streets have steep grades, the maximum being about 11%. The average grade for the longest hill, which is 4,100 ft., is 6.2%, and the average grade for the shortest hill is about 10.6%. Our tracks cover the entire island fairly well, but as the streets for the most

Of the track mileage on city streets or highways, viz., 172.52 miles, about four miles of single track and 40 miles double track is laid on paved streets, in other words 84 miles of single track, or 44 miles of city paved streets, have tracks on them.

The subsoil in the streets of Montreal is for the most part blue clay, and for this reason we have decided to construct a concrete slab under our tracks, with ties spaced 2 ft. centres, separated from the slab with 1 in. sand cushion. After the rails have been laid and the track brought to proper surface and alignment the ties are entirely concreted in, this concrete serving as a foundation to the pavement. The pavement is

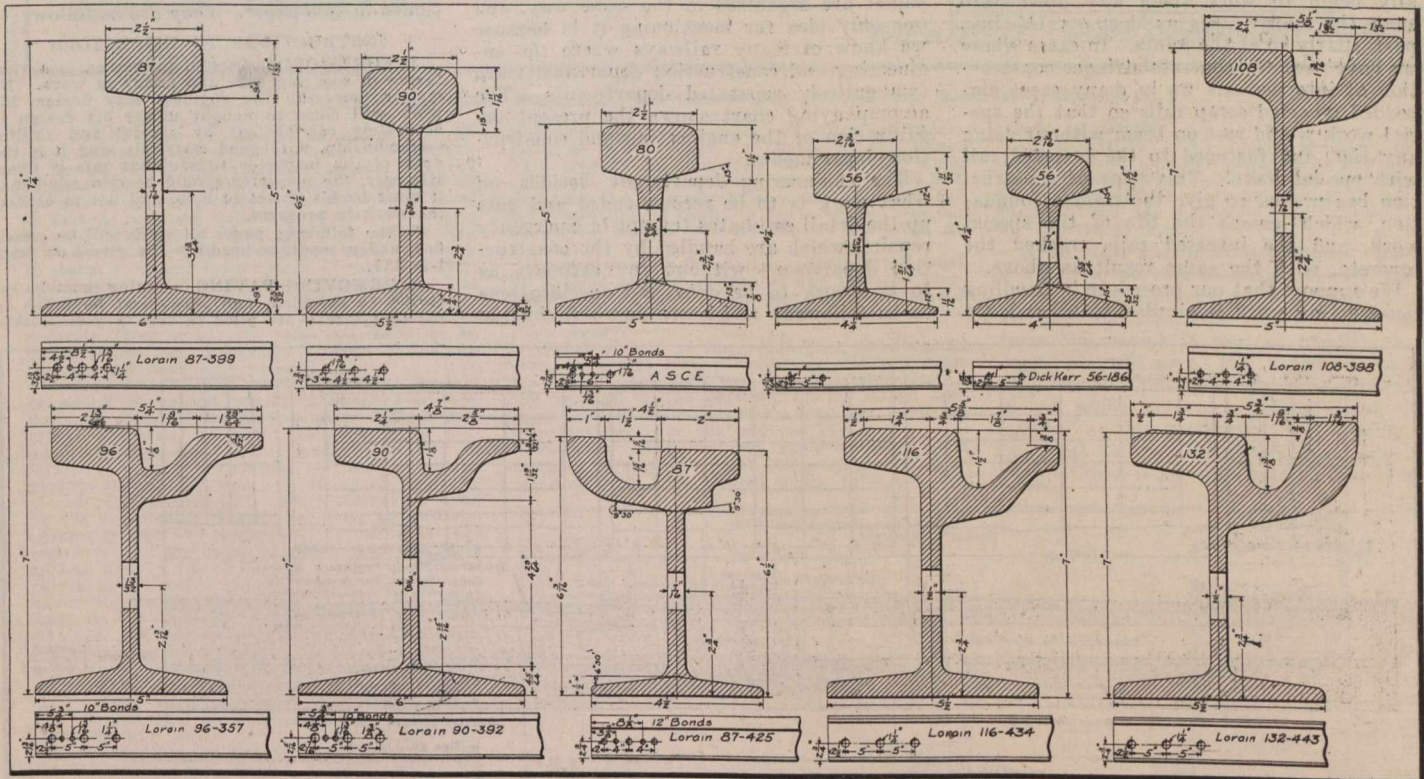
87-399 H. J. Skelton and Co.
96-357 Lorain "Trilby" section.
108-398 Lorain girder guard, Dick Kerr, 96C.

116-434 Lorain lip rail, Dick Kerr, section 142.

132-443 Lorain guard rail, Dick Kerr, section 141.

We have within the last year standardized on three rail sections, viz., for suburban work 80 lbs. A.S.C.E. 5 in. T, 87 lbs. T rail, 7 1/4 ins., where we are permitted by the city franchises to use same on paved streets, and where we are obliged to use girder rail we use 116 lbs.

Where guard rail is used we use the 108



Rail Sections, Montreal Tramways Co.

part are narrow and so laid that none of them can be classified as arterial streets, we have to contend with some difficult problems in construction, because the car routes are so laid out that it is impossible to divert traffic on most of them during the reconstruction period, which feature alone increases the costs.

The Montreal Tramways Co. controls the following companies:—

Montreal Street Railway	148.01	miles track
Montreal Park & Island Ry.	53.36	" "
Public Service Corporation	6.12	" "
Montreal Terminal Railway	28.42	" "
Total mileage	235.91	" "

Of the above 172.52 miles is laid on city streets or highways, 39.86 miles on private right of way, 55.14 of single track, and 78.62 miles of double track. The total of siding and car barn tracks is 23.53 miles.

either of scoria block, granite block, or granitoid.

Those who have seen the track allowance on the streets on which the cars run may have gone away with the impression that the construction of the tracks is not of the best, but as the city does all the paving construction the company is not responsible for this item, and when the fact is added to this that foundation under the concrete is in many cases composed of rubbish or a bed of an old creek, composed of quicksand or clay, the holding of the track with modern heavy cars passing over it causes the paving to break up rapidly.

Our rail sections are as follows:—

80 lb. A.S.C.E. tee, made in Sydney, N.S.
87-425 Lorain section girder guard, Dick Kerr, 57A.

87-399 Lorain section tee, H. J. Skelton and Co.

lbs. G.G., which fishes with the 96 lbs. girder rail, and 116 lbs. girder rail which fishes with the 132 lbs. girder guard. Plan 99 I-L-A shows our rail sections used at present.

The rail plate which we have adopted as our standard is the continuous joint 6 hole, as per plan 121 I-C.

The 116 lb. girder and 132 lb. girder guard rail sections that we adopted this year we are not perfectly satisfied with, because we consider that the back is not bevelled off enough, and we much prefer the 7 in. girder rail sections which have been recommended recently by the American Electric Railway Association's committee of way matters.

As we are great believers in a more flexible foundation for all track construction we have adopted the concrete slab construction which is shown in plan 171 I-B, and have abandoned the concrete stringer con-

struction and the use of steel ties, composed of 4 by 6 in. angles and 10 in. channels, for the following reasons:—

It affords too rigid a construction and causes the rail to become cupped at the joints, and in case of intersections they pound out much more quickly than on a more flexible foundation.

Where concrete stringer and steel ties were used our experience has shown that the rail could not be renewed and still use the steel tie, because the holes in the tie, through which the bolts pass to fasten the rail, become rusted out, or if they do not become rusted any loosening of the tie in the concrete will loosen the grip of the concrete on the head of the bolt, the result being that it is impossible to remove the nut, therefore the bolts have to be cut off and others could not be used without excavating under the tie.

Almost invariably where the rails were placed directly on a concrete stringer with or without steel ties, but with tie rods, this type of construction has proved insufficient to withstand the constant vibration and pounding of cars over it, for in time it causes the cement to disintegrate or crack, thus allowing water to go into these cracks and the action of frost damaging the concrete to such an extent that the rails gradually begin to work their way down into same, in many cases as deep as 1½ ins., particularly so at the joints. In cases where we have used the concrete stringer construction at intersections we in many cases embedded inverted scrap rails so that the special work would rest on them without using any ties, and fastened to the inverted rail with special bolts. This type of construction has proved to give too rigid a foundation, which lessens the life of the special work, and the inverted rails cracked the concrete, with the same result as above.

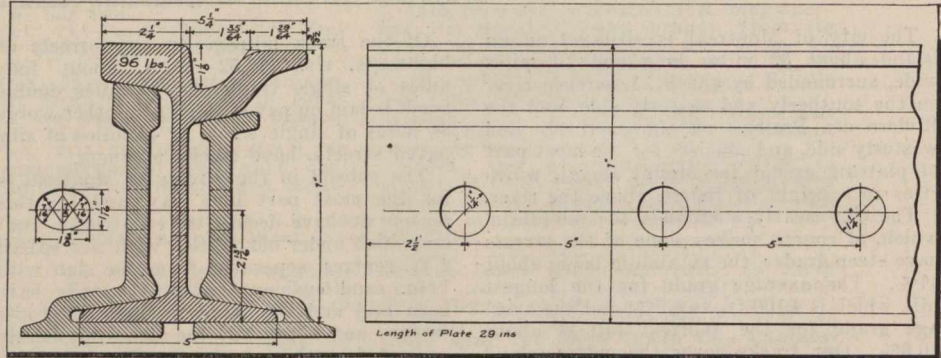
We suppose that our procedure in handling construction work is similar to other large

panies are organized in the same way, and our only idea for mentioning it is because we know of many railways where the engineering and construction departments are two entirely separated departments. The accompanying chart shows the present organization of the engineering and construction departments.

the engineering department decides on what work is to be recommended and gets up the detail estimates (except in emergency repairs, which are handled by the construction department without any estimate as to the work to be done and specifications to be followed) which are approved by the

be adopted during construction. As soon as any work has been authorized the engineering department gets out full detail specifications, copies of which are given to the Chief Inspector, who delegates an inspector to look after the particular job, a copy also being sent to the Assistant Superintendent of Construction, who in turn hands it to the roadmaster for the guidance of himself and foreman in charge of the work.

The general instructions that we give to our inspectors we think should be men-



Continuous Joints in 96 lbs. Girder Rails, Montreal Tramways Co.

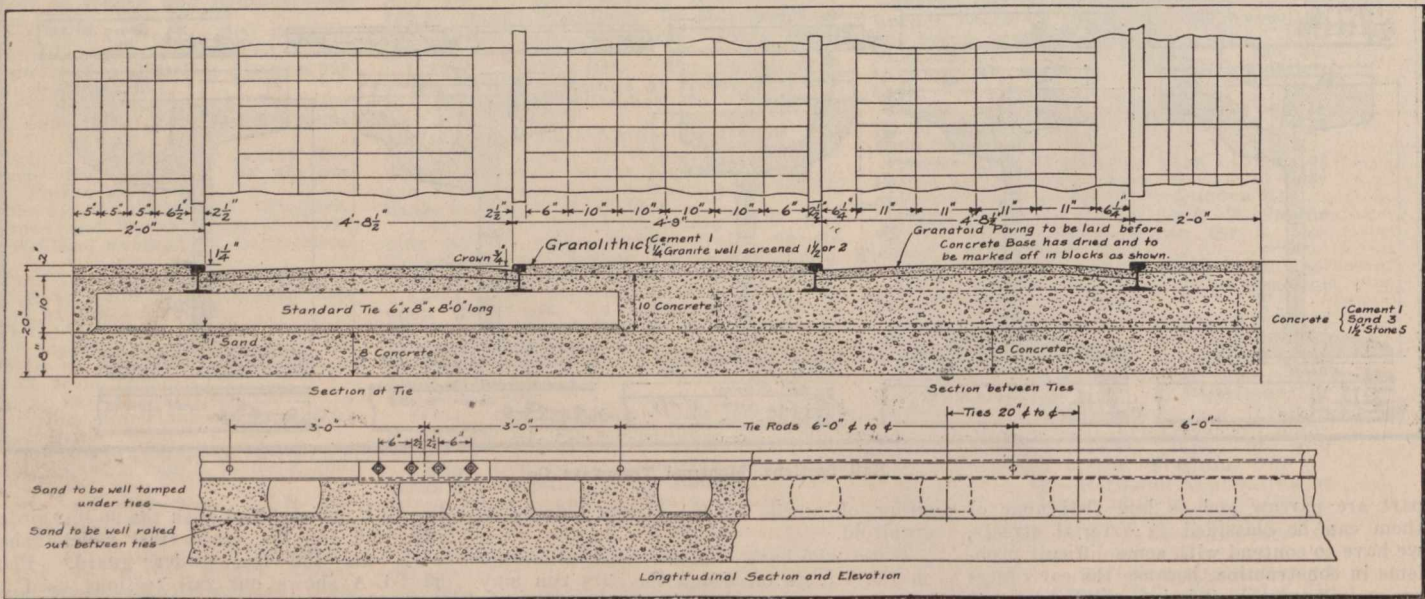
tioned in this paper. They are as follows:--

INSTRUCTIONS TO INSPECTORS.

1. FOREWORD. Careful inspection is a vital factor in securing safe and enduring work. No matter how well the engineer may design, his work will come to naught unless his design is accurately carried out by careful and skillful workmanship, with good materials, and it is the duty of the inspector to see that this is done. However, the inspector should bear in mind that it must be his object to help, and not to hinder, the work in progress.

In the following pages all work will be classified under separate headings, as given on form I-D 337.

2. REMOVING PAVING. Paving must be removed as specified, and care must be taken to see that blocks are piled in such a manner that



Granitoid Paving With 80 lbs. A.S.C.E. Rails, Montreal Tramways Co.

electric railway systems, but nevertheless we will endeavor to outline the methods used by us.

Our engineering and construction departments are under the direct charge of one head, the Chief Engineer and Superintendent of Construction, who reports direct to the General Manager. The engineering department is under the control of the Assistant Chief Engineer, and the construction department under the control of the Assistant Superintendent of Construction, who in turn report to the Chief Engineer and Superintendent of Construction. We find that it

they will not interfere with any other branch of the work.

This estimate is then summarized on form 193 and sent to the Comptroller, who in turn has a special form 66, which is sent to the General Manager for authorization. After receiving the General Manager's approval the Comptroller then sends on work order authorizing the work on form 251. This comes to the Chief Engineer, who signs same and sends it to the Assistant Superintendent of Construction with any special instructions he cares to issue, which are usually confined to the date when the work is to be started, or any special methods that are to

they will not interfere with any other branch of the work.

3. EXCAVATING CONCRETE. Concrete is to be excavated under three headings, which are to be specified and classed accordingly:—

(a) Picking:—As a rule, concrete will be excavated by picking, and in the first instance this will be found where, if either of the other classifications are to be followed or not, if the concrete is of medium thickness or is inclined to be soft, picking will be followed.

(b) Hammer breaking should be followed where the picking has loosened up a large block or where the concrete is unsupported by material underneath.

(c) Wedging is to be used where the block of concrete is exceptionally thick and starting of the wedge has been made by picking to be used

for breaking concrete into large blocks, such as can be lifted by the crane or broken by the hammer; also, in cold weather wedging will be found the better way to excavate the concrete.

4. EXCAVATING MACADAM. Care must be taken to see that the points and elevations as given by the company's engineers are followed exactly and report the foreman in charge of work if he allows his men to cart the earth in shovels in any distance beyond which it may be cast by the shovels, but if the distance is too long to be cast by the shovels, wheelbarrows are to be used.

5. REMOVING TRACK. Track to be removed as specified and all old rails, plates, switches, ties and other material to be carefully piled and marked

- (a) Blue for all material that is considered can be used again with economy and which would be classed as seconds, and
- (b) Red, material which cannot be used again

plies enough material for a section of slab reaching half way to the next adjacent stock pile, and they should not contain more or less material, otherwise a surplus remains to be cleaned up or a deficiency to be supplied by borrowing from another pile. A little care will ensure the proper distribution and more money is saved by not rehandling surplus or borrowed material. The inspector should confer with the foreman on the quantity of material thus to be piled and advise him.

Proportioning. The duty of the inspector is to make certain that the specified proportions are accurately and uniformly adhered to; the inspector should bear in mind that while splitting hairs is not warranted, slipshod and careless methods are not to be tolerated.

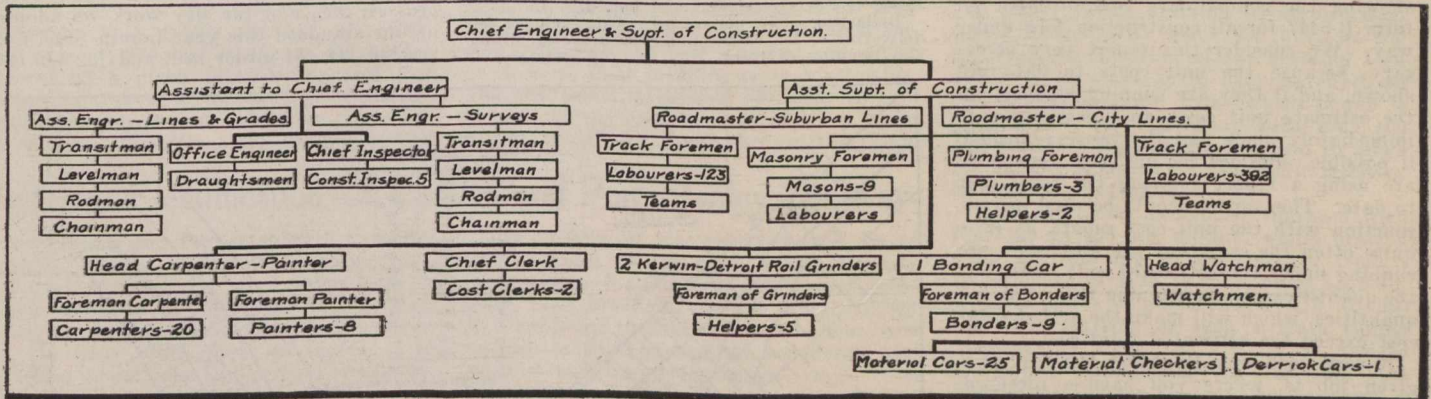
Mixing. See that the mixing operations are conducted according to a regular system, that is, to see that the proper mixture of sand, cement and stone is adhered to, and before any work

stone, and all ballast must be well tamped and rammed under the ties, especially under the rail and for one foot each side of the rail.

10. BACKFILLING. Specifications must be followed in this regard, where the backfilling consists of material from street or new macadam, it must be well rolled, and in the case of new macadam good sand must be used for blinding same.

11. PAVING. If old blocks are to be relaid they must be well cleaned and scraped, and after rails have been plastered with a mixture of sand and cement they must be laid as specified; care must be taken that paving is laid as uniformly as possible, and that no hollows or irregularities are left in the surface.

12. REMOVING EXCAVATED MATERIAL. Inspectors must see that excavated material is shovelled direct into cars and not carried in shovels. Dump cars should be used wherever obtainable, and loads on cars be distributed as



Organization Chart, Engineering and Construction Departments, Montreal Tramways Co.

and which is to be classed as scrap. In all cases when possible where the tie rods and bolts can be saved it will be necessary to see that the foreman does not allow his men in cutting off the nut to injure the bolt or tie rod; this is done so that tie rods and bolts can be used over again by the application of a new nut and having thread cleaned. All material to be taken away to stores yard and report made of same to office, and receipt to be taken from storekeeper. The different grades of material are to be piled separately in the yard, that is, seconds to be kept separate from scrap, tie rods and bolts to be delivered to the blacksmith's shop to fix up threads and have nuts put on.

6. LAYING TRACK. All track is to be laid on ties 2 ft. centres, standard gauge 4 ft. 8 1/2 ins., and standard devil strip to be 4 ft. 9 ins., unless otherwise specified. Joints must be suspended joints, that is, tie under each end of joint. If a gully or manhole will not permit the proper spacing of ties the stringers must be placed parallel with rail. Specifications as given by the engineering department must be followed absolutely and any deviation from same at once reported. All ties must be well spiked with four spikes, and in the inside of radius of rails of curves to be double spiked. Joints must be well hammered up to place and bolts installed. Care must be taken to see that bolts are not over-strained, and lock nuts must be used on all bolts. Tie rods must be installed on all rails above the 5 in. or 80 lbs. rail, 4 ft. centres and nut both inside and outside of web must be well tightened up and the track placed accurately to gauge.

7. CHANGING INTERSECTION. Inspectors must see that points given by the engineer are followed and special ties laid as shown on plan. No intersection will be laid without special ties except under the order of the engineer. Special heavy National lock nuts will be used on all intersections, and care must be taken to see that all bolts are of sufficient length to have at least the full length of the bolt in the nut. At all ends of intersections the high lip on the G.G. rail, which stands above the level of the head of the rail, must be cut down on an angle to meet the level of the rail; this cut should extend not less than 9 ins. on the angle.

8. CONCRETING. Storage of cement. The requisites for the proper storage of cement are protection from dampness and excessive heat. All cement must be piled on raised platforms or ties and covered with tarpaulins. Supplies of cement as well as other material must be piled as close to the work as possible, though traffic must not be impeded whatever in doing so.

Inspection of sand. Sand composed of round grains makes quite as strong mortar as does sand composed of angular or sharp grains, but if composed of a mixture of fine and coarse grains would be better, but between a coarse and a fine sand of one size of grain the coarse sand is better to use. All sand must be clean and sharp as possible.

Inspection of stone. Stone should be the size specified and free from dust or loam.

Distribution of stock piles. In slab work stock piles should be so distributed that each pile sup-

plies enough material for a section of slab reaching half way to the next adjacent stock pile, and they should not contain more or less material, otherwise a surplus remains to be cleaned up or a deficiency to be supplied by borrowing from another pile. A little care will ensure the proper distribution and more money is saved by not rehandling surplus or borrowed material. The inspector should confer with the foreman on the quantity of material thus to be piled and advise him.

Preparation of foundation. Foundation must be levelled off and compacted and must be thoroughly wetted down before any concrete is placed on it, as a dry foundation draws moisture from the concrete.

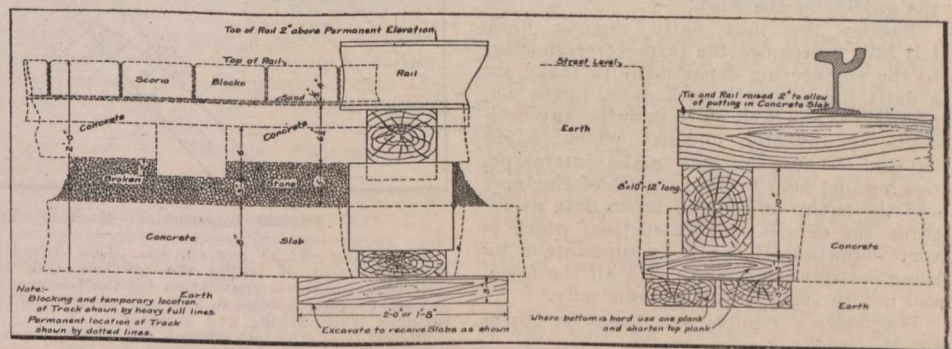
Wheeling. It is important that in wheeling concrete across tracks, boards or runways must be laid so that rails are not an obstruction to the passage of the barrows, as the added cost more than counterbalances the time lost in lifting wheelbarrows over obstructions, etc.

Placing. Wet concrete requires very little tamping or spreading, but care must be taken to see that it is well tamped under rails and ties

evenly as possible.

13. BONDING. All bonds to have brazed terminals, and all cable connections down centre of track must be brazed to each rail, 8 1/2 in., 12 in., and brazed cable bonds will be used as specified, and any deviation from this rule must be reported at once.

After the specifications as to how the work is to be carried on are issued the engineering department gets up the details for all the material required for the job on form 192, which is sent to the Purchasing Agent as well as to the Assistant Superintendent of Construction. The Purchasing Agent sends his copy to the Chief Storekeeper, as his authority for issuing the material shown thereunder, but only upon requisitions from the construction depart-



Blocking for Installing Concrete Slab for Intersection Work, Montreal Tramways Co.

and that the surface is brought up to the required grade and smoothed and evened, that expansion joints are to be left where ordered. Care must be taken not to have longer distance than 60 ft. in length of slab. At close of work at night all work must be brought to a finish at the end of a slab.

Wetting down. In hot weather concrete must be wet down once or twice each day for at least a week after it has been placed, in order to allow the inside concrete proper time to set and stop checking and cracking by uneven setting.

9. BALLAST. Unloading ballast. When ballast is to be spread out over a space of comparatively small area it is preferable to dump the cars using wings to spread ballast, but when material must be spread out to 200 to 300 ft., as in placing final material under ties, it is cheaper to drop car doors by pulling out cottor pin at end of levers and unload by hand the quantity required.

Ballasting. Specifications must be strictly adhered to in regard to depth of fill and size of

ment per form 15. It is the duty of the inspectors to see that the material received on the job is properly checked and reported to the Assistant Superintendent of Construction, also to see that old material is returned to the stores department for proper credit. In case the stores department order form 192 does not show the quantity of material required for the job, on account of some unforeseen change, it is immediately reported to the engineering department, which in turn makes out a supplementary statement and sends to the Purchasing Agent for him to instruct the storekeeper. This is done only after the original authorized estimate has been extended by the proper authorization from the Comptroller,

through the General Manager.

As soon as the work begins daily reports are sent to the construction department on form I-D 337, which are signed by the inspector, checker and foreman. This report must show the quantity of work done under each classification and the unit cost of same. It also shows the material received and sent away.

The daily reports are posted on form 999 by the cost clerk, whose duty it is to check the daily unit cost for each class of work, and to compute the total unit cost to date as the reports come in, also to enter up the material used on form B-6357.

The Chief Engineer and Superintendent of Construction is given a daily statement showing the comparative cost of labor on form B-5447 for all construction jobs under way. We consider this report very necessary, because the unit costs to date are shown, and if they are running higher than the estimate unit costs an investigation is immediately made and the cause remedied, if possible. Besides the unit cost report we are using a report showing the total cost to date. This report should be used in conjunction with the unit cost report, as it is quite often the case that the unit costs are running under the estimated unit costs, but the quantities are overrunning the estimated quantities, which will make the actual total cost exceed the estimated total cost.

A very good way to reduce the cost of a given job is, where you have a piece of double track to reconstruct, to have one foreman do one side, and after this is completed to change the foreman and gangs for constructing the other side. In one case where we did this the foreman who started the work was removed when it was time to do the other side, and the foreman who came to do the second track under the same specification reduced the total cost 12%. Of course the second foreman knew that he was being judged by the work of the first foreman, and he naturally tried to win out by beating the other man's labor cost. You can readily see that this brings about a healthy condition of affairs which is to the advantage of the company. We do not feel that this would be good practice for the best results in obtaining first class work, unless there is an inspector looking after the quality of the work.

Besides the unit daily reports, form I-D 337, we require the inspectors reporting to the engineering department to make out a daily diary of all work done, forces employed, etc., as well as to describe any accidents or anything unusual which might happen. These reports make interesting reading and help to keep the Chief Engineer and the entire office staff up to date as regards the details of construction, which is very important if one is to superintend by being entirely conversant with all the facts, and not to superintend in name only.

Watchmen's reports are kept on form 132 B.

Weekly record of tools is kept on form 171.

Accidents are reported on form 274.

We are of the opinion that we are getting the right kind of data as to cost keeping by the shortest methods, and one thing we are sure of, and that is, that we know what is going on at all times, which we feel would be impossible if we did not have the present system in force. We make it our aim to have a logical reason for doing everything and we are not afraid to say that we make mistakes, but we try not to make the same mistake in the same way the second time. We consider that by having the general instructions to inspectors carried out that it will continually aid in the reduction of the unit costs.

The unit costs of our work are affected

by traffic conditions:—

1. Keeping cars running.

2. Keeping streets open for vehicular traffic.

It is very seldom that we can have the full use of any street and the tracks for reconstruction purposes. We will now cite below some of our unit costs.

1. TRACK RENEWALS.

Of seven jobs the unit costs averaged, with traffic running, as follows:—These jobs estimated to cost a total of \$88,000.

- Taking up paving—17½c. per sq. yd.
- Excavation of concrete—\$2.02 per cu. yd.
- Excavation of macadam—60c. per cu. yd.
- Removing track—11c. per lin. ft. This includes entire work of taking up track and transporting material back to store yard.
- Tracklaying—18c. per lin. ft. This includes taking material from store yards, and laying track completely, spiked and bolted.
- Ballasting—88c. per cu. yd. This includes the delivering of the ballast and the surfacing, lining and tamping of track.

the tie, quantity small as compared to the labor. Laying concrete slab and concrete for paving base—\$1.75 per cu. yd.

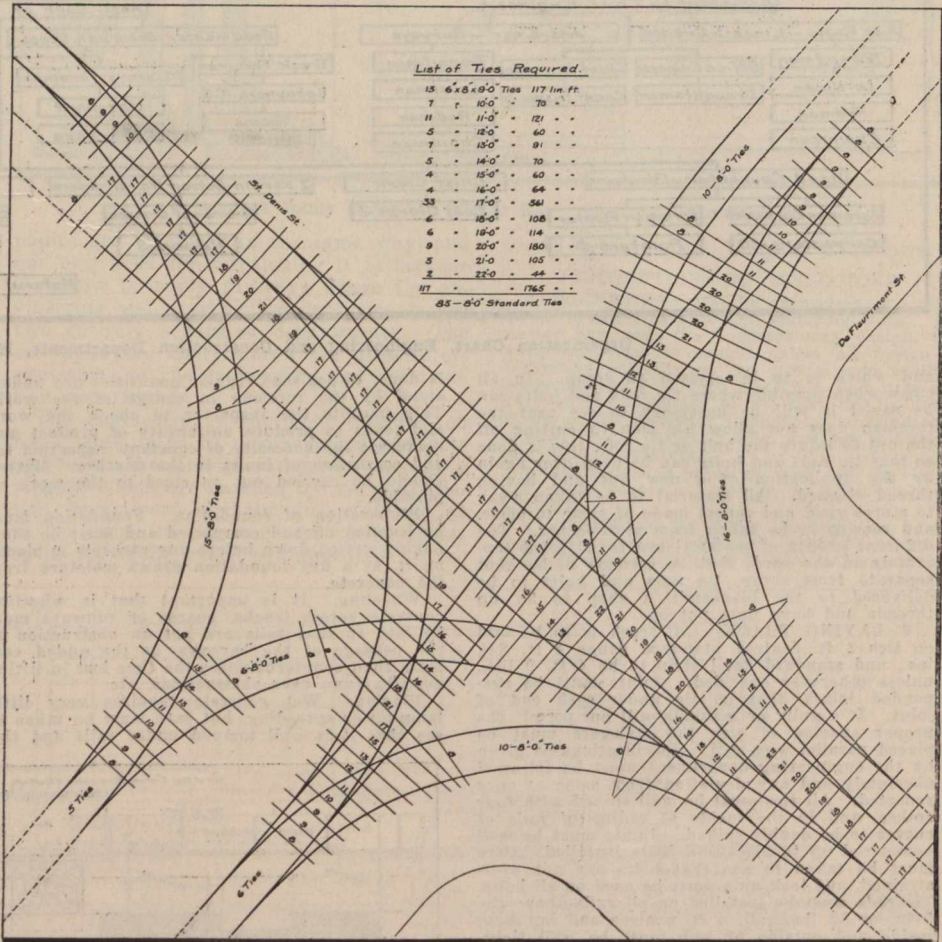
Paving, scoria block—37½c. per sq. yd. Removing excavated material, including transportation to dump—57c. per cu. yd. Unit cost dependent upon haul to dump.

Labor changing intersection averaged \$405 per intersection. This item includes taking new and old material to and from the store yard.

BONDING INTERSECTION.

- Stringing cable—3-5c. per lin. ft.
 - Drilling holes—8c. per hole.
 - Installing cable bonds—11 3-5c. per bond.
 - Installing brazed bonds—23c. per bond.
 - Grinding for bonds—17c. per joint.
- These two latter costs change depending upon traffic conditions.

Our intersections are mostly constructed of solid manganese steel to the rail sections specified for all switches, mates, frogs, crosses, etc., and for city work we adopted as our standard this year Lorain Steel Co.'s section 116-434 girder rail, and 132-443 G.G.



Typical Intersection, Montreal Tramways Co., Showing Layout of Ties.

Concreting—\$1.59 per cu. yd. This includes the labor cost of laying the concrete slab as well as the concrete foundation for the pavement.

Paving—Scoria blocks, 39c. per sq. yd. This includes labor, laying and grouting.

Backfilling—46c. per cu. yd. Including tamping or rolling.

Removing excavated material—61c. per cu. yd. This includes labor and transporting material to dump.

The bonding unit costs on the above jobs are as follows:—

Stringing cable—2c. per cu. ft. Includes transportation of material from the stores department.

Drilling holes for cross bonding—8½c. per hole.

Installing cable bonds (plug terminals)—16c. per bond.

Installing brazed bonds—14½c. per bond.

Grinding for bonds—8½c. per joint.

2. INTERSECTION RENEWALS.

On six jobs the unit cost ran as follows:—

Taking up paving—13c. per sq. yd.

Concrete excavation—\$2.55 per cu. yd.

Macadam excavation—\$1.13 per cu. yd.

Removing track—15½c. per ft. Laying track—43½c. per ft. These prices are high because the track laid was only 15 ft. on each end of the intersection, the quantity being small.

Ballasting—\$2.09 per cu. yd. This item is high because ballast is only one inch thick under

rail, which fishes together, thus doing away with compromise joints. We have given up the idea of having the outer rails of curves guarded, and all curves are made transition to gauge, namely, 4 ft. 8½ ins. We require the manufacturer when accepting an order to agree to the following guarantee:—

The manufacturer agrees to replace:—

- (1) Material in which defects develop within one year, at his sole expense.
- (2) To replace any part of a given intersection that fails within the second year, at 50% of its value.
- (3) To replace any part of a given intersection that fails within the third year, at 66 2-3% of its value.

The most difficult part of our track work to construct and maintain is the intersection work, because we always have to carry on the work by keeping the traffic running, and the headway of the cars is often very close, and when the vehicular traffic is added to this, the wear and tear in the roadbed is found to be enormous. The most essential thing requisite in an intersection is a good foundation, not that the most rigid founda-

tion is the best, as we have explained elsewhere, but it should be placed on a well drained sub-base, with good stiff construction (concrete slab) over it to support the ties, rails and pavement. Various methods of designing the foundations for intersection work have been tried and our experience teaches us that with a more flexible foundation the life of the special work exceeds the life when placed on a rigid foundation, and with this in mind we have adopted the concrete slab 8 ins. thick on a well compacted sub-base with 1 in. sand cushion between it and the ties. The same general type of construction as is used in our straight track work per plan 171 I-B referred to in the beginning of this paper. As cited above we are constructing all intersections with traffic running, the only time cars are stopped is during the actual removal of a given intersection, and the placing of the new intersection which is usually between 8 p.m. and 5 a.m. Some of the smaller intersections are changed in five

hours. We bring into use to a great advantage in changing the steel work of the intersections a five ton electric traction crane. When we have an intersection to renew we confer with the Superintendent of Transportation as to the most convenient time for him to give us full use of the particular location in order to divert the traffic by other routes. As soon as the date is arranged when the cars can be diverted, we start removing the paving blocks, and after this work is completed we arrive on the job on the appointed day at 8 p.m. with the electric traction crane and all material loaded on flat cars. As soon as the joints have been disconnected the crane car begins to remove the intersection and place the pieces on the side of the street. After they have all been removed the crane hoist begins to unload the new material and set it as close to final position as is practicable. The new work is painted in colors to correspond to the corners at which it is to be finally placed, as shown by erection plan.

ing St. Thomas on the hour. In this way, three passenger cars, two of which also carry baggage and express, would give a half hourly service between London and St. Thomas, and an hourly service between St. Thomas and Port Stanley, which would probably meet the most exacting requirements for ordinary traffic.

As to the type of car, it is believed that one having a weight, loaded, of approximately 40 tons, would give the requisite characteristics for safety and easy riding qualities so much desired in interurban railway service. Such a car would call for an equipment of four 100 h.p. motors (nominal rating), with a full speed (45 to 50 miles an hour) requirement of about 150 e.h.p. The power, while starting or accelerating, would momentarily reach 300 k.w., or 400 h.p., but the duration of the starting load would be so short as to have no effect on the 10 minute peak under which power is purchased. The equipment with four 100 h.p. motors gives sufficient margin to allow for hauling a trailer, if the traffic is heavy enough to warrant it.

A 60 to 75 ton locomotive equipped with four 125 to 150 h.p. motors, would draw a train of from 700 to 800 tons, or from 8 to 10 loaded cars, at 15 to 25 miles an hour, with a power requirement of 175 to 250 k.w., the starting of such a train taking momentarily about 500 k.w. This freight locomotive would make the run from Port Stanley to London in from an hour and a half to an hour and 50 minutes, allowing for stops at such points as would be necessary in permitting passenger cars to go by it.

Ordinary conditions of traffic, represented by three passenger cars and one freight train, would require approximately 600 k.w., on a ten minute peak basis, with momentary peaks of twice that amount. Allowing for transmission and conversion losses, this would amount to approximately 1,000 h.p.

It is estimated that, for handling heavy passenger traffic in summer, each passenger car will be supplied with a trailer, and a half hourly service maintained from London through to Port Stanley; and, in addition to the above, a fifteen minute shuttle service could be maintained between St. Thomas and Port Stanley, at such periods of the day when the traffic warrants it.

With the equipment and service as indicated above, and with a proper charge for the service, it is believed that the passenger earnings alone should amount to over \$100,000 a year. According to the records furnished for 1910, the London and Port Stanley Ry. carried a total of 168,577 passengers, with a mileage of 3,183,466, an average travel of 18.89 miles per passenger, with a corresponding average revenue of 20.82c., or practically 1.1c. per passenger mile. October shows a passenger mileage of 100,990, with an earning of \$2,071.30, or over 2c. per mile. November shows a passenger mileage of 121,522, with an earning of \$1,290.80 or practically 1c. per mile, the mileage being 20% greater, and the revenue 40% less, than the preceding month.

A comparison with the London and Lake Erie Ry. and Transportation Co., which earns \$120,000 a year from passengers, mail, express and small freight, seems to indicate that the London and Port Stanley Ry., with its far superior service and schedule, as given below, can easily earn over \$100,000 from the same class of service. It is estimated that, with the superior service and schedule proposed, the passengers carried over this road will not be less than 450,000 a year, and that the haul will be about 18 miles. The passenger traffic, at a rate of 1.5c. per mile, will give a revenue of \$121,500 a year.

Proposed Electrification of London and Port Stanley Railway.

The London and Port Stanley Ry., which connects London and Port Stanley, Ont., is owned by the city of London and is leased by the Pere Marquette Ry., as successor to the Lake Erie and Detroit River Ry., the lease being about to expire. The following report, based upon instructions by the engineers of the Ontario Hydro Electric Commission and S. B. Storer, consulting engineer, Syracuse, N.Y., has been submitted to the London city council by Hon. Adam Beck, M.P.P. for London and Chairman of the Ontario Hydro Electric Commission:—

The track is in very bad condition, and it will be necessary to entirely reconstruct it, as the rails and ties are of no value other than scrap. The buildings are in fair condition, and, with a moderate outlay for repairs, can be made to answer the purpose of the road after electrification.

The amount expended by the city of London on the road is \$765,311.00. Physical statistics, revenue and operation of the present road under steam are as follows:—

Length of line	23.66 miles.
Length of track	33.69 miles.
Freight carried	572,000 tons.
Revenue from freight	\$ 92,132.00
Passengers carried in 1910	168,577.
Revenue from passengers for 1910	35,097.00
Total earnings for 1911	141,264.00
Total earning for 1910	127,859.00

Operating expenses for 1910	\$138,131.00
Rent, taxes and percentage earnings paid the city	19,919.11

Total operation, including rentals, taxes, etc., but not including fixed charges	\$158,050.11
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Of the above operating expenses, over \$50,000 was for fuel and repairs to locomotives and cars, and \$22,000 for pay of conductors, enginemen, brakemen and switchmen.

The London and Lake Erie Ry. and Transportation Co. operates between London and Port Stanley, with a length of main track approximately 15% greater than that of the London and Port Stanley Ry. The equipment in use consists of 12 passenger cars, closed; 10 freight cars, and two work cars. It carried in 1910, 637,861 passengers and 5,811 tons of freight, from which were obtained a revenue of \$103,835.50 for passengers, and \$12,513.00 for freight, together with miscellaneous earnings, giving gross earnings of \$122,988.92. The total operating expenses, including general expenses, rentals, insurance, etc., was \$77,699.78. The above expenses do not include fixed charges on capital. The capital is \$2,700,000, of which \$2,000,000 is stock, and \$700,000 bonds. This makes a capital expenditure of \$93,103.44 a mile.

The system of electrification will be of the overhead trolley type, using catenary construction, 3 point suspension, with wood poles, steel brackets, and 40 copper trolley. It is proposed to double track the line from London to St. Thomas, the remaining portion of the line being single track from St. Thomas to Port Stanley, the present road to be entirely reconstructed and replaced by new 80 lb. rails. The proposed overhead trolley system will be operated at 1,200 volts, d.c., with the substations located at London and at or near the Hydro Electric Power Commission's transformer station north of St. Thomas.

The proposed schedule of trains gives a high speed half hourly service between London and St. Thomas, and an hourly service between Port Stanley and St. Thomas, with freight locomotives running at the same time. Every other car is of the combination passenger, baggage and express type, making the run, with all stops between London and Port Stanley, in 54 minutes. A limited passenger car makes the run, without stops, between London and St. Thomas in 24 minutes. A summer schedule is also estimated upon, which gives a half hourly service between London and Port Stanley, with every car carrying a trailer, if necessary. It is also possible, with the equipment which has been provided, to give a 15 minute shuttle service between Port Stanley and St. Thomas, for especially heavy traffic.

The following car equipment has been estimated upon:—Six passenger cars, half of which is the combination passenger and baggage type, with each having four 100 h.p. motors and a multiple unit control for a maximum speed of 50 miles an hour. Four locomotives of 60 to 75 tons, equipped with four 125 to 150 h.p. motors, multiple unit control, and for ordinary speeds of 15 to 25 miles per hour while hauling a 750 ton train. Two snow plows and six trailers.

The above train schedule will handle the traffic under ordinary conditions for both freight and passengers. It comprises a local service combination passenger, baggage and express car leaving London on the hour, and stopping at all stations between London and Port Stanley, the complete run being made in 54 minutes. The trip from Port Stanley to London begins on the hour, and requires the same time for completion, giving a round trip every two hours. A limited passenger car leaves London on the half hour, and makes the run to St. Thomas in 24 minutes, no stops being made between these two cities. The return trip is made in the same time, leav-

From reliable information received, it is estimated that the freight traffic of the London and Port Stanley Ry. for 1911 was as follows:—572,000 tons of general freight over the Pere Marquette Rd., and not less than 150 to 200,000 tons of general freight carried by the Michigan Central Rd. over this road, or a total freight traffic of from 720,000 to 772,000 tons. About 400,000 tons of coal and steel were handled through Port Stanley, and, in addition to this, 150,000 tons of coal came through St. Thomas to London to Rondeau. The general merchandise was probably in the neighborhood of 200,000 tons, as it was 160,000 tons in 1909. The total tonnage during 1911 appears to have been as much as 750,000 tons, although the detailed reports do not so indicate. The reports show that the gross revenue during 1911, for the 572,000 tons of freight carried, was \$92,131.73. This is equivalent to 14.8c. per ton hauled, or a revenue of .9c. per ton mile for all classes of freight, on an average haul of 16.5 miles. It is estimated that an average minimum revenue of at least 40c. per ton will be obtained for first and second class freight, and 16c. per ton for coal and steel. The revenue from coal and steel, estimating on 400,000 tons hauled at 16c., is \$64,000, and from 200,000 tons of general merchandise, \$80,000, after allowing for car rentals, etc., or a total freight revenue of \$144,000. The rate used for general merchandise is very low, and would be found to be higher under operation.

The following estimate covers reconstruction of the present road from London to Port Stanley, using 80 lb. rails, and double tracking from London to St. Thomas, including overhead catenary construction, three point suspension, no. 40 trolley, substation and substation equipment, and the necessary feeder system.

Reconstruction of track and new track, and repairs to buildings	\$ 442,573
Overhead construction and bonding ..	129,000
Passenger car and locomotive equipment	235,000
Substation feeder equipment and new freight shed or warehouse for Port Stanley	84,000

Total capital expenditure for new construction and reconstruction track..\$ 890,573

The car equipment estimated upon is as follows:—Three combination cars for the accommodation of baggage, express and passenger traffic, together with three cars for passengers alone, each one of these cars being equipped with 4 100 h.p. motors suitable for operation at 1,200 volts d.c. and with multiple unit control, so that two or more cars could be operated as a train if so desired. Four 60 to 75 ton locomotives equipped with 4 125 to 150 h.p. motors with multiple unit control. Six trailer cars for operation with motor cars. Two snow plows. Estimated at a total of \$235,000 for equipment. All of the above cars and locomotives are provided with air brake equipments.

The following operating expenses have been estimated:—

Superintendence, administration, labor maintenance of track and equipment	\$ 70,000
General expenses	30,000
Power	30,000
Interest and sinking fund, at 6.3% on \$890,573	56,106
Interest, at 4%, on moneys expended on present road, \$765,311	34,439

Or a total operating expenditure and fixed charge of

\$220,545
In maintenance of expenses an allowance is now made for oiling right of way.

SUMMARY OF THE ESTIMATED REVENUES AND OPERATING EXPENSES:

Net revenue from freight	\$140,000
Net revenue from passengers	121,500

Total gross revenue

\$261,500

Estimated operating expenses

\$130,000

Estimated interest and charges on capital expenditure	90,545	220,545
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Excess earnings over operation

\$ 40,955

From the above it is estimated that the road, under ordinary traffic conditions, will have excess earnings over operating expenses of \$40,955, which can be used for the redemption of bonds and depreciation.

The double tracking of the line from London to St. Thomas will answer the requirements of traffic for some time to come. In any event, should the conditions warrant it, the double tracking between St. Thomas and Port Stanley can be carried out at any time in the future without interfering with the operation of the road.

On the present right of way the grades and curves are small, giving an excellent road for a fast and safe passenger schedule between the cities. The cleanliness which is attendant upon electrical operation of the road will be an inducement to greater passenger traffic, and the more frequent service will add considerably to the business of the road.

I have slight hesitation in saying that with the freight traffic of the present road, and the increased passenger traffic, which I have no doubt will maintain, that the road can be made to pay a good profit after electrification.

The following are comparisons of operating expenses and estimated earnings under the assumed conditions, showing the results of operation:—

1. The estimated operating expenses and earnings when operated by an independent company or commission, this commission or company paying a rental to the city of \$20,000 a year. The freight and passenger service, as shown above, have been used in this estimate.

Operation and maintenance of road..	\$ 130,000
Interest and sinking fund on \$765,311..	56,106
Rental to city	20,000

Revenue from operation, as given above

261,500

Or excess earnings over operating expense

\$ 55,394

2. This estimate covers the same equipment as used in estimate 1, but the earnings from the haulage of coal and steel have been omitted.

Operation and maintenance of road..	\$ 130,000
Interest and sinking fund on \$890,573..	56,106
Rental to city	20,000

Total operating expenses

\$ 206,106

Earnings from passengers and freight other than coal

201,500

Giving an excess operating expenditure over earnings of

\$ 4,606

The operating expenses in this case can readily be reduced from \$4,000 to \$10,000, as the locomotives will not be required for the hauling of coal and steel from Port Stanley.

3. The equipment estimated under this comparison is the same as 1 and 2, with the exception that a single track only is constructed between London and St. Thomas. No earnings are estimated from the hauling of coal from Port Stanley. A single track line from London to St. Thomas would be satisfactory for the passenger service when the freight haulage is reduced to general merchandise between London and St. Thomas.

Operation and maintenance of road ..	\$ 125,000
Interest and sinking fund on \$615,000..	38,745
Rental to city	20,000

Total operating expenses

\$ 183,745

Earnings from freight and passengers, as per no. 2

201,500

Excess earnings over operating expenses

\$ 17,755

The report was discussed at a meeting of the London Board of Trade, Nov. 11, when a committee of citizens was appointed to enquire into the whole matter and obtain further information.

Following up the above action representatives of the Canadian Northern Ry., or Mackenzie, Mann and Co., appeared on the scene and asked for a conference with the L. & P.S. Ry. board, which is composed of representatives of the city of London. On Nov. 25 it was stated that such a conference would be held a few days thereafter, and that propositions to buy the line or to lease it would be submitted.

Hull Electric Railway Employes' Wages, Etc.

The conductors and motormen of the Hull Electric Co., which operates between Ottawa, Ont., and Aylmer, applied to the Minister of Labor a short time ago for a board of conciliation under the Industrial Disputes Investigation Act. The board appointed consisted of Peter McDonald, chairman; G. D. Kelly, representing the company, and G. C. Wright representing the men. The wages heretofore paid conductors and motormen were as follows: 1st year, 19c. an hour, 3rd year, 20c. an hour; 5th year, 21c. an hour.

The men asked that they be paid the same as the Ottawa Electric Ry. employes and submitted the following rates, viz.:—25 cents an hour for week days; 27 cents an hour for Sundays; time exceeding 10 hours, time and a half. The board of conciliation unanimously recommended that the following scale take effect Nov. 1:—First year men, 20 cents an hour; second year men, 21 cents an hour; third year men 22 cents an hour; men employed over three years 23 cents an hour. That motormen and conductors requiring an overcoat shall be supplied with one by the company every two years, the cost to be borne half by the company and half by the employe, this not to interfere with the present arrangement of supplying uniforms. That the company furnish each conductor with \$25 worth of tickets and cash to make change each day, each conductor to give a bond therefor. The award to be in force for 2½ years. The board considers that in view of the different conditions of employment and the difference in cost of living the new scale is practically equal to that paid by the Ottawa Electric Ry.

The following important recommendation was also made: "The members of the Board are of the opinion that in view of the proposed increase of wages, and considering the financial condition of the company, as shown by its annual statement, and the evidence given before the board, the company would be justified in increasing its charge for fares."

Proposal for Municipal Electric Railways in Ontario.

At a meeting of the Ontario Municipal Electric Association, in Toronto, Nov. 15, G. R. Geary, city counsel of Toronto, who presided, said it had been called to consider if some plan similar to that by which the lighting and power plants of the province had been developed under the Hydro-Electric Power Commission could be devised with reference to the transportation problem.

Hon. Adam Beck, M.L.A., said the Hydro-Electric Commission would be only too pleased to help along the movement suggested. There were many difficulties in the way, for instance, the government had in the past only leased the right of way for its

transmission lines, in many places. It was intended in future to purchase these outright. There was no reason why electric railways, like other public utilities, should not be successfully operated by the people. He thought, however, that if it were the wish of the meeting that the commissioners should study and report upon the suggestions made for the establishment of lines of light railways for freight and passenger traffic it should only be asked to report upon the cost of construction, operation and probable revenue. The matter of financing should be left over to be dealt with separately.

The following resolution was adopted: "That it is desirable that a system of electric railways, including street railways, to be owned by the municipalities, be established and built, and further, that the Hydro-Electric Power Commission be requested to look into the advisability and practicability of building such a system and to furnish a report thereon to this association. In order that the request to the Commission be made definite, it is further suggested that the initial report should refer only to roads following the hydro high tension transmission lines of the Commission at present existing as contemplated in the Niagara power zone, extending throughout Western Ontario and the midland district. It is desired that the report shall cover cost of construction, cost of operation and probable revenue in each case."

Berlin and Waterloo Street Railway Dispute

The town of Waterloo, Ont., brought a suit recently against the neighboring city of Berlin to enforce accounting under an agreement dated Jan. 18, 1910, respecting the operation of the Berlin and Waterloo St. Ry. Chancellor Boyd gave the following judgment Nov. 8: "The agreement as a whole makes provisions for the operation of the street railway between the municipalities, the railway itself being owned and operated by defendants. Clause 20 provides that Berlin shall pay to Waterloo one quarter of the annual net profits earned by the railway, on Jan. 1 of each year. The complaint is that Berlin has wrongly assumed to make deductions from the total profits, 'under the guise of taxes,' and has so reduced the amount properly payable to plaintiff; and also, with like effect, the defendant has charged to maintenance several sums which should have been properly charged to capital, and otherwise has failed fully to account for other profits. A general accounting is asked, with special declarations of liability. The defendant pleads as a matter of law that the court has no jurisdiction. The objection is well taken, and the action should stand dismissed, with costs. This, of course, without prejudice to any further application being made to the Ontario Railway and Municipal Board."

London Street Railway Adheres to Steam Power.

The London (Ont.), Street Ry. has definitely decided not to use Hydro-Electric power, but to increase its present steam plant, and it has bought a 500 k.w. generator direct connected to an Allis cross compound condensing engine. As direct current turbines of such small capacity are still in somewhat of an experimental stage it was considered best to buy the unit above mentioned. The engine is of such a size that a low pressure turbine could be installed at any time to work satisfactorily with it.

Negotiations for the use of hydro-electric

power by the London St. Ry. have been carried on for the past three years. The company installed at considerable expense a graphic recording watt meter showing the exact load conditions. The results obtained by these charts for a whole year were very carefully analyzed and comparisons made as between hydro-electric power and what could be done with steam machinery, the results showing a difference of from \$6,000 to \$8,000 a year in favor of the steam plant. The London St. Ry. condition is somewhat different from that of the Galt, Preston and Hespeler St. Ry., and the London and Lake Erie Ry. and Transportation Co., which have adopted hydro-electric power, inasmuch as the London St. Ry. would have to suffer the loss in conversion from alternating current to direct current. The other roads mentioned already suffered that loss in their own generation of power, and this may explain why they could use hydro power satisfactorily while the London St. Ry. could not.

Order Respecting Winnipeg, Selkirk and Lake Winnipeg Railway.

There has been a long standing dispute between the city of Winnipeg and the Winnipeg, Selkirk and Lake Winnipeg Ry., a subsidiary of the Winnipeg Electric Ry., respecting the use of a portion of Main street north for freight purposes and the alleged blocking of traffic by the electric railway cars. In June the city applied to the Public Utilities Commissioner, H. A. Robson, in connection with the matter, who has recently issued an order disposing of it, the following being the principal points decided. The interurban company (the Winnipeg, Selkirk and Lake Winnipeg Ry.) is to build a double track line along Main street from the south boundary of Kildonan parish, lot 3, to the city's northerly limit, these tracks to be a continuation of the Winnipeg Electric Ry. After a reasonable time for the construction of these tracks has elapsed the interurban company's present single track is to be removed from the west side of Main street, together with all appurtenances, freight accommodation, etc. The Winnipeg Electric Ry. is always to have the use of the line to be built by the interurban company, on terms to be agreed on. The interurban company is authorized to establish a terminal station on lots 1 to 14, in block 1 and lots 1 to 34 in block 2, of Kildonan parish, lot 4, and to build tracks from its line into the station. The interurban company may use the Winnipeg electric railway tracks on Main and Athol streets, etc., for turning cars, and is to be provided with facilities for receiving and discharging passengers there. The double track to be built by the interurban company is to be used by the Winnipeg Electric Ry., and the same facilities for passengers on Main street in the present city limits shall be afforded north of the former city limits as south of it.

Levis County Railway Report, Etc.

The financial statement for the year ended June 30, presented at the annual meeting recently, showed receipts \$71,523.86; expenses, \$61,424.74; surplus on operation, \$10,099.12. The interest on bonds and compound interest on loans, etc., was \$12,907.13, leaving a profit and loss debit for the year of \$2,808.01. The profit and loss debit at June 30, 1911, was \$32,213.11, making the total debit at June 30, 1912, \$35,021.12.

The officers and directors for the current year are:—President, S. H. Ewing; Vice President, Hon. R. Turner; other directors,

J. A. Richardson, J. Forman, J. C. Blouin, C. E. A. Jones; Secretary-Treasurer, E. A. MacNutt.

Too Late For Classification.

Winnipeg Electric Ry.—Winnipeg press dispatches state that the company has refused the Reese syndicate's offer for the property.

Chatham, Wallaceburg and Lake Erie Ry.—Press reports state that Mackenzie, Mann and Co. interests have obtained an option on this line, which runs from Wallaceburg, Ont., to Erie beach, on Lake Erie, 32.85 miles, with a short branch to Paincourt.

Halifax Electric Tramway Co.—The deal whereby the control of this company passes to E. A. Robert, President, Montreal Tramway Co., and his associates, has been completed, the stock acquired by them having been taken over at 160. The city of Halifax now wants to obtain control, and it is suggested that 170 be offered for the stock, and that if he refused the legislature be asked to authorize expropriation.

London St. Ry.—Gross earnings for Sept., \$29,541.07; expenses, \$17,656.01; net earnings, \$11,885.06; deductions, \$2,371.25; net income, \$9,513.81; for October, gross earnings, \$25,668.78; expenses, \$17,890.65; net earnings, \$7,778.13; deductions, \$2,450; net income, \$5,328.13. Aggregate gross earnings for ten months ended Oct. 31, \$252,775.14; expenses, \$173,831.86; net earnings, \$78,943.28; deductions, \$24,089.75; net income, \$54,853.53.

A Trackless Trolley System, which is said to be the first to be established in Scotland, has recently been placed in operation in Dundee. It is similar in general to other installations which have lately been made in several parts of Great Britain. The cars travel on the highway with a considerable lateral range of motion and obtain their power from overhead wires through two trolley poles, one of them and one wire acting as a return for the current. The cars weigh 3½ tons and accommodate 28 passengers. Two cars are in operation on the Dundee line. The cost of the installation per mile is said to be about one tenth that of an ordinary electric railway system. The principal use of the lines is contemplated to be as feeders to the regular city lines of public conveyance.

The Calgary Municipal Ry. has received three single end, double truck, p.a.y.e. cars from the Preston Car and Coach Co.

The Toronto and York Radial Ry. has received three double end, double truck, p.a.y.e. car bodies from the Preston Car and Coach Co.

The Cape Breton Electric Co. has granted its motormen and conductors the following increases in wages:—First year men from 18c. to 20c. an hour, second year men from 20c. to 21c., third year men from 21c. to 22c., over three years from 22c. to 24c.

The Quebec Ry. Light and Power Co. has granted its motormen and street car conductors an increase of 1½ cents an hour dating from Nov. 1, and an additional 1c. an hour dating from Jan. 1. The question of the recognition of the union and the taking back of discharged employes is being made the subject of an arbitration.

JAMES ANDERSON, General Manager, Sandwich, Windsor & Amherstburg Ry., expects to sail from New York on the s.s. Cedric, Jan. 21, for a trip to the Mediterranean.

The taxpayers of London, Ont., may be asked to vote, Jan. 1, on a bylaw to raise \$890,000 for the electrification of the line to Port Stanley.

Electric Railway Projects, Construction, Betterments, Etc.

The Bowness Improvement Co. is making application to the Alberta Legislature for an act of incorporation empowering it among other things to build railways other than steam in the subdivision of Bowness, near Calgary. Jones, Pescod and Adams, Calgary, are solicitors for applicants.

Berlin and Northern Ry.—The ratepayers have defeated the bylaw, approved by the Berlin, Ont., town council, authorizing a contribution towards the building of a bridge at Bloomingdale in connection with the extension of the company's line. (Oct., pg. 520.)

Brandon Municipal Ry.—The city engineer, reporting to the Brandon, Man., city council, Nov. 1, stated that the track work, so far as projected, was practically finished. A good deal of the overhead work has been got in place, and the remainder would be gone on with during the winter. Nothing has been settled as to the power for operating the line, or the ordering of cars. It is stated that the lines will be put in operation May 1, 1913. (Nov., pg. 573.)

British Columbia Electric Ry.—Two additional extensions of the lines in the vicinity of Vancouver have been placed in operation. The first is in the Fairview section, and the second serves A.L. 472, South Vancouver, and the Sixteenth avenue district.

Plans are being prepared, according to press reports, for a line from Clayburn to Mission City. Arrangements have been made for the survey of a line from New Westminster to Port Moody, and G. R. G. Conway, Acting General Manager, informed the New Westminster city council, Oct. 31, that as soon as the reports were received the company would be in a position to give definite consideration to the question of the desirability of its construction.

A draft agreement for a consolidation of the company's franchises, embodying conditions that have been accepted by the company, has been prepared. The mayor claims that Vancouver is not ready for a consolidation of franchises, but he will not oppose the submission of the agreement to a vote of the ratepayers.

The second unit of the new Jordan river power plant on Vancouver island has been put in operation. The company is now supplying 12,000 h.p. to Victoria, and is completing a 6,000 h.p. plant at Tod inlet. The Jordan river plant is to be doubled immediately.

The new line from Willows to the Uplands section of Cadboro bay, Victoria, was expected to be put in operation Nov. 30. A right of way has been secured for a further extension of the line. (Nov., pg. 573.)

The Vancouver city council, Nov. 8, declined to take up for discussion the report of the special committee on the proposed consolidation of the company's franchise in Vancouver.

Calgary Municipal Ry.—The Calgary, Alta., city council is considering recommendations for the expenditure next year of \$450,000 upon extensions of the municipally owned electric railway. (Nov., pg. 573.)

Chatham, Wallaceburg and Lake Erie Ry.—Press reports state that the directors have plans under consideration for the extension of the line to Sarnia, Ont., on the north and Blenheim on the south. (Jan., pg. 38.)

Eastern Ontario Electric Ry.—Application is being made to the Ontario Legislature to extend the time within which the company may build the lines authorized

by chap. 184 of the statutes of 1909, and to change the provisional directors. (May, 1909, pg. 367.)

Edmonton Interurban Ry.—We are officially advised that the company is building the first section of its projected lines, viz., from Edmonton to St. Albert, Alta., about ten miles. The contractors are pushing the grading ahead as fast as possible so as to have it completed this year. An order for 1,000 tons of steel rails has been placed. In the event of the operation of the line being successful it is expected that arrangements will be made for the building of other branch lines radiating from Edmonton.

It is intended to operate gasoline electric cars on the line, but no orders have yet been placed for cars.

The officers and directors of the company are:—President, G. Barbey, President Franco-Canadian Corporation, Vancouver, B.C.; Vice-President, J. H. Picard, Edmonton; other directors:—M. Kimpe, Edmonton; L. Bureau, Paris, France. (Nov., pg. 573.)

Edmonton Radial Ry.—We are officially advised that the construction of the projected extension of the line to St. Albert, Alta., depends upon a satisfactory arrangement being made between the two corporations. Negotiations are in progress and, if they result satisfactorily, construction will be started in the spring, and the line should be completed and in operation by Jan., 1914. (Nov., pg. 573.)

Farmers Interurban Ry.—Application is being made to the Quebec Legislature for the incorporation of a company with this title to build a railway from Riviere des Prairies to Ste. Anne de Belleville, Que.; and from St. Laurent to St. Jerome, Que., with branch lines; to connect the same with any existing railway, and to operate them by steam, electricity or any other motive power. Loranger, Loranger and Prudhomme, Montreal, are solicitors for applicants.

Halifax Electric Tramway Co.—Press reports state that the new interests in control of the company will spend a considerable sum upon the betterment of the lines. (July, pg. 367.)

Hamilton Radial Ry.—According to press reports the project of building an electric railway round the north shore of the bay from Hamilton to Burlington, Ont., is again under consideration. It is said that the plan involves the utilization of the present line to Burlington as a branch of the Hamilton Street Ry. (June, pg. 308.)

Hamilton Street Ry.—E. P. Coleman, General Manager, is quoted as stating that the company proposed to extend its tracks along Barton street to Kenilworth and on to the Hamilton Radial Ry., near the site of the National Car Co.'s plant. The matter was discussed with the Hamilton city council's committee on street railways, Nov. 1, and it is said that the line will be built as soon as certain legal difficulties are straightened out. (Oct., pg. 520.)

Imperial Traction Co.—Application is being made to the Dominion Parliament for an act to authorize the building of the following additional lines:—From Smithville, in Lincoln county, to Bridgeburg, Welland county, and from Hamilton to Toronto. Harding and Owens, Stratford, Ont., are the solicitors. (June, 1911, pg. 555.)

Kingston, Portsmouth and Cataraqui Electric Ry.—While an understanding has been reached between the company and the Kingston, Ont., city council as to the laying of the new road bed, some further

information is to be secured before the necessary bylaws are prepared for submission to the taxpayers. (Nov., pg. 573.)

London and Northwestern Ry. of Canada.—Press reports from London, Ont., state that this company's charter has been acquired from D. A. Stewart by Canadian Northern Ry. interests. The company has power to build a line from London to Sarnia, with a number of branch lines. (Oct., pg. 520.)

Medicine Hat, Alta.—The terms of the proposed agreement with Sir Max Aitken and associates for a street railway franchise in Medicine Hat have been put into writing, and are being given a final consideration. Representatives of a British financial firm are asking for an opportunity to submit an alternative proposition. (Nov., pg. 573.)

Moncton Tramways, Electricity and Gas Co.—Track is reported laid on the Mountain road extension of the line in Moncton, N.B., as far as the bridge, and the overhead work has been completed. It is expected that the extension will be opened for traffic early in December. (Oct., pg. 520.)

Montreal and Southern Counties Ry.—The Minister of Railways has approved of route map for extension of the line through Greenfield Park municipality, 2.25 miles.

The Montreal city council has granted the company permission to extend its lines in the city across McGill street and along Youville square. It has also granted permission to carry farm produce as freight.

W. B. Powell, Vice-President and General Manager, is reported to have recently stated that it was expected to have the company's line to Richelieu in operation by Nov. 30. The greater part of this 17 miles of line is over the right of way of a section of the Central Vermont Ry., which has been taken over, and this C.V.R. branch will be utilized as far as St. Cesaire for the Granby extension. A new right of way, for the greater distance along the old Montreal road, has been secured from St. Cesaire to Granby. The building of this extension will necessitate the erection of a new four span bridge over the Yamaska river near St. Cesaire. (Nov., pg. 573.)

Montreal Tramways Co.—The new line to Westmount boulevard is reported to have been completed. The Outremont town council has accepted the company's proposition to lay a single track line on Bernard and Outremont streets at once, and to lay a second track thereon at some future time. (Nov., pg. 573.)

Moose Jaw Electric Ry.—A. H. Dion, Superintendent, in an interview, Oct. 31, is reported to have said that two extensions have been completed during this year, the company having now 10 miles of track in operation. The extension to the park had to be abandoned for the present owing to inability to get steel and the scarcity of labor, and the completion of two other extensions under construction would also have to be left over until the spring. An addition is being built to the car barn. The foundations for the new section of the power plant have been completed, and the machinery is in course of delivery. The new unit will be a 500 k.w. one. (July, pg. 368.)

Application is being made by the company to the Saskatchewan Legislature for power to extend its lines outside the city of Moose Jaw, subject to agreements being made with the various municipalities and to increase its capital from \$500,000 to \$1,000,000.

Niagara, St. Catharines and Toronto Ry.—The Board of Railway Commissioners

from Welland avenue to the Welland canal has approved of location plan of the line crossing in St. Catharines, Ont., 0.75 miles. This is the final section of the extension to Niagara-on-the-Lake. The right of way has been acquired for nearly the whole distance, and it is expected that construction will be started at an early date.

Application is being made to the Dominion Parliament for an act extending the time within which the company may build the lines authorized to be built by paragraphs b, c and d, sec. one, chap. 132 of the statutes of 1906, and by sec. eight, chap. 77 of the statutes of 1899. (Nov., pg. 574.)

We are officially advised that no statement can at present be made regarding the time when construction will be started on the new line from St. Catharines to Niagara-on-the-Lake, right of way matters not having been settled.

Nipissing Central Ry.—The final inspection of the extension of the line from Hailybury to Liskeard, Ont., was made by the Temiskaming and Northern Ontario Ry. Commissioners, Oct. 23, when a special car was run over the line. A regular car service was placed in operation Nov. 1. (Nov., pg. 574.)

Ottawa and St. Lawrence Electric Ry.—Press reports state that surveys are practically completed for the line between Ottawa and Morrisburg, Ont., and that the contractors are preparing to start work next spring. The contract is said to call for the completion of 50 miles by the spring of 1914. (Nov., pg. 574.)

Owen Sound, Ont.—Mayor Lemon is quoted as stating that negotiations are in progress for the construction of an electric railway in the town, and that a definite proposal will be submitted to the council at an early date. (Feb., pg. 91.)

St. John Ry.—Application has been made to the St. John, N.B., city council for authority to lay out turn-ins to the new car shed on Wentworth street.

Tenders are being received to Dec. 2 by the Provincial Government for the construction of a new bridge at the reversible falls. The bridge will have a total length of 730 ft., and will have two sets of tracks for the electric railway. (Nov., pg. 574.)

Saskatoon Municipal Ry.—We are officially advised that the building of this railway is being supervised for the Stone and Webster Engineering Corporation of Boston, Mass., which is financing the work for the city council, by J. B. Townsend, the city commissioners being in charge for the city.

The car barn is of brick, 163 by 94 ft. The foundation walls, column fittings, pits and floors are concrete. There are three intermediate lines of wooden posts, and the wooden roof is covered with tar and gravel. One of the longitudinal bays is given over to office room, employes rooms, shops, etc., while the remainder of car barn is devoted to tracks. There are three pits about 70 ft. long, and a paint shop 23 by 40 ft. The windows all around the walls, skylights and ventilators give plenty of light and air. An efficient heating layout is being installed to insure the inside temperature against the severe winter weather. The power station is to be equipped with two 300 k.w. generator sets, which have been ordered from the Canadian Westinghouse Co.

The city has under consideration the question of the appointment of a manager. (Nov., pg. 574.)

Stratford Ry.—A new bylaw for an electric railway franchise was practically agreed upon at a meeting of the Stratford, Ont., city council, Oct. 31. This bylaw, it is

expected, will be finally completed for submission to the taxpayers at the election, Jan. 1, 1913. (Nov., pg. 574.)

Taber, Alta.—Preliminary surveys have been made for an electric railway to connect Taber, Alta., with the various coal mining camps in the vicinity, and it is reported that applications will shortly be made to the town for a franchise, and to the Legislature for a charter incorporating a company to build the line. Calgary men are reported to be interested.

Toronto Civic Car Lines.—The Toronto city council has authorized the purchase of the necessary rolling stock and equipment for the civic car line on Gerrard street east, and to inaugurate a service thereon at the earliest possible moment. This was decided upon after a suggestion by the General Manager of the Toronto Ry. for the operation of the lines had been mentioned. This suggestion came through a special committee which had been authorized to see him. The suggestion was a tentative one, and was to the effect that the city pay the company 20 cents a car mile for the operation of cars over the line, the line to be operated in conjunction with the company's line. (July, pg. 368.)

Toronto Eastern Ry.—The Minister of Railways has approved of route map for the line from Pickering, Ont., westerly for 12 miles. The route originally surveyed ran from Pickering to a junction with the Canadian Northern Ontario Ry., near Cherrywood. The new route runs south-westerly from Pickering, crossing the G.T.R., and going on to the crossing of the Kingston road west of West Hill. (Oct., pg. 521.)

Toronto Suburban Ry.—The right of way for the line is reported to have been secured from Meadowvale to Guelph, Ont., with but few small exceptions. Some grading is reported to have been done on this section. On the Maher subcontract, the grading is practically completed from west of Islington to Summerville, and is now in progress from Islington easterly to Lambton. (Nov., pg. 574.)

Winnipeg Electric Ry.—Work on the double tracking of the Main street line from the southern boundary of parish lot 3, Kildonan, to the present northern limits of Winnipeg is being rushed. At the end of the extension of double track, new terminals for the Winnipeg, Selkirk and Lake Winnipeg Ry. will be laid out on a site recently acquired. The extension on Mountain avenue has been completed. A franchise has been granted the company for the construction of an electric railway in St. Vival. (Nov., pg. 575.)

Electric Railway Finance, Meetings, Etc.

British Columbia Electric Ry.—Gross earnings for Sept., \$559,486; operating expenses, \$345,366; net operating earnings, \$214,120; renewal funds, \$51,620; net earnings, \$162,500; approximate income from investments, \$35,000; net income, \$197,500, against \$453,391 gross earnings; \$282,443 operating expenses; \$170,948 net operating earnings; \$37,935 renewal funds; \$133,013 net earnings; \$25,000 approximate income from investments; \$158,013 net income for Sept., 1911. Aggregate gross earnings for three months ended Sept. 30, \$1,651,474, net earnings, \$579,342, against \$1,299,241 aggregate gross earnings; \$441,138 net earnings, for same period 1911.

Calgary Municipal Ry.—Revenue for September, \$59,956.25 against \$34,204.35 for Sept., 1911. Net earnings, \$13,056.62 against \$7,095.24 in 1911. Passengers carried, 1,433,067 against 818,969.

Cape Breton Electric Co.—Gross earnings for Sept., \$34,363.62; operating expenses and taxes, \$15,777.26; net earnings, \$18,586.36; interest charges, \$4,495.84; balance, \$14,090.52; sinking and improvement funds, \$1,206.66; balance for reserves, etc., \$12,883.36, against \$30,314.16 gross earnings; \$14,976.26 operating expenses and taxes; \$15,337.90 net earnings; \$4,512.50 interest charges; \$10,825.40 balance; \$1,140 sinking and improvement funds; \$9,685.40 balance for reserves, etc., for Sept., 1911. Construction charges for month, \$6,087.39.

Hamilton Street Ry.—It was reported to the Hamilton, Ont., city council, Nov. 1, that the total receipts of the street railway for the three months ended Sept. 30 were \$150,144.49, compared with \$130,758.93 for the corresponding three months of 1911. The city's rental and percentage were \$12,011.58.

Kingston, Portsmouth and Cataract Electric Ry.—At a meeting of the Kingston, Ont., city council, Nov. 14, it was decided to ask the company if it was willing to sell its line to the city.

Lethbridge Municipal Ry.—Receipts for Oct., \$7,034.24; passengers carried, 159,140.

Port Arthur and Fort William Electric Ry.—Passenger earnings for Sept., \$21,411.02; Arthur street line, \$910.01; baggage and miscellaneous earnings, \$948.45; total earnings, \$23,269.48; operating expenses, \$12,401.59; net earnings, \$10,867.89. Car mileage, 101,515; gross earnings per car mile, 22.921 cents; operating expenses per car mile, 12.216 cents; net earnings per car mile, 10.704 cents.

Quebec Ry., Light, Heat and Power Co.—A recent cable from Paris, France, states that the French Association of Foreign Bondholders has formed a committee of defence for the bondholders of the company resident in France.

Toronto Ry., Toronto and York Radial Ry., Etc.—Gross earnings for Sept., \$767,944; operating expenses, maintenance, etc., \$404,171; net earnings, \$363,773, against \$705,961 gross earnings; \$309,706 operating expenses, maintenance, etc.; \$396,255 net earnings, for Sept., 1911. Aggregate gross earnings for nine months ended Sept. 30, \$6,221,043; net earnings, \$3,185,100, against \$5,559,647 aggregate gross earnings, \$2,886,405 net earnings, for same period, 1911.

Winnipeg Electric Ry.—Gross earnings for Sept., \$309,722; operating expenses, \$162,870; net earnings, \$146,852, against \$321,664 gross earnings; \$175,524 operating expenses; \$146,140 net earnings, for Sept., 1911. Aggregate gross earnings for nine months ended Sept. 30, \$2,737,552, net earnings, \$1,280,748, against \$2,825,637 aggregate gross earnings; \$7,433,507 net earnings, for same period 1911.

Electric Railway Notes.

The British Columbia Electric Ry. Co. has ordered five 50 ton electric locomotives from the Westinghouse Electric & Manufacturing Co., to be equipped with four 308B-3 motors and H.B. control.

The Sandwich, Windsor and Amherstburg Ry., which is about to increase its power house equipment, has ordered a 1,250 h.p. engine and 800 k.w. railway generator from Allis-Chalmers Co., Milwaukee, Wis., to be delivered in March, 1913.

The Guelph (Ont.) Radial Ry. received recently from the Preston Car & Coach Co. a single truck snow sweeper, double end operation, with 33 in. brooms, an illustration of which appears in this issue. It has standard steel underframe and steel tired wheels. The motor equipment consists of two Westinghouse 101B2 motors with K10

controllers, and one 101B motor with K10 controller to operate the brooms.

The St. John (N.B.) Ry. has received two additional pay-as-you-enter cars.

The Ottawa Electric Ry. is said to be preparing plans for a car house on Cobourg street, to cost about \$25,000.

The Kingston, Ont., city council is negotiating for the purchase of the Kingston, Portsmouth and Catarqui Electric Ry.

The British Columbia Electric Ry. has received ten of the 22 passenger cars recently ordered in the United States.

Four new cars were put in operation on

Loading Electric Cars at Ottawa Car Company's Plant.

This plant is located in the centre of the city of Ottawa, away from the steam railway lines, and in consequence has no siding for the loading of the finished street cars on to flat cars for transshipment to their destination. The Ottawa Car Co. and the Ottawa Electric Ry. Co. are in close touch with each other, and have come to an agreement whereby the latter company's tracks, which pass the rear door of the car plant,

tion over the car on which each body is to be placed.

The body is raised from the trucks and lowered on the car top by the means illustrated in the accompanying illustration. On each side of each end of the car body there are placed jacks of a peculiar design, carrying a cross bar between each end pair, which is run up under the car body sills. The jacks consist of a wooden base with two wooden uprights, between which there is carried a square threaded screw in a bearing about half way up the vertical supports. The top of the screw carries a cross-head, guided between the uprights. The screw supporting bearing carries an engaging nut, the outside of which is a bevel gear pinion. A horizontal shaft carries a mating bevel pinion. The outer end of the horizontal shaft carries a double lever by which the screw is raised or lowered. The very design speaks for a powerful lifting jack.

By these four jacks the car body is raised off the trucks, so that the latter clear. The trucks are then run from out under the car, and the temporary rail on the top of the car removed. Timbers of the form shown in the foreground in the illustration are then secured to the flat car, and the street car body lowered into the cradle thus formed. This jack arrangement is very convenient for loading car bodies.



Double End, Single Truck Snow Sweeper, for Guelph Radial Railway.

the Hamilton (Ont.) St. Ry., Nov. 13. They are each 21 ft. long, and replace the old 16 ft. cars.

The Toronto Railway's revenue for October was \$480,942.37, against \$419,004.75 in 1911. The city's percentage this year was \$38,475.39.

A. Sturgeon, a Toronto Ry. motorman, was recently fined \$50 and costs or 60 days' imprisonment, by the police magistrate, for driving a car while intoxicated.

The Montreal city council has put in force a new traffic bylaw under which the street railway bylaw 210 will be enforced by the policemen at street intersections.

The Moose Jaw Electric Ry. has in service 12 cars, and there are being built by the Ottawa Car Co., for 1913 delivery, four double truck cars and several single truck cars.

C. L. Case, A.M. Can. Soc. C.E., read a paper on the Sherbrooke Ry. and Power Co.'s hydro electric plant at Sherbrooke, Que., before the Canadian Society of Civil Engineers recently.

The Nipissing Central Ry. was bought about a year ago by the Timiskaming and Northern Ontario Ry. Commission for \$250,000. The net earnings from Nov. 1, 1911, to June 30, 1912, were \$13,488, or over.

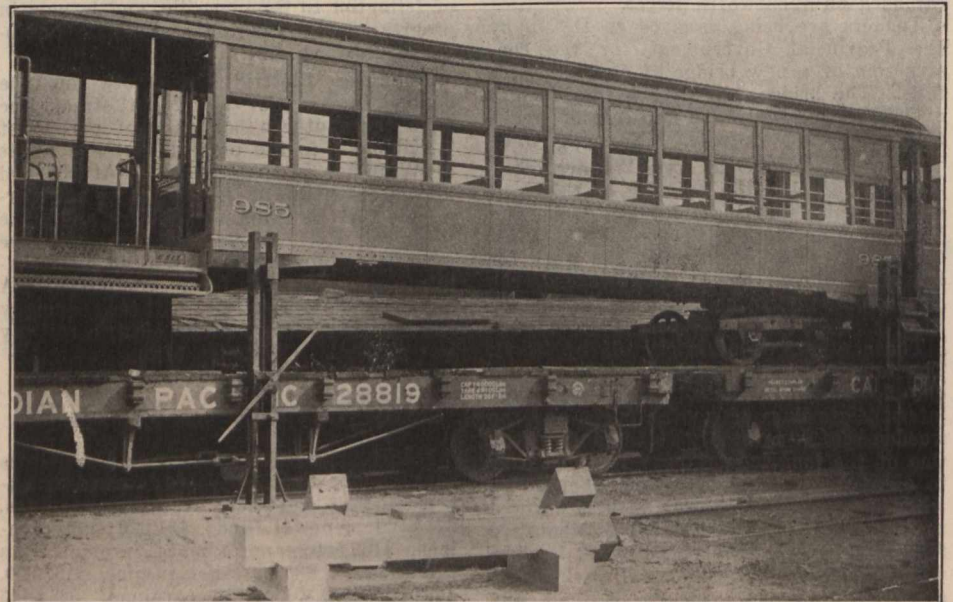
The Halifax city council has been discussing the advisability of offering E. A. Robert, President, Montreal Tramways Co., and his associates \$170 a share for the controlling interest in the Halifax Electric Tramway Co., which they bought at \$160 a share recently.

Arrangements are being made to have a vote taken in London, Ont., on the question of permitting the operation of a car service in the city on Sundays. Owing to the recent annexation of additional territory the city now has more than the 50,000 population required.

A club for the British Columbia Electric Ry.'s office staff was opened, Nov. 1, by G. R. G. Conway, Acting General Manager. The space devoted to the club is 80 by 60 ft., and is divided into three rooms, one for social gatherings, one for reading and games, and the other a billiard room.

are used for the moving of the cars to the siding where they can be transhipped.

The cars to be shipped are provided with temporary trucks, used specially for that purpose, saving the appearance of the regular trucks, which are taken to the shipping point by different means. The car bodies, mounted on the special tracks, are hauled to a siding where all shipments are made.



Method of Loading Electric Car Bodies for Shipment.

On the end of the siding track there is a ramp leading up from the street level, carrying tracks connecting with the street car line. This ramp rises to the level of the top of the flat car. On the top of the string of flat cars backed into the siding for the shipment there is laid a pair of light rails, spiked to the car top, connecting at the ramp end with the ramp rails. Up this ramp and along the car tops the car bodies on the temporary tracks are run into posi-

The London St. Ry., at the end of October, voluntarily increased its motormen and conductors' wages as follows:—Spare men from 16c. to 18c. an hour; for remainder of 1st year's service from 18c. to 20c.; 2nd year's service, from 19c. to 21c.; 3rd year's service, from 19c. to 22c.; 4th year and thereafter, from 22c. to 23c.

The Toronto Railway's Employees Union is petitioning the city council to place restrictions upon the strength of lights used on automobiles, contending that the strong lights dazzle conductors, make it difficult to see pedestrians and vehicles, and cause accidents.

The British Columbia Electric Ry. Co. is reported to have commissioned Somerveil and Putnam, Vancouver, to prepare plans for a group of car houses to be built near False creek, Vancouver, to cost about \$250,000.

A storage battery train of three cars has been built for the United Railways, of Havana, Cuba, for use on a seven mile suburban line where two or three car trains are needed during a certain few hours.

Marine Department.

Wireless Telegraphy on the Great Lakes.

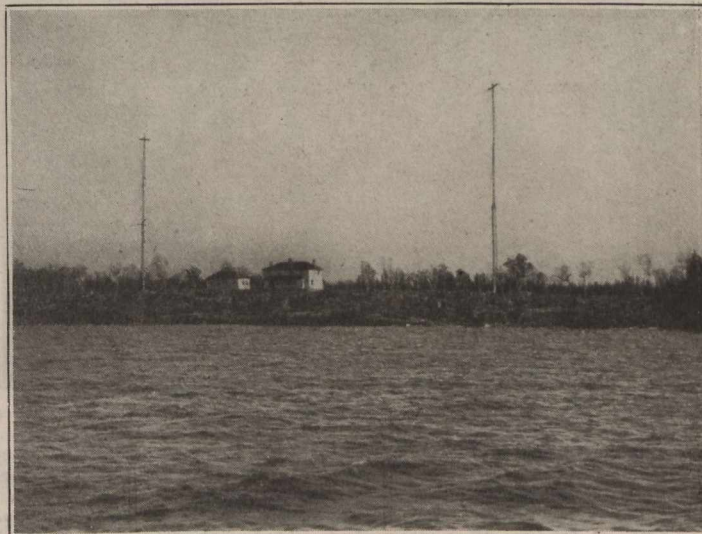
The Dominion government has, during this year, had three wireless telegraph stations erected on the upper lakes, at Midland, Tobermory and Sault Ste. Marie, Ont., the Marconi Wireless Telegraph Co. of Canada, Ltd., being the contractors. These stations will work in conjunction with the one at Port Arthur, Ont., erected in Dec., 1910, by the Marconi Co., and now to be taken

stations is intended are:—(1) To aid navigation by enabling the masters of steamboats to communicate with the shore, their owners or agents and the ports which they have left or to which they are destined; (2) To provide similar facilities for passengers; (3) To provide direct communication between the points where shipping interests are centred without necessitating

when they are in close proximity to shore, leaving it, making a port, entering canals or narrow straits, and under other similar circumstances which occur very frequently with great lakes vessels. It must also be remembered that the larger of the great lakes are at certain seasons subject to exceedingly stormy weather, fogs, ice and cold, just as much as the oceans, and at



Wireless Telegraph Station at Midland.



Wireless Telegraph Station at Tobermory.

over by the government. A station at Sarnia is in course of construction, and other stations are to be built at Port Stanley, Port Colborne, Toronto and Kingston, Ont., which will also work in connection with the existing stations.

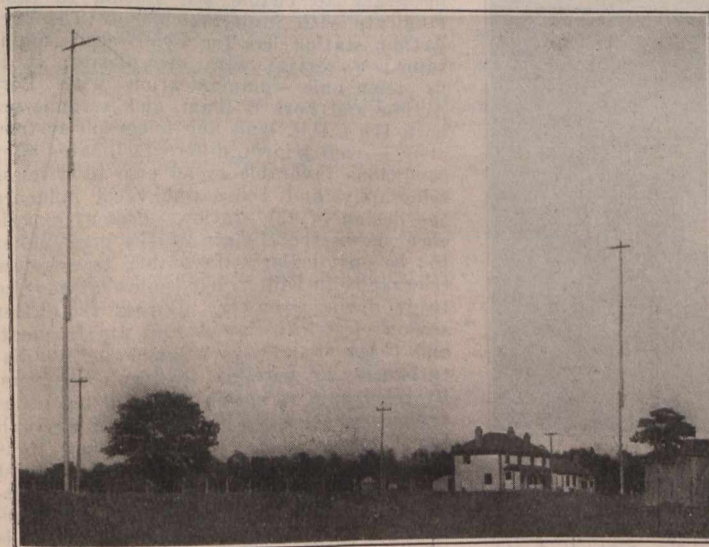
The erection of these stations on the great lakes is a continuation of the system

the use of the more circuitous routes of the land line telegraph for communication between these points.

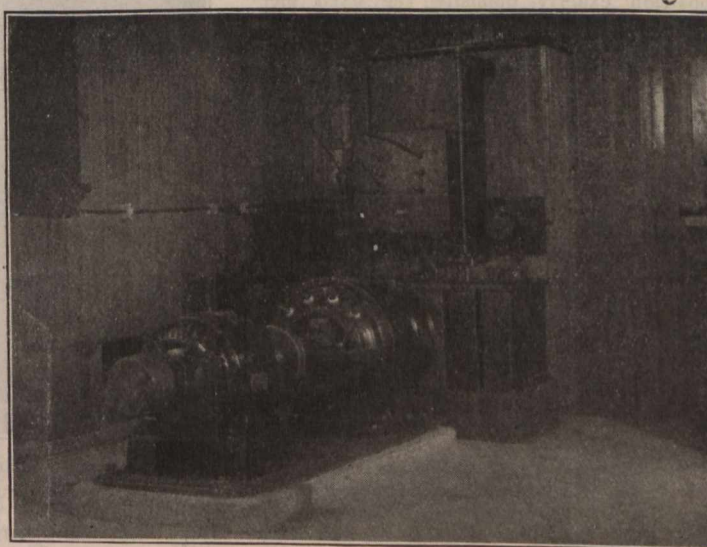
The places that have been chosen on the great lakes will show at once how these interests have been considered. By the opening of navigation in 1913 all the main shipping points in the upper lakes, viz.,

such seasons constant communication with land or passing steamers is very acceptable.

EQUIPMENT OF STATIONS.—Each station requires a piece of land about 650 by 150 ft. There are erected two wooden masts, each 185 ft. high and 450 ft. apart. They are built in three sections, supported



Wireless Telegraph Station at Sault Ste. Marie.



Transmitting Machinery at Sault Ste. Marie.

of wireless telegraph stations in connection with the great waterways of Canada which was commenced in 1904 in the Straits of Belle Isle and at Cape Race, Newfoundland, and has been completed as far as Montreal. The great lakes branch, when completed, will also connect with Montreal.

The main uses for which this system of

Midland and Victoria Harbor, Sarnia, Sault Ste. Marie and Port Arthur, will be in direct communication with one another by wireless.

The necessity for stations on the great lakes, for their primary function, might be questioned by those unacquainted with the conditions. Steamboats probably find the greatest usefulness in wireless telegraphy

by a steel guy, and are 22 ins. in diameter at the bottom and 9 ins. at the top.

Each station is provided with two buildings, one double house containing two dwellings, and one station house separated from the dwelling house by about 50 ft. The dwelling houses provide accommodation for three men and have been made very comfortable. The station house is divided

into engine and transmitting room, operating room and office. All buildings are of wood with concrete foundations.

TRANSMITTING MACHINERY.— A standard type of transmitter is being installed at all the great lakes stations. It consists of a 10 h.p. 3 phase, 550 volt standard induction motor, worked by public power supply. The motor is directly connected through a flexible coupling to a special a.c. generator, generating a.c. at

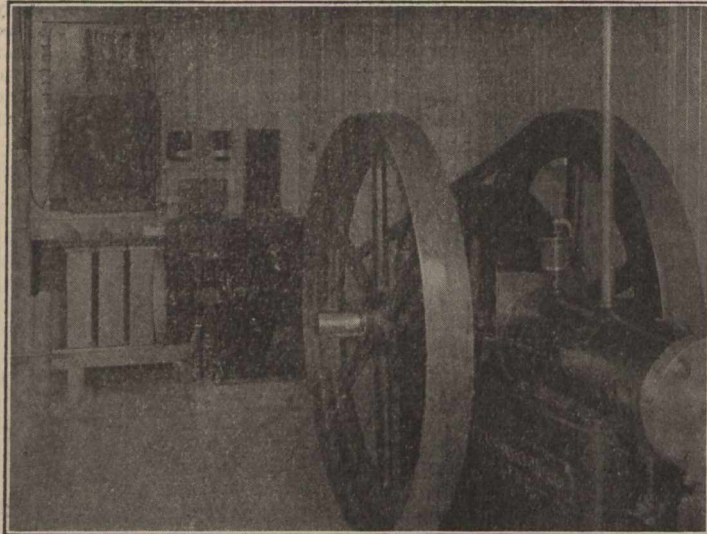
solely for communication with other great lakes stations.

The aerial wires are stretched between the two masts and are of phosphor bronze wire 42/23 B. & S. gauge. They are supported by four strain insulators designed for a mechanical load of 1,500 lbs. and to withstand an electrical voltage of 100,000 volts, wet or dry.

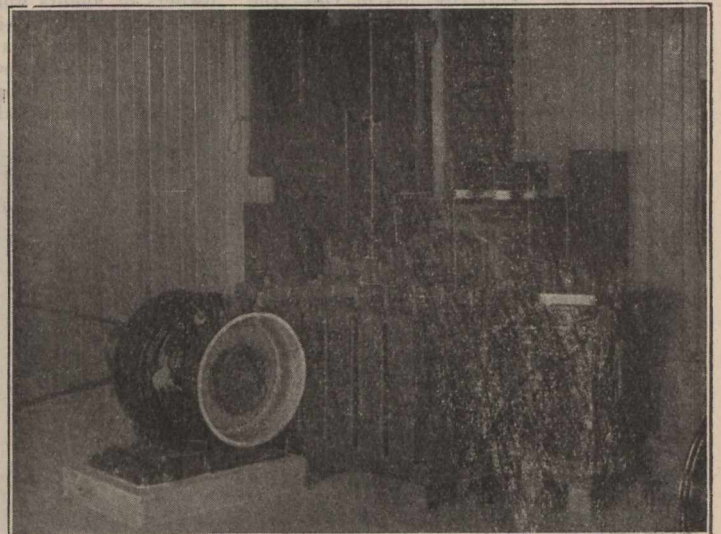
The transmitting apparatus is completely duplicated at all stations. Where a public

receiving apparatus on the table, the switchboard completely controls the transmitting apparatus and can be manipulated by the operator without rising from his chair.

The Midland station is situated at the southeast corner of Georgian bay, half way between Midland and Victoria Harbor, both important transportation centres, and is in telephonic communication with both places. It is also connected direct with



Engine and Transmitter at Tobermory.



Transmitting Machinery at Tobermory.

440 volts and 240 cycles, and a spark discharger is attached to the a.c. generator and consists of an insulating disc attached to the generator shaft and rotating inside a muffler. It has 16 copper studs fixed radially in a copper rim (16 is the number of poles of the a.c. generator). Fixed in the muffler and insulated from it are two fixed electrodes adjustable radially and coming opposite to any two adjacent rotating disc studs; these fixed electrodes form the terminals of the spark gap and it is between their inner extremities and the points of the rotating studs that the spark occurs each time the latter come into a position exactly opposite the fixed electrodes. The fixed electrodes can also be adjusted in an angular direction. This adjustment allows their position to be fixed so that the spark always occurs in a certain position relative to the a.c. generator pole pieces, and therefore relative to the curve of the impressed e.m.f. of the generator. It is arranged that this point shall be that point in each alternation at which the condenser, which forms an important part of the transmitter, has been charged to maximum voltage. All these complications in the design are necessary to enable the spark to be obtained absolutely free from arcing and giving a pure musical note. The vibration per second of the musical note is twice the a.c. generator frequency, in this case equal to 480 per second. The note is about equal to middle C on the piano. The remainder of the transmitter is of regular design consisting of a transformer for 240 cycle a.c. and specially constructed with regard to transformation ratio and magnetic leakage; various high and low tension adjusting and protective chokers and glass plate condenser capable of withstanding a voltage of 50,000 volts, and of a capacity of .06 m.f., high frequency primary and secondary inductances, and oscillation transformer. The transmitter is capable of emitting oscillations of any wave length between 600 and 1,700 metres, but is specially adjusted for wave lengths of 600 metres and 1,600 metres, the former being the standard wave length for ship communication and the latter being

power supply is used one 8 h.p. Canadian Fairbanks-Morse special electric horizontal gasoline engine is installed to provide motive power in case of breakdown of the electric power supply. Where no public power supply is used and the engine is the main motive power, the engine is

the land line telegraph system.

The Tobermory station is situated on Cape Hurd, at the junction of Georgian Bay and Lake Huron and commands the whole of Lake Huron.

The Sault Ste. Marie, Ont., station is situated quite close to that town, and is in telephonic communication with the town and the Canadian canal offices, and is also to be connected to the C.P.R. telegraph system.

At Port Arthur preliminary preparation for converting it into a regular standard station have been commenced. This will entail considerable enlargement, and is necessary to enable the station to communicate with Sault Ste. Marie. The Port Arthur station has for two seasons maintained a service with steamboats; it is in telephonic communication with Port Arthur and Fort William, and is connected with the C.P.R. land line telegraph system.

As is well known, different climates offer conditions favorable or adverse to wireless telegraphy and these conditions influence the design of the station. Present experience shows the climate of the great lakes to be particularly favorable to wireless telegraphy in winter, but somewhat adverse to it during summer. During the latter season electrical disturbances are frequent, and these are always accompanied by disturbances to wireless telegraph receivers. In telephonic reception these disturbances evidence themselves by scratching and dull toned noises in the telephone, and it is when these electrical disturbances exist that the pure toned note of the transmitters installed on the great lakes is particularly advantageous. The same note is communicated to the telephone receiver and can be easily distinguished by the operator from the dull noise caused by the atmospheric disturbances.

EQUIPMENTS ON STEAMBOATS.— Now that the land facilities are being provided Canadian steamship owners on the great lakes have commenced to equip their vessels with wireless telegraphy. Up to the present 11 Canadian steamboats are operating it. These are:—

Canadian Pacific Ry.—Alberta, Keewatin,



Receiving Apparatus and Switchboard at Sault Ste. Marie.

duplicated with the remainder of the transmitting gear. The only station of this latter type is at Tobermory.

The receiving apparatus is contained in a room entirely separate from the transmitters and consists of the Marconi type of valve receiver, with tuning apparatus capable of receiving similar wave lengths to those transmitted by each station, and the Marconi magnetic receiver is also installed as an emergency or duplicate. The accompanying illustration of the receiving room shows the operator's chair, with the

Assiniboia, Athabasca, Manitoba.
Northern Navigation Co.—Huronic, Hamonic, Saronic.

Canadian Towing and Wrecking Co.—Barges Imperial, Empire, Provence.

It is expected that during this winter there will be considerable activity in the fitting of other Canadian great lakes steamboats with wireless telegraphy. A large number of these vessels trade with United States ports, and the legislation with which the U.S. followed up the Titanic disaster makes equipment with wireless telegraphy compulsory with all vessels trading in U.S. ports. This legislation for the great lakes comes into effect on April 1 next, and requires all vessels carrying over 50 people to have a correctly licensed and operated installation. Full particulars of it are contained in a circular, "Regulations for radio apparatus and operators on steamers," issued by the Commerce and Labor Department at Washington, D.C., Sept. 5.

Since the foregoing article was written it has been announced that the contract between the Dominion government and the Marconi Wireless Telegraph Co. of Canada provides for the operation of nine wireless stations on the great lakes, four of which are in operation, one under construction, and the remaining four to be commenced probably next year. As soon as all these stations have been completed the company will be in receipt of a subsidy of \$31,500 a year from the government for the operation of all the stations. The agreement is said to be for 19 years.

An interim report has been submitted to the Dominion government by Professor Barnes, of McGill University, Montreal, on his investigations of methods whereby ships may be warned of the nearness of ice or land. It is said that a government vessel will be placed at his disposal next spring to enable him to continue his investigations and experiments.

Notwithstanding earlier reports that the Dominion Government steamship Minto had found ice conditions so unfavorable at Wolstenholme, in the Hudson straits, that she had returned to winter in Hudson Bay, she arrived in Halifax Nov. 11. Capt. Anderson is reported to have stated that the conditions for navigating the straits could not have been better.

The Canadian Interlake Line's Vessel Fordonian

This vessel, which has been built recently at Port Glasgow, Scotland, has been referred to in several recent issues of the Canadian Railway and Marine World. The following additional particulars have been received:—

The vessel is 2,368 gross tons. The leading dimensions are:—Length, 250 ft.; beam, 42½ ft.; depth, 26½ ft. She has been built to Lloyd's highest class for the grain carrying trade of the great lakes. The propelling machinery consists of a four cylinder set of the Diesel two stroke cycle engine. The engines are placed right aft, and the exhaust, after passing through a silencer, is led overboard under the counter. The cylinder dimensions are 18½ in. in diameter, with a 32¼ in. stroke. The main features are the standard marine frames for the cylinders, with the open and accessible crank case, marine connecting rods, cross heads, and built up crank shaft. The scavenging pumps are driven by links off the cross heads. The pumps are double acting, of 27½ in. diameter, and 23½ in. stroke. The main engines develop 750 brake horse power at a nominal speed of 120 revolutions a minute. Compressed air is supplied by compressor. One is driven off the forward end of the main engine crank shaft, while the auxiliary set is steam driven. The steam for this and for the steering gear, winches and capstans is generated in an oil fired donkey boiler on deck.

With Diesel engines it has become regular practice to test the engine against the brake for some time in the shop prior to installing it in the ship in order to make minor adjustments more readily, as brake horse power, fuel and water consumptions can be measured for guidance. With the engines of the Fordonian this was not possible, and yet, although the engines had only run for short periods, totalling 12 hours, on dock trials, the results of the trial trip on Sept. 21 were entirely satisfactory, demonstrating the state of efficiency for marine propulsion to which this type of prime mover has so quickly been brought.

A speed of 10 knots was exceeded, which

is better than the rate achieved with single screw ships of the same type having steam engines of 950 i.h.p. The revolutions were 120 a minute, and the manoeuvring, stopping, starting, and reversing corresponded exactly to those which would be required in passing through a series of locks. Sixty-three reversals were accomplished in 42 minutes, and at the end of this trial more than half of the stored compressed air was still available. The steam driven air compressor was, of course, running. Complete reversal from full speed ahead to full speed astern occupied six seconds, and the engines were stopped dead from full speed in three revolutions. Although a fairly heavy fly wheel is fitted, the slowest speed at which the engine turned when all cylinders were firing was 46; but when final tuning up has been done, and all fuel valves are so adjusted that each cylinder is receiving exactly the same quantity of oil, 35 revolutions a minute will be the minimum working speed on fuel. The running of the engine was very silent; the engine room is 33% shorter than would be the case for steam machinery; the fuel consumption was 0.47 lb. per brake horse power per hour throughout the trial; the engine room was free from smoke and vapour, and was cool.

Press reports state that as a result of the investigation of the loss of the s.s. Key-storm, E. Adams, chairman of the Board of Inspectors of Steam Vessels, has resigned, and that the Minister of Marine is taking steps to put the matter of inspection, and of the enforcement of the navigation laws, upon a more rigorous basis.

The shipbuilding now in progress in the yards of Great Britain and Ireland exceeds all previous records. The total number of vessels in progress is 587, representing a total tonnage of 2,341,367 tons. This is an increase of 25% over the tonnage under construction a year ago. Ship yards are experiencing difficulty in getting workmen enough to keep pace with the demand, and many yards are working overtime and double shifts. Not only is the activity in shipbuilding unprecedented, but the prospects of future activity are promising. Orders for new vessels are being received faster than the completed vessels are turned out of the yards.

List of Steam Vessels Registered in Canada during September, 1912

Name.	No.	Where and When Built.	Engines, etc.	Length	Breadth	Depth	Gross Tons	Reg. Tons	Port of Registry	Owner or Managing Owner
Boonton	131211	Philadelphia, Pa., 1871	Screw 48 n.h.p.	75.0	18.5	8.9	115	53	Sydney	Rudderham, North Sydney, N.S.
Carillon	131124	Montreal, 1912	" 16½ "	57.3	14.5	6.7	41	24	Ottawa	Minister of Railways and Canals, Ottawa
Casarco 4	131192	Bear River, N.S., 1912	" 2 "	45.4	12.2	5.6	15	10	St. Andrews	Canadian Sardine Co., St. Andrews, N.S.
Casarco 5	131191	Bear River, N.S., 1912	" 3 "	45.4	12.2	5.6	14	10	St. Andrews	"
Ewayea	131004	St. John, N.B., 1912	" 3 "	39.5	8.7	4.6	15	10	St. John, N.B.	J. F. Williamson, St. John, N.B.
Fairfax	111966	Grand Haven, Mich., 1890	" 85 "	209.0	38.0	21.0	1424	984	Pictou, Ont.	Ontario & Quebec Navigation Co., Pictou, Ont.
Helen F.	130894	Seattle, Wash., 1910	" 1½ "	32.0	9.3	3.5	8	4	Victoria	J. F. Norton, Sydney, B.C.
I Wonder Y.	130594	Sambro, N.S., 1912	" ½ "	48.6	12.8	6.0	17	16	Halifax	W. S. Henneberry, Sambro, N.S.
Invermere	130892	Golden, B.C., 1912	" 1½ "	75.0	13.0	3.7	66	45	Victoria	A. Blakley, Golden, B.C.
Lachine	131125	Montreal, 1912	" 16½ "	40.0	13.8	6.4	26	15	Ottawa	Minister of Railways and Canals, Ottawa
Mekinae	131012	Three Rivers, Que., 1912	" 9½ "	70.8	27.2	5.3	65	23	Quebec	R. F. Grant, Three Rivers, Que.
Neophyte	130990	Amsterdam, Holland, 1903	" 9½ "	107.0	20.7	6.2	150	97	Chatham, N.B.	Navigation Syndicate, Nordin, N.B.
Ondot	130893	Proctor, B.C., 1912	" 9½ "	59.0	12.0	5.5	30	20	Victoria	F. Cogle, Proctor, B.C.
Point Ellise	130897	N. Vancouver, B.C., 1911	" 47 "	79.6	20.0	11.6	163	69	Victoria	Minister of Public Works, Ottawa
Rockland	131126	Rockland, Ont., 1912	" 6½ "	76.8	16.8	6.8	75	38	Ottawa	Hawkesbury Lumber Co., Ottawa
San Felice	131158	Seattle, Wash., 1910	" 2 "	46.0	11.4	5.2	20	14	Vancouver	R. J. Cromie, Vancouver, B.C.
Speedy II	104920	Leith, G.B., 1896	" 88 "	115.0	20.6	10.6	252	145	Ottawa	Minister of Public Works, Ottawa
Wake (The)	131159	Vancouver, B.C., 1912	" 2 "	41.0	11.2	4.0	18	12	Vancouver	A. McEvoy, Vancouver, B.C.

List of Sailing Vessels and Barges Registered in Canada during September, 1912

Name.	No.	Where and When Built.	Rig.	Length	Breadth	Depth	Reg. Tons	Port of Registry	Owner or Managing Owner
Dredge P.W.D. no. 301	130896	New Westminster, 1908	Dredge	105.3	38.2	10.4	538	Victoria	Minister of Public Works, Ottawa
Lyra	188265	Cambridge, N.B. 1883	Schr.	83.1	27.3	7.0	99	Parrsboro, N.S.	R. Newcombe, Parrsboro, N.S.
Marona	130595	Tancook, N.S., 1912	Schr.	49.2	13.0	6.9	25	Halifax	E. and A. Parker, Owls Head, N.S.
New Brunswick no. 1	131003	Upper Gagetown, N.B., 1912	Dredge	75.3	30.1	6.8	244	St. John, N.B.	New Brunswick Construction Co., Welsford, N.B.
Rock Cutter P.W.D. no. 1	130895	Victoria, B.C., 1911	Dredge	100.0	36.5	7.6	222	Victoria	Minister of Public Works, Ottawa
Saint John	131002	U.S.A., (Unk)	Dredge	115.1	48.4	14.0	941	St. John, N.B.	Beaver Dredging Co., St. John, N.B.

Harbor Improvements at Fort William.

A large amount of work has been done at Fort William harbor during this year, and it is claimed that this amounts to 27% of all the harbor work done in Canada this year. Unconfirmed reports say that the following work will be gone on with next year:—

A series of eight slips, 1,000 by 500 ft., on the south side of the Kaministiquia river between the Mission river and the Grand Trunk Pacific Ry. bridge. The slips will be on G.T.P.R. property, and are to be dredged out to permit of additional water frontage and constitute a part of a scheme of increased freight docks and other facilities which the G.T.P.R. has in hand.

Island One on C.P.R. property, according to government reports, is to be improved by the addition of seven new slips near the mouth of the Kaministiquia river.

Twenty-five acres are to be dredged and removed out of the Kaministiquia river almost immediately opposite the Canadian Car and Foundry Co.'s plant near the western limits of the city. By this means the river will be straightened and a turning basin over 1,000 ft. wide will be formed. The natural depth of the river at this point is 35 ft., and the dredging to be done will be uniform with this depth. It is also said that dredging is to be continued for some distance beyond the city limits.

Panama Canal Tolls.

The United States President has fixed the following tolls for vessels using the Panama canal:—

On merchant vessels carrying passengers or cargo, \$1.20 per net vessel ton—each 100 cu. ft.—of actual earning capacity.

On vessels in ballast without passengers or cargo, 40% less than the rate of tolls for vessels with passengers or cargo.

Upon naval vessels, other than transports, colliers, hospital ships and supply ships, 50 cents per displacement ton.

Upon army and navy transports, colliers, hospital ships and supply ships, \$1.20 per net ton, the vessels to be measured by the same rules as are employed in determining the net tonnage of merchant vessels.

Under the legislation enacted by Congress United States coastwise shipping will be exempted from tolls.

Extension of Lighting Period on Great Lakes.

The Marine Department has issue the following notice:—

All Canadian lights and fog alarms in Lake Superior will be kept in operation this autumn until Dec. 15, or later if the season of navigation will permit, with the exception of Caribou island, Otter island, Michi-

picoten island, Gargantua, Michipicoten harbor, and Corbeil point lights, from which stations the keepers may be removed at any time after Dec. 1. Mariners must not rely on finding any of these lights in operation later than the dates above specified for closing.

All Canadian lights and fog alarms in Lake Huron, Georgian bay, Lake St. Clair, Lake Erie, Lake Ontario, and connecting waters will be kept in operation until Dec. 15, except Southeast shoal lightship, Lake Erie, which may be removed from her station not earlier than Dec. 5; and also Lonely island light in Georgian bay, which may be closed and the keeper taken ashore on Dec. 5.

Vessels Removed From the Register.

The following vessels were removed from the register during September for the reasons assigned:—

STEAM.—Arlington, Toronto, 16 tons, burnt; Arthur Mack, Port Stanley, Ont., 46 tons, broken up; Chummy, Ottawa, 4 tons, broken up; Emma, Toronto, 94 tons, burnt; J. L. Beckwith, Sault Ste. Marie, Ont., 33 tons, wrecked; Scotia, Port Stanley, Ont., 9 tons, broken up; Shawanaga, Toronto, 65 tons, broken up; William Hackett, Quebec, 86 tons, lost; Wobun, Picton, N.S., 990 tons, sold to Dutch subjects.

SAILING.—Amanda, Yarmouth, N.S., 15 tons, broken up; Fannie W. Freeman, Shel-

List of Steam Vessels Registered in Canada During October, 1912

No.	Name	Port of Registry	When and Where Built	Length	Breadth	Depth	Gross Tons	Reg. Tons	Engines, etc.	Owner or Managing Owner.
*131053	Atikokan	Port Arthur	West Superior, Wis., 1895	362.0	38.8	18.0	2004	1315	144 sc.	F. S. Wiley, Port Arthur, Ont.
130866	Birdswell	New Westminster	Ladner, B.C., 1912	106.6	24.0	9.0	217	129	20 sc.	I. Whitworth, Ladner, B.C.
131193	Casarco No. 2	St. Andrews	Pt. Hawkesbury, N.S., 1912	69.7	16.6	6.7	35	25	4 sc.	Canadian Sardine Co., St. Andrews, N.B.
131194	Casarco No. 3	St. Andrews	Mahone Bay, N.S., 1912	73.3	16.4	7.0	39	34	3 sc.	"
131198	Casarco No. 12	St. Andrews	Lunenburg, N.S., 1912	50.0	12.7	5.5	15	12	1 1/2 sc.	"
130865	Choreboy	New Westminster	New Westminster, B.C., 1911	35.2	9.6	3.0	11	8	1 1/2 sc.	J. W. Pike, New Westminster, B.C.
131127	Chummy	Ottawa	Rockland, Ont., 1912	49.4	9.8	4.4	22	12	2 sc.	W. E. Beaton, Ottawa, Ont.
131160	Daphrona	Vancouver	Hong Kong, 1912	57.3	13.0	8.0	41	28	3 sc.	W. F. Brougham, Vancouver,
133701	Elizabeth	Vancouver	Seattle, Wash., 1908	53.6	16.0	5.6	37	25	3 3/4 sc.	G. A. Barrett, Vancouver, B.C.
130898	Errand Boy	Victoria	Bonnars Ferry, Idaho, 1902	43.8	9.0	3.7	12	8	2 sc.	W. W. West, Nelson, B.C.
130238	Frank H. Stanley	Port Stanley	Port Stanley, Ont., 1912	66.0	15.0	7.5	43	29	10 1/2 sc.	H. L. Moore and W. S. Stanton, P. Stanley, Ont.
133702	Ivercraig	Vancouver	Vancouver, B.C., 1912	42.0	9.8	4.8	16	11	1 sc.	J. C. Keith, Vancouver, B.C.
131111	Keybell	Montreal	Collingwood, Ont., 1912	258.0	42.6	17.2	1730	1254	95 sc.	Keystone Transportation Co. of Can., Montreal
†104263	Kwasind	Quebec	Sunderland, 1894	297.0	40.0	21.7	2211	1376	333 sc.	Arctic Steamship Co., Quebec.
126860	L. Robidoux	Sorel	Yamaska, Que., 1912	50.0	14.8	6.4	43	21	24 sc.	M. Robidoux, Yamaska, Que.
131013	La Jeannette	Quebec	Chicoutimi, Que., 1910	28.8	9.6	2.7	12	8	sc.	A. Girard, St. Anne, Que.
133703	Lureda	Vancouver	Vancouver, B.C., 1912	34.2	8.0	4.1	10	7	sc.	T. F. Greenhow, Vancouver.
26599	Mary Blanche	Parrsboro	Port Greville, N.S., 1912	61.2	16.0	6.0	44	25	2 1/2 sc.	J. W. Cochrane, Fox River, N.S.
107689	Miss Vandenburg	Prescott	Wilmington, Del., 1909	97.8	20.9	9.0	266	181	10 sc.	Prescott & Ogdensburg Ferry Co., Prescott, Ont
105040	Orontes	Vancouver	Beverly, G.B., 1895	111.5	21.0	11.5	178	76	60 sc.	Wallace Fisheries, Vancouver.
133704	Owasco	Vancouver	Unknown (U.S.A.)	40.0	11.0	5.5	18	16	sc.	C. F. Perry, Vancouver, B.C.
131212	Susibell	Sydney, N.S.	Sydney, N.S., 1907	38.0	8.2	4.1	8	6	1 sc.	W. A. Fitch, Sydney, N.S.
131161	Thelma C.	Lunenburg	Little Tancook, N.S., 1912	40.6	10.5	6.4	14	13	sc.	F. Cleveland, South West Cove, N.S.
111965	Wiley M. Egan	Picton, Ont.	Cleveland, O., 1887	258.8	39.6	20.0	1733	1255	105 sc.	Ontario & Quebec Navigation Co., Picton, Ont.
130496	Yankee Boy	New Westminster	Tacoma, U.S.A., 1910	42.0	12.8	5.9	18	13	1 1/2 sc.	A. Radoslorich, Port Guichon, B.C.

*Foreign name—John B. Trevor. †Formerly Turret Bell.

List of Sailing Vessels Registered in Canada During October, 1912

No.	Name	Port of Registry	Rig	When and Where Built	Length	Breadth	Depth	Reg. Tons.	Owner or Managing Owner
130596	A. Hubley	Halifax	Schr.	Shelburne, N.S., 1912	91.3	20.5	9.1	69	A. Hubley et al., St. Margaret's Bay, N.S.
126600	Dannebrog	Parrsboro	"	Port Greville, N.S., 1912	105.4	25.3	9.6	100	J. E. Roberts, New York
*131110	Dominecol No. 2	Montreal	Scow	Chicago, Ill., 1900	138.1	31.8	6.2	234	Dominion Coal Co., Sydney, N.S.
131112	Edouard D.	Montreal	Sloop	Notre Dame de Pierreville, Que., 1903	96.5	21.4	5.4	93	G. Deschenaux, Notre Dame de Pierreville, Que.
131213	Elizabeth Donovan	Sydney, N.S.	Schr.	Ingonish, N.S., 1912	41.0	12.6	8.0	11	W. T. Donovan, Ingonish, N.S.
130428	Fanny May	St. Andrews	Schr.	Campo Bello, N.B., 1911	51.1	15.3	7.0	25	W. McLellan, Campo Bello, N.B.
130250	Geraldine D.	Liverpool	"	Liverpool, N.S., 1912	84.8	29.2	9.3	96	C. LeBlanc, Arichat, N.S.
131162	Ida M. Zinck	Lunenburg	"	Liverpool, N.S., 1912	177.2	27.4	10.6	113	E. Zinck, M.O., Lunenburg, N.S.
130862	J. W. P. No. 3	New Westminster	Barge	New W'minster, B.C., 1912	90.0	30.0	8.0	202	J. W. Pike, New Westminster, B.C.
131086	J. E. Russell's Drill Boat No. 6	Toronto	Drill boat	Toronto, Ont., 1912	80.0	30.0	5.3	289	J. E. Russell, Toronto.
130626	Joseph Lester	Yarmouth	Schr.	Pubnico, N.S., 1912	41.0	12.4	5.0	15	J. R. Amiro, West Pubnico, N.S.
130863	P. D. C. 3	New Westminster	Dredge	New W'minster, B.C., 1908	66.0	17.5	5.3	119	J. Wm. Pike, New Westminster, B.C.
130864	P. D. C. 4	"	"	" 1909	85.0	32.5	6.5	338	"
133705	P.S.B. Co. No. 2	Vancouver	Scow	N. Vancouver, B.C., 1910	81.5	29.8	7.7	180	Progressive Steamboat Co., Vancouver, B.C.
133706	P.S.B. Co. No. 5	Vancouver	"	Vancouver, B.C., 1910	82.8	30.1	7.7	177	"
131128	P.W.D. No. 110	Ottawa	Dredge	Kingston, Ont., 1896	109.4	40.6	8.4	458	Minister of Public Works, Ottawa.
131129	P.W.D. No. 116	Ottawa	"	Sorel, Que., 1904	91.0	34.3	8.2	376	"
131214	Phoebe Jordan	Sydney, N.S.	Schr.	South Ingonish, N.S., 1911	40.6	11.8	7.8	15	J. C. Williams, South Ingonish, N.S.
130763	Sand Boy	Kingston	Scow	Kingston, Ont., 1912	82.8	22.8	6.0	92	G. Pike, Wolfe Island, Ont.
131041	W. Robidoux	Sorel	Dredge	Yamaska, Que., 1912	85.4	25.4	6.0	128	M. Robidoux, Yamaska, Que.

*Foreign name—Scow No. 2.

burne, N.S., 79 tons, transferred to St. Johns, Nfld.; Little Annie, Weymouth, N.S., 16 tons, broken up; Swallow, St. John, N.B., 90 tons, broken up.

The following vessels were removed from the register during October:—

STEAM:—Alert, Vancouver, 8 tons, broken up; Corinthia, St. John, N.B., 39 tons, sold to foreigners; Damara, Vancouver, 3,219 tons, sold to foreigners; Ella

off until the spring tides, commencing Nov. 24, which will be at the highest about Nov. 26. Divers have examined the hull in order to ascertain the damage, and all the cargo possible has been lightered.

D. B. Hanna, Second Vice President, is reported as stating that the vessel was insured for \$1,275,000, while the cost of replacing her would be from \$1,700,000 to \$2,000,000. The floating dry dock at Mont-

Atlantic and Pacific Ocean Marine.

Capt. Wylie, for many years a commander on the Allan Line, died in London, Eng., Oct. 31.

The Canada Line, press reports state, has under construction two 13,000 tons steamships for next year's traffic between Montreal and Liverpool.

Unconfirmed press reports state that a steamship service is to be established in the fall of 1913 by the G.T.R. between a Canadian port and Antwerp.

The C.P.R. has arranged that its trans-Atlantic steamers will, during the current winter season, make 11 more sailings from St. John, N.B., than last season.

During this year's navigation to Oct. 31 there arrived at Montreal 655 vessels of 2,141,053 tons from the ocean, against 694 vessels of 2,116,275 tons during 1911.

Herr Ballin, director of the Hamburg-American Line, was in Montreal, Oct. 31, discussing arrangements for an extension of that company's sailings to Canadian ports.

The Shipping Federation of Canada proposes to ask the Dominion Government to appoint a commission to investigate the pilotage system between Father Point and Quebec.

It is reported that Capt. Beetham of the C.P.R. s.s. Empress of India will be appointed to the command of the new s.s. Empress of Russia, which will be put on the Vancouver-Japan-China route early in 1913.

The steamship Kesbrel, which has been sold out of the Dominion Government service, is being fitted up at Victoria, B.C., to be put on a run from Fanning island, the midocean station of the Pacific cable, to Honolulu.

During October 53 ocean going steamships of 382,658 tons arrived in Montreal. Only one of these was a tramp, which was, however, consigned to the Elder-Dempster Co. The Allan Line, with 12 steamships of 111,919 tons, headed the list.

During the six months ended Sept. 30, the number of vessels arriving at and departing from Victoria, B.C., in the ocean trade was 1,957. During October 168 vessels of 198,256 tons arrived, and 199 vessels of 182,038 tons sailed from the port.

The Allan Line s.s. Poweraman has arrived in St. Johns, Nfld., after having undergone a thorough overhauling. The passenger accommodation has been increased and modernized, the vessel now providing for 70 saloon and 160 steerage passengers.

The Thomson Line s.s. Bellona ran aground in the Upper Traverse below Quebec, Oct. 31. Shortly after the grounding Capt. Cunningham had a paralytic seizure and was removed to the hospital at Quebec, Nov. 2. The stranded vessel was floated Nov. 5, and reached Quebec Nov. 6.

The New Zealand Shipping Co. has declared a dividend of 15s. a share on the operations of 1911-12, after placing £30,000 to the credit of the insurance fund, and carrying £21,555 forward to the current account. The company has acquired the Australian business of Houlder Bros. and Co.

News was received in Montreal Nov. 13 of the death in England of Capt. Jas. Wylie, who retired from the Allan Line service in 1888. When 21 years of age he was in command of the Allan Co.'s ship Albion, and commanded in succession the steamships added to the fleet until his retirement.

Capt. Morrisby was the recipient of several presents, Oct. 25, on relinquishing

Sault Ste. Marie Canals Traffic.

The following commerce passed through the Sault Ste. Marie Canals during October, 1912:

ARTICLES			CANADIAN CANAL	U.S. CANAL	TOTAL
Copper.....	Eastbound.....	Short tons	1,078	15,126	16,204
Grain.....	".....	Bushels	3,053,569	5,421,684	8,475,253
Building stone.....	".....	Short tons			
Flour.....	".....	Barrels	299,480	1,260,383	1,559,863
Iron ore.....	".....	Short tons	4,827,212	2,253,776	7,080,988
Pig iron.....	".....	".....	1,325	5,768	7,093
Lumber.....	".....	M. ft. b.m.	3,059	86,883	89,942
Silver ore.....	".....	Short tons			
Wheat.....	".....	Bushels	20,226,471	13,236,924	33,463,395
General merchandise.....	".....	Short tons	4,323	36,023	40,346
Passengers.....	".....	Number	618	824	1,442
Coal, hard.....	Westbound.....	Short tons	84,945	275,958	360,903
Coal, soft.....	".....	".....	298,946	1,063,965	1,392,911
Flour.....	".....	Barrels			
Grain.....	".....	Bushels			
Manufactured iron.....	".....	Short tons	38,460	37,151	75,611
Iron ore.....	".....	".....			
Salt.....	".....	Barrels	8,155	71,613	79,768
General merchandise.....	".....	Short tons	112,424	121,948	234,372
Passengers.....	".....	Number	1,002	189	1,191
Vessel passages.....	".....	Number	1,157	2,198	3,355
Registered tonnage.....	".....	Net	3,834,194	4,742,266	8,576,460
Freight—Eastbound.....	".....	Short tons	5,543,633	3,097,454	8,641,087
—Westbound.....	".....	".....	535,940	1,539,764	2,075,704
Total freight.....	".....	".....	6,079,573	4,637,218	10,716,791

and Jennie, St. Andrews, N.B., 25 tons, sunk in collision; Hope, St. John, N.B., 162 tons, broken up.

SAILING:—Arizona, Yarmouth, N.S., 85 tons, stranded; Ethel, Yarmouth, 93 tons, abandoned at sea; H. C. Corson, Sydney, N.S., 38 tons, burnt; Monica A. Thomas, Halifax, N.S., 46 tons, burnt; Nina S., Halifax, 19 tons, burnt; Recruit, Toronto, 297 tons, broken up; Venture, Charlotte-town, P.E.I., 43 tons, wrecked.

The Running Aground of the s.s. Royal George.

The s.s. Royal George, owned by the Canadian Northern Steamships, Ltd., while making her last trip to Quebec for the season, ran aground about a mile east of Point St. Lawrence, Isle of Orleans, on Nov. 5, at 5.10 p.m. It was high tide at the time, and although there was a thin fog, the vessel is said to have been running from 16 to 18 knots an hour, with the view of making port the same evening. The grounding took place on the north shore of the south channel, and the receding tide soon left the vessel in such a condition that the tugs and other steamboats which went to her aid were unable to get close enough to render any practical help. At low tide there was only 6 ft. of water over the rocks, and as the vessel is 60 ft. from keel to boat deck, her position was regarded as precarious. The Quebec and Levis Ferry Co.'s steamboat North took off about 400 of the passengers early on the morning of Nov. 6. A severe storm which came up, with a hurricane wind, prevented the remainder of the 901 passengers being taken off until the morning of Nov. 8. Lighters were requisitioned to take off baggage and cargo. With the passing of the spring tides the hopes of towing the vessel off had to be given up, and on Nov. 11 the company announced its intention of abandoning her to the underwriters, this being done as a precautionary measure. As this is being written (Nov. 15) it is not likely that any attempts will be made to haul the vessel

real is ready to receive the vessel, and the Vickers Co. is prepared to make all the repairs necessary.

The Royal George was built by the Fairfield Shipbuilding Co., Glasgow, Scotland, in 1907, for the Mediterranean traffic, and was then known as the Heliopolis. With her sister ship as the Cairo she was bought by the Canadian Northern Steamships, Ltd., and partially rebuilt for the trans Atlantic trade, for which they are eminently adapted and have become exceedingly popular on account of their speed and excellence of accommodation. Her dimensions are:—Length, 545 ft.; beam, 60 ft. 3 ins.; depth, to shelter deck, 38 ft.; tonnage, 11,000. The machinery consists of three sets of compound steam turbines, one h.p. turbine in the centre, and a l.p. turbine on either side, having a collective power of 18,000 i.h.p., at 340 shaft revolutions. The vessels developed 21 knots an hour on their trial trips, and in actual service have maintained 19 knots an hour. A full description of the vessels as rebuilt was given in Canadian Railway and Marine World for April, 1910.

Capt. Saunders, New York, and Capt. Parry-Jones, Cleveland, Ohio, arrived in Quebec, Nov. 12, and took charge of the vessel on behalf of Lloyds, and are superintending the salvage operations. Capt. H. St. G. Lindsay, the Dominion Wreck Commissioner, arrived in Quebec, Nov. 16, to conduct an investigation into the circumstances attending the wreck.

THE RELEASE OF THE VESSEL.

After the above had been put in type the vessel was released on Nov. 24 at 4 p.m., when the tide reached 21.2 ft. forward. The Quebec Salvage and Wrecking Co.'s steamship Strathcona pulled the Royal George into deep water, and the latter left for Quebec at 6 p.m. under her own steam, arriving there at 7 p.m., when she entered the Louise basin. An examination showed that she was damaged considerably less than expected, and it was hoped that temporary repairs would be completed so that she might start to recross the Atlantic a few days thereafter.

the command of the Canadian-Australian steamship Marawa. He has been appointed to the Makura, succeeding Capt. Gibbs, who takes command of the company's new steamship Niagara. He is succeeded on the Marawa by Capt. J. T. Rolls.

The Admiralty Court in London, Eng., gave judgment, Oct. 31, in the action arising out of the loss of the s.s. Helvetia, after collision with the s.s. Empress of Britain, on the St. Lawrence in July. The court found that while blame was attachable to both vessels the principal fault lay with the Helvetia, the owners of which must pay seven-twelfths of the damage.

The Plant Steamship Co.'s new steamship Evangeline arrived in Halifax, N.S., from the builders' yard in Scotland, Oct. 30. She left Greenock, Oct. 17, and had rather a rough trip, but proved to be a good seaboat. H. L. Chipman, the company's representative in Halifax, who came over on her, states that a sister ship to the Evangeline is to be built the season of 1914.

E. C. Fry, Lloyd's agent at Quebec, considers that if the British marine underwriters are reluctant to assume risks on the St. Lawrence route after Nov. 25, the Dominion Government should subsidize trans-Atlantic vessels using the route after that date to the amount of the increased cost of insurance. He believes the navigation is quite safe until Dec. 15 at least. In the old days of wooden ships, he said, the date for the expiry of insurance was Oct. 1.

The Shipping Federation of Canada has complained to the St. John, N.B., city council and to the Government about tax of \$7.50 levied on laborers taken into St. John for the winter navigation season. About 200 men are annually taken from Montreal to St. John by the steamship companies in order to provide the necessary skilled labor for loading and unloading trans-Atlantic vessels. The St. John council has informed the Federation that it cannot be expected to supply all the civic benefits gratis to those who are only half yearly residents.

The Head Line steamship Bengore Head, stranded northeast of the Flower Island light in the Straits of Belle Isle early in October, was floated and taken to Quebec, where it was found that she was but slightly damaged. After temporary repairs she sailed for Dublin, Ireland. The investigation by the Wreck Commissioners' Court at Quebec was concluded Oct. 30 and judgment was reserved. A special point for consideration is whether the court has jurisdiction, as the vessel is registered in Ireland and the grounding occurred in Newfoundland waters.

Maritime Provinces and Newfoundland.

The old sealing steamboat Diana, of St. John's, Nfld., is undergoing extensive repairs at Halifax, N.S.

Reports from Indiantown, N.B., state that a company is being formed there to operate a steamboat between St. John and Wickham.

The Halifax, N.S., city council has determined to reconsider its decision of having twin docks built at the Halifax terminal of the Dartmouth ferry.

The Dominion Coal Co.'s tug, Douglas H. Thomas, sank in Halifax harbor Nov. 13, after having been run into by the steamship City of Sidney.

The Dominion Public Works Department has let a contract for the dredging of the harbor at Seaforth, N.S., to the Halifax Dredging Co. at a cost of \$17,300.

The Cape Breton Electric Co. is negotiating for the purchase of the steamboat Henry C. Eaton from the Frontier Navigation Co., Calais, Me., for ferry purposes at Sydney, N.S.

The contract for the building of the marine wharf at Carleton, in the harbor at St. John, N.B., is reported to have been let to F. L. Boone, St. Mary's Ferry, N.B. The estimated cost is \$185,000.

The Dominion Coal Co.'s chartered steamships, running between Sydney, N.S., and Montreal, Que., carry Chinese crews. The navigating and engineering officers are British, but the entire working crews are Chinese.

The steamship Wilhelmina went on the dry dock at St. John's, Nfld., for extensive repairs, Nov. 16. The contract price is said to be \$30,000, and it is biggest piece of work undertaken by the Reid Newfoundland Co. at the docks.

The Dominion Coal Co.'s chartered collier, Glace Bay, arrived at Sydney, N.S., from the builders' yards, Newcastle-on-Tyne, Eng., recently, and was at once put on the trade carrying coal to Montreal. She has a deadweight capacity of 11,000 tons.

The Nova Scotia Construction Co. received Nov. 12 at Halifax from the builder's yard at Liverpool, N.S., a large scow for use on the new harbor works. It is filled with six steam engines for operating the pile driving machines. There are 1,000 concrete piles, of about 16 tons each, to be driven at the new terminal immigration pier under construction.

According to an Ottawa press despatch the Shipping Federation of Canada has protested to the Minister of Marine against the action of Wreck Commissioner Lindsay in investigating the grounding of the s.s. Bengore Head in the Straits of Belle Isle. The accident, it is claimed, took place in Newfoundland waters, and the jurisdiction of the Wreck Commissioner is questioned.

The Crystal Stream Steamship Co. has purchased a new steamboat to be placed on the St. John river between St. John and Fredericton, N.B., next season. The steamboat it now being operated in the vicinity of New York, and is to be delivered during the winter. J. Purvis, representing the company, is reported as stating that the new boat is of modern type steel construction, 160 ft. long, with 5 ft. draught. She is capable of making 18 miles an hour, and has accommodation for 600 passengers.

Province of Quebec Marine.

It is said that the Dominion Government has decided to build a dry dock at Quebec as a public work.

The Quebec Harbor Commissioners extended the time for receiving tenders for the building of a 1,000,000 bush. capacity elevator on the Prince Louise Embankment to Nov. 30.

The Nova Scotia Steel and Coal Co.'s s.s. Gladstone, from Sydney, N.S., to Montreal, with coal, grounded at St. Laurent, Isle of Orleans, Nov. 5, and received considerable damage.

The vessel was released from the rocks and towed into Quebec Nov. 13.

Hon. L. P. Pelletier, Postmaster General, in a speech at Quebec, Nov. 5, stated that it had been finally decided that the location of the dry dock for Quebec will be at Lauzon, near Levis, and that it will be built by the Dominion Government as a national work.

The Aurelie G., the new tug built in

Glasgow, Scotland, for the Sincennes-McNaughton Co., Montreal, had reached a point 700 miles west of the Irish coast, when stress of weather compelled her to return. It has been decided that she will remain in Glasgow for the winter.

The Steamboat Cecilia L sank at Ile Perrot on Lake St. Louis, Montreal, with the loss of 12 lives, Nov. 2. She traded between Valleyfield and Montreal, was built of wood, and had a capacity of 175 tons. She was caught in a gale, and driven on the rocks, and broke up in a few minutes. Of the 17 persons on board, four only were saved.

The statistics of vessels passing through the Lachine canal for October showed that they carried 5,031,600 bush. of wheat; 495,613 bush. of oats; 38,805 barrels of flour; 595 cases of eggs; 36,425 boxes of cheese; 543 pkgs. of butter; 17,192 barrels of apples, and 51,997 tons of coal, while 64,429 tons of coal were landed at various points on the canal banks. From the opening of navigation to Oct. 31 5,399 vessels passed through the canal against 5,080 during the same period in 1911.

The new Quebec harbor commissioners have entered on their duties, but it will take some time before they can familiarize themselves with the works, wants, etc., of the harbor. The season being so advanced they will, for the present, study the position and call in engineers with a view of having plans prepared for the development of the harbor. The commissioners will endeavor to have the plans sufficiently advanced to be able to commence the most necessary works at latest by next spring.

A. R. Decarry, District Engineer Department of Public Works, Quebec, informed the city board of trade, Nov. 12, of the Government plans for the development of the St. Charles river. It is proposed to build four piers extending northeasterly from the north walls of the Louise docks, to run parallel with the present breakwater. These piers will each be 1,000 by 300 ft. A masonry extension of the Louise embankment will be built in the shape of a triangle to a point where it is proposed to build a dam across the river 2,217 ft. long. There will be two locks in the dam, one to be used for vessels seeking an entrance into the upper reaches of the river, and the other as an exit for shipping. A steel bridge will be built to carry steam and electric railway tracks, as well as for general traffic. The river will be dredged from its mouth to near the marine hospital, and a wall will be built along the north wall of the river.

Ontario and the Great Lakes.

During October 6,780,566 bush. of grain passed through the Welland canal, against 4,826,900 in Oct., 1911.

M. Henry, Deputy Superintendent, Welland Canal, Port Dalhousie, Ont., has been notified that his services will be dispensed with Dec. 31.

The dredge Little Lake has been taken to Lake Simcoe to clear out the berths for the new wharf at Orillia, Ont., which will be 200 by 22 ft.

A bylaw for the imposition and collection of tolls, etc., for the harbor at Meaford, Ont., has been approved by the Dominion Government.

The keel of a new steamboat for the Northern Navigation Co. has been laid by the Western Dry Dock and Shipbuilding Co., Port Arthur, Ont.

The new oil burning steamship Calgary, just out from Glasgow, Scotland, ran aground Nov. 3 in entering the harbor at Buffalo, N.Y., on her first trip.

Capt. A. McMaugh, a well known mariner on the Great Lakes, died at St. Catharines, Ont., Oct. 30, aged 74. He was father of Capt. Jas. McMaugh, Toronto.

It is reported that the Richelieu and Ontario Navigation Co. is arranging to establish a fruit market in Toronto, at the waterfront, east of Yonge street.

The Keystone Transportation Co.'s capital has been increased from \$100,000 to \$500,000 by supplemental letters patent under the Dominion Companies' Act.

The Northern Navigation Co. proposes to erect a storehouse and cold storage plant, a laundry, and to double the capacity of its warehouses at Point Edward, Ont.

During October there passed through the St. Lawrence canals vessels carrying 1,765,632 bushels of grain. Vessels carrying 8,228 tons of coal discharged at Kingston, Ont., during the same period.

An appropriation of \$30,000 is reported to have been secured for the construction of a dry dock at Peterboro', Ont., on the Trent river canal. It is said that the dock will be built at once.

The Dominion Government steamboat *Dollar* was launched at Kingston, Ont., Oct. 24. She is to be used in the lighthouse and buoy service, and will be fitted with wireless telegraph.

The steamboat *Rosedale*, owned by the Inland Lines Co., Hamilton, Ont., went aground at Detour light, near Sault Ste. Marie, Ont., Nov. 11, during a gale, but was released with but slight damage.

The Keystone Transportation Co.'s new steamboat *Keybell*, built at Collingwood, Ont., is completing her first round trip. She is of the regular canal dimensions, with a dead weight capacity of 2,200 tons.

W. F. Herman, G.P.A., Cleveland and Buffalo Transit Co., is reported as stating that the company proposes to inaugurate a passenger service between Cleveland, Ohio, and Port Stanley, Ont., next season.

A contract has been arranged with the Great Lakes Dredging Co. for the operation of its icebreakers at Port Arthur and Fort William, Ont., in order to keep navigation there open as late as possible this season.

Nicholas Huff, Chief Marine Engineer, Detroit, Belle Isle and Windsor Ferry Co., who retired recently after 20 years' service with the company, was given a dinner by the President and presented with a travelling bag.

The Keystone Transportation Co.'s steamship *Keystone* ran on the Scotch Island shoal, near Brockville, Ont., Oct. 26, and sank. She was valued at \$125,000. Her cargo consisted of 2,400 tons of coal consigned to Montreal.

The *Mayflower*, a freight and passenger steamboat trading on the Madawaska river, between Barry's bay and Ottawa, ran on a rock and sank when three miles out from Barry's bay on the night of Nov. 12, with the loss of nine lives.

Representatives of the Toronto Harbor Commissioners laid before the Dominion Government, Nov. 6, plans for the development of the harbor. The details of the plans will be made public after their approval by the city council.

The Dominion Government steamship *Estevan* has successfully completed her trial trips at Collingwood, Ont., and has started for Victoria, B.C., via the Straits of Magellan. It is expected that she will reach her destination in January.

The International Waterways Commission is being asked by the United States Government for permission to carry out extensive improvements on the Livingstone

channel on the Detroit river. The channel passes through both Canadian and U. S. waters.

The first Welland canal was opened for traffic Nov. 3, 1829. There were between Lake Erie and Lake Ontario 40 wooden locks, each 100 ft. long, 22 ft. wide, and 8 ft. deep. On the proposed new canal, the locks will be 900 ft. long, 32 ft. wide and 30 ft. deep.

The Toronto Ferry Co.'s annual meeting has been postponed for a month owing to the audit being incomplete. The Managing Director, L. Solman, is reported as stating that the earnings for the year will not be as great as last year, owing to the wet season.

The Hamilton Steamboat Co. has surrendered its charter to the Ontario Government, and has been dissolved. Its property was acquired some time ago by the Niagara Navigation Co., and afterwards transferred to the Richelieu and Ontario Navigation Co.

The Richelieu and Ontario Navigation Co. is reported to have acquired an extensive waterfront site at Fort William, Ont.

The Dominion Government has awarded the Windsor Dredging Co. a contract for dredging at Port Stanley, Ont., estimated to cost \$17,000.

G. Charett, Windsor, Ont., had his license as a first class pilot suspended for 30 days from Nov. 5, for violation of certain navigation rules in connection with the collision between the steamboats *Pine Lake* and *Fleetwood* on Lake St. Clair, Oct. 21, in which the former was sunk.

The new Livingstone channel, which the U.S. government has completed through the Detroit river at a cost of \$10,000,000, has been opened for traffic.

Beginning Nov. 10 all downbound steamboats started to use the new channel at night as well as by day. The old channel will be used exclusively by upbound vessels.

The Georgian Bay Elevator Co. has been incorporated under the Ontario Companies' Act with a capital of \$100,000 and offices at Meaford, Ont., to build a transshipment elevator there. Following are the provisional directors:—G. W. Mason, F. C. Carter, C. G. French, W. A. McCarthy, W. H. Beatty, Toronto.

The steamboat *S. and Y.*, owned by the Upper Ontario Steamboat Co., went ashore about four miles below Flat rapids on the Montreal river, Ont., Nov. 14, and sank.

The oil driven vessel *Calgary* left Kingston, Ont., on her first trip to the head of the lakes Nov. 12. She arrived at Kingston from the builder's yards in Great Britain Oct. 28.

The U.S. Lake Survey reports the levels of the great lakes in feet above tidewater for October as follows:—Superior, 602.59; Michigan and Huron, 580.50; Erie, 572.12; Ontario, 246.17. As compared with the average October levels for the past 10 years Superior was 0.19 ft. below; Michigan and Huron, 0.14 ft. below; Erie, 0.05 ft. below, and Ontario, 0.30 ft. above.

It was semi-officially announced at Detroit, Mich., Nov. 11, that the *Wabash Rd.* had purchased three of the car ferries formerly used by the Michigan Central Rd., between Detroit and Windsor, Ont., viz., the *Transfer*, *Transport* and *Detroit*. The price paid is said to be \$200,000. Up to the present the *Wabash* trains have been carried across the river on the G.T.R. car ferries.

The Great Lakes Dredging Co. is having built by the Western Dry Dock and Ship Building Co., at Port Arthur, an ice breaking tug, of which the following are particulars:—Length over all, 125 ft.; length between perpendiculars, 114 ft.; beam,

moulded, 28 ft.; depth, moulded, 16 ft.; one Scotch boiler 15 ft. 4½ ins. diameter by 11½ ft. long; triple expansion engine, diameter of cylinders 18, 30, 48 by 38 ins. stroke.

Ottawa reports state that the plans for the new Welland canal are practically completed. It will start from near Thorold, and will extend to Lake Ontario at McCollas cove, three miles from the present outlet at Port Dalhousie, a distance of eight miles. The present canal will be utilized from Port Colborne to Thorold, thus making the whole canal 28 miles long. It is hoped that construction will be started on the new canal in the summer of 1913.

W. N. Warburton, Manager of the London and Lake Erie Transportation, is reported as stating that the new steamboat service to be run in connection with the company's London-Port Stanley electric railway will be from Port Stanley, Ont., to Cleveland, Ohio; that a steamboat of the Cleveland and Buffalo line will make four round trips a week—that the service will be continued annually to Dec. 1, and that traffic arrangements will be made with other lines.

Press reports stated recently that the oil engines on the vessel *Toiler*, which is managed for a syndicate by James Richardson and Sons, Kingston, Ont., have proved so unsatisfactory that they are to be replaced by steam engines. We are advised that this report is without foundation, and that while the engines have not been operating satisfactorily, it is improbable that some remedy cannot be found for the troubles. The sister oil engine ship, the *Calgary*, has been most satisfactory in operation.

The steamboat *Marshall*, owned by the Central Canada Coal Co., Brockville, Ont., ran into the gates at lock 13 on the Welland canal, Nov. 1. Four of the gates were carried away, but the repairs were completed so as to permit traffic being resumed on the following day. The vessel was not damaged.

The steam barge *Juneau*, with barge in tow, from Point Anne to Toronto, got caught in the gale of Oct. 31. Cutting off the tow the *Juneau* ran into Cobourg, where she sank. The barge, *Lock*, got adrift, and springing a leak, sank near the Gull lighthouse. The crew reached Port Hope Nov. 1, after several hours' rough experience in an open boat.

Manitoba, Saskatchewan and Alberta.

The Dominion Government tug *Sir Hector* ran on a rock near the mouth of the Little Saskatchewan river, in Lake Winnipeg, Nov. 2, and sank in 18 ft. of water.

W. W. Fryer, who died at Selkirk, Man., Oct. 31, had been engaged many years in navigating Lake Winnipeg. Starting with the Northwest Navigation Co. in 1882, he finally organized the Ewing-Fryer Fish Co.

It is reported from Grand Forks, N.D., that the Red River Transportation Co., which has passed under the control of W. A. Whitney, Superior, Wis., will likely move its headquarters to Winnipeg, Man., for the opening of the navigation season of 1913.

Navigation is suspended for the season on the Red River and the steamboats of the various companies engaged in the trade have been tied up at their wharves. The managers report that the season has been a good one, despite the weather which affected the passenger traffic, and the accidents.

The St. Andrew's lock on the Red river, near Winnipeg, was closed for the season,

Oct. 25. The lock has been drained, and the Ball Construction Co. has restarted work building cement approaches. The approaches on the east side have been completed, and the foundation work on the west side is well advanced.

An Ottawa press dispatch says the Minister of Railways is planning to push construction in the harbor and on the terminals at Port Nelson, so that when the Hudson Bay Ry. is completed steamships will be able to take cargoes of grain. H. T. Hazen, M. Can. Soc. C.E., has been at Port Nelson all summer making surveys, taking soundings and making a complete investigation as to the feasibility of the port for terminals.

In connection with the press reports referred to in Canadian Railway and Marine World for November as to a projected ship canal from Portage la Prairie, Man., to Lake Winnipeg, it is further reported that a preliminary survey has been made by W. E. Hobbs, of Winnipeg. It is expected to have the surveys completed this year, so that everything will be ready to start construction in the spring. Nothing is said as to who is behind the project.

British Columbia and Pacific Coast Marine.

The C.P.R. s.s. Princess Patricia is undergoing a general overhaul at Victoria.

The last steamboats for the season on the Yukon river left Dawson, Oct. 22.

Capt. C. G. Stormgren, a well known Pacific coast shipmaster, died at Victoria, B.C., Nov. 9.

The C.P.R. steamship Princess Sophia is to have oil burning apparatus installed during the winter.

The Coquitlam Shipbuilding Co., Coquitlam, B.C., has laid the keel of its first vessel, a 175 ft. four masted schooner.

The traffic receipts of the North Vancouver Ferry Co. for October were \$11,692, against \$11,230 in Oct., 1911, and \$6,974 in Oct., 1910.

The Victoria, B.C., tug Bute went ashore off Albert Head, near Victoria, Nov. 2, and sank. She was floated Nov. 5 and towed into port for repairs.

Tenders have been invited for the building on the Pacific coast of two 45 ft. gasoline launches for the Dominion fisheries protection service on the coast.

The steamboat Vidette left Dawson, Yukon, Nov. 3, but was stalled by the ice in the Indian river. The passengers returned to Dawson, 28 miles, by land.

The winter service from Victoria to the Lynn canal, B.C., provided by the C.P.R., started Nov. 2, and is a fortnightly one, the Princess May being on the run.

The beacons and buoys placed by the Dominion Government on Pacific coast waters, which are now painted red, are, it is said, to be painted white in future.

It was announced in Vancouver Nov. 11 that tenders would shortly be asked for the building of a dipper type dredge for use on the Pacific coast, at an estimated cost of \$150,000.

Two additional steam trawlers are on their way from Grimsby, Eng., for the Canadian Fisheries and Cold Storage Co., at Prince Rupert, B.C. Two others have already reached Prince Rupert.

The Dominion Government has advanced Vancouver, B.C., from a port of entry to a first class port. Under the new regulations vessels will be able to secure clearance papers at any hour of the day or night.

The plans for the dock and harbor at Coquitlam, B.C., prepared by A. O. Powell provide for the laying out of district lots

343, 168 and 169 for railway and industrial purposes, with docks, wharves, etc., on the Coquitlam river.

The British Columbia Express Co.'s steamboat B-X ran aground on a bar on the Upper Fraser river between Fort George and Quesnel, B.C., recently. This is the second time she has been damaged on the same bar during this year.

The Vancouver-Tacoma Steamship Co. has been sold to Frank Waterhouse & Co., Seattle, Wash. The company owned one steamboat, the Morning Star, which although having some passenger accommodation, only carries freight.

During the six months ended Sept. 30, the number of vessels arriving at and departing from Victoria, coastwise, was 3,790. During October 316 vessels of 221,094 tons arrived in, and 334 vessels of 190,329 tons departed from the port.

The old paddle steamboat George E. Starr, built in 1879, and operated for years between Olympia, Seattle, Wash., and Victoria, B.C., has been sold to Frank Waterhouse Co., Seattle, Wash. She is to be dismantled and converted into a barge.

The Boscowitz Steamship Co.'s steamboat Vadso, ran aground at the entrance of Bayne sound, Oct. 15. She was floated Oct. 26, and beached in Deep bay, where temporary repairs were made, and she was then towed to Vancouver for repairs.

The owners of the Vancouver tug Nouaine are suing the Inland Navigation Co., of Seattle, Wash., to recover \$37,000 damages for the sinking of the tug after a collision with that company's steamboat Iroquois off the Fraser river mouth, Oct. 22, 1911.

It is reported that the owners of Victoria sealing schooners propose to place them under the German flag in consequence of the signing of the convention between Great Britain and the United States prohibiting pelagic sealing in the Pacific ocean for 15 years.

The contract for the building of the breakwater at Ogden point, Victoria, B.C., has been let to the London, Eng., firm headed by Sir John Jackson, at an estimated cost of \$1,800,000. The structure will be 2,500 ft. long, and will extend into a depth of 80 ft.

The Terminal Steamship Co., controlled by Capt. Cotes, has added to its fleet the twin screw oil burner Rowena. This is the old Rowena, remodelled and refitted at a cost of \$35,000. She will be put on the Vancouver-Howe sound run, in place of the present steamboats Bramba and Britannia.

Canadian Notices to Mariners.

The Department of Marine has issued the following:—

48. Nov. 9. 281. Nova Scotia, Cape Breton island, Washaback river, buoy established. 282. Quebec, River St. Lawrence, ship channel between Quebec and Montreal, change in characteristic of lights shown from gas buoys on starboard side.

49. Nov. 14. 287. Nova Scotia, south coast, westward of Halibut islands, Salamander rock, buoy established. 288. Prince Edward Island, north coast, North Rustico, change in position of outer range lights. 289. Quebec, River St. Lawrence, port of Quebec, Maheux road, limits of examination anchorage.

92. Oct. 22. 257. Nova Scotia, south coast, off entrance to Lockport harbor, Gull rock, change in characteristic of light. 258. Newfoundland, east coast, St. Johns harbor entrance, existence of a rock; amended position of White rock. 259. Newfoundland, east coast, Bonavista bay, Shoepoint, light-

house established. 260. Newfoundland, east coast, Bonavista bay, Puffin island, change in character of light.

93. Oct. 24. 261. Ontario, Georgian bay, approach to Victoria harbor, Midland point range lights established. 262. Ontario, Lake Superior, Thunder bay, Port Arthur, light on Thunder bay elevator wharf, additional information.

94. Oct. 24. 263. British Columbia, Vancouver island, west coast, shelter sheds established. 264. British Columbia, Burrard inlet, Vancouver harbor, Burnaby shoal, characteristic of fog bell. 265. British Columbia, Chatham sound, Prince Rupert harbor, Charles point, characteristic of fog bell. 266. United States of America, Washington, Juan de Fuca strait, Cape Flattery light station, intended change in fog signal.

95. Oct. 29. 266. Ontario, great lakes and River St. Lawrence, dates to which lights will be kept in operation.

96. Oct. 29. 267. Nova Scotia, south coast, entrance to Halifax harbor, Sambro outer bank, gas and whistling buoy to be replaced during winter by lightship. 268. Nova Scotia, North Atlantic ocean, Sable island, west end, change in character of light.

97. Oct. 31. 269. Ontario, Lake Ontario, Welland canal entrance, Port Dalhousie, operation of fog alarm temporarily discontinued.

98. Oct. 31. 270. Nova Scotia, southwest coast, Clarke harbor, buoy established. 271. Nova Scotia, Cape Breton island, east coast, Eastern harbor, Cheticamp, shoal in entrance, caution. 272. Quebec, River St. Lawrence, Cock point, can buoy replaced by gas buoy. 273. Labrador, uncharted shoal reported in the vicinity of Quaker reef and Tinker island. 274. England, south coast, Plymouth approaches, Draystone, light buoy established.

99. Nov. 5. 275. St. Lawrence river from Quebec to Lake Ontario, first edition of the St. Lawrence Pilot (above Quebec). 276. United States Lake Superior, Superior entry, north pierhead, light established, temporary light discontinued. 277. United States Lake Superior, Superior entry, north breakwater, light established, temporary light discontinued.

100. Nov. 7. British Columbia. 278. Vancouver island, west coast, Clayoquot sound, Templar channel, change in character of buoys. 279. Change in color of lighted beacons. 280. Queen Charlotte islands, Houston Stewart channel, beacon to be moved from Flat rock to Separation point, Tolmie channel.

102. Nov. 13. 283. Quebec, Ottawa river, Rigaud river entrance, range lights now shown from lanterns on poles. 284. Ontario, Ottawa river, Ile Rosalie, lighthouse established. 285. Ontario, Lake Huron, north channel, approach to Blind river, uncharted rock reported. 286. Ontario, Michigan, Detroit river, Livingstone channel, lighted buoy established, buoys provided with lights.

104. Nov. 15. 290. British Columbia, strait of Georgia, sandheads of Fraser river, diaphone fog alarm established on lightship, fog bell discontinued. 291. Alaska, Sumner strait, Vichnefski rock, light established.

105. Nov. 18. 292. New Brunswick, Bay of Fundy, Machias seal island, change in character of light. 293. New Brunswick, south coast, Bay of Fundy, Passamaquoddy bay, Chamcook head, buoy established, Chamcook harbor, buoys established.

106. Nov. 19. 294. Ottawa river, Lake of Two Mountains, St. Placide upper range, new back range lighthouse. 295. Ontario, Georgian bay, Colpo bay, Warton, change

in position of light. 296. Ontario, Georgian bay, east side, southeastward of Roberts island, Honey harbor, beacon erected. 297. Ontario, Georgian bay, east side, approach to Parry Sound, red rock characteristic of fog alarm.

Comprehensive Scheme for Toronto Harbor Improvements.

The Toronto Harbor Commissioners have approved of a comprehensive scheme for the improvement of Toronto harbor, which was prepared by the commissioners' engineer, E. L. Cousins. The plans call for an expenditure of \$19,142,088.91 within the next 10 years, it being apportioned as follows:

Commissioners' work, raised by debentures on property\$11,215,920.85
City's work (essential only) 146,500.00
Government work 6,123,284.66
Total\$17,485,705.51
Further city payment if council accepts park and boulevard scheme 1,656,383.40
Grand total\$19,142,088.91

The plans have been submitted to the Dominion government, and it is expected that some provision will be made in the estimates at the current session, so that work may be started next spring.

The commissioners have submitted the following summary of the scheme:

A modern harbor, with a uniform depth of water capable of accommodating any vessel with a draught of 24 ft.

Modern, permanent docks on the central waterfront served by 24 ft. of water, and equipped with the best of freight sheds, warehouses, and appliances.

A dock and industrial district at the foot of Cherry street, equipped with freight sheds, warehouses, and the first of a series of factory buildings to serve the needs of the east end.

A similar area at the foot of Bathurst street, to take care of west end business.

Proper co-ordination of rail and water traffic at all three of the above points, in order to properly develop the port.

An industrial area containing 644 acres of available land in the Ashbridge bay district, which will be known as the Toronto harbor industrial district, capable of accommodating factory buildings with a value of \$30,000,000, and producing a ground rent revenue of \$500,000 a year.

A ship channel, 6,800 ft. long, 400 ft. wide, and 24 ft. deep, with turning basin 1,000 ft. square at its east end, serving the industrial district and the eastern portion of the city generally, and equipped with three miles of dockage.

A dock area on the west face of the industrial district capable of development, so as to provide an additional dock frontage of 2½ miles.

A new lakefront park and waterway, extending from the eastern channel to the foot of Woodbine avenue, and containing 352 acres protected by a breakwater three miles long. Inside the breakwater will be ample accommodation for east end aquatic clubs.

A protected waterway, with an average width of 600 ft., behind a breakwater from Woodbine avenue to the east city limits.

Additional park areas on the Island totaling 352 acres. New park areas in the district from Bathurst street to the Humber river containing 190 acres, and fronting on a protected waterway 500 ft. wide, which is separated from the lake by a breakwater.

A total area of new park lands of 894 acres.

A bathing beach 1-1.3 miles long, from Sunnyside to the Humber. A similar beach 4¼ miles long, from the eastern channel to Victoria park.

A lakefront boulevard system of drive-ways, bridle-paths, and walks across the waterfront for 11 miles.

A protected waterway 12 miles long, from east to west along the city front.

A terrace promenade 6,880 ft. long and 55 ft. wide, from Sunnyside to the Humber.

A double-deck combined traffic and recreation pier 300 by 20 ft. in front of the exhibition grounds.

A location for aquatic clubs 1,000 by 300 ft. north of the new western channel, with an anchorage basin of absolutely protected water covering 42 acres. A similar location at the foot of Roncesvalles avenue, 800 by 250 ft., fronting on the protected waterway formed by the western breakwater.

A public playground covering 3½ acres east of the foot of Roncesvalles avenue. A public square 600 by 500 ft. west of Roncesvalles avenue.

A reservation 80 ft. wide, from the Humber river to Sunnyside crossing as a right of way for radial lines.

A new Lake Shore road 66 ft. wide, to the south of the radial railway reservation.

Large Lake Passenger Steamboats.

The Detroit and Cleveland Navigation Co.'s steamboat City of Detroit III., which was put in service between Detroit, Mich., and Buffalo, N.Y., during the past summer, was claimed to be the largest vessel of its type on the great lakes, if not in the world. She is 470 ft. long overall, 455 ft. on the keel, 55 ft. beam of hull and 22 ft. deep. But she will be outclassed by a vessel which is being built for the Cleveland and Buffalo Transit Co. to run between Cleveland, Ohio, and Buffalo, and which will be 500 ft. long overall, 58 ft. beam, 96½ ft. wide over the guards, and have a displacement of 7,000 tons.

The hull of the C. & B. vessel is of steel, divided into 12 compartments by watertight bulkheads, and having a double bottom extending over the entire length. The doors in the bulkheads will be operated by hydraulic power, controlled from the engine room. There will be automatic sprinklers and an automatic fire alarm system, and the kitchen will be in a separate fire-proof compartment. The vessel will have 500 staterooms, accommodating 1,500 passengers, and will have a total capacity for 6,000 passengers and 1,500 tons of freight. All rooms will be equipped with running filtered water, electric light and telephones; ventilation will be provided by fans delivering cooled air. The main saloon will be 400 ft. long, and the dining room will have a series of alcoves with bay windows so as to afford a good view from the tables.

As to the use of side wheels instead of screws for propulsion, the company states that the former system has been adopted as affording maximum comfort to passengers, although it is thought to cost more for construction and operation. The engine is of the three cylinder compound inclined type, having a high pressure cylinder 66 x 108 ins. and two low pressure cylinders 96 x 108 ins. It will drive feathering wheels 30 ft. diameter over the buckets. At 30 r.p.m. the engine will develop about 9,500 h.p. and give a speed of about 22 m.p.h. the boiler equipment will include six single end and three double end marine boilers, each 14 ft. diameter, and these will have 24 furnaces 56 in. diameter. They will be arranged in four batteries, each with its own smokestack, the height from grates to top of stack being about 80 ft. The bunkers will have capacity for 600 tons of coal. There will be three turbo generators, supplying current for fans, motors and over 5,000 lamps.

For convenience and safety in the hand-

ling of so large a vessel in the harbors, she will be provided with double rudders, one at each end.

The Port of New Westminster, B.C.

The following information has been sent by the New Westminster Progressive Association. The city is on the Fraser river, 18 miles from salt water:—

The harbor extends from the head of Douglas island, about 28 miles from Sandheads lightship, down the north arm to salt water, south to the international boundary and up the south arm to Douglas island again. The main deep-water channel, or south arm, is 28 miles long, and the north arm, for log towing and small vessels, 14 miles. There is a depth of 14 ft. at low water and 26 ft. high water at Sandheads. When the Dominion government's work at the Sandheads is finished the depths will be 25 ft. at low water and 37 ft. at high water. There is an average depth of 40 ft. along 1.7 miles of municipal waterfront. The tides are 12 ft. at the Sandheads and 5 ft. at New Westminster. The water is fresh and good for boilers. Marine growth dies and falls off in the river in 10 days or so.

The pilotage is \$1 per foot of vessel's draught and 1c. per registered ton each way. Half charges if no pilot is employed. The harbor dues run from 50c. for vessels of 50 tons and under to \$5 for vessels over 700 tons. There are no dock dues. The wharfage is 5c. a ton. Railways make no charge on freight delivered from or to their own trains. The berthage is \$1 a day, where any charge at all is made. Towage is unnecessary except for sailing vessels, when the charge is a matter of bargain.

The wharves are as follows:—C.P. Railway, 340 ft. long; C.P. Navigation, 700 ft. long; B.C. Transport, 600 ft. long; B.C. Electric Ry., Great Northern Ry., Canadian Northern Ry. at Port Mann, 1,000 ft. long, and many other privately leased wharves.

The C.P.R., the Great Northern Ry., and the B.C. Electric Ry. parallel the waterfront and run right on to the wharves.

A Dominion government dredge is at work at Sandheads, and another on the north arm. The Dominion government contract for the first 6,900 ft. of three mile jetty will be completed by April 1, 1913, and will form part of the LeBaron scheme, which will give 25 ft. at low water from the Pitt river to the Gulf of Georgia. A municipal dredge will soon be at work improving the city water front by filling Front street and carrying the harbor line farther out to an unbroken quay over a mile long.

The Floating Dry Dock for Montreal.—

The Duke of Connaught, the dry dock for Montreal, a description of which was given in Canadian Railway and Marine World for October, arrived in Montreal, Nov. 1. The dock was 60 days in making the trip from Barrow-in-Furness, Eng., being towed across the Atlantic by two tugs. The voyage was a very tempestuous one, the dock breaking away from the tugs five times. The average rate of progress during the trip to Sydney, N.S., was four miles an hour. After lying a week at Sydney, stormbound, the towing was resumed. Traffic was suspended in the river at Montreal, Oct. 31, to the afternoon of Nov. 1, in order to give the dock a free passage. The dock was formally opened Nov. 18 by the Duke of Connaught, after whom it was named.

The Richelieu and Ontario Navigation Co. has declared a quarterly dividend of 2%, payable Dec. 2, to shareholders of record of Nov. 30.

The Minister of Marine on the St. Lawrence Insurance Rates.

Following are extracts from a verbatim report of the speech of Hon. J. D. Hazen, Minister of Marine, at the Canadian Manufacturers Association's annual dinner in Ottawa recently:—

I see that you had before you for consideration a subject of very great importance to the people of Canada as a whole, of special importance to the shipping interests and to those bringing from across the seas goods and raw material for the purpose of selling them in Canada or manufacturing them into goods that will be sold in Canada. I notice that a resolution was brought before you and after some amendment was passed with regard to the rates of insurance that are being paid upon the St. Lawrence route. I don't think I am overstating the case when I say it is the conviction of all who have studied trade conditions so far as they relate to the shipping interests of this country, that Canada is discriminated against by the underwriters so far as the rates of marine insurance upon the St. Lawrence, and in fact in the whole of British North America are concerned. Lloyd's insurance rates on single screw vessels plying to United States ports are from 10 to 11 cents on \$100; and for the same type of steamer using the St. Lawrence route it is 15 cents. On double screw steamboats plying to U.S. ports the rate is 15 cents, and for the same type of vessel on the St. Lawrence route 22½ to 25 cents. It will be admitted, I think, on all sides that that is a very serious handicap to Canadian shipping and to the importers of goods from the British Isles; but there is worse than that, for commencing on Sept. 1 Lloyd's raised the rate on tramp steamers using the St. Lawrence 1% on the cost of the vessel, and for the month of October 2% on the cost of the vessel, the result is a rate is imposed upon tramp steamers coming to the St. Lawrence that is practically prohibitive, and that vessels of that class are kept away from the St. Lawrence, and in the fall an impossible state of affairs occurs, and it is impossible to move from the St. Lawrence the amount of grain that is coming there for shipment or that would come there for shipment if steamers of the tramp class could be got to come to Montreal for the purpose of carrying that grain away. That constitutes a tremendous handicap upon the Canadian trade, it gives that enormous advantage to U.S. ports, and the result of that is that thousands upon thousands of tons of grain that in the natural course of events ought to be shipped out of the St. Lawrence in ships sailing to Montreal or Quebec, are carried down to U.S. ports and shipped on vessels sailing to U.S. ports and the business given to those U.S. ports, and the advantage of that trade is lost to the Dominion. That is a state of affairs that cannot be regarded complaisantly by people endeavoring to build up on this northern part of the continent a great commercial country, that ought to be able to handle through its own ports the products of its own fields and prairies.

The resolution finally adopted at the meeting of the Manufacturers' Association to-day asks the government to cause representations to be made to those who are engaged in underwriting risks upon vessels sailing between Great Britain and Canada, and if those representations are not availing, then asking the government to assist in the carrying out of some plan of insurance that will enable vessels engaged in the Canadian trade to get insurance rates on terms that were more equitable and fair, and that were more in proportion to the rates imposed upon vessels sailing to U.S. ports. Representation of the

character asked have already been made to the underwriters and to Lloyd's in Great Britain. Representations have been made in the past, representations were made during the past summer when a number of the Canadian ministers were in London. Facts and figures have been laid before the underwriters; it has been pointed out that during late years great improvements have been made in the St. Lawrence route; that not many years ago the depth of water in the channel from Montreal down in places did not exceed 10 ft.; to-day from Montreal to the sea we have a channel 30 ft. deep, a channel that is being widened, straightened out and improved every year, and which is now being deepened to 35 ft.; it was pointed out that of late years aids to navigation of the most modern character it is possible to obtain, have been placed along the St. Lawrence; that there is a lighthouse practically on every headland, that on every promontory and point there is something to guide the mariner, and that the channel is well buoyed, and in addition to that submarine bells have been established, and that the most modern and up to date aids to navigation have been established along the St. Lawrence route, and that the government is willing to go on spending money, putting better aids on as the inventive genius of man produces aids that are better than those we have to-day; and there has been an improvement of a very great character indeed in the aids to navigation upon the St. Lawrence, and to-day there is no waterway in the world that is better guarded better protected, better buoyed or lighted than is the St. Lawrence from Montreal to the sea. It has been pointed out to the underwriters that the reductions in insurance rates have not been at all commensurate with the improved conditions that have been brought to pass on the St. Lawrence river, and that today the rates being charged to Canadian ports are out of all reason and all proportion to the rates that are being charged to the U.S. Although all these facts have been laid before the underwriters I regret very much to have to say that I cannot give any reason to hope that the underwriters are prepared to make any reduction in the rates at present time so far as the St. Lawrence route or the ports of Halifax and St. John are concerned. Therefore, I think there is little to be gained or to be hoped for from any further representations that will be made to the underwriters.

The second part of the resolution asks the government to assist in a scheme that may be evolved for the purpose of causing a reduction of those rates, or, as I understand it, of having some scheme of insurance evolved under which owners of vessels coming to Montreal and the St. Lawrence and St. John and Halifax may get their ships insured at a rate that is fairly in reason compared with the rates to vessels going to the U.S. Up to the present no proposition of a feasible character seems to have been made to any government in Canada with regard to the establishment of a Canadian Lloyd's or a marine insurance to be assisted by the government. I read the resolution passed this forenoon not to mean that they expect the government of Canada to undertake the work of insuring ships coming to the St. Lawrence, but as a request on their part that they would be willing to co-operate with vessel owners and others interested in this trade for the purpose of bringing to pass a better condition of affairs than exists today. I have no right to state, without consulting with my colleagues, what the policy of the government may be in that

respect, but I think the practical course to take would be for the shipping interests on the St. Lawrence and for those who are interested in the importation of goods, to formulate some scheme of bringing about a better condition as regards insurance rates, with government aid, and to submit that proposition for the consideration of the government of Canada, and I don't think that the Premier would haul me over the coals at all for making the statement that I believe if they do so their appeal will not fall on unsympathetic ears, and that the government, having regard to the great industrial and commercial interests of this country, will be prepared to assist in a generous manner anything that may be suggested that will bring about what is so much desired by the shipping interests, and which will do so much to build up trade in Montreal and in the ports of the lower provinces as well.—Industrial Canada.

Port Colborne-Dundurn Collision.

The investigation into the collision between the s.s. Port Colborne and the s.s. Dundurn, while going through the draw of St. Dominique bridge in the Soulanges canal, on Sep. 9, whereby damage was done to a bridge and to the Dundurn, was held by Commander H. St. G. Lindsay, Dominion Wreck Commissioner, assisted by Captains F. Nash and J. McGrath, as assessors. Following is the decision:—

The Port Colborne is a vessel whose size is almost the limit which can navigate the canal. She therefore requires the deepest water, viz., the centre of the canal to navigate in. She was proceeding up the canal and, when within a short distance of the bridge, sighted the Dundurn, which was coming down, and almost at the same time answered the signal made by the Dundurn, of one blast on the whistle, meaning that he was going to pass to port in the usual manner. The Port Colborne was proceeding at about three knots when this signal was made, and expected to pass the draw of the bridge before the other vessel (the Port Colborne having the right of way). As the Port Colborne entered the draw of the bridge her master noticed that the Dundurn was steering in an erratic manner, and coming with considerable speed she struck the Port Colborne with her bow, and the impact of this threw the Dundurn's head towards the bridge, which was open and lying parallel with the south side of the canal, causing her to run into the bridge, damaging both the bridge and herself. The evidence of the Dundurn's master and crew showed that when the Port Colborne's lights were sighted, and the one blast signal was given, the master was unaware of the close proximity of the bridge, owing to the regular bridge lights not being exhibited, and he having allowed his vessel to get too close to the bank increased her speed so as to enable her to answer her helm quickly, and after getting his vessel straightened up and headed for the Port Colborne he noticed that that vessel was sheering slightly towards the south bank, thereby giving him a very small space to pass, and with the idea of avoiding a collision he gave the order for full speed ahead, hoping that he would be able to clear the Port Colborne and avoid running into the bank. At this time he first noticed the bridge, but the speed of his vessel was such that he could not then with safety have reversed his engines and stopped his ship, and the two vessels came together. Just before the impact the captain of the Dundurn reversed his engines and put his helm hard aport, the fact of the engines going astern and the helm hard aport increased

the swing to such an extent that his vessel struck the swing span of the bridge, knocking it off its pivot.

Had the Port Colborne, on sighting the Dundurn and answering her one blast signal, made the signal of three blasts which the court is informed is customary in such cases in the canal, and to be a request to the other vessel to check her speed, the accident might possibly have been prevented. The court is also of opinion that if the regular bridge signal lights had been exhibited, the Dundurn would never have attempted to pass the other ship in the draw. The captain of the Dundurn committed an error of judgment in still reversing his engines after the collision with the Port Colborne, as that order when carried out tending to increase the swing of the ship's head towards the bridge. The ordinary lights at St. Dominique bridge are a red and green light on the bridge itself and a white arc light on a pole at the south approach. On the night in question these lights were out of repair and in place of them the bridge tender had placed one ordinary oil lantern, showing a white light on the east side of the bridge and another similar lantern on the bank at the south approach to the bridge. The court therefore finds that the Dundurn was to blame for the accident and censures her master, and is of opinion that the lights used on the bridge to replace the regular lights which were out of order also contributed to the accident, and suggests that this matter be drawn to the attention of the Department of Railways and Canals.

C.P.R. Transfer Barge for Pacific Coast Service.

The C.P.R. has let a contract for building a car ferry barge, to be known as Transfer Barge no. 4, to handle traffic between Vancouver and Ladysmith, the company's point of connection with the Esquimalt and Nanaimo Ry., on Vancouver Island. She has been designed to carry 15 loaded 40 ft. freight cars.

The length overall will be 260 ft.; beam, 42 ft.; depth, 12 ft. She will be built similar in design to other barges already in the Pacific coast service, that is to say, she will have a moulded shipshape bow with a scow stern. The cars will be loaded and unloaded over the stern. The forward end will be divided off for the accommodation of the crew. She will be fitted with a steam boiler and windlass for the handling of anchors and the necessary pumps, etc. She is to be built by the British Columbia Marine Ry. Co., at Esquimalt, B.C., will be of steel throughout, and will be delivered in about eight months.

A araverse web frame will be placed in the way of longitudinal floors. There will be transverse watertight bulkheads, dividing the hull into six compartments. There will be two watertight bulkheads, to form fresh water tanks. The forepeak and two wing spaces in the after compartments will be fitted for water ballast. Instead of the usual bulwarks there will be trusses extending from aft to break of house. There will be three railway tracks. There will be heavy bumpers placed aft of break of house. There will be all deck fittings for securing apron, cars and barge, and all the necessary machinery for handling—such as boiler, windlass, capstan and pumps. There will be a short forecandle deck, arranged for housing machinery, coal bunkers, galley and crew's quarters, etc. The housework and pilot house will be constructed on the forecandle deck.

Investigation Into the Loss of the s.s. Keystorm.

Following is the finding of Commander H. St. G. Lindsay, Dominion Wreck Commissioner, who was assisted by Captains F. Nash, F. J. Thomson and J. McGrath, acting as assessors:—

The Keystorm, a vessel of 1,037 tons register, belonging to the Keystorm Transportation Co., of Montreal, engaged regularly in the coal trade between various coal ports in the United States and Montreal, left Charlotte, N.Y., on Oct. 25, about 3 p.m., for Montreal with a cargo of 2,273 tons of coal, and arrived off Tibbett point in the St. Lawrence about midnight. At 12.15 a.m., on Oct. 26, the master gave over the charge of the navigation to his first mate, with orders of a very indefinite nature as to what he should do, but, for some reason or other did not go below to his quarters, but remained on the forward deck, evidently not being quite satisfied of the first mate's ability to run the vessel in the intricate channel in that locality, and also being doubtful as to the state of the weather, which was at that time unsettled. At 3 a.m., the ship being off Alexandria bay, the master retired to his bed, the weather conditions, according to his evidence, being the same, but he did not take off his clothes, evidently expecting a call. From that point the vessel proceeded safely up to Sister's island light, which was a perfectly straight course from Sunken Rock light. When passing the Sister's she ran into a bank of fog, which obscured all lights and land marks. The first mate then showed a total disregard of prudence, or common sense, and not knowing what course the vessel should steer by compass, never having, as he said, paid any attention to such a method of navigation, he tried to take the customary course by using what he supposed was the glimmer of the light on Sister's island over the stern, but without being able to see the gas buoy on Chippewa point shoal, which under ordinary circumstances would have shown on the starboard bow, and then being doubtful of the ship's position, and without any reduction of speed, sent down to call the master, but before this could be done the ship struck on the Outer Scow shoal and became a total loss.

The court finds that the master, Louis Daigneault, showed a lack of judgment in allowing the mate to take charge of the navigation of this valuable vessel in this particular locality, where the greatest amount of care is necessary for navigation even during the day time, knowing as he did the limited experience the mate had in this work, and his going below at 3 a.m. was an act of culpable negligence, as there were still dangers to avoid, and in less than two hours' time it would have been daylight. The court therefore suspends his certificate from Nov. 1, 1912, to Nov. 1, 1913. With respect to the conduct of John Leboeuf, the mate, the court is of opinion that his neglect to call the master when the weather became thick, his lack of initiative in not stopping the engines when he lost his bearing, and his utter disregard of the compass course to be steered was gross and culpable negligence, and suspends his certificate from Nov. 1, 1912, to Nov. 1, 1914.

The court severely reprobates the very loose method of navigation which seems to be customary on vessels of this class, and particularly the want of compass courses, and suggests a printed card of all courses and distances on the various runs, the card to be hung up in the pilot house, ready for instant reference in case the leading

lights or marks become obscured, as happened in this case.

The court is of opinion that everything was done in the engine room with regard to this the water gradually gained and ultimately caused the vessel to slip off the shoal into deep water and founder about five hours after stranding. No attempt seems to have been made to try and get the vessel off the shoal, and it is the court's opinion that under the circumstances it was just as well that such was the case.

Running Down of Fishing Boat by s.s. Canada.

Commander H. St. G. Lindsay, Dominion Wreck Commissioner, assisted by Capt. F. Nash, of Montreal, and Capt. C. Powell, of Campbellton, N.B., held an investigation at Campbellton recently into the collision between the s.s. Canada, belonging to the Campbellton and Gaspé Steamship Co., and a fishing boat of Grand River, Que., on Aug. 9, whereby the fishing boat sank and one man was drowned.

The court on considering the evidence of the master and crew of the Canada (that of F. Thibaudeau, the other member of the crew of the fishing boat who was saved not being obtained owing to his refusal to attend the court at Campbellton) finds that the Canada was navigated with proper and seamanlike care after leaving Grand River, and that the cause of the accident was due to the fact that no lights, fog signal or lookout were in evidence on the fishing boat at the time, although the weather was dark and hazy; therefore, the court does not consider that any blame for the accident should be attributed to A. Belanger, master of the Canada. The court is of opinion that for the greater safety of both coasting steamboats and fishing boats on the coast, that more attention should be given by fishermen to article 9 of the International Rules of the Road regarding lights and fog horn signals for fishing boats, and that a proper lookout should be kept while lying at anchor, or at their nets, for had such been the case on the morning of Aug. 9 this un-

Dominion Expenditures on Canals, Harbors Etc.

The public accounts for the year ended Mar. 31 show that in addition to the consolidated fund expenditures there was expended on Canadian canal systems on capital account \$2,560,938.11, of which \$1,746,095.48 was on account of the Trent valley canal. There was also expended on capital account the following sums on harbor and river works:—

Port Arthur and Fort William harbors	\$996,120.02
Quebec harbor	510,818.45
River St. Lawrence ship channel	1,167,462.56
Red river improvements, Man.	50,939.49
St. John, N.B., harbor improvements	579,059.21
Tiffin, Ont., harbor	105,525.65
Victoria, Ont., harbor	149,983.76
Bare Point breakwater	19,335.70

Total \$3,579,244.84
Advances of \$3,050,000 have been made to the Montreal Harbor Commissioners under statutory powers.

The total revenues from the canal systems were \$263,716.75 against \$221,138.49 in 1910-11.

W. P. ANDERSON, Chief Engineer of the Marine Department, Ottawa, has been appointed to represent Canada at the River and Harbor Congress to be held in Washington, D.C., in December.

Telegraph, Telephone and Cable Matters.

The Canadian Northern Telegraph Co. has opened offices at Conquest and McGee, Sask.

The Canadian Northern Telegraph Co. has opened offices at Norquay, Steven, Delmas and Harwell, Sask., and Drumeller, Alta.

In the general balance sheet of the Dominion for the year ended Mar. 31, the government land and cable telegraph lines are valued at \$348,320.77.

The G.N.W. Telegraph Co. has reopened its office at Richmond, Que., and has closed its offices at Anson and Beamsville, Ont., and Abenakis Springs hotel, Que.

J. B. Rogers, for many years wire chief in the Great Northwestern Telegraph Co.'s Toronto office, has been appointed chief operator, vice C. E. McManus, resigned on account of ill-health.

The new wireless telegraph station at Alert Bay, B.C., the tenth of the stations being erected on the British Columbia coast, is expected to be ready for operation early in December.

The Western Union Telegraph Co. commenced on Nov. 1 to operate all former Great Northwestern offices in New York state except Bombay and Fort Covington, which will still stand as G.N.W. offices.

B. Oldham, wireless operator on the Northern Navigation Co.'s steamboat Huronic, was recently ordered to pay the costs in a case in which he was charged with deserting his ship at Sarnia, Ont., Oct. 21.

The Western Union Telegraph Co. has removed its office in Victoria, B.C., from the corner of Government and Bastion streets to 614 View street, where every provision has been made for its increasing business.

The cable ships Mackay-Bennett and Colonia are at their wharves in Halifax, N.S., transferring cable preparatory to starting out on further repair work. The Commercial Cable Co. has completed the erection of a new wharf for the use of these repair steamers.

The Canadian Northern Steamship Co.'s s.s. Royal Edward, on a recent inward trip signalled her position to the wireless station at Cape Race, Nfld., when 430 miles eastward of that place, which is said to be the longest distance over which communication has been established without a relay in the records of the Canadian signal service.

What is said to be the largest wireless station in the world is being completed and tested out at Arlington, Va. It is one of proposed system of government stations connecting all the strategic naval and military centres of the country. The Arlington plant, including towers, equipment and power station is estimated to have cost about \$1,000,000.

The G.T.R. is gradually extending the telephone system of train despatching. As soon as the line can be completed it will be put in force from Montreal to Chicago on the main line. It is said that this system will be in use on the 15th district between Toronto and Sarnia tunnel about Jan. 1. During the course of the next few months the various despatchers will visit Allandale, Ont., and familiarize themselves with its operation.

Two new wireless telegraph stations have been completed on the upper lakes, viz.:—Midland and Tobermory, Ont., and a third is being completed at Sault Ste Marie, Ont. It is proposed to remodel the station at Port Arthur, Ont. These stations have a range of 300 miles each. Work has been started on a station at Point Edward, near Sarnia, Ont., and it is proposed to erect a

series of stations through to Montreal. When the stations are fully equipped regulations will probably be put in force to compel all vessels to have wireless equipment.

The Dominion Government telegraph line from Ashcroft, B.C., to the Yukon territory is over 2,500 miles long. During the last operating year about 100,000 messages were despatched in each direction, the financial report showing a loss of \$80,000. This is due to the excessive cost of maintenance owing to the severe weather, and the fact that repairmen are constantly patrolling the line. During the last operating year a branch line was built to Port Stewart, 175 miles, and a branch is being built from 150 Mile House on the Cariboo road to Bella Coola.

The Intercolonial Ry.'s Ocean Limited trains will be left on the route between Halifax and Montreal and Montreal and Halifax as daily trains, instead of being discontinued for the winter as heretofore, this being rendered necessary by increased traffic. The Maritime Express trains will also be continued, giving two through trains per day each way.

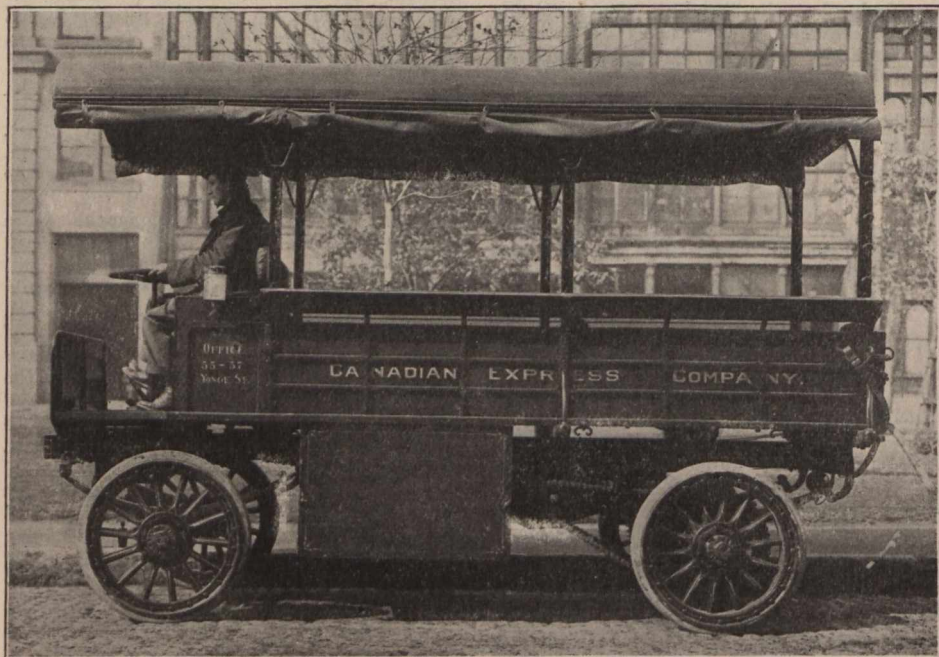
Among the Express Companies.

The Canadian Northern Ex. Co. has opened offices at Conquest and McGee, Sask.

The Canadian Northern Ex. Co. has opened offices at Norquay, Steven, Delmas and Harwell, Sask., and Drumeller, Alta.

The Canadian Northern Ex. Co.'s agency at Antar, Sask., has been transferred to South Moose Jaw, at end of steel on Moose Jaw subdivision. As there is at present no direct means of connection between that point and the city of Moose Jaw, all traffic for the latter point will, until further notice, continue to be routed via Regina for transfer to Dominion Ex. Co.

The Board of Railway Commissioners has defined the express delivery limits for Halifax, N.S., as follows:—the water front at northwesterly boundary from east end of Miller street, from south end of I.R.C. fence in Campbell road, to Duffus street, Longard road, Livingston street, Intercolonial cotton factory, Young, Oxford and North streets, Chebucto road (to Swain street), Beech street, Quinpool road, Oxford street, Co



Canadian Express Company, Electric Truck.

(For description see Canadian Railway and Marine World, November, pg. 568.)

Internal Combustion Locomotives are, it is said, to be used on the construction of the Australian Transcontinental Ry. on account of the waterless desert country traversed by this new line to the west coast. These will be mainly small contractors' engines, such as have been used elsewhere, but it is suggested that the experience with them may assist in the development of larger ones of the same type to handle the traffic when the railway is in operation.

Railway Trespassers are responsible for a number of accidents and are a source of much trouble and expense to the companies, according to a survey of this matter just made by the Pennsylvania Rd. Last year 527 trespassers lost their lives on the Pennsylvania lines, where they were present in violation of the law. Their acts endangering the lives of the public and employes and giving difficulty to the railway were of such nature as breaking signal and switch lamps and placing obstructions on the tracks. Over \$100,000 was spent by the company's police department during the year in efforts to overcome these troubles.

bourg road to northwest arm, including Oakland road, Wellington and Inglis streets, Tower and Bowery roads and Franklyn and Miller streets, to the harbor.

The United States Ex. Co. has issued the following statement:—"The directors have decided not to declare the semi-annual dividend usually paid in November. For the year ended June 30, gross revenue from operation increased \$709,181. The increase of expense was \$1,149,484, and net earnings for the year from all sources applicable to dividends was \$233,228. In view of these results and the establishment of the parcels post and other problems now confronting the company and the uncertainty arising therefrom as to future earnings, the directors do not feel justified in declaring the dividend at this time." The company has paid dividends continuously since 1896. The annual rate of 6% was established in 1910.

The Wabash Rd. is said to have decided to proceed at an early date with the construction of new locomotive repair shops at Decatur, Ill.

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 to distinctly 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.

W. B. SNOW, publicity engineer, Boston, Mass., has increased his staff by the addition of F. R. Lufkin, formerly of the instructing staff in electrical engineering of the Massachusetts Institute of Technology, and late Assistant Superintendent of Lighting and Wires of Brookline, Mass.

THE TITANIUM ALLOY MANUFACTURING Co., owing to the rapidly increasing demand for its product, and the necessity for greater efficiency in consequence, has removed its general sales department to the works at Niagara Falls, N.Y., and has created a district office at Pittsburgh, Pa., where the usual effective work with the iron and steel trade will be continued. C. V. Slocum is General Sales Agent.

THE PRATT AND LETCHWORTH CO., Ltd., manufacturers of malleable iron castings, Brantford, Ont., has sold its plant, etc., to the Canadian Car and Foundry Co., Ltd., Montreal. The Brantford business, which has heretofore been owned by the Pratt and Letchworth Co., of Buffalo, N.Y., will, it is said, be carried on under its present local management and without change of name. The plant is to be enlarged.

THE COMMERCIAL ACETYLENE Railway Light and Signal Co., 80 Broadway, New York city, has been licensed by the Commercial Acetylene Co. under the letters patent covering dissolved acetylene, and has secured other important inventions in connection with railway and signal lighting. It has also purchased from the Commercial Acetylene Co. all the latter's charging and manufacturing plants.

M. BEATTY AND SONS, LTD., Welland, Ont., has issued a booklet, "Beatty Hoists," which contains full particulars of their steam and electric hoists, dredges, steel scows, drill boats, centrifugal pumps, clam shell buckets, derricks, derrick fittings, etc. Among the illustrations are views showing Beatty hoists in use at the erection of the C.P.R. Skugog river bridge, the C.P.R. Lethbridge viaduct, and the Algoma Central & Hudson Bay Ry. Montreal river bridge. A copy will be sent to anyone interested on application.

Transportation Conventions in 1912-1913

Dec. 11.—Association of Passenger Steamboat Lines, Washington, D.C.

Dec. 12-13.—Association of Transportation and Car Accounting Officers, Louisville, Ky.

Jan., 1913.—American Wood Preservers' Association, Chicago, Ill.

Mar. 18-20.—American Railway Engineering Association, Chicago, Ill.

May 6-9.—Air Brake Association, St. Louis, Mo.

May 20.—Association of Railway Telegraph Superintendents' Association, St. Louis, Mo.

May 26-29.—Master Boiler Makers' Association, Chicago, Ill.

The Michigan Central Rd. is building a 40 stall engine house at Bay City, Mich., and the new machine shops will be largely increased.

Railway and Allied Associations, Clubs, Etc.

The names of persons given below are those of the secretaries.

Canadian Car Service Bureau, J. E. Duval, 401 St. Nicholas Building, Montreal.

Canadian Freight Association (Eastern Lines), G. C. Ransom, Canadian Express Bldg., Montreal.

Canadian Freight Association (Western Lines), W. E. Campbell, 502 Canada Building, Winnipeg.

Canadian Railway Club, J. Powell, St. Lambert, Que. Meetings at Montreal 2nd Tuesday each month, 8.30 p.m., except June, July and August.

Canadian Society of Civil Engineers, C. H. McLeod, 413 Dorchester St. West, Montreal.

Canadian Street Railway Association, Acton Burrows, 70 Bond Street, Toronto.

Canadian Ticket Agents' Association, E. de la Hooke, London, Ont.

Central Railway and Engineering Club of Canada, C. L. Worth, 409 Union Station, Toronto. Meetings at Toronto 3rd Tuesday each month, except June, July and August.

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.

Nova Scotia Society of Engineers, A. R. McCleave, Halifax, N.S.

Quebec Transportation Club, J. S. Blanchet, Quebec.

Western Canada Railway Club, W. H. Rosevear, 25½ Princess St., Winnipeg. Meetings at Winnipeg 2nd Monday each month, except June, July and August.

The French state railway authorities have been conducting electrification experiments on a stretch of the Western Ry., and it is stated that results have been so satisfactory that it has been decided to go into the matter on a larger scale. Contracts for 100 electric locomotives have been placed with French and Belgian builders.

The Master Car and Locomotive Painters' Association of the United States and Canada held its annual convention at Denver, Col., recently. Reports on the maintenance of steel cars, vestibule end finish, car interior renovators, treatment and finish of passenger car concrete floors, care of steel passenger car roofs, etc., were discussed at length. T. J. Hutchinson, of the G.T.R., London, Ont., was elected Second Vice President for the current year. The place for the next convention, which has not yet been settled, will be either Ottawa, Detroit or Chattanooga.

WANTED

Car Estimator, familiar with both freight and passenger work of steel and wood construction. Apply, stating experience, age, and salary expected, to box 4484, Canadian Railway and Marine World.

WANTED

Bill of Material man, familiar with both freight and passenger work of steel and wood construction. Apply, stating experience, age, and salary expected, to box 4484, Canadian Railway and Marine World.

Briquetted Coal on Intercolonial Ry.—A press report from Amherst, N.S., stated recently that a new patent coal fuel had been put on the market and that a test had been made on the I.R.C. We are officially advised that some briquetted coal, made up egg shaped, about 4 ins. long, was used on the I.R.C. recently on a few trips. There is nothing new in this description of fuel, except its manufacture in Canada. It generally gives satisfactory results.

CANADIAN PACIFIC RAILWAY COMPANY

Issue of New Ordinary Capital Stock

Notice is hereby given that pursuant to Resolution passed at the Special General Meeting of Shareholders on 2nd October, 1912, an issue of \$60,000,000, additional Ordinary Capital Stock of the Company, or 600,000 Shares of \$100 each, has been ordered by the Board of Directors.

The said Stock will be offered to the Ordinary Shareholders of record at 3 p.m. on Thursday, the 2nd day of January, 1913, at the price of one hundred and seventy-five dollars per share, being at a premium of seventy-five per cent. over and above the par value thereof, on the basis of thirty per cent. or three shares in ten of their respective holdings.

The right to subscribe will expire at 3 p.m. on Thursday, 13th February, 1913.

Payments will be received at the Bank of Montreal, London, New York or Montreal, as follows:—

20% or \$35 per share on subscription on or before 13th February, 1913.

20% or \$35 per share on 14th April, 1913.

20% or \$35 per share on 16th June, 1913.

20% or \$35 per share on 18th August, 1913.

20% or \$35 per share on 20th October, 1913.

Interest at the rate of 7% per annum will be paid in October, 1913, from the due date of each instalment to September 30th, 1913, on instalments up to and including that of the 18th August, 1913, which have been paid on or before due dates.

All shares of the issue on which instalments have been paid in full on the due dates will rank with the existing stock for the full dividend accruing for the quarter ending 31st December, 1913.

A circular containing the terms of subscription and payment and enclosing warrants of subscription will be mailed to the Shareholders on or about the 15th day of January, 1913.

By order of the Board.

W. R. BAKER,
Secretary.

Dated at Montreal, 18th November, 1912.

WANTED

1,000,000 RAILWAY TIES

The Central Railway Company of Canada invites tenders for supplying railway ties in lots of five to one hundred thousand, for delivery at Ste. Agathe, La Chute, Montreal and Grenville, in the Province of Quebec, and Hawkesbury, McAlpine, Ottawa, South Indian, Carleton Place, Bannockburn, Fenelon Falls, Orillia and Midland, in the Province of Ontario.

Tenders will be received until noon on Dec. 20, 1912.

For specifications and other particulars apply to

F. STUART WILLIAMSON,
Chief Engineer,
44 Beaver Hall Hill,
Montreal.

Canadian Northern Ontario Railway Company.

NOTICE is hereby given that the Canadian Northern Ontario Railway Company will apply to the Parliament of Canada, at its next session, for an Act extending the time wherein the company may construct:

(a) The lines of railway authorized by the Statutes of Canada for 1911, chapter 57, section 2, paragraph (a), items (i) to (iv), (vi), (ix) and (x), shortly described as follows:—

- (i) Washago to Kincardine.
- (ii) Arnprior to Gananoque.
- (iii) Pembroke to Cobourg or Port Hope.
- (iv) Frenchman's Bay, northwesterly to Owen Sound.
- (vi) Niagara River to Goderich.
- (ix) Hawkesbury to a point in the County of Leeds or Lanark.

(x) Parry Sound to North Bay.
(b) Also the line specified in paragraph (c) of the same section and chapter, namely:—

Berlin, through Guelph, Acton and Brampton to Toronto.

(c) Also the line of railway authorized by the Statutes of Canada for 1908, chapter 93, section 2, shortly described as follows:—

From between Udney and Rathburn to the Georgian Bay.

(d) Also to authorize the construction of the following lines of railway:—

(I) An extension of the line mentioned in paragraph (b) of this notice, southwesterly to Stratford and St. Mary's with a branch to Woodstock.

(II) Sarnia to Chatham.

(III) Orillia to Goderich via Owen Sound, or with a branch to Owen Sound.

GERARD RUEL,
Chief Solicitor.

Toronto, 30th October, 1912.

Canadian Northern Railway Company.

NOTICE is hereby given that the Canadian Northern Railway Company will apply to the Parliament of Canada, at its next session, for an Act extending the time wherein the Company may construct the lines of railway authorized by the Statutes of Canada for 1908, chapter 92, section 2, paragraphs (a), (b), (c) and (h), shortly described as follows:—

- (a) Humboldt to Calgary.
- (b) Maryfield to Lethbridge.
- (c) North Battleford to Athabasca Landing, with a branch to Green Lake.
- (h) Neepawa, northwesterly to the South Saskatchewan River.

Also the line of railway which the Saskatchewan Midland Railway Company (amalgamated with the Company) was authorized to build by chapter 41 of the Statutes of Saskatchewan for the year 1909, section 7, paragraph (v), namely:— Humboldt to Melfort.

Also to authorize the construction of the following line of railway:—

From a point at or near Swift Current, westerly to a point at or near the junction of the Company's authorized lines to MacLeod and Lethbridge.

Also to confirm and ratify an agreement between the Company and the Canadian Pacific Railway Company respecting the terminals at Regina.

Also to increase the bonding powers of the Company.

GERARD RUEL,
Chief Solicitor.

Toronto, 30th October, 1912.

Niagara, St. Catharines and Toronto Railway Company.

NOTICE is hereby given that the Niagara, St. Catharines and Toronto Railway Company will apply to the Parliament of Canada at its next session for an Act extending the time wherein the Company may construct the lines of railway authorized by the Statutes of Canada for 1906, chapter 132, section 1, paragraphs (b), (c) and (d), shortly described as follows:—

(b) Port Colborne to Fort Erie, and Fort Erie to the City of Niagara Falls.

(c) From the City of Niagara Falls to the Town of Niagara, and from the Town of Niagara to the City of St. Catharines.

(d) From the Town of Welland to the City of Brantford.

Also the line of railway authorized by the Statutes of Canada for 1899, chapter 77, section 8, shortly described as follows:—

An extension of the line of the St. Catharines and Niagara Central Railway Company to a point on the Niagara River at or near Fort Erie, and an extension to the City of Toronto by way of the City of Hamilton or thereabouts.

GERARD RUEL,
Chief Solicitor.

Toronto, 30th October, 1912.

Canadian Northern Quebec Railway Company.

NOTICE is hereby given that the Canadian Northern Quebec Railway Company will apply to the Parliament of Canada at its next session for an Act:—

(a) Extending the time wherein the Company may construct the lines of railway authorized by the Statutes of Canada for 1911, chapter 58, section 2, namely:—

(a) Rawdon, northerly to the National Transcontinental Railway, with a branch to Joliette.

(b) St. Jerome to St. Eustache.

(b) Also authorizing the construction of the following lines of railway:—

(i) From a point in the City of Montreal, crossing the St. Lawrence River opposite the City, and from thence to Levis.

(ii) From a point on the last mentioned line east of the St. Lawrence River to a point at or near St. Rosalie Junction, thence to a point at or near Sherbrooke or Lennoxville.

(c) Also defining and increasing the bonding powers of the Company.

GERARD RUEL,
Chief Solicitor.

Toronto, 30th October, 1912.

THE CANADIAN PACIFIC RAILWAY COMPANY.

DIVIDEND NOTICE

At a meeting of the Board of Directors held to-day, a dividend of two and one-half per cent. on the Common Stock for the quarter ended 30th September last, being at the rate of seven per cent. per annum from revenue and three per cent. per annum from interest on the proceeds of land sales and from other extraneous assets, was declared payable on 2nd January next to Shareholders of record at 3.00 p.m. on 2nd December next.

By order of the Board,
W. R. BAKER,
Secretary.

Montreal, November 11th, 1912.

Kootenay and Arrowhead Railway.

NOTICE—The Kootenay and Arrowhead Railway Company will apply to the Parliament of Canada at its next session for an Act extending the time within which it may construct the railway from Gerrard to Arrowhead, and authorizing an increase of its bonding powers, and for other purposes.

Dated at Montreal, this 23rd October, 1912.

H. C. OSWALD,
Secretary.

Pringle, Thompson & Burgess,
Ottawa agents.

Collingwood Southern Railway Company.

NOTICE—The Collingwood Southern Railway Company will apply to the Parliament of Canada, at its next session, for an Act extending the time within which it may construct the line of railway which it has been authorized to construct by section 8 of chapter 77 of the Statutes of Canada, 1907, and authorizing an increase of its bonding powers, and for other purposes.

Dated at Ottawa, this 23rd October, 1912.

ANDREW T. THOMPSON,
Solicitor for Applicants.

Attawa Northern and Western Railway.

NOTICE—The Ottawa Northern and Western Railway Company will apply to the Parliament of Canada, at its next session, for an Act extending the time within which it may construct the extension of its main line from Maniwaki to a point at or near James Bay and the extension to Lake Temiscamingue, authorizing an increase of its bonding power, and for other purposes.

Dated at Montreal, this 23rd October, 1912.

H. C. OSWALD,
Secretary.

Pringle, Thompson & Burgess,
Ottawa agents.

Shuswap and Okanagan Railway.

NOTICE—The Shuswap and Okanagan Railway Company will apply to the Parliament of Canada, at its next session, for an Act authorizing it to enter into an agreement with the Canadian Pacific Railway Company for any of the purposes specified in section 361 of "The Railway Act," and to lease its railway to the said company, and authorizing an increase of its bonding power, and for other purposes.

Dated at Montreal, this 23rd October, 1912.

A. R. CREELMAN,
Solicitor for applicant.

Pringle, Thompson & Burgess,
Ottawa agents.

NOTICE!

The Canadian Pacific Railway Company will apply to the Parliament of Canada at its next Session for an Act authorizing it to lay out, construct and operate a railway from a point on the company's Kleinburg-Sudbury Branch, between Bolton Junction and Palgrave, thence in a westerly direction through the Counties of Peel and Halton to a point on the Ontario and Quebec at or near Campbellville.

Dated at Montreal this First day of November, 1912.

W. R. BAKER,
Secretary.

Pringle, Thompson & Burgess,
Ottawa Agents.

British Columbia Southern Railway.

NOTICE—The British Columbia Southern Railway Company will apply to the Parliament of Canada, at its next session for an Act extending the time within which it may construct its railways to the 49th parallel and the Tobacco Plains, and from the main line at a point about 36 miles west of the Eastern Boundary of British Columbia, authorized by chapter 55 of the Statutes of 1899; the western section of its railway and the branches to Nelson and Martin Creek as described in section 1 of chapter 52 of the Statutes of 1900, and the branch from Michel to Kananaskis as described in section 1 of chapter 54 of the Statutes of 1909, and authorizing an increase of its bonding powers and for other purposes.

Dated at Montreal, this 23rd day of October, 1912.

H. C. OSWALD,
Secretary.
Pringle, Thompson & Burgess,
Ottawa agents.

Manitoba and Northwestern Railway.

NOTICE—The Manitoba and Northwestern Railway Company will apply to the Parliament of Canada at its next session for an Act extending the time within which it may construct the lines of railway from Yorkton to Prince Albert, from Russell to the Northern or Western boundary of Manitoba, from a point between Portage la Prairie and Arden to the boundary of Manitoba, from some point between Westbourne and Beautiful Plains northwesterly in the direction of Lake Dauphin or Duck Mountains, from a point between Theodore and Insinger to a point in Township 32, Range 18 or 19, west of the 2nd Meridian, and from Bradenbury to Kamsack, and authorizing an increase of its bonding powers, and for other purposes.

Dated at Montreal this 23rd October, 1912.

H. C. OSWALD,
Secretary.
Pringle, Thompson & Burgess,
Ottawa agents.

The Guelph and Goderich Railway Company.

THE Guelph and Goderich Railway Company will apply to the Parliament of Canada, at its next session, for an Act extending the time within which it may construct the branches which it has been authorized to construct by section 7 of chapter 81 of the Statutes of Canada, 1904, and authorizing an increase of its bonding powers, and for other purposes.

Dated at Montreal, this 23rd October, 1912.

H. C. OSWALD,
Secretary.
Pringle, Thompson & Burgess,
Ottawa agents.

Campbellford, Lake Ontario and Western Railway.

NOTICE—The Campbellford, Lake Ontario and Western Railway Company will apply to the Parliament of Canada, at its next session, for an Act authorizing an increase of its bonding powers, and for other purposes.

Dated at Montreal, this 23rd October, 1912.

H. C. OSWALD,
Secretary.
Pringle, Thompson & Burgess,
Ottawa agents.

Alberta Central Railway.

NOTICE—The Alberta Central Railway Company will apply to the Parliament of Canada, at its next session, for an Act extending the time within which it may construct the railway from a point in township 38, range 23, west 4th Meridian westerly to a point in or near Red Deer authorized by chapter 44 of the Statutes of 1901; the extension from a point in township 38, range 23, west 4th Meridian easterly to a point in township 39, range 11, west of the 4th Meridian authorized by chapter 75 of the Statutes of 1903; branches from westerly terminus near Rocky Mountain House to a point in or near the Yellowhead Pass, from easterly terminus near the elbow of the Battle River to a point at or near Saskatoon or Warman and from a point on main line east of Red Deer to a point at, in or near Moose Jaw authorized by chapter 39 of the Statutes of 1909; and the extension from Saskatoon to a point at or near Fort Churchill with a branch from some point on such extension at or near the Pas to a point at or near Port Nelson; extension from Moose Jaw to a point on International Boundary in township 1, range 16, west 2nd Meridian; railway from a point between Red River and Cygnet Lake to a point at or near Blackfalds thence to Lacombe; three branch lines, 30 miles each, from authorized line into Big Horn Range between North Saskatchewan and Brazeau Rivers; two branches, 25 miles each, through ranges 20, 21 and 22, townships 43, 44, 45 and 46, west of the 5th Meridian, and northeasterly from north end of Big Horn Range along Brazeau River thence to Pembina River authorized by chapter 30 of the Statutes of 1911, and authorizing an increase of its bonding powers, and for other purposes.

Dated at Montreal, this 23rd October, 1912.

H. C. OSWALD,
Secretary.
Pringle, Thompson & Burgess,
Ottawa agents.

Alberta Railway and Irrigation Company.

NOTICE—The Alberta Railway and Irrigation Company will apply to the Parliament of Canada, at its next session, for an Act extending the time within which it may construct the railways which it has been authorized to construct by chapter 79 of the Statutes of 1900, and by chapter 187 of the Statutes of 1903, namely from a point between Lethbridge and Stirling to a point on the International Boundary between ranges 24 and 30, west 4th Meridian; from Cardston to a point in range 1, west 5th Meridian; from a point at or near Cardston to a point at or near Pincher Creek, thence to a point between range 2, west 5th Meridian and range 27, west 4th Meridian; and from Stirling to a point in range 4, west 4th Meridian between the line of the Canadian Pacific Railway and the International Boundary, and authorizing an increase in its bonding powers, and for other purposes.

Dated at Montreal this 23rd day of October, 1912.

H. C. OSWALD,
Secretary.
Pringle, Thompson & Burgess,
Ottawa agents.

Canadian Pacific Railway.

NOTICE—The Canadian Pacific Railway Company will apply to the Parliament of Canada, at its next session, for an Act,

1. Authorizing the company to lay out, construct and operate the following lines of railway:—

(a) From a point at or near Snowflake on the Windygates subdivision and running in a westerly direction to a point in or near Section 14, Township 1, Range 11, west of the Principal Meridian, all in Manitoba, a distance of about 9 miles;

(b) From the present terminus of the Gimli branch at or near Gimli, in a northerly direction for about 60 miles through Range 3 or 4, to some point on or near the west shore of Lake Winnipeg, thence in a northwesterly direction to a point on the Little Saskatchewan River, all in the Province of Manitoba;

(c) From some point on the line of railway described in Sub-section "C" of Section 4 of "The Canadian Pacific Railway Act, 1911," situate not more than 50 miles east of Stirling to a point on the Alberta Railway and Irrigation Company's Railway at or near Stirling, all in the Province of Alberta;

(d) From a point at or near Cayley on the Macleod branch in a southerly and southwesterly direction to a point at or near Burmis on the Crow's Nest subdivision;

(e) From a point on the company's Kleinburg-Sudbury branch between Bolton Junction and Palgrave, thence in a westerly direction through the counties of Peel and Halton to a point on the Ontario and Quebec Railway at or near Campbellville;

(f) From a point on the company's railway south of Forsythe street in Hochelega ward, Montreal, thence in a northerly direction through the counties of Hochelega and L'Assomption to a connection with the company's railway at or near L'Epiphanie;

2. Extending the time within which the company may construct the following lines of railway:—

(a) From a point on the company's Crow's Nest branch in Section 12, Township 9, Range 26, west of the Fourth Meridian, thence westerly along the north side of the Old Man River to a point in Section 36, Township 7, Range 4, west of the Fifth Meridian, all in the Province of Alberta;

(b) From a point at or near Tantallon, on its Pheasant Hills branch, to a point at or near Craven on its branch northerly from Regina, all in the Province of Saskatchewan;

(c) From a point at or near Dysart or Lipton in a southerly and southeasterly direction to a junction with the line described in paragraph 2 (b);

(d) From a point in Townships 32 to 34, Ranges 21 to 23, west of the Second Meridian in a northerly direction into the Town of Prince Albert, a distance of about 130 miles;

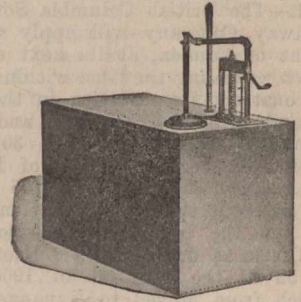
(e) From Stonewall or Teulon or a point between those two places or north of Teulon, thence in a direction generally north-west to a point on the east shore of Lake Manitoba between Marsh Point and the north boundary of Township 25.

And for other purposes.

Dated at Montreal, this First day of November, 1912.

W. R. BAKER,
Secretary.
Pringle, Thompson & Burgess,
Ottawa agents.

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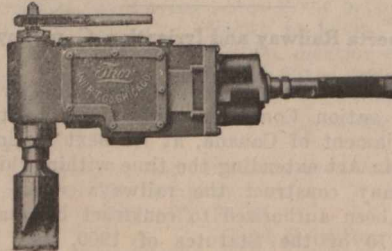
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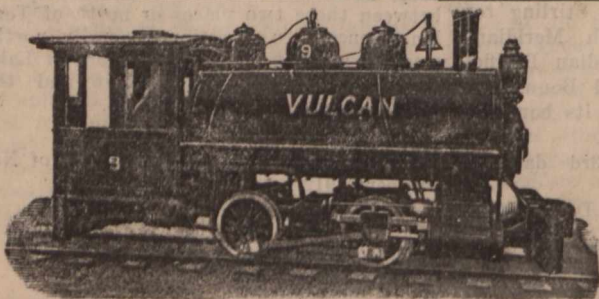
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