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## The Grand Trunk Railway's Practice in Machining the Stephenson Link Motion.

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At the G.T.R. Point St. Charles shops, Montreal, the process of machining a complete link motion has been developed to a nice degree, many simple labor-saving jigs which not only facilitate but improve the quality of the work, have been introduced, so that today the process is rather unique in its simplicity and thoroughness. The process outlined in this article has been developed step by step by the machine shop foreman, through whose assistance the following information has been obtained.

The Stephenson link motion is rapidly falling into disfavor as compared to the simpler Walschaert gear, but its use is

cast iron in two sections divided in a plane through the centre of the driving axle on which the sheave is to be mounted. The first machining operation is that of planing both sides in a shaper, each section being machined independently to the same thickness. Following this, the mating face of the small section of the sheave is tongued to fit a corresponding groove of the mating surface of the larger section. The two sections are next drilled perpendicularly to the contact faces on each side of the driving axle opening. This is performed in simple jigs. The holes in the smaller section are tapped to receive studs which

from the fact that where the sheaves are produced in sets of several at a time, no time is lost in setting up, all that is necessary being to slide the sheave on to the jig block, key and clamp.

The only remaining operation on the sheave is that of drilling two holes for the pinch or set screws which keep the sheave from travelling along the shaft. For this operation, one surface of the sheave is scribed in chalk as shown, in a line through the bosses in the cored cavity of the larger section; and when the sections are parted, by setting up in the drill press to this scribed line, the two holes are drilled and tapped for the

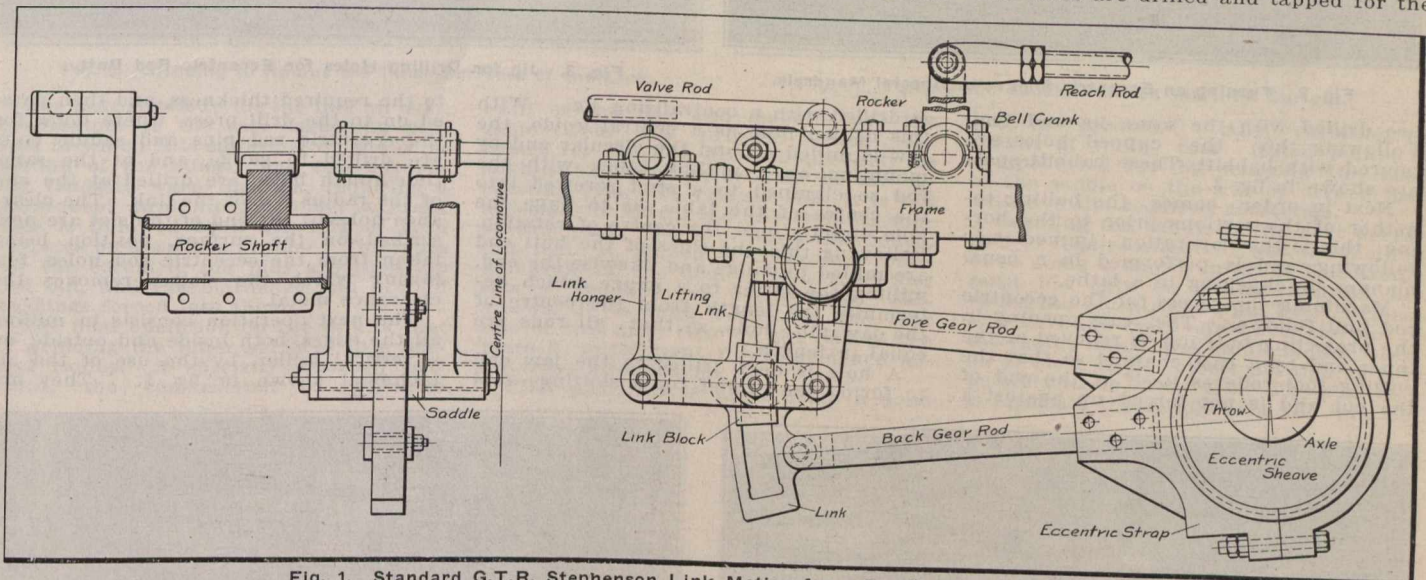


Fig. 1. Standard G.T.R. Stephenson Link Motion for a Pacific Type Locomotive.

still sufficiently great in new equipment to warrant a description of the process of manufacture, more for the value of the methods and processes used than from the fact that it is to be extensively used in the future. So long as existing locomotives equipped with the Stephenson motion require repair and renewal of parts, just so long will it be a matter of interest to those responsible for its production in the shop.

The motion selected as an example of the method of procedure, is that which is standard for Pacific type locomotives of classes ACEFP, the commonest example of this lot being that series of locomotives commonly called the 900 class. Such a motion is shown assembled in fig. 1. It will be noticed that it has been the aim throughout to keep the parts standard as far as possible, so that the factor of fitting new parts in the event of renewal is reduced to a minimum. This is emphasized by the fact that the one gear is applicable over such a range of types. It has been with this standardizing object in view that the ways and means outlined in this article have been devised.

THE ECCENTRIC SHEAVE shown partially finished in fig. 2, is made of

pass through clearance holes in the larger section, clamping nuts in the cored cavity of this section holding the two parts together.

After clamping together, the next operation is that of boring the driving axle opening by chucking in a lathe, centralizing and boring in a manner familiar to all. Following this comes the operation of slotting a keyway centrally in the bore of the large section. The next operation is rather interesting, being that of turning the outside for the strap fit, and giving the correct amount of throw. This is performed in the manner illustrated in fig. 2. A cast iron block of the driving shaft or axle diameter, is bolted to a small faceplate in an engine lathe, this block being adjusted in location to give the required throw. A keyway in this block is set in a line through the two centres of the lathe and block, so as to correctly engage the keyway of the sheave. The jig block thus mounted and adjusted is ready to receive the sheave, which after being keyed, is clamped to the lathe faceplate for turning to gauge or to an old strap. The value of such a rig lies not so much in its ability to produce a single sheave more rapidly, but rather

set screws to be entered from the cored cavity end.

THE ECCENTRIC STRAP shown in the assembled view, is made in two sections, parted through the centre in the usual manner, and held together by bolts through the projecting flanges. The eccentric rod is attached from a projecting lug of one of the sections.

The first operation is that of milling the engaging surfaces to fit together. Following this comes the operation of drilling the clamping holes, and babbitt and oil holes in the inner face. The method of doing this alone, with jig and tool used, was described in Canadian Railway and Marine World for February last. Briefly, the method is as follows: On the vertical face of a radial drill table, a jig, carrying a plate free to revolve, is mounted. On this plate, contact faces uppermost, a half section of the strap is clamped, the revolving disc being so mounted for the first operation as to have the contact faces level. A drilling gauge, consisting of a steel plate formed to the inner contour of the sheave, with ends projecting over on to the bolting flanges of the sheave, is dropped into position. In the level position, the bolt holes are drilled through

drill bushings held in the jig plate. Subsequent to this, the carrying plate is swung around an amount sufficient to bring the jig holes for drilling the babbitt recesses into a level position, this position being obtained by placing a level on the drill bushing in each position as it is required to be levelled up. In this position the revolving plate is clamped, and a shallow hole drilled, this being followed by a recessing tool so designed as to have the cutting edges spread at the ends after entering the hole, recessing the hole to form a retaining collar all around for the babbitt later poured into these spots. Both halves of the strap

shape shown, has a pin projecting inward from the downwardly projecting end. This pin, rounded on its inner end, forms a stop against which the jig block is drawn. In this position the holes are drilled, the holes being exactly located with regard to the finished interior of the strap. With the jig used in this manner, the time of laying out the holes is saved, and at the same time, the holes are drilled absolutely accurately.

THE ECCENTRIC ROD is a wrought iron forging, with the forked end solid. The first operation consists of milling the surfaces all over, on the completion of which the pin hole through the jaw end

of the block B, (the same block as that shown at A in fig. 3). These plates project down from the sides and end over the sides and end of the butt, thereby locating it centrally and true with the locating end. Clamped in that position the bolt holes are drilled. As in its former use, it is reversible for drilling either right or left hand butt ends by merely turning over, the side and end plates projecting above and below the surfaces of the gauge.

THE RADIUS LINK as it reaches the machine shop, is a solid forging roughly shaped to size. In the first place, it is surfaced off on both faces on the planer

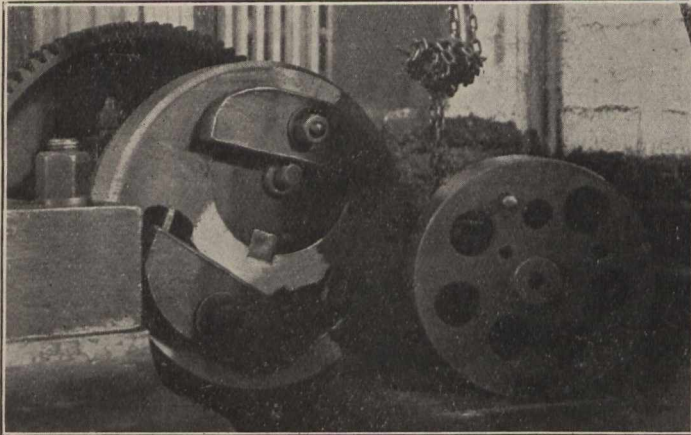


Fig. 2. Turning an Eccentric Sheave on Special Mandrels.

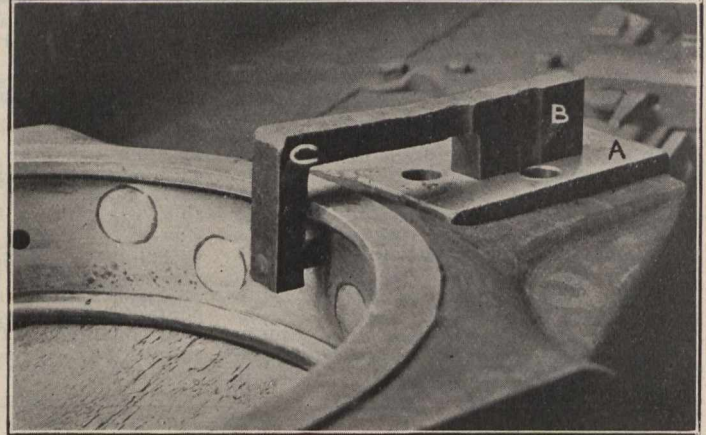


Fig. 3. Jig for Drilling Holes for Eccentric Rod Butt.

are drilled with the same jig and tool. Following this, the cupped holes are poured with babbitt. These babbitt spots are shown in fig. 3.

Next in order comes the bolting together of the sections prior to the boring; this is the operation immediately following, and is performed in a usual manner by chucking in a lathe.

Machining the recess for the eccentric rod butt follows. The cast opening in the projecting butt lug, is relieved at the inner end by a cast channel so that the cutting tool relieves itself at the end of the cut and is not forced up against a

is drilled with a centralizing jig. With this drilled hole as a central guide, the jaw is milled around the circular end by mounting on a milling table, with the rod so clamped to a stud screwed into the centre of the table, as to have the hole directly over the centre of rotation. Following this, the sides of the butt end are milled to gauge and likewise the end, milling the latter to a gauge which determines the length from the centre of the jaw pin hole, so that all rods are equal in length.

A hole is next drilled in the jaw end to form the relief for a slotting tool

to the required thickness, and then passed on to the drill press, where holes for the eccentric rod pins and saddle bolts are drilled to gauge, and at the same time rough holes are drilled at the end of the radius slot of the link. The clearance holes at the end of the slot are next scribed on the surface, position being taken from the eccentric rod holes, following which the slotter removes the clearance metal.

The next operation consists in milling all the edges, both inside and outside, on a vertical miller, by the use of the attachment shown in fig. 5. They are

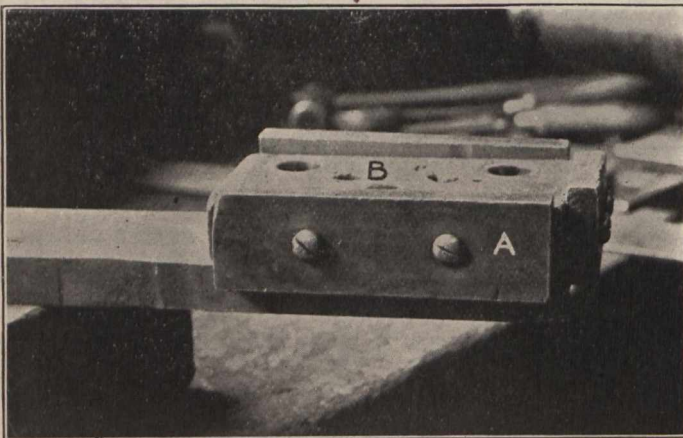


Fig. 4. Jig for Drilling Holes in Eccentric Rod Butt.

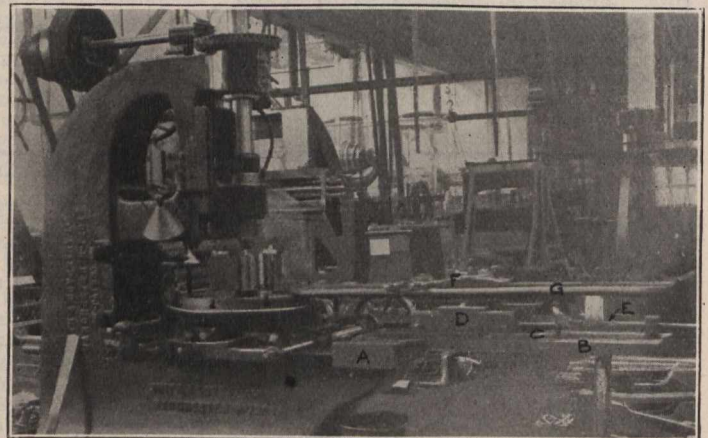


Fig. 5. Vertical Miller Attachment for Milling Radius Link.

shoulder. This machining is performed in a planer or shaper.

Drilling the bolt holes for attaching the eccentric rod butt is accomplished in the manner indicated in fig. 3, a rather novel jig being used for the purpose. A block of steel, A, containing bushed drill holes of the correct size and in the proper location, fits snugly into the machined recess for the eccentric rod butt. The jig is reversible, for the bushes are chamfered for the entry of the drill from either side. Through this block, there are two 1/2 in. holes, into which pins projecting from the lower surface of the block B fit snugly. The arm, C, of this block, formed to the

which removes the block of wrought iron between the forked jaws in a slotter, finishing the inner faces to gauge. This completes the rod, with the exception of drilling the bolt holes in the butt ends as shown in fig. 4. The extreme end of the butt having been previously machined to a given length, as mentioned earlier, this end may be used as the determining point to which a drilling gauge may be set for this operation.

Reference to fig. 4, will show that the drill jig is the same one as that used for drilling the eccentric strap butt, so that the bolt holes are certain to match up correctly. Thin plates, A, as shown, are attached to the sides and one to the end

machined in pairs. The construction of the attachment is very simple. On the end of the platen guides, there is attached an extension bracket A, centrally located and in line with the platen guides. On the bed, B, of this bracket, there is a plate, C, the upper surface of which has guiding ways for the carriage, D, adjustable lengthwise by means of the screw attached to the end of rod E with a handle at the outer end of the attachment. The carriage D, has a pin projecting from its upper surface carrying the clamp block F. This clamp block secures a slotted rod, G, which is rigidly attached at its inner end to the miller platen. In operation, the outward and

circular feeds of the miller are disengaged, and only the cross feed employed, the whole platen swinging on the centre pin of the attachment, the platen carriage adjusting itself thereto. Adjustment for locating the milling cutter for the successive cuts on the different edges, is made through the screw on the end of the rod E. The inside edges of the link are open to machining by milling, from the fact that the clearance holes at the end have been previously drilled and slotted. The correct radius is set from the pin on the carriage of the attachment. Following this the oil holes are drilled.

connecting rod of variable length from the power driven wheel, G, on which any throw of the crankpin may be obtained. The oscillating arm is guided in its movements by the supports, H, between which the arm moves vertically. In the foreground stands the standard grinder, driven from above. The feed, however, is derived from the oscillating arm drive through the train of gears, I, making the speed and feed interdependent.

The oscillating arm and supporting carriage are first set to give the correct radius. The link is then approximately attached as previously mentioned, when, by trial, it will be found that while the

shape so that it will sit without support, is placed. A form of surface gauge, C, adjustable in two directions, is held against the pin of the saddle on its V shaped base. Each edge of the V shaped base has a small projecting pin, forming the gauge support on the shoulder of the saddle. The arms of the surface gauge are adjusted so that the point just scrapes the top of the straight edge when pressed against the saddle pin and resting on the saddle shoulder. The gauge is swung out in turn to each end of the straight-edge, any error being noted. The straight-edge is then moved across to the other end of the link and this same

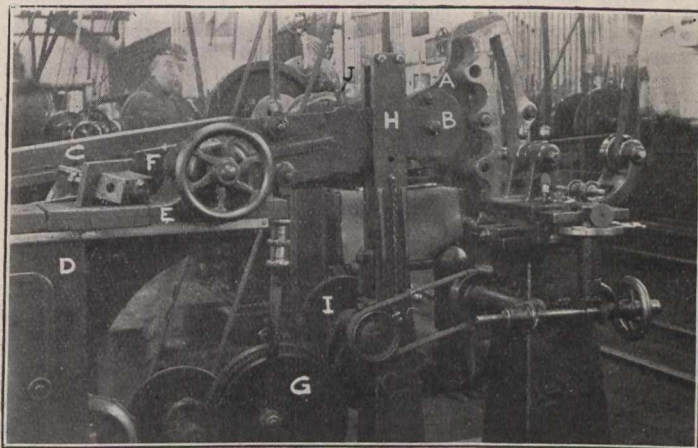


Fig. 6. Grinding to Radius the Inner Surfaces of the Link.

The next step is to file the link all over, preparatory to the case-hardening process to which it is subjected on the completion of the filing. The case-hardening tends to warp the link, requiring a subsequent straightening under a press. This is followed by a grinding of both surfaces on a surface grinder. The holes for the eccentric rod pins are then lapped out, and case-hardened and ground bushings forced into them.

The final operation on the link is that of grinding the inner surfaces to a correct radius. A specially designed machine, the construction of which is

radii of the link and machine are the same (from the original setting), the centre for the link arc will probably be slightly above or below that of the oscillating arm. To remedy this, it is not necessary to loosen the link from its supporting plate. As previously mentioned, this plate A, pinned at B, projects back alongside of the arm C, (on the other side of the arm, so not visible). Set-screws, J, through bosses on the rear side of this arm, bear on the end of the plate A, adjustment for coincidence being there attended to.

THE SADDLE is made from a solid

process repeated. Any variation in height at these four tested points is compensated for by scraping the base of the saddle on the side or corner that will give the required correction.

Locating the saddle is the next operation to require attention, and the method of so doing is shown in fig. 8. This saddle must not only be located midway between the eccentric rod pin holes, it must also have the exact offset over the slot of the radius link. The saddle is first located as close to its correct position as it is possible to do so by eye. The next step is to locate the saddle over the link slot

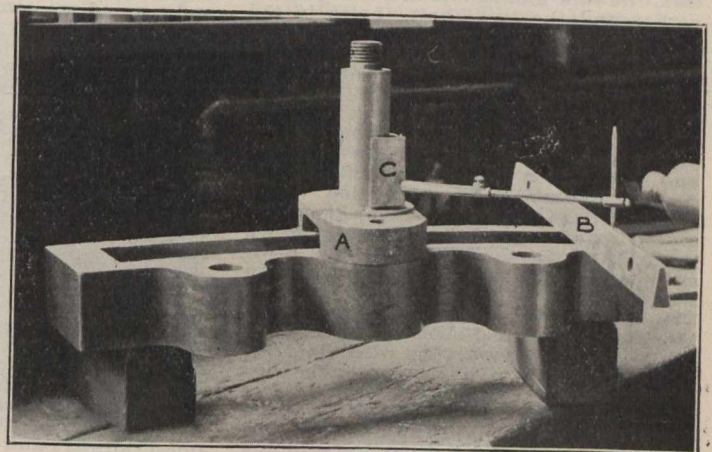


Fig. 7. Testing the Saddle Base on the Link Surface.

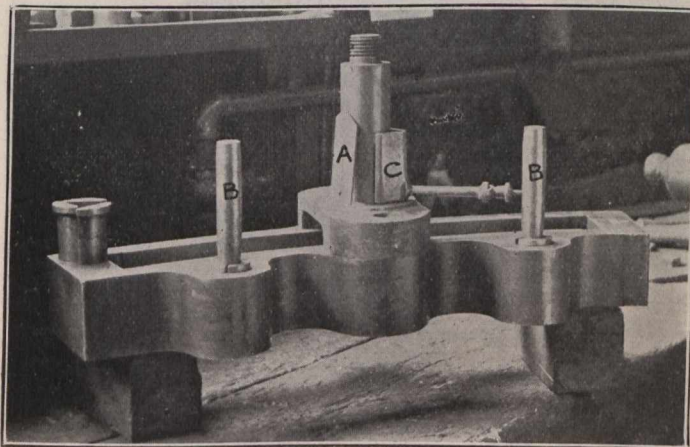


Fig. 8. Locating the Saddle Correctly on the Link.

shown in fig. 6, in conjunction with a standard grinder which is likewise shown, performs this operation. On a plate, A, the link to be ground is mounted. This carrying plate, A, is pinned at B to a long slotted arm, C, an arm of the plate A passing back a couple of feet alongside. A stand, D, carries on its upper surface a carriage, E, adjustable along the top in guided ways. Through the centre of the carriage E, there is a pin on which plates F, for clamping the slotted rod C are free to oscillate. The clamp plates, F, are secured to the slotted rod in any position of the carriage E, by the handwheel in front of the carriage. The slotted rod is oscillated by a

forging, and after reaching the machine shop, is turned and milled all over to the form shown in figs. 7 and 8, where it is mounted on the link. In view of the fact that a great deal of wear comes on the pin, that part of the saddle is case-hardened and ground. Following this case-hardening of the pin end, the base is refaced in the lathe.

The next step is that of determining the alignment of the saddle with regard to the ground surface of the radius link to which it is attached. The method of doing this is shown in fig. 7. A saddle, A, is mounted into approximate position on the link. Near one end of the link, a triangular straight-edge, B, made this

to give the correct offset; this is done by the use of the plate gauge shown standing up against the saddle pin at A. The distance from the right hand edge of this gauge to the centre point of the upper end, is made exactly to suit the offset required. Putting this centering gauge under the saddle against a wall of the slot, and bringing the lathe centre hole of the saddle to fit over the gauge point, places the saddle in its proper location.

This having been accomplished, the centralizing of the link with regard to the eccentric rod pin holes follows. Two pins, B, fit into segmental bushings in the eccentric rod pin holes. These segmental bushings to hold the pins, are made in

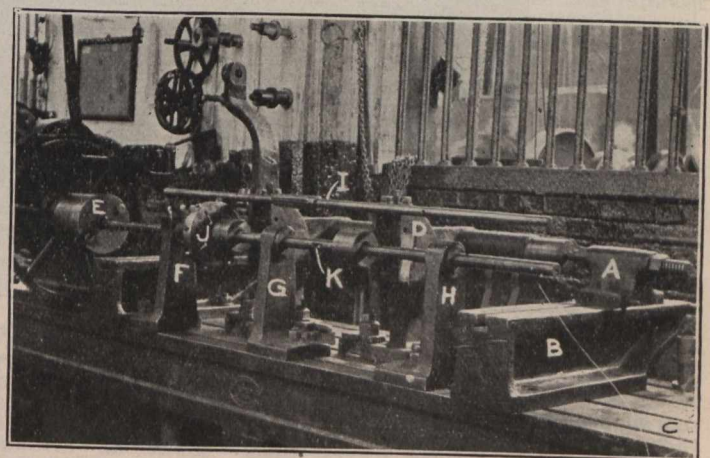


Fig. 9. Machine for Finishing the Tumbling Shaft Arms.

three sections, in pairs, a wide range of these pairs being at hand for use with different sizes of pin holes. The set standing on the left end of the link is for use with larger holes. The lower ends of the gauging pins are tapered, with a corresponding taper in the bore of the segmental sections. The gauging pins are thus made solid, and perfectly central and in line with the eccentric rod hole. A gauge, C, corresponding in construction to a height gauge, placed between the saddle pin and gauging pins in turn, locates the saddle in its central position. When thus located correctly, with regard to the two determining factors, the link and saddle are clamped together and the two bolt holes in the saddle drilled through the previously drilled holes in the link.

**LINK BLOCK.**—From the fact that the link block is such a small member, it is made in sets of four from a forged wrought iron block. This wrought iron block is first planed on its flat surfaces, and then drilled to gauge with four holes for the rocker shaft connection. Following this, the block of four is milled to the required radius on the rig shown in fig. 5, previously described. The drilled holes are the determining points from which to set the block up in the machine. The four pieces are then cut from the block. Both planed sides are then faced off in the lathe, concentric with the drilled holes, to form bosses on each side, over which the retaining collars fit. After drilling the rivet and oil holes, each block is case-hardened, followed by lapping out the central hole and a grinding of the arc surface of the blocks in the radius grinding machine. This completes the link block up to the stage of assembling.

**THE LINK BLOCK PLATES** are made from thin forged blocks, faced on a milling machine and bored in a lathe one at a time. The large edge radius is given the plates by mounting them 12 at a

forging. The first operation is that of turning the body for the end journals, these turned ends acting as guiding points from which the balance of the machining is done. Slotting the faces of the bosses follows, gauging from the finished surfaces of the journals.

Next in order comes the boring and reaming of the two lifting link arms, the reach rod arm and the spring arm in the machine shown in fig. 9. The shaft is held between centres, A, mounted on the stands B, across which the centres are adjustable. The stands, B, are attached to a surface plate base, C, and may also be adjusted to suit the size of the piece being machined. The arms to be bored and reamed are centred by set screws top and bottom in the steadying castings, D, bolted to the base C. The first operation after correctly aligning horizontally and vertically, is that of drilling the bosses. A drill rod held in the chuck E, is guided in a bushing in the support F, against

the first boss. Stand G guides the drill rod for the second boss. There is also a third support at H.

The second or reaming operation, is performed by the reamer rod I, held in the chuck E, and guided into the drilled holes by the supports. The outside of the boss ends are turned by the use of a cutter head, J, mounted on a guiding bar. Following this, the previously slotted boss faces are faced off by a facing cutter through the cutter bar as at K. The reach rod and spring arm bosses are machined in a similar manner.

After removing from the special machine, the metal on the boss opposite the arm, which could not be removed by the cutter head, is slotted off by standing the bosses on end over centres in the slotter. Ground bushings are then forced in to the holes in the reach rod and spring arms. Likewise, the lifting link pins are ground into their arms and there set, completing the machining of

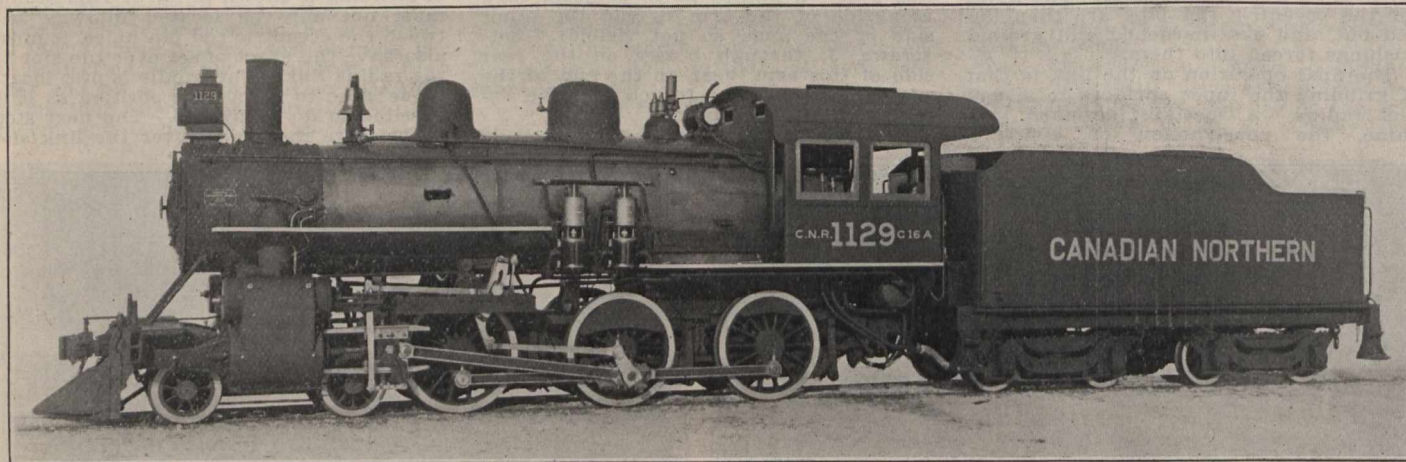
## Canadian Northern Railway Ten Wheel Superheater Locomotives.

Within the past few months the Canadian Northern Ry. has received 20 ten wheel locomotives from the Montreal Locomotive Works. Though of moderate weight, these locomotives are of more than ordinary interest, because of the number of features presented in the design which are said to be new on Canadian railways and which are quite a radical departure from present practice.

Among these will be noticed the arrangement of steam pipes connected to the cylinders outside of the smoke box; the so-called self centering guide for the valve stem crosshead and the guide for the extended piston rods. All of these have been quite widely adopted on United States lines. These same details

heated steam is used. A much better joint to the cylinders is also obtained; as eight bolts of equal length with a symmetrical circular flange are used in place of four or six bolts, as in the case of the bent inside steam pipe. Should a small leak occur, this arrangement also prevents any injurious effect on the steaming of the engine. A leak would merely waste steam, but would not interfere with the vacuum in the smoke box, as it does in the case of ordinary inside steam pipe construction.

One of the principal advantages of the design of valve stem guide lies in the fact that it can be erected, taken down and replaced without lining up, at the same time insuring that the guide is absolutely



Canadian Northern Railway Ten-Wheel Superheater Locomotive.

time in a miller and running over the edges with a formed cutter of the correct shape. After drilling the rivet holes, they are case-hardened, followed by a surface grinding which leaves them ready for rivetting to the link block, four rivets being required.

**THE LIFTING LINKS** are also wrought iron forgings. The first machining is that of facing the four faces on the miller to give the necessary surfaces from which to work. Both ends are then drilled to jig for the insertion of bushings. Following this, the link is milled all over, including the round ends and flat sides, completing the machining by drilling the oil holes. Hardened steel bushings are then ground and pressed into the drilled ends, this operation being followed by a facing off of the first-milled surfaces by a cutter on a mandrel working in the hardened bushings.

**THE TUMBLING SHAFT** is a built up

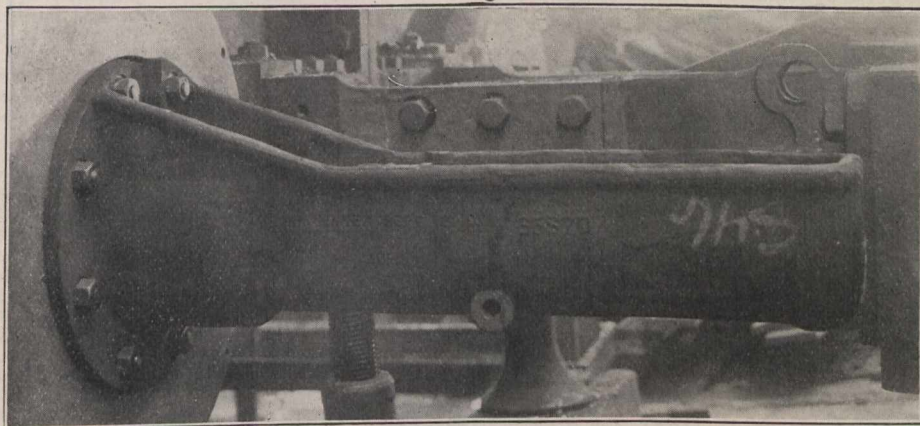
were applied to 20 heavier 10 wheel locomotives constructed by the same builders for the C.N.R. in 1911.

One of the accompanying illustrations shows an arrangement of the outside steam pipes similar to the one here employed. An air tight joint is provided where the steam pipes are carried out through the smoke box. This arrangement removes much of the obstruction to draught in the smoke box which is present with steam pipes of the ordinary construction. It also eliminates the live steam passages in the cylinder saddle, thereby greatly simplifying the coring of the cylinder. This also reduces any tendency of cylinders cracking in service, due to the difference in temperature between the live steam and the exhaust steam passages which exists in the ordinary cylinder construction where the two passages are side by side. This is of special importance where highly super-

in line with the centre of the piston valve chamber. This device consists of a guide made integral with the back head of the valve chamber. It is consequently self-centering and is also self-supporting, no bracing from the crosshead guides or any other source than the cylinder being required. The guide is so designed as to be easily adjustable for wear. Liners are provided on the top and bottom, which in case of wear, may be removed or inserted as may be required. This arrangement makes it possible to use a straight design of combination lever without forks which is connected to the crosshead by a pin passing through the wings of the latter. This affords more lateral stability than is provided in other designs.

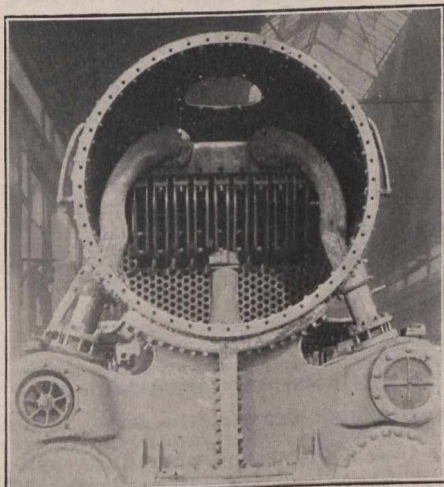
In the design of guide for the extension piston rod, the self centering principle is also employed. As a result, the guide can be removed and replaced without requiring lining, and at the same

time its axis exactly coincides with the longitudinal axis of the cylinder. It also provides ample wearing surface to insure long service without requiring adjustments. The general construction of this device is shown in one of the accompanying illustrations. The guide is so constructed that it is bored out and faced off at one setting on the machine. Its circular face registers with a corresponding face on the front cylinder head and the surface of the guide is struck from the centre of the cylinder. The shoe fitted to the extension of the piston rod has a radial bearing on the guide. Consequently, any refinement in adjustment between the piston rod shoe and the main cross



C.N.R. Locomotive. Piston Crosshead Guide.

head is unnecessary because, while the latter works in a flat guide, the former will swing around on the centre of the cylinder so that it will always take a fair bearing without cramping. The guide casing is open at the top, with a corresponding opening in the flange; so that the guide can be easily removed, if the engine is on the forward centre, without taking down the pilot and bumper. It is provided with a dust tight top and cover and with oil stops; so that the shoe always runs in oil. Experience with this device, covering nearly two years on a large railway in the northwest of the



C.N.R. Locomotive. Arrangement of Outside Steam Pipes.

United States, indicates that the wear on the shoe and guides in two or three years will not exceed 1-16 in. This obviates the necessity of relining between general shoppings. In view of the general use of extended piston rods on superheater locomotives, this device represents an important improvement in locomotive construction.

In the boiler construction, the principal features of interest are the superheater and the brick arch. The superheater is the Locomotive Superheater Co.'s type

A. design. This arrangement employs a top-header and superheater pipes of the double loop construction. It is arranged to give a high degree of superheat and provides a superheating surface of 279.6 sq. ft. Because of the use of superheated steam, a low boiler pressure of 170 lbs. is employed. The boiler, however, is designed to stand a pressure of 200 lbs. The brick arch is supported on studs.

Following are the principal dimensions of the locomotives:—

Fuel .....	Soft coal
Weight on drivers in running order .....	112,500 lbs.
Weight on truck in running order .....	41,500 lbs.
Weight, total of engine in running order .....	154,000 lbs.
Weight of tender in running order .....	123,400 lbs.
Wheel base, driving .....	13 ft. 6 ins.

Wheel base, total engine .....	23 ft. 10 ins.
Wheel base, total engine and tender .....	52 ft. 8 ins.
Tractive power, maximum .....	243,000 lbs.
Adhesion (factor of) .....	4.63
Cylinders, diameter and stroke .....	20 in. by 24 in.
Valves, type of gear .....	Walschaert
Valves, diameter .....	12 in.
Greatest travel .....	5½ in.
Lead in full gear .....	3-16 in. lead constant
Driving wheels, diameter outside tire .....	57 in.
Driving journals, diar. and length .....	8½ in. by 10 in.
Main crank pin journals, diar. length, 6 in. by 6 ins.	
Side rod crank pin journals, diar and length .....	6¾ in. by 5 in.
F. H. B. journals .....	4½ in. by 3½ in.
Engine truck, type .....	4 wheel with swing bolster
Engine truck journals, diar. and length .....	5½ by 10 ins.
Engine truck wheels, diar. .....	30 ins.
Boiler, style .....	Extended wagon top, radial stay
Boiler, outside diar. front end .....	58¼ in.
Boiler, largest course .....	65 in.
Boiler, height over crown, front .....	21½ in.
Working pressure .....	170 lbs.
Firebox, length .....	102¼ in.
Firebox, width .....	41¼ in.
Firebox depth .....	Front, 71½ in. back 58½ in.
Firebox, depth (top of grate to cen. lowest tube) ..	28-15-16 in.
Tubes, material .....	Kewa seamless steel
Tubes, thickness .....	no. 11 B.W.G.
Tubes, number of .....	133
Tubes, diameter .....	2 in.
Tubes, length .....	13 ft. 2¼ in.
Flues, material .....	Kewa seamless steel
Flues, number of .....	18
Flues, diameter of .....	5¾ in.
Flues, spacing of .....	6¼ in. and 6½ in.
Heating surface, tubes, .....	1,241 sq. ft.
Heating surface, firebox .....	141 sq. ft.
Heating surface, total .....	1,382 sq. ft.
Superheating surface (on basis of inside diar. of superheater pipes) .....	279.6 sq. ft.
Grate area .....	29.2 sq. ft.
Exhaust pipes .....	Ry. Co.'s standard with single nozzle
Exhaust nozzle .....	4¾ in.; 5 in. and 5½ in.
Smoke stack, diameter inside .....	16 in.
Tender wheels, number of .....	8
Tender wheels, diameter .....	33 in.
Tender journals, diar. and length .....	5½ in. by 10 in.
Tender wheel base .....	17 ft. 10 in.
Tender frame .....	13 in. cen. and 10 in. outside channels
Tender trucks, type .....	Ry. Co.'s 4-wheel pedestal type
Tank, kind .....	water bottom
Tank capacity .....	5,000 imp. gals.
Tank, coal capacity .....	10 tons

G. G. Hare, Assistant Engineer, Dominion Atlantic Ry., Kentville, N.S., writes:—"I enclose renewal order for my subscription to Canadian and Marine World. Please forward me the July and August numbers, which I have not received, owing to my removal here from Kingston, Ont., so that my file of your valuable publication may be complete."

### Removing and Repacing a Wrecked Timber Truss Span on the C.N.R.

The clearing of a wrecked timber truss span and erection of a temporary structure, restoring traffic, was accomplished in three days on the Canadian Northern Ry. at Saskatoon, Sask., where a derailed car demolished the north shore span of the bridge over the South Saskatchewan River. This bridge consists of six 150 ft. through Howe truss spans of timber on concrete piers, the rail elevation being about 45 ft. above the surface of the water. The bridge was of Pacific Coast fir in first class condition. It was built about six years ago.

As one of the southbound through passenger trains, carrying several sleeping cars on its rear end, was pulling through the south end of the yard at the approach to the bridge on March 4, the rear truck of the last sleeper left the rails at a switch about 500 ft. north of the bridge. The truck slewed and led off on the switch to the west or right hand side until the wheels that should have been on the left hand rail were over a foot outside the right hand rail and beyond the guard timber. There was a 30 ft. approach trestle, but the wheels were hanging over the ends of the ties when this was reached, so the guard rails could have no effect. The sleeper was dragged in this position on to the bridge, sideswiping the truss and breaking or knocking out the posts and diagonals. This span collapsed completely, falling with the last car to the river bed below, which was almost dry and frozen to the bottom. The damage to the bridge did not extend beyond the first pier and the car preceding the one which wrecked the truss remained on the structure, having its rear badly damaged, however. Fifteen passengers were in the rear sleeper, and 12 were injured, but none fatally. A fire started in the wreckage, but was quickly put out by the city forces.

The wreckage of the truss and the car was cleared away with the aid of a Lidgetterwood ballast unloader, which dragged it sideways off the bridge site. A track which runs west along the river bank at right angles to the bridge was utilized for this purpose, the Lidgetterwood car being set at the point marked A on the photograph of the reconstruction.

The cable was then run down to the wreckage, dragging the tangled mass of rods and timber and the wrecked sleeper out of the way.

Reconstruction was started by first erecting a temporary trestle over which traffic could be opened. Bents were framed on the ice and raised by a wrecking crane working outward from the shore end, blocking being put under the bents. On account of the end of the second sleeper overhanging the adjacent span, it was necessary to build entirely from the shore, so that the crane could be used to lift the overhanging car. The last two bents next to the pier were framed at the side of the bridge, then lifted clear and swung into place. When all but one panel of the trestle was decked, the crane lifted the end of the hanging car and pushed it forward on the undamaged part of the bridge.

With traffic thus restored, work was continued on the erection of the permanent Howe truss span, utilizing the trestle for falsework. Additional posts were placed vertically on the end of each sill to carry the weight of the new span.

The nature of this accident was such that it was believed to be unpreventable by the guard rails, and it is also believed that a steel structure would have suffered similarly.

The clearing of wreckage and re-erection of the span was done under the direction of J. A. Crawford, Bridge and Building Master, C.N.R. at Saskatoon.

# National Transcontinental Railway Terminal Facilities at Moncton, N.B.

The National Transcontinental Ry. has under construction the facilities for its eastern terminal at Moncton, N.B., where it connects with the Intercolonial Ry. for St. John N.B., and Halifax, N.S. The trackage at present contemplated amounts to 10.6 miles, with room for the laying of an almost equal number when the demand arises.

The extent of the terminal, with its various auxiliary buildings, may be judged from the accompanying plan of the yard layout. The yards, with approaches, are over a mile long, and are located one mile from the point where the line joins the I.R.C., or about 1 1/4 miles from Moncton station. It is but a short distance from the I.R.C. new shops. The yards are located on a slight grade of 0.2088 ft. per hundred, rising from east to west. The eastern, or Moncton, end is 79.10 ft. above mean high water mark, and the western end, 87.45 ft., meaning a total rise in the length of the yard of 8.35 ft.

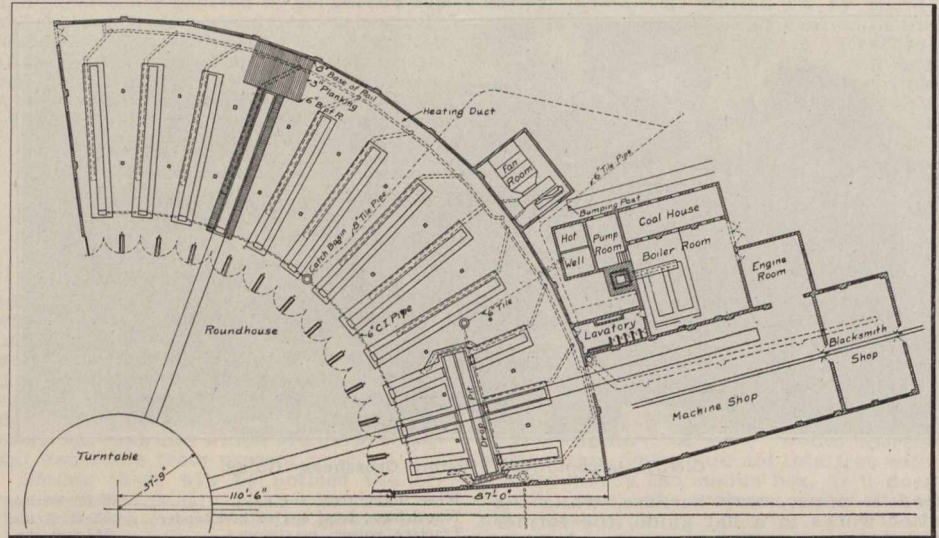
The yards are all to be north of the through main line, as it is expected that the trackage that can be placed there will prove ample for some time. To the south, it will be noticed, there is a strip the length of the yard which it is intended at some future date to convert into storage tracks, with a possible diversion of the main line to the south of this larger yard. The present storage capacity amounts to 600 cars, and the newer yard addition will add room for 600 more.

The main line along the south side of the property is located 18 ft. centres from a parallel track, the western end of which is used for caboose storage. Parallel with this, there is another through running track connecting with the caboose track through cross overs at the eastern end of the caboose storage space. To the north of this, at a 14 ft. spacing, there are nine through storage tracks leading from a 1 in 6 ladder track from the second track at the west end, and into a similar ladder at the eastern end, except for the lower three, which converge before leading on to the ladder, made necessary by the curve of the main line at that end of the yard. The first

The roundhouse and machine shop, located at the end of the car repair tracks, is of standard type, being erected along both the N.T. Ry. and the Grand Trunk Pacific Ry., and is shown more in detail in the plan of the standard layout. The same roundhouse and shop are used at this point, the layout being reversed, which is the only difference. The one to be built here will have 12 stalls, but it will be noticed in the yard plan that space has been left for a future addition, for

Between the bad order tracks and the upper through running track, there are three leading from the west from the same ladder as the upper running track at a 19 ft. spacing. The middle one of these from the west leads on to the coaling trestle, from which the chutes are supplied. The two outer tracks are for coaling the tender. Further east on the same tracks are the ashpits, both tracks converging from that point on to the turntable. From the turntable east, there is only a single track leading parallel to the ladders to the main line.

The engineering difficulties in the way of locating the yard were considerable, and careful planning was required. The

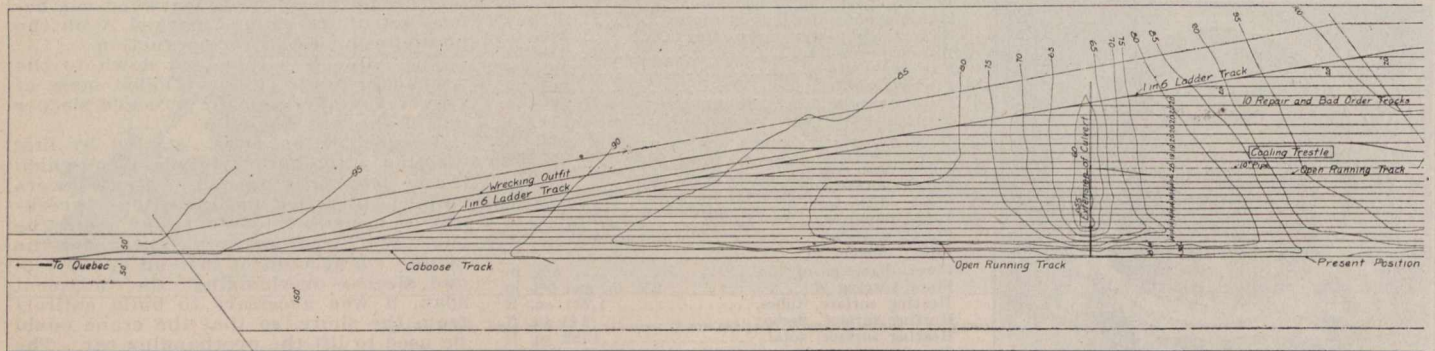


Standard Divisional Roundhouse and Shops for National Transcontinental Ry.

which the design of the shop layout is planned to accommodate. A 75 1/2 ft. turntable serves the roundhouse, the inner posts of which are at a 110 1/2 ft. radius. The roundhouse is 87 ft. deep. The upper nine of the stalls have no special fittings, but are constructed of concrete, the floor edge and the forward end planked. The three lower stalls have a drop pit connecting the three, with the centre track leading through into the

yards could not be located in Moncton from a lack of suitable space. Likewise, it was impossible to place the yards very close to the city, from the fact that the track rises out of Moncton on a 0.6% grade, which is rather too great for an extensive yard. The nearest place where a nearly level yard could be built, was the present site, 1 1/4 miles from town.

The contour lines of the original ground formation are shown on the yard



Yard Layout and Shop Arrangement for National

track north of these storage tracks is an open running track, connecting with the main line at both ends through a separate track parallel to the end ladder tracks. At both ends, there is a short parallel track, the one at the eastern end being used for caboose storage for traffic made up to travel in the opposite direction to that for which the west end caboose track is placed.

The upper ten tracks, at a 20 ft. spacing, entered by a separate 1 in 6 ladder track from the west, are for repair and bad order cars, conveniently located to the shops. Parallel with the ladder, near the west end, there is a short track for the wrecking outfit, which is handy to the main line on to which it can be run without any intermediate interference from blocked tracks.

machine shop to the rear. The machine shop in turn communicates with the blacksmith shop, which has an intervening wall, an optional construction being the elimination of this wall. An industrial railway connects the shops, leading out into the yard to the rear, where the bad order tracks are located. The engine room, boiler room, coal house, pump room and hot well adjoin this building. One of the bad order car tracks leads in alongside of the coal house for the coal supply. The fan room, along the outer wall of the roundhouse, supplies hot air through a concrete duct buried along the outer wall, smaller ducts leading therefrom along the walls of the pits, with entries at short intervals. The shops also have a buried system of conduits for heating.

layout plan. Between the level at the location of the culvert under the tracks and that of the ground where the roundhouse is to stand, is a full 45 ft. At the east end, the final elevation is to 79.10 ft., necessitating the reduction of the 100 ft. level of the shop site and the filling in of the ravine, carrying the filling-in operation nearly to the western end of the yards, where the final level is to be 87.45 ft. The tracks on the western portion of the yard are all on made ground, but the shops are all on the higher levels that were reduced. Any settling of the fill will not affect the buildings. A very convenient arrangement of tracks and buildings has been obtained, considering the restrictions laid upon the engineers in the laying out of these yards.

All the work of filling has been com-

pleted, and track laying is in progress. The contract for the roundhouse has been let, and work is to commence in the near future. Tenders have been invited for the coaling trestle and the other buildings of the shop plan. The yard layout was designed at Ottawa, and the work carried out under the direction of the C. O. Foss, District Engineer, N.T.R., St. John, N.B.

**Grand Trunk Terminals Warehouse Company Ltd.**

Canadian Railway and Marine World for August contained some extracts from this company's prospectus, which contained the names of W. Wainwright, J. E. Dalrymple and R. S. Logan, three of the G.T.R. Vice Presidents, as directors. Just after the issue had gone to press, McCuaig Bros. and Co., of Montreal, who issued the prospectus, sent out the following notice:—

"Referring to the circular which we recently issued in connection with the bonds of the Grand Trunk Terminals Warehouse Co., Ltd., we beg to advise you that the composition of the board of directors as given therein is not as stated. While the G.T.R. reserved the privilege of appointing three out of the seven directors, they have so far not definitely decided whom they will appoint, although the directors as they appear in our circular were announced in the Montreal papers. Pending therefore a definite statement in this connection, we beg to advise you that we have withdrawn our circular in connection with the above company and would therefore ask you to cancel same."

It seems an extraordinary thing that a prospectus of a company should be prepared and names of directors inserted on the strength of a daily newspaper report.

**Completion of the Atlantic, Quebec and Western Ry.**

By the opening of the Atlantic Quebec and Western Ry. on August 1 to Gaspé Basin, the extreme eastern end of the Gaspé peninsula, in the Province of Quebec, has been given the railway

The whole route from Matapédia to Gaspé is most picturesque, with a charming variety of scenery, embracing the Baie de Chaleur, the Gulf of St. Lawrence and Gaspé Bay and the wooded mountainous country reaching back from the shores, which offers great attractions to tourists, to salmon and trout fishermen and for moose and cariboo as well as a variety of bird shooting.

The train dispatching on both lines is done from New Carlisle by telephone, and it is said that the line now operated as the Quebec Oriental Ry. was the first in Canada to equip its trains with portable telephone apparatus.

**Superheated Steam in Locomotive Service.**

The conclusions arrived at concerning the use of superheated steam as obtained in a series of experiments reported in the University of Illinois Engineering Experiment Station bulletin 57, may be summarized as follows:—

Superheated steam may be successfully used in locomotive service without involving mechanism that is unduly complicated or difficult to maintain.

Evidence points to the fact that the various details of the locomotive that come in contact with the highly superheated steam give little trouble as regards maintenance, and are not among the members usually most in need of repair when the locomotive is shopped.

Superheating materially reduces the consumption of both water and fuel, and increases the power capacity of the locomotive.

The locomotive tested had boiler and superheating surface of 943 and 193 sq. ft. respectively, superheating approximately 150 degs. The superheat decreases with increased boiler pressure, and vice versa, in the following relation:—

$$T=123 - 0.265P + 7.28H$$

where T is superheat, P the boiler pressure, and H the equivalent evaporation per foot of water-heating surface per hour.

The evaporative efficiency of the boiler and superheater is

$$E=11.706 - 0.214H$$

where H is the equivalent evaporation per hour per foot of water-heating and superheating surface.

Absorbed by steam in superheater .....	5%
Total utilized .....	57%
Lost in vaporizing moisture in coal .....	5%
Lost in CO .....	1%
Lost through high temp. of escaping gases .....	14%
Lost in form of sparks and cinders .....	12%
Lost through grate .....	4%
Lost through radiation, leakage, etc. ....	7%

The water consumption under normal conditions of running for boiler pressures of 120, 160, 200 and 240 lbs., respectively amounts to 23.8, 22.3, 21.6 and 22.6 lbs. per i.h.p. per hour.

The coal consumption under normal conditions of running at the following boiler pressures of 120, 160, 200 and 240 lbs., is respectively 3.31, 3.08, 2.97 and 3.12 lbs. per i.h.p. per hour.

Neither the steam nor coal consumption is materially affected by considerable changes in boiler pressure, a fact that justifies the use of comparatively low pressures in connection with the superheating.

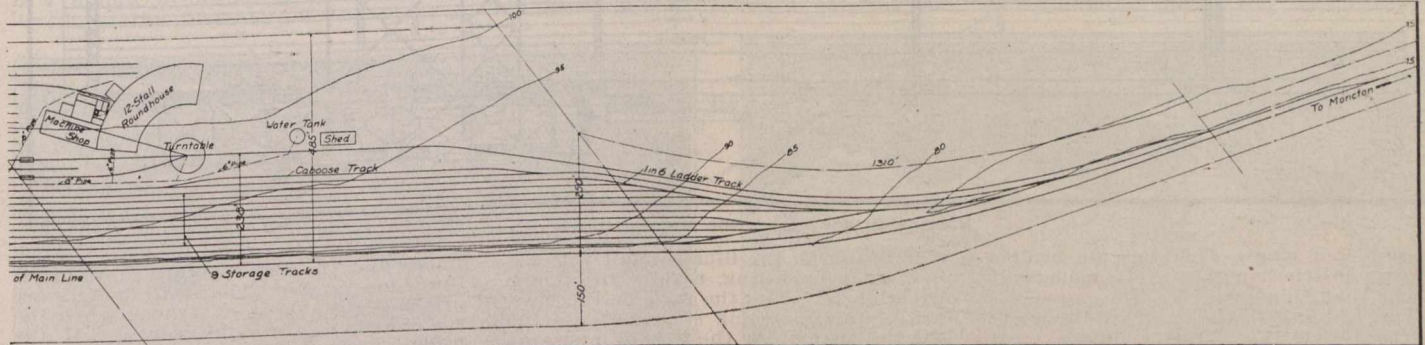
Contrary to the usual conception, the conditions of cut-off attending maximum cylinder efficiency are substantially the same for steam superheated 150 degs. as for saturated steam. With superheated steam, when the boiler pressure is 120, the best cut-off is approximately 50% of the stroke, but this value should be diminished as the pressure is increased, until at 240 lbs. it becomes 20%.

Tests under low steam pressures for which the cut-off is later than half-stroke, give evidence of superheat in the exhaust.

The saving in coal between a saturated and a superheated locomotive varied from 18% at 120 lbs. to 9% at 240 lbs. The saving in water under the same conditions and between the same limits varied from 17% to 6%.

The power capacity of the superheating locomotive is greater than that of the saturated steam locomotive.

The above results are based on the results of a series of tests at the Purdue University Testing Laboratory conducted by Dr. W. F. M. Goss, and extending over a period of eight years, the locomotive tested being an eight wheel American equipped with a Cole superheater. Under four different pressures, 4,851 miles were run off during the experiments, so that the observations may be considered as being quite as accurate as experimental results can be.



Transcontinental Ry. Terminals at Moncton.

communication which has been looked forward to for so many years.

Starting at Matapédia, Que., on the Intercolonial Ry., the Quebec Oriental Ry., formerly the old Baie de Chaleur Ry. and subsequently the Atlantic and Lake Superior Ry., runs to New Carlisle 98 miles, from which point the Atlantic Quebec and Western Ry. has been built to Gaspé Basin, 104 miles, a total of 202 miles. A through train is now being run each way daily, except Sunday, between Matapédia and Gaspé Basin, both lines being under the general managership of C. R. Scoles, who was the contractor for a considerable portion of the A.Q. and W. Ry., which is a well constructed line with some interesting engineering features.

The addition of the superheater to a boiler originally designed for saturated steam involved some reduction in the area of the heat-transmitting surface, but the efficiency of the combination when developing a given amount of power, was not lower than that of the original boiler.

The ratio of the heat absorbed per foot of superheating surface to that absorbed per foot of water-heating surface, ranges from 0.34 to 0.53, the value increasing as the rate of evaporation increases.

When the boiler and superheater are operated at normal maximum capacity, and when they are served with Pennsylvania or West Virginia coal, the available heat supplied is accounted for approximately as follows:—

Absorbed by water .....	52%
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The C.P.R. has transferred its local freight offices at Fort William, Ont., to a new building just above shed 5 on the Kaministikwia River.

F. G. MARTYN, Assistant Superintendent, C.P.R., West Toronto, writes:—"I feel quite justified in saying that Canadian Railway and Marine World is the best journal dealing with railway matters printed to-day. I wish it continued success."

During June, 13 employes were killed, and 23 were injured in the course of their work in connection with Canadian steam railways. Of the fatalities, five were due to collisions, three to being run over, two each to being crushed and being struck by trains, and one to a fall.

## Canadian Pacific Railway Bascule Bridge Over Kaministikwia River.

A large bascule bridge is being built across the Kaministikwia River at Fort William, Ont., for the C.P.R. It is a combination bridge, for the handling of both railway and highway traffic, a lower deck with a double track providing for the railway requirements, while on an upper deck there are two street car tracks in addition to a roadway and foot-path on each side. The double deck feature in bascule bridge construction is said to be unique, and it is reported that there is no other bridge of the bascule construction containing a double deck that is quite as large, although there are

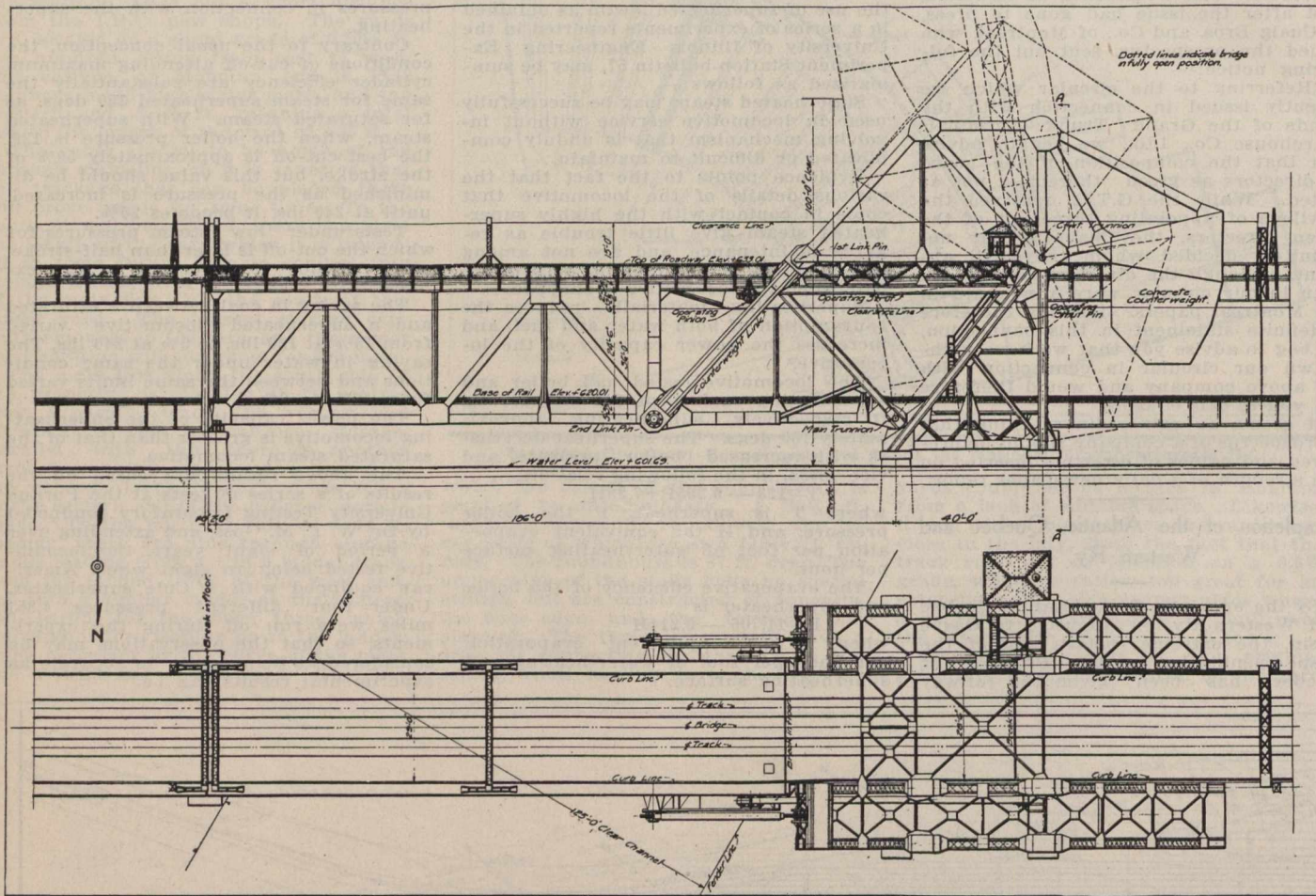
a solid mass of concrete, of such a weight as to maintain the weight of the main span in a state of equilibrium, the only power required to raise the span being that necessary to overcome the friction of the parts.

The operation of the bridge is rather unique. Pinned to the front of the towers on each side are operating struts, on the lower edge of which are long racks each engaging at the outer end with a pinion. This pinion is connected through gearing to an 85 h.p., 490 r.p.m. 550 v. 60 cycle motor fitted with solenoid brakes. These two motors are mounted on the towers,

from white to red, indicating that the bridge is closed to traffic. Similar changes in light occur on the operator's panel.

Until the end locks are withdrawn, the contactors of the operating motors remain open. When withdrawn, these contactors are closed, so that the operator can, as soon as the light signals that the time is proper, energize the main motors through the controllers. The first notch of the controller merely opens the solenoid brakes. This position can be used at any time when it is desired to coast. The starting of the span on its upward movement opens the lock motor contactors so that the latter cannot operate by accident.

The closing of the span is performed by the reversing of the operations out-



Bascule Bridge across the Kaministikwia River.

a couple of single deck bascule bridges under construction that are considerably larger than this one.

The Kaministikwia river, at the point where the railway crosses, has a clear channel of 125 ft., but as the line crosses the river at an angle, a clear span of 186 ft. is required. This leaves the channel perfectly clear when the lift is raised into the open position. The construction of the bridge is rather out of the ordinary, as an inspection of the accompanying illustration will show. The main span is pinioned on a main trunnion at the forward end of the triangular tower. On the top of this tower, a cantilever counterweight arm is trunnioned, the counterweight overhanging the right end of the bridge, the opposite end being connected by a connecting link with pins at both ends to a point along the lower part of the span member as indicated. As the main span swings on the main trunnion, the counterweight cantilever at the same time moves through a similar angle, as the pins are so located as to form a parallelogram. The counterweight on the outer end of the counterweight arm is

as indicated in the illustration. The motors, when operating, revolve the pinion, which moves along the rack on the lower face of the operating strut. This action lifts the spans. As the bridge moves up, the motors move through the same angle, which in the highest position is 80 degs.

At the outer end of the span there are two lock motors of 5 h.p. each at 810 r.p.m. on 550 v. 60 cycle. These operate the locks through worm gearing. There is also a 3 h.p., 3 phase 550 v. motor geared to a crank disc to operate the emergency brake.

When the bridge is closed and ready for traffic, the lock signal switch and the bridge signal switch are both closed, and the contacts in the circuits of the main operating motors and the lock motor are open. To open, the danger signal is first set. The action of so doing energizes the contactor points of the lock motor, causing them to close, when by the closing of the lock motor circuit breaker by the operator, the locks are withdrawn. The lock moving out automatically changes the light in the signal tower

lined, and the signal lights show up in the same reverse order. Air buffers are provided to take up any shock when the span strikes the abutments. If the bridge is travelling too fast, these air buffers will cause the motors to overload and trip the oil switch. The operators cabin, at the top of one of the towers, is fitted with a complete electrical control outfit, including switch board and the necessary attachments.

The structural steel work and mechanism were fabricated and erected by the Canada Foundry Co., Ltd., and the electrical equipment was furnished and installed by the Canadian General Electric Co., Ltd.

**Railway Lands Patented.**—Letters patent covering Dominion lands in Manitoba, Saskatchewan, Alberta and British Columbia, were issued during June, as follows:—

	Acres.
Calgary and Edmonton Ry. ....	1,104.00
Canadian Northern Ry. ....	644.00
Grand Trunk Pacific Ry. ....	20.47
Total .....	1,768.47



# Railway Mechanical Methods and Devices.

## Moulding Grease Cellars at the C.P.R. West Toronto Shops.

A special method of forming in moulds the locomotive driving axle grease cellars is in use in the C.P.R. West Toronto locomotive shops, A. Dixon, general foreman. The method used is shown in the accompanying four illustrations.

Customarily, the grease is moulded into the driving axle cellars in a piecemeal manner, packing the grease into

which is keyed to the trunnion shaft of the plunger shell, B, through which the latter receives its motion from the small air cylinder, E.

On the forward end of the hollow shell, B, there is a die-head, H, bolted thereto as fig. 2 shows. This die has an aperture through which the grease is forced, of the same shape and size as the section of the largest grease cellar that is required to be filled. The face of the die opening is machined off, and has projecting studs by which different sized apertures may be bolted on to give the

come from the machine on the supporting board, are placed on a table and cut up into short blocks of the required length to fit the grease cellars, into which they may be slipped without any further work. The blocks are cut off as before with a thin piece of sheet metal.

If, however, the correct size of grease forcing die to attach to the end of the trunnioned shell is not to be had through the fact that that particular size is not in sufficient demand to cause such a one to be made, or for any other reason one is not available, the next larger size is used,

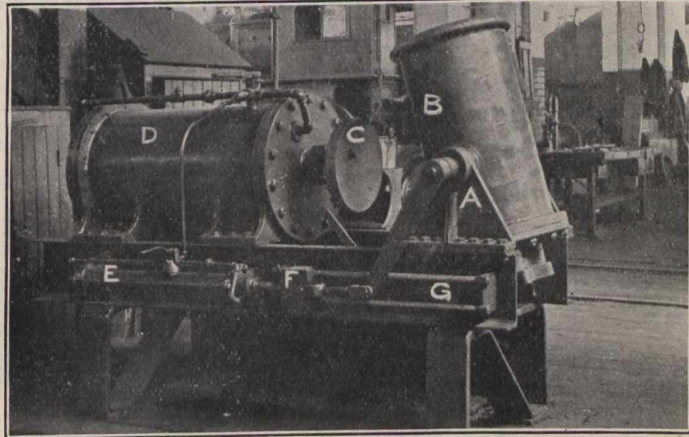


Fig. 1. Grease Cellar Moulding Machine in Open Position.

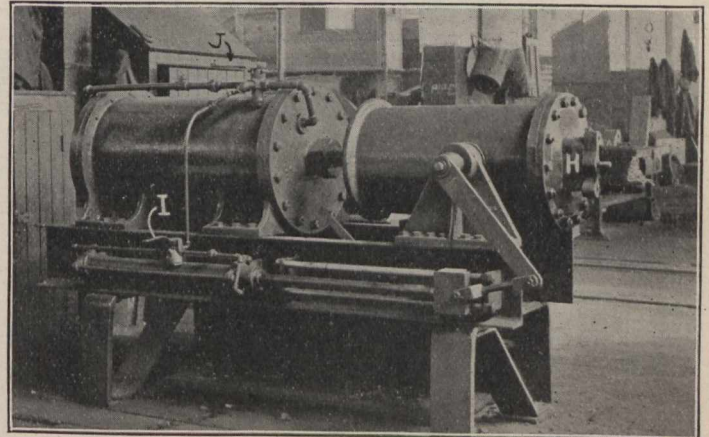


Fig. 2. Grease Cellar Moulding Machine in Operation.

position as the work progresses. This method, while giving eminently satisfactory results, is slow, and requires careful work to give these good results. In consequence, it was considered that some purely mechanical method of forming them, if it were possible to devise such a scheme, would be much more preferable. The method outlined in this article is the result.

The moulding machine is shown in figs. 1 and 2. Trunnioned on a shaft, A, there is a hollow cylinder, B, bored the full length to the diameter of the plunger

different sizes of grease blocks that are required by various journals.

The operation of the machine is as follows: With the hollow cylinder, B, in its vertical position, as indicated in fig. 1, it is filled with axle grease—cleaned grease, scraps and new stock—this being lightly pressed down into the bottom. Turning the air handle, I, to the left lets air in behind the piston in the cylinder E, forcing it forward, lowering the shell B into the position assumed in fig. 2. The air valve, J, is next turned to the left, forcing the air plunger forward, entering the

and the surplus grease trimmed off in the manner indicated in fig. 4. A cut off block of grease is dropped into the cellar as indicated at A. Then, with a hammer, or any such convenient tool, the grease is forced down to fit into the cellar, as at B. This operation packs the grease into a solid mass, and is even freer from imperfections than the original die pressed block. Following this with a sharp edged bar of metal, the surplus grease is removed from the cellar, the circular forms in the end plates guiding the cutting tool through

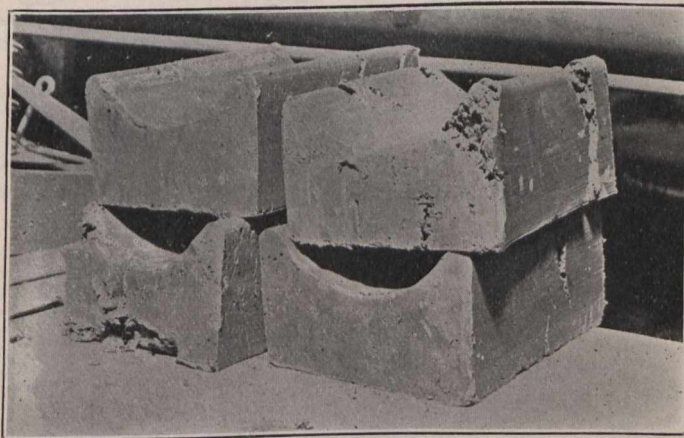


Fig. 3. Blocks of Grease from the Moulding Machine.

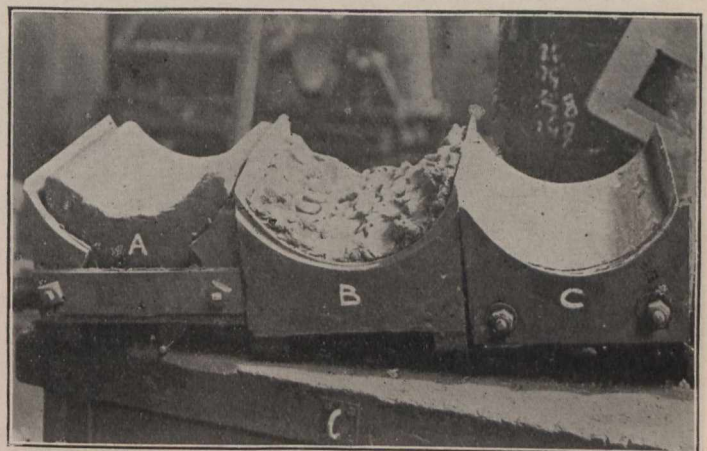


Fig. 4. Moulding the Blocks into the Grease Cellars.

head, C. This cupped plunger head, C, is attached to the end of a piston rod, on the other end of which is a piston in the air cylinder, D. Both the air cylinder D, and the plunger cylinder trunnion support, A, are mounted on a frame built up of channel sections, raised from the floor on bent bar sections, all as indicated in figs. 1 and 2. In the front channel, there is a small diameter air cylinder, E, containing a piston connected to the crosshead, C. This cupped plunger head, C, A short link from this crosshead connects with the lower end of the arm,

plunger head, C, into the shell, B, against the grease contained therein. By regulating the intensity of the pressure in this cylinder, D, the grease can be forced out through the forward end of the die aperture. A block some 3 or 4 ft. in length is forced out on to a board, and cut off with a piece of thin sheet metal. If the shell has been sufficiently charged, two or three such blocks may be cut off without reloading. The air handles are again reversed, bringing the machine back into the position in fig. 1.

These long blocks of grease, as they

the grease leaving the finished grease cellar in the form indicated at C.

The G.T. Pacific Ry. has put in operation a regular tri-weekly passenger and freight train service from Prince Rupert to Van Arsdol, B.C., in place of the mixed train heretofore operated.

D'Arcy Scott, Assistant Chief Commissioner, Board of Railway Commissioners, turned the first sod on the site of the Canadian Car and Foundry Co.'s new plant at Fort William, Ont., recently.

### Repairing Air Hose at the Central Vermont Railway Shops.

In several previous issues of Canadian Railway and Marine World, various arrangements and devices in use in the different railway shops throughout the country for the never ceasing task of renewing and repairing air and steam hose have from time to time been described, especial emphasis being given to the fact

similar to the one to be found in the usual construction, and a vertical cylinder, B, under the table, N. On the table, N, there is a block, M, carrying a guiding casting, L, along which the lower half of the clamp C, is free to slide. The upper half of the clamp is suspended from the clamp lever K, one end of which is attached to the upper end of the plunger from the cylinder B, and fulcrumed near the centre on a standard L. The lower end of the standard L, fits a channel in the circular slide J, so that

Through a horizontal hole along the centre of the block M, the lower rod of the attachment E is slipped and attached to the block on the end of the plunger of cylinder A, in the hole near the lower edge. To the face of the block of attachment E, the permanent coupler is attached, to which the coupler of the hose to be repaired is connected, and after clamping as before, by the admission of air into the cylinder, the force on the hose is in the opposite direction, dismantling the end pieces from the hose. The clamping sections for the machine to replace the ones used in the mounting operation are those shown to the right at D. One end is removed at a time, the carriage being made stationary by the insertion of a pin through the part I into the carriage.

The machine as installed is shown in fig. 2. The different sized attachments for the steam and air hose may be noticed on the shelf below. To the left are the bins for the storage of the hose after completion, and they are also used to temporarily store the hose during the steps through which the hose passes in going through the machine. The control handles for all the valves are located conveniently for the operator in the front of the machine, as may be seen.

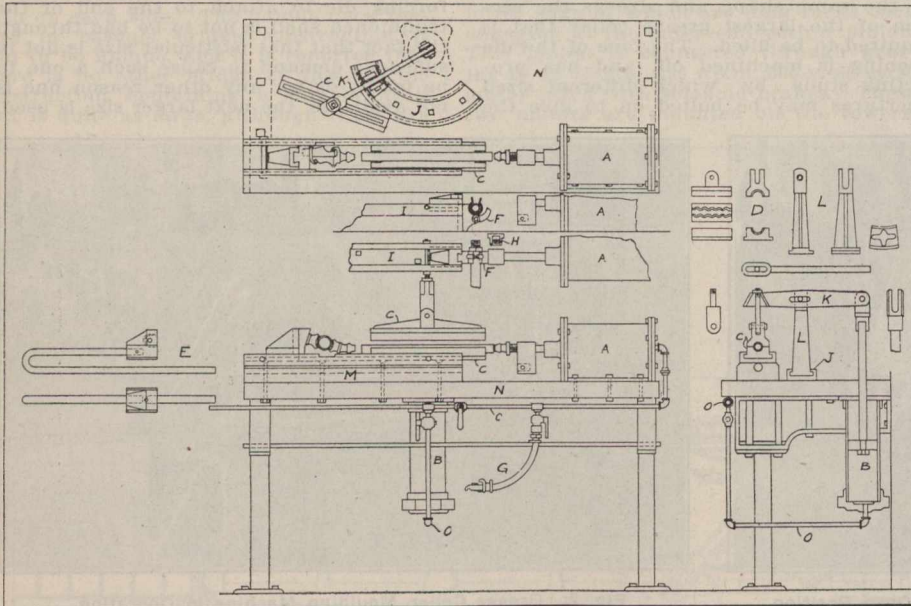


Fig. 1. Details of Machine for Mounting and Dismounting of Air Hose Connections.

that the number of such devices to be found would seem to be legion, each shop having a method peculiarly its own, with special advantages and disadvantages accompanying each. To determine the best one out of such a large selection would be a difficult task, as they have so many inherently good features, each one seeming to meet the particular requirements of the shop in which it is located.

The accompanying two illustrations show the arrangement as used in the

the upper clamp section can swing through an arc of about 90 degs.

On the face of a block at the left end of the table, the coupler piece is attached to corresponding coupler on that face, and on the plunger end there is the threaded hose nipple, and in the clamp, the hose is secured. Admitting air into the cylinder A, forces the plunger forward, forcing both nipples into the hose, the carriage C accommodating the hose to the new positions assumed as the nipples move further into the hose ends.

### Heavy One-Piece Forging at the Montreal Locomotive Works.

A rather heavy forging to be produced in a single heat under the steam hammer is shown in the accompanying illustration of a locomotive connecting rod. The billet from which the rod was forged had a section 6 x 15 ins. The practice outlined, is that of the Montreal Locomotive Works.

The original dimensions at the large section of the rod, the right end in the illustration, were not altered appreciably. The 6 x 15 in. bar, heated through the required length to a bright red working heat, was brought under a large steam hammer, handling the hot bar by tongs from a hydraulic crane, by means of which the billet could be changed about under the stroke of the hammer. The right hand tip was first drawn down to the shape indicated, followed by a reduction of the body of the rod to the left, to the point where it was still attached

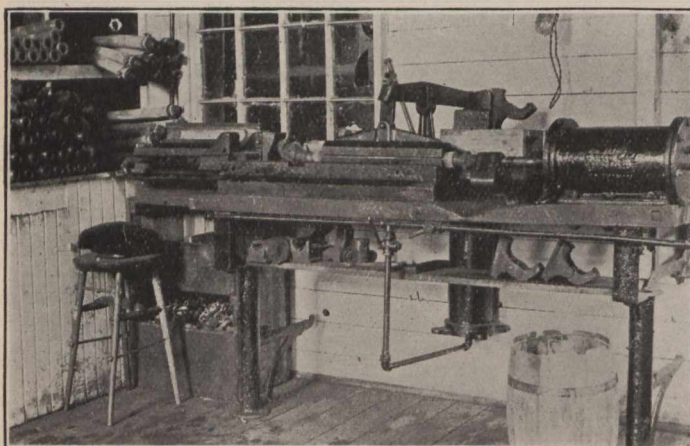


Fig. 2. Installation of Machine for Repairing Air Hose.

Central Vermont Ry. Shops at St. Albans, Vt. It is essentially the same as most of the others previously described, working with a series of air cylinders and guiding ways, with the one advantage that the attachments are so varied as to make it equally useful for all stages of hose renewal, the whole construction and operation being withal very simple. The details of construction are shown in fig. 1, and the machine as installed, in fig. 2.

Referring to fig. 1, it will be noticed that there is a horizontal cylinder, A,

For the fitting on and tightening up of the hose clamps, the attachment F, is slipped into vertical channels in the face of the member I. Forcing forward the block face of the plunger against the open jaws of this attachment containing an open coupler clamp, closes the latter tightly so that the operator can quickly screw up the clamping bolt. Both ends being the same as regards the clamp, can be fixed in a similar manner.

The machine has attachments also for the removal of old connection nipples.



800 lbs. Forging Made in a Single Heat.

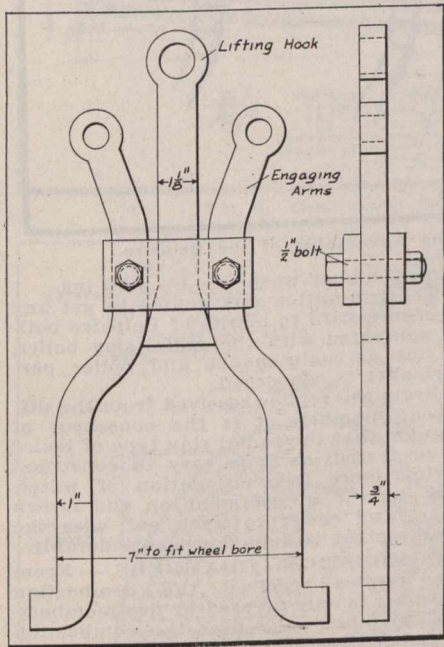
to the original bar. All this was performed in a single heat, and yet the forging was still sufficiently hot at the expiration of the reduction to shape to make possible a further reduction were this necessary. This demonstrates the dexterity of the operator, W. W. Shackford, foreman hammersmith, who personally handles all the heavier and more complicated pieces of forging. Not only must the work be done quickly to make production in one heat possible, every move telling, but great skill is also shown

in the manner in which the forging is kept down to such dimensions as to make the machining as light and as uniform as could reasonably be expected.

On the completion of the forging on the end of the bar, it was cut off and allowed to cool, no further forging on the rod being necessary. The forged rod at this stage weighed 800 lbs. The production of rods in this manner in a single heat, and close to the required dimensions, as the rod illustrated, is common practice with this company, and represents everyday work.

### Hook for Lifting Coach and Tender Wheel Centres at the C.P.R. Angus Shops.

The hook for lifting coach and tender wheel centres is an idea developed in the C.P.R. Angus shops, Montreal, where it is used in the tender department. In Canadian Railway and Marine World, for March last, the process of mounting and dismounting tires from the centres in this department of these shops was described, and if the process be recalled, it will be remembered that the steel centres



Hook for Lifting Coach and Tender Wheel Centres.

are placed flat on the floor and the heated tires slipped over them and allowed to cool in that position. In the placing of these centres in this manner on the floor, is where the hook device described herewith is employed.

The construction of the hook consists of two engaging arms, fulcrumed on bolts in two retaining distance pieces. Between these arms, and held in the same retaining pieces, there is a lifting hook, the lower end of which is tapered from the bottom upward so as to engage from the side arms when drawn up. The lower parts of the side or engaging arms have the sides so formed as to be parallel when inserted in the bore of the wheel centre the hook is designed to lift.

To use, the lifting hook is allowed to drop into its lowest position, and the upper part of the engaging arms swung outward, permitting the entry of these hook ends into the wheel centre bore. Then, by swinging the tops of the engaging arms together and pulling upward on the lifting hook, holds the hooks under the lower face of the wheel bore. The crane chain is attached to the lifting hook. The advantage of such a lifting device lies in the fact that the centres do not need to be raised by the flanges and flopped over into location, but are placed in the desired position by lifting from the flat.

### Birthdays of Transportation Men in September.

Many happy returns of the day to:—

G. W. Alexander, Local Treasurer, G.T.R. Western Lines, Detroit, Mich., born at Lightcliff, Yorks, Eng., Sept. 10, 1859.

H. Bailey, Bridge and Building Master, Dominion Atlantic Ry., Yarmouth, N.S., born at Huntsville, Ont., Sept. 2, 1879.

W. B. Bamford, Division Freight Agent, Atlantic Division, C.P.R., St. John, N.B., born at Belleville, Ont., Sept. 10, 1863.

W. D. Barclay, General Manager, Canadian Northern Quebec Ry., Quebec and Lake St. John Ry., Halifax and Southwestern Ry., and Inverness Ry. and Coal Co., Quebec, Que., born at Campbellton, N.B., Sept. 23, 1852.

G. T. Bell, Assistant Passenger Traffic Manager, G.T.R. and G.T.P.R., Montreal, born there, Sept. 7, 1861.

W. H. Biggar, K.C., General Counsel, G.T.R. and G.T.P.R., Montreal, born at the Carrying Place, near Trenton, Ont., Sept. 19, 1852.

E. R. Bremner, ex-Division Freight Agent, G.T.R., Ottawa Division, Ottawa, born at Toronto, Sept. 9, 1875.

M. H. Brown, Division Freight Agent, Ontario Division, C.P.R., Toronto, born at Victoria Square, Ont., Sept. 2, 1866.

W. G. Brownlee, ex-General Transportation Manager, G.T.R., Montreal, born at Lawrenceville, Ill., Sept. 9, 1858.

W. B. Bulling, ex-Assistant Freight Traffic Manager, C.P.R. Eastern Lines, Montreal, born there, Sept. 16, 1858.

C. F. Burns, Auditor of Disbursements, Intercolonial Ry., Moncton, N.B., born at Clements Port, N.S., Sept. 10, 1854.

A. D. Cartwright, Secretary, Board of Railway Commissioners, Ottawa, born at Kingston, Ont., Sept. 20, 1864.

A. W. Davis, Locomotive Foreman, G.T.R., Stratford, Ont., born at Sittingbourne, Kent, Eng., Sept. 5, 1864.

A. S. Dawson, M. Can. Soc. C.E., Chief Engineer, Department of Natural Resources, C.P.R., Calgary, Alta., born at Pictou, N.S., Sept. 6, 1871.

O. L. Dickeson, President, White Pass and Yukon Route, Vancouver, B.C., born at Ottumwa, Ia., Sept. 16, 1877.

W. E. Duperow, General Agent, Passenger Department, Grand Trunk Pacific Ry., Vancouver, B.C., born at Stratford, Ont., Sept. 4, 1872.

W. H. Estano, Traffic Auditor, Intercolonial Ry., Moncton, N.B., born at Halifax, N.S., Sept. 29, 1874.

C. B. Foster, General Passenger Agent, C.P.R. Western Lines, Revelstoke and east, Winnipeg, born at Kingston, N.B., Sept. 30, 1871.

J. P. Ferguson, representing Galena Signal Oil Co., Ottawa, Ont., born at Drummondville, Que., Sept. 12, 1856.

D. W. Hatch, Travelling Agent, Atchison, Topeka and Santa Fe Ry., Montreal, born at Bedford, Que., Sept. 1, 1841.

J. E. Hutcheson, General Manager, Montreal Tramways Co., Montreal, born at Brockville, Ont., Sept. 15, 1858.

W. H. Kelson, ex-General Storekeeper, C.P.R., Montreal, born at Bath, Eng., Sept. 5, 1850.

C. B. King, Manager, London St. Ry., London, Ont., born at Galena, Ind., Sept. 12, 1871.

R. E. Larmour, Division Freight Agent, British Columbia Division, C.P.R., Vancouver, born at Brantford, Ont., Sept. 26, 1868.

H. D. Lumsden, C.E., ex-Chief Engineer, National Transcontinental Ry., Ottawa, born at Belhaire, Scotland, Sept. 7, 1844.

F. J. Mahon, Superintendent Telegraphs, C.P.R. Eastern Division, Montreal, born there, Sept. 18, 1865.

R. E. Merkle, Trainmaster, District 3, Manitoba Division, C.P.R., Brandon, born at Ottawa, Sept. 3, 1882.

J. F. Mundle, City Freight Agent, C.P.R., Montreal, born at Prescott, Ont., Sept. 20, 1857.

M. B. Murphy, Superintendent, District 2, Central Division, Canadian Northern Ry., Winnipeg, born at Napa, Cal., Sept. 11, 1866.

B. S. Murray, Route Agent, Canadian Express Co., London, Ont., born at Glenwood, N.Y., Sept. 17, 1856.

J. Paul, District Freight Agent, Canadian Northern Ry., Winnipeg, born in Euphrasia tp., Grey Co., Ont., Sept. 13, 1858.

W. J. Pickrell, Master Mechanic, District 1, Ontario Division, C.P.R., West Toronto, born at London, Ont., Sept. 15, 1880.

C. S. Richardson, District Freight Agent, C.P.R., Buffalo, N.Y., born at New York City, Sept. 26, 1870.

W. D. Robb, Superintendent of Motive Power, G.T.R., Montreal, born at Longueuil, Que., Sept. 21, 1857.

W. H. Rosevear, ex-General Car Accountant, G.T.R., Montreal, born at Wadebridge, Cornwall, Eng., Sept. 26, 1837.

F. W. Sterling, Travelling Freight Agent, C.P.R., Vancouver, B.C., born at Thornbury, Ont., Sept. 14, 1881.

E. W. Taylor, General Freight Agent, Reid Newfoundland Co., St. John's, Nfld., born at Carbonear, Nfld., Sept. 8, 1870.

Sir William Whyte, Director, C.P.R., Winnipeg, born at Charleston, Scotland, Sept. 15, 1843.

H. A. Young, Traffic Manager, Canadian Lake Line, Toronto, born at Brooklyn, N.Y. Sept. 1, 1864.

### C.P.R. Station at Calgary.

The ground floor plan of the enlarged station at Calgary, Alta., shows a building with a total frontage of 514 ft., and a general width of 46 ft. In the centre there will be a general waiting room, 74 by 46 ft., with a vestibule on the street side along the whole 74 ft., from which there will be two stairways to the offices above. On the east side, immediately off the general waiting room, a corridor will run through to the baggage room, which will be 62 ft. long, and will have direct access to the street and to the track. On the street side of the corridor, leading out of the general waiting room will be the women's waiting room and retiring room; baggage-checking and baggage transfer offices and vaults, while on the track side, will be the smoking room, men's lavatories, room for trainmen, parcel office, and offices for the baggage master and customs officials.

The company's telegraph department offices are located in the recently built extension to the east wing. The west wing now under construction, which it is expected will be completed on October, has a frontage on the track of 226 1/2 ft. The ticket office immediately adjoins the general working room, and a corridor on the street side leads to a large luncheon room, pantry, etc. Beyond this is the express room, express office, and stairway to offices located on the first floor.

The central portion of the building was erected, but the eastern extension was then made, and the western extension is now being added. With the addition of this latter extension the central portion is being rearranged, so as to provide for the large general waiting-room. The entire building is of reinforced concrete with Calgary stone facing. Sharp and Co., Winnipeg, have the contract for the present addition.

The Canadian Northern Prairie Lands Co.'s sales during June amounted to 640 acres, realizing \$9,760, an average of \$15.25 an acre. To the end of June there remained unsold 69,240 acres.

# THE DESIGN AND CONSTRUCTION OF LOCOMOTIVE BOILERS.

## Report of American Railway Master Mechanics' Association's Committee.

Following is the report of the Standing Committee, of which D. R. MacBain, Superintendent, Motive Power, Chicago, Rock Island and Pacific Ry., was chairman, as presented at the association's convention at Atlantic City, N.J., recently:—

Your committee sent out a circular of inquiry to all the members of the association in regard to their experience and recommendations concerning construction of locomotive boilers. We received replies from 21 members, comprising a total of 22,900 locomotives, which is about one-third of the locomotives represented. The intention of the committee is to give the different members the benefit of the experience of the different roads.

**TYPE OF BOILER.**—In no case is a special type of boiler used for any special service. One of the members advises that they use Belpaire boilers of crown bar construction for road locomotives entirely on account of greater ease in maintaining staybolts. Another member advises that they use the Belpaire boiler as well as the radial stay boiler, and their experience with the Belpaire is that it reduces the number of staybolt breakages, which has been proved by the records of staybolt breakages. From the experience that they gained with Belpaire boilers they developed a system of cross-

few roads use it on narrow-type fireboxes. On the crown bar type of boiler it is found to be a hard matter to keep the crown bars free from mud, but in renewing fireboxes on this class of locomotive, beneficial results have been obtained by raising the crown bars and in-

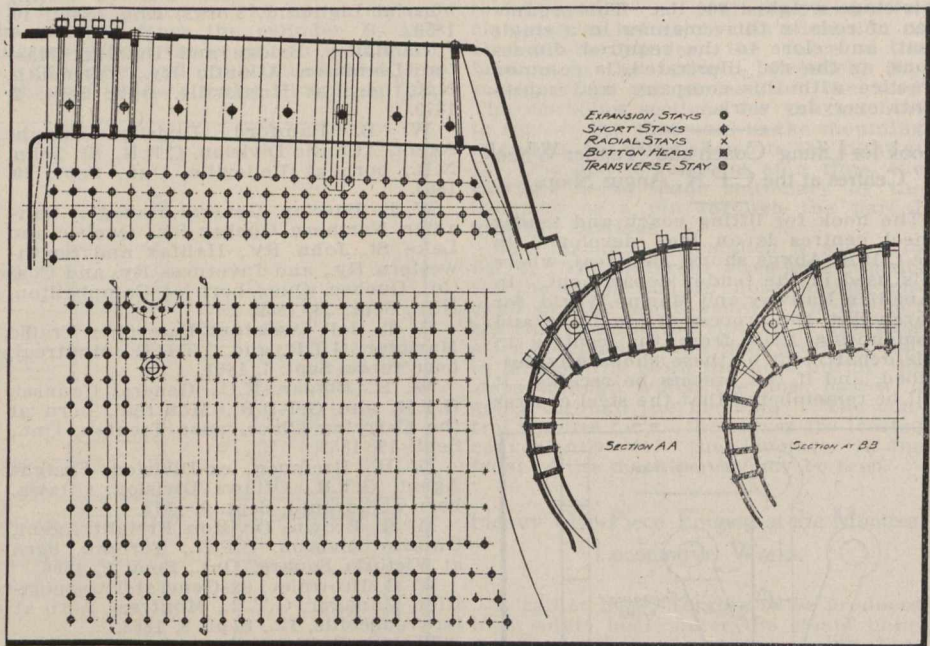


Fig. 1. Boiler Bracing Embodying Advantages of the Belpaire.

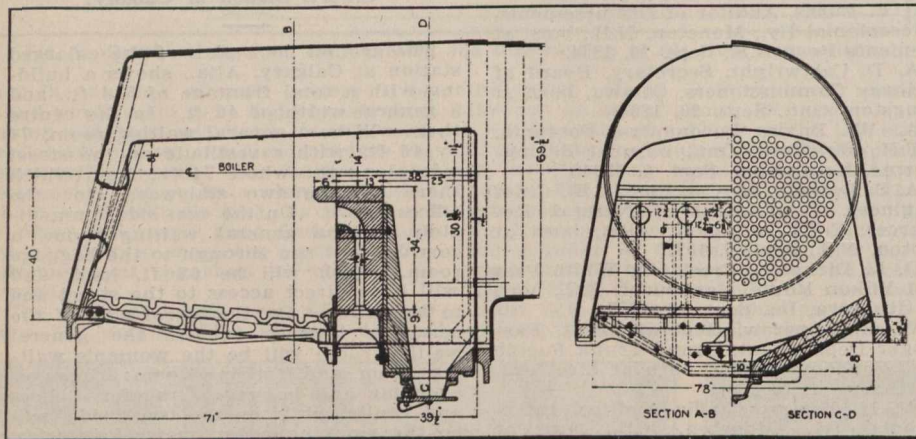


Fig. 2. Firebox Showing Great Economy in Fuel.

setting higher washers—1½ to 2 ins.

The committee was unable to get any data in regard to merits of Belpaire boiler compared with the radial stay boiler, as far as maintenance and boiler performance is concerned.

From the replies received from the different members it is the consensus of opinion that the radial stay type of boiler is preferred, as it is easy to construct, giving more free circulation of water, less deposit of sediment on the crown sheet and easier to wash out; also the dead weight is kept down considerably.

**COMBUSTION CHAMBERS.**—From the replies received the combustion chamber is only favored by five members. One member, who uses the combustion chamber covered by fig. 2, advises that it shows a great economy in fuel, a decrease in the amount of smoke, and cinders and increased mileage. No information was given in regard to mainten-

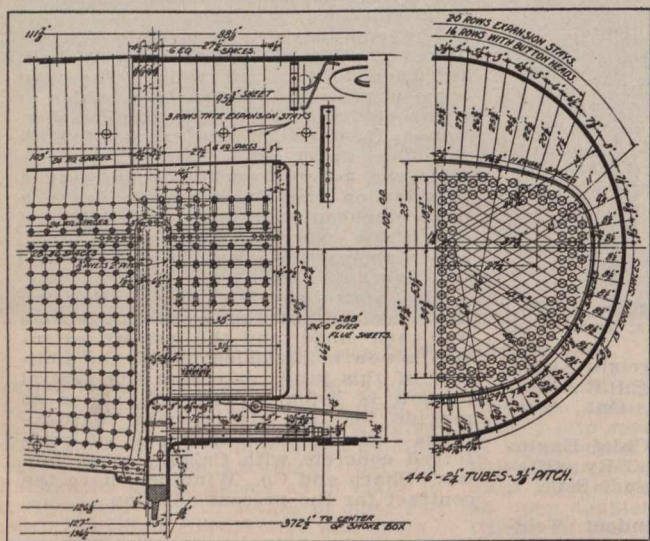


Fig. 3. Combustion Chamber with Low Maintenance Cost.

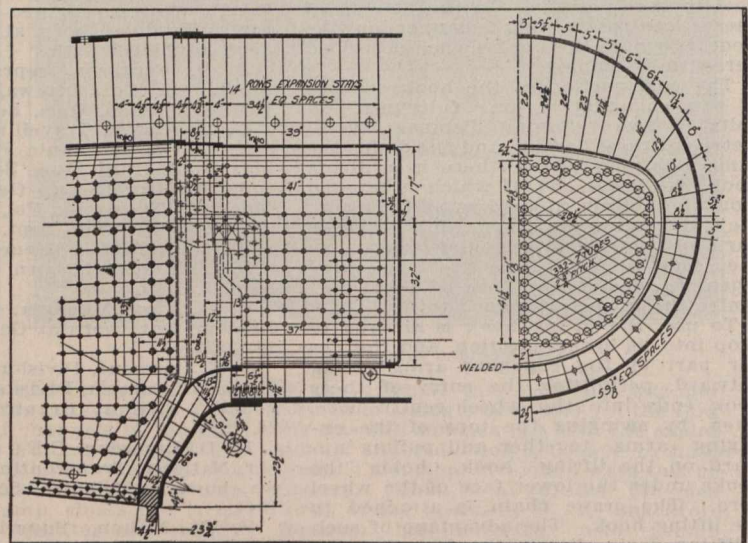


Fig. 6. Combustion Chamber Difficult to Maintain Tight Seams.

bracing, shown by fig. 1, which has practically all the advantages of the Belpaire staying, and in addition it reduces the

dead weight and is cheaper to construct. Crown bar construction is not used to any extent on wide firebox boilers, but a

ance. Another member advises that the reason they favor the combustion chamber in certain types of boilers, such as

Mallet, is that it keeps the tubes a reasonable length and increases the heating surface of firebox. No information was

moved on account of costing too much to maintain. The advantages claimed by the use of

Your committee feels that a combustion chamber is desirable on boilers with extra long flues, such as Mallet and M1-

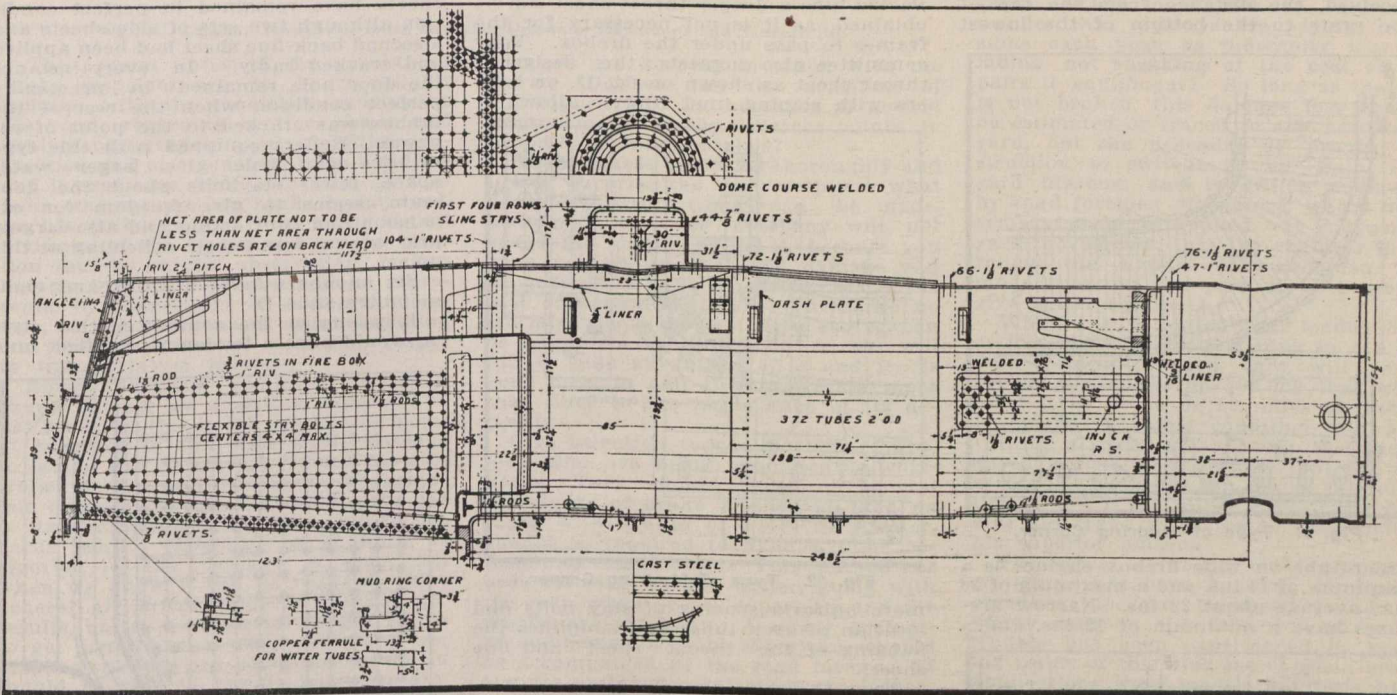


Fig. 4. Combustion Chamber, Anthracite Road, showing Good Combustion and Protection of Flues.

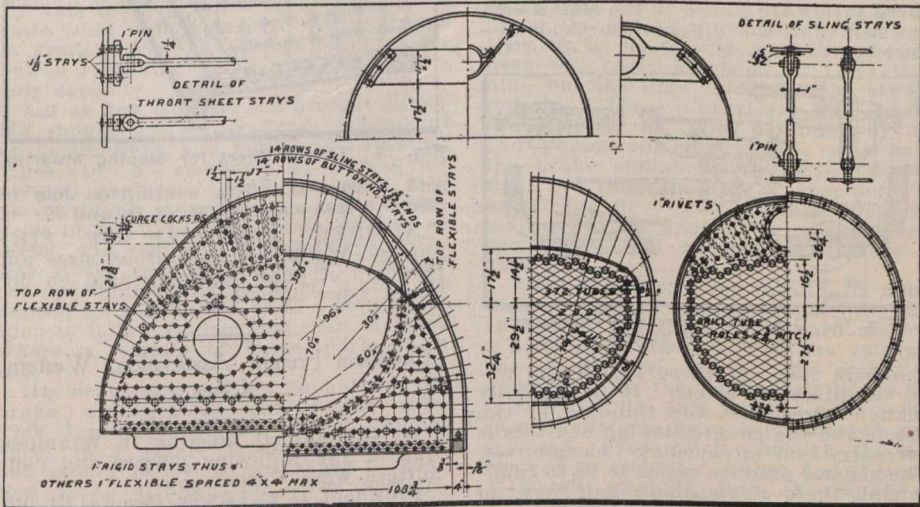


Fig. 5. Details of Anthracite Road Combustion Chamber.

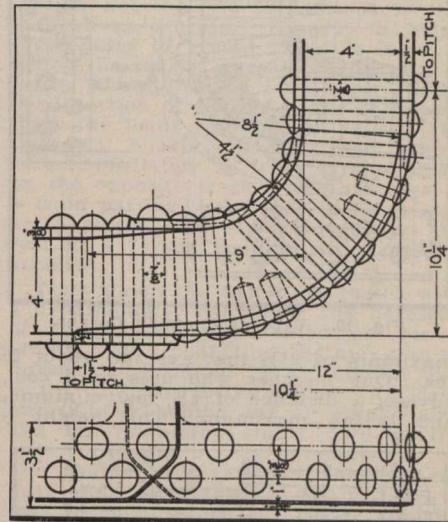


Fig. 8. Type of Mudring Corner.

have had all combustion chambers re-given as to the fuel economy derived from these combustion chambers, but a saving in maintenance and an improvement in performance is reported. The type of combustion chamber he uses is covered by fig. 3.

Another member reports being in favor of combustion chambers, but does not have them on all locomotives. This member was from an anthracite road and the particular claim was they thought they got better combustion and also derived a good deal of benefit in the way of protection of flues, particularly so, the boxes being extremely shallow below the flue sheet. Type of combustion chamber used by this member is shown in figs. 4 and 5.

Another member advises that they have had five passenger locomotives with combustion chambers, as shown in fig. 6, but considerable difficulty was experienced keeping the seams tight, and on account of this fact combustion chambers were removed when applying new fireboxes. This was the first development of the combustion chamber which has been materially improved since that time.

Another member advises that they

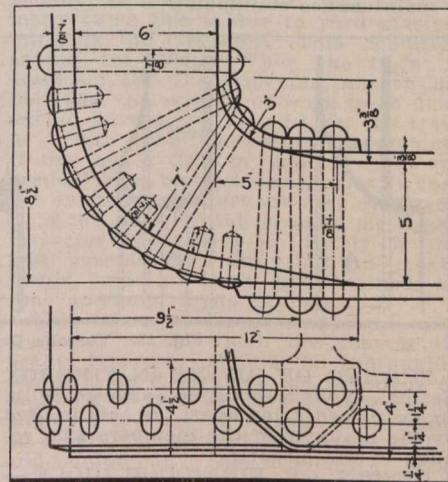


Fig. 7. Type of Mudring Corner.

combustion chamber are that it keeps the tubes within a reasonable length, protects the flue beads, increases the firebox heating surface and gives better combustion.

kados, but are not prepared to recommend any particular design.

**FIREBOX.**—Continuous crown and side sheets are favored by all of the members except one.

Therefore, the committee recommends the use of continuous crown and side sheet for new construction or with renewal of firebox.

**MUD-RING CORNERS.**—Type of mud-ring corners which have been giving good service are shown in figs. 7, 8, 9, 10, 11 and 12. One member advises that they use a cast iron plate held in place with a 3/4 in. bolt and a cast steel clamp, leakage prevented by a composition joint. No prints were attached to his reply and therefore cannot illustrate same.

Your committee recommends mud ring with large radius, as shown on any one of the illustrations and the flanges of the tube and door sheet should be carried back far enough to get at least three straight rivets through the ring. Scarf the inside sheets down to be properly fitted to the mud ring by heating the same. If the scarfing and the fitting of these sheets is given proper attention it will overcome leaky mudring corners

that some of the members are now experiencing considerable difficulty with.  
**THROAT SHEET.**—From the replies received, the distance from the top of the grate to the bottom of the lowest

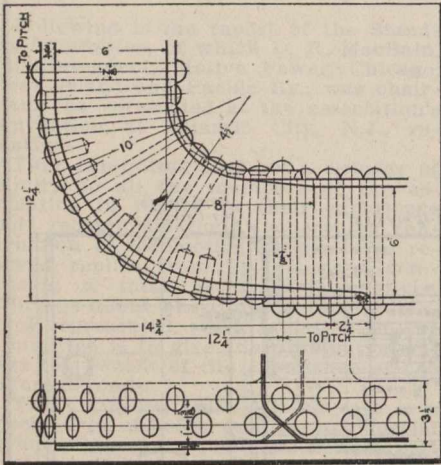


Fig. 9. Type of Mudring Corner.

boiler tube on wide firebox engines is a minimum of 14 ins. and a maximum of 26 ins., average about 22 ins. Narrow fireboxes have a minimum of 13 ins. and a

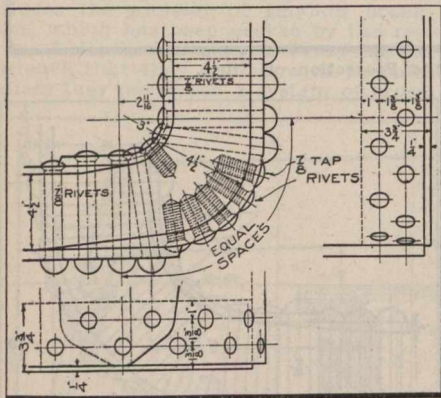


Fig. 10. Type of Mudring Corner.

maximum of 28 1/2 ins., average about 20 ins. One member who uses hard coal, advises a distance of 8 1/2 ins. minimum and 12 ins. maximum. This height is

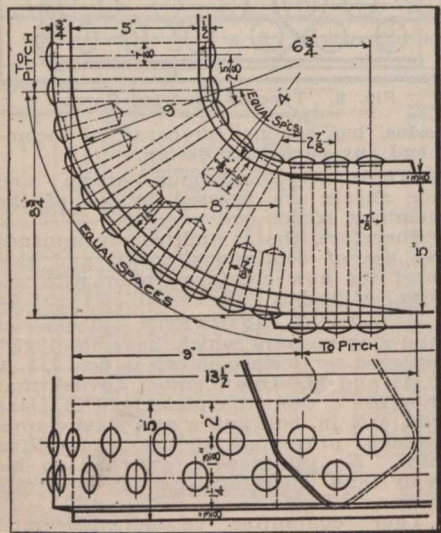


Fig. 11. Type of Mudring Corner.

limited due to the design of the locomotive.

Your committee recommends as deep a throat sheet as the design of the locomotive will permit. On consolidation locomotives the depth of the throat sheet is limited, due to the frame passing un-

der firebox and on account of rear driving wheel, which is located under firebox. On Atlantics, Mikados, Mallets and Pacific type a deeper throat sheet can be obtained, as it is not necessary for the frames to pass under the firebox. Your committee also suggests the design of throat sheet as shown on fig. 13, on boilers with sloping mud ring to allow for

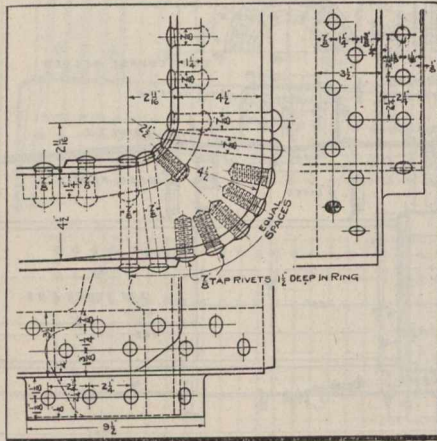


Fig. 12. Type of Mudring Corner.

more uniform spacing of stay bolts and location of arch tubes and simplifies the flanging of the throat sheet and flue sheet.

From the replies received in regard to thinning out of flue and door sheets, also the use of countersunk rivets where these sheets are joined to the side sheets, you will find the different methods followed out in fig. 14. About 50 % of the

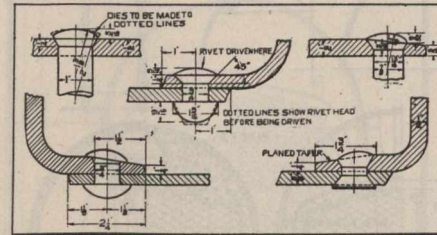


Fig. 14. Use of Countersunk Rivets at Juncture of Sheets.

members thin out these sheets and apply countersunk rivets. It is generally acknowledged that the thinning of the sheets and the countersinking of rivets is necessary on oil burning locomotives. The general practice seems to be to countersink these rivets about half way up the side sheets. No data were given in regard to which practice is the best from a maintenance standpoint.

with this type of fire door for a number of years. On boilers so equipped, they have had several cases where the door sheets have remained in perfect condition although two sets of side sheets and a second back-flue sheet had been applied and cracked badly. In every instance the door hole remained in practically perfect condition when the rest of the firebox was cracked to the point of renewal. Boilers equipped with this type of fire-door hole give larger water space, fewer staybolts about the door seam, seems to give freedom for expansion and contraction and also largely prevents mud and scale collecting at this point.

Six members favor style E, and eight members style D.

It seems to the committee that style A, would have a tendency to collect mud

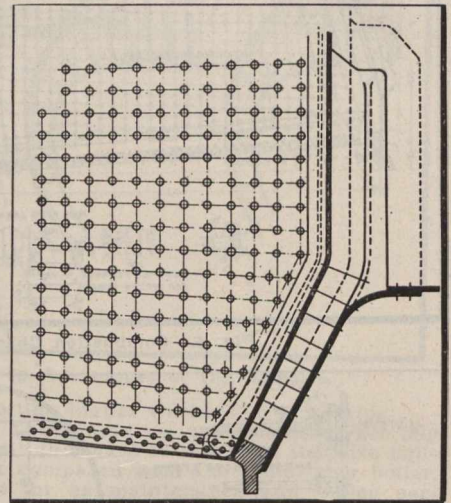


Fig. 13. Throat Sheet for Sloping Mudring.

and burn out. The committee has no choice between styles B. C. D. and E.

**NUMBER AND SIZE OF FIRE DOORS.**—We find that various sizes and numbers of door holes are used on different types of boilers.

Canadian Freight Association, Western Lines.

At the annual meeting in Winnipeg, Aug. 1, the following officers and committees were elected:—

President, C. E. Dewey, General Freight Agent, G. T. Pacific Ry.; Vice President, W. C. Bowles, General Freight Agent, C.P.R.

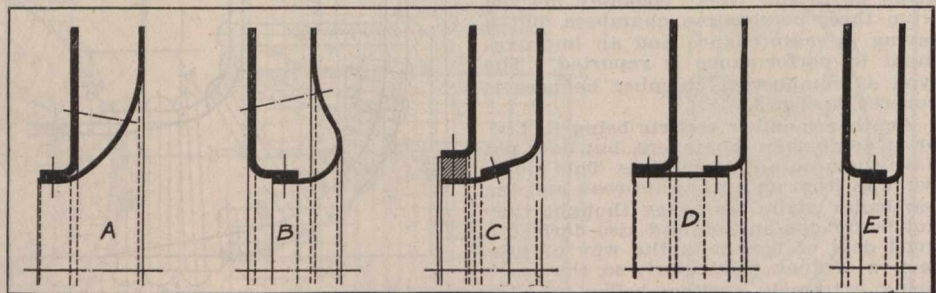


Fig. 15. Various Designs of Fire-door Holes.

**SPACING OF RIVETS IN FIREBOX Seams.**—Your committee suggests 3/4 in. rivets spaced 2 ins. apart, as this is used by the majority of the members who replied to the circular.

**DESIGN OF FIRE-DOOR HOLE.**—Fig. 15 shows various designs of fire-door holes used by different members. Three members advise that they use style A, which is the O'Connor type of fire door. One of the members reports that they have had 1,200 locomotives equipped

Executive Committee.—C. E. Dewey, W. C. Bowles, G. Stephen.

Car Service Committee.—A. Hatton, J. P. Driscoll, T. P. White, W. B. Harris.

Classification Committee.—W. B. Lanigan, G. Stephen, C. E. Dewey, W. G. Manders, R. J. Foreman, P. H. Burnham, W. C. Bowles.

Inspection Committee.—W. G. Manders, G. H. Smith, W. J. Hunter, P. H. Burnham.

## The Present and Future Duties of General Air Brake Inspectors.

By B. J. Langan, General Air Brake Inspector, Delaware, Lackawanna and Western Rd.

The present duties of the general air brake inspector are to be thoroughly familiar with the conditions existing on his road, regarding motive power and equipment, grades, yard facilities, inspection and maintenance, train handling and instructions, and, in fact, on all subjects wherein the air brake is involved. As his duties require him to be on all divisions of the system, he is in a position that by careful observation, he can become invaluable to the road he represents, by suggestions to better the service, as the questions of rough handling and inspection are of vital importance in transportation matters.

Rough handling in yard terminals should attract his attention, especially in flat yards, as this is the originating point of breaking in two, and where damage to lading can be traced. It can be controlled in hump yards by a check system on each car rider who rides the car to its destination in the yard, but in flat yards, where "kicking" or shunting is resorted to, the damage is appalling, when we know it can be reduced. The general air brake inspector cannot get results, unless he rides on freight trains to get conditions as they exist, and see that instructions are being followed. He should be able to handle trains in any class of service and give practical demonstrations when called upon to do so. By this method he is in a position to state what is necessary to control trains in grade work and the air facilities required regarding pump and main reservoir capacity.

Let us first consider his present duties. He should check the brake equipment on locomotives, and reduce the different types to a standard, by having air pumps, engineers' brake valves, feed valves, pump governors and main reservoirs of one type, if possible, and by so doing, will reduce engine failures, carry less stock, reduce cost of repairs, and the locomotive engineers on whom we depend for results will be in a better position to follow instructions than they are where a variety of these parts is in use.

His next consideration should be the brake arrangement on freight cars. This, I consider of the utmost importance, as a great amount of efficiency and money is lost by improper foundation brake arrangement. The application of air brakes to all freight equipment makes it essential that maintenance is the paramount issue to get the full value for which they were applied, and increase the factor of safety. When a locomotive is built, it is given a tonnage rating, and this is not reduced at any time. When this locomotive cannot pull its tonnage, the necessary repairs are made and it represents 100% until sent to the shop for repairs. How near 100% are our freight brakes maintained?

Do we get over our equipment by the cleaning process yearly? How many packing leathers are applied monthly or yearly? What is the angle of brake hangers on our equipment? Is it such that we get uniform wear on the brake shoe? What is the length of brake beam? Do the shoes overlap? On this alone he can save his salary. Have we an easy method of adjustment of piston travel so that inspectors will not neglect this important part of their duties? Have we a card system, and is it being given proper attention? Have we proper air facilities in yards? Are our inspection forces properly organized? This requires personal supervision. Are we supplying the different inspection points with material to maintain your brakes? Do we visit the inspection points on the system to show the men

that we are keeping in touch with the work? Do we call the attention of our superiors to the necessity of needed improvements at the different points, to properly maintain brakes?

Go into these questions thoroughly and it will surprise the most sceptical what an added improvement can be made. You may say our company will not spend the money. That is, because you have not shown that the damage can be reduced a greater amount than the cost of needed material. There are no officials, when shown that a saving can be made by a small expenditure, who will fail to take advantage of it and it is your duty to call their attention more than once to the importance of its necessity.

Give attention to qualification of firemen who are being promoted to engineers. They should have a general knowledge of brake mechanism, and on roads with grades of  $1\frac{1}{2}\%$  or greater, should be required to handle trains before final examination. This method has been followed by the writer, going with the men when occasion permits and the results are excellent. A newly promoted engineman without experience should be accompanied by the road foreman of engines or the general air brake inspector on his first trip, if possible. Instructions should be furnished him in pamphlet form for handling trains, or printed in the special rules on the back of time card. It is seldom that an engineer will carry his book of rules with him, but the time card must be always present. This is a great aid, and lessens the difficulty of train handling by old and young enginemen. We may have the brake equipment in perfect condition, but through lack of judgment or knowledge of proper manipulation on the part of the engineman, serious damage occurs, and our best efforts are in vain.

What does inspection mean? It is insurance against damage and a premium on safety. To the general yard master, a bone of contention. To the railway, one of its best assets. The word, as understood by the general air brake inspector, implies that when a train is inspected, defects have been located and repaired. How often, through the neglect of an inspector, do we find the cost of wrecks running into thousands of dollars, by failing to apply a cotter pin or split keys? Brake rigging down, caught switch point or frog, and in many cases this is due to yard masters hurrying the inspector. This condition should not exist. When the train is made up and the inspector puts on his blue flag, the amount of work to be done should govern the time to put the train in a safe condition before dispatching. If too long a time is required and congestion takes place, it shows clearly that not enough inspectors are employed, and it is the duty of the general air brake inspector to remedy it. Safety is the first consideration in all train movements, and can only be obtained by time and men to do the work.

This takes us to an important subject, and one in which the general air brake inspector should be thoroughly familiar, as it involves the questions of breaking in two, which are made prominent on account of detentions to trains of superior class, and damage to lading and equipment. The originating point of these breaks is in yard terminals, and any operating official can be convinced of this by remaining in a yard one day, flat yards, where cars are "kicked," being most conspicuous. When we consider that the draft gear in 90% of the cars in service will only absorb a shock

of 40,000 to 60,000 lbs., and a loaded car kicked or shunted against a number of cars at a speed of 5 m.p.h. will develop 300,000 to 500,000 lbs., is it any wonder that railways are paying large sums each year as indemnity loss on lading, not speaking of the cost of repairs to equipment? So long as the car is not broken, this damage loss cannot be estimated or traced to any particular yard, but the necessity of proper instruction to switchmen by train and yard masters, and to switch engineers by road foremen of engines, would be a remedy properly applied. It is true, in yard movements, that the engineer must follow the signals of switchmen, but moderation on the part of both would give better results.

While I have stated that loaded cars at five miles an hour coming in contact with a train of such cars, will cause shocks of 300,000 to 500,000 lbs., what must it be at 10 or 12 miles an hour? It means that this condition will prevail to a great extent, and the necessity of a friction draft gear that will absorb 250,000 to 300,000 lbs. is the question, and it is the future duty of the general air brake inspector to keep before his superior officers.

The logical method of making up mixed trains has been to keep all loaded cars next to the locomotive, and all empty cars on the rear, but so much trouble has been experienced in keeping trains of this kind intact when brake applications were made, that tests have proven they can be handled successfully by deviating from this practice. Loads should not be placed indiscriminately throughout a train. I have in mind three cases of recent date, in one of which the consist was 55 empty cars, 17 loads, 15 empties. A hose burst on the head portion of the train, and the shock from the loads running in caused the train to buckle, throwing the empty cars immediately in front of the loads, on the opposite track. Another case of a train parting with loads in three separate places, and seven loads on the rear of a 75 car train caused a similar accident.

Tests which the writer conducted with a dynamometer car, show the necessity of changing the old method and prove, after a year's trial, that the make-up of mixed trains should be as follows: Ten empty cars next to the engine. All loads immediately behind the 10 empty cars, and the remaining empty cars on the rear. The number of empty cars on rear should be in excess of those on the head end. Regardless of the number of cars in such trains, the empty cars on front portion should not exceed 10, and this to avoid such accidents as quoted, to prevent buckling. On one division of the D.L. and W.R., where this practice has been followed, there is no complaint of breaking in two, and conductors and engineers will tell you it is the only way to handle them successfully.

Breaking in two occurs on trains of all loads and all empties, but when a condition exists where engineers are afraid to use the automatic brake, it should be remedied at once. Superintendents and yard masters may object on the ground that it requires too much switching—it requires not more than two switch movements, and a trial will convince that it is worth the effort. There is nothing in railway work that cannot be done when a question of safety is involved—the saving of equipment and probably loss of life must be considered.

With a train of 25 loads and 50 empty cars, there is eight times greater retarding force on the empties than on the loads. By transferring 10 empty cars next to the locomotive, this ratio is changed less than  $2\frac{1}{2}\%$ , as you have taken 20% from behind the loads and added it to that of the loads. In case of train parting by accident or other-





17044. July 16.—Authorizing C.N. Quebec Ry. to cross seven highways in Two Mountains and Terrebonne counties.
17045. July 17.—Authorizing C.N. Ontario Ry. to construct across Nichols Creek, Marlborough tp., Ont.
- 17046 to 17048. July 17.—Approving Canadian Northern Ry. revised location, mileage 206.95 in Saskatchewan to 280.62 in Alberta.
17049. July 17.—Authorizing C.N. Ontario Ry. to build across two highways in Bristol tp., Que.
17050. July 17.—Authorizing Canadian Northern Ry. to build its Alsask Southeastery line across 10 highways.
17051. July 17.—Approving revised location of Algoma Central and Hudson Bay Ry. between mileage 82.38 and 123.53 northerly from Hobon, Ont.
17052. July 17.—Relieving Vancouver, Victoria and Eastern Ry. (G.N.R.) from erecting and maintaining fences on portion of its line between Keremeos and Princeton, B.C.
17053. July 17.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.), to cross highways from mileage 128.09 to 131.23 Hope, tp., Ont.
17054. July 17.—Authorizing Atlantic, Quebec and Western Ry. to open for traffic its line between Grand River station, mileage 51½ and Gaspé station, mileage 102½, Que.
17055. July 17.—Naming express delivery and collection limits for Estevan, Sask.
17056. July 16.—Authorizing C.P.R. to build spur for Saskatoon Tent and Mattress Co., Saskatoon, Sask.
17057. July 17.—Authorizing Canadian Northern Ry. to cross nine highways on its Alsask Southeastery line.
17058. July 17.—Authorizing James Bay and Eastern Ry. (C.N.R.) to build bridge across Salmon River, mileage 22.1.
17059. July 17.—Authorizing Vancouver-Victoria and Eastern Ry. (G.N.R.), to open for traffic its line from Abbotsford to Kilgard, B.C.
17060. July 17.—Authorizing C.P.R. to build spur for Winnipeg Supply Co., Winnipeg.
17061. July 19.—Authorizing C.P.R. to revise grade of main line and build additional main line track from mileage 17.35, Farnham subdivision to Iberville Jct., thence to mileage 41.8 Highlands, Que.
17062. July 18.—Authorizing C.P.R. to build spur for Roofers Supply Co., Toronto.
17063. July 18.—Authorizing C.N. Quebec Ry. to cross public road in St. Eustache parish.
17064. July 5. Re interswitching by G.T.R. in Galt, Preston, Hespeler, Berlin and Waterloo, Ont. This order is given in full on another page.
17065. July 15.—Authorizing C.N. Ontario Ry. to cross Jacques Cartier and Union Ry. (G.T.R.), near Jacques Cartier Jct., Que., interlocker to be installed.
17066. July 20.—Apportioning cost of work, etc., re C.N.R. and G.T.P.R. spur for Tuxedo Park Co., Winnipeg, Man.
17067. July 17.—Authorizing Canadian Northern Ry. to cross public road on its Alsask Southeastery line.
17068. July 19.—Authorizing G.T.R. to build certain bridges on its Holmedale branch, Brantford, Ont.
17069. July 19.—Ordering G.T.R. to file within 15 days, plan of location of station proposed at level crossing of Quebec, Montreal, and Southern Ry., at St. Gregoire; that St. Gregoire be established as regulation station with telegraph communication between Doucets Landing and Victoriaville; and that Q.M. and S.R. build platform for transfer of passengers.
- 17070, 17071. July 15.—Approving proposed change of C.P.R. station at Bredenbury, Sask., and change in location of C.P.R. station at Merritt, B.C.
17072. July 20.—Ordering C.P.R. to maintain permanent watchman, day and night, at crossing at mileage 101.6 Boundary subdivision, near Fisherman, B.C.
17073. July 19.—Authorizing Toronto Eastern Ry. to cross public road on con. 2, between Pickering and Whitby tps.
17074. July 19.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.), to build bridges 180.2 and 180.13, at Little Rouge and Big Rouge Rivers, Ont.
17075. July 19.—Authorizing C.P.R. to build spur for Provincial Reformatory, lot 3, con. 1, Guelph tp., Ont.
- 17076, 17077. July 19.—Approving C.P.R. proposed shortening of track circuit in connection with crossing bells at Argyle St., Renfrew, Ont., and interlocking and signal device to be used in operating over the Lachine canal.
17078. July 19.—Authorizing C.N. Ontario Ry. to cross public road between cons. 16 and 17, Ferris tp.
17079. July 19.—Approving C.N. Ontario Ry. station grounds at Smiths Falls, subject to agreement of June 3, 1911, with the town.
17080. July 20.—Authorizing C.N. Ontario Ry. to cross G.T.R. near Davenport Road, Toronto, question of taking of lands left to Chief Engineer of Board.
17081. July 20.—Ordering G.T. Pacific Ry. to repair approaches to crossing on D. McKenzie's property, Kirk, Alta., within 30 days under penalty of \$25 a day.
17082. July 20.—Authorizing Lachine, Jacques Cartier and Maisonneuve Ry. (G.T.R.), to take lands 597 ft. by 100 ft. wide, of Montreal Park and Island Ry. in St. Laurent parish, Montr. al.
- 17083, 17084. July 22.—Approving C.P.R. plans for steel trestle of bridge 26.8, Suffield-Kipp subdivision, and authorizing it to rebuild bridge 109.4, Muskoka subdivision.
17085. July 22.—Authorizing G.T.R. to build spur for New Burford Canning Co. Brant county, Ont.
17086. July 22.—Approving G.T. Pacific Branch Lines Co.'s proposed station and site at Edwin, Sask.
17087. July 20.—Ordering Dominion Atlantic Ry. to install gates at Gerrish St., Windsor, N.S., 20% to be paid from railway grade crossing fund.
17088. July 23.—Dismissing application of Board of Trade, Pelly, Sask., re delay to shipments of freight by Canadian Northern Ry.
17089. July 22.—Ordering C.N.R. within 10 days to file plan for station at Fort Frances, Ont.
17090. July 22.—Authorizing Toronto Suburban Ry. to cross under C.P.R. in Vaughan tp., Ont.
17091. July 22.—Authorizing C.N. Ontario Ry. to build across Wistiwasung river, Chisholm tp.
17092. July 22.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.), to cross G.T.R. at mileage 163.46 from Glen Tay, interlocker to be installed.
17093. July 22.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.), to build bridge 170.57 over Duffins Creek, Ont.
17094. July 22.—Approving location of Georgian Bay and Seaboard Ry. (C.P.R.), station on lot 18, con. 9, Cartwright tp., Ont.
17095. July 23.—Approving Campbellford, Lake Ontario and Western Ry. (C.P.R.), revised location from mileage 63.59 to 68.50 and from mileage 70.25 to 72.44.
17096. July 23.—Authorizing C.P.R. to build bridge over Wyandotte St., Windsor, Ont.
17097. July 22.—Authorizing C.P.R. to build spur for Twohy Bros., on its Thompson subdivision, near Kamloops, B.C.
17098. July 23.—Authorizing C.P.R. to build spur across Avenue E. for Western Foundry and Machine Co., on lots 9 and 31, and lane between, Saskatoon, Sask., and rescinding order 16581, May 23 in same connection.
17099. July 22.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.), to build across highways from mileage 141.26 to 154.3, Durham county, Ont.
17100. July 23.—Authorizing Canadian Northern Ry. to build across certain highways on its Strathcona-Calgary extension, Alta.
17101. July 23.—Approving of the location of the Canadian Northern Montreal Tunnel and Terminal Co. station and track layout, Montreal.
17102. July 23.—Authorizing Central Ry. of Canada to build across certain highways near McAlpine, Ont.
17103. July 23.—Approving Kettle Valley Ry. location, between mileage 40 and 57.4, west of Hydraulic Summit, B.C.
17104. July 23.—Authorizing C.P.R. to open for traffic portion of its second track, mileage 114.54 to 119.06, Kenora subdivision.
17105. July 22.—Approving location of Campbellford, Lake Ontario and Western Ry. (C.P.R.), from mileage 160.86 to 161; 165 to 174, and 176 to 177.30, all from Glen Tay, Ont.
17106. July 22.—Authorizing C.P.R. to build additional track across public road at lot 30, con. 7, Spencerville, Ont.
17107. July 22.—Authorizing Michigan Central Rd. to build spur for Shredded Wheat Co., Niagara Falls, Ont.
17108. July 25.—Approving location of Erie, London and Tillsonburg Ry., from mileage 1, near Port Burwell, mileage 13.6 at Aylmer, Ont.
17109. July 24.—Authorizing C.P.R. to rebuild bridge 100.6, Sherbrooke subdivision, Que.
17110. July 25.—Authorizing C.P.R. to build two private crossings opposite Granville St., and opposite Burrard St., Vancouver, B.C.
17111. July 24.—Authorizing C.P.R. to build two additional sidings on lots 10 and 11, con. 1; and across Glasgow St., London, tp.
17112. July 24.—Authorizing G.T.R. to rebuild bridges 203 at mileage 151.05 20th district, Northern Division, and 49, at mileage 95.80, 15th District, Middle Division.
17113. July 23.—Authorizing Canadian Northern Montreal Tunnel and Terminal Co. to cross C.P.R. by carrying same overhead, Montreal, and to cross C.P.R. near Outremont Yard, Montreal.
- 17114 to 17116. July 23, 25.—Authorizing C.P.R. to build spurs for McGillivray Coal and Coke Co., Coleman, Alta.; Buell & Co., Cochrane, Alta., and two spurs for Alberta Ice Co., Keith, Alta.
17117. July 23.—Authorizing C.P.R. to cross public road between sec. 31-51-24 and sec. 6-52-24, w. 4 m., on its Strathcona-Calgary extension, Alta.
17118. July 24.—Authorizing C.N. Ontario Ry. to cross public road between lots 30 and 31, con. 1, Nepean tp.
17119. July 22.—Ordering that stop over privileges granted to British Canadian Cannery, Ltd., by railways operating from the Peninsula westward, in Ontario, be granted them at two points east of Toronto, viz., Bowmanville and Cobourg.
17120. July 19.—Approving and authorizing G.T. Pacific Branch Lines Co. station grounds on Tofield-Calgary branch between tps. 42.21 and 41-21, w. 4 m.
17121. July 27.—Authorizing C.N. Ontario Ry. to cross public road between lots 84 and 85, Ste. Dorothee parish, Que.
17122. July 29.—Dismissing application of C.P.R. for authority to build its Asquith to Conquest branch, across G.T. Pacific Ry. in sec. 20-26-6, w. 3 m., Sask.
17123. July 30.—Dismissing application of town of Forward, Sask., to order C.P.R. to furnish station, telegraph service, etc.
17124. July 24.—Approving G.T. Pacific Branch Lines Co., station and site at Dinant, Alta.
17125. July 29.—Dismissing application of C. M. Kelly, Edmonton, Alta., in relation to the diversion of Fort Saskatchewan Trail, and crossing of G.T. Pacific Ry. over same.
17126. July 29.—Dismissing G.T. Pacific Ry. application for leave to appeal to the Supreme Court from order 16700, authorizing crossing of the G.T.P. Ry. at Spruce St., Edmonton, Alta.
17127. July 29.—Dismissing petition of residents of Resplendent, B.C., alleging that supplies carried on G.T. Pacific Ry. in that district for contractors' use have been sold in competition to private dealers.
17128. July 29.—Authorizing C.P.R. to remove spur connecting lot 23, part of block 1, lot 1, St. John parish, Winnipeg.
17129. July 29.—Ordering Canadian Northern Ry., on or before Sept. 1, to build farm crossing on A. Meunier's farm on s.e. ¼ sec. 16-24 w. 4 m., Alta.
17130. July 29.—Ordering G. T. Pacific Ry. on or before Sept. 1, to survey and convey to city of Edmonton, Alta., a lane 20 ft. wide in lieu of lane blocked by company's construction.
17131. July 29.—Ordering Canadian Northern Ry. to fence portion of its right of way from Saskatoon to northern limits of rural municipality 344, to be completed on or before Nov. 1.
17132. July 29.—Ordering Hamilton Radial Ry. to make gravel crossings at suitable point for accommodation of each house on its track south of canal, Burlington Beach, Ont., wherever such a crossing does not already exist, within 30 days.
- 17133 to 17136. July 30.—Approving agreements between Bell Telephone Co., and East Middlesex Telephone Co., Byron Telephone Co., North Colchester tp., and Brook tp., Ont. for interchange of service.
17137. July 31.—Approving of location of Edmonton, Dunvegan and British Columbia Ry., mileage 29.783 to 68.30 and authorizing it to cross highways.
17138. July 31.—Approving agreement between Bell Telephone Co., and Rochester tp., Ont., for interchange of service.
17139. July 26.—Approving proposed change in location of C.P.R. station building at St. Hermanas, Que.
17140. July 30.—Authorizing Canadian Northern Montreal Tunnel and Terminal Co. to cross Cote de Liesse Road, St. Laurent parish, Que.
17141. July 26.—Approving G.T. Pacific Ry. revision of grade at Tete Jaune Cache, between mileage 179 and 180, Wolf Creek, west, B.C.
17142. July 26.—Authorizing G.T.R. to build spur for A. Knibb and Son, on lot 3, con. 3, Machar tp., Ont.
17143. July 25.—Authorizing G.T. Pacific Branch Lines Co., to operate trains over crossing of its Melville-Regina branch with Canadian Northern Ry. Prince Albert branch, at Regina, without stopping.
17144. July 25.—Authorizing G.T. Pacific Branch Lines Co., to cross and divert highways at mileage 108.9 and 109.2 in sec. 24-48-26, w. 2 m., Sask.
- 17145 to 17147. July 31.—Approving agreements between Bell Telephone Co., and Osprey, tps.; and West Tilbury tp., Ont., and Nelson Telephone Co., for interchange of service.
17148. July 26.—Authorizing C. N. Ontario Ry. to cross township road at station 3167.84, and to divert highway between mileage 268.68 and 269.23, Crerar tp.
17149. July 25.—Authorizing Edmonton, Dunvegan and British Columbia Ry. to cross

Canadian Northern Ry. at grade in sec. 35-55-25, w. 4 m., just south of Morinville, Alta., interlocking plant to be installed.

17150. Aug. 1.—Authorizing C.N. Ontario Ry. to cross Levease river and C.P.R. at mile-age 224.2 from Ottawa.

17151. July 31.—Authorizing C.N. Ontario Ry. to build spur for Central Ry. of Canada, at McAlpine station, Ont.

17152. July 31.—Authorizing C.P.R. to build bridge over Thames river at Ingersoll, Ont., to carry siding for Stone Fertilizer Co.

17153. July 31.—Authorizing Canadian Northern Ry. to build spur through block 3, Hudson's Bay Reserve, Edmonton, to serve lots 164-168 and 209-211, and to cross Athabasca Ave.

17154. July 31.—Authorizing C.N. Ontario Ry. to cross public road between lots 6 and 7, con. 1, Gibbons tp.,

### Grand Trunk Railway Betterments, Construction, Etc.

**Central Vermont Ry.**—The Public Service Commission of Vermont has approved of the company's plans for a new union station with the Rutland Rd., at Burlington, Vt., and other improvements, in preference to those submitted by the latter company. The C.V.R. plans provide for the separation of grades and for track elevation.

**Quebec Freight Sheds, Etc.**—Application was made to the Quebec Harbor Commission, Aug. 8, by the company for space to enable it to build new freight sheds in place of the present premises by the riverside. The Commissioners are negotiating with the city council with a view of acquiring certain areas, so as to be able to grant the company all the land between St. Andrew and St. James St., south of Prince of Wales St.

**St. Lambert Yards, Etc.**—Montreal press reports, Aug. 14, state that preparations are being made for the immediate erection of a 40 stall locomotive house on the south shore, about 1.5 miles from St. Lambert station.

We are officially advised that a contract has been let to the John S. Metcalf Co., Montreal, for the erection of a 27-stall locomotive house, together with turntable pit, machine shop, water supply system and accessories. The locomotive house will be of concrete and brick construction with wooden posts and roof.

**Prescott, Ont.**—An agreement has been signed under which the G.T.R. will within two years lay out large yards and build thereon a locomotive house and other terminal facilities, at a cost of \$150,000, in consideration of a fixed assessment of \$16,000 a year, and the building of a subway by the town. The laying out of these terminal buildings will necessitate the closing of those at Brockville, and it was stated in Montreal, Aug. 7, that the object in view is the equalizing of the divisions. The distance from Montreal to Brockville is 125 miles, and from Brockville to Belleville 95 miles, while Prescott is almost equidistant from Montreal and Belleville.

We are officially advised that the work to be done at Prescott will consist of the laying out of a terminal yard, with roundhouse, and the other necessary buildings and facilities.

**South Parkdale Station.**—The Toronto city council is selling 13,344 sq. ft. of land at Sunnyside for the erection of a station to take the place of the old one known as North Parkdale. H. R. Safford, Chief Engineer, is reported as stating that the plans for the new station have been approved, that work on it will be started at once, and that it will be completed this year.

**Port Burwell to London.**—There is every indication that the charter of the Erie, London and Tillsonburg Ry. has been acquired from J. H. Teall by the G.T.R. The notices calling a meeting of shareholders for Sept. 9, at Tillsonburg, Ont., is signed "Frank Scott" instead of "J. H. Teall" as formerly. Mr. Scott is Treasurer of the G.T.R.

Approval of the plans for the line from

Port Burwell to Aylmer is being asked. Construction is to be gone on with this year, according to a statement made by Mayor Graham, of London, Ont., who added that the G.T.R. is desirous of obtaining a lease of the London and Port Stanley Ry. E. J. Chamberlin, President G.T.R., while in London, Aug. 8, advised the mayor to abandon the idea of electrifying that line, and to lease it to a steam road. It is reported locally that if an agreement to lease the line to the G.T.R. can be arrived at, the line from Port Burwell will be extended from Aylmer to St. Thomas and connected there with the L. and P. S. Ry. (Aug. pg. 415. See Erie, London and Tillsonburg Ry.)

### The Fraser River Bridge.

The British Columbia Government's bridge over the Fraser River at New Westminster, an illustration of which is given on this page, and which cost about \$1,000,000, is a very interesting structure. It is 11,985 ft. long including approaches, and is double decked, the lower road being utilized for railways, and the upper for pedestrian and vehicular traffic. It is built on 17 piers, 11 pedestals and 3 abutments, with a centre span opening for the passage of vessels; the pivot pier of the swing span is carried 90 ft. into the river bed; the deepest pier is 141 ft. below high water mark—made up of 69 ft. below the bed of the Fraser and a volume of water 72 ft. in depth. The power for opening the swing bridge is supplied by the B.C. Electric Ry. Co. The lower part of the bridge is being used by the Great Northern Ry. and by the B.C.

### Notes on Locomotive Building.

By H. H. Vaughan, Assistant to the Vice President, Canadian Pacific Ry.

While, no doubt, men engaged in operating railway shops are entirely competent to construct new locomotives, there is no question that to do so economically would necessitate a more extensive and systematic supervision than is necessary for straight repair work. No doubt the system thus involved would be a good thing for the shop, but at the same time it is not economical unless the work is sufficient to justify its being occupied.

The tools used in locomotive building can, no doubt, be advantageously employed in repair work, except in the case of special tools which cannot be sufficiently employed in repair work to justify their installation, but could be used to a sufficient extent in building locomotives to expect them to assist in reducing the cost of the locomotive repair output. All the machine tools employed in locomotive building are in addition to those used for turning out a given number of repairs and must be regarded as an additional investment.

The size of shop necessary to accommodate these tools, blacksmith shop, foundry, and other equipment required to construct new locomotives is all, practically speaking, in addition to that required for a repair output. It is therefore entirely unreasonable for a road to consider that because it can turn out locomotives at a cost less than it can obtain them from the builders that it can neglect the additional investment. There are many cases where locomotives have



The British Columbia Government Bridge over the Fraser River.

Electric Ry. Co. on an annual rental basis. The transmission lines for supplying power for the operation of the B.C. Electric Ry.'s Fraser Valley branch are carried over the bridge on towers at a height of 165 ft. above high water.

The Consolidated Engineering Co., Ltd., has been incorporated under the Dominion Companies Act, with \$100,000 capital, and office at Montreal, to carry on a general railway and other construction business. The incorporators are: S. G. Dixon, J. M. Montle, R. E. Allan, V. and C. T. Jette, Montreal.

been turned out without adding anything like a sufficient amount to the actual cost of material and applied labor to cover the necessary expenses in connection with the operation of the plant, to say nothing of the interest and depreciation on the investment involved. Such items as repairs to tools and machinery, maintenance of buildings, supervision, drawing office expenses and a number of charges which have to be taken care of by every concern, are ignored in the case of railways building their own locomotives.

I do not believe there is a railway shop

in the country which constructs a new locomotive with as low a net cost of labor as any of the large building concerns do. It is true that even if expenses are evenly pro-rated, they may show a saving which is part of the profit obtained by the locomotive builder. This profit is, however, expended by the builder in keeping his plant up to date or spending dividends on the moneys invested in his plants so that when all is said and done the saving on the part of the railway company is comparatively small if looked at from a broad point of view.

I do not see why standards cannot be just as well obtained when locomotives are purchased as when they are constructed by a road itself. The question of design is not affected by purchasing or building, but when locomotives are arranged for without regard to maintaining a standard class of power, it is therefore no wonder that some roads get so many diversities of equipment. The standardization obtained in England is not so much on account of a road building its own locomotives, but on account of the large amount of responsibility placed on the locomotive department in the designing of its power and the permanence of the locomotive policy on the roads, not disturbed with each new general manager, but allowed to take its course and progress in a systematic way. There are some American roads which have followed similar methods and they have obtained standardization.—Railway Master Mechanic.

### Operation of the N.T.R. Superior Junction-Winnipeg Section.

The question of the taking over of the Superior Jct.-Winnipeg section of the National Transcontinental Ry. has been under discussion for some time. At present the line is being operated by the Grand Trunk Pacific Ry. under a special agreement with the Dominion Government, which the company wants renewed. An order-in-council was signed July 27 in which it is recited that the portion of the railway comprising the section for which J. D. McArthur had the contract, and 11 miles of the O'Brien McDougall contract, and extending from Transcona to Superior Jct., "being now completed to the satisfaction of the Commissioners, the Minister recommends that in the event of the G. T. Pacific Ry. not exercising within 30 days from Aug. 12, 1912, its right to take a lease of said portion of the railway under the provision of clause 3 of the statutory agreement of Feb. 18, 1904, the Commissioners be authorized to make such arrangements as they may think best for the further operation of the said portion."

An official statement was made Aug. 7, by E. J. Chamberlin, president G. T. P. Ry., in which he said: "The G.T.P. Ry. has been operating that piece of line since Aug. 1, 1911, handling all of last season's grain business and other traffic offered over that line without any detriment to the public. The Government is now asking that the G.T.P. Ry. execute a permanent lease of that portion of the line between Winnipeg and Lake Superior Jct., known as district F and negotiations are pending between the government and the company on that point, but do not, so far as a matter of accommodation, in any way affect the public. The contract between the government and the G.T.P. Ry. relative to the National Transcontinental Ry., that section between Moncton and Winnipeg, which was to be constructed by the government and is known as the eastern division, provides that:—

"Pending the completion of the eastern division by the Government the company shall be entitled to lease from the Commissioners to be appointed under the said act, and to operate such portions of

the eastern division as may from time to time be completed, upon such terms, etc., but does not bind the railway company to take over any sections unless they desire to do so, until the entire line is completed.

"Negotiations are in progress between the Government and the company relative to a further lease of the section above referred to when it is fully completed and pending the completion of the whole line. Notwithstanding reports in the papers throughout the country, that portion of the Transcontinental line is not yet completed. There is considerable work to be performed on the entrance into Winnipeg, connecting up the Transcontinental with the G.T.P. Ry. and the Canadian Northern at the union station. There is also considerable other work on the line necessary to be done before the terms of the contract are complied with.

"With regard to the Springfield, or Transcona shops, Chairman Leonard, of the Transcontinental Railway Commission, has decided that the shops are not part of the contract between the Government and the railway, while the company contends that they are part of the Transcontinental contract. If Mr. Leonard's contention is eventually sustained, the taking over of the line between Winnipeg and Lake Superior Jct. would not include the taking over of the shops by the G.T.P. Ry. On the other hand, if the G.T.P. Ry.'s contention that the shops are a part of the Transcontinental Railway is sustained, the taking over of the line would also mean the taking over of the shops and placing them promptly in operation."

### Canadian Northern Railway Earnings, Etc.

Gross earnings, working expenses, net profits, increases or decreases, compared with those for 1910-11, from July 1, 1911:—

	Earnings.	Expenses.	Net Earnings.	Net Increase
July	\$1,475,900	\$1,114,800	\$361,600	\$13,400
Aug.	1,420,600	1,105,900	314,700	51,700
Sept.	1,576,400	1,157,000	419,400	38,200
Oct.	2,028,900	1,348,500	680,400	99,900
Nov.	2,001,500	1,336,800	665,200	106,300
Dec.	1,831,400	1,327,600	503,800	144,600
Jan.	1,223,100	1,004,400	223,700	122,000
Feb.	1,203,400	965,800	237,600	101,800
Mar.	1,572,700	1,145,900	426,800	72,000
Apr.	1,608,100	1,205,000	403,100	42,000
May	1,822,100	1,364,000	458,100	54,900
June	1,769,500	1,347,800	421,700	108,500

\$19,588,600	\$14,422,500	\$5,116,100	\$950,800
Inc. \$4,399,100	\$ 3,888,800	\$ 950,800	.....

Average mileage in operation during 1911-1912, 3,888 miles, against 3,385 miles during 1910-11.

Approximate gross earnings for July, \$1,829,700, against \$1,475,900 for June, 1911.

### Canadian Pacific Railway Earnings, Etc

Gross earnings, working expenses, net profits, increases or decreases, compared with those for 1910-11, from July 1, 1911:—

	Earnings.	Expenses.	Net Profits.	Increases
July	\$ 9,661,818.14	\$5,958,789.81	\$3,708,028.33	\$218,408.74
Aug.	10,421,904.42	6,346,333.41	4,075,571.01	389,898.68
Sept.	10,049,084.97	6,131,638.17	3,917,446.80	5,847.16
Oct.	11,207,991.99	6,526,887.24	4,681,104.75	175,944.23
Nov.	10,570,694.80	6,583,328.31	3,987,366.46	250,244.23
Dec.	10,654,871.67	6,549,141.41	4,105,730.26	819,196.87
Jan.	7,328,781.81	6,245,924.11	1,082,857.70	426,739.83
Feb.	8,931,907.20	6,548,040.53	2,383,866.67	1,239,159.16
Mar.	10,519,328.76	6,890,317.65	2,718,401.11	561,834.57
Apr.	11,301,349.46	7,185,597.67	4,115,751.79	958,777.18
May	11,360,420.81	7,679,905.58	3,680,515.23	736,430.47
June	11,311,897.20	7,464,794.51	3,846,602.69	821,981.64

\$123,319,541.23	\$80,021,298.40	\$43,298,242.83	\$6,598,412.26
Inc. \$19,151,733.02	\$12,853,320.76	\$6,598,412.26	.....

Approximate gross earnings for July, \$11,641,000 against \$9,291,000 for June, 1911.

The mileage in operation was increased, during July, to 11,152.

The net results of the company's operations for the year ended June 30, are as follows:—

Gross earnings	\$123,319,541
Working expenses	81,021,298

Net earnings	\$ 43,298,243
Net earnings of steamships in excess of amount included in monthly reports.	1,104,449

\$44,402,692

Deduct fixed charges	10,524,937
Surplus	\$ 33,877,754
Deduct amount transferred to steamship replacement account	\$1,000,000
Deduct contribution to pension fund	125,000
Net revenue available for dividend	\$ 32,752,754
Surplus carried forward after payment of all dividends declared for the year	\$ 17,560,519
Special income from interest on land sales and from other extraneous assets	\$ 5,158,585

### Grand Trunk Railway Earnings, Etc.

Subject to audit, the accounts for the half year ended June 30, show the following results:—

Gross receipts	\$18,673,041
Working expenses	13,603,371
Net receipts	\$ 5,069,670
Deduct debit balance on account of rentals, outside operations and car mileage	163,145

Total net revenue	\$ 4,906,525
Net revenue charges	2,502,693

Balance	\$ 2,403,832
Deduct Canada Atlantic Ry. deficiency	\$257,136
and Detroit, Grand Haven and Milwaukee Ry. deficiency	246,909
	504,045

Surplus \$1,899,787  
This surplus of \$1,899,787 added to the balance of \$33,116 from Dec. 1911, makes a total of \$1,932,903 available for dividend, which will admit of the payment of full dividend for the half year on the 4% guaranteed stock and first and second preferred stocks, leaving a balance of about \$41,395 to be carried forward.

The accounts of the Grand Trunk Western Ry. for the year ended June 30, after providing for all fixed charges, including the debit balance of \$153,215, brought forward from the previous year, show a deficit of \$78,621, which will be carried forward to the current year.

### TRAFFIC RECEIPTS OF THE SYSTEM.

Aggregate from July 1 to July 31:—	1912.	1911.	Increase
G.T.R.	\$3,689,098	\$3,339,247	\$349,851
C.A.R.	197,186	177,818	19,368
G.T.W.R.	573,014	551,903	21,111
D.G.H. & M.R.	185,752	171,322	14,430
Totals	\$4,645,050	\$4,240,290	\$404,760

### Long Distance Non Stop Trains in Europe.

The longest nonstop trains run on European railways are in England, where there are 11 runs over 150 miles, three of which are over 200 miles (maximum 226), and the average speeds range from 50 to 58 m.p.h. for the entire distance. In Germany, there are five runs of over 150 miles (maximum 178), with speeds of 48½ to 53½ m.p.h. France has only one run of over 150 miles (153), with a speed of 53¼ m.p.h. American railways rank much lower, the longest nonstop run being 141 miles, from Englewood (Chicago) to Fort Wayne, at 59 m.p.h. It is true that the timetables show runs as long as 438 miles, but these include actual stops to change engines, etc. The English runs are for regular trains, but some of the foreign long distance runs are special steamer trains or international express trains. The accompanying table gives particulars of some of the runs mentioned:—

Train runs	Distance miles	Time min.	Speed m.p.h.
England			
London-Plymouth	226.75	247	55.1
London-Rhyl	209.25	237	52.9
London-Shipley	206.50	245	50.6
London-Liverpool	192.25	215	53.6
London-Wilmslow	176.82	193	55.0
Wakefield-London	175.75	185	57.0
London-Exeter	173.75	180	57.9
Germany			
Berlin-Hamburg	178.20	200	53.4
Munich-Wurzburg	178.20	205	50.4
Berlin-Liegnitz	164.3	203	48.6
France			
Paris-Boulogne	157.8	170	55.7

W. J. GERBRACHT, travelling auditor, C.P.R., Nelson, B.C., was married, Aug. 8, to Miss C. M. Hyde, at Ingersoll, Ont.

## RAILWAY DEVELOPMENT.

## Projected Lines, Surveys, Construction, Betterments, Etc.

**Alberta Interurban Ry.**—We are officially advised that a subcontract for construction has been let to John Breckenridge, Calgary, Alta., and that work will be started as soon as the plans have been approved by the Board of Railway Commissioners. ((July, pg. 339).

**Algoma Central and Hudson Bay Ry.**—The Board of Railway Commissioners has approved of revised location plans for the extension of the line from Hobon, Ont., between mileage 82.8 and 123.53. (Aug., pg. 411.)

**Atlantic, Quebec and Western Ry.**—The Board of Railway Commissioners having authorized the opening for traffic of the line from Grand River to Gaspé, Que., mileage 51.5 to 102.5, a passenger train service was started Aug. 1. With the opening of this section of line, there is in operation a through line from Matapédia, on the Intercolonial Ry., to Gaspé, 202.5 miles, under one management. The first section of 100 miles from Matapédia to New Carlisle is the old Atlantic and Lake Superior Ry., now the Quebec Oriental Ry. (Aug., pg. 411.)

**Burrard Inlet Tunnel and Bridge Co.**—The Board of Railway Commissioners at Vancouver, July 28, directed the company to start work on the construction of the bridge within 30 days after the plans are approved by the Board's engineer.

At a meeting of directors, Aug. 7, a resolution was passed authorizing the company's consulting engineers in London, Eng., to have the complete plans and specifications for the bridge, with an opening span of 200 ft., in accordance with the orders of the Board, prepared as speedily as possible.

The company is being financed to a large extent by the municipalities, while the Vancouver, Westminster and Yukon Ry. has secured a Dominion subsidy towards building a bridge. The two companies agreed to consolidate interests so far as the bridge is concerned. Differences have arisen as to the location of the bridge, and the V. W. and Y. Ry. objects to the location on the ground that it is to be used for railway lines which will compete with those it proposed building. In giving a decision, Assistant Chief Commissioner Scott said the B. I. T. and B. Co. would have to compensate the V. W. and Y. Ry. for any cost to which it may be put in altering its plans to suit the revised location of the bridge. The application of the B. I. T. and B. Co. for approval of its line is to stand over for a year, it being understood that in the meantime the V. W. and Y. Ry. shall show some signs of activity. (Aug., pg. 411.)

**Canada and Gulf Terminal Ry.**—We are officially advised that surveys are being made with a view of immediate further construction from Matane, Que., towards Gaspé Basin, Que. The line is in operation from St. Flavie, on the Intercolonial Ry. to Matane, 34 miles. (May, pg. 238.)

**Central Ry. of Canada.**—W. D. Hogg and E. Wilson Smith, Montreal, are reported to have been elected directors in place of Hon. A. Campbell, Toronto, and E. Goff Penny, Montreal, resigned. Mr. Campbell was president of the company.

The Board of Railway Commissioners has authorized the Canadian Northern Ontario Ry. to build a spur line at McAlpine station, for use by the C. Ry. of Canada for construction purposes. (Aug., pg. 411.)

**Dominion Atlantic Ry.**—Press reports state that the C.P.R. proposes to spend over \$1,000,000 on betterments on the line. At present the bridge structures are being brought up to C.P.R. standard, some be-

ing rebuilt and others strengthened. Other betterments are being arranged for. (Aug., pg. 411.)

**Edmonton, Dunvegan and British Columbia Ry.**—The Board of Railway Commissioners has authorized the company to build its line across the Canadian Northern Ry. at grade in sec. 35-55-25, west of the 4th meridian, just south of Morinville, Alta., on installing an interlocking plant; and has also approved of location plans for the line from mileage 29.783 to 68.30 out of Edmonton. (Aug., pg. 411.)

**Erie, London and Tillsonburg Ry.**—The Board of Railway Commissioners has approved of location plans for this projected railway from mileage one, near Port Burwell, to Aylmer, Ont., at mileage 13.6. The Aylmer, Ont., town council is being asked to approve of the route through that town, the consent being asked for by W. H. Biggar, K.C., General Counsel, G.T.R. The charter for the E. L. and T. Ry. was obtained by J. H. Teall, of Tillsonburg, Ont., and it is reported that it was recently acquired by the G.T.R. (May, pg. 238.)

**Esquimalt and Nanaimo Ry.**—A new freight station has been completed at Duncans, B.C., and a new passenger station is under construction at the same place. The clearing of the line from Duncans to Cowichan Lake is in progress, the Island Lumber Co. having the contract.

R. Marpole, Vice President, and other officials, made a trip of inspection over the line, Aug. 2, including the extension to Cowichan Lake, and the branch to Osborne Bay.

Culliton Bros., Spokane, Wash., who have a contract for the first 10 miles north of McBride Jct., B.C., have been given another contract for a further five mile section. J. W. Hoard, Victoria, who has a contract for a five mile section from Trent River southwest, will probably be given a further five miles.

**Fredericton and Grand Lake Coal and Ry. Co.**—A plan of the proposed bridge across the Nashwaak River, and a description of the site has been deposited with the Registrar of the county of York, and application is being made to the Governor-in-Council for approval of the same.

The Minto Coal Co. has been incorporated under the New Brunswick Companies Act, with a capital of \$400,000 and offices at Minto, N.B., to develop collieries, and deal in coal, coke, etc. The company is given power to build tramways, piers, wharves, coal pockets, and to own steam and other vessels, etc. The provisional directors are:—Sir Thos. Tait, V. E. Mitchell, Montreal; A. H. Slipp, R. B. Harrison, Fredericton, N.B.; J. Henderson, Northfield, N.B. We are advised that it is not the company's intention to place any securities upon the market. (Aug., pg. 411.)

**Howe Sound and Northern Ry.**—See Pacific Great Eastern Ry. (June, pg. 300.)

**Hudson Bay and Pacific Ry.**—The creditors and shareholders of the H. B. and P. Development Co., London, Eng., on Aug. 7, nominated Sir W. B. Peat as Liquidator. A London cable says: "The company's history really consisted of repeated attempts to borrow money. It was successful in borrowing a little, but had to pay an awful price for it." (Aug., pg. 411.)

**Intercolonial Ry.**—An order for 5,000 tons of 80 lb. steel rails has been placed with the Dominion Iron and Steel Co., Sydney, N.S.

A contract has been let to Morrison and Clark, Summerside, P.E.I., for the

erection of a 10-stall locomotive house and annex, brick chimney with concrete foundation, turntable ring wall and centre foundation, concrete cinder pit, and moving existing stores and office building and providing new foundation,—at Point Tupper, N.S.

J. H. Evans is reported to be making arrangements for a survey of the line from Point Tupper to Sydney, with the view of improving the alignment, cutting down gradients and eliminating curvature. Owing to the great increase in traffic since the line was originally built, it is stated that the management is desirous of securing a line which can be operated at less cost than the present one.

In connection with the proposal to build a line to Wallace Harbor, N.S., by the Cumberland Ry. and Coal Co., referred to in Canadian Railway and Marine World for August, we are officially advised that no actual work has been done. The Dominion Parliament last session granted \$60,000 to cover the cost of building a line from Wallace station to Wallace Harbor, three miles, it being understood that the Dominion Coal Co. is to build the necessary pier and coal handling plant, and that the Department of Public Works will do the necessary dredging of the harbor to permit of deep draught vessels reaching the site of the proposed pier. (Aug., pg. 411.)

**Kettle Valley Lines.**—An agreement has been concluded between the city council of Grand Forks, B.C., the Kettle River Valley Ry. and the C.P.R., under which the two railway companies will provide joint yards, shops, roundhouses, etc., in Grand Forks. The work, it is reported, will be started immediately.

Press reports state that the ballasting and other work on the section of the line under construction in the vicinity of Merritt, B.C., will be completed early in Oct. The work in progress consists of ballasting, the erection of station houses and the stringing of the telegraph line.

The Board of Railway Commissioners has approved of location plans for the extension of the line, between mileage 40 and 57.4, west of Hydraulic Summit, B.C. (Aug., pg. 412. See also Midway and Vernon Ry.)

**Kootenay and Alberta Ry.**—We are officially advised that construction on the line from near Pinetree station, on the C.P.R. Crownsnest Pass line, to Beaver Creek, Alta., has been completed. No arrangements have yet been made for its operation. (June, pg. 300.)

**Midway and Vernon Ry.**—The commission appointed by the British Columbia Government to settle up the claims against the old M. and V. Ry. in respect of the work done from Midway to Rock Creek, which has been taken over for the extension of the Kettle Valley Lines, has practically completed its work. The total amount awarded is about \$15,000, and Judge Foran of Nelson, the chairman of the commission, is reported as stating, Aug. 3, that the amounts awarded the several claimants would soon be paid over. One half of the total amount will be paid by the Provincial Government and the other by the Kettle River Valley Ry. This will close up the history of the M. and V. Ry. project. (May, 1910, pg. 353.)

**Minneapolis, St. Louis and Canadian Ry.**—The names mentioned in the incorporation papers for this new company are:—N. Erb, President, Minneapolis and St. Louis Rd.; W. G. Bierd, connected with the M. and St. L. Rd.; J. Wellman and H. A. Harrison, representing two New York banking houses. The organization meeting was held in Minneapolis, Minn., July 22, when N. Erb was elected President, and W. G. Bierd, Vice President. The President is reported as stating that preparation for construction of a line to the Canadian border would be started in the fall. (Aug., pg. 412.)

**Minneapolis, St. Paul and Sault Ste. Marie Ry.**—The new through line, giving a direct connection between Minneapolis, Superior and Duluth, Minn., was opened for traffic, Aug. 2. It starts from the main line at Dresser Jct., and passes through Frederic and Boylston Jct., Wis., connecting with the previously existing lines near Superior.

Press dispatches from Chicago, Ill., Aug. 12, state that announcement was made that day of the purchase by the Central Terminals Co. of parcels of land at a cost of \$1,719,153, in addition to the 208 already bought for terminals of the M. St. P. and S. S. M. Ry., which enters Chicago over the tracks of its subsidiary, the Wisconsin Central Ry. (Aug., pg. 412.)

**North Ry.**—It is reported that the sea terminal of this projected railway from Montreal to Hudson Bay will be on the west side of the Nottaway River, Que. The route from Montreal is via Ottawa and along the valley of the Coulonge River to Bell River, near which the National Transcontinental Railway will be crossed, and along the valley of the Nottaway River. Three engineering parties are in the field. (Aug., pg. 412.)

**Pacific Great Eastern Ry.**—The British Columbia Government has authorized the issue of the bonds, which it undertook to guarantee, and the construction of this railway from Vancouver to Fort George, B.C. Route maps of the line from Vancouver to Lillooet, 150 miles, have been filed with the Government. So far as they affect the city and the district of North Vancouver, they have been approved by the local municipalities, but West Vancouver has made an objection, with the result that the Government has held up the consideration of the matter so far as it affects that municipality.

The section of the general location of this projected railway approved by the Minister of Railways for British Columbia extends from the boundary of North Vancouver to the north boundary of the district of New Westminster, from D.L. 204 to Green River, north of D.L. 1276.

The question of terminals in North Vancouver is under consideration. The route map ties up with the line of the Howe Sound and Northern Ry., which the P.G.E.R. Co. has power to acquire, and negotiations for the purchase of that line have been resumed. J. Callaghan, Vancouver, is Chief Engineer.

P. Welch, Vice President, is quoted as stating, Aug. 7, that construction would be started early in September near the confluence of the Squamish and Cheakamus rivers, about 11 miles from Newport; that by the end of the year construction gangs would be at work along the line to Lillooet, 120 miles, and that in the spring construction would be started from Fort George southerly.

D'Arcy Tate, Vice President and General Counsel, is reported as stating, July 30, that satisfactory progress had been made with the negotiations for the purchase of the Howe Sound and Northern Ry., and he expected they would be closed soon after the arrival in Vancouver, during September, of J. W. Stewart, President, P. G. E. Ry., who is in Europe. In addition to a main line 12 miles long, now in operation, the Howe Sound road, of which Mr. Keith is President, has six miles of branch lines extending into logging camps in Squamish Valley. The southern terminus is Newport, at the head of Howe Sound. The company has a charter for a railway from Newport to Lillooet. The surveys have been completed and a subsidiary company also owns a charter for an extension from Lillooet to Fort George, following the same route as the Pacific Great Eastern.

P. Welch, Vice President, is reported as stating, Aug. 17, that orders have been given for grading outfits to be shipped in to Newport, and conveyed thence by rail to the point where it is proposed to

start construction. The right of way as far as Green Lake has been cleared, and it is expected that by the end of the year the 120 mile section to Lillooet will be covered with men. Engineers are making surveys for the line between Point Atkinson and Newport. Owing to the deep water close in shore it will be impossible to build bridges consequently there will be a good deal of tunnelling.

**Quebec and Saguenay Ry.**—Press reports state that, owing to the shortage of steel, the company will not be able to complete the laying of track to Murray Bay, Que., sufficiently early to enable to allow of the opening of the line for traffic this year, as was expected. (Aug., pg. 412.)

**St. John and Quebec Ry.**—A. R. Gould, President, is reported as stating, July 31, that there were over 1,000 men at work on the line between St. John and Grand Falls, N.B., and that good progress was being made with grading. (July, pg. 340.)

**The Southampton Ry.** is projected from Millville, N.B., on the C.P.R. Gibson branch, to Lower Southampton, on the St. John River, 13 miles. Six miles, from Millville to Pender's Mills, have been graded, track laid and ballasted complete, with the exception of dressing up. A daily train service is being given on this mileage. Grading has been nearly completed on the remaining seven miles to Southampton, and it is expected to have the work completed and the whole line in operation this season. The line is to be operated under lease by the C.P.R. D. W. Brown, Fredericton, N.B., is Chief Engineer. (Aug., pg. 412.)

**Timiskaming and Northern Ontario Ry.**—J. G. McMillan, who has made a report of his preliminary survey of the country between Cochrane and Moose River, has returned to complete his work. An engineering party, in charge of W. R. Maber, is engaged in locating a line from Cochrane northerly, and, Aug. 5, was reported to be working between the Metagam and Fredericthouse rivers. J. L. Englehart, Chairman of the Commission, who returned to Toronto July 30 from an inspection of the line, is reported as stating that the work mentioned is being undertaken so that the Commission will have things in readiness should it be decided at the next session of the legislature to extend the line to Hudson Bay. (Aug., pg. 412.)

**The Vancouver Terminals Co.** submitted plans to the Vancouver city council, Aug. 2, for the laying out of extensive terminals. The details laid before the meeting by A. K. H. Macfarlane set out that the company proposes to build a line from New Westminster to Vancouver, and to lay out a railway terminal, with docks and harborage in Vancouver by the reclamation of Spanish Bank, and to lay out a central station and local freight yard in the heart of the city by the reclamation of 40 acres of False Creek under the Granville St. bridge. The plans show 12 miles of actual dock frontage, with the reclamation of 1,000 acres of land and provision for 150 miles of terminal trackage. The council promised to give consideration to the project at a future meeting.

**Vancouver, Westminster and Yukon Ry.**—See Burrard Inlet Tunnel and Bridge Co.

**White Pass and Yukon Route.**—We are officially advised that the branch line recently completed to the Pueblo mine leaves the main line 1,055 miles north of Skaguay, and extends 11 miles northwesterly in the Yukon Territory. The maximum gradient is 2.25% against northbound and 1.5% against southbound traffic, with a maximum curvature of 15 degrees. There are no tunnels, but there are seven wooden trestles. The entire traffic movement is southbound, and consists of ore. No further extensions are contemplated, and there is no construction in progress at present. (Aug., pg. 412.)

## Railway Finance, Meetings, Etc.

**Buffalo and Lake Huron Ry.**—The report for the half year ended June 30 shows that after providing for the interest on the first and second mortgage bonds, and the usual dividend of 5s. 3d. a share, and making the necessary charges against revenue account, there remained a balance of £30 19s. 6d., which has been transferred to investment account. The railway is operated under lease by the G.T.R., on a half yearly rental of £35,000.

**Canadian Pacific Ry.**—Following the annual meeting of shareholders to be held in Montreal, Oct. 2, a special meeting will be held to authorize the issue of consolidated debenture stock to acquire the Dominion Atlantic Ry., as outstanding securities and to consider a recommendation from the directors to increase the capital stock by not exceeding \$60,000,000, such additional capital to be issued as may be determined by the directors.

**Cap de la Madeleine Ry.**—A meeting of shareholders will be held in Montreal, Sept. 3, to pass resolutions approving of the terms upon which the line is to be conveyed to the C.P.R.

**Dominion Atlantic Ry.**—Passenger earnings for July, \$119,895.38; freight earnings, \$38,472.43; total earnings, \$158,367.81, against \$160,600 total earnings for July, 1911.

**Esquimalt and Nanaimo Ry.**—Application is being made to the Board of Railway Commissioners for a recommendation to the Governor-in-Council to sanction a lease of the company's lines to the C.P.R. for 99 years from July 1, 1912.

**Grand Trunk Ry.**—Copy of the conditional sale of rolling stock between the American Car and Foundry Co. and the G.T.R., dated July 24, has been filed with the Secretary of State at Ottawa.

**Kingston and Pembroke Ry.**—The shareholders at the annual meeting at Kingston, Ont., Aug. 14, passed a resolution approving of the leasing of the line in perpetuity to the C.P.R. The terms and conditions of the lease were not made public. Before being final it will have to be ratified by the C. P. R. shareholders. Following are the directors for the current year:—President, W. D. Matthews, Toronto; Vice President and General Manager, W. R. Baker, Montreal; other directors, J. B. Walkem, W. F. Nickle, R. Crawford, W. Harty, Kingston, Ont.; H. P. Timmerman, A. R. Creelman, Montreal; J. T. Arundel, Toronto.

**Nelson and Fort Sheppard Ry.**—See Red Mountain Ry.

**Quebec Central Ry.**—Gross earnings for 12 months ended June 30, \$1,355,301, against \$1,208,948 for same period 1910-11.

**Red Mountain Ry.**—Nelson and Fort Sheppard Ry.—Vancouver press reports state that the C.P.R. held options, expiring Aug. 31, for the purchase from the Great Northern Ry., U.S., of the Red Mountain Ry. and the Nelson and Fort Sheppard Ry. in B.C.

**St. Marys and Western Ontario Ry.**—A special meeting of shareholders will be held in Montreal, Sept. 9, to consider the expediency of cancelling the present lease and entering into a new one upon terms to be submitted, and to decide upon the means to be adopted for raising funds.

**Temiscouata Ry.**—Profit on operation for May, \$5,871.

**White Pass and Yukon Route.**—Earnings for six months ended June 30, \$315,769, against \$397,130 for same period 1911.

S. Hale has been appointed General Manager of the Algoma Steel Corporation, Sault Ste. Marie, Ont.

## Canadian Pacific Railway Construction, Betterments, Etc.

**Elevator at St. John.**—Work has been started upon the preparation of the foundations for the new 1,000,000 bush. elevator at West St. John, N.B., to the west of the existing elevator. The new building will be of reinforced concrete and will be capable of unloading 160 cars in ten hours, and, by means of a shipping gallery system, of loading into vessels lying at different berths. The machinery will be operated by electricity. The new elevator is to be completed for the winter of 1913. The John S. Metcalf Co., Montreal, has the contract for the design and construction.

**Farnham Subdivision Second Track.**—The Board of Railway Commissioners has authorized the revision of grade of the present main line, and the building of a second track from mileage 17.35 on the Farnham subdivision to Iberville Jct., and thence to Highlands, Que., mileage 41.8.

**Quebec Yards, etc.**—A new plan covering the portion of Victoria Park required by the C.P.R. for yard extension purposes is under consideration by the city council. There will not be so much encroachment on the park with this plan as under the plan first considered.

**Windsor St. Station, Montreal.**—Two of the new tracks at this enlarged station, have been in use since Aug. 1, and a third track was expected to be ready by Aug. 31.

**Ottawa Improvements.**—D. McNicoll, Vice President, is reported as stating that work will be started early in the spring of 1913, improving the entrance of the company's lines into Ottawa, and that some detail matters have to be settled before the plans can be finally approved.

**Campbellford, Lake Ontario and Western Ry.**—A special meeting of shareholders will be held in Montreal, Sept. 9, to approve of a lease of the line to the C.P.R., and to take steps for raising funds to construct and equip the line.

The Board of Railway Commissioners has authorized the changes in the line at mileage 43.86, and a crossing of the Bay of Quinte Ry.; has approved location plans from King St., Port Hope to mileage 127.3; through the town of Whitby; from mileage 160.86 to 161.0; from mileage 165 to 174, and from 176.0 to 183.51; revised location plans from mileage 63.59 to 68.50, from mileage 70.25 to 72.44, and from mileage 155.13 to 157; has authorized the crossing of the Oshawa Electric Ry. at mileage 158.85; and has authorized a junction to be made with the C.P.R. Montreal-Toronto line at mileage 87.41 westerly from Havelock, Ont., mileage 183.51 of the C. L. O. & W. Ry.

Construction is being rapidly proceeded with and it is expected to have the section from Leaside Jct. to Whitby completed this year. Just east of Whitby there will be a bridge across Ruffins creek, 900 feet long, and 110 feet above high water level.

**North Toronto Improvements.**—The tenants of the buildings and land on the line of the track elevation in North Toronto, were notified Aug. 1 to vacate immediately. Large quantities of materials are being delivered, and a good deal of other preparatory work is being gone on with. The company's engineers have opened an office at the corner of McPherson Ave. and Avenue Road from which the construction work will be directed. The project comprises a viaduct across Yonge street, a union station, and track elevation westerly to Dovercourt Road.

**Islington West.**—The second track out of Toronto, ends a short distance west of Islington. A survey party under the direction of H. D. Lumsden, started in at

this point Aug. 6, and is working westerly. There have been a number of surveys made in this vicinity within the last six or seven years with the view of eliminating the Erindale gradient, and cutting out the long curve round to Streetsville Jct., as well as surveys for a second track, and for a line connecting the Toronto-Windsor line, with the Sudbury line to the north and Hamilton to the south.

**Woodstock Line Revision.**—The Board of Railway Commissioners has authorized the revision of the line through Woodstock, Ont., a subway to be built under Dundas St. Twenty per cent. of the cost of the subway is to be paid out of the Dominion railway grade crossing fund.

**Collingwood Southern Ry.**—Local press reports state that the company's agents have secured most of the right of way from Baxter on the Toronto-Sudbury line to Collingwood, and that a start will be made with construction early in September. Representatives of the Dominion Construction Co. are said to have been going over the located route Aug. 6.

**Sudbury-Port Arthur Second Track.**—Press reports state that subcontracts on the several sections of this work which has been put under contract to the Dominion Construction Co., have been let to McCaffrey and McCaffrey, W. T. S. Tomlinson, A. and A. Zebren, M. McCormick, Welsh Bros.

**Fort William-Winnipeg Second Track.**—The Board of Railway Commissioners has authorized the opening for traffic of the second track on the Kenora, Ont., subdivision, from mileage 114.54 to 119.06.

**North Transcona Terminals.**—Construction has been started on the new terminals at North Transcona, near Winnipeg. The contract for grading and track laying has been let to Foley Bros., Welch and Stewart, and it is expected to complete about 750,000 cubic yards of levelling and grading, and to lay 35 miles of track this year. By the fall of 1913 it is expected to have the eastbound and westbound yards completed. This will require about 2,000,000 cubic yards of levelling and grading, and about 70 miles of track. A 30 stall locomotive house, together with machine shop, boiler house, stores, etc., are being constructed, the contract for which has been let to the Lyall-Mitchell Contracting Co. There is also under construction a transfer elevator with a storage capacity of 1,000,000 bush., with a grain drier and the usual elevator facilities. Details of this elevator, which is being built by Barnett, McQueen & Co., were given in Canadian Railway and Marine World for July.

**Gimli Branch Extension.**—Press reports state that a contract has been let to T. Ingaldson, Arberg, Man., for the clearing of the right of way for the extension of the branch now terminating at Gimli, along the shore of Lake Winnipeg, for 26 miles to Riverton, on the Icelandic river. Work is reported to be in progress.

**Moose Jaw Southwesterly.**—We are officially advised that the extension of the branch running southwesterly from Moose Jaw, Sask., which now terminates at mileage 37.85, will not be gone on with this year. The route of the extension has been approved for 16.62 miles.

**Swift Current Northwesterly.**—This line is already in operation from Swift Current northwesterly to beyond Cabri, Sask., 34 miles. The route plan, recently approved by the Minister of Railways, shows an extension to the Saskatchewan Alberta boundary immediately south of the south Saskatchewan river. This extension is being built this year.

**Ogden Shops, Calgary.**—We are officially advised that excellent progress is being made with the erection of the shops at Calgary, Alta., a complete preliminary description of which, with plan, was published in Canadian Railway and Marine World for February.

The locomotive shop, boiler shop and blacksmith shop are erected; the roof sheathing has been put on, and the roof waterproofing is being applied; building walls are being laid up; concrete erecting pits have been put in, heating ducts in five buildings are being constructed, and the contractors are ready to put in machine tool foundations.

The coach repair and paint shop and the tender shop and planing mill are enclosed; the storehouse and office building and the foundry are being erected; the yard crane runway has been erected; foundations are in place for the power house and the freight car shop, and these structures are being erected; sewer and water piping have been installed in the shop yards, and the grading of the property is going ahead, there being considerable cuts and fills, requiring the services of two steam shovels on the site.

The contractor, Westinghouse, Church, Kerr & Co., expected to continue the present progress of the work to an early completion.

**Calgary Irrigation Belt Lines.**—In connection with the opening up of the lands in the irrigation belt, easterly of Calgary, a line was built northerly from Langdon to Acme, with a branch from Irricana easterly and southerly through Tudor. This branch is being extended to Dead Horse Lake and then south-easterly to a junction with the main line at Bassano. The track laying gang was reported Aug 7 to be nearing Bassano, and it was expected to have the steel laid by Aug. 31.

**Alberta Central Ry.**—The amended route map of this line from Rocky Mountain House to the Yellowhead Pass, is projected to give a 0.4 gradient throughout. The previously located line is followed to 140 miles from Red Deer, a few miles beyond the point from which a branch line is located southwesterly to the Brazeau collieries. The line first located from the 140 mile post proceeded almost due westerly to the Pass, but it was found to be impracticable to obtain a 0.4 gradient on it without a series of further gradients and considerable tunnelling. The route now adopted, although very much longer, has an advantage of a 0.4 gradient all the way, easy of construction and traverses more directly the extensive coal fields of the Brazeau district. It runs northerly from the 140th mile post in tp. 44, range 16, west of the 5th meridian, and enters the Athabasca river valley about 50 miles west of Edson on the G. T. Pacific Ry., and follows the route of that line and the Canadian Northern Ry. from this point to the Yellowhead Pass in tp. 45, range 4, west of the 6th meridian. J. Grant MacGregor is assistant engineer in charge of construction.

**Grand Forks, B.C.**—The agreement between the city council, the C.P.R. and the Kettle Valley Lines, by which the railway companies will erect joint terminals in Grand Forks, B.C., awaits the sanction of the ratepayers. Preparations are being made for starting work.

**Rossland Branch Electrification.**—In connection with the announcement that the C.P.R. purposed electrifying its line from Nelson to Rossland, B.C., the West Kootenay Power and Light Co. proposes to enlarge its power plant. This company controls 30,000 of the 35,000 estimated horse power that may be developed at Bonnington Falls. With the completion of the improvements contemplated the company will have 19,000 h.p. available.

**Coquitlam Terminals.**—Rapid progress has been made with the erection of the

## Railway Rolling Stock Notes.

terminal buildings at Coquitlam, B.C. It is expected that the locomotive house will be completed early in September. The shunting yard is being laid out on the hump principle, with 10 tracks running west and 17 east. The tracks stretch from the Pitt river to Coquitlam. Other trackage is being laid down. Tenders are being asked for a three-track bridge across the Coquitlam river, and surveys are being made for the erection of a double track bridge across the Pitt river, in connection with the company's plans for the terminals.

### Ruby Creek-Vancouver Second Track.

—The construction of a second track from Hammond to Vancouver, B.C., 24 miles, is reported to be practically completed. The work is being carried out under the charge of H. Kindal, division engineer, Vancouver.

We are officially advised that Grant Smith and Co. have been given a contract for building a second track from Ruby Creek to Hammond, 57 miles, which will give a continuous second track to Ruby Creek from Vancouver, 81.1 miles.

**Burrard Inlet Line.**—We are officially advised that while the Minister of Railways has approved, with certain restrictions, the route map of the proposed line along the north shore of Burrard Inlet, the location plans are not yet finally settled. It is not, we are informed, the intention to proceed with the construction of the line under present circumstances. The route plan approved by the Minister of Railways shows a line of 21 miles from mileage 115 of the Cascade subdivision to North Vancouver

## Manufacturers Urged to Load and Unload Cars Promptly.

J. E. Walsh, Manager Transportation Department, Canadian Manufacturers Association, has issued the following circular to members:—

Notwithstanding the fact that the railways are adding materially to their equipment and terminals, the indications are that the car shortage and congestion at terminals is going to be worse this fall than for some years past. This statement is based on the car surplus and shortage figures of the American Railway Association.

Upon the ability of the railways to move the crops promptly will depend to a great extent the business welfare of the country. Everybody can help by facilitating the movement of any cars he consigns or receives, viz., by loading and unloading as expeditiously as possible. Every time the loading or unloading of a car is needlessly delayed the available supply of cars is correspondingly reduced. If a shipper by his own act reduces the available supply of cars he cannot very well complain of a shortage. Cars are furnished for transportation, not for storage, and every one used for storage reduces the number available for transportation.

The annual crop movement beginning around October 1st brings a car shortage lasting about four months; during the balance of the year there is usually a surplus. By moving as much as possible of your freight inwards and outwards within the next few weeks you will be helping yourself, the railways, and all others concerned.

The C. P. R. has entered an action against the G.T.R., at Osgoode Hall, Toronto, to recover \$2,277.28 alleged to be due as the result of a derailment at Woodstock, Ont. The claim is made up of, damage to equipment, \$775.30; clearing wreckage and repairing track \$164.18, and \$726.03 alleged to have been paid to the Pere Marquette Rd. for taking C. P. R. trains over its line. The derailment in question occurred in Dec., 1910.

The Central Ontario Ry. has ordered 25 ore cars from J. T. Gardner, Chicago, Ill.

The Canadian Northern Ry. will probably be in the market shortly for between 3,000 and 4,000 freight cars.

The Canadian Northern Ontario Ry. has ordered 50 coal cars from J. T. Gardner, Chicago, Ill.

The Duluth, Winnipeg and Pacific Ry. has received 150 coal cars, from J. T. Gardner, Chicago, Ill.

The Halifax and South Western Ry. has ordered six excursion cars from J. T. Gardner, Chicago, Ill.

The Niagara, St. Catharines and Toronto Ry. has ordered 10 coal cars from J. T. Gardner, Chicago, Ill.

A United States press report states that the G.T.R. has ordered 2,000 thirty ton box cars and 50 tank cars, in the U.S.

The Dominion Bridge Co. has received one Lidgetwood unloader from the Canadian Car and Foundry Co., Montreal.

The Intercolonial Ry. has received one first-class car from the Preston Car and Coach Co., completing an order of five.

The Algoma Central and Hudson Bay Ry. has received four first class cars from the Canadian Car and Foundry Co., Montreal.

The Canadian Car and Foundry Co., Montreal has delivered one logging engine car to Allis-Chalmers-Bullock Ltd., Montreal.

The Canadian Northern Quebec Ry. has ordered 50 coal cars, 50 flat cars and six excursion cars from J. T. Gardner, Chicago, Ill.

The Brockville, Westport and North Western Ry. has ordered two first class cars and one combination car from J. T. Gardner, Chicago, Ill.

The Timiskaming and Northern Ontario Ry. has received two consolidation locomotives, Nos. 139 and 140, from the Canadian Locomotive Co.

The Grand Trunk Pacific Ry. has received 173 ballast cars, nos. 392820 to 392992, from the Canadian Car and Foundry Co., Montreal; and 256 flat cars, nos. 361642 to 361897, from the American Car and Foundry Co.

The G. T. R., between July 13 and Aug. 15, received three Pacific type locomotives, nos. 230 to 232, ordered Oct. 7, 1911, and two first class cars, from its Montreal shops; and 46 refrigerator cars, 157 automobile cars and 457 steel coal cars, from the U.S.

The Canadian Northern Ry. has ordered two cafe-parlor cars, from J. T. Gardner, Chicago, Ill.; four Pacific type locomotives, from the Montreal Locomotive Works, and 25 consolidation locomotives, from the Canada Foundry Co., Toronto, and is in the market for 50 or more additional locomotives.

The Reid Newfoundland Co. will complete the order for eight locomotives, placed last year at its shops at St. John's, before the end of this year. We have already given details of these. Four have been completed, a fifth was expected to be ready by Aug. 31, and the remaining are to be finished during the next four months.

J. H. Corbett and Sons Co., contractors, National Transcontinental Ry., Moncton, N.B., have ordered one Rodger double plough distributing car from the Hart-Otis Car Co., Montreal. Following are the chief dimensions:—

Capacity ..... 30 tons  
Length over end sills ..... 32 ft.  
Width over side sills ..... 8 ft. 9 ins.  
Height from rail to floor ..... 4 ft. 1 1/4 ins.  
Truck centres ..... 23 ft. 8 ins.  
Wheel base of truck ..... 5 ft. 2 ins.

Following are the chief details of the 60 logging cars which the C.P.R. recently

ordered for the Esquimalt and Nanaimo Ry.'s Cowichan Lake branch, as mentioned in a previous issue:—

Capacity ..... 80,000 lbs.  
Length over end sills ..... 41 ft.  
Wheel base, extreme ..... 36 ft. by 5 ins.  
Truck centres ..... 31 ft. 2 ins.  
Truck, type ..... 40 ton  
Truck wheel base ..... 5 ft. 4 ins.  
Truck bolsters ..... Simplex  
Width, over floor ..... 9 ft.  
Width over side sills ..... 8 ft. 10 ins.

The Canadian Northern Ry., between July 15 and Aug. 15, received the following additions to rolling stock,—four consolidation locomotives, from the Canadian Locomotive Co.; two consolidation locomotives, from the Canada Foundry Co.; four first class cars, three second class cars, one dining car, three baggage cars and 140 box cars, from the Canadian Car and Foundry Co.; two baggage and mail cars and 80 box cars, from the Crossen Car Co.; and 40 box cars, from the Nova Scotia Car Works.

The C.P.R., between July 17 and Aug. 15, ordered the following rolling stock,—10 sleeping cars, five dining cars, 10 tourist cars, two double track snow ploughs, one double track flanger, and 20 type D.4 locomotives, from its Angus shops, Montreal; 13 steel snow ploughs, from the Canadian Car and Foundry Co., and 5,000 steel frame box cars, from Barney and Smith Car Co., Dayton, Ohio. We have been further officially advised that 6,000 standard steel frame box cars have been ordered from the Canadian Car and Foundry Co., for delivery by July 31, 1913.

The C.P.R., between July 17 and Aug. 15, received the following additions to rolling stock,—21 freight refrigerator cars, 25 stock cars, 50 vans, 587 wooden box cars, one pile driver, 12 tourist cars, 20 suburban cars, five U.3 switching locomotives, and three P.1 locomotives, from its Angus shops, Montreal; 177 steel frame box cars, 167 coal cars and 173 ballast cars, from the Canadian Car and Foundry Co., 20 dump cars, from the Hart-Otis Car Co.; 16 ballast ploughs and one Jordan ballast spreader, from F. H. Hopkins and Co., and 86 stone cars, from the Nova Scotia Car Works.

Following are chief details of the 41 Pacific type locomotives which the G. T. R. is having built by the Montreal Locomotive Works, as mentioned in previous issues:—

Cylinders, diar. and stroke ..... 23 by 28 ins.  
Driving wheels, diar. .... 31-69 ins.; 10-73 ins.  
Boiler, outside diar. first course ..... 70 1/2 ins.  
Firebox, length and width inside ..... 96 3/4 by 75 1/4 ins.  
Tubes, no. and diar. .... 181—2 ins.; 24—5 3/8 ins.  
Tubes, length ..... 20 ft. 7 ins.  
Grate, area ..... 60.6 sq. ft.  
Wheel base, driving ..... 13ft. 4 ins.  
Wheel base, engine ..... 33 ft. 2 ins.  
Wheel base, engine and tender ..... 62 ft. 3 1/2 ins.  
Weight on leading truck ..... 40,000 lbs.  
Weight on drivers ..... 145,000 lbs.  
Weight on trailing truck ..... 38,000 lbs.  
Weight, total engine ..... 223,000 lbs.  
Weight of tender ..... 144,600 lbs.  
Capacity, water ..... 8,000 U.S. gals.  
Capacity, coal ..... 10 tons  
Superheater, type ..... Top header, double loop

Following are chief details of the one G.1 locomotive which the C. P. R. is building at its Angus shops, Montreal, as mentioned in our last issue:—

Weight on drivers ..... 136,000 lbs.  
Weight, total ..... 217,000 lbs.  
Cylinders, diar. and stroke ..... 21 by 28 ins.  
Valves, diar. and type ..... 11 ins, piston  
Drivers, diar. .... 75 ins.  
Boiler, type ..... Extended wagon top  
Boiler pressure ..... 200 lbs.  
Heating surface, tubes ..... 2777 sq. ft.  
Heating surface, firebox ..... 183 sq. ft.  
Heating surface, total ..... 2960 sq. ft.  
Heating surface, superheater ..... 539 sq. ft.  
Equivalent heating surface ..... 3767 sq. ft.  
Tubes, no. and size ..... 193—2 1/4; 22-5 1/4 ins.  
Tubes, length ..... 19 ft. 4 7/8 ins.  
Firebox, type ..... Radial stay with cross stay  
Firebox, dimensions 7 ft. 8 3/8 ins. by 5 ft. 0 7/8 ins.  
Grate area ..... 45.6 sq. ft.  
Capacity, coal ..... 10 tons

Capacity, water ..... 5,000 gals.  
 Axles .... main 9½ by 12 ins.; others 9 by 12 ins.  
 Brakes ..... Westinghouse, E.T. 6  
 Brake beams ..... Simplex outside hung  
 Valve gear ..... Walschaert  
 Superheater ..... Vaughan and Horsey  
 Wheel centres ..... cast steel

Following are chief details of the 19 Pacific type locomotives which the G. T. R. is having built by the Baldwin Locomotive Works, Philadelphia, Pa., as mentioned in previous issues:—  
 Cylinders, diar. and stroke ..... 23 by 28 ins.  
 Valves, type ..... Piston  
 Boiler, type ..... Straight  
 Boiler, pressure ..... 185 lbs.  
 Beller staying ..... Radial  
 Firebox, length and width ..... 96% by 75¼ ins.  
 Tubes, no. and diar. .... 181—2 ins.; 24—5¾ ins.  
 Tubes, length ..... 20 ft. 7 ins.  
 Driving wheels, outside diar. .... 69 ins.  
 Journals ..... 9½ by 12 ins.  
 Truck wheels, front, diar. .... 31 ins.  
 Truck wheels, back, diar. .... 49 ins.  
 Wheel base, driving ..... 13 ft. 4 ins.  
 Wheel base, total engine ..... 33 ft. 2 ins.  
 Wheel base, engine and tender ..... 62 ft. 3½ ins.  
 Weight on drivers ..... 145,000 lbs.  
 Weight on front truck ..... 40,000 lbs.  
 Weight on back truck ..... 38,000 lbs.  
 Weight, total engine ..... 223,000 lbs.  
 Weight, total engine and tender ..... 368,000 lbs.  
 Tender, wheels, diar. .... 34 ins.  
 Journals ..... 5½ by 10 ins.

Capacity, water ..... 8,000 gals.  
 Capacity, coal ..... 10 tons  
 Superheater ..... Schmidt

Following the chief details of the 20 ten wheel locomotives, class D.4g., which the C.P.R. are building at Angus shops, Montreal:—

Weight on drivers ..... 103,000 lbs.  
 Weight, total ..... 142,000 lbs.  
 Cylinders, diar. and stroke ..... 19 by 24 ins.  
 Valves, diar. and type ..... 11 ins. piston  
 Drivers, diar. .... 62 ins.  
 Boiler, type ..... Extended wagon top  
 Boiler pressure ..... 180 lbs.  
 Heating surface, tubes ..... 925 sq. ft.  
 Heating surface, firebox ..... 143 sq. ft.  
 Heating surface, total ..... 1068 sq. ft.  
 Heating surface, superheater ..... 231 sq. ft.  
 Heating surface, equivalent ..... 1414 sq. ft.  
 Tubes, no. and size ..... 117-2 ins.; 18-5 ins.  
 Tubes, length ..... 10 ft. 11-16 ins.  
 Firebox, length, width, 8 ft. 3¾ ins. by 3 ft. 5¾ ins.  
 Firebox, material and make ..... Otis firebox steel  
 Grate area ..... 28 sq. ft.  
 Tank capacity, water ..... 4,000 imp. gals.  
 Tank capacity, coal ..... 10 tons  
 Axles ... main 8½ by 8½ ins., others 8 by 8½ ins.  
 Brakes ..... Westinghouse, E.T. 6  
 Brake beams, tender .... Simplex truss, inside hung  
 Couplers ..... Tower  
 Headlights ..... Oil, C.P.R. Standard  
 Steam heating ... Gold with Leslie reducing valves  
 Superheater ..... Vaughan and Horsey  
 Wheel centres ... main, cast steel; others, cast iron

been completed, and when the train filling is finished, new 80 lb. steel rails will be laid, so as to make the line conform to the general standard of construction. It is expected to have this work completed this season.

The steel work for the two bridges across Sydenham Lake is being erected. Grading is practically completed to Chaffey's locks. Considerable grading has been done right on to Ottawa, and track has been laid out of Ottawa to Hog's Back, where the line to Port Arthur branches off.

Plans are reported to be in preparation for laying out a terminal site on the north side of the Rideau River.

Sir Wm. Mackenzie, President, and D. B. Hanna, Third Vice President, were in London, Ont., Aug. 14, and discussed railway matters with the Mayor, who subsequently stated that the C.N.O. Ry. would come to London but beyond that it was impossible to say anything at present. The company's engineers are making surveys.

**Canadian Northern Ry.**—The company has given the Barnett and McQueen Co. a contract for an extension to its Port Arthur elevators, which will increase the capacity by 2,500,000 bush.

The plans for the cut-off from near River Park to the main line east of Winnipeg came before the Board of Railway Commissioners, Aug. 7. An inspection of the route was made, owing to the objection of residents, and the Board directed its engineer, H. A. K. Drury, to make a special survey and see whether any other route could be adopted which would serve the railway equally well and do less damage to property.

The extension of the Bird's Hill branch along the eastern shore of Lake Winnipeg to Fort Alexander, Man., is under construction. The grading is reported to have been completed from near the East Kildonan carline to Balsam Bay, whence it will run in an almost straight line to Fort Alexander. Press reports state that a hydro-electric power plant is to be developed at Bonnet Falls, north of Fort Alexander, and that the branch will be operated by electricity.

Hon. F. Cochrane, Minister of Railways, is reported as stating that the Dominion Government has offered to guarantee the company's bonds to aid in the building of a line from Prince Albert, Sask., to a junction with the line to Hudson Bay, near Split Lake.

Press reports state that construction is being proceeded with on a branch line from Laird, Sask., northerly for about 12 miles to Carlton.

We are officially advised that a contract has been awarded to the Northern Construction Co. for the work on the Calgary-Macleod branch, south of Calgary, Alta.

**Canadian Northern Pacific Ry.**—Twohy Bros., Spokane, Wash., have been given a sub-contract by the Northern Construction Co., and Cowan Construction Co., for 100 miles north from Kamloops, mileage 60 to 160.

The Premier of British Columbia returned to Vancouver, Aug. 2, after a trip over the line under construction as far east of Kamloops. He is reported as stating that 82 miles of the line easterly from Kamloops have been completed, and that the bridges are expected to be completed within a year. The whole of the line is under contract to the Yellowhead Pass, and construction is being progressed with almost throughout the whole mileage.

The branch line projected from Kamloops to Vernon, B.C., will be about 85 miles long; the extension from Vernon to Kelowna 30 miles, and the extension from Vernon to Lumby, 14 miles. It is being laid out as a steam line. Prospective contractors are inspecting the ground with a view of tendering, as soon as the

## Canadian Northern Railway Construction, Betterments, etc.

**Canadian Northern Quebec Ry.**—The locomotive house and machine shop at Limoilou, Que., are well advanced to completion, and work has been started on the erection of the car shops adjoining. A number of houses have been removed to make room for the approaches to the shops and the yard surrounding them which is to be laid out.

The company has started the laying of a permanent branch into the exhibition grounds at Quebec, on a right of way granted by the city.

The route map for a line from St. Jerome Jct., southerly through the counties of Two Mountains and Terrebonne to a junction with the line under construction from Hawkesbury to Montreal, near St. Eustache, has been approved by the Minister of Railways. After the old Montford and Gatineau Colonization Ry. was acquired by the C. N. Q. Ry. it was extended southerly from near Montford to St. Jerome, and the proposed line will give a direct connection with Montreal.

**Montreal Tunnel and Terminal Construction.**—Sir Donald Mann, recently laid before the Montreal board of control a complete statement of the company's plans for its lines in the city. From the tunnel portal within the city there will be a viaduct extending about 1,600 yards to the waterfront. The viaduct is an essential part of the company's plans, without it there would not be station facilities in the lower part of the city accessible to the business and financial districts; a local yard for light and perishable freight convenient to the produce and wholesale districts, and adjacent to facilities at present used for this purpose by another company, and a direct connection with the Harbor Commissioners, tracking along the river front. The viaduct would pass over land owned by the company, coming into view at the street crossings in the business sections upon ornamental bridges designed to give absolutely no interference with street traffic. The trains would all be operated by electricity. These plans are under consideration. In a report to the city council Aug. 10, the board of control expressed opposition to the level crossings and to certain other points in the plans of the company's line from the tunnel portal on the Outremont side to the present station in the east end of the city.

Sir Donald Mann was in Montreal Aug. 13 inspecting the work being done on the northern end of the tunnel. Some 205

feet have been driven and timbered. The rock has been reached and a drilling plant is being installed.

**Montreal-Ottawa-Port Arthur Line.**—Sir Donald Mann is quoted as stating in Montreal, Aug. 15, that construction work is being proceeded with on the two bridges across the Back river. One of them is nearly completed, and considerable work has been done on the second. These bridges are on the new short line to Hawkesbury, Ont., which is expected to be completed this year. The line from Hawkesbury to Ottawa is already in operation.

Construction has been started on the section of the line from just outside Ottawa towards Pembroke, Ont. The work starts at Hog's Back, and the route is through Fitzroy Harbor, and Portage du Fort, but does not run into Pembroke. It crosses the C.P.R. in Pembroke township, and the G. T. R. in Stafford township and then follows the valley of the Tuckon river for a considerable distance.

The Board of Railway Commissioners has approved of revised location maps for the line through Beauceage, Boulter, Lander, Pentland, Master, Stratton and Barron tps. Nippissing district, and through unsurveyed territory in Sudbury and Algoma districts.

Track is reported to have been laid easterly from Port Arthur to McKenzie river, where a large steel bridge is to be built. A temporary trestle has been built for construction purposes, pending the erection next year of the permanent bridge.

**Canadian Northern Ontario Ry.**—The line from Toronto to Ottawa is being operated as far as Deseronto, where connection is made with the Bay of Quinte Ry., and the section of that line from Deseronto to Sydenham, 29.7 miles, has been incorporated into the line. There were gradients as high as 1.75% on the B. of Q. R., and to overcome these, revisions have been made at Newbury, three miles long; at Yarker, one mile long; and at Sydenham, 2.5 miles long, reducing the gradient to 0.5 and making it uniform with the whole line from Toronto to Ottawa. Between the points where revisions were made a considerable amount of train filling is being done, and when this is completed there will be no gradients exceeding 0.5%. At Yarker it was necessary to build a bridge over the Napanee River, 400 ft. long, and 37 ft. above high water. The revision work has



location is completed, which we are officially advised should be within a few weeks.

We are officially advised that no plans have yet been decided on for a comprehensive lay-out of the terminal yards at Port Mann, B.C. The Northern Construction Co. is grading and laying out such part of the yard as will be required in the immediate future. Meantime the rest of the lay-out is under consideration.

Recent press reports stated that the C.N.P. Ry. had acquired a railway running between New Westminster and Hazelmere, which would give a through line to New Westminster via Port Mann. We are advised, in this connection, that the company is negotiating with the Great Northern Ry. for acquiring the right of way of the old New Westminster Southern Ry. between Port Mann and Port Kells.

## James J. Hill on the History of the Great Northern Railway.

On retiring recently from the chairmanship of the board, Great Northern Ry., J. J. Hill issued a circular to the shareholders, which contains a lot of interesting matter about northwestern railway development. Following are extracts:

Nearly 40 years ago the thought of a possible railway enterprise in the northwest began to occupy my mind. It was born of experience in northwestern transportation problems that had occupied most of my early business life, of faith in the productive powers and material resources of this part of the country, and of railroad conditions at that time. The feverish activity in securing railway concessions in land and cash that marked the sixth decade of the last century had been followed by collapse. Doomed as these enterprises were to ultimate failure by their lack of commercial foundation and financial soundness, they were suddenly wrecked by the panic of 1873. Aside from the Northern Pacific property, the lines in Minnesota most important and available if converted into real assets for the development of the northwest were the fragments of the old St. Paul & Pacific Co. Following the panic of 1873 these were in the hands of a receiver. The holders of their securities in Holland were more anxious to recover what they could from the wreck than to put more money into its completion and improvements that must be made if the properties were to continue to be operated at all. Their value lay to some extent in what was left of a land grant, which would be valuable as soon as the country should be opened, but chiefly in the possibilities of traffic from the millions of productive acres in the northwest to be opened to settlement by transportation facilities. Yet so great seemed the task and so uncertain the reward, in the general opinion, that any plan of acquiring and reorganizing the property was regarded as visionary in those days by most holders of capital and most men of affairs.

After long and close study of the situation the slender beginning was made on which we risked our all. Failure would be immediate and final disaster. My associates were Geo. Stephen, now Lord Mount Stephen, Donald A. Smith, now Lord Strathcona, and N. W. Kittson. We bought the defaulted bonds of these properties from the Dutch committee agreement with the Dutch committee was executed March 13, 1878, and practically all outstanding indebtedness was subsequently secured. The mortgages were afterwards foreclosed and the property was bought in. For those days it seemed a formidable financial undertaking. The stock of these companies aggregated \$6,500,000, and their bonded indebtedness with past due interest

H. K. Wicksteed, Chief Engineer of Surveys for Mackenzie, Mann & Co., arrived in Vancouver, July 30, and spent nearly three weeks inspecting the lines under construction, and in going over plans for the company's extensive development projects in the vicinity.

Press reports state that a contract has been let to Rigby and Marsden, Vancouver, for the building of eight steel bridges on the line east of Yale, B.C.

**Vancouver Island.**—Tenders are under consideration for building a further section of 40 miles of the line on Vancouver Island. The section extends from mileage 100, west of Cowichan Lake, to the Alberin canal, and is styled Division D. The work includes clearing, grubbing, grading, fencing, and the building of bridges, trestles, culverts and masonry. It is to be completed within a year from the signing of the contract.

nearly \$33,000,000, aside from floating obligations. These had to be purchased at prices above those for which they had previously been offered in the open market. The total capitalization and indebtedness at that time of the companies taken over was approximately \$44,000,000.

The property secured consisted of completed lines from St. Paul via St. Anthony to Melrose, 104 miles, and from Minneapolis to Breckenridge, 207 miles; and of two projected lines, one from Sauk Rapids to Brainerd and one from Melrose to the Red River at St. Vincent on the international boundary line. On these latter some grading had been done and about 75 miles of track had been laid. There were gaps between Melrose and Barnesville, Crookston and St. Vincent, that must be filled quickly. In themselves, had it not been for the promise of the future, these were scattered tracks in a country just being settled, out of which to construct a railway system and on which to base the financing of their purchase and development.

We advanced the money to build the Red River Valley Rd., 14 miles of track from Crookston to Fisher's Landing, on the Red River, making a through route by steamboat from that point to Winnipeg. While negotiations were pending and also after they were concluded, but before possession could be secured through the foreclosure of mortgages, an immense amount of work had to be done. The extension from Melrose to Barnesville must be pushed, and was carried 33 miles, as far as Alexandria; and 90 miles were built in the Red River Valley to reach the Canadian boundary. The former was necessary to save the land grant, whose time limit, already extended, was about to expire. The latter was in addition to connect with a railway projected by the Canadian government from Winnipeg south. As the properties were still in the hands of a receiver, an order had to be obtained from the court for the completion of the work in Minnesota with funds furnished by us. Money had to be raised to build these lines and to furnish equipment necessary for their operation.

In May, 1879, the St. Paul, Minneapolis & Manitoba Ry. Co. was organized to take over all these properties, whose bonds had been largely purchased, whose stocks had been secured and whose assets were to be bought in under foreclosure. It had an authorized capital stock of \$15,000,000, limited by its charter to \$20,000,000, and made two mortgages of \$8,000,000 each. Geo. Stephen was made first President of the company, R. B. Angus, Vice President, and I was chosen General Manager. This placed upon me the practical conduct of the enterprise from its formal inception.

The lines of the new system turned over to our possession on June 23, 1879, comprised 667 miles, of which 565 were completed and 102 under construction. From the beginning its business fulfilled the expectations of its founders. The annual report for 1880 showed an increase in earning of 54% and land sales amounting to \$1,200,000. And now began the long task of building up the country. No sooner was a mile of road finished than the need of building other miles became apparent. Before Minnesota had filled up, the tide of immigration was passing even the famous Red River Valley country and flowing into Dakota. By 1880 it had become necessary to add a line down the Dakota side of the Red River, to plan for many extensions and branches, and two local companies, building lines in western Minnesota, were purchased.

Only a detailed history of the railroad could follow step by step the progress of track extension and the financial arrangements by which capital was furnished for these constant and always growing demands from this time on. In a brief review such as this, I can call attention only to what may fairly be called points of historic interest in the growth of what is now the Great Northern System. One of these was the provision of an eastern outlet by way of the Great Lakes. An interest was obtained in the St. Paul & Duluth Rd. in 1881. This, with the building of the link from St. Cloud to Hinckley, gave the necessary access to the Great Lakes, until the organization of the Eastern Minnesota in 1887 as a subsidiary company furnished a permanent outlet and terminals. I was made Vice President of the company Nov. 1, 1881, and on Aug. 21, 1882, succeeded to the Presidency, a position whose duties I was to discharge for a quarter of a century. J. S. Kennedy, who had joined our party after the organization of the company, was elected Vice President. At no time have I accepted any salary for my services as President or Chairman of the Board of Directors, since I have felt that I was sufficiently compensated by the increase in the value of the property in which my interest has always been large.

Business now grew more and more rapidly, the Northern Pacific was about completed and the Canadian Pacific was building toward the Coast. The St. Paul & Pacific Rd. was originally, as its name implied, intended as a transcontinental line. The route to be traversed was rich in fertile soils and abundance of mineral and forest resources. Quite as important, perhaps, was the fact that it admitted of the construction of a line with grades so low and curves so moderate as to make possible cheaper overland carriage than had ever been previously considered. Montana was beginning a large development of her own; while the active growth of the North Pacific Coast, though only in embryo, could be foreseen. In 1887 the lines of the Manitoba were extended to a connection with the Montana Central. This latter company had been incorporated early in Jan., 1886. Realizing the importance of occupying a field in Montana which was essential to the future transcontinental line, valuable in itself and one which others were already preparing to secure, we had, with some friends, organized the company under the laws of Montana. Work was begun at once, the surveys being made in the coldest winter weather. Construction was rushed. The track was completed to Helena in 1887 and to Butte by the middle of 1888. A branch to Sand Coulee opened up the coal mines of that region, furnishing fuel for use on Montana and Dakota divisions of the line, and for the development of the mining interests in Montana which had been obliged up to that time to bring in their coal from Wyoming. The work of extending the Manitoba line to connect with the Mon-

tana Central launched this company up- on the most active period of construction ever known in this country.

Five hundred continuous miles were graded between April and Sept., 1887, and by Nov. 18, 643 miles of track had been laid, an average rate of construction of 3 1/2 miles for each working day. But this activity on the main line to the west was only one item in the extension programme. Between 1882 and 1888 the stone arch bridge and terminals in Minneapolis were completed; the Dakota line down the Red River was finished to a connection with the Canadian Pacific; the Casselton branch was purchased; a line was built from Willmar to Sioux Falls, and afterward extended to Yankton; some railways in South Dakota were bought; the Montana Central was taken over at cost, and an elevator and large terminals at West Superior were arranged for. In 1889 the line to Duluth and West Superior was completed, giving terminals and dock accommodations which today are not surpassed anywhere in the country. The total mileage operated had now increased to 3,030 miles. The company had also begun to operate its own steamships, through the Northern Steamship Company, on the Great Lakes. These boats, which began to run in 1888 and 1889, not only afforded greater dispatch in the carriage of grain and flour from the head of the lakes to Buffalo and other lake ports, but they made the railway independent of other lake lines. It was thus enabled to protect its patrons, and to prevent its reductions in rates from being absorbed by increases made by the lines east of its lake terminals.

In 1889 the Great Northern Ry. Co. was organized, to bind into a compact whole the various properties that had grown too large for the charter limitations of the old Manitoba. It leased all the property of the latter company, and was prepared to finance the undertakings about to be completed or in contemplation. By 1893 the line was opened through to Puget Sound. In the next five or six years many improvements were made by relaying track with heavier rails and by changes in equipment and large additions thereto. Branches and feeders were built to round out the system. In 1897 a more direct line from the head of the lakes to the west was created by purchase and construction that completed a road across northern Minnesota to a connection with the main line. The taking over of the Seattle & Montana which, like the Montana Central, had been built by us to assure adequate terminals on the Pacific Coast and to enable construction to go forward from both ends of the line at once, extended the system from Seattle to Vancouver, British Columbia.

In 1907 the company decided to open negotiations for the joint purchase of the Chicago, Burlington & Quincy System by the Great Northern and the Northern Pacific. These were carried to a successful completion by the issue of joint collateral trust bonds to the amount of \$215,154,000 secured by the stock of the company acquired. It has confirmed the wisdom of this act by which through traffic arrangements have been simplified, and the public has gained much by the drawing together of markets and the quick and cheap distribution of products from Chicago, St. Louis and the Pacific Coast to all business points on the West Coast. It was planned through the formation of the Northern Securities Company to combine the holding of the control of these three great properties. The purpose was to prevent a dispersion of securities that might follow where large amounts were held by men well advanced in years, and so to secure the properties against speculative raids by interests at best not directly concerned in the promotion of the country served by these lines. This was declared illegal, under the Sherman anti-trust law, by a divided court upon suit by the United States govern-

ment, and the Northern Securities Company was dissolved.

In 1907 the subsidiary companies controlled by the Great Northern, including fourteen railway companies operated as a part of it, were purchased and incorporated into the Great Northern System, making of these related parts one homogeneous whole. In the same year I resigned the presidency of the system, and became Chairman of the Board of Directors,—the office that I lay down to-day. The work of extension and improvement has gone forward steadily. By the construction of the Spokane, Portland & Seattle line, along the north bank of the Columbia River, the Great Northern and the Northern Pacific obtained jointly entry over their own tracks into Portland. Lines are now being constructed through eastern Oregon that will open up a large and productive country. In 1909 the Burlington obtained control of the Colorado & Southern; so that the Great Northern covers, directly or over the tracks of allied lines, a territory reaching from Chicago, St. Paul, Minneapolis, Duluth and Superior on the east to Puget Sound and Portland on the west, and

from Galveston to Vancouver, British Columbia. The Great Northern System has grown from less than 400 miles of the original purchase to 7,407 miles.

Not lightly may the relation between a man and the work in which he has had a vital part be set aside. My personal interest in the Great Northern remains as keen as ever. The financial interest of myself and family in it is larger now than it ever was at any time in the past, and any change would more probably increase than diminish it. While I shall be no longer the responsible head of the Great Northern, I will contribute henceforth such counsel and advice as may seem best from one no longer holding the throttle valve or controlling the brake.

Most men who have really lived have had, in some shape, their great adventure. This railway is mine. I feel that a labor and a service so called into being, touching at so many points the lives of so many millions, with its ability to serve the country, and its firmly established credit and reputation, will be the best evidence of its permanent value and that it no longer depends upon the life or labor of any single individual.

### Railway Track Labor.

By E. J. McVeigh, Storekeeper, Grand Trunk Railway, Ottawa.

When the man who handled track labor 20 years ago stops to consider, and compare, the conditions then existing with the conditions of today, and hopes for the future, he must feel that his day for doing things has gone by, never to return. Moreover, it is hard to teach old dogs new tricks, and many of the older roadmasters are really more pessimistic than they need be. In this matter we are, as in all other matters, in a state of evolution, and we must conform, or be left on one side, while younger men, men of the hour, carry on the work under the conditions they find, as the older men did in their day and generation. That conditions are different and more difficult is perfectly true, but conditions have changed in all lines of human effort. Life has become more strenuous all along the line, and where brawn fails us, we must use our brain to make life possible.

That we have done this is seen clearly on all sides, and nowhere more than in the construction and maintenance of railway permanent way. Our machinery for loading, unloading and spreading ballast and handling material shows this. In the portion of our country where the fall of snow is heavy we handled it by hand in the past when hands were many and willing; today we have other means to do it better with fewer hands, and it will be so to the end, which is not yet, and in the meantime we must live in the present and prepare for the future.

If we glance back over the railway history of this continent we will learn that when we wanted men for our track work they were recruited largely from the native stock, farmers' sons, the most intelligent and best trained labor the world has ever seen. In the early days of railway laboring, work off the farms was not so plentiful as it became later, so that these young men were more willing to take up track work. And they, with their natural intelligence and ambition, soon became expert in their work and proud of it. Many spent their lives at it, and it is from this number that our present day roadmasters and supervisors largely come.

But time flies, and as our country advanced and opened up, opportunity for this class of men increased, the railways did not fully realize the position, and did not raise wages fast enough to hold them. Whether they could in any case have held them in such a country as ours is a question, but the fact is they did not. It is today we are confronted with a fact and a condition. It is with the condition created by the fact that we must

deal, now and in the future. Go ahead we must, but we may, if we will, gather a few lessons from the past that may be of assistance in the future.

The questions have been asked, how do the railways now obtain labor, for, first, section gangs; second, extra gangs. The answer is that they obtain such labor in any way they can, and not fully recognizing the present condition of having to deal with ignorant foreign labor, few arrangements have been made, so far, to make and keep laborers satisfied and hold them. Another reason for this is that such labor is largely wanting, and no arrangements we have made will hold it for long.

It is indeed difficult to get a fair day's work out of our present track men. Even when they are willing to work hard, their ignorance and inability to understand what is said to them makes it next to impossible to get satisfactory results. Our only salvation is that we still have a few of the native stock left to lead and direct. The methods adopted to increase the amount of work accomplished will vary according to the men and conditions. There can be no rule laid down in such a matter, and I have yet to see a failure through treating men considerably. One man may do considerable driving and accomplish much without losing his men or having them go sour on him, while another may do just the reverse. But one thing we can never afford to neglect is the square deal. Man from infancy resents injustice. It may be true that in the older countries men have been forced to accept a greater measure of injustice than do men on this continent, but even then they resented it, though unable to make their resentment felt. In this country, with a choice of where and for whom they shall work, they can, and do, make their resentment effective. So that even if on no higher grounds than that of expediency, let us be fair and do justice only, in our dealings with our laborers. Not only do this personally, but see to it so far as in us lies that others do the same. The fact that many of these men will not make a fair return for fair treatment does not lessen our obligation in the matter. You owe it to yourself if not to your men, but you do owe it to them; and besides it pays, believe me, it pays well. You may not see it at once, not today nor tomorrow but our railways are not here for today nor tomorrow only, and a reputation for fair treatment or dealing is a never failing source of strength to the railway company as well as to the individual. We have all seen

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or heard of trouble with foreign labor; do not be too hasty in condemning the men in such cases. In the light of my own experience I would accept no man's word as to where the fault lies until I had heard both sides. Our railway executive are always desirous of dealing fairly with their men, but there are many heads and hands between the executive and the man with the shovel—the contractor with his "drivers," storekeepers and timekeepers; the roadmasters with their assistants. How can our executive officers be sure that these men in excess of zeal, or greed, have not gone beyond what is fair and just? And when trouble comes it is their side of the case that is heard, and the blame put on the men.

There are several causes that lead to trouble with foreign labor. One of these is, of course, the natural foolishness of the human animal, and that is not confined to any breed or nation. The other might be shortly expressed as unfair treatment; to divide this into its several phases it would read, poor food and sleeping quarters, excessive charges for supplies, "shaving" of time, brutal treatment by foremen and indifference on the part of higher officers.

Shortly after I had become interested in this matter I had an experience that was amusing and enlightening at the same time. I had given a certain man a contract to cut and pile on the right of way some thousands of cords of hard wood. He could not secure good woodmen and picked up a gang of Italians to do the work. As we required the wood for steamboat firing, the roughness of the work was of no consequence, so we let him go ahead. When they had got a fair amount cut and piled I dropped off a train and measured it up for a 30 day estimate. I did not see any of the men at this time, but it was necessary that the wood I had measured should be marked to prevent confusion, and I left a stamp hammer at the station with instructions for the section foreman to go up next morning and stamp the piles. About noon the following day I received a telegram from the foreman to the effect that he had attempted to stamp the wood, but he Italians had swarmed out of the bush and chased him two miles, and would have certainly killed him had he not been a good runner.

I wired him to meet me the next morning, and when I stepped off the train he asked me how many soldiers I had brought with me. I told him I had no soldiers, but he and I would go up and stamp the wood. He offered me the hammer and promised to pick up as many pieces of me as he could find after the gang had got through playing with me; but to go back there with one man, and he only five foot seven, he would not. He was a big Scotchman, and we had considerable of an argument, but when I told him I would offer myself as a sacrifice and give him a chance to make another run, he came along.

The roadway used by the teams bringing out the wood was west of the wood piles, and the piles stretched a quarter of a mile east in the direction of the station. I took my stand on the track opposite the roadway, while Sandy got ready either to work or run, at the east end of the longest pile. I signalled him to go ahead, and the sound of the hammer on the beech wood echoed through the forest. Wow! He had not struck six blows when hell broke out for noon, back in the cutting, and out came the Italians. One fellow had a gun, some had knives, others brought their chopping axes, and one chap had a long crosscut saw that kept catching in the brush and throwing him down, but he held on to it as his only hope. I have often listened to a pack of wolves, but that crowd could give the largest pack I ever heard cards and spades and then win in a walk. It was funny to me because I knew, but it was not funny to Sandy. I glanced at him,

and he stood in the centre of the track ready to light out for home and safety. Then the gang poured out through the opening in the fence.

But alas, what a come down! They saw me standing there laughing at them, and recognized in me the authority, so instead of murder and sudden death, there were abject apologies and attempts at explanation. But I needed none. I was the one in fault; they did not understand, and I did. I had no right to send a strange man there to stamp their wood without explaining to them. This may not seem to have a bearing on the question we are considering, but I think it has. We must make up our minds that in future we must expect to do the greater part of our track work with foreign labor. Personally I favor the Swede, and the Italian from the north of Italy. But we must do something to keep these men with us. To begin with, we should go systematically to work to secure the men we want for our sections from the better class of the people I have named, and do it now while we have a few of the native stock left to train them. Then we should help and encourage them to make homes for themselves. Keep our section force down to a reasonable number and make that number permanent. The constant change in number and personnel of our section force has a demoralizing effect. Place on the shoulders of our small permanent force the full responsibility for general maintenance, but send an extra gang over each section in the spring to put in ties and line track. If new ballast is put out, have this gang attend to it also. Rush this class of work through to a finish, and then lay off the extra gang.

Railway men everywhere are considering this very important matter carefully, and I am of the opinion that the plan I have tried to outline above is the real solution of the problem. We have been trying to go ahead in a catch as catch can manner, conditions beoming worse each year. It is time we adopted a system and followed it. Our section forces are discouraged and demoralized. If a crew manages to get ahead with the work they are taken off their section to help the fellow who, for some reason is behind. We allow an extra man, or two, if we can get them, to help with the ties. Even then it takes all summer to get a reasonable number under the track, while all other work must be neglected. The small section force can no longer line the heavy track, and crews must be doubled up for that purpose. These things are all bad, and we should get away from them.

It will be claimed that these changes will cost more money than the railway can afford to pay. But we must first remember that the work must be done whether we can afford it or not. And then I am not sure that it would cost more than now. Suppose we have been in the habit of putting two men on each section of a district of 25 sections to help out during April, May, June and July, and it takes the crews so strengthened all of this time to get in the ties, and then they cannot line or do any other work. Now make up two extra gangs of 25 men to do nothing but put in ties and line. Would not they do the whole district in less than four months, while all other work should be kept up-to-date by the regular section crew, who would neither be increased in the spring nor decreased in the fall?

We must secure permanence and contentment in our section force. It is not good policy to reward a man and crew for extra effort by taking him off his section to help some other fellow.—Railway Engineering and Maintenance of Way.

The Algoma Central and Hudson Bay Navigation Co.'s steamboat Leafield went ashore, Aug. 17, near Bagster's lighthouse, Georgian Bay.

## Mainly About Transportation People.

MRS. ROBERT PATTERSON, wife of the Master Mechanic, G.T.R., Stratford, Ont., died July 26.

P. SMITH, chief clerk to the Auditor of Passenger Receipts, G.T.R., died in the Homeopathic Hospital, Montreal, Aug. 7.

Mrs. Pariseau, wife of L. S. PARI-SEAU, of the Department of Railways engineering staff, died at Montreal, July 28.

E. A. McGUINNESS, C.P.R. station ticket agent, Brandon, Man., was married at Souris, Man., Aug. 7, to Miss E. G. Dolmage.

B. B. KELLIHER, Chief Engineer, G.T. Pacific Ry., Winnipeg, left Vancouver, Aug. 6, for a holiday trip to the United States.

F. McKINNON, baggage master, Intercolonial Ry., at Norton, N.B., was run over and killed by a train in the yard, Aug. 10.

W. F. RYAN was presented with a case of cutlery, July 27, by the C.P.R. telegraph's staff at Montreal, on leaving the service.

G. U. RYLEY, Land Commissioner, Grand Trunk Pacific Ry., Winnipeg, is convalescing after an operation for appendicitis.

Mrs. Leonard, mother of R. W. LEONARD, Commissioner, National Transcontinental Ry., died at Brantford, Ont., July 27, aged 87.

T. HORNER, General Roadmaster, Northern Division G.T.R., Allandale, Ont., left, July 29, for a six weeks' trip to the Pacific coast.

R. H. SPERLING, General Manager, British Columbia Electric Ry., and Mrs. Sperling left Vancouver, Aug. 8, for London, Eng., on a lengthened trip.

A. F. WEBSTER, steamship ticket agent, Toronto, is one of the provisional directors of the Union Brick Co., which has just been incorporated there.

H. B. SAMPLE, Terminal Agent, Intercolonial Ry., Bonaventure station, Montreal, for the past 13 years, died there, Aug. 9, after a lengthened illness.

A. A. Andrews, of Winnipeg, Man., who died in St. Luke's Hospital, Chicago, Ill., Aug. 2, was father of P. C. ANDREWS, of Mackenzie, Mann and Co.'s office.

Sir HENRY M. PELLATT, director, Toronto Ry., Toronto, has been appointed by the King to be a Knight of Grace of the Order of the Hospital of St. John of Jerusalem.

LORD STRATHCONA celebrated his ninety-second birthday, Aug. 7. He is enjoying good health, having apparently completely recovered from his recent indisposition.

A. PRICE, General Superintendent, Alberta Division, C.P.R., Calgary, returned to duty, Aug. 15, after spending a month's vacation in the Columbia valley and on the Pacific coast.

MISS B. M. BRADY, daughter of F. P. Brady, General Superintendent, Canadian Government Railways, was married at Moncton, N.B., Aug. 14, to E. H. Parmelee, of North Bay, Ont.

D. SIMPSON, who had been in the employ of the G.T.R. for 50 years, for 41 of which he has been a locomotive driver running out of Montreal west, retired from active service, July 31.

SIR WILLIAM MACKENZIE returned to Toronto from England, Aug. 1, accompanied by M. NORDEGG, one of the directors of Brazeau Collieries Ltd., with which Sir William is associated.

T. P. SHONTS, President, Toledo, St. Louis and Western Rd., New York, it is reported, will resign shortly, so that he may devote more time to the work of the Interborough Rapid Transit Co.

J. W. FARRELL, Trainmaster, Dis-

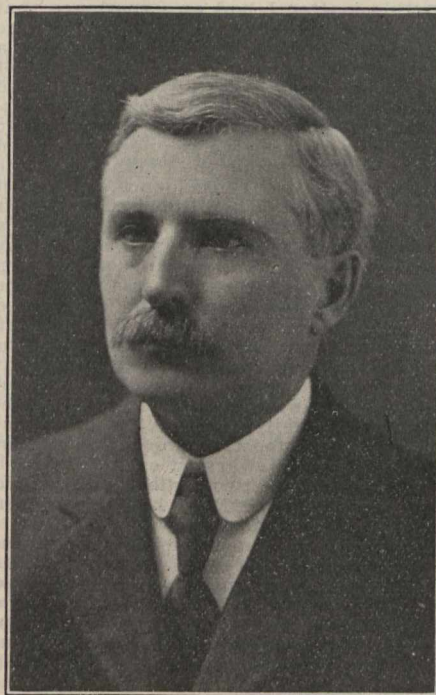
tricts 1 and 2, Eastern Division, G.T.R., Island Pond, Vt., who was recently granted extended leave of absence, on account of ill health, has resumed duty, as Trainmaster, District 2.

A. BUTZE, formerly General Purchasing Agent, Grand Trunk and Grand Trunk Pacific Railways, has been appointed Assistant Secretary and Purchasing Agent, National Steel Car Co., which is building a plant at Hamilton, Ont.

G. H. HAM, Chief of the Publicity Department, C.P.R., Montreal, was recently presented with a gold cigarette case, suitably engraved, by a number of British manufacturers, on the completion of a tour through the Dominion.

MISS FLORENCE MILLS BERTRAM, only daughter of Alex. Bertram, of John Bertram & Sons Co. Ltd., Dundas, Ont., is to be married early in the autumn to F. J. Sharp, son of the Rev. J. Sharp, of Bridgewater, N.S.

MRS. W. E. DUPEROW, wife of the General Agent, Passenger Department, G.T. Pacific Ry., Vancouver, has been visiting relatives and friends in Toronto



R. Armstrong,  
Superintendent, District 3, Saskatchewan  
Division, Canadian Pacific Ry., Saskatoon.

and Stratford, Ont., after an absence of over three years.

HUGH McDONALD, Freight Claims Agent, Canadian Northern Quebec Ry., and Quebec and Lake St. John Ry., Quebec, was married, Aug. 6, to Miss B. Neville, after which they left for a trip to New York and New Jersey.

J. W. LEONARD, Assistant to Vice President McNicoll, C.P.R., and M. N. TODD, President, Galt, Preston and Hespeler St. Ry., sailed from Montreal, Aug. 17, on the s.s. Lake Manitoba, intending to return about the middle of October.

W. C. BROWN, President, New York Central and Hudson River Rd., left Spokane, Wash., for Alaska, Aug. 9, and on returning will land at Vancouver, whence he will return to New York via the C.P.R., spending some time in the Rocky Mountains.

C. H. RUST, M. Can. Soc. C.E., City Engineer, Victoria, B.C., and formerly City Engineer, Toronto, has been elected First Vice President, American Society of

Civil Engineers. He was President, Canadian Society of Civil Engineers for the year 1911-12.

N. L. RAND, who died at Moncton, N.B., Aug. 5, entered the European and North American Ry. service in 1859, and finally retired from railway work in 1909, at which time he was Master Mechanic, Intercolonial Ry., with jurisdiction east of Campbellton, N.B.

F. W. MORSE, formerly Vice President and General Manager, Grand Trunk Pacific Ry., has resigned the position of Vice President and General Manager, Chicago and Alton Rd., Chicago, Ill., and the duties have been assumed by the President, B. A. Worthington.

R. J. WICKSTEED, LL.D., barrister, Ottawa, who died there recently, left his estate, valued at over \$58,000, to McGill University, Montreal. He was a brother of H. K. Wicksteed, M. Can. Soc. C. E., Chief Engineer of Location, Mackenzie, Mann and Co., Ltd., Toronto.

P. McQUAID, whose appointment as Master Mechanic, Prince Edward Island Ry., Charlottetown, P.E.I., was announced in a recent issue, entered P.E.I. Ry. service, Apr. 16, 1888, as machinist, and was appointed Roundhouse Foreman, Jan. 1, 1905, and Master Mechanic, June 1, 1912.

W. O. HOUSTON, who has been appointed Division Engineer, Michigan Central Rd., St. Thomas, Ont., is a graduate of the University of Michigan. He was at one time Chief Engineer, New Orleans Great Northern Rd., and has been, for the past year, an assistant engineer, M.C.R.

W. E. HAYWARD, whose appointment as Locomotive Foreman, C.P.R., North Bend, B.C., was announced in our last issue, entered C.P.R. service, June 20, 1911, since when he has been, to June 26, 1912, machinist at Revelstoke, B.C.; June 26 to July 1, 1912, Shop Foreman at Kamloops, B.C.

Mrs. Scott, who died at SIR WILLIAM WHYTE'S house, Winnipeg, Aug. 18, aged 96, was the mother of Lady Whyte. Her late husband, Adam Scott, was engaged in railway work in Toronto several years ago, and was killed on the old Northern Ry. Her son, B. W. Scott, is Freight Agent, G.T.R., Montreal.

W. D. WASHBURN, who died at Minneapolis, Minn., July 29, was, from 1861 to 1865, Surveyor General of Minnesota, and was the promoter, and for many years President of the Minneapolis and St. Louis Rd., and the Minneapolis, St. Paul and Sault Ste. Marie Ry., the latter now being controlled by the C.P.R.

H. McEWEN, whose appointment as Superintendent, Prince Edward Island Ry., Charlottetown, P.E.I., was announced in a recent issue, entered P.E.I. Ry. service, May 14, 1875, as station master at Mount Stewart, and was appointed dispatcher, Feb., 1892; Chief Dispatcher, May 1899, and Superintendent, May 1, 1912.

A. W. SMITHERS, Chairman of the Board, G.T.R., arrived in Canada, from England, Aug. 4, accompanied by his son and daughter. E. J. Chamberlin, President, G.T.R., and G. T. Pacific Ry., joined the party at Montreal, which left for a tour of the G.T.R. to Chicago, whence they proceed to Winnipeg to go over the G. T. P. Ry.

W. PHILLIPS, European Traffic Manager, Canadian Northern Ry., who has been busily engaged since his arrival in England recently, in reorganizing the department, is about to make a tour of the European agencies, accompanied by a representative of P. A. Van Es & Co., of Rotterdam, the company's General Agents on the continent.

J. M. BANNERMAN, who recently resigned from the Canadian Northern Ry. freight department, Winnipeg, on his ap-

pointment as station master, Fort Garry union station, which latter position he also resigned to become inspector, Canadian Northern Transfer Co., Winnipeg, was, on July 23, presented with a suite of furniture by the C.N.R. freight department staff.

Miss H. M. Bury, eldest daughter of GEORGE BURY, Vice President and General Manager, Western Lines, C.P.R., was married at Winnipeg, Aug. 17, to H. R. Drummond-Hay. The bride and bridegroom travelled to Montreal in the C.P.R. private car Manitoba, and sailed, Aug. 21, on the s.s. Royal George to spend about two months in Europe. They will live in Winnipeg.

S. P. PORTER, who is reported to have been appointed Executive Agent, Grand Trunk Pacific Ry., Regina, Sask., was born in Somersetshire, Eng., in 1870, and came to Canada in 1886. He was engaged in farming for a few years, and entered railway service in 1889 as trainman on the C.P.R. He was appointed homestead inspector for the Dominion Government in 1901, and in 1908 was appointed Deputy Minister of Railways, Telegraphs and Telephones for Saskatchewan.

SIR MAURICE FITZMAURICE, M., Inst. C. E., M. Can. Soc. C. E., recently resigned the position of Chief Engineer of the London County Council, Eng., to take up private practice. He was a member of the first board of engineers appointed by the Dominion Government in connection with the designing of the Quebec bridge, now under construction. One of the U. S. technical papers states that he was knighted by King George IV., who has been dead for something over 80 years.

F. H. McGUIGAN, formerly Fourth Vice President, G.T.R., and later Vice President, Great Northern Ry. (U.S.), but who has for several years carried on a general engineering and contracting business in Toronto and Montreal, was reported to be in a serious condition of health, Aug. 13, when the Montreal board of control intimated that he was compelled to abandon his contract for the construction of a filtration plant. He suffered a breakdown in July, and has been advised to take a complete rest for some time.

FOLEY BROS. & LARSEN, railway contractors, for many years carried on an extensive provision and supply business, mainly for the purpose of supplying railway construction camps. Some years ago the Winnipeg business was closed out, and it was reported, Aug. 12, that the Edmonton business had been sold. The firm originally consisted of the Foley Brothers; subsequently it was Foley Bros. and Larsen, and at a more recent date P. Welch and J. W. Stewart became associated with it, and the firm name is now Foley, Welch and Stewart.

G. C. RANSOM, who has been appointed Chairman Canadian Freight Association Eastern Lines, was born at Victor, N.Y., August 20, 1864, and entered transportation service in 1887, his record being: June, 1887 to October, 1898, with the Blue Line, Rochester, N. Y.; October, 1898 to October, 1899, New York Central Lines, Buffalo, N. Y.; October, 1899 to April, 1906, at Montreal, Chief Clerk, General Freight Department, Michigan Central Road, Detroit, Mich.; April, 1906 to January 31, 1907, Chief Clerk, same department; February 1, 1907 to August 15, 1912, District Freight Agent, New York Central Lines, Buffalo, N. Y.

O. MASSE, whose appointment as acting Chief Dispatcher, districts 4 and 5, eastern division, G.T.R., Montreal, was announced in our last issue, was born at Coteau Jet., Que., Nov. 6, 1884, and entered G.T.R. service Nov. 1, 1901, since when he has been, to Feb. 25, 1903, night freight clerk; Feb. 25, to Dec. 2, 1903, night operator; Dec. 2, 1903, to June 21, 1904, day operator; June 21, 1904 to May

30, 1905, day operator and supervisor of crews; May 30 to Oct. 15, 1905, operator in dispatchers' office; Oct. 15, 1905, to Oct. 14, 1911, dispatcher in various districts; Oct. 14, 1911, to July 1, 1912, Night Chief Dispatcher, Montreal.

J. V. DILLABOUGH, who is reported to have been appointed office engineer on the Dominion Government railway to Hudson Bay, commenced his railway work in 1905, as Resident Engineer, District D, National Transcontinental Ry., being transferred to District F, with headquarters at St. Boniface, Man., in 1907. While there, the chief works with which he was connected were the design and layout of the Transcona shops and yards, and the construction of the double track bascule bridge over the Red River, carrying the track to the Fort Garry station. He was transferred to office engineer, District F, Dec. 1911.

R. R. NEILD, who recently resigned the position of General Locomotive Foreman, C.P.R., Winnipeg, on his appointment as General Superintendent, Manitoba Bridge and Iron Works, there, entered C.P.R. service in 1900, and has held the positions of Foreman, machine shop, General Foreman, erecting shop, and was the first official to take charge of the locomotive department of the Angus shops, Montreal, supervised the organization there previous to the removal of the staff from the old plant on Delorimier Ave., and started the piece work system. He was appointed General Locomotive Foreman at Winnipeg, Feb. 1908.

ERNEST ALEXANDER, who has been appointed Assistant Secretary, C.P.R., was born in Yorkshire, Eng., Dec. 8, 1862, and commenced railway work in 1882, as private secretary to the Superintendent, Southern Division, G.T.R., Hamilton, Ont., remaining in that position until the abolition of the company's general offices there, early in 1893. On Mar. 1, 1893, he entered C.P.R. service as secretary to the President, Sir William Van Horne, and on Sir William's retirement from the presidency in 1899, he remained in the same capacity with Sir Thomas Shaughnessy, until July 1908, when he was appointed Assistant Treasurer, C.P.R., Montreal.

J. H. BROOKS, who has been appointed District Master Mechanic, District 2, Lake Superior Division, C.P.R., White River, Ont., was born in Lancashire, Eng., Aug. 6, 1867, and commenced railway work there, as fireman on the London and North Western Ry. He came to Canada in 1884, and entered C.P.R. service as stationary fireman in the car shops at Perth, Ont., remaining there until 1885, when he left railway service, returning to C.P.R. service Oct. 1887, since when he has been, to Feb. 1888, fireman at Schreiber, Ont.; Feb. 1888 to 1900, fireman at North Bay, Ont.; 1900 to Oct. 1911, locomotive driver, North Bay, Ont.; Oct. 1911 to July 1, 1912, acting District Master Mechanic, North Bay, Ont.

J. H. JOHNSTON, whose appointment as Master of Bridges and Buildings, Eastern Division, G.T.R., Montreal, was mentioned in our last issue, was born at Uxbridge, Ont., Apr. 22, 1866, and entered railway service, Oct., 1886, since when he has been, to Aug., 1898, in various positions in the engineering department, Midland Ry., now part of the G.T.R.; Aug., 1898, to Nov., 1903, Building Foreman, Northern Division, G.T.R.; Nov., 1903, to Sept. 1904, Building Inspector, Northern Division, G.T.R.; Sept., 1904, to Aug., 1905, Building Inspector, Middle Division, G.T.R.; Aug., 1905, to Jan., 1906, General Foreman, Middle Division, G.T.R., London, Ont.; Jan., 1906, to July, 1912, Master of Bridges and Buildings, Ottawa Division, G.T.R.

J. A. GLASFORD, whose appointment as Terminals Manager, Winnipeg Joint Terminals, was announced in a recent issue, and whose portrait appeared in our last issue, was born at Cardinal, Ont.,

Apr. 27, 1863. He commenced railway work 25 years ago as telegraph operator, G.T.R., Montreal, and his record covers the positions of chief clerk to General Superintendent, Detroit, Mich.; General Yardmaster, Montreal; Trainmaster, Queen and Crescent Route, Chattanooga, Tenn.; Construction Superintendent, Norfolk and Southern Ry., Virginia; Superintendent, Northern Division, same road; in charge of handling freight and passenger traffic, C.P.R., Winnipeg; and, until the date of his present appointment, in a similar position at Toronto.

SIR PERCY GIROUARD, who recently resigned the position as Governor-General and Commander-in-Chief of the British East Africa Protectorate, to join the firm of Armstrong, Whitworth and Co., of Elswick and Manchester, Eng., was engaged on early construction work on the C.P.R., but since 1888 has been connected with military service with the Royal Engineers, during which time he organized the railway system at Woolwich Arsenal, Eng., and has been director of Sudan Railways; President, Egyptian Railway Board; Director of Railways in South Africa, during the early period of the war, and in the later stages, Commissioner of Railways for the Transvaal and the Orange River colony. He was born in Montreal in 1867, and is a son of the late Justice Girouard of the Supreme Court of Canada.

J. G. RUTHERFORD, V.S., who has been appointed Superintendent of Animal Husbandry, Department of Natural Resources, C.P.R., Calgary, Alta., was born at Mountain Bank, Peeblesshire, Scotland, Dec. 25, 1857, and was educated at the Glasgow High School, Ontario Agricultural College, and Ontario Veterinary College, receiving his degree with gold medal in 1879. He was elected an honorary associate of the Royal College of Veterinary Surgeons in 1908, and was in practice for several years in Canada, the United States and Mexico. He served during the North-West rebellion in 1885, receiving the medal and clasp, and has held many Provincial and Dominion appointments in a professional capacity, his last position being Chief Veterinarian for the Dominion. He was appointed a Commander of the Order of St. Michael and St. George in 1910.

F. E. WARD, who recently announced that he would, on Sept. 1, resign the position of General Manager, Chicago, Burlington and Quincy Rd. lines east of Missouri River, Chicago, Ill., was born July 29, 1867, and educated at McGill Model School, Montreal. He entered railway service Sept. 1881, since when he has been, to Nov. 1885, consecutively, apprentice, clerk and stenographer, G.T.R. Mechanical Department, Montreal; Jan. 1886 to Dec. 1887, secretary to Second Vice President, St. Paul, Minneapolis and Manitoba Ry., St. Paul, Minn.; Jan. 1888 to Nov. 1890, secretary and chief clerk to President and General Manager, Eastern Ry. of Minnesota; Jan. 1891 to July 1894, secretary to President, Great Northern Ry.; July 1894 to Feb. 1898, Assistant to President, same road; Mar. to Oct. 1898, General Superintendent, Montana Central Ry.; and subsequently General Superintendent, Great Northern Ry., St. Paul, Minn.

J. A. HEAMAN, who has been appointed Assistant to Chief Engineer, Grand Trunk Pacific Ry., Winnipeg, was born at Memphis, Tenn., June 3, 1874, and educated in the public schools and the Collegiate Institute, London, Ont., and McGill University, Montreal. He entered railway service, Apr. 1901, since when he has been, to Apr. 1902, instrumentman, G.T.R. double track construction; Apr. to Nov., 1902, Resident Engineer on construction, G.T.R.; Nov. 1902 to Nov. 1903, Resident Engineer on maintenance, G.T.R.; Nov. 1903 to May 1905, Assistant Engineer, G.T. Pacific Ry. location, east of Winnipeg; May 1905 to Nov. 1907, Assistant Engineer in charge of location and

construction, National Transcontinental Ry.; Nov. 1907 to Oct. 1908, Assistant District Engineer, National Transcontinental Ry.; Oct. 1908 to June 1910, Assistant District Engineer, G.T. Pacific Ry.; June 1910 to Apr. 1911, District Engineer, G.T. Pacific Ry.; Apr. 1911 to Apr. 1912, Office Engineer, G.T. Pacific Ry.; Apr. to Aug. 1, 1912, Division Engineer, G.T. Pacific Ry., Fitzhugh, Alta.

W. C. LANCASTER, who was recently appointed Electrical and Mechanical Engineer, Montreal Tunnel and Terminal Construction, Mackenzie, Mann and Co., is a member of the American Institute of Electrical Engineers, and also of the American Society of Mechanical Engineers, and took degrees in both of these branches of engineering at the Virginia University. His record covers the following positions:—Electrical engineer for a large street railway in the south, in charge of the electrical and mechanical work on the construction of the Pennsylvania Rd., Manhattan crosstown tunnels, and electrical and mechanical engineer of the following works:—Five-mile section of the Catskill aqueduct tunnel in New York City, part of the Erie barge canal near Lockport, N.Y., electric pumping and water works for Long Beach, electric pumping plant for Long Island Rd., a tunnel and water power development at Shelburne Falls, Mass., and the design of the electric power plant and sewage pumping station at Havana, Cuba. He also made the tests of the first New York Central Rd. electric locomotive.

G. C. MARTIN, whose appointment as General Freight and Passenger Agent, Toronto, Hamilton and Buffalo Ry., Hamilton, Ont., was announced in our last issue, was born at Creemore, Ont., Jan. 2, 1866, and commenced his railway career as assistant to agents, Northern and North Western Ry., at Creemore, New Lowell and Thornbury, Ont. He was engaged as an operator on construction, C.P.R., near Calgary, Alta., and at Hawke Lake, Ont., in 1883, and was appointed agent and operator, Northern and North Western Ry., Colwell Jct., Ont., in 1884, was moved to Caledon East, Ont., in 1886, to Cardwell Jct., Ont., in 1888, and to the city ticket office, London, Ont., in 1889. He entered C.P.R. service in 1891 as relieving agent, and after a varied experience in station work, station auditing, dispatching, etc., for several years, he left railway service for one year, returning to the service as clerk in the G.T.R. ticket office, union station, Toronto, and in 1897 was appointed chief clerk in the General Freight and Passenger Department, Toronto, Hamilton and Buffalo Ry., Hamilton, Ont., being promoted to Assistant General Freight and Passenger Agent, same road, Oct. 1909, which position he held to July 22, 1912, the date of his present appointment.

R. ARMSTRONG, who has been appointed Superintendent, District 3, Saskatchewan Division, C.P.R., Saskatoon, and whose portrait appears in this issue, was born at Kingston, Ont., Jan. 27, 1865, and commenced railway work, May 1886, since when he has been, to June 1894, operator, Kingston and Pembroke Ry.; June 1894 to 1896, in private business; June 9 to July 1896, operator C.P.R.; Weyburn, Sask.; July to Dec. 1, 1896, operator, C.P.R., Revelstoke, B.C.; Dec. 1, 1896, to Oct 1900, agent, C.P.R., Illecillewaet, B.C.; Oct. 1900 to Oct. 1901, dispatcher, C.P.R., Nelson, B.C.; Oct. 1901 to Apr. 1902, relieving agent, Nelson and Vancouver districts, C.P.R.; Apr. 1902 to Sept. 1906, yard agent, C.P.R., Vancouver, B.C.; Sept. 1906 to Aug. 1907, agent, C.P.R., Vancouver wharf; Aug. 1907 to May 1908, agent, C.P.R., Vancouver, B.C.; May 1908 to Jan. 1910, General Agent, C.P.R., Fort William, Ont.; Jan. 1910 to July 1912, Superintendent Fort William Terminals, C.P.R. On leaving Fort William recently, he was presented with a gold chain and locket, and a silver tea

set and casket of silver for Mrs. Armstrong, by the local staff, and an address, a cut glass set, two chairs and a travelling bag, by members of the board of trade and the city council.

W. G. BROWNLEE, who has resigned the position of General Transportation Manager, G. T. R., Montreal, was born at Lawrenceville, Ill., September 9, 1858, and entered railway service in 1877, since when he has been, to 1879, operator, Ohio Mississippi Ry.; 1879 to 1881, operator and train dispatcher, Union Pacific Ry.; 1881 to 1884, train dispatcher and trainmaster, Denver and Rio Grande Road; 1884 to 1887, train dispatcher, Union Pacific Road, Laramie, Wyo.; 1887 to 1889, train dispatcher, same road, St. Louis, Mo.; 1892 to February, 1900, Division Superintendent, same road, St. Louis, Mo.; February, 1900 to May, 1901, Assistant Superintendent, Eastern Division, G. T. R., Belleville, Ont.; June, 1901 to March, 1902, Superintendent, Eastern Division, same road, Montreal; March, 1902 to December, 1904, Superintendent, Western Division, same road, Detroit, Mich.; January, 1905 to April, 1907, Superintendent, Middle Division, same road, Toronto; April 1907 to August 16, 1912, General Transportation Manager, same road, Montreal. In an interview after his resignation had been announced, he is reported to have said: "I have been 36 years in railway service and have never been a day off the pay roll in that time. For the last two and a half years I have not had a holiday and in that time I have travelled in the course of my duties, at the rate of over 70,000 miles a year. I have now come to the conclusion not only that I want a rest, but that it is time I enjoyed some of the pleasures of life. I intend to go down to my summer cottage on Peaks Island, Casco Bay, until October 1, when I shall probably go abroad for four or five months. Beyond that I have no plans so far."

The Great North Western Telegraph Co., in order properly to take care of its rapidly increasing business, has recently completed a number of improvements in its larger offices. In the Toronto office there has been installed an up to date plant, the large main line switch which accommodates all the trunk lines having been moved, and the wires placed in a new, all steel frame, which also contains marble panels for table connection jacks. Special features of the new work include: steel switch board frame, new combined transfer protector, terminal rack and repeater tables. The multiplex apparatus has been placed on repeater tables near the switch board, and the operators placed on extended locals. This greatly facilitates the wire chiefs' work. The operating tables have been equipped with new style resonators and improved message clips. These changes have been made under the direction of C. E. Davies, Supervisor of Equipment, and J. Murdock, Electrician. The company is also making further improvements in its equipment at Montreal, Quebec, Ottawa, Hamilton, Ont., Campbellton, N.B., and Winnipeg, which when completed will add considerably to its present facilities.

The Fort George and Alberta Telephone and Electric Co. has erected a telegraph line connecting Fort George with the Government Yukon telegraph line at Blackwater, and it is said that arrangements are being made with the Government by which the company will cut in straight to Ashcroft and thence to Vancouver, thus obviating the necessity for relaying messages to the coast.

The Roadmasters and Maintenance of Way Convention will be held at Buffalo, N.Y., Sept. 10-13. Among those named to speak at the dinner on Sept. 12 is M. S. Blaiklock, Engineer Maintenance of Way, G.T.R., Montreal.

## Honor Bestowed on T. C. Keefer.

T. C. Keefer, past President of both the Canadian and American Societies of Civil Engineers, and one of the oldest and best known engineers in America, has been elected an honorary member of the Institution of Civil Engineers of Great Britain, in recognition of the distinguished part he has taken in the engineering enterprises which have aided so largely the development and prosperity of Canada, and on account of the services he has rendered to the engineering profession during his long association with it. He will be 91 years old on Nov. 4. He began his engineering career in 1838 on the Erie canal. Later he was Division Engineer in the building of the Welland canal. In 1845 he was Chief Engineer of the Ottawa River improvement work. Six years later he made preliminary surveys for the G.T.R., and his influence was largely responsible for the abandonment of the broad gauge. He was engineer for the design and construction of the waterworks of Montreal, Hamilton and Ottawa, and was prominent in the inception and ultimate construction of the C.P.R. He was the first President of the Canadian Society of Civil Engineers in 1887, and served again in that office in 1897. He is a Companion of the Order of St. Michael and St. George, an officer of the French Legion of Honor, and has been the recipient of many other honors.



## The Commissioners of the Transcontinental Railway.

### NOTICE TO CONTRACTORS

#### Tenders for Piping Systems, Pipe Tunnels, Pipe Coverings and Wiring Ducts.

Sealed Tenders, addressed to the undersigned, and marked on the envelope, "Tenders for Piping Systems, Pipe Tunnels, Pipe Coverings, and Wiring Ducts," will be received at the Office of the Commissioners of the Transcontinental Railway, at Ottawa, Ontario, until 12 o'clock noon, of the 16th day of September, 1912, for furnishing and installing all Piping Systems, Pipe Tunnels, Pipe Coverings, and Wiring Ducts required in connection with the Car Shop Plant of the Winnipeg Shops, situated in Section 5, Township 11, Range 4-E, on the line of the National Transcontinental Railway, about six miles East of Winnipeg, Manitoba.

Plans may be seen and specifications and forms of tender obtained at the office of Mr. W. J. Press, Mechanical Engineer, Ottawa, Ont., and at the office of Mr. H. H. Pinch, Assistant Engineer, Transcona, Manitoba.

Persons tendering are notified that tenders will not be considered unless made on the printed forms supplied by the Commissioners.

Each tender must be signed and sealed by all the parties to the tender, and witnessed, and be accompanied by an accepted cheque on a Chartered Bank of the Dominion of Canada, payable to the order of the Commissioners of the Transcontinental Railway, for a sum equal to ten per cent. (10 p.c.) of the amount of the tender.

The cheque deposited by the party whose tender is accepted will be deposited to the credit of the Receiver-General of Canada, as security for the due and faithful performance of the Contract according to its terms. Cheques deposited by parties whose tenders are rejected, will be returned within ten days after the signing of the contract.

The right is reserved to reject any or all tenders.

By order,

P. E. RYAN,

Secretary,

Dated at Ottawa, August 22nd, 1912.

Newspapers inserting this advertisement without authority from the Commissioners, will not be paid for it.—27510.

## Transportation Appointments Throughout Canada.

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

**Canadian Northern Ry.**—P. A. Van Es & Co., Rotterdam, Holland, who are the General Agents on the European continent for the Canadian Northern Ry., except in Patras, Greece, have appointed the following agents:—

- Antwerp—John P. Best & Co.
- Bremen—Carl Prior.
- Paris and Havre—Caplain, Cahen & Strauss.
- Barcelona and Valencia—McAndrews & Co.
- Alicante—Carey & Co
- Stockholm—Aktiebolaget Nyman & Schultz.
- Gothenburg—C. W. Lindegren.
- Christiana—Th. Mortensen.

**Canadian Pacific Ry.**—ERNEST ALEXANDER, heretofore Assistant Treasurer, has been appointed assistant Secretary, vice A. R. G. Heward, deceased. There are two Assistant Secretaries, H. Campbell Oswald being the other. Office, Montreal.

M. J. POWER, heretofore secretary to the President, has been appointed General Storekeeper for Lines East of Fort William, Ont., vice J. H. Callaghan, deceased. Office, Montreal.

F. E. DEWEY has been appointed Assistant Inspector of Transportation, Eastern Lines, vice J. B. Smith, who is acting as Assistant Superintendent, Montreal Terminals. Office, Montreal.

W. H. STEWART, heretofore chief clerk to H. H. Vaughan, Assistant to the Vice President, Montreal, and latterly acting Assistant Superintendent, Ottawa, has been appointed Assistant Superintendent, District 4, Eastern Division, vice J. H. Boyle, appointed Superintendent, District 3, Lake Superior Division, Schreiber, Ont., as announced in our last issue. Office, Ottawa.

R. C. MORGAN, heretofore Superintendent, Great Northern Ry., Spokane and Marcus, Wash., has been appointed Superintendent, Fort William Terminals, vice R. Armstrong, transferred. Office, Fort William, Ont.

A. McARTHUR has returned to duty as Locomotive Foreman at Fort William, Ont., and A. Sturrock, who has been acting Locomotive Foreman, has returned to his former position as Back Shop Foreman at Fort William.

L. B. COPELAND, heretofore Roadmaster, Parry Sound, Ont., has been appointed Roadmaster, Regina subdivision, Saskatchewan Division. Headquarters, Regina.

District 3, Saskatchewan Division, heretofore covering the territory, Bredenbury to Hardisty, except Bredenbury; Neudorf to Lanigan, except Neudorf, Rosetown to Macklin, has been divided, and is now operated as Districts 3 and 4, respectively, as follows:—District 3: Wynyard subdivision, except Bredenbury; Neudorf subdivision; Lanigan subdivision, including Saskatoon. Superintendent, R. ARMSTRONG, heretofore Superintendent, Fort William Terminals, Manitoba Division, Fort William, Ont. Office, Saskatoon. District 4: Saskatoon subdivision, except Saskatoon; Wilkie subdivision; Kerrobert subdivision. Superintendent, H. H. BOYD, heretofore Superintendent, District 3, Saskatchewan Division. Office, Saskatoon.

R. A. JONES, heretofore locomotive driver, Moose Jaw, Sask., has been appointed Master Mechanic, Saskatoon, Sask., vice J. D. Watson, resigned.

G. WHITELEY, heretofore District Master Mechanic, Moose Jaw, Sask., has been appointed acting Master Mechanic, Saskatchewan Division, vice D. T. Main, on leave of absence. Office, Moose Jaw.

G. F. BURGESS has been appointed acting District Master Mechanic, District 2, Saskatchewan Division, vice G. White-

ley, appointed acting Master Mechanic, Saskatchewan Division. Office, Moose Jaw.

W. J. READER has been appointed Storekeeper at East Calgary, Alta., vice A. Clark, transferred.

A. C. HARSHAW, heretofore Trainmaster, Maintenance and Operation, Calgary Terminals, has been appointed Superintendent, Calgary Terminals. Office, Calgary, Alta.

J. G. RUTHERFORD, V.S., formerly Chief Veterinarian, Dominion Government service, Ottawa, has been appointed Superintendent of Animal Husbandry, Department of Natural Resources, reporting to J. S. Dennis, Assistant to the President. Office, Calgary, Alta.

D. G. McDONALD, heretofore Locomotive Foreman, Red Deer, Alta., has been appointed Assistant Foreman, East Calgary, Alta., roundhouse.

H. ALLAN, heretofore first class boiler maker, Calgary, Alta., has been appointed Assistant Boiler Inspector, Alberta Division. Office, Calgary.

D. H. FORD, heretofore Roadmaster, White River, Ont., has been appointed Roadmaster, Laggan subdivision, Alberta Division. Headquarters, Calgary.

J. W. CORMODE, heretofore chief clerk, Stores Department, Calgary, Alta., has been appointed Assistant Stores Inspector, vice F. G. Bannister, resigned.

W. J. WOOD, heretofore Storekeeper, Medicine Hat, Alta., has been appointed chief clerk, Stores Department, Calgary, Alta., vice J. W. Cormode, promoted.

A. A. SMITH, heretofore Trainmaster, Lethbridge, Alta., has been appointed acting Superintendent, District 1, Alberta Division, vice J. M. Cameron, on leave of absence. Office, Medicine Hat.

H. ALLEN has been appointed Assistant Boiler Inspector, Alberta Division.

A. CLARK, heretofore Storekeeper, East Calgary, Alta., has been appointed Storekeeper at Medicine Hat, Alta., vice W. J. Wood, transferred.

W. BELL, heretofore Bridge and Building Foreman, Medicine Hat, Alta., has been appointed acting Bridge and Building Master, there, vice W. H. Gordon, appointed Trainmaster, Red Deer, Alta., as announced in our last issue.

C. A. LITTLE, heretofore Locomotive Foreman, Alberta Ry. and Irrigation Co., Lethbridge, Alta., has been appointed Locomotive Foreman, C.P.R., Red Deer, Alta., vice D. G. McDonald, assigned to other duties.

W. H. MORTON, who was recently appointed Locomotive Foreman at Roseberry, Man., vice H. Ingram, resigned, has been appointed Shop Foreman at Kamloops, B.C., vice H. A. Keswick, resigned, and the position of Locomotive Foreman at Roseberry, Man., has been abolished.

W. E. HAYWARD has been appointed Locomotive Foreman at North Bend, B.C., vice C. H. Tedlock, resigned.

F. COCHRANE, heretofore conductor, has been appointed Night Yardmaster, Revelstoke, B.C. This is a new position.

**Central Vermont Ry.**—J. S. CARDER has been appointed Travelling Passenger Agent, New London, Conn.

**Duluth, South Shore and Atlantic Ry.**—E. R. LEWIS, formerly Division Engineer, Michigan Central Rd., Bay City, Mich., has been appointed Assistant to the General Manager, D. S. S. and A. Ry., and Mineral Range Rd., with duties as may be assigned to him from time to time by the Vice President and General Manager. Office, Duluth, Minn.

J. C. BEBB, formerly of the Michigan Central Rd. engineering department, is reported to have been appointed Assistant to Chief Engineer, D.S.S. & A.R., vice N. Cadarette. Office, Marquette, Mich.

**Grand Trunk Pacific Ry.**—H. A. WOODS, Assistant Chief Engineer, whose headquarters were removed from Montreal to Winnipeg, some time ago, has

again been transferred to Montreal.

J. A. HEAMAN, heretofore Division Engineer, Fitzhugh, Alta., has been appointed Assistant to Chief Engineer. Office, Winnipeg.

S. P. PORTER, heretofore Deputy Minister of Railways, Telegraphs and Telephones, for the province of Saskatchewan, Regina, is reported to have been appointed Executive Agent, G.T.P. R., with office at Regina, Sask.

E. FARRINGTON, heretofore chief clerk, Trainmaster's office, G.T.R., Ottawa, has been appointed chief clerk and secretary to Superintendent, G.T.P.R., Regina, Sask.

F. J. GEORGE, heretofore Assistant Engineer on construction between Tete Jaune Cache and Fort George, reporting to Division Engineer, Fitzhugh, Alta., has been appointed Division Engineer, Fitzhugh, Alta., vice J. A. Heaman, promoted.

A. WATT, heretofore Locomotive Foreman, Prince Rupert, B.C., has been appointed General Foreman there.

The following agents have been appointed:—Cabot, Man., A. Jackson; Gregg, Man., D. W. Peters; Grand Trunk Pacific Jct., Man., E. E. Blaine; Gerald, Sask., R. W. Gibson; Tate, Sask., G. V. Nowlan; Bradwell, Sask., T. W. Fleming; Biggar, Sask., J. O'Leary; Coblenz, Sask., H. E. Henshaw; Lestock, Sask., P. D. Hamilton; Ebenezer, Sask., P. L. Bolton; Camrose, Alta., A. McRae; Ryley, Alta., E. D. Young.

**Grand Trunk Ry.**—W. G. BROWN-LEE, General Transportation Manager, having resigned, the position has been abolished. Division superintendents, Superintendent Car Service and others, reporting formerly to the General Transportation Manager, will report, until further notice, direct to the Vice President in charge of operation, H. G. Kelly.

E. S. COOPER, heretofore acting Trainmaster, Districts 1 and 2, Eastern Division, has been appointed Trainmaster, District 1, Eastern Division. Office, Island Pond, Vt.

J. W. FARRELL, heretofore Trainmaster, Districts 1 and 2, Island Pond, Vt., has been appointed Trainmaster, District 2, Island Pond, Vt.

H. W. MATTHEWS, Trainmaster, Districts 25 and 29, Western Division, has had his office changed from Port Huron, Mich., to Battle Creek, Mich.

C. A. GORMALY, heretofore Commercial Agent, St. Louis, Mo., has been appointed Commercial Agent, Chicago, Ill., vice H. E. Graves, retired after 46 years continuous service with the system and its affiliated interests.

W. H. BURKE, heretofore Travelling Freight Agent, Chicago, Ill., has been appointed Commercial Agent at St. Louis, Mo., vice C. A. Gormaly, promoted.

J. A. BUCKNELL, heretofore Agent, Jackson, Mich., has been appointed Travelling Freight Agent, Chicago, Ill., vice W. H. Burke, transferred.

The following agents have been appointed:—Lacadie, Que., J. A. Langlois; Huntingdon, Que., E. E. Bourdon; Beauharnois, Que., E. Rheaume; St. Dominique, Que., J. B. Cataford; Keene, Ont., P. Stinson; Uthoff, Ont., R. G. Winters; Kirkfield, Ont., G. Raymes; Alliston, Ont., E. M. Ellis; Everett, Ont., E. N. Marshall; Grimsby Beach, Ont., J. A. Mitchell; Winona, Ont., S. A. Fairweather; Hespeler, Ont., N. A. Walford; Owen Sound, Ont., J. G. Heyd; Whitechurch, Ont., R. M. Patten; Ripley, Ont., W. M. Salkeld; Vankleek, Ont., G. A. Cass; Kinburn, Ont., O. B. Elliott; Wilno, Ont., G. H. Bates; Brule Lake, Ont., P. F. Madden; Sprucedale, Ont., H. W. Otta; Rose Point, Ont., R. J. Hardy; Beaverton, Ont., W. T. Byam; Stouville Junc., Ont., J. R. Hodgins; Brown Hill, Ont., S. W. Sterritt, Assistant; Greenfield, Ont., J. S. Gemmill; Pembroke, Ont., F. O. Parent; outside agencies: Galt, Ont., G. T. Misener; Ridgeway, Ont., J. G. Little; Sarnia, Ont., G. E. Wadland.

**Hudson Bay Ry.**—J. V. DILLABOUGH, heretofore office engineer, District F. National Transcontinental Ry., is reported to have been appointed to a similar position on the Dominion Government railway to Hudson Bay.

**Intercolonial Ry.**—J. GRAHAM has been appointed Foreman of Erecting Shop, Moncton, N.B., vice J. Nugent, superannuated.

**Michigan Central Rd.**—W. O. HOUSTON, heretofore on the engineering staff, has been appointed Division Engineer at St. Thomas, Ont., vice G. H. Harris.

J. H. MEGLEMYR has been appointed Division Freight Agent, Buffalo, N.Y., vice G. C. Ransom, resigned on his appointment as Chairman, Canadian Freight Association Eastern Lines, Montreal.

D. S. SUTHERLAND, heretofore Division Superintendent, Detroit, Mich., has been appointed General Agent, with such duties as may be assigned to him by the General Manager, and the position of Division Superintendent at Detroit has been abolished. Office, Detroit.

F. B. MARBLE, heretofore Division Engineer, Detroit, Mich., has been appointed Assistant to Chief Engineer, Detroit.

G. H. HARRIS, heretofore Division Engineer, St. Thomas, Ont., has been appointed Division Engineer, Detroit, Mich., vice F. B. Marble, promoted.

**Prince Edward Island Ry.**—J. E. R. McEWEN has been appointed Assistant Train Dispatcher, Charlottetown, P.E.I.

**White Pass and Yukon Route.**—J. L. McPHERSON, Civil and Mining Engineer, has been placed in charge of the Industrial Department, the purpose of which is to investigate the mining resources of Alaska and Yukon contiguous to the transportation property, and to aid in its development. Office, Skagway, Alaska.

C. J. ROGERS, heretofore acting Purchasing Agent, has been appointed Purchasing Agent, and the position of acting Purchasing Agent has been abolished. Office, Vancouver, B.C.

G. H. MILLER, heretofore acting Auditor, has been appointed General Auditor, and the position of acting Auditor has been abolished. Office, Skagway, Alaska.

H. WHEELER, who has been appointed Superintendent at White Horse, Yukon, vice W. Taylor, resigned, has charge of the River Division and the Mail Service Department, including stage lines.

The Northern Electric & Manufacturing Co.'s general supply catalogue no. 2 is now ready for distribution, and copies will be sent to every one regularly engaged in the electrical business whose name is at present on this company's mailing list. It is a large, well bound catalogue, with over 850 pages devoted to electrical supplies, telephone apparatus and fire alarm apparatus. An examination of the catalogue shows great care taken in compiling, particularly in the arrangement of the various sections, so as to make the location of any particular article quick and easy. The method of arrangement follows along the line of grouping the materials together in their various classes, thereby having the advantages of a separate bulletin catalogue, with the further advantage of the information all being under one cover, with no possible chance of being incomplete. Complete stocks of standard material listed in this catalogue are carried by the different branch houses at Montreal, Toronto, Winnipeg, Regina, Calgary, Edmonton and Vancouver, so that prompt shipment can be made to any part of Canada, and the delivery effected promptly.

J. W. Craigie, Goderich, Ont.; J. S. Giles, C.P.R., Lachute, Que., and F. Eastman, G.T.R., Danville, Que., have become members of the Canadian Ticket Agents Association.

### Dominion Railway Subsidy Agreements.

The Dominion Government has entered into agreements, under the acts granting aid for the construction of railways, as follows:—

**QUEBEC AND SAGUENAY RY.**—From St. Joachim, northeasterly, 62.8 miles. June 29.

**DOMINION ATLANTIC RY.**—From Centreville to Weston, not exceeding 15 miles, in lieu of subsidy granted in 1908. July 2.

**NORTHERN NEW BRUNSWICK and Seaboard Ry.**—From Drummond Mines at Austin Brook to the Intercolonial Ry., and from the latter point to Alston Point, not exceeding 26 miles. July 18.

**HA HA BAY RY.**—From the Quebec and Lake St. John Ry., at or near Mathias, Jonquieres tp., Que., not exceeding 20 miles;

From Labrosse Jct., to the Saguenay river, northerly through Chicoutimi, not exceeding 5 miles;

From La Terriere Jct., southerly to Lake Kenogami, by way of La Terriere village, not exceeding 12 miles;

From Bagotville village, easterly to St. Alexis village, not exceeding 3 miles. July 18.

**CANADIAN PACIFIC RY.**—Towards the construction of a railway bridge over the Saskatchewan river, connecting

Strathcona with Edmonton, in lieu of subsidy granted in 1908. Aug. 2.

**CANADIAN NORTHERN PACIFIC Ry.**—From the Yellowhead Pass to Vancouver and the mouth of the Fraser river, 525 miles. Aug. 7.

**Eye and Ear Tests for Railway Employees.**—The Board of Railway Commissioners' judgment in this matter was given fully in Canadian Railway and Marine World for August. An order has been set forth in a schedule attached to the order and entitled "Uniform rules governing the determination of visual acuity, color perception and hearing of railway employes on steam railways."

**First Aid to Injured on the C.P.R.**—In the article on this subject in Canadian Railway and Marine World for August reference was made to a number of places at which classes have been established, but Smiths Falls, Ont., was not mentioned. We are advised that this is the banner class in the Dominion, having at the examinations last autumn passed the largest number of first aid men of any class.

The Canada Railway News Co. has been given the contract for catering in the Fort Garry union station, Winnipeg. Alterations are to be made in the north wing on the ground floor, so as to provide adequate accommodation, and it is expected to open the restaurant during September.



The Fort Garry, the Grand Trunk Pacific Railway's Winnipeg Hotel.

This illustration, from the architect's drawing, shows the Grand Trunk Pacific Ry.'s hotel being built on Broadway, Winnipeg, opposite the Manitoba Club, and close to the Fort Garry union station. It is said it will be the equal of the Chateau Laurier, at Ottawa, in appearance and luxuriousness of appointment and will cost about \$1,000,000.



## Bridge Construction on the Canadian Northern Pacific Railway.

Some details of the ten bridges on the Fraser and Thompson Rivers in British Columbia, for which tenders were being asked by the Canadian Northern Pacific Ry., were given in Canadian Railway and Marine World for July, pg. 337, mentioning the location and character of each bridge. We now republish the details, together with considerable further information as to the weight, method of erection, etc., of the bridges.

No. 1 will cross the Fraser River a short distance above the C.P.R. bridge, or about five and a half miles below Lytton. Starting from an abutment on the hillside at the west end, the structure will have three 40 ft. deck plate spans, supported by a steel bent and a steel tower, a 60 ft. plate girder span over the C.P.R. right of way, a 40 ft. tower span and tower, a 90 ft. plate girder span, a 424 ft. three hinged rivetted spandrel arch span and a 30 ft. plate girder span.

The substructure will consist entirely of concrete pedestals, those for the arch springing from solid rock, and the others, with enlarged bases, resting upon earth. The depth of the foundations of the latter cannot be determined until the excavations are made. At the easterly end of the structure the almost vertical face of the rock will have to be cut away in order to reach material sound enough to provide a satisfactory footing for the steel pedestals of the arch, and to give clearance for the end vertical posts thereof. The arch is to be erected by cantilevering from the rock bluff at the easterly end, and from the steel towers at the westerly end.

The approximate quantities of materials are:—Concrete in pedestals and abutments, and for filling column feet, 1,290 cubic yards; metal furnished specially for substructure and embedded in the concrete, 1,000 lbs.; solid rock removed from bluff at east end, 1,000 cubic yards; structural steel in arch span, including that temporarily used for cantilevering, 2,355,000 lbs.; structural steel in plate girder spans and trestle, 520,000 lbs.; lumber in deck, 124 M., B.M.; track, 775 lineal feet.

No. 2 will cross the Fraser River just below Lytton, about half a mile from the C.P.R. station. The portion of this bridge over the water will consist of a 292 ft. riveted span, with flanking spans of 150 ft. at each end, from which the centre span is to be erected by cantilevering. The approaches will be of deck plate girders supported by concrete piers.

The two main piers, of concrete, are to be put in by cofferdams; one of the side piers will be on bare rock, and the other piers and abutments are to be founded on earth in the dry. A small amount of riprap will be required for one of the main piers, and possibly for some of the others, but this cannot be determined until the excavations are made. The current of the river in the channel is swift, but at the sides it is moderate, and the bed is covered with rather large boulders, a combination which renders the use of false work for the middle span inadvisable, hence the side spans are first to be erected on falsework, and the main span is to be cantilevered from there; after which the toggles are to be removed and the bridge left as a single span structure. The upstream ends and the sides of the main piers are to be protected against grinding by metal plates.

Approximate quantities of materials:—Concrete in piers and abutments, excepting only the base of pier four (in which there will be 1,600 cubic yards), 6,900 cubic yards; metal for embedding in concrete, 2,000 lbs.; metal in pier protection, 26,000 lbs.; structural steel in truss spans, including that temporarily used for cantilevering, 2,345,000 lbs.; structural steel in plate girder spans, 510,000 lbs.; timber in deck, 124 M., B.M.; track, 981 lineal feet.

No. 3 will cross the Thompson River a very short distance above the mouth and within the town limits of Lytton. At the west end of the bridge there is to be a concrete abutment supporting a 90 ft. plate girder span, following which there will be three 150 ft. deck, open webbed, riveted girder spans, the westerly one resting on either a small concrete abutment or a bearing cut into the solid rock. The concrete piers are all to be parallel to the current.

The foundations for the piers are of solid rock, and the construction will be in the dry at a comparatively low stage of water. The spans will be on a skew. No protection will be required against ice. The current is very swift, from seven to 11 miles an hour, but the low water channel is quite narrow.

Approximate quantities of materials:—Concrete in piers, pedestals and abutments, 3,870 cubic yards; metal embedded in concrete, 1,000 lbs.; rock excavation from bluffs, 40 cubic yards; structural steel in truss spans, 1,134,000 lbs.; structural steel in plate girder spans, 140,000 lbs.; timber in deck, 130 M., B.M.; track, 580 lineal feet.

No. 4 will cross the Thompson River midway between Spatum station and Black Canyon siding, on the C.P.R. The superstructure will consist of six 125 ft. deck, open webbed, riveted spans, supported by five concrete piers and two concrete abutments. Four of the piers have to rest on pneumatic caissons, and the other pier and abutments are to have ordinary earth foundations.

Approximate quantities of materials:—Concrete in shafts of piers and in abutments, 1,750 cubic yards; mass of bases in pneumatic piers, 1,700 cubic yards; mass in base in open dredging pier, 285 cubic yards; piles below cutting edges of base, 1,000 lineal feet; metal embedded in concrete, 6,000 lbs.; metal in cutting edges, 50,000 lbs.; structural steel in truss spans, 1,724,000 lbs.; timber in deck, 156 M., B.M.; track, 780 lineal feet.

No. 5, which will cross the Thompson River about six miles below Ashcroft, will consist of a single through truss span of about 16 ft., resting on little concrete abutments that are resting on solid rock. As the final survey of this crossing has not yet been made, the span length may have to be changed later. As the bridge is located over a narrow deep gorge, it will be necessary to erect by cantilevering and anchoring back into the solid rock.

Approximate quantities of materials:—Concrete in abutments, 380 cubic yards; metal embedded in concrete, 1,000 lbs.; structural steel in truss span, including that temporarily used for cantilevering, 500,000 lbs.; timber in deck, 22 M., B.M.; track, 190 lineal feet.

No. 6 will cross the Thompson River about two miles above Ashcroft. It will consist of six 93 ft. deck plate girder skew spans on concrete piers having shafts parallel to the current. These shafts will rest on cribs containing concrete and piles, if the latter can be driven, as in all probability they can by using water jets, for the material to be penetrated is mainly sand and gravel, covered in many places with boulders.

Approximate quantities of materials:—Concrete in shafts of piers and abutments, 2,120 cubic yards; mass of bases of piers, 1,820 cubic yards; metal embedded in concrete, 1,000 lbs.; metal in cutting edges, 45,000 lbs.; structural steel in plate girder spans, 783,000 lbs.; timber in deck, 75 M., B.M.; track, 555 lineal feet.

No. 7, which will cross the Thompson

River another mile above Ashcroft, will be on a skew. It will consist of twelve 85-ft. deck plate girder spans, resting on 11 concrete piers and two concrete abutments.

For about half the foundations it will probably be advisable to use cofferdams, and for the other half cribs. Piles are to be used in every foundation where it is possible to drive them.

Approximate quantities of materials:—Concrete in shafts of piers and in abutments, 2,760 cubic yards; mass of bases of piers, 3,410 cubic yards; piles below cutting edges of bases of piers, 18,200 lineal feet; metal embedded in concrete, 3,000 lbs.; metal in cutting edges, 43,000 lbs.; structural steel in plate girder spans, 1,436,000 lbs.; timber in deck, 146 M., B.M.; track, 1,055 lineal feet.

No. 8 will bisect the Thompson River about a mile below Wallachin. It will consist of 11 93 ft. deck plate girder, skew spans. These will rest on 10 concrete piers and two concrete abutments to be founded on piles, if they can be driven.

It will be advisable to employ cofferdams instead of cribs for the building of some of the piers. Riprap of large stones will be required round each pier. The depth of the foundations cannot be determined until the excavation is done.

Approximate quantities of materials:—Concrete in shafts of piers and in abutments, 2,290 cubic yards; mass of bases of piers, 1,820 cubic yards; metal embedded in concrete, 1,000 lbs.; riprap, 660 cubic yards; structural steel in plate girder spans, 1,455,000 lbs.; timber in deck, 140 M., B.M.; track, 1,030 lineal feet.

Bridge No. 9 will cross the Thompson River almost midway between Wallachin and Savonas, which stations are some seven miles apart. At the west end of the bridge location there is a rocky hill from the foot of which the bridge will start with a through skew span of about 200 ft., then will come six half through, plate girder skew spans of 91 ft. each. These spans will rest on concrete piers and abutments.

The west abutment will be built in the dry; no. 1 pier, the east abutment and two or three of the other piers will require the use of coffer dams, and the remaining piers will rest on cribs filled with concrete and piles. The water is deep and swift, and the bottom is so paved with large boulders as to be practically impenetrable, so that the erection of falsework for the long span is out of the question.

Probably the most satisfactory and economical method would be to use three barges thoroughly braced together horizontally at their tops and carrying timber falsework braced substantially in vertical planes. The metal would have to be barged out from up stream and let down by lines from deadmen. By always adhering to as symmetrical and uniform a distribution of metal over the falsework as possible, cantilevering the two end panels beyond the barges, keeping the metal at all times well above its final elevation, and letting water into the barges when the steelwork is all up and connected, no serious inconvenience would be encountered in the erection of this span. It would be only sudden fluctuations of water level that could cause trouble; but from the time that the high water is over in the autumn until about the middle of April no material rise of the water level is likely to occur. The other spans, of course, would be erected in the usual manner by travelling derrick.

Approximate quantities of materials:—Concrete in shafts of piers and in abutments, 4,610 cubic yards; mass of bases of piers, 2,150 cubic yards; piles below cutting edges of bases of piers, 2,600 lineal feet; metal embedded in concrete, 1,000 lbs.; metal in cutting edges, 24,000 lbs.; structural steel in truss span, 570,000

lbs.; structural steel in plate girder spans, track, 756 lineal feet.

No. 10 will cross the North Thompson River some four miles by water from Kamloops. It will consist of thirteen 93-ft. deck plate girder spans resting on fourteen concrete piers.

For the present there will be no abutments, as there is to be a wooden trestle at each end of the structure. One of the spans will be lifted from two steel towers in order to permit the passage of river steamers, which at certain stages of the water navigate the stream. Long piles sunk by water jets are to be used, and there will be no difficulty in sinking any of the cribs to the required depths. The operating machinery for the lift span is to consist of a 12 h.p. gasoline engine.

Approximate quantities of materials:—Concrete in shafts of piers, 1,910 cubic yards; mass in bases of piers, 3,290 cubic yards; piles below cutting edges of bases of piers, 29,000 lineal feet; metal embedded in concrete and for pier protection, 29,000 lbs.; structural steel in plate girder spans, towers, dolphin-chains and counterweights, 1,886,000 lbs.; machinery metal of every kind, except wire ropes with their attachments, gasoline engine and all its appurtenances, 33,000 lbs.; wire ropes, 3,700 lbs.; attachments for wire ropes, 1,000 lbs.; wire rope dressing 100 lbs.; concrete in counterweights, 53 cubic yards; piles in dolphins, 2,100 lineal feet; timber in deck, 160 M., B.M.; track, 1,209 lineal feet.

The contracts call for the completion of the substructure work as follows:—Piers for the main span of bridge 9, Dec. 1; entire substructures of bridges 1, 2, 3 and 4, by Jan. 1, 1913; entire substructures of bridges 6, 7, 8 and 10, by Feb. 1, 1913; remaining piers of bridge 9, by Mar. 1, 1913. The contracts fix the following dates for the completion of the superstructures:—Feb. 1, 1913, main span of bridge 9; Mar. 1, 1913, bridge 5; Mar. 15, bridge 4; April 1, 1913, spans of bridge 10; May 1, 1913, bridges 6, 7, 8, and the remaining spans of bridge 9; May 15, 1913, bridges 2, 3, and the towers and machinery of bridge 10; June 1, 1913, bridge 1.

The plans and specifications were prepared by Waddell and Harrington, Consulting Engineers, under whose supervision the construction will be carried out. The substructures for bridges 1, 2, 4, 5, 6, 7 and 10 will be built by Armstrong, Morrison & Co., Vancouver, B.C.; and that for bridge 3 by the John Galt Engineering Co., Winnipeg, Man. The contracts for the substructures at bridges 8 and 9 were not definitely let, but we are advised they will probably be let to C. F. Graff, Seattle, Wash. The Dominion Bridge Co. will erect the superstructures of bridges 1, 2, 3, 5, 9 and 10; and the Canadian Bridge Co. will erect bridges 4, 6, 7 and 8.

### Prevention of Fires Along Railways.

The Canadian Pacific, Canadian Northern, and Grand Trunk Pacific railways applied to the Supreme Court, at Ottawa, Aug. 8, for leave to appeal against certain sections of order 16570 of May 22, 1912, issued by the Board of Railway Commissioners prescribing regulations to be adopted by the railways under its jurisdiction, with a view to preventing forest fires along their rights of way. The order was issued following an application of the British Columbia Lands Department, supported by the Forestry Branch of the Dominion Conservation Commission. The order was given in full in Canadian Railway and Marine World July, pg. 342.

The section providing that the companies shall have inspectors at terminal or divisional points where its locomotives are housed and repaired, and prescribing the duties of such inspectors regarding fire protection and equipment, was argued by the applicants to be outside

the Board's jurisdiction, but the Court held that there was no arguable case, and refused leave to appeal.

On the question that any authorized officer of the Board might inspect at any time any and all locomotives, and remove from service such as are not considered properly equipped with fire protective appliances, the Court held that the Board's jurisdiction in so far as it delegated its power to an officer, might be called in question, the Board itself might do it, and by amendment, the Board might bring this section within its jurisdiction.

The section forbidding the use of lignite coal is one on which the Board has jurisdiction, but the question was adjourned to the fall sitting of the Court, as was also the application re the section providing that the chief fire inspector shall send to each railway every year regulations which the companies are required to comply with, on the question of delegation of authority by the Board, which the Court considers might be got over by amendment, the time being allowed in order that the British Columbia Government might suggest such amendment if wanted.

The section providing that sectionmen and other railway employes shall take measures to report and extinguish fires along the right of way, was declared to be within the Board's jurisdiction and leave to appeal was refused.

### Railway Connections and Interswitching at Galt.

As a result of a joint sitting of the Board of Railway Commissioners of Canada and the Ontario Railway and Municipal Board, the following order, 17064, was issued by the Board of Railway Commissioners under date of July 5:—

Re applications of the boards of trade of Galt, Preston, Hespeler, Berlin, and Waterloo, Ont., for an order directing the C.P.R., the G.T.R., the Galt, Preston and Hespeler St. Ry., and the Preston and Berlin St. Ry. Co. to connect their tracks in Galt, Preston, Hespeler, Berlin and Waterloo, so as to admit the safe and convenient transfer or passing of engines, cars, and trains from the tracks of one of the above to those of the others, and that such connections shall be maintained and used by the said railway companies, respectively. Upon the hearing of the application at a joint session of the Board of Railway Commissioners for Canada and the Ontario Railway and Municipal Board at Galt, Ont., June 20—

It is ordered that the G.T.R. and the Galt, Preston and Hespeler St. Ry. tracks be connected in the towns of Galt, Preston and Hespeler, and that the G.T.R. and the Preston and Berlin St. Ry. tracks be connected in Berlin and Waterloo, at points to be agreed upon between the said companies within ten days from the date of this order, for the purposes applied for, and for the reasonable receiving, forwarding, delivering, and interswitching of traffic between the said railways; that plans showing the locations of said connections be submitted for the approval of an engineer of the Board of Railway Commissioners; that in the event of the companies failing to agree upon the said points of connection, the same be fixed by the Chief Engineer of the Board of Railway Commissioners; that the work of construction be done by the respective railway companies on their own rights of way, provided that the Galt, Preston and Hespeler St. Ry. and the Preston and Berlin St. Ry. do the work of overhead wiring on the property of the G.T.R. as well as upon their own rights of way; that the question of the distribution of cost be reserved for further consideration, except that with regard to the interchange connection at Hespeler, the work, by agreement, be done by Mr. Cribbs to the satisfaction of an engineer of the

Board of Railway Commissioners, he having undertaken it for \$1,000; and that the determination of the proper inter-switching rates be reserved until the matter has been reported upon by the Traffic Officer of the Board of Railway Commissioners.

### Transportation Conventions in 1912.

Sept. 9.—International Association of Ticket Agents, Muskoka, Ont.

Sept. 10-13.—Roadmasters' and Maintenance of Way Association, Buffalo, N.Y.

Sept. 10-13.—Master Car and Locomotive Painters' Association of United States and Canada, Denver, Col.

Sept. 12.—American Association of General Passenger and Ticket Agents, Seattle, Wash.

Oct.—American Railway Bridge and Building Association, Baltimore, Md.

Oct. 7-11.—Association of Transportation and Car Accounting Officers, Chicago, Ill.

Oct. 7-11.—American Electric Railway Association, Chicago, Ill.

Oct. 8-9.—Canadian Ticket Agents' Association, Ottawa, Ont.

Oct. 15-17.—American Railway Bridge and Building Association, Baltimore, Md.

Oct. 17-19.—American Association of Dining Car Superintendents, Denver, Col.

Oct. 23-25.—Society of Railway Financial Officers, Atlantic City, N.J.

Nov. 6-10.—Association of Railway Electrical Engineers, Chicago, Ill.

Nov. 15.—American Railway Association, Chicago, Ill.

Nov. 15-16.—American Association of Freight Traffic Officers, Chicago, Ill.

Nov. 19-21.—Maintenance of Way Master Painters' Association, Chicago, Ill.

Dec. 12-13.—Association of Transportation and Car Accounting Officers, Louisville, Ky.

### 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.

### Grand Trunk Pacific Railway Construction.

Collingwood Schreiber, Dominion Government Consulting Engineer, returned to Vancouver, B.C., Aug. 8, after having completed a trip of inspection over the line and the sections under construction in British Columbia. He stated that he was satisfied with the progress made and the character of the work done. The work, however, had been held up to some extent by strikes, but these had not been so extensive as had been reported. There was also some shortage of labor. He was of opinion that the line would be completed through to the Pacific coast before the end of 1914, although there will be a great deal of finishing up work to be done after the track had been laid.

A. W. Smithers, Chairman of the Board, and E. J. Chamberlin, President, arrived in Winnipeg, Aug. 12, on an inspection trip. They planned a trip to the end of the steel west of Edmonton, returning to Edmonton and proceeding thence by C.P.R. to Vancouver; from that place by steamer to Prince Rupert, and east by rail to the end of track. On the return journey it is proposed to make an inspection of the several branch lines under construction. Both Mr. Smithers and Mr. Chamberlin stated that there was nothing to announce as to future plans; the trip was being made for the purpose of seeing the work which was in progress, and of obtaining information upon which future developments would be decided.

It is said that a union station will be erected at Edmonton, in conjunction with the Edmonton, Dunvegan and British Columbia ry. Press reports state that the building will be two stories high, with a frontage of four city blocks, and that the train shed will have six sets of double tracks, with four platforms.

We are officially advised that a contract has been let to the Canadian Stewart Co. for the erection of an hotel in Edmonton at a cost of about \$750,000.

Track has been laid through Tete Jaune Cache to mileage 53 in British Columbia. This will be the terminus for some time, as the Fraser River is being utilized to get supplies in as far as Fort George. The contractors have met with an unexpected setback at the Goat River, where a quicksand has been struck in a 1,000 ft. tunnel which is being driven there. It is expected to have the steel laid to the Shuswap River, 50 miles beyond the present rail head, by Oct. 1, and to have the grading and bridgework as far as Smithers ready for the steel laying gang by Nov. 1.

From the western end track has been laid to mileage 171, and it is reported that as soon as the bridgework is completed, which, it is expected, will be early in the fall, track can be laid as far as Aldermere.

#### GRAND TRUNK PACIFIC BRANCH LINES.

The mayor of Brandon, Man., has been advised that the construction of the branch line into Brandon will be undertaken at once, but it will not be completed this season, as its construction involves the erection of a large bridge across the Assiniboine River.

The Board of Railway Commissioners has authorized the operation of trains over the Canadian Northern Ry. in Regina, Sask. This is on the line from Melville, Sask. On the line southerly from Regina to the International boundary track has been laid to Cedux, and it is expected that track will be laid to Frobisher, near the boundary, by the end of the year. Press reports state that construction is to be started at once on a line from Cedux into Weyburn.

In connection with the line under construction from Regina to Moose Jaw, Sask., an agreement has been reached as to the route through the city. The plans are before the Board of Railway Com-

missioners for approval, and the right of way is being acquired. Track is reported to have been laid for about 10 miles on the branch north-westerly from Moose Jaw, and it is further reported that considerable grading has been done on the branch running out of Moose Jaw westerly.

Ballasting is reported to have been completed between Young and Wakow on the branch line from Young to Prince Albert, Sask, but no further tracklaying has been done. The construction of the branch involves the erection of a bridge across the South Saskatchewan River, but it is said that this will not be started until next year.

Tracklaying on the branch from near Biggar to Battleford was started in July, and about 10 miles is reported to have been laid. Grading has been completed as far as Battleford, and for some distance beyond into the Cutknife district. For this extension revised location plans have been approved for 13 miles between mileage 26.26 and 38.74 by the Board of Railway Commissioners.

It is expected to complete tracklaying on the branch from Biggar towards Calgary, as far as Lovearne this season. This branch will connect with the Tofield-Calgary line near Swalwell, Alta. This latter branch is being operated as far as Trochu, 121 miles, and track is reported to have been laid 14 miles further on. It is expected to have track laid to Irricom, 35 miles further south, this season. The grading has been practically completed into Calgary. A Calgary press dispatch states that there is a prospect of track being laid into Calgary this year. The erection of the bridge across the Elbow River may delay matters somewhat, as this will not be progressed with until the company can haul in the material over its own line.

In an interview in Winnipeg, M. Donaldson, Vice President and General Manager, is reported as stating that in addition to completing the branch under construction from Bickerdike, Alta., to the Brazeau coal fields, a branch will be built from Bickerdike in a south-westerly direction. A coal mining company is also proposing to build about 30 miles of lines to connect its mines with the G.T.P. Ry. lines in the district. (Aug., pg. 413.)

### National Transcontinental Railway Construction.

Recent press reports from Fredericton, N.B., state that three gangs of section men have been placed on the line between Moncton and Grand Falls, N.B., and are at work under the direction of T. C. Burpee, Engineer of Maintenance of Way, Intercolonial Ry. It is added that the local understanding is that the Intercolonial Ry. will shortly establish a train service on the line, pending its being taken over by the G.T. Pacific Ry.

In an interview at Quebec, Aug. 11, R. W. Leonard, Commissioner, is reported as stating that he had been studying the question of the terminal in Quebec. He had a conference with W. Wainwright, Vice President, and a representative of the engineering staff of the G.T.P. Ry. on the matter. It is proposed to make some changes in the plans, which will be submitted to E. J. Chamberlin, President, upon his return from the west early in September.

M. J. O'Brien is reported as stating that grading is completed on the section of the line he is building to 150 miles east of Cochrane, Ont., with the exception of about 35 miles, which he expects will be finished this year. Track has been laid over the greater portion of this mileage, and will be completed early next year. Track is laid from Cochrane easterly practically to a junction with the O'Brien contract. It is expected, adds Mr. O'Brien, that the whole line from Quebec to Coch-

rane will be ready for traffic, except for the finishing up process, by June 30, 1913.

Track is laid for over 250 miles west of Cochrane, and on the section under construction between track end and Superior Jct. temporary trestle bridges are being erected, in the expectation of connecting up the steel, so that it may be possible to run grain trains over the line and out to eastern points via the Timiskaming and Northern Ontario Ry. and the G.T.R. during the winter.

### 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:—

#### Rates on Gas House Coke.

16707. June 4. Re complaint of Consumers' Gas Co. of Toronto complaining that rates on gas house coke from Buffalo to Hamilton, Brantford, and Toronto create an unjust discrimination in favor of Buffalo and against Toronto; and re order 16453, dated May 6, 1912, made therein; and re the application for an order to amend the said order, upon reading what is alleged, and the consent of parties interested, it is ordered that order 16453, be amended by substituting the words "forty thousand pounds" for the words "thirty thousand pounds" where they occur in the said order.

#### Grand Trunk Pacific Railway Tariff.

16922. June 28. Re application of G.T. Pacific Ry., under sec. 327 of the Railway Act for an order approving of its Standard Freight Mileage Traffic C.R.C. 10, between its stations in Alberta, Thornton to Fitzhugh, inclusive, it is ordered that the said tariff be temporarily approved, pending the result of the enquiry by the Board into the rates charged generally by the railway companies west of and including Crowsnest, Canmore and Thornton.

#### Vancouver, Fraser Valley and Southern Railway Rates.

16939. July 4.—Re order 16225, April 3, prescribing local tolls of Vancouver, Fraser Valley & Southern Ry. on lumber and other forest products, in carloads, between stations on its railway, and the joint through rates on the said lumber and other forest products, in carloads, from its stations between Vancouver and New Westminster to points on the Canadian Pacific and Canadian Northern Railways via Vancouver or New Westminster: Upon the failure of the V.F.V. & S. Ry. to file tariffs of its rates, so as to comply with the requirements of the order, although repeatedly urged, under the direction of the Board, to do so—it is ordered that the railway company be subject to a penalty of \$25 a day for every day after July 10 it shall be in default in complying with the requirements of the said order.

#### Stop-off Arrangements East of Toronto, Ont.

17179. July 22.—Re application of British-Canadian Cannery, Ltd., and the notice calling upon the G.T.R. to show cause why the "stop-off" arrangement with respect to canned goods, as shown in item 4 of the company's Special Freight Tariff C.R.C. E. 2374, applicable west of Toronto only, should not be extended so as to include Bowmanville and Cobourg as stop-over points; it is ordered that the stop-over privileges granted by the said railway companies operating from the Niagara Peninsula, westward, in Ontario, be granted the applicants at the two points east of Toronto, namely, Bowmanville and Cobourg, Ont.

The Grand Trunk Pacific Ry. has advanced the wages of its track repair laborers to a minimum basis of \$2 a day, and the foremen to a minimum of \$79 a month.

## The Handling of Section Gangs.

By T. Hickey, Roadmaster, Michigan Central Rd., St. Thomas, Ont.

The majority of our track laborers on sections in this country are English speaking, although I have on a few sections some foreigners, Greeks, Italians and Austrians. Our yard forces are composed of English speaking men and foreigners, the latter in the majority, as we find it more difficult to hire and hold English speaking men in the larger cities, although we pay laborers in yards five cents a day more than is paid on outlying sections.

Our system is to hire our summer force commencing April 1, and work them until about November 1, reduction of forces of about 35% is then made during the winter months. If summer forces are hired April 1, we can usually get all the men we want at that time, and as a general thing they will work all through the summer months, but if we do not hire our summer forces on April 1, the men whom we expect to get will hire out elsewhere, and the chances are that the section foremen, on several sections, at least, will be short of men the greater part of the summer. It is important to hire summer forces early in the season, as by so doing the required number of men can easily be obtained by the foremen and better men can be secured. Foremen have men engaged for their summer force, in the majority of cases, expecting to be instructed to hire them April 1st. Should anything prevent and the foremen are not instructed, there is a disappointment. The men go in search of employment elsewhere, which results in a shortage of men on sections during the season, more particularly in small towns.

Where section headquarters are so located that there is no available house for the foreman to rent in which to live, a house is provided by the company, for which the foreman should pay a nominal rent, sufficient to pay 5% on the money invested. It is a great advantage to have the foremen and their laborers, when possible, live in the company's houses, as the roadmaster would then know where to find them on short notice, if wanted at night. Foremen and laborers should be allowed to cultivate for garden purposes a small patch of ground on the right of way, where there would be no objection to doing so. It would be an encouragement to the men and no detriment to the company; in fact, it would be a benefit, as such cultivating may prevent fire from spreading and will keep down obnoxious weeds.

Section foremen make a weekly work report. They are furnished a form on which to make such reports. On this report is shown the number of men employed each day and the amount and kind of work performed each day. It is surprising to note the interest taken by the different foremen in increasing their daily output of work, as each foreman tries to see if he cannot do a little more than his neighboring foreman.

Some 20 years ago section laborers were almost universally English speaking, and in most cases native Americans. Conditions have gradually changed, and now a large proportion of track laborers belong to inferior classes and foreign labor. As is to be expected under these conditions, it is getting difficult to select suitable foremen.

To induce young men to enter the service, provision should be made, I think, to pay them a slightly higher rate than the average laborer's rate to one man in each gang, with the understanding that he remain in the service and be given opportunity to develop into a foreman. This would encourage at least a few good bright young men to enter the track service and remain, and would be the means of selecting good foremen. It is the am-

bition of a good roadmaster to have an organization of good foremen about him, the work of which he should appreciate.

With the rapid change taking place in the character of forces making up extra gangs, the methods of organization of ten years ago have become inapplicable. The roadmasters who have studied conditions and revised their methods to meet these changed conditions are making the least complaint about the quality of the present labor. While the labor is not all that could be desired, in many cases the man who complains is not getting from it all that he can. Its quality will scarcely improve, and the problem facing the roadmaster is so to arrange his forces as to get the best results from the labor available.

A roadmaster has several first class section foremen from whom he can select extra gang foremen. To change a foreman from a section to an extra gang should be considered a promotion and recommendations for the position of assistant roadmaster can be made from extra gang foremen, according to ability shown and not on account of personal likes and dislikes, as is often the case. A section foreman used on extra gangs should not tend to demoralize the section organization. There is scarcely ever a time when a section foreman is promoted to an extra gang, but the roadmaster has a foreman ready to take charge of the section. The promotion of a section foreman should not disrupt the organization any more than the promotion of an assistant roadmaster to that of roadmaster, or assistant superintendent to that of superintendent.

Material should always be carefully distributed in advance of a gang so that there would be no delay or loss of time. The foreman should so place his men in doing the work that each man would do his part. For instance, in relaying rails he would place a certain number of men pulling spikes, a certain number of men adzing, wrenching, on tongs, spiking, etc., so that it will not be necessary to be continually changing some of the men from one place to another, with the consequent loss of time. This is particularly true with foreign labor; the same method can be carried out in doing other work.

A foreman should be furnished with a copy of all estimates of the cost of the work he is in charge of, to illustrate the advantage to the foreman of having such information as to the cost of work, and to give him a chance to do better than the estimate, or to explain its discrepancy.

A foreman should have good judgment and be familiar with the methods he intends to employ, both in the performance of his work and with different classes of labor. He should have force of character enough to uphold his opinion and give his men the impression that he thoroughly understands what he is doing. When a gang is organized, the first day is usually a try out between the foreman and the men, as the gang is usually composed of some men at least who have had some experience in the class of work they are about to engage in. If he has confidence in his own ability, the foreman will start in as if he had just moved from one portion of the work to another; the gang will have confidence in him at once; results will be shown from the start.

The foreman should have authority to hire his assistant foreman and timekeeper (timekeeper should be under bond); he should have power to hire and discharge without interference. His decision should be supreme as far as the organization of his gang is concerned. Roadmasters and other officials should judge him only by results obtained. The

roadmaster should examine his requisitions for tools, etc., and look over such requisitions with him on the ground. Tools and other supplies and material should be furnished promptly. If requisitions are required the gang is hindered in making the progress it should, and this often reflects on the foreman on account of slow progress of the work, while in reality the fault is not his. Daily work reports should be made each day by the foreman, showing the number of men employed, the amount and kind of work performed, and these should be forwarded to the office of the division engineer and roadmaster; blank forms for such reports should be furnished the foremen.

Extra gangs should not be moved for small jobs. Instead of taking the extra gang away from an assigned job, and moving them perhaps a considerable distance, combine two section gangs for perhaps a day or two and complete the job. A foreman is given credit according to the cost of the work, not according to the labor actually spent upon it, and the cost of transportation is not always figured in the estimate.

A foreman who is doing good work and giving good results, as a rule, has complaints made against him frequently. I have noticed where other departments made it unpleasant for the foreman, who has been told that if he cannot get along without so many complaints that there would be a change of foremen.

For the last five years I have dispensed with the services of interpreters in gangs of foreign laborers, after which I found that trouble with the men is minimized and greater efficiency is apparent.—Railway Engineering and Maintenance of Way.

### Dominion Government Railway to Hudson Bay.

Hon. F. Cochrane, Minister of Railways, left Winnipeg August 9 for Selkirk, whence he took a steamboat for the head of navigation and thence on to Norway House. From this point it was arranged that he should travel by canoe to Port Nelson, to investigate the suitability of that port as a terminus of the railway under construction from Le Pas. At Port Nelson, the Dominion Government steamship Nelson was to be in readiness to convey the Minister to Fort Churchill the other port named as a possible terminal. The Minister was then expected to travel by the Stanley to Halifax, N.S., to reach there Sept. 7. Prior to starting out Mr. Cochrane said he expected to be able to determine as the result of his trip, which of the two ports would be used as the terminus of the line.

Tenders have been invited to Sept. 12, 1912, for the completion of the line to Hudson Bay, contractors being asked to give prices for the work both to Port Nelson and to Fort Churchill. The object of this is the Minister explained that it will then be possible for the contractors to get to work during the winter.

Winnipeg press reports state that the contract for the second section of 68 miles ending near Split Lake, will be let to J. D. McArthur Co., which firm has the contract for the first section out of Le Pas. The dispatch says that the approval of the cabinet only is required to close up the matter. Split Lake is the point at which the surveys for the line diverge either to Port Nelson or to Fort Churchill, and it is from this point that contractors are asked to submit prices to both the suggested terminal points.

At a meeting of the Privy Council in Ottawa, held Aug 15, the tender of J. D. McArthur Co., was accepted for the building of the line from Thicket Portage to near Split Lake, 68 miles. The estimated cost of the work is \$1,825,000. The J. D. McArthur Co. is building the first portion of the line.

# Electric Railway Department

## Montreal Tramways Company's Report.

The following report for the period, Oct. 1, 1911 to June 30, 1912, was presented by the President, E. A. Robert, at the annual meeting in Montreal, Aug. 6:—

Gross earnings .....	\$4,355,403.57
Operating expenses .....	2,618,943.65
Net earnings .....	\$1,736,459.92
From which deduct:—	
City percentage on earnings	\$279,030.17
Interest bonds and loans	449,513.67
Interest debenture stock	600,000.00
Taxes .....	50,850.00
	<u>1,379,393.84</u>

Surplus .....	\$ 357,066.08
From which has been appropriated for:—	
Contingent account .....	150,000.00

Transferred to general surplus .....

\$207,066.08

In view of the amalgamation of the Montreal St. Ry. Co., and its subsidiary companies under the name of the Montreal Tramways Co., the figures submitted cannot very well be compared with the same period last year, but your directors are pleased to state that the increase in gross earnings has been very satisfactory, and the ratio of operating expenses to earnings is also satisfactory.

Your directors have appropriated from surplus, \$150,000 for contingent account, this being in addition to \$85,000 appropriated for the same purpose during the above period, making a total credit to this account of \$235,000, against which has been charged the sum of \$107,351.87, leaving a balance at the credit of this account of \$127,648.13.

During the above period \$741,427.68 has been expended on capital account.

Your directors considered it advisable to insure the company's properties against fire, and the amount previously at the credit of the fire insurance fund, amounting to \$576,329.83, has been transferred to special capital reserve, which will be used as the directors may decide in the interest of the company.

During the past year the company secured an amendment to its charter whereby certain agreements and deeds of sale with the Montreal St. Ry. Co. and other companies were ratified. The town of Montreal West has granted an exclusive franchise to the company for 50 years.

The company reports that under the Imperial Privy Council judgment, the judgment rendered by the Board of Railway Commissioners with regard to through traffic and rates of fares in Mount Royal Ward was dismissed.

There are now only a few shares of the Montreal St. Ry. which have not been exchanged for this company's securities.

The property has been maintained in a proper state of efficiency, and a considerable sum has been spent in the upkeep of the tracks and rolling stock; the power plant and buildings are in excellent condition. The company has continued its liberal policy towards its employees in respect to wages, having increased them during the year. Owing to the continued rapid growth and congestion of the city your directors have been in negotiation with the city for the purpose of making a new contract which would be more applicable to the present day conditions.

In conclusion, your directors desire to place on record their appreciation of the valuable and faithful services rendered by its officers and employees.

### STATISTICAL STATEMENT.

Operating expenses .....	\$2,618,943.65
Operating expenses .....	\$2,618,943.65
Net earnings .....	\$1,736,459.92
Expenses per cent. of earnings .....	60.13
Passengers carried .....	104,458,960
Car earnings per passenger .....	4.06
Transfers .....	34,947,315
Total passengers carried .....	139,406,275
Car earnings per passenger total carried,	3.04

### GENERAL BALANCE SHEET.

ASSETS.	
Cost of road and equipment	\$32,143,280.93
New construction .....	741,427.68
	<u>\$32,884,708.61</u>
Accounts receivable .....	\$ 107,074.20
Stores .....	410,115.90
Cash and trust funds:—	
Underlying securities redemption fund .....	1,147,000.00
Cash .....	58,162.68
	<u>1,722,352.78</u>
Investments .....	495,000.00
	<u>\$35,102,061.39</u>
LIABILITIES.	
Capital stock common .....	\$ 2,000,700.00
Capital stock debentures*	16,000,000.00
First and refunding 5% mortgage gold bonds due July 1, 1914 .....	10,445,000.00
Underlying bonds:—	
4½% due Aug. 1922 .....	681,333.33
4½% due May 1922 .....	1,500,000.00
4½% due May 1922 .....	2,238,666.67
Mortgages .....	6,863.00
	<u>\$32,872,563.00</u>
Accounts and wages payable .....	\$ 332,895.95
Accrued interest .....	241,125.00
Accrued tax on earnings .....	292,992.28
Employees' securities .....	21,242.28
Unclaimed dividends .....	1,956.57
Unredeemed tickets .....	119,348.19
Suspense account .....	308,894.08
	<u>1,318,454.35</u>
Contingent account .....	\$ 127,648.13
Surplus .....	207,066.08
	<u>334,714.21</u>
Special capital reserve .....	576,329.83
	<u>\$35,102,061.39</u>

\*This includes the amount due on shares not yet exchanged.

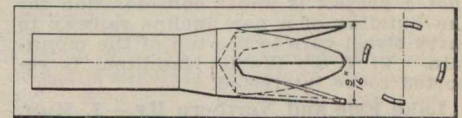
Nothing but routine business took place at the meeting, the report being adopted unanimously, and the officers being re-elected for the current year, as follows:— President, E. A. Robert; Vice President, J. W. McConnell; other directors, F. H. Wilson, Hon. J. M. Wilson, W. C. Finley, J. M. McIntyre, and G. G. Foster, K.C.

## Underground Electric Railway Project for Montreal.

A letter was read at the Montreal city council meeting, Aug. 1, signed by A. E. Forget, Secretary of the Comptoir Financier Franco-Canadian, stating that a French syndicate, possessed of ample means, was about to apply for a franchise for an underground electric tramway system in the city. The letter set out that the company was actively engaged in preparing plans for the construction of an underground system of electric tramways, similar to those already in operation in Paris, France. Application would be made for parliamentary powers next session, and if the privileges sought were granted work would be started within two years. The proposed company would have a capital of \$100,000,000, which was to be furnished by a syndicate of French bankers. The members of the provisional company include M. J. Girard, M.P.; E. Lapointe, A. E. Forget and J. B. Charbonneau. Accompanying the letter was a draft project, which the aldermen were invited to examine. In this project it was stated the company desired a 50 years' agreement, with powers of renewal. First and second class cars to be run on the underground trains. First class tickets to be eight cents each, and second class tickets four cents. Workmen's tickets to be sold at two cents each, good during certain hours. Trains to consist of five coaches, one of first class and four of second class, each coach holding about 110 passengers. The letter was referred to the board of control.

## Cutter for Taper Plugs at the Halifax Electric Tramway Co.'s Shops.

Taper wooden plugs for filling up holes and recesses over the heads of bolts in various parts of the car body, are a very much needed article in a street car repair shop. The Halifax Electric Tramway Co. is no exception, save in so far as the method of making the plugs is concerned, for D. B. Logan, Foreman Machinist, has devised a method that is both unique and good. A cutter of the form indicated in the accompany illustration forms the basis of the method. This cutter is gripped in a drill chuck in the head of a small speed lathe, giving the cutter thereby a high enough speed to satisfactorily cut wood. A piece of board of a thickness slightly over twice the depth of the required finish plug forms the stocks from which the plugs are to be made. This block is held on its rear surface against the spindle of the lathe stock, by



Cutter for Making Taper Plugs.

which it can readily be brought up to the rapidly revolving cutter. The particular lathe in use has a lever operated tail stock spindle, and in consequence, the spindle movement for bringing the work up to the cutter is particularly quick in action. The operator, holding the block of wood in one hand, with the other brings the tail stock spindle forward against the block, forcing it against the cutter until the latter has entered to about half its full depth. This operation is repeated very rapidly all over the face of the block. The block is then reversed, and the same operation repeated on that face, aligning the cuts as closely as possible to those made from the reverse side. This operation completes the cutting out of double taper pins, slightly over twice the length of the pins required. Running a saw cutter across the centre of these double pins, leaves them complete and ready for driving into the holes to be plugged. These plugs can be produced very rapidly by this method.

## Electric Railway Regulation in British Columbia.

Under the authority of the Tramway Inspection Act, the Attorney General of British Columbia has issued regulations governing the operation of electric cars within the province. The new regulations, among other things, call for the installation of gates at the rear of all cars, which will be the only way of entrance and egress; the gates are to be under the control of the conductor; they are to be closed before the car starts, and are not to be opened until the car stops again. When a car is filled to capacity, which is to be fixed, no more passengers will be allowed on under penalty. The lowest step on each car is not to be more than 16 inches above the ground; on interurban cars a separate compartment must be provided for baggage and mail; provision is made for the standardizing of cars, and single truck cars are to be done away with as speedily as possible. All new cars are to be approved by the Inspector under the Tramway Inspection Act. All employees are to undergo an examination and eye test. The regulations which cover a number of other detail matters, come into force at once. The companies affected, the B. C. Electric Ry. and the Nelson Tramway Co., are given until the end of the year to make the required alterations in the cars.

## Electric Railway Projects, Construction, Betterments, Etc.

**British Columbia Electric Ry.**—A. T. Goward, Local Manager, Victoria, is reported as stating Aug. 5, that the whole of the route for the Saanich line had been cleared, the greater portion of the grading done, and the track material delivered. It was expected to have track laid on the 22 miles in a couple of months, and to have the line opened by Jan. 1, 1913. The second track work on Hillside Ave., was well advanced, and the other betterments in the city were being progressed with satisfactory. (Aug., pg. 421.)

**Dunnville, Wellandport and Beamsville Electric Ry.**—Press reports state that financial arrangements have been made for the completion and operation of the section of the line from Dunnville to St. Ann's, Ont. The directorate is stated to be in course of reorganization, and will in future consist of three representatives of St. Catharines' interests, and one each representing Toronto and Welland. (June pg. 308.)

**Hamilton, Ont.**—Press reports state that a project is under consideration for the building of a new incline railway to carry street cars to the top of the mountain. V. T. F. Webb, Hamilton, is reported to be interested.

**Lake Erie and Northern Ry.**—J. Muir, President, is reported as stating on his return to Brantford, Ont., Aug. 2, from Montreal, that the financing of the company had been arranged for, and that tenders for the building of the line would be called for immediately. Montreal press reports, Aug. 2, state that a meeting of directors was held in that city on the previous day, when an agreement was concluded with G. W. Farrel & Co. for the purchase of the entire issue of \$1,100,000 of 5% first mortgage bonds.

The annual meeting of shareholders will be held in Brantford, Ont., Sept. 4.

We were officially advised Aug. 19, that all of the tenders had not been received for the building of the line from Port Dover, via Brantford, to Galt. It is expected that these will be in and the contract let early in September. The northern portion of the line from Brantford to Galt will be put under construction first and it is hoped to have it completed this year.

Some changes were made in the directorate at the recent meeting of shareholders in Montreal. The board is now constituted as follows:—J. Muir, H. Cockshutt, L. Harris, J. Saunderson, Brantford, Ont.; R. Thompson, Paris, Ont.; F. H. Deacon, Toronto; Mr. Todd, Galt, Ont.; G. W. Farrell, Montreal.

**Lethbridge Municipal Ry.**—General Superintendent Reid reported, Aug. 8, that two of the cars had been delivered, and three more were on the way. He expected to be able to start the cars running Aug. 15, although the municipal power plant would not be ready for some time. The track construction work is in charge of Superintendent Doughty, and the overhead work in charge of W. Symonds. (Aug., pg. 421.)

**Moncton Tramways, Electricity and Gas Co.**—E. B. Reeser, President, is reported as stating that an arrangement has been made with the Moncton and Buctouche Ry., by which the company's cars will be run over the M. and B. Ry. as far as Humphreys. In order to carry out this agreement it will be necessary to extend the track from King St., along Harbor St. to the railway tracks. This work will be started as soon as the agreement is ratified. The city loop line will be completed in the fall, and should business warrant it, a summer park will be laid out in 1913.

Press report state that permission has been given the company to extend its John St. line to the Intercolonial Ry. shops, and that the work will be gone on with immediately. (July, pg. 367.)

**Montreal and Southern Counties Ry.**—The Board of Railway Commissioners has approved location plans for the extension from Renelagh to the boundary between Longueuil and Laprairie parishes. (Aug., pg. 421.)

**Montreal Tramways Co.**—Pending the completion of plans for the improvement and extension of the lines in the city, the company has started work on the renewal of 38 street intersections. Long ties are being used, so that four of the rails are tied together, thus providing the greatest possible stability. The rails are 132 lbs., instead of 96 to 116 lbs. formerly used. The concrete work and ballasting is being done by M. J. Stack and Co. J. D. Evans, Chief Engineer, is in charge of the work. (Aug., pg. 421.)

**Morrisburg and Ottawa Electric Ry.**—At a meeting of shareholders in Ottawa, Aug. 29, the directors asked for authority to complete arrangements for starting construction. Three proposals for securing an entrance into Ottawa were submitted for consideration. The directors are understood to have reported that the plans for financing construction were in a forward condition. Jas. Oliver is President, and R. A. Bishop, secretary. The company's offices have been moved from Morewood, Ont., to Ottawa. (June, pg. 309.)

**Ontario West Shore Ry.**—The position of the municipalities in connection with the guaranteed bonds of this partially built line was considered at a meeting held in Kincardine, July 24, when a committee was appointed to take some action. J. W. Moyes, Toronto, the promoter of the line, was present at a meeting of the committee, Aug. 1, at which a sub-committee was appointed to interview the Provincial Government to ascertain if a subsidy could be obtained to enable the line to be completed as a municipal undertaking, and to ask the Ontario Railway and Municipal Board to make an investigation as to the expenditure of the money secured for the bonds issued for principal and interest of which the municipalities are liable under their guarantees. (Mar., pg. 148.)

**Ottawa and St. Lawrence Electric Ry.** A meeting of shareholders was called to be held in Ottawa, Aug. 28, for the purpose of electing directors, perfecting the organization of the company and for the transaction of general business. J. E. Askwith, is chairman, and F. Iveson is secretary of the provisional directorate. (July, pg. 368.)

**Ottawa, Rideau Lakes and Kingston Ry.**—We are officially advised that as soon as the surveys for this projected line are completed, which it is expected will be early in Sept., the final details of the general contract for construction will be worked out. This general contract was arranged with British financiers in March, and covers the building and equipment of a line from Ottawa to Kingston, with a branch from near Lombardy, crossing the river at Rideau ferry, and proceeding thence to Perth, Bolderson and Lanark. The main line and branch will have a total length of 127 miles. The line will open up a territory that is at present almost without railway facilities. It is not probable that any construction will be done this season, but it is hoped to make a start early in the spring of 1913. U. L. Upson, Ottawa, is General Manager. (Aug., pg. 421.)

**Port Arthur and Fort William Electric Ry.**—The Port Arthur, Ont., city council passed a resolution June 30, adopting the route for the proposed belt line in the city. The construction is to be done under the superintendence of the chief engineer, and it is expected to have the new line in operation by the winter.

The Fort William, Ont., city council has decided to order the materials for the laying of street railway tracks on

Pacific Ave., Walsh and Franklin streets, and on Island 2. (Aug., pg. 421.)

**Quebec Ry., Light and Power Co.**—Track has been laid on Dorchester St. as far as the approaches of the proposed Drouin bridge, on the extension to Limoulin. As soon as the bridge is built, tracklaying will be restarted on the extension.

A number of improvements have been made at the St. Paul St. station, Montmorency division. A shed covering three platforms and four tracks has been provided, and an additional long track has been set apart for the pilgrimage traffic to St. Anne. (June, pg. 310.)

**The Sarnia Street Ry.** is erecting a new car barn. It is to be finished in the fall, and is estimated to cost about \$12,000. It will be 160½ ft. by 78 ft. 8 in. and will be built of solid blocks of concrete with prepared roofing. There will be five tracks the entire length of the building, giving a capacity of 15 cars, with two pits, one 90 ft. long, the other 150 ft. A workshop will be provided on the south side of the building, with a paint shop 38½ ft. by 59 ft. On the south west corner of the building there will be a superintendent's office and store room, with lavatory accommodation for employes. The machinery in the present shops will be utilized in the new one. (Aug., pg. 421.)

**Simcoe Ry. and Power Co.**—Press reports state that the company has under consideration plans for the building of an electric railway along its power transmission line from the Big Chute on the Severn river to Waubashene, Ont., for the construction of which the Ontario Legislature last session granted an extension of time. (Mar., pg. 149.)

**Toronto Eastern Ry.**—We are officially advised that considerable grading has been done on this line by the several subcontractors. No further subcontracts have been let.

The spur under construction from the Canadian Northern Ontario Ry. into Oshawa, Ont., is being built by the C. N. O. Ry. It will be operated by steam until the completion of the T. E. Ry., when it is probable that it will be operated electrically in conjunction with that line. (Aug., pg. 422.)

**Toronto Suburban Ry.**—The grading of the branch from Weston to Woodbridge, Ont., is practically completed, and it is expected to have the track laid in about a month. On the extension from Lambton to Guelph, W. Maher started work just west of Islington, and has the grading well advanced to Summerville, near where the line will be carried under Dundas st. No further subcontracts have been let. Right of way agents are at work at various points as far as Guelph, to which point the line is under contract to Ewen MacKenzie. (Aug., pg. 422.)

### The Montreal Tramways Company and Its Employes.

The Montreal Tramways Co. has voluntarily increased its employes wages, the new scale, which has been put in force will date from July 1, the commencement of the financial year, under the present management.

The comparative rates of pay are as follows:

	Old rate.	New rate.
First and second year men . . . .	20c.	21c.
Third to fifth year men . . . . .	21c.	22c.
Five years and over . . . . .	22c.	24c.

On the whole, some 2,200 employes about \$100,000 a year. We are advised that the employes are well satisfied with the new rate.

The Board of Railway Commissioners has asked railway companies to furnish a statement of the number of passenger cars they have, heated by stoves, and to what service assigned.

**Automatic Signals on the Hudson Valley Railway.**

By G. W. Davison, Superintendent of Line Construction.

The Hudson Valley Ry. at Glens Falls, N.Y., crosses the Hudson River from Main St. by a single track block, which block is used both ways by two local lines, each three times per hour, and one interurban every hour, 14 regular cars therefore passing hourly; the running time through it being 2¼ minutes. Express, line cars, and electric locomotives drawing freight cars pass over the track, all this varied traffic on the block being protected by the Nachod Automatic signal type C, made by the Nachod Signal Co. of Philadelphia. These signals are located at the end of the single track block, and operate through a single line wire by the passage of cars under trolley contactors. The power to actuate the signals is derived from the trolley circuit, and no insulated rail joints or other disturbance to the track is required. Fig. 1 is a view of the signal at the north end of the block, neatly mounted on a bracket attached by pole bands to a tubular iron pole. The signals are normally neutral, showing neither lights nor discs. When a car runs under the contactor to take the block, the opposing signal at the other end of the block is set at stop, a red light and a red disc, and the signal in sight of the motorman changes to permissive, a white light and a white disc, as an evidence of

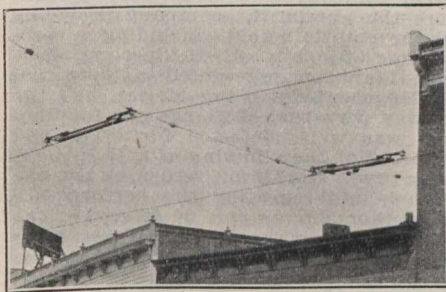


Fig. 2. Trolley Contactors, Hudson Valley Railway Automatic Signal System.

this. An opposing movement to the car in the block is thereby prevented, but following movements are permitted. Should another car enter the block before the first has left, warning of the presence of the first car will previously have been given by the permissive signal. When the first car leaves the block, the signals will not be changed, but will be held until the second leaves also. Fifteen cars, if desired, may thus occupy this block under signal protection. The arrangement is such that the second car if desired, might have backed out of the block without passing through the same, such an operation as might be caused by the line car following the regular car.

The trolley contactors are hung on the wire at the double track ends. The flexible contact strips, opening them somewhat and diverting a temporary current from them to the relay, thereby causing a change of signal indication. Fig. 2 shows them installed at Glens Falls. These contactors are without moving parts, operate at high speed, and require no maintenance. They are hung at one end only on the span wire, thus being free from any line stress, and are attached to the trolley wire by the usual ears. They are connected by vertical leads from two span wires across the street, and considerably higher than the trolley wire, so that, should the wheel fly off, it cannot cut the connections.

The relay in the signal, including both coils and contacts, is immersed in a tank of transformer oil, the high insulation of which prevents lightning troubles, cools the coils, protects the electrical

contacts, and in general conduces to extremely low maintenance.

Access is most conveniently had to the signal relay when necessary, by lowering the entire signal box to the ground without disconnecting the leads. By taking out three bolts, and drawing up on the block and tackle, the hood and relay may be raised for repair or inspection, leaving the oil tank on the ground.

**The British Columbia Electric Ry. Co.'s Franchises.**

The negotiations initiated by the Vancouver Board of Trade with the company in respect to its differences with the various municipalities spoken of as Greater Vancouver, are reported to have made considerable progress. It is desired

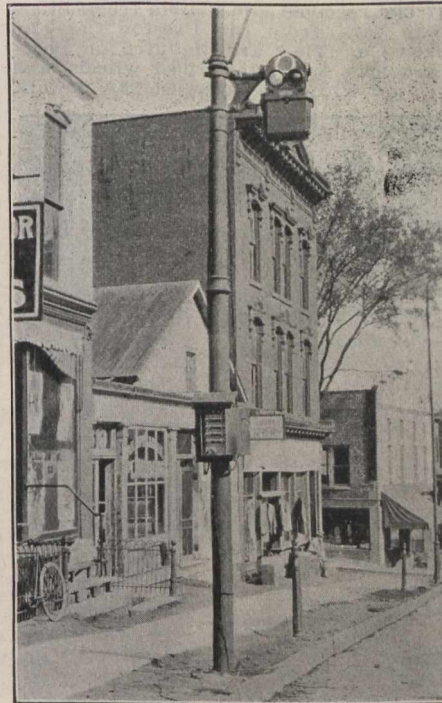


Fig. 1. Automatic Signal on the Hudson Valley Railway.

to bring about an extension of the boundaries of the city of Vancouver so as to include a number of outside municipalities, and as the company has franchises in most of them, with varying terms to run, an endeavor was made to secure a surrender of these, and the framing of a new charter to cover the whole area. The discussion to this end became complicated by legal proceedings in connection with some of the franchises, and the stopping of services on the lines in consequence. On the breaking off of negotiations so far as the Vancouver city council was concerned, the business men took the matter up, with the result that a modus vivendi is likely to be arrived at. The matter is now before the directors in London, Eng., and R. H. Sperling, General Manager, left Vancouver Aug. 8, to discuss the various matters with them.

The Montreal Tramways Co. is reported to be building, at its shops, two cars for the conveyance of prisoners between the courts and the jail. The cars, it is stated, will be built entirely of steel, and completely closed in, being largely an adaptation of the present style of prison van as an electric car. The cars, which will be the Government's property, will be in charge of a motorman and conductor of the company, and there will be two guards in attendance. A special switch is to be built at the court house, and also at the jail at Bordeaux.

**Electric Railway Finance, Meetings, Etc.**

**Berlin and Waterloo St. Ry.**—Profits on operation for July, \$2,135.03. Number of passengers carried, 96,511, an increase of 28% over July, 1911.

**British Columbia Electric Ry., Vancouver Power Co.**—Gross earnings for June, \$498,306; operating expenses \$317,840; net operating earnings \$180,466; renewal funds \$37,935; net earnings \$142,531; approximate income from investments, \$25,000; net income \$167,531, against \$387,664 gross earnings; \$252,819 operating expenses; \$134,845 net operating earnings; \$29,770 renewal funds; \$105,075 net earnings; \$20,000 approximate income from investments; \$125,075 net income for June 1911. Aggregate gross earnings for 12 months ended June 30, \$5,749,649; net earnings \$2,004,631, against \$4,226,834 aggregate gross earnings; \$1,589,784 net earnings for same period 1910-11.

**Calgary Municipal Ry.**—Passenger earnings for July, \$57,770.20; miscellaneous earnings, \$1,007.90; total earnings, \$58,778.10; operating expenses, \$33,725.36; net operating earnings, \$25,052.74; contingent account, interest, etc., \$8,202.23; net profit, \$16,850.51, against \$38,301.90 passenger earnings; \$845.85 miscellaneous earnings; \$39,147.75 total earnings; \$15,187.22 operating expenses, \$23,960.53 net operating earnings; \$7,220.71 contingent account, interest, etc.; \$16,739.82 net profit for July, 1911.

**Cape Breton Electric Co.**—Gross earnings for June, \$29,448.22; operating expenses and taxes \$16,791.57; net earnings \$12,656.65; interest charges \$4,495.84; balance \$8,160.81; sinking and improvement funds \$1,206.67; balance for reserves, etc., \$6,954.14, against \$27,426.61 gross earnings; \$15,538.20 operating expenses and taxes; \$11,888.41 net earnings; \$4,512.50 interest charges; \$7,375.91 balance; \$1,131.66 sinking and improvement funds; \$6,244.25 balance for reserves, etc. The construction charges during June, were \$1,544.17.

**Halifax Electric Tramway.**—Railway receipts for June, \$21,435.18; July, \$24,563.81, against \$19,498.63 for June, and \$23,821.28 for July, 1911.

**Hamilton St. Ry.**—Gross receipts for quarter ended June 30, \$134,567.27, against \$111,285.40 for same period, 1911. City percentage of earnings, \$10,765.38, against \$8,902.84 for same period, 1911.

**Quebec Ry. Light, Heat and Power Co.**—A press report from Quebec states that the report for the financial year, recently closed, which will be issued shortly, will show gross earnings of \$1,565,000, compared with \$1,280,126 for the previous year; also that the operating expenses will show an increase, from \$661,907 to \$733,000, and the net earnings, from \$618,219 to \$832,000.

**Toronto Ry., Toronto and York Radial Ry., Toronto Power Co., Etc.**—Gross earnings for June, \$696,980; working expenses, maintenance, etc., \$357,365; net earnings \$339,615, against \$634,275 gross earnings; \$300,351 working expenses, maintenance, etc.; \$333,924 net earnings, for June 1911. Aggregate gross earnings for six months ended June 30, \$4,012,718; net earnings \$2,036,072 against \$3,568,293 aggregate gross earnings; \$1,805,205 net earnings from same period 1911.

**Winnipeg Electric Ry.**—Gross earnings for June, \$300,402; working expenses \$150,090; net earnings \$150,312, against \$305,353 gross earnings; \$141,251 working expenses; \$164,102 net earnings, for June 1911. Aggregate gross earnings for six months ended June 30, \$1,808,703; net earnings \$841,129, against \$1,881,605 aggregate gross earnings; \$925,550 net earnings, for same period 1911.

The Halifax Electric Tramway Co. has ordered four box cars from the Nova Scotia Car Works, for delivery in the fall.

### Electric Railway Notes.

The Manitoba Public Utilities Commission has under the provisions of section 42 of the Public Utilities Act of 1912, issued the rules of practice to be observed in all proceedings before it.

G. R. G. Conway, Chief Engineer, British Columbia Electric Ry., is also acting General Manager during R. H. Sperling's absence in England, which will probably continue until towards the end of this year.

We are officially advised that the position of manager of the Transportation and Sales Departments, British Columbia Electric Ry., Vancouver, left vacant by the recent resignation of Jas. Roosevelt, has not been filled.

M. J. Kennedy, General Freight Agent, Montreal Tramways Co., has resigned, intending to devote his time to the Montreal Tunnel Co., in which he is associated with D. McDonald, ex-General Manager, Montreal Tramways Co.

It is reported from Winnipeg that the Winnipeg Electric Ry. has selected R. S. Kelsch M., Can. Soc. C. E., of Montreal, as its expert to adjust matters with the Winnipeg city council, in connection with the joint use of poles, etc.

During June, one employe was killed, and five were injured in the course of their work in connection with Canadian electric railways. The fatality was due to the conductor being pulled from his car, his clothing having caught in a wire fence.

The Lethbridge Municipal Ry. has received five double truck city cars from the Preston Car and Coach Co. They are mounted on 27-G-1 trucks, with Westinghouse 101 B.2 motors, for single end operation, with pay-as-you-enter vestibule on rear end.

H. E. Smith comptroller Montreal Tramway Co., has been elected a director of the Efficiency Society of New York, an organization for promoting efficiency in commercial, financial and industrial enterprises of all kinds, including public service corporations.

W. D. Power, heretofore freight expert for the Vancouver board of trade, has been appointed general freight and passenger agent, British Columbia Electric Ry., in charge of all freight and passenger tariffs, preparation of cases for the Board of Railway Commission, etc.

D. McDonald, on retiring recently from the position of General Manager of the Montreal Tramways Co., addressed a letter to the company's officials and employes in which he thanked them for the way in which they had co-operated with him in his many years of service with the company.

J. B. Ingersoll, heretofore Electrical Engineer, British Columbia Electric Ry., Vancouver, who recently resigned, as mentioned in our last issue, has assumed his new duties in charge of the work of the Kootenai Power and Construction Co., in installing a 40,000 h.p. plant at Kootenai Falls, Idaho.

The Berlin and Waterloo St. Ry., which is owned by the city of Berlin, Ont., has decided to provide new uniforms for its employes, and has adopted the following increased scale of wages:—First six months, 16c. an hour; second six months, 17c. an hour; second year, 17½c. an hour; third year, 19½c. an hour; fourth year, 20½c. an hour.

The Quebec Railway, Light and Power Co. has, according to press reports, increased its conductors' and motormen's pay. It is said that employes with eight years service to their credit will receive one cent increase an hour, and those in the service twelve years two cents an hour. Other demands made by the men were not considered.

The Guelph Radial Ry. has ordered a snow sweeper from the Preston Car and Coach Co. It will be of the single truck type, with double end operation, with 33 ins. brooms. The motor equipment will consist of two Westinghouse 101B2 motors with K10 controllers, and one 101B motor with K10 controller to operate the brooms. It will be delivered about the middle of October.

Arthur Reid, General Superintendent of light, power and the street railway of Lethbridge, Alta., returned from Boston, Mass., recently, where he had been attending the American Institute of Electrical Engineers' convention. Press reports stated that he was also on a tour for the inspection and purchase of additional street railway equipment and machinery, but we are officially advised that the city is not, at present, in the market for such.

The Galt, Preston and Hespeler St. Ry. has received two double truck inter-urban cars, from the Preston Car and Coach Co. They are mounted on Baldwin trucks, with steel tired wheels, and equipped with Westinghouse 93A motors,



F. D. Burpee,

Superintendent and Purchasing Agent,  
Ottawa Electric Ry., Ottawa.

multiple unit control, Westinghouse AMM air brakes, and steel underframes. The interior finish of the passenger compartment is inlaid mahogany, and of the smoking compartment, quartered oak, empire finish throughout, with arc lamps.

D. Miller, Superintendent, Hamilton Street Ry., was charged in the Hamilton, Ont., police court, Aug. 2, on complaint of R. McNeil, a former employe, with violating sec. 3 of the Ontario Act which regulates the hours which street railway motormen and conductors shall work. The charge was withdrawn, as it had been ascertained that no action could be taken by a private individual under the Act unless the consent of the Ontario Railway and Municipal Board had previously been obtained.

H. Weeks, a passenger on one of the Halifax Electric Tramway Co.'s cars, was fined \$15 and costs, recently, for using abusive language to a conductor for not giving him a transfer as speedily as desired. On behalf of the company, it was stated that the man had been abusive to other conductors, and the company intended to take action in all similar cases,

as the conductors were placed in such a position that they could not resent the treatment except by bringing the offenders before the court.

J. E. Hutcheson, before leaving Ottawa recently to assume the General Managership of the Montreal Tramways Co., was entertained by his fellow members of the Laurentian Club and presented with a very handsome gold mounted clock and a silver model of an electric car. The function was attended by a large number of Ottawa's principal citizens, and all the speakers highly eulogized the recipient. The Ottawa Electric Railway Co.'s directors adopted a resolution expressing their appreciation of Mr. Hutcheson's great services to the company, and presented him with a cheque for a substantial amount.

The Registrar of Joint Stock Companies for British Columbia has given notice under sub-sec. 3, sec. 268 of the Companies Act that the following companies have been struck off the register, but are given one month from July 25 to obtain re-registration if necessary:—Vancouver Electric Ry. and Light Co.; Vancouver and Lulu Island Electrical Ry. and Improvement Co., registered under the Act of 1878; The National Electric Tramway and Lighting Co.; Chilliwack Tramway Co.; Vancouver and Westminster Electric Tramway and Light Co., registered under the Act of 1890; Nelson Electric Tramway Co., registered under the Companies Act of 1897.

The British Columbia Electric Ry. recently gave its employes, with their families, a two-days' picnic at Hastings Park, Vancouver. Over 6,000 persons were the guests, the company providing all the entertainment, including a programme of sports. R. H. Sperling, General Manager, presented a perpetual challenge cup for a tug of war, and the Conway perpetual challenge cup for line-men was well contested for. The test consisted of the climbing of a 45-ft. pole, going over the arm, returning to the ground, and repeating the performance at another similar pole 30 ft. away. The contest was won by the New Westminster team, one of its members performing the feat in 52 2-5 secs., creating a new record on the coast.

### Double Deck Electric Railway Car.—

The New York Railways Co. is experimenting with a double deck car on its street railways. The car, which has been made from special designs, is 44 ft. 10 ins. long and 8 ft. 3 ins. wide, with the upper deck shorter than the lower one. The entrance is in the middle at the side of the car, and the floor of the lower deck is about 10 ins. above the pavement. The stairways to the upper deck are inside the car at each end, and the upper seats are arranged in two rows longitudinally, back to back. The car has seating capacity for 88 passengers and a maximum capacity for 171 passengers. The weight of the car per seated passenger is given as less than 500 lbs. The head room on the lower deck is for the most part, 7½ ft., and for the upper deck, 6 ft. 1in. The car is equipped with an air brake and provision is made for increasing the brake power in proportion to the weight of the car load. The doors are opened and closed by compressed air, the arrangement being controlled by a foot lever next the seat occupied by the conductor, opposite the entrance to the car, where he sits to take fares. We are given to understand that Canadian street railways are not much interested in the matter, as it is believed that such cars are not suitable for city operation.

**Nipissing Central Ry.**—Tracklaying and ballasting is reported to be well advanced on the extension of the line from Haileybury to New Liskeard, Ont. It is expected that the extension will be fully completed and in operation by Oct. 1.



**Calgary Municipal Railway.**

The report of the Calgary Municipal Ry. operations for the year ended June 30, shows—

Gross earnings .....\$479,240.24  
Operating expenses ..... 282,600.56

Net operating earnings .....\$196,639.68  
Taxes, (real property) .....\$ 2,264.18  
Interest ..... 45,000.00  
Sinking fund ..... 18,160.00  
Contingent fund, 5% of gross revenue ..... 23,962.01 89,386.19

Net profits .....\$107,253.49

The operating expenses include—Way and structures, \$9,946.12; equipment, \$44,934.14; transportation, purchased power, \$74,272.72; operation of cars, \$136,404.27; general expenses, \$17,043.31. The proportion of operating expenses to revenue, was 59.44%. Amount paid to employes, in wages, \$172,251.75. The value of the property is given in the report, in detail, as follows:—

Engineering .....\$ 4,055.40  
Track construction ..... 901,622.29  
Line construction ..... 94,551.77  
Buildings ..... 24,317.85  
Shop tools and machinery ..... 2,145.65  
Cars ..... 205,431.15  
Electric equipment ..... 59,318.50  
Miscellaneous ..... 639.56

\$1,292,082.17

The following statistical information is also given:—car miles 1,643,328; car hours, 195,206; passengers carried, 11,578,130; transfers, 1,262,400; total passengers carried, 12,941,530; average fare, 4.076c.; average fare, including transfers, 4.615c.; car earnings per car mile, 28.722c.; miscellaneous earnings per car mile, 0.440c.; gross earnings per car mile, 299.162c.; car earnings per car hour, \$2.41; gross earnings per car hour, \$2.45; miscellaneous earnings per car hour, 0.04c.; operating expenses per car mile, 17.196c.; operating expenses per car hour, \$1.44.

The total length of road, computed as single track, is 53 miles, made up as follows:—First main track 42 miles, second main track 10 miles, sidings and turn-outs one mile. There are 49 passenger cars owned, 48 of which are closed; four work cars, and two sprinklers.

During the year one passenger was injured, and three persons were killed in accidents.

**Killing Weeds with Water Gas Tar.**

The Conestoga Traction Company, of Lancaster, Pa., has 162 miles of track, covering the city and practically the whole of Lancaster county. It has been found that sprinkling with water tar is effective in laying dust, as well as entirely removing weeds, and is believed to have additional value in preserving ties. The cost of the treatment is stated to be \$60 to \$65 a mile, about 3,000 gals. of tar being required per mile, and the cost of the tar being 2 cents a gallon, at the holder. Tank cars, holding 1,000 gals. in are used, built by placing a tank 4 ft. in diameter and 15 ft. long on an old truck. The sprinkler consists of a 2 in. iron pipe, the length of a tie, capped at the ends and attached to the tank by two adjustable rods, permitting raising and lowering. A hose attachment to the tank outlet gives flexibility. Three rows of staggered 3/16 in. holes are bored in the sprinkler, except over the rails, where blank spaces are left to prevent tar from getting on the rails. A 2 in. wire flue brush on a 3/8 in. pipe is run through the sprinkler occasionally to clear out dirt which collects on it. It is expected that one application of the tar to the roadway will last two years. The tar carries a slight odor of gas, it is stated, which soon disappears.

MISS S. E. STORY, eldest daughter of D. A. Story, General Freight Agent, Intercolonial Ry., Moncton, N.B., was married in Toronto, Aug. 26, to C. S. Clark, of Moncton.

**National Steel Car Company Limited.**

This company has been incorporated under the Dominion Companies Act, as stated in Canadian Railway and Marine World for August. Following are extracts from the prospectus issued in connection with the sale of stock.

The capitalization is \$3,000,000 of 7 per cent cumulative preference stock, of which \$1,500,000 is being issued now and \$3,000,000 of common stock, of which \$2,000,000 is being issued. The preference stock is being sold to the public at 98, with a bonus of 60 per cent. of common stock. The directors are Sir John Gibson, Lieutenant-Governor of Ontario; J. J. Scott, K.C.; and W. Southam, Hamilton, Ont. Sir Henry Pellatt, Toronto; C. H. Cahan, K.C.; Mortimer Davis, W. G. Ross, Montreal; W. W. Brice, W. B. Parsons, M. H. Coggeshall, New York; Basil Magor, President, Magor Car Co., Passaic, N.J. The head office is in Montreal and the plant is to be built in Hamilton, Ont.

It is pointed out that the present car building facilities in Canada are inadequate to supply the railways' growing demands, and that existing plants are behind in their orders and that a large number of cars are of necessity imported from the United States despite the heavy customs duty.

As a large portion of the materials used in building freight cars are of necessity imported from Pittsburgh and the Mississippi Valley, Hamilton was selected as the best point for manufacturing and it is claimed that the saving in freight, over any other point considered, should, when the plant is working to 60 per cent. capacity, equal three-quarters of the preferred dividend.

The plant, which has been designed by Barclay, Parsons and Klapp, New York, will have a large ultimate capacity, property has been bought and construction has been started on the first portion which will have a full capacity of 30 cars a day. The cost of the plant is estimated as follows:—Buildings, \$261,230; machinery, \$204,500; property, \$100,000; contingencies and engineering, \$84,000; total, \$649,730.

Based upon the earnings of the car plants in Canada and the U. S., and the actual earnings of the Magor Car Co., of Passaic, N.J., in particular, and without taking into consideration the advantageous location of the new plant, the following estimated earnings in the average year are submitted by the management for a capacity of 30 cars per day or 9,000 a year. Average operation 60% of capacity, 5,400 cars average profit of 8% net on gross business, \$400,000. 7% preference stock dividend, \$105,000. Available for common dividend, \$295,000. Or 14 3/4% on common stock.

In 1908, previous to the consolidation, the Canada Car Co., with a daily capacity of 25 cars, showed earnings of over \$445,000, and the Dominion Car and Foundry Co., with a capacity of 30 cars, earned over \$414,000. A careful study of the earnings of car plants in Canada and the U. S. for a period of years, would indicate that the estimate of \$400,000 in the average year is conservative. In order to cover the preferred dividend it will be necessary for the new company to earn but slightly more than a quarter of this amount, which is well within the minimum earnings which the management anticipates even in years of serious depression.

The Magor Car Co. for 11 months ended March 31, showed a trading profit of 37% for the full year as the actual fit of 37% for the full year on the actual was one of depression in the car business in the U.S., with very keen competition.

The company will be managed by Basil Magor, who is resigning the presidency of the Magor Car Co., believing in the greater possibilities for business in

Canada. His former superintendent at Passaic will be associated with him. A. Butze, formerly General Purchasing Agent, Grand Trunk and Grand Trunk Pacific railways, has been appointed Assistant Secretary and Purchasing Agent.

**Among the Express Companies.**

J. B. Dickey has been appointed agent, Dominion Ex. Co., Revelstoke, B.C., vice J. L. Stark.

D. Doody has been appointed route agent, Dominion Ex. Co., with headquarters at Montreal.

H. J. Berry has been appointed agent, Canadian Northern Ex. Co., Emerson, Man., vice R. D. Carlow.

J. W. Herbert has been appointed agent, Canadian Northern Ex. Co., Regina, Sask., vice W. A. Best, transferred.

Z. M. Middleton has been appointed chief clerk to Superintendent, Canadian Northern Ex. Co., Winnipeg, vice G. S. Jackson, promoted.

The Canadian Northern Ex. Co. has opened offices at Antar, Briercrest, Mistatin and Waseca, Sask., and Athabasca Landing and Clyde, Alta.

G. S. Jackson, heretofore chief clerk to Superintendent, Canadian Northern Ex. Co., Winnipeg, has been appointed route agent, Winnipeg, vice W. F. Pillar, transferred to Edmonton, Alta.

E. M. English, heretofore financial agent, American Ex. Co., Montreal, has been appointed Assistant Manager of the company's Eastern Financial Department, New York, and A. B. Howard has been appointed financial agent at Montreal, to succeed him.

C. A. Roach, who was recently appointed route agent, Canadian Ex. Co., Montreal, was entertained to dinner and presented with a club bag, by a number of his friends and associates at Cornwall, Ont., Aug. 13, on his leaving the company's local office for Montreal.

The Canadian Ex. Co. has opened offices at Birch, Wyebridge and Picton, Ont., and has extended its service to the steamboat line between Nanawee and Picton, Ont., and on the Grand Trunk Pacific Ry. to Mirton, 56 miles west of Edson, Alta. Offices will be opened at Bickedike and Makanum.

The British Columbia Express Co. recently made an offer to purchase the old stage coach Stampede, but the owners are expecting to realize a high price for the coach as a relic than the company is willing to give for it for ordinary use. In these days of steam and electric railways it is interesting to know that this company has in operation over 30 stage coaches carrying mail and express matter through central British Columbia and right up to the Cariboo district.

**C.P.R. Scholarships at McGill University.**—Two of the scholarships which the C.P.R. offers for employes under 21 years of age, and for minor sons of employes, recently became vacant. One has been secured by E. A. Leslie, son of J. Leslie, Assistant Comptroller, and the other by W. J. Shrimpton, son of F. E. Shrimpton, Auditor of Disbursements.

Prior to the adjournment of the British House of Commons, Aug. 7, the Postmaster General announced that the Government contract with the Marconi Wireless Telegraph Co. provided that the Government supply \$3,000,000 for the erection of five wireless stations, Australia supplying \$500,000 for one station, thus forming a wireless telegraph circuit round the world. He also stated that the Government was unable to undertake the construction itself, and the company named was the only one with the necessary experience and plant to carry out the scheme.

# Marine Department

## The Thousand Island Steamboat Co.'s New Vessel.

The steamboat Thousand Islander, which was delivered to the Thousand Island Steamboat Co. in July, and which has been taken over by the Richelieu and Ontario Navigation Co., with the rest of the T.I.S.B. Co.'s fleet, has the following dimensions:—

Length over all, 172 ft. 9 ins.; beam moulded, 32 ft.; depth moulded, 9 ft. 6 ins.; gross tonnage, 355; net tonnage, 241.

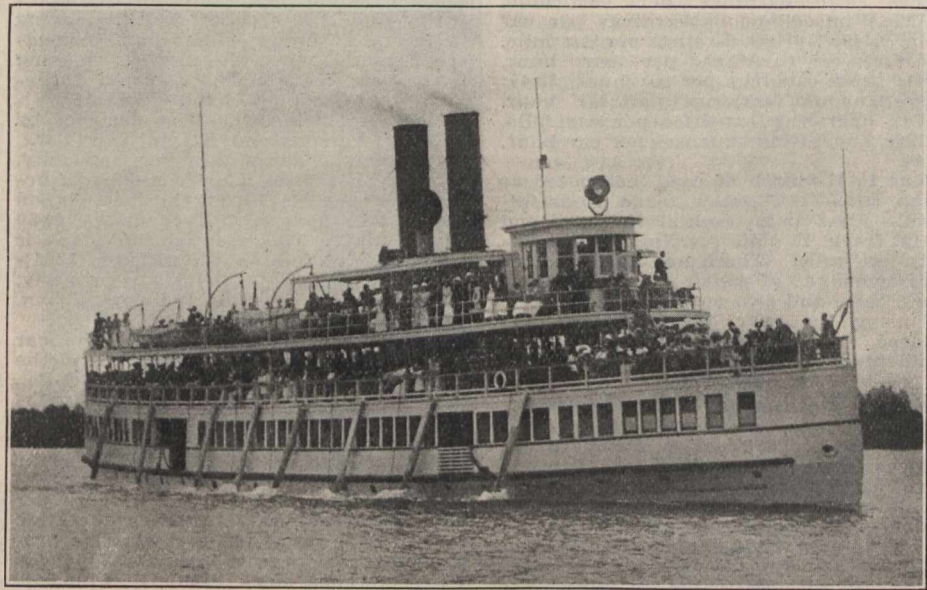
She is of the tunnel stern, shallow draught, twin screw type, and consists of main, promenade and boat decks. There is life saving equipment for 1,000 passengers, included in which are three 18 ft. life boats and one 14 ft. working boat. All decks, cabins, etc., above the main deck are constructed of wood, and the part below the main deck is of steel.

The hold is arranged for chain locker, crews quarters and power plant. From frame 1 to 16 there is accommodation for four firemen and seven deck hands. There are staterooms from frame 16 to 26 for souvenir boys, mess boy, bartender, cook and assistant, two waiters, oiler, watchmen and steward. The two boilers and engines, together with the auxiliaries, take up the space from frame 26 to 55. The space from frame 55 to 66 is occupied by 14 people, including the chief engineer, assistant engineer and electrician. All berths are of metal, and the quarters are finished in redwood.

On the main deck a hand capstan windlass occupies the space as far aft as frame 7. From frame 7 to 12 space is taken up by the mens' toilet, which is finished in redwood. The bar room is finished in chestnut and leads as far aft as frame 19. Access to the toilet and bar room is maintained by a 3 ft. passage extending along the port side of the ship forward from frame 19 and terminating in the windlass room. This passage is finished in oak. The deck from frame 19 to 43 is clear, with the exception of the boiler casing, which is 14 ft. wide and extends from frame 26 aft to 44. The upper part of the boiler casing forward is cut away to make room for the stairs leading from the promenade to the main deck. The forward gangways extend on each side of the ship from frame 22 to 25. This part of the ship is finished in oak. The ship is coaled through five 20 in. scuttles, placed between frames 26 and 42. The starboard side of the ship from frame 43 to 54 is taken up by the galley, which extends from the ship's side to the engine hatch coaming. A passage is left between the galley and boiler casing to connect with an athwartship passage between the forward engine hatch coaming and the after boiler casing, making a clear passage from port to starboard 42 ins. wide. This passage in turn connects with a fore and aft passage on the port side leading from the main deck amidships to the social hall aft. The ladies' lavatory on the port side, extending from frame 43 to 56, communicates with this passage. The engine hatch is 13 ft. wide and extends from frame 46 aft to 54. The social hall extending from frame 54 to 62, includes the stairs leading from the main to the promenade deck, while gangways take up the space from frame 56 to 59. The breakfast room, extending from frame 62 aft to the stern includes the linen room on the starboard side and the purser's room on the port. The breakfast room is finished in quartered oak and contains 20 tables with redwood tops. The purser's room, linen room, galley and ladies' lavatory are finished in redwood, while the social hall is finished in mahogany.

The promenade deck extends from stem to stern and is clear but for a closed cabin 19 ft. wide which extends from frame 19 to 62. The forward end of this cabin contains the stairs leading to the main deck, while a stack casing 7½ ft. wide extends from frame 31 to 41. The after end of the cabin is taken up by a stairs leading to the social hall on the main deck and by a souvenir counter placed in the extreme end. The deck is supported amidships by the boiler casing, which in turn, is given additional strength. Forward and aft of the boiler casing I beam stringers, in connection with gas pipe stanchions, are used in giving support to the deck, while the space between the promenade and main deck is built up of wood. The deck itself is of ¾ in. pine, covered with canvas and supported by 4¼ x 1¼ in. pine beams, spaced 24 ins. centre to centre. The deck is enclosed by an oak rail 1 ¾ x 5 ins., supported at equal intervals by oak stanchions, the whole being enclosed by galvanized wire iron work. Window stools and sashes of cabin windows are of mahogany, the cabin exterior is finished in

**THE STEEL HULL.**—The hull is divided into six compartments by transverse bulkheads, three being watertight and two non-watertight. The peak bulkhead at frame 6 is made up of 10 lb. plate, stiffened in a vertical direction by 3½ x 2½ x 6.1 lb. angles and in a horizontal direction by 2½ x 2½ x 4.1 lb. angles. The plating of watertight bulkheads at 26 and 66 runs from 12½ lbs. per sq. ft. below to 6 lbs. above. Horizontal and vertical stiffeners are all 2½ x 2½ x 4.1 lbs. The bulkhead at frame 44 is non-watertight and separates the boiler from the engine space. It is built up of 6 lb. plate stiffened vertically by 2½ x 2½ x 4.1 lb. angles and horizontally by 3½ x 2½ x 7.2 lb. angles. The engine space is separated from the after hold by a non-watertight bulkhead at frame 55; it is built up of 14 b.w.g. plate and stiffened vertically and horizontally by 2½ x 2½ x 4.1 lb. Double angles are used in connecting the watertight bulkheads to the shell, while single angles are used for those that are non-watertight. Diamond shaped liners are fitted to all bulkheads in way of outside strakes of plating. There are two coal



The Thousand Island Steamboat Co.'s Steamboat, Thousand Islander.

redwood and the interior in white pine covered with white enamel. The souvenir stand is of mahogany, together with the newell posts of stairways and the wood finish around the pipe stanchions.

The boat deck extends from frame 17 aft to the extreme stern. The deck forward carries the usual pilot house and chart room, together with accommodations for the captain, owner, maid and mate. The stack casing, 7½ ft. wide, extends from frame 31 to 41. Aft of frame 42 there are four life boats. The stairs leading to the promenade deck are located between frames 72 and 75. The entire deck is enclosed by a ¾ in. pipe railing about 2 ft. 9 ins. above the deck, supported by ¾ in. pipe stanchions placed at 5 ft. intervals. The support for the deck is arranged in the same manner as the promenade deck. The deck is of ¾ in. pine, covered with canvas. The beams are of pine, 1¼ x 4¼, spaced 25 ins. centre to centre, the camber being 6½ in. in 32 ft. The texas is finished in redwood and the sash for the windows is mahogany.

bunkers placed on opposite sides of the ship and having doors that open into the fire hold. The starboard bunker extends from frame 36 to 44 and the port bunker from 26 to 35. The bunkers are built up of 6 lb. plate stiffened vertically by 2½ x 2½ x 4.1 lb. angles spaced 24 ins. keel to keel. The boiler casing consists of 6 lb. flanged plate built up from 10 lb. coamings. The plates are flanged the necessary depth to do away with the angle stiffeners. The shell plating includes the garboard strake of 11 lbs. fore and aft, bilge and bottom plate 10 lb. fore and aft. Strake next below the sheer strake 11 lbs. fore and aft, while the sheer strake is 12 lbs. for ¾ length amidships reduced to 11 lbs. at the ends. The keel plate is flat, being 30 ins. wide by 15 lbs. fore and aft, and worked in lengths of not less than seven frames spaces. The butts are double riveted; a single inside 18 lb. strap being fitted extending to the garboard edge laps. The garboard bottom and bilge strakes are butt lapped, double riveted, with ¾ in. rivets. The side and sheer strakes are butt lapped, double

rivetted with  $\frac{3}{4}$  in. rivets. The fore and aft edge laps of the garboard and sheer strakes are double rivetted, the remainder are single rivetted. The under body of the boat is sheathed with rock elm,  $2\frac{1}{2}$  ins. thick. The sheathing extends from between frames 15 and 16 to frames 66 and 67 and extends upward to the turn of the bilge. After the shell plating had been caulked, the wood sheathing was fastened in place by means of bolts and nuts and the bottom was then caulked in the usual manner. The floors, 12 ins. deep, are solid on every frame, being formed of 10 lb. plates, with the exception of the engine and boiler space, where they are increased to 14 lbs. Deep floors are provided for the engine space and also for the ends of the ship. The frames are formed of  $3 \times 2\frac{1}{2} \times 4.5$  lb. angles and spaced 24 ins. keel to keel. The reverse frames forward and aft of the engine and boiler space are  $2\frac{1}{2} \times 2\frac{1}{2} \times 4.1$  lb. angles extending alternately to the main deck stringer plate and to the upper turn of the bilge. In the engine and boiler space they are increased to 5 lb., and all extend to the main deck stringer plate, while additional reverse frames are fitted for the length of the floors.

There are two longitudinal keelsons on each side of the centre line, worked intercostal between solid floors on each frame. The longitudinals are formed of 10 lb. vertical plates, the lower edges being flanged and rivetted to the shell, while the top edges are rivetted to a 6 in. x 10.5 lb. channel, which extends fore and aft over the tops of the floors to which it is attached by angle clips.

The channels are continuous fore and aft, and are not cut in the way of bulkheads. Bracket connections are made at all the bulkheads besides the necessary watertight construction. The longitudinals are carried as far forward as practicable and as far aft as the stern, where they help to stiffen the roof of the tunnel.

The bilge and side stringers are formed of a 6 in. x 10.5 lb. channel, connected to the frames by  $2\frac{1}{2} \times 2\frac{1}{2} \times 4.1$  lb. clips. The channels are slotted in way of the frames and cut at the bulkheads to which they are attached by suitable brackets. The outer flange of the channel is connected directly to the shell, while the channel itself is fastened to the frames by angle clips. At the stem the stringers are connected by 10 lb. plate breast hooks together with the necessary angles.

The foundation for the engines is formed mainly of four longitudinal girder plates each of 10 lb. intercostal, between the floors, to which they are attached by means of double angles  $2\frac{1}{2} \times 2\frac{1}{2} \times 4.1$  lbs. The girder plate itself extends to the shell to which it is connected thereto. The rider plates are continuous and formed of 20 lb. plates, 15 $\frac{1}{2}$  ins. wide connected to the floor plates and longitudinals, thereby tying the whole together.

There are two saddles for each boiler, consisting of 14 lb. plate and double angles  $3 \times 3 \times 7.2$  lbs. The fore and aft saddles for each boiler are connected by 14 lb. plate girders to which they are connected by  $2\frac{1}{2} \times 2\frac{1}{2} \times 5$  lb. angles.

The main decks beams are of angle steel  $5 \times 3 \times 8.2$  lbs. placed on every frame to which they are connected by 10 lb. gusset plates  $15 \times 15$  ins. The camber is 6 ins. in 32 ft. The main deck stringer plates are 18 ins. x 10 lbs. for two thirds length amidships reduced to 8 lbs. at the ends. They are fitted close to the sheer strake plating and connected thereto by a 6 in. x 14.52 lb. Z bar. The top edge of the sheer strake is flanged outward to receive the lower flange of the Z bar while the deck stringer is connected to the upper flange of the bar.

The only plating on the main deck, other than that of the main deck stringer, is that due to the reinforcement of hatch openings in the way of boiler and engine

space and stairways. The main deck is of pitch pine  $2\frac{1}{4}$  i.u.s. thick x  $3\frac{3}{4}$  ins. wide, laid in long lengths, and well fastened to the beams and plating by  $\frac{1}{2}$  in. diar. cheese head, square necked, galvanized bolts and nuts. An oak fender, strake  $6 \times 8$  ins. is placed on a line with the main deck and extends around the stern to as far forward as the stem.

**THE MACHINERY.**—There are two main engines of the two cylinder, vertical, direct acting compound type, well balanced and each capable of developing about 500 h.p. at 200 revolutions a minute, from a steam pressure of 150 lbs. per square inch.

The sequence of cylinders, beginning forward, is high pressure and low pressure, with diameters, respectively, 15 and 30 ins. and a common stroke of 20 ins.

The main engines are placed 8 ft. apart in a single engine room without a centre line bulkhead, the starting platform being conveniently located between the engines, with ample space for the engine crew to work. The cylinders are fitted with safety valves in the bottom and covers. From the centre of the engines to the centre of propeller is  $62\frac{1}{2}$  ft.

The cranks are set at 90 degrees. The high pressure cylinder has one piston valve 9 ft. in diar., while the low pressure cylinder has a flat, double ported slide valve 28 ins. wide and 24 ins. long, the valve travel in each case being 4 $\frac{1}{2}$  ins.

The valves are operated by Stephenson's link motion, through overhung double bar links, with motion derived from eccentrics keyed to the crank shaft. The valve gear is so adjusted that the mean cut-off in full gear will be about 66 $\frac{3}{4}$ % in the high pressure cylinder, and 56 $\frac{3}{4}$ % in the low pressure cylinder. The point of cut-off will be variable by means of slotted reverse arms. The pins on the links for the attachment of the eccentric rods are  $2\frac{1}{4}$  ins. centre to centre, the full throw of the links being 12 ins.

The high pressure eccentric sheaves are of cast iron and made in one piece, while the low pressure sheaves are made in halves. The straps for all the eccentrics are of cast iron and made in halves, the bearing surface in each being  $2\frac{1}{4}$  in. wide. The distance from the centre of the shaft to the centre of the links is  $50\frac{1}{2}$  ins.

The valve stems in all cases are  $1\frac{1}{2}$  ins. diar. through the valves, 2 ins. through the stuffing boxes and  $2\frac{1}{4}$  ins. at the guides. The piston rods are each  $3\frac{3}{4}$  ins. diar. The framing of each engine consists of two cast iron I section columns at the front and two cast iron box section columns at the back.

The bed plates are of cast iron and contain three bearings each. The exhaust passage from the high to the low pressure cylinder is formed by an 8 in. extra heavy steel pipe, bent to the arc of a circle and connected by flanges to the upper facing of the steam chests.

From the inboard side of each low pressure steam chest a steel exhaust pipe leads to a cast iron fitting bolted directly to the condenser, which is common for both engines. Each exhaust pipe is of 11 ins. diar. at the cylinder and 12 ins. at the condenser.

The high pressure pistons are of cast iron, fitted with cast iron plugs arranged for water grooves. The low pressure pistons are of cast steel fitted with the usual arrangement of cast iron follower, and two spring rings in each piston. All pistons have a depth of  $4\frac{1}{2}$  ins.

The crossheads are of cast steel with pins 4 ins. diar. by  $5\frac{1}{2}$  ins. long. Brass slippers are fitted for both ahead and astern thrusts. The slipper for the ahead thrust is 10 ins. wide by 12 ins. long, while the combined width of the slippers for the astern thrust is ins. with a length of 12 ins.

The crosshead backing guides of L section are made of cast iron and bolted directly to the back columns.

The connecting rods which are 45 ins. centre to centre, having a diameter at the crosshead end of  $3\frac{1}{2}$  ins., and  $3\frac{3}{4}$  ins. at the crank end. The crosshead end has a single connection, and the adjustment for wear at that end is taken up by means of a wedge, while at the crank end a bolt connection is used.

The crank shafts are each made in one forging with a coupling disc  $14\frac{1}{2}$  ins. diar. by  $1\frac{1}{2}$  ins. thick at one end. The length over all is 7 ft.  $1\frac{1}{2}$  ins.

The journals are  $6\frac{3}{4}$  ins. diar., while the crank pins are  $6\frac{3}{4}$  ins. by 8 ins. long.

The crank webs are  $7\frac{3}{4}$  ins. wide by  $4\frac{1}{2}$  ins. thick. Opposite each crank slab a tail piece is forged, to which the cast iron counterbalances are bolted. The counterbalances are of sufficient weight to take care of the reciprocating as well as the rotating weights. Each thrust shaft is  $6\frac{3}{4}$  ins. diar. and 3 ft. 7 ins. over all, being fitted with four collars 13 ins. diar. by  $1\frac{1}{2}$  ins. thick and  $3\frac{1}{2}$  ins. apart. A coupling disc is forged on each end  $14\frac{1}{2}$  ins. diar. by  $1\frac{1}{2}$  ins. thick.

There are two intermediate shafts for each engine,  $6\frac{3}{4}$  ins. diar. by 12 ft.  $9\frac{1}{4}$  ins. long and coupling discs forged at each end. The tail shaft is  $7\frac{1}{4}$  ins. diar. in the bearings and  $6\frac{3}{4}$  ins. diar. between the bearings and at the ends. Length over all is 30 ft.  $3\frac{5}{16}$  ins. A cast iron coupling disc  $18\frac{3}{4}$  ins. diar., is shrunk on the forward end.

Each crank shaft has three bearings,  $6\frac{3}{4}$  ins. diar., two being 8 ins. long and one  $11\frac{1}{4}$  ins. The thrust bearings consist of cast iron pedestals, fitted with three cast iron horse shoe collars lined with white metal in each pedestal.

The intermediate shafting for each engine is carried by two spring bearings made of cast iron, the lower halves being lined with white metal.

Each propeller shaft is supported at the outboard strut and also in the stern tube by a bearing at each end. The bearing in the strut consists of a brass sleeve 22 ins. long, carrying wood strips of lignum vitae. The after bearing in the stern tube is a duplicate of the strut bearing, while the bearing at the inboard end consists of a brass sleeve.

The stern tube is made of two cast iron sleeves connected by a standard steel pipe 9 ins. diar. The after sleeve is made to fit a cast steel boss rivetted to the shell of the ship, while the inboard end is flanged to receive the after collision bulkhead. The over all length of stern tube is 14 ft. 5 ins. There are two propellers of cast iron, solid, three bladed, and made to the right and left hand. The diameter of each wheel is 6 ft, while the pitch is 9 ft. The developed area for one wheel is  $14\frac{1}{2}$  sq. ft. The propellers rotate outboard.

#### AUXILIARY MACHINERY.

All auxiliary machinery is placed below the main deck with the exception of the dynamo and hand deck pump, which are placed on the main deck.

**REVERSING GEAR.**—A steam cylinder 7 ins. diar., and 12 ins. stroke, is used for reversing each engine and is bolted directly to its respective front column. A slide valve of cast iron governs the action of this cylinder.

**AIR PUMP AND JET CONDENSER.**—A single acting, independent, vertical air pump and jet condenser is fitted, having one steam cylinder, 12 ins. diar., placed directly over the air chamber 24 ins. diar., with a common stroke of 18 ins. The diameter of the injection pipe is 5 ins. while the overboard discharge pipe of the air pump is 10 ins. The air pump is placed athwartship, the centre being 9 ft. 5 ins. aft of the centre of the engine, the base resting upon the ship floors.

**THE FEED WATER HEATER** is located on the starboard side on the forward engine room bulkhead and uses the auxiliary exhaust steam. It is a film feed water heater consisting of eight spirally corrugated tubes  $2\frac{1}{2}$  ins. diar. by 46 ins. long.

**FEED PUMP.**—There is one  $10 \times 6\frac{1}{2} \times 12$

independent, simplex, plunger, horizontal feed pump. It is located on the port side of the engine room and has a discharge of 2½ ins. diar., while the suction connects with a 4 in. two valve manifold which draws from the hot well and sea.

**GENERAL SERVICE PUMP.**—There is one 8 x 5 x 12 independent, duplex, plunger, horizontal general service pump placed on the starboard side of the ship. The suction of this pump is connected to a 4 in. three valve manifold which draws from the sea, bilge and hot well. The discharge 2½ in. diar. is connected to the general service pump manifold, through which the pump discharges indirectly to the ash gun, fire hose, deck hose, engine hose, condenser, overboard, fresh water tanks, to the boilers through the feed water heater and to the boiler direct through independent lines. A 14½ in. injector discharges into the after end of this manifold.

**FRESH WATER PUMP.**—There is one 4 x 4¼ x 5 independent, duplex, piston, horizontal fresh water pump placed on the starboard side of the ship on the forward engine room bulkhead. The suction and discharge are, respectively, 2 ins. and 1½ ins. The suction and discharge are connected to the fresh water tanks, which are in the boiler room.

**SANITARY PUMP.**—There is one 5½ x 5 x 5 independent, duplex, piston, horizontal sanitary pump placed on the starboard side of the ship, suction being taken from the sea. The suction and discharge are, respectively, 3 ins. and 2 ins.

**BILGE PUMPS.**—There are two dependent, horizontal, plunger bilge pumps, 4½ ins. diar. by 4 ins. stroke, each pump deriving its motion from a pin driven into the forward end of the crank shaft. The pump body is bolted to the outboard side of the bed plate of each engine, the suction 3 ins. diar., is connected to the bilge, while the water is discharged through two 2½ in. pipes directly overboard.

**STEERING ENGINE.**—There is a double cylinder 5 x 5½ steering engine, steam and hand combined, on the port side of the ship, connecting with the rudder quadrant by chains.

**DYNAMO.**—There is a 25 kilowatt generator direct connected to a steam turbine, which furnishes current for lighting the ship. This outfit is placed on the main deck, starboard side, just aft the engine platform. The switchboard is placed on the port side near the entrance to the engine platform; the whole being within the engine well.

The distribution of lights is as follows:—

<b>BOAT DECK.</b>	<b>MAIN DECK.</b>
10—8 c.p.	57—8 c.p.
5—16 c.p.	45—16 c.p.
4—32 c.p. Signal Lights.	HOLD.
<b>PROMENADE DECK.</b>	37—8 c.p.
76—8 c.p.	36—16 c.p.
8—16 c.p.	

**THE FAN AND ENGINE** used in connection with the forced draught for the boilers is placed on the port side of the engine room at the forward engine room bulkhead. The 5 x 5 high pressure engine is direct connected to a no. 6 fan.

board side of the ship, on the forward side of the coal bunker bulkhead. This gun consists of the hopper into which the ashes are thrown and discharged over-

**THE ASH GUN** is placed at the starboard through a 7 in. extra heavy pipe, check valve and a deflector which is riveted to the side of the ship. A water jet at the top and bottom of the gun furnishes the necessary power to discharge the ashes.

**HAND PUMP.**—There is one vertical, duplex, plunger hand pump, required by the U.S. laws, placed on the main deck, aft. Each cylinder is 4¼ ins. diar. with a stroke of 6 ins. making a total capacity for each cylinder 106 cu. in.

**BOILERS.**—Two single ended Scotch boilers of the cylindrical type working at a pressure of 150 lbs. to the square inch are located on the centre line of the ship in one boiler room. The dis-

tance between the boilers longitudinally is 9 ft. 9 ins. between the furnace fronts, while each boiler has a separate funnel spaced 12 ft. apart. The funnels are 40 ins. inside diar., while the outside stacks are 48 ins. diar., the top being 40 ft. 3 ins. above the grates. The boiler aft, projects through the bulkhead between the boilers and engines about 3 ins. There is an exit to the main deck at the forward end of the boiler room. Ventilation for the boiler room is provided by two 24 in. ventilators placed in the centre of the boiler room, the outlets being carried down level with the bottom of the air heater.

The furnaces, two in each boiler, have internal and maximum diameters of 45 ins. and 48-16-16 ins. respectively, the thickness being 15/32 in. The grates are 5½ ft. long, the grate surface of each boiler being 41¼ sq. ft., while the heating surface in each boiler is 1713 sq. ft., or a ratio of 41.5 to 1; making for the two boilers an aggregate grate surface of 82.5 sq. ft. and a total heating surface of 3426 sq. ft. The furnaces are of the Morison suspension type, and have independent combustion chambers. The length of the tubes between the tube sheets is 6 ft. 10 3/16 ins., and they are spaced 3½ ins. in a vertical and 3¾ ins. in a horizontal direction. Each boiler contains 326 tubes, of which 44 are stay tubes; all have an outside diameter of 2½ ins., with 10 gauge for the stay tubes and 12 gauge for the ordinary tubes. The tube sheets have a thickness of ¾ of an inch. The top of the combustion chamber, which is 9/16 of an inch thick, is supported in the usual manner by bridge girders. The boiler shell is 15/16 in. thick.

**FORCED DRAUGHT.**—The positive forced draught unit consists of a no. 6 fan direct connected to a 5 x 5 high pressure engine. The suction of the fan is taken from the engine room, while the air is discharged, through a 24 x 24 in. galvanized steel pipe to the air heaters, which are studded to the boiler fronts. The suction of the fan has a diameter of 31¼ ins. while the discharge has a sectional area of 576 sq. ins. The air heater for each boiler measures 9 ft. long by 2 ft. 8 ins. wide and 5 ft. 2 ins. deep. Each heater consists of 127 horizontal tubes, whose ends are expanded into steel plate headers, ¼ in. thick. All the tubes are of steel, 2¼ ins. outside diar., 14 gauge and 9 ft. long. The total heating surface for both air heaters is 1346 sq. ft. The operation of the positive draught is such that the burnt gases from the boiler pass on the outside of the air heating tubes, while the fresh air for the furnaces is forced through the tubes, thus abstracting heat from the boiler gases for the benefit of combustion.

The Thousand Islander was built by the Toledo Shipbuilding Co., Toledo, Ohio.

### British Columbia-Mexico Steamship Service.

The Pacific Canadian Steamship Co. Ltd., has been formed in Liverpool, Eng., to take over the Canadian Mexican Pacific Steamship Co., which operates a steamship line between Victoria, Vancouver and Salina Cruz, in connection with the Tehuantepec National Ry., which latter crosses the Isthmus of Tehuantepec to Puerto Mexico, on the Gulf of Mexico, where connection is made with the Gulf Transport Line to Europe. The company proposes to establish and maintain the running of a line of steamships between Canadian and Mexican ports, in particular between Vancouver and Salina Cruz, calling at intermediate ports whether in Canada, Mexico or the United States, and at San Francisco, and to adopt an agreement with the Tehuantepec National Ry. The capital stock is mentioned as \$100,000, half of which is subscribed by J. H. Welsford and Co., Liverpool, Eng., who either own or control the

Gulf Transport Line, the Canadian Mexican Pacific Steamship Co., the Union Steamship Co. of British Columbia, and the Boscowitz Steamship Co., and the remaining half by B. C. Pearson, London, Eng., of Sir W. D. Pearson and Co., who control the Tehuantepec National Ry., and who were the contractors for its construction. It is stated that the steamships Ikalis and Ikala of the Gulf Transport Line will be transferred to the Pacific Canadian service immediately.

The Canadian Mexican Pacific Steamship Co., received a subsidy from the Dominion Government for the service between Vancouver and Salina Cruz, a condition of the agreement being that no calls had to be made at any U. S. port.

### New Brunswick-Prince Edward Island Car Ferry Service.

Differing from the usual custom of calling for tenders by advertisement, the Department of Railways and Canals issued a circular letter to vessel builders inviting tenders for the construction and delivery of a steel car ferry for the service on Northumberland Straits between Cape Tormentine, N.B., and Carleton Point, near Cape Traverse, P. E. I. The circular points out that special investigation has been made by Prof. A. K. Kirkpatrick, M. Can. Soc. C. E., of Queen's University, Kingston, Ont., into conditions of ice, currents and weather, and his report also suggests type, dimensions and power of the vessel. The vessel adopted will require to have a deck capacity of 10 loaded freight cars of 80,000 lbs. capacity each, or six passenger cars, each 76 ft. long over all, and must be capable of maintaining a speed of at least 14 miles an hour under load in open water, and be able to negotiate the worst conditions of ice to be encountered in the Straits at a speed of not less than half a mile an hour. The type of vessel suggested by the report would be something between the design of the Delaware and the Bessemer and Pere Marquette types. It should have an ice crushing bow with bow propeller of special nickel steel and engines of 200 i.h.p. each, belt plating, stiffening deck without camber or sheer at water level, to protect hull against pinching by moving ice floes. Two railway tracks would have to be provided with accommodation for five freight cars each, arranged to be loaded and unloaded over the stern, and with accommodation for passengers as well as crew. This would necessitate a vessel about 280 ft. long, 50 ft. beam and 16 ft. draught light and about 18 ft. draught under full load, which would be able to negotiate any of the ice conditions to be found in the Straits.

Tenders were invited to Aug. 15, and the successful tenderer will be required to deliver the vessel on the route not later than July 1, 1913, free of all charges. In addition to the deposit of 10% of the tender price, the successful tenderer will also be required to enter into a bond or other satisfactory security to the value of the remaining 90% of the tender price, which will be held for 12 months from the date of delivery of the vessel, as an additional security for fulfillment of the specified requirements, more particularly as regards the overcoming of the ice conditions. Payment for the vessel will be made on delivery, provided the requirements of the contract and specifications are then fulfilled, apart from the actual overcoming of the ice conditions.

The contract for the construction of the Government grain elevator at Fort William, has been awarded to the Barnett-McQueen Co. The elevator is to be ready for operation by Sept. 20, 1913. The amount of the tender is said to have been \$1,179,503.

**Patrol Steamship for the Dominion Customs Service.**

Tenders will be received to Sept. 2, for the construction of a twin screw steel steamboat for the Customs service on the Atlantic coast, to be named Margaret, the profile of which is illustrated on this page.

Following are the principal dimensions, length between perpendiculars, 185 ft.; breadth, moulded, 32 ft.; depth, moulded to main deck, 16 ft.; draught, forward and aft, 10½ ft.; deadweight, 175 tons; coal, full supply, 200 tons; indicated horse power, 2,000; complement, officers and crew, 32; armament, two 6 pounder quick firing guns.

She is to be of steel throughout except where otherwise specified, under Government survey; fitted with water ballast and double bottom; ram stem, cruiser stern and five main transverse water tight bulkheads extending to the main deck.

The machinery is to consist of twin screw triple expansion engines with two Yarrow water tube boilers, working under forced draught. The armament of two 6 pounder quick firing guns will be supplied by the Government. A complete electric lighting installation is to be

the boat, with the result that it crashed into the upper gates (head), carrying them away. The rushing water from the upper level, locks 23 and 24, carried the boat back some distance, the stern striking the corner of a bridge over a narrow channel which connects the canal prism and the equalizing basin alongside. A hole was punched in the boat, but it was soon repaired, and she did not sink. The protection, or stop, logs along the west bank of the canal prism were washed out into the adjoining embankment, the flood of water also overtopping the same and doing some little damage to the G.T.R. tracks, which run immediately along the base of the embankment. Fortunately, there was no loss of life, as was the case when the government steamboat La Canadienne carried away the gates of lock 22, which is located about 900 ft. below lock 23.

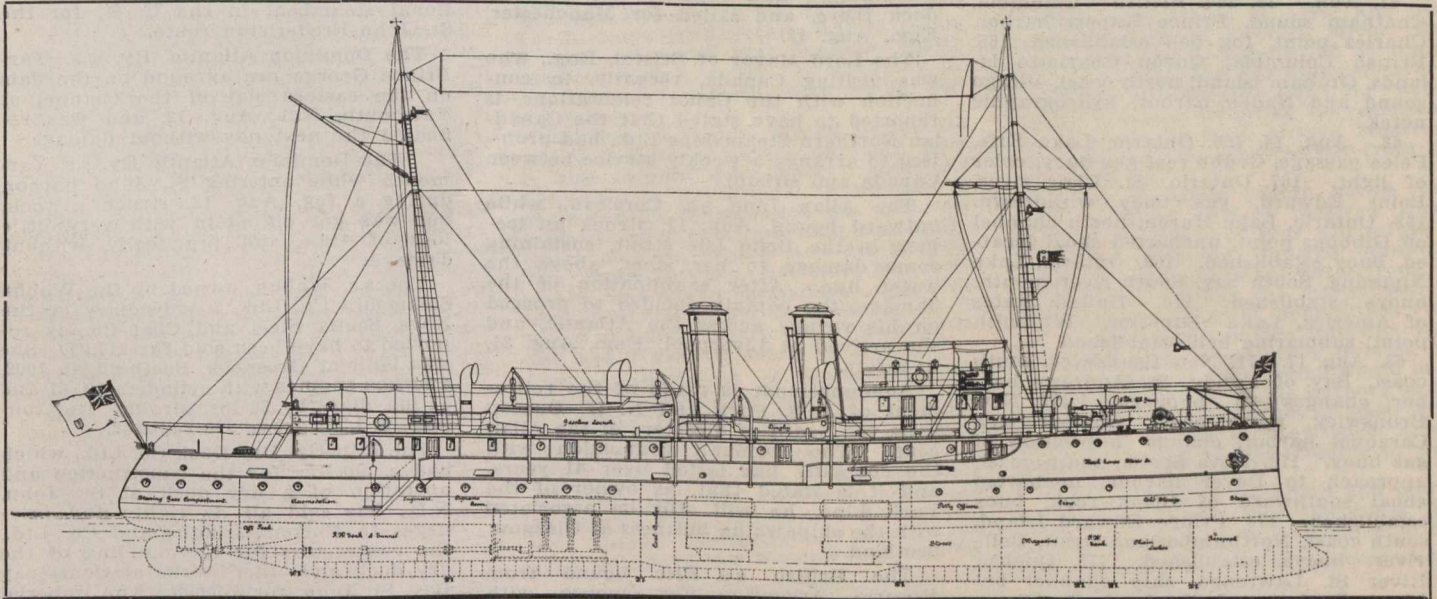
New gates were sent up at once from Port Dalhousie, on Lake Ontario (a supply being kept there all the time), and were installed Aug. 3. The canal was out of commission a comparatively short time. This is the third time this season that the canal has been tied up by accidents to lock gates.

The levels between Port Dalhousie and Thorold, locks 1 to 25, inclusive, are comparatively short ones, the distance being

**Empress of Britain-Helvetia Collision.**

The formal investigation into the causes of the collision of the C.P.R. s.s. Empress of Britain with the s.s. Helvetia, in the Gulf of St. Lawrence, July 27, when the latter vessel was rammed in a fog, and sank, was held early in August by Capt. H. St. G. Lindsay, Wreck Commissioner, and concurred in by Capt. Clift and Nash, as nautical assessors.

The court found that the Empress of Britain is alone to blame for the collision, inasmuch as the speed at which she was proceeding prior to the accident was excessive, considering the state of the weather at the time. During the investigation exception was taken to the action of the master of the Helvetia when the Empress was sighted, but in view of the close proximity of the two vessels and the speed of the Empress, the court is of opinion that the collision was unavoidable, and also that, as the Helvetia was under a port helm with engines stopped when the Empress was sighted, the master of the Helvetia adopted the best course open to him under the circumstances. The court censures the master of the Empress of Britain, but on account of his previous good record, the skilful



Patrol Steamship for the Dominion Customs Service.

supplied, including two sets of dynamos and engines, search light, etc. All the auxiliary machinery is to be of the latest improved type, and the Marconi system of wireless telegraphy is to be installed.

**Another Lock Gate Accident in the Welland Canal.**

An accident to the gates of lock 22, Welland canal, which occurred June 20, was fully described and illustrated in Canadian Railway and Marine World for August. Another accident on this canal happened August 2, this time to lock 23, both the upper and the lower gates being carried away as the result of the collision of a steamer.

The wooden freight steamer Wiley M. Egan, 252.2 ft. long, 39.8 ft. in breadth and 20 ft. deep, with a gross tonnage of 1,677 and a net tonnage of 1,380, built in Cleveland, Ohio, in 1887, and carrying a crew of 17, was bound light from Deseronto to Ashtabula to load coal. She had entered lock 23 under good control. Approaching the upper gates, the captain gave the required bells to reverse and stop. The engineer understood the signal, but was unable to control the advance of

about nine miles. The summit level, however is about 18 miles long. To guard against what might be very serious consequences, a guard-gate is located about 900 ft. south of lock 25, the end of the summit level. This guard-gate is invariably closed whenever the gates of lock 25 are open, as well as at other times when no traffic is passing lock 25, lock tenders being stationed at both places. To regulate the opening and closing of these upper gates, two semaphores are installed, one at each place (guard-gate and lock 25). As the distance between is short, about 900 ft., they can readily be seen by the lock tenders, their operation thus being visual. They are also provided with white and red lights for night work. The opening or closing of the gates operates these semaphores automatically.—E. Lowe in Engineering News.

A press dispatch from Liverpool, Eng., early in August stated that on account of the prevalence of ice in the North Atlantic, steamship companies interested decided that it would be undesirable to revert to the northern track for west bound vessels on Aug. 15, and for east bound vessels on Aug. 24, as had been arranged, and that no change would be made in the routes before Aug. 31.

manner in which he handled his vessel after the impact, and the efficient way in which steps were taken to rescue the crew of the Helvetia, does not deal with his certificate.

**Canadian Notices to Mariners.**

The Department of Marine has issued the following:—

56. July 24. 145. Ontario, Lake Ontario, Cobourg harbor, outer portion of central pier carried away, temporary light and buoy, caution. 146. Ontario, Lake Ontario, off mouth of Niagara river, change in position of gas and bell buoy, bell buoy to be established. 147. Ontario, Detroit river, Ballard reef channel, deepening of western half of channel completed, change in position of gas buoys, channel for light draught vessels marked by lighted buoys.

57. July 29. 148. Ontario, Lake Ontario, Toronto harbor, new western entrance, color of front range lighthouse, character of back range light. 149. Ontario, Lake Ontario, Welland canal entrance, Port Dalhousie, front range light improved. 150. Ontario, St. Clair river, Chenal Ecarte, buoy established. 151. Ontario, Lake Huron, north channel, Clapperton island, light improved. 152.

Ontario, Lake Superior, Thunder bay, Port Arthur, light established on Thunder bay elevator wharf, gas buoy placed temporarily at entrance to channel to Thunder bay elevator.

58. July 29. 152. Nova Scotia, south west coast, westward of Cape Sable, Cornwall rock, buoy established. 154. Nova Scotia, North Atlantic Ocean, Sable island, west end, intended change in character of light. 155. Nova Scotia, Cape Breton island, east coast, South Ingonish harbor, light established on breakwater.

59. Aug. 2. 156. British Columbia, Vancouver island, east coast, Nanaimo harbor, Newcastle island passage, uncharted rock, buoy established. 157. British Columbia, Strait of Georgia, Malaspina strait, Lund, Ragged islands, change in position of light. 158. British Columbia, Chatham sound, Prince Rupert harbor, Barrett rock, gas buoy replaced by gas and bell buoy.

60. Aug. 7. 159. Prince Edward Island, north coast, Savage harbor, change in position of range lights. 160. New Brunswick, east coast, Miramichi bay, Grandoon flats, dredging. 161. New Brunswick, Chaleur bay, Caraquet harbor, dredging. 162. Newfoundland, east coast, Cape St. Francis, change in fog alarm. 163. England, south coast, Southampton harbor, light buoys established.

61. Aug. 13. 164. British Columbia, Chatham sound, Prince Rupert harbor, Charles point, fog bell established. 165. British Columbia, Queen Charlotte islands, Graham island, north coast, Virago sound and Naden harbor, hydrographic notes.

62. Aug. 14. 166. Ontario, Lake Erie, Pelee passage, Grubb reef gas buoy, color of light. 167. Ontario, St. Clair river, Point Edward, gas buoy withdrawn. 168. Ontario, Lake Huron, north channel off Gibbons point, uncharted shoal located, buoy established. 169. Ontario, Lake Nipissing, South bay, South river mouth, buoys established. 170. United States of America, Lake Superior, Whitefish point, submarine bell established.

63. Aug. 17. 171. New Brunswick, south coast, Bay of Fundy, St. Andrews harbor, changes in buoyage. 172. New Brunswick, north coast, Chaleur bay, Caraquet harbor, change in position of gas buoy. 173. Nova Scotia, south coast, approach to Dover harbor, uncharted shoal southward of Black rock, buoy established. 174. Prince Edward Island, south coast, Northumberland strait, Belle river, buoys established. 175. Quebec, River St. Lawrence, ship channel between Quebec and Montreal, St. Pierre les Becquets to Batiscan, changes in buoyage. 176. Newfoundland, east coast, Arliege bay, existence of shoals.

64. Aug. 20. 177. Ontario, St. Clair river, Sarnia, removal of wreck of steamer Joliet. 178. Ontario, Lake Huron, Goderich, south breakwater under construction. 179. Ontario, Georgian bay, Meaford, change in position of breakwater light, range lights discontinued.

### Electrically Propelled Vessels for the Canadian Lake Trade.

The Montreal Transportation Co. has ordered in England, a vessel for the lake and canal trade, which is to be a departure from the customary means of propulsion, in that electricity will be utilized for the purpose, for the first time in a vessel of such size. The machinery will consist of two 300 h.p. high speed Diesel engines, each connected with an alternating current generator and exciter, and on the propeller shaft, just ahead of the thrust block, there will be fitted the armature of a large induction motor running at about 80 r.p.m. The whole of the mechanism will be controlled from the bridge. The vessel will be of the

usual Canadian canal size, with a dead-weight capacity of 2,400 tons on a 14-ft draught.

The vessel has been designed by John Reid and Co., Montreal and Glasgow, the electrical system to be adopted being invented by H. A. Mavor, Glasgow. J. Reid, stated in Montreal, recently, that the peculiar conditions encountered in Canada in the canal traffic had caused the country to lead the world in experimenting in such matters. The absolute limit of hull capacity had been reached at above 2,200 tons, and as a result the only way to add somewhat to the capacity was to reduce the weight of the engines. Canal boats required very coarse pitch propellers, working at about 80 r.p.m. With the Diesel engines on the vessel Toiler, the propellers run at about 250 r.p.m., and as a result, the vessel is not so well adapted for the Canadian canal traffic as she might have been. With the electric motive power, the proper speed will be easily obtained.

### Atlantic and Pacific Ocean Marine.

The Manchester Liners s.s. Manchester Inventor, which collided with an iceberg off Belle Isle, towards the end of July, and went to St. John's, Nfld., for examination and repairs, left the dry dock there, and sailed for Manchester, Eng., Aug. 13.

The Lord Mayor of Bristol, Eng., who was visiting Canada, recently, in connection with the Cabot celebrations, is reported to have stated that the Canadian Northern Steamships Ltd., had promised to arrange a weekly service between Canada and Bristol.

The Allan Line s.s. Corsican, while outward bound, Aug. 12, struck an iceberg in the Belle Isle strait, sustaining some damage to her stem, above the water line. After examination of the damage, the captain decided to proceed on his voyage across the Atlantic, and she arrived at Liverpool, Eng., Aug. 21, in safety.

Announcement is made of the retirement of J. S. Park and N. H. Dunlop from the board of directors of the Allan Line. The former's connection with the company has lasted over 41 years, and it is stated that, as owner of the Park Line, he will still be associated with the shipowning business at Glasgow, Scotland.

The British s.s. Eric bound from Rosario, Argentine, for Quebec, with maize, for J. Richardson and Sons Ltd., went ashore on Sable Island, Aug. 14, and subsequently broke up, becoming a total loss. She was built at Whitby, Eng., in 1892, and was screw driven by triple expansion engines having cylinders 23, 37½ and 61½ ins. diam. by 39 ins. stroke, 235 n.h.p. Her dimensions were, length 312.5 ft., breadth 40.7 ft., depth 21.9 ft., tonnage, 2768 gross, 1788 register.

The Union Steamship Co. of New Zealand's s.s. Niagara, under construction at Glasgow, Scotland, for the Australasia-Canada mail service, was launched there, Aug. 17, the christening ceremony being performed by Mrs. Borden, wife of the Canadian premier. The vessel's dimensions are, length 522½ ft., breadth 66 ft., depth 37½ ft., and she will be about 13,000 tons gross. The equipment will be of the highest and most modern class, and wireless telegraph equipment will be installed. The propelling machinery will be of the combined reciprocating and turbine type, with boilers fitted to burn either coal or liquid fuel, for a speed of 17 knots an hour. A full number of boats and life saving appliances will be provided to serve all passengers and the entire crew, and there will also be a complete electric light installation.

The report of Furness Withy and Co. for the year ended April 30, shows the earnings, including balance brought forward from the previous year, of £768,622 2s. 5d., compared with £564,339 14s. 7d. for the previous year. After paying directors' fees, income tax, etc., there remains £756,121 0s. 3d. The usual half-yearly dividend on preference shares, and the interim dividend on ordinary shares at 5% per annum, were paid Nov. 1, 1911, and there has been transferred to depreciation account, £240,000, leaving an available balance of £430,810 16s. 7d. A bonus of 5% on the ordinary shares was declared, making 10% for the year. The report announces the addition to the company's fleet of the steamships Hochelaga and Lingan, specially built for the coal trade, and leased to the Dominion Coal Co. Description and illustration of these vessels have already appeared in Canadian Railway and Marine World. Announcement is also made that a Diesel engined vessel, named Eavestone, has also been launched for the company.

### Maritime Provinces and Newfoundland.

The Crystal Stream Steamship Co. is negotiating for the purchase of an additional steamboat in the U. S., for the St. John-Fredericton route.

The Dominion Atlantic Ry. s.s. Yarmouth Prince George ran aground on the flats on the eastern side of the channel at Yarmouth, N.S., Aug. 12, and was refloated the next day without damage.

The Dominion Atlantic Ry. s.s. Yarmouth while entering St. John harbor, during a fog, Aug. 12, struck a rock, but was got off again with very little loss of time and practically without damage.

The s.s. Woburn, owned by the Woburn Steamship Co. Ltd., a subsidiary of the Nova Scotia Steel and Coal Co., is reported to have been sold for £17,000. She was built at Greenock, Scotland, in 1902, and has engines with cylinders 19, 31 and 51 ins. diam., by 36 ins. stroke. Her tonnage is 1,551 gross, 990 register.

The Imperial Dry Dock Co. Ltd., which had a charter for the construction and operation of a dry dock at St. John, N.B., has sold all its rights and privileges to Norton Griffiths and Co. Ltd., the contractors for the building of the dry dock and other works at Courtenay Bay, St. John, for \$75,000. The Imperial Dry Dock Co. was promoted in 1900, and a certain amount of stock was taken up locally. It is reported that the amount realized by the sale, will pay all expenses, and return the shareholders double the money they paid in.

### Province of Quebec Marine.

The Minister of Public Works, at a dinner at Quebec, Aug. 1, stated that if a company was not willing to undertake the construction and operation of the proposed Quebec dry dock, the Government would do so.

It is reported that the Montreal Harbor Commissioners have decided to build three large grain elevators, each with a capacity of 2,500,000 bush. It is stated that they will probably be of re-enforced concrete, but the general details have not been made public.

C. C. Ballantyne, one of the Harbor Commissioners who arrived in Montreal from Great Britain, Aug. 11, stated that the floating dry dock, at the launching of which he was present, might be expected in Montreal about the middle of September. It was being towed across the Atlantic by three powerful tugs.

The Levis Dry Dock Realty Co. Ltd.,

has been incorporated under the Quebec Companies Act, with \$100,000 capital, and office at Quebec, to carry on any operations connected with construction generally, and with real estate. The incorporators are, J. Paradis, J. A. Lesage, L. Moreau, A. Savard and R. Pare, Quebec.

Capt. L. A. Demers, harbor master, Montreal, recently stated that because of the new order which he has introduced, to the effect that either a harbor master, or deputy harbor master, must be present at the arrival and departure of each vessel, he expects that a second deputy harbor master will have to be appointed.

The new lighthouse on St. Helens Island, near Montreal, is of re-enforced concrete, the base being 52 ft. square. The tower is 11 3/4 ft. square at the base, tapering to 6 1/4 ft. square at the top. The lamp is of the catadioptric type, the light being supplied by vaporized coal oil. It is expected that the structure will be completed early in September. The cost is reported as \$21,000.

The Dominion Public Works Department has received tenders for the construction of piers 1 and 2 in connection with the Louise dock extensions. The work includes considerable dredging in the St. Charles river. The north side of the Louise embankment wall will have to be extended 100 ft. further into the river for a length of 500 ft. Pier 2 will be 1,000 ft. long extending from the embankment towards Beauport in line with the breakwater extension, and will be 350 ft. wide with freight sheds built thereon. In connection with pier 3, it is intended to build one half at present, and the other half at some future date. The entire work is estimated to cost over \$2,000,000.

The returns for July show that permits to pass through the Lachine canal were issued to 1,064 vessels, against 964 issued in July, 1911. The various commodities passing through the canal during July were, wheat, 2,617,411 bush.; oats, 860,859 bush.; flax, 99,388 bush.; flour, 99,188 bbls.; eggs, 2,645 cases; butter, 1,112 pkgs.; cheese, 43,985 boxes; coal, 98,580 tons; coal, landed on banks, 70,853 tons.

The C.P.R. and the Sincennes-Naughton Line, were each fined \$1. by the Montreal Harbor Commissioners, Aug. 1, for breaking bylaws of the port regarding the dumping of refuse in the harbor. Charges against the White Star-Dominion Line and the Richelieu and Ontario Navigation Co., in respect of their steamships Megantic and Saguenay, for passing up the river in front of the harbor at excessive speed, were dismissed, as the defendant companies pointed out that the Harbor Commissioners had no jurisdiction over vessels passing outside the harbor.

Ontario and the Great Lakes.

The steamboat Alexandra, formerly known as Sunbeam, registered at Lindsay, Ont., has had its name changed by order in council to Arthur C.

The gates of lock 23 on the Welland canal, were carried away, Aug. 2, by the Pittsburgh and Erie Coal Co.'s steamboat Wiley M. Egan. Traffic was suspended for the better part of a day, while new gates were rushed up from Port Dalhousie.

Press reports state that the Government will, during the coming winter, build an addition to the Port Colborne elevator, increasing its storage capacity from 800,000 to 2,000,000 bushels. The existing elevator was designed by J. A. Jamieson, Montreal, who has the preparation of plans, etc., for the extension in hand.

The Canadian Interlake Line steamboat Hamiltonian, which was recently built at Port Arthur, for the Montreal

and Fort William package freight trade, was put into service early in August, when the company entertained a party of citizens at Hamilton, after which city the boat was named.

The Richelieu and Ontario Navigation Co's steamboat Macassa was taken off the Hamilton route, and placed on a special route, Aug. 28, running between Cobourg, Port Hope, Bowmanville, Oshawa and Toronto, for traffic in connection with the Canadian National Exhibition at Toronto. For similar purpose, the company's steamboat Rochester was run between Oswego and Charlotte, N.Y., and Toronto.

The Superior Elevator Co. Ltd., has been incorporated under the Dominion Companies Act, with \$150,000 capital, and office at Winnipeg, to carry on a general grain and elevator and grain warehouse business, and in connection therewith to own and operate steam and other vessels, and carry on a general transportation business in freight and passengers. The incorporators are, W. L. Parrish, G. N. Heimbecker, F. B. Hamilton, W. J. Dowler and J. T. Haig, Winnipeg.

The U. S. Lake Survey reports the levels of the Great Lakes in feet above tide-water for July, as follows, Superior 602.26; Michigan and Huron 580.48; Erie 572.56; Ontario 247.01. Compared with the average July levels for the past ten years, Superior was 0.34 ft. below; Michigan and Huron 0.60 ft. below; Erie 0.30 ft. below, and Ontario 0.16 ft. above. It was anticipated that Superior, Michigan and Huron would rise about 0.1 ft., and Erie and Ontario about 0.2 ft., during August.

The new steamship, City of Detroit III, which is now in service on Lake Erie, is the largest side wheel passenger steamship in the world. In the history of steamship construction she has only been exceeded once, and that was by the Great Eastern, which was 692 ft long. The Great Eastern, however, was both paddle and screw propelled. The City of Detroit III is 500 ft. over all, 55 ft. broad molded, 100 ft. over the guards, and has a molded depth of 22 ft.

The Department of Marine recently asked for tenders for the removal of the steamboat Douglas which was wrecked near Walkerville, several years ago, and which has been considered to be a menace to navigation. Before being wrecked she was operated between Kingsville, Pelee Island and Walkerville. The barge Monguagon, which ran aground above the Windsor waterworks,

about a years ago, is also to be removed. The latter vessel is owned in Detroit, Mich.

With reference to press reports that engineers of the Department of Railways and Canals are preparing plans for the construction of a new canal and lock at Sault Ste. Marie, and that instructions have been issued to go ahead with preparations for the work immediately, we are officially advised that suggestions have been made as to the desirability, in view of the growing traffic at that point, of having further canal accommodation, and that information is being gathered on the subject.

A quick system of handling sacks of flour for loading vessels, is in operation in the upper story of the C.P.R. freight shed at Fort William. An endless belt arrangement, reaching to every part of the upper story, has been set up, and is driven by a motor, the sacks are merely thrown on the belts and conveyed to the exit, where they are sent down a chute to the vessel hold. The arrangement was devised and set up by R. Armstrong, then Superintendent of the Fort William terminals, now Superintendent at Saskatoon, Sask.

An enquiry is being held into the causes of the foundering of the steamboat Adiramied, about six miles from Stony Island, Lake Ontario, in June, while bound to Montreal from Fairhaven, N.Y., with coal. She was built at Cleveland, Ohio, in 1866, and was rebuilt in 1882, at Detroit, Mich. She is equipped with engine of 30 n.h.p., driving a screw, and her dimensions are, length 198 ft., breadth 27.4 ft., depth 10.6 ft.; tonnage, 630 gross, 364 registered. She is owned by M. J. Morris, Montreal, who only recently acquired her from the United States.

An Ottawa press report states that from unofficial advices received there, the U. S. Secretary of War will refuse to allow the proposed Chicago drainage system to take additional water from the Great Lakes. When the matter was up for discussion recently, deputations from all the Dominion marine interests went to Washington, where they pointed out that the effect of the scheme would be to lower the water in all the harbors on the Great Lakes, by six inches at least, while the effect on the St. Lawrence, it was claimed, would be detrimental to Canadian navigation.

It was stated in Canadian and Marine World for August that the coffer dam arrangement used in replacing broken

Sault Ste. Marie Canals Traffic.

The following commerce passed through the Sault Ste. Marie Canals during July, 1912:

ARTICLES	CANADIAN CANAL	U. S. CANAL	TOTAL
Copper .....	759	15,490	16,249
Grain .....	2,470,664	989,130	3,459,794
Building stone .....			
Flour .....	328,800	616,162	944,962
Iron ore .....	4,917,378	2,403,863	7,321,241
Pig iron .....	3,981	1,783	5,714
Lumber .....	4,670	100,897	105,567
Silver ore .....			
Wheat .....	4,558,993	3,116,289	7,675,287
General merchandise .....	6,150	19,712	25,862
Passengers .....	4,214	4,747	8,961
Coal, hard .....	64,141	216,176	280,317
Coal, soft .....	404,605	1,861,227	2,265,832
Flour .....			
Grain .....			
Manufactured iron .....	39,605	53,518	93,123
Iron ore .....			
Salt .....	2,639	69,960	66,599
General merchandise .....	99,384	96,033	195,417
Passengers .....	6,044	3,821	9,865
Summary.			
Vessel passages .....	1,158	2,079	3,237
Registered tonnage .....	3,797,604	4,437,550	8,235,154
Freight—Eastbound .....	5,151,072	2,785,572	7,936,644
—Westbound .....	608,112	2,236,548	2,844,660
Total freight .....	5,759,184	5,022,120	10,781,304

propeller blades on the Niagara Navigation Co.'s SS. Cayuga was designed by B. W. Folger, ex-General Manager. A letter has been received, stating that the device referred to was invented by Barlow Cumberland, formerly Vice-president, N. N. Co., as a result of experience gained by him with the SS. Campana, and that the coffer dam arrangement referred to was constructed by J. Whalen, formerly the N. N. Co.'s ship carpenter, under Mr. Folger's direction. The Campana, above referred to, was cut in two and taken up from Montreal in 1881 for the Canada Transit Co., under Mr. Cumberland, to run between Collingwood and Port Arthur, and was the first twin-screw steamship on any of the upper lakes.

### Manitoba, Saskatchewan and Alberta.

The Department of the Interior has purchased a ferry steamboat from Grand Trunk Pacific Ry. contractors, for use on the Athabasca river, to maintain a service connecting with Jasper Park as a public convenience.

In connection with the proposal to improve the navigation of the Red river, it is reported that the survey of the portion south of the international boundary is to be taken up at the earliest possible moment, and it is expected to be completed before the severe weather arrives.

The Hudson's Bay Co.'s steamboat, Athabasca River, which was mentioned in our last issue as being under construction at Athabasca Landing, Alta., was launched about the middle of July. The machinery installed was taken from the company's steamboat Hazelton, which has been dismantled.

An Ottawa press report states that engineers of the Public Works Department are at work on the final report in connection with the surveys made for the proposed 6 ft. barge canal between Winnipeg and Edmonton. It is said that the report, with estimates, will be in the Government's possession early in the fall, and that an amount will be placed in the estimates, to cover the preliminary work.

### British Columbia and Pacific Coast Marine.

During June, 66 steamships called at Prince Rupert, and during the same period, 65 sailed from the port, a daily average of two arrivals and two departures.

The Swift Steamship Co. has commenced a freight service between Puget Sound ports and Victoria, with its steamboat Neptune. She is 84 ft. long, with tonnage, 235 gross, 176 register.

The Vancouver Portland Cement Co.'s steamship Leona, which recently arrived at Victoria from England, was built at Glasgow, Scotland, in 1884, and is a steel screw, three masted vessel, with one iron deck. She has a cargo capacity of 940 tons, her gross tonnage being 634 tons, and 243 tons net.

A bylaw is under consideration by the West Vancouver council, providing for the borrowing of \$120,000 for the purchase of shares in the West Vancouver Ferry Co., thus increasing the company's capital stock to \$150,000. The company intends buying additional vessels, and extending its wharf accommodation and facilities.

It is reported that the C.P.R. will build a large slip at Kaslo, for the inauguration of a regular barge service between Kaslo and Nelson, in anticipation of heavy shipments of ore on the completion of the standardization of the Kaslo and Slocan Ry. It is stated that the cars will be run direct on the barges at Kaslo, transferred to the line again at Nelson, when they will be forwarded to Trail.

The Nanaimo Transportation Co., has been organized at Nanaimo, to operate

the steamboat Starling, on a daily schedule to Departure bay and Gabriola island. The Starling was built at Port Guichon in 1899, and she is equipped with engine of 2 n.h.p., driving a screw. Her dimensions are, length 30 ft., breadth 9 ft., depth 3 ft.; tonnage, 8 tons, gross, 5 tons, register.

Side Streams Navigation Co., Ltd., has been incorporated under the Dominion Companies Act, with \$50,000 capital, and office at Dawson, Yukon, to own and operate steam and other vessels, and conduct a general navigation and forwarding business, etc. The incorporators are, S. C. Barrington, J. Raymond, C. F. Merrified, W. H. Barrington and F. E. Allison, Dawson, Yukon.

The Dominion Department of Public Works will receive tenders, to Sept. 5, for the construction of a breakwater in Victoria harbor. Plans may be seen, and forms of tender obtained from the Department's Resident Architect, Victoria, the District Engineer, New Westminster; District Engineer, Toronto; District Engineer, Montreal; District Engineer, Quebec; and at the post office, Vancouver.

While there has been some increase in the insurance rates on some of the vessels operating on the Pacific coast, the rates on the Grand Trunk Pacific Coast Steamship Co.'s vessels have remained as last year. The steamships Prince Rupert and Prince George, which are valued at \$450,000 each, pay 5¼%, the Prince John, valued at \$75,000, 8-2/5%, and the Prince Albert, 9 guineas on a value of \$65,000.

W. P. Anderson, Chief Engineer, Department of Marine, in a recent interview at Vancouver, on his return from a tour of inspection of the northern waters of British Columbia, is reported to have stated that he had been looking into the question of improving the aids to navigation, and that he would advise the establishing of an acetylene beacon mounted on a screw pile foundation on Rose spit, on the north east coast of Graham island, the most northern of the Queen Charlotte group.

A press dispatch from Victoria states that the C.P.R. is negotiating for the sale of its steamboat City of Nanaimo. She was taken from the service last year, and has since been lying idle at Esquimalt. She was built at Vancouver in 1891, and after operating for some years between Vancouver, New Westminster and Nanaimo, she was bought by Jas. Dunsmuir, and operated with the steamboat Joan, until both were disposed of to the C.P.R. The engine is of 58 n.h.p., driving a screw. Her dimensions are, length 159 ft., breadth 32 ft., depth 9.4 ft.; tonnage, 761 gross, 518 register.

Electric Traction will supplant steam on the Boston-Providence section of the New York, New Haven & Hartford Rd. This is the third section to be so operated, and it will form part of a New York-Boston electric trunk line; the New York terminal zone, extending to Stamford, Conn., is already under operation, and an extension of the single-phase equipment to New Haven is under way. The work involves four tracking, grade reduction, and grade-crossing elimination. There will be a power house at Providence. The cost is estimated at about \$7,000,000. Only a small portion of the Boston South station and yard will be equipped at present.

G. T. Pacific Ry. Maintenance of Way Employees.—A new schedule of wages for these employes which has been arranged by M. Donaldson, Vice President, and General Manager, has been accepted by the employes and is now operative. The minimum wage of a section man is \$2 a day. Section foremen receive a minimum of \$79 a month.

### Wireless Telegraph Alarm Bell.

A London cablegram says that in testifying at the Titanic enquiry, recently, G. Marconi described a new wireless invention for the safety of vessels. He said he had been working on it since the Titanic disaster. "My idea is," he said, "to make wireless apparatus ring a bell and thereby give warning that there is a ship in distress and in need of assistance. This can be done by a sequence of waves lasting fifteen to thirty seconds, which will cause the bell to give a prolonged ring. Some tests of the apparatus have been made, and I have considerable confidence that it can be employed."

### A Proposed Trans-Atlantic Service.

While the Dominion Premier and other members of the cabinet were in England, recently, an interview was arranged by those interested in the proposal made some years ago to establish a fast steamship service between the west coast of Ireland and Halifax, N.S. Sir Thomas Troubridge explained that the company was organized in 1906 to build a harbor at Blacksod Bay, Ireland, and a railway connecting the harbor with the Irish railway system, and a contract had been placed for the carrying out of the work, which he anticipated would be finished in time to accommodate the large vessels which it was proposed to place on the Canadian route. He also stated that he and his associates were prepared to build the necessary vessels for such service both on the Atlantic and Pacific oceans, provided reasonable compensation for the carrying of mails, etc., was granted by the governments interested.

The Premier's reply stated that the question of increased facilities for transportation between Canada and Great Britain, and Canada, and Australasia, was one of the most important ones that the government had under consideration, and if the deputation had any further suggestions, or any modifications of former proposals to make, he would like them sent in at once, as the matter would have the earliest consideration on his return to Canada.

### Commission on Sale of Steamships to Sir William Mackenzie.

Judgment was recently delivered in the English court of appeal, on the appeal of the Fairfield Shipbuilding and Engineering Co., Glasgow, against whom an order had been made for the payment, to W. Petersen, of £8,000, as commission on the sale of three steamships, now the Royal George and Royal Edward and another to Sir William Mackenzie, for £403,000. By a majority of the court, the appeal was allowed, and the judgment of the lower court reversed, it being held that there was no evidence of authority for the plaintiff to act on behalf of the company in the matter, and if any promise to pay commission was made by any of the company's directors, such a bargain was invalid, as the plaintiff was already acting for other proposed purchasers, with whom negotiations subsequently fell through, and he had not the assent of his principals to his bargaining for commission. On that ground therefore, he failed, and also failed on the ground that the purchase by Sir William Mackenzie was carried through independently of the plaintiff.

C. D. Sargent, M. Can. Soc. C.E., Resident Engineer, St. Lawrence canals, Cornwall, has been appointed Superintending Engineer, vice W. A. Stewart, Superintendent, resigned.



The British Maritime Trust Limited.

This company, which was originally established in 1888, to carry on the ordinary business of a trust and mortgage company, passed, in 1896, under the control of Furness, Withy and Co., and in 1897, the name of the British Maritime Mortgage Trust Ltd., was changed to the present one.

The prospectus states that as the vast developments in Canada have led to a large demand for capital, the board has been directing its attention for some time past to the Dominion as a promising field for extending the company's business.

business already arranged for, and additional business for which negotiations are pending.

As a further aid in dealing with proposals from the Dominion, the directors have retained the services of a Canadian consulting adviser, C. G. Bryan, of Toronto, who has taken up his residence in London, Eng.

The directors have already conducted an important series of investigations and negotiations into a number of highly promising projects, the principal of which are, a substantial holding in the old established business of the Richelieu and Ontario Navigation Co., representing approximately 12,000 shares of \$100 each, which were on July 4, quoted at \$118, equal to \$1,416,000, or about £292,500.

sheds, wharves, pontoons, hotels, cottages, etc., covering about 150 acres in all, and situated at Montreal, Sorel, Three Rivers, Quebec, Murray Bay, Tadousac, Longueuil, etc. In this already large undertaking there has now been merged the Northern Navigation Co., with its fleet and valuable properties at Collingwood, Sault Ste. Marie, Point Edward and Gore Bay.

There have also been acquired or in course of negotiation, one half interest in the joint purchase with Furness Withy and Co., of the White Diamond Steamship Co., Liverpool, and an equal interest with them in the business of G. D. Warren and Co., of Liverpool, Eng., and Boston, Mass.; valuable freehold properties in Montreal, Toronto and Winnipeg; and an important harbor proposition in Vancouver, B.C., which should not only be a very valuable asset in connection with

List of Steam Vessels Registered in Canada during May and June, 1912

Table with columns: Name, No., Where and When Built, Engines, etc., Length, Breadth, Depth, Gross Tons, Reg. Tons, Port of Registry, Owners. Lists various vessels like Adamantine, Adiramled, Alporto, Anoka, Ardeola, etc.

the shipping development of that port, consequent on the opening of the Panama Canal, but which, if acquired on the terms proposed, should represent a considerable increment of value as real estate.

Lord Furness is chairman of directors, who are all located in England. The Canadian department consists of J. R. Binning, Montreal, Manager; W. Molson Macpherson, President. Molsons Bank, Montreal, Consulting Adviser in Canada, and C. G. Bryan, Canadian Consulting Adviser, London, Eng.

### Nautical Assessors for Marine Enquiries in British Columbia.

The Merchants Service Guild of British Columbia, which represents captains and officers in the province's coasting and freight shipping trade, has through its Secretary, H. G. Jarvis, brought under the Dominion Government's attention the question of the appointment of nautical assessors sitting upon courts of enquiry into shipping casualties occurring in B.C. waters. Following are extracts from the memorial:—

"The Guild feels that the composition of these courts has recently been of a very unsatisfactory nature, and that this should be remedied without further delay, because there is a strong liability that incompetent decisions may be given, resulting in grave injustices being inflicted upon captains and officers whose certificates and professional status are involved. The assessors sitting upon recent cases have mostly been persons whose practical knowledge of the waters in which the casualties occurred, has been insufficient to justify their appointment, and the Guild would therefore respectfully suggest that future assessors should be persons who are, by personal experience in command of local vessels, thoroughly conversant with the navigation of the particular place where the acci-

dent occurs. The Guild considers that if greater discretion were exercised in the appointment of these officials, along the lines suggested, the local profession would receive fairer treatment and a sounder judgment would be obtained."

### Vessels Removed from the Register.

The following vessels were removed from the register, during May and June, for the reasons assigned:— Steam—D. A. Martin, Ottawa, 57 tons, dismantled; D. B. Mulligan, Ottawa, 46 tons, dismantled; Hercules, Ottawa, 13 tons, broken up; Iona, Picton, Ont., 157 tons, burnt; J. S. Blazier, Collingwood, Ont., 60 tons, sold to foreigners; Kennebecasis, St. John, N.B., 10 tons, broken up; Lilly May, Collingwood, Ont., 7 tons, dismantled. Lorna Doone, Collingwood, Ont., 18 tons, abandoned; Mildred, Ottawa, 13 tons, foundered; Mink, Toronto, 38 tons, dismantled; Minnie D., Collingwood, Ont., 2 tons, out of existence; Samson, Ottawa, 8 tons, broken up; Vergey, Hamilton, Ont., 14 tons, out of existence. Sailing—Aldine, St. Andrews, N.B., 299 tons, wrecked; Arkansas, Lunenburg, N.S., 98 tons, lost at sea; Bertie Calkins, Kingston, Ont., 227 tons, sold to foreigners; Calceolaria, Halifax, N.S., 30 tons, transferred to Newfoundland; Earl of Aberdeen, Parrsboro, N.S., 416 tons, transferred to Barbados; Hancock, St. John, N.B., 346 tons, transferred to Newfoundland; James A. Stetson, Picton, N.S., 71 tons, wrecked; Kestrel, Shelburne, N.S., 99 tons, transferred to Newfoundland; Louise, Vancouver, B.C., 552 tons, wrecked and abandoned; Minnie F. Crosby, Halifax, N.S., 119 tons, sold to foreigners; Peerless, Yarmouth, N.S., 278 tons, transferred to Newfoundland; Uranus, Lunenburg, N.S., 90 tons, sunk; Warren W., Charlottetown, P.E.I., 79 tons, wrecked; Water Witch, St. Andrews, N.B., 12 tons, broken up; William A., Magdalen Islands, Que., 9 tons, out of existence.

### Harbor Development on the Great Lakes.

The Minister of Public Works, who recently returned to Ottawa after an extended trip over the Great Lakes and a part of the St. Lawrence, stated that the appropriations of about \$40,000,000 made this year, seem quite inadequate to meet pressing needs at important points, on account of the rapid expansion in every direction. In the course of his tour he met boards of trade, municipal councils and other public bodies, all of whom seemed conversant with the urgent needs of the various localities visited, as regards transportation, navigation, dock and wharfage facilities, and in no case did he consider that any extravagant requests had been made. He considers that there is a lack of proper facilities at Canadian ports, and the navigation improvements in the Detroit river behind the times. In referring to Sault Ste. Marie, he stated that Canada requires another lock, but as that comes under the Department of Railways and Canals, which he understood had the matter under consideration, he could not deal with it, beyond stating that he believed the work to be necessary. In general, the Minister deplored the general unpreparedness of the ports on the Great Lakes to meet the legitimate exigencies of trade.

The Department of Public Works received tenders, Aug. 28, for the construction of a breakwater at Port Arthur, Ont.

A press dispatch from Ottawa states that the act providing for the granting of aid in the construction of dry docks, will be amended on the reassembling of Parliament, it having been found that companies desiring to build dry docks have been unable to finance such undertakings under the present conditions. It is said that the amendment will take the form of a larger guarantee, or the payments of the guarantee during the time the work is proceeding.

List of Sailing Vessels and Barges Registered in Canada during May and June, 1912

Name	No.	Where and When Built	Rig	Length	Breadth	Depth	Reg. Tons	Port of Registry	Owners
Abacena	130,947	Shelburne, N. S., 1912	Schr.	37.0	23.0	9.2	88	Lunenburg, N.S.	J. Sarby, M.O., LaHave, N.S.
Alexisna	130,985	Little Lameque, N. B., 1912	"	37.5	14.0	6.0	17	Chatham, N. B.	R. A. Noel, Little Lameque, N. B.
Alfarata	130,956	Mahone Bay, N.S., 1912	"	103.0	25.8	10.3	92	Lunenburg, N.S.	W. Ernst, Mahone Bay, N.S.
Auy B. Silver	130,942	Lastave, N.S., 1912	"	106.8	26.4	10.5	99	"	K. Silver, M. D., LaHave, N.S.
Airator	130,988	Caraquet, N.B., 1912	"	37.0	14.3	6.0	17	Chatham, N. B.	P. S. Langleigne, Caraquet, N.B.
Bolina	130,657	Caraquet, N.B., 1912	"	38.0	14.5	6.5	20	"	P. J. Fiott, Caraquet, N.B.
Cantow	130,953	Blandford, N.S., 1912	"	40.3	10.2	5.8	13	Lunenburg, N.S.	E. Publicover, Blandford, N.S.
Cento	130,344	LaHave, N.S., 1912	"	33.4	23.4	9.7	99	"	N. Rafuse, M.O., LaHave, N.S.
Clara M.	100,484	Lunenburg, N.S., 1892	"	63.8	20.8	8.1	53	Sydney, N.S.	J. D. McMillan, Sydney, N.S.
Comet G.	130,954	Tancork, N.S., 1910	"	40.2	10.6	5.0	11	Lunenburg, N.S.	A. G. Allen, Indian Harbor, N.S.
Cormier	126,780	Aldouane, N.B., 1907	"	30.0	12.0	5.0	10	Chatham, N. B.	R. R. MacLean, Chatham, N.B.
Dit On	130,982	Caraquet, N.B., 1912	"	35.0	13.0	4.7	12	"	J. Poirier, Caraquet, N.B.
Dombro No. 5	130,539	Lachine, Que., 1911	Scow	98.9	38.4	7.4	226	Montreal	Dominion Barging Co., Lachine, Que.
Dombro No. 6	130,540	Lachine, Que., 1911	"	98.9	38.4	7.4	226	"	"
Drill Boat No. 5	130,771	S. Chicago, Ill., 1907	"	127.5	31.0	7.5	589	Sault Ste. Marie, Ont.	Soo Dredge & Construction Co., Sault Ste. Marie, Ont.
E. R. Brenner	130,643	Hull, Que., 1912	Scow	113.0	24.2	7.8	179	Ottawa	Ottawa Transportation Co., Ottawa
Emerencienne	130,936	Lameque, N. B., 1912	Schr.	37.6	13.5	6.0	17	Chatham, N. B.	T. Noel, Lameque, N. B.
Flora Matthews	130,781	Eastern Harbor, N.S., 1912	"	65.3	20.3	5.8	36	Quebec	A. Trepanier, Chateau Richer, Que.
Fulta	130,665	Richibucto, N.B., 1912	"	46.9	12.2	7.4	16	Pt. Hawkesbury, N.S.	A. Cormier, Point Cross, N.S.
Gaetta	130,247	Port Medway, N.S., 1919	"	38.0	11.5	5.0	14	Richibucto, N.B.	G. H. Long, Richibucto, N.B.
Gilbert B.	130,356	Cape George, N.S., 1912	"	40.0	11.7	6.1	16	Liverpool, N.S.	S. Parks, Port Medway, N.S.
H. C. M. No. 5	130,921	Toronto, 1910	Dredge	45.8	12.1	6.0	13	Arichat, N.S.	A. Bauthillier, M. O., Halifax, N.S.
Hancock	130,636	Bucksport, Me., 1869	Bktn.	104.4	36.2	8.7	498	Montreal	Harbor Commissioners, Montreal
J. D. Hazen	130,943	LaHave, N.S., 1912	Schr.	121.5	29.5	16.0	346	St. John, N.B.	E. B. Nickerson, West Port Clyde, N.S.
Karna II	130,782	Eastern Harbor, N.S., 1912	"	104.8	26.2	10.2	99	Lunenburg, N.S.	D. Romkey, M. O., LaHave, N.S.
Katie Brainard	126,196	Marine City, Mich., 1871	Scow	57.0	14.3	8.2	21	Pt. Hawkesbury, N.S.	L. S. Chasson, Eastern Harbor, N.S.
L'Acadie	130,984	Lameque, N.B., 1912	Schr.	37.0	14.0	6.4	17	Chatham, N. B.	G. Home and G. Y. Chown, Kingston, Ont.
L'Assomption	130,987	Lower Caraquet, N.B., 1912	"	41.8	14.5	6.0	18	"	L. Ache, Lameque, N. B.
Lamecca	130,983	Lameque, N.B., 1912	"	39.0	13.6	6.4	19	"	J. J. L. Chiasson, Lower Caraquet, N. B.
Lobelia	130,981	Carquet, N.B., 1912	"	42.0	14.0	6.5	21	"	C. Ache, Lameque, N. B.
Louis P.	130,625	Shelburne, N.S., 1912	"	74.0	19.6	8.3	60	"	T. Gallien, Caraquet, N. B.
M. and F. No. 10	126,859	Sorel, Que., 1910	Dredge	132.5	42.1	9.5	702	Yarmouth, N.S.	L. P. D'Entremont, M. O., Pubnico, N.S.
Madonna V.	130,586	Essex, Mass., 1892	Schr.	91.2	23.8	9.2	77	Sorel, Que.	Marine and Fisheries Department
Marie H. LeBlanc	130,784	Margaree, N.S., 1912	"	52.0	14.1	9.5	21	Halifax, N.S.	L. R. Verge, M. O., Sober Island, N.S.
Mary and Mildred	130,941	LaHave, N.S., 1912	"	106.8	26.3	10.4	100	Pt. Hawkesbury, N.S.	G. LeBlanc, Margaree, N.S.
Mildred Elaine	130,659	Lameque, N.B., 1912	"	41.0	13.8	6.3	20	Lunenburg, N.S.	F. Conrad, M. D., LaHave, N.S.
New Brun'sk No. 2	130,639	St. John, N.B., 1889	Dredge	61.2	19.3	5.4	56	Chatham, N. B.	G. D. LeRiche, Lameque, N. B.
P. S. Co. XX.	130,919	N. Vancouver, B.C., 1912	Scow	64.0	23.6	3.0	79	St. John, N.B.	New Brunswick Construction Co., Westford, N.S.
Pepperell	130,246	Liverpool, N.S., 1911	Dredge	60.4	30.0	5.8	152	Vancouver, B.C.	Packers Steamship Co., Vancouver, B.C.
St. Sauveur	130,660	Lameque, N.B., 1912	Schr.	37.5	14.0	6.5	18	Liverpool, N.S.	Atlantic Dredging Co., Louisburg, N.S.
Titus McLeod	130,949	Lunenburg, N.S., 1906	"	39.8	11.2	5.2	11	Chatham, N. B.	I. Chiasson, Lameque, N. B.
Typhon	85,410	House Harbor, Que., 1912	"	69.3	19.8	7.4	58	Lunenburg, N.S.	J. Berringer, West Dover, N.S.
Winona	130,023	U. S.	Sloop	27.0	8.5	2.8	5	Magdalen Islands, Que.	A. Arseneau, M. O., House Harbor, Que.
Zambuck	130,783	Plateau, N.S., 1912	Schr.	47.5	13.1	7.2	17	Vancouver, B. C.	S. Burke, Vancouver, B. C.
								Pt. Hawkesbury, N.S.	S. P. Lefoot, Plateau, N.S.

### The Construction of the Port Arthur Dry Dock.

Canadian Railway and Marine World for March contained a description by A. V. Powell, M. Am. Soc. C.E., of the dry dock which has been built at Port Arthur, Ont. Following are particulars as to the construction methods, plant, etc.

The dock is constructed of concrete and steel and rests upon a foundation of solid rock. A large amount of excavation was necessary, 90,000 cubic yards of earth and rock being removed. A 70-ton Marion shovel, with a 2½ yd. dipper fitted with Panama teeth was used. Digging began at the shore end in April, 1910, and trains and dump cars hauled by locomotives transported the excavated material to form an earth fill on either side, making new ground beyond the original shore line. To cut off

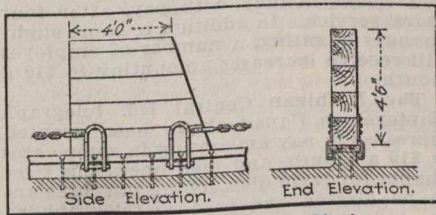


Fig. 1. Detail of Bilge Block.

the water during construction a cofferdam 900 ft. long was built in the shape of a horseshoe surrounding the site on three sides, as shown in fig. 2.

Two pile drivers, working in opposite directions from the portal end, drove round piles in two parallel rows, 900 ft. long, forming an enclosure around the entrance end 300 ft. wide. These piles, spaced 3 ft. centres, formed an outer and inner fence for the 6 by 10 in. and 2 by 10 in. sheet piling which was afterwards driven to rock. Waling strips 8 by 12 ins. were used for the sheet piling and round pile wales were used for the outside. Steel tie rods were placed across the cofferdam every 3 ft. On top of the round piling and sheet piling a framing was constructed of 8 by 12 in. timbers on which a temporary track was laid. As fast as the sheet piling was driven, earth filling was carried out by means of trains of dump cars operated by small locomotives. The resulting cofferdam was a very stable structure. To pump out and keep dry the dock excavation, and the enclosure formed by the cofferdam, three pumps were installed. The cofferdam completed, excavation was carried to rock throughout, enough shale and igneous rock being removed to level the basin. Six Canadian Rand drills and a 5 in. well boring machine comprised the drilling outfit.

The speed with which the concrete work was done was due to the organization of the working forces and the efficient arrangement of the plant. Placing concrete was so simplified that from the dredging to the final pouring the work was continuous. The arrangement of the construction plant is shown in fig. 2. Scows of 1,000 yards capacity, fitted with derricks and clam shell buckets, dredged sand and gravel from Lake Superior, at 60 miles from the site, and unloaded it at the portal face upon the cofferdam on either side of a travelling whirley; two hoppers placed over a 24-in. conveyor belt, electrically driven, received the materials from the whirley and alternately fed the belt which led to the mixer tower. Here were two receiving hoppers for sand and gravel, and below were two charging hoppers. The latter received the proper quantities of sand, gravel and cement for separate batches of con-

crete, and the whole charge was run into one of the two mixers below. A new charge was immediately prepared and this in turn was run into the second mixer. In this way it was possible to have the plant working to its full capacity without intermission. The concrete, after being mixed, was elevated by a bucket hoist, to V-shaped steel dump cars, of one yard capacity, on a truck running along the top of the forms for the dock wall. From the cars the concrete was poured directly into the forms. The tracks were laid in a number of loops crossing the dock excavation on trestles, so that there was no confusion in returning empty cars to the mixers. (Fig. 2.) By this system as much as 1,000 yards of concrete was placed by two shifts in one 24-hour day.

The forms for the side walls were made in small sections, for convenience in handling. Each section was 5 ft. wide and extended the full height of the wall. Seven of these were placed together and bulkheads were attached at each end. In this way a section of the wall 36 ft. long could be poured, making a huge monolithic block. Alternate 36 ft. lengths were first built, and when the concrete had finally set the intermediate sections were poured. An expansion joint was formed for every 36 ft. of length, and so cracking was obviated.

The dock proper is 85 ft. 4 ins. wide at the floor level and 98 ft. 8 ins. at the top of the walls. It is 700 ft. long, and a further length of 28½ ft. within the portal or entrance may be utilized. Spaced every 18 ft. in the side walls are three altar steps designed to hold lateral bracing to support vessels in the dock. The floor is solid concrete from 2 to

mixture, which is used also in the side walls. The outside corners are curved and are protected from injury by steel plates firmly attached by means of steel angle anchors embedded in the concrete. The portal jambs and sills are faced with steel. Angles 6 by 6 by ¾ ins., firmly fastened to the concrete floor by 3 by 3 by ½-in. angles, 4 ft. long, spaced 2 ft. apart, form a connection for the 16 by ¾ in. plate against which the heavy steel gate and caisson rests. Strong lateral anchors embedded in the portal piers hold the jambs in position. Great care was exercised in placing this steel framework to obtain a truly vertical and longitudinal alignment.

A feature of interest is the construction and arrangement of the bilge and keel blocks with their attachments. The slides upon which the bilge blocks move are spaced 12 ft. apart on each side of the dock, and are made of 3 by 14 in. white oak timbers bolted every 2 ft. Split anchor bolts, ¾ by 18 ins., fasten them securely to a concrete base and the nuts are countersunk, leaving a smooth upper surface on which the bilge blocks slide. These blocks are 4½ ft. in height, made of 12 by 12 in. Oregon fir timbers. They are drift bolted together at the ends and are furnished with slide irons and wooden slide blocks clamping them to the slides.

Two hauling chains are attached to each block by means of U bolts, and two fair leaders are attached to the dock wall, one at the lower angle and the other near the top. The keel blocks, constructed of 12 by 12 in. white oak timbers, fastened together with 1 by 20 lag screws, rest on a 12 by 14 in. white oak timber set in the concrete floor and fastened thereto with 24 in. expansion

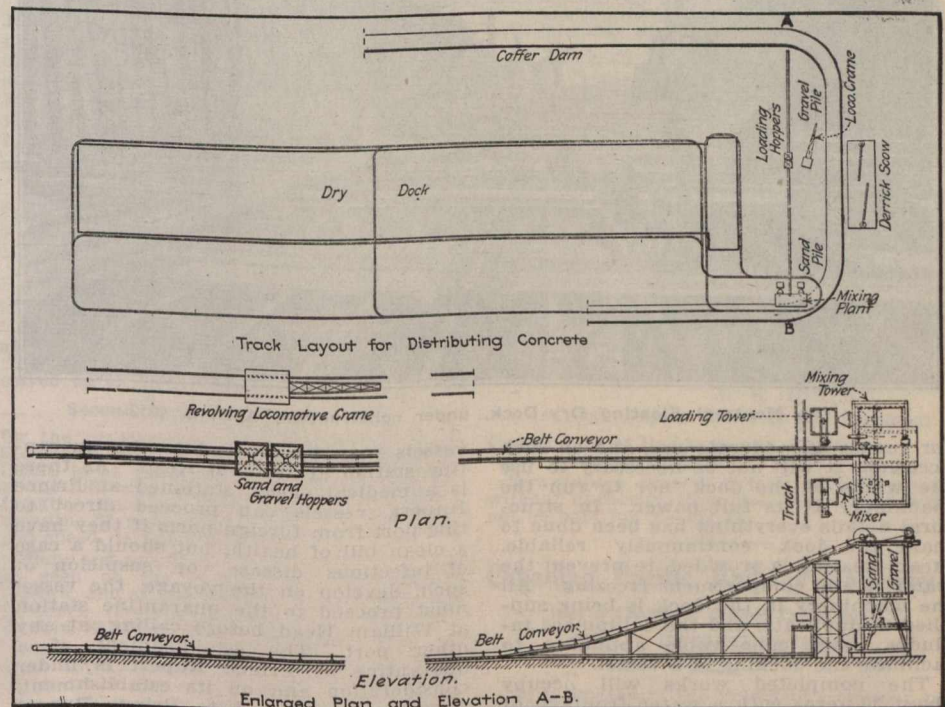


Fig. 2. Arrangement of Construction Plant for Mixing and Handling Concrete.

4 ft. thick, sloping towards a central drain which terminates in a rudder well at the portal end. From the rudder well a drain protected by an iron grating gives access to the pumping well situated in the west portal pier. With a view to future extension this drain was duplicated on the opposite side of the pumping well so that when a second dry dock is built parallel to the present basin, the pumping outfit will serve for both docks.

The portal walls are solid masses of concrete, faced with concrete of a 1-3-5

bolts. These are spaced 6 ft. apart and extend from the rudder well to within 12 ft. of the shore end of the dock.

Concrete sidewalks 5 ft. wide run the full length at each side, and four reinforced concrete stairways lead from their ends to the top of the dock walls. The dock was begun April, 1910, and completed by the end of November of the same year. The work was carried out under the direction of W. R. Sinks, Manager, and R. H. Folwell, Engineer for the contractors, Canadian Stewart Co., Ltd.

### The Floating Dry Dock for Montreal.

The dry dock, which has been built at Barrow, Eng., for the Canadian Shipbuilding and Engineering Works, to be located at Maisonneuve, Montreal, the launching of which was mentioned in our last issue, is 600 ft. long by 135 ft. wide over all. The depth of the pontoons at the bottom is 17 ft., the side walls rising to a height of 42 ft. from the pontoon deck, so that the over all depth is 59 ft. Vessels of 100 ft. beam will be easily docked, and as the ends are opened, vessels of any length can be accommodated. There are bridges at both ends for the conveyance of the workers. This type of dock was chosen in preference to a masonry or concrete construction, because although normally it will be utilized within the basin which has been prepared for it at Montreal, it will be possible to tow it to any point on the Atlantic coast to assist in the raising of any vessel which may get damaged by running aground, etc. A feature in the design was the aim to economize in the working of the dock, thus, although it will be capable of taking the heaviest vessels, it will be more frequently used

### British Columbia Quarantine Regulations.

The Marine Department has issued the following information regarding quarantine regulations for vessels trading to B.C. ports:—

The quarantine station for the ports of Victoria and Vancouver, Vancouver Island and the lower mainland of British Columbia, is at Parry Bay, on the southeast coast of the island, and all vessels bound for the foregoing and other ports in that district must call at that station for inspection and permission to proceed to port of destination. Vessels from ports on the U.S. Pacific coast, including Alaska, are exempt from the usual quarantine inspection, but in the event of epidemic disease prevailing at the port of departure, the exemption will be withdrawn, and the vessels must then call at the quarantine station. Should any case of infectious disease, or suspicion of such, develop during the voyage, a vessel must proceed without delay to the quarantine station. An inspecting officer is stationed at Port Alberni, who will clear any vessel which has a clean bill of health. In case of illness requiring fumigation,

### Telegraph and Cable Matters.

C. F. MacGowan has been appointed agent, Great North Western Telegraph Co., Belleville, Ont., vice P. F. Canniff, resigned.

A. B. Smith, Manager of Telegraphs, G.T. Pacific Ry., was in Prince Rupert, recently, arranging for the handling of telegraph supplies for the line erection as soon as the Skeena River bridge is completed.

The C.P.R. Telegraph Department has opened offices at Mount Stephen House, Field, B.C.; Bethany, Bethany Jct., Brechin, Eldon, Grass Hill, McAlpin, Petewawa camp, Orillia, Point au Baril and Uhtoff, Ont.; Expanse, Khedive and Milden, Sask.

The C.P.R. has arranged a new schedule of wages for its commercial telegraph operators, by which an increase of \$5 a month is granted to all operators, with two weeks holiday with pay, after four years' service. In addition to some slight changes in rating, a number of employes will receive increases amounting to \$10 a month.

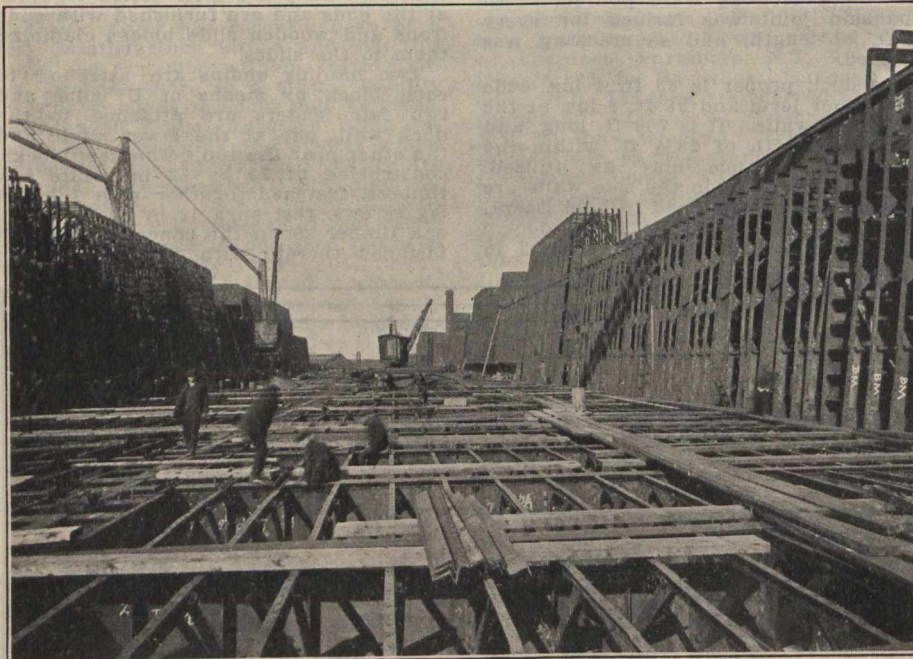
The Michigan Central Rd. telegraph employes in Canada have been granted increases in pay amounting in some cases to \$10 a month, and men operating telephones for train dispatching purposes are to be classed and paid as telegraphers. In connection with the employes' demands for increased pay, etc., a conciliation board was appointed some time ago, but the agreement outlined has been reached without the board's aid.

J. T. Phelan, Superintendent of Government Telegraphs, who returned to Vancouver, Aug. 15, from a trip of inspection of the telegraph lines in the north, stated that on account of the amount of business being handled by the lines there, further extensions, no doubt, will be made. The line from Bella Coola to the coast to connect with 150 mile house on the Caribou main line is about half finished, and the remainder, about 140 miles, will be ready for operation before the winter.

The C.P.R. has installed automatic instruments for its telegraph service between Montreal and Toronto, and if it proves successful, it is stated that the system will be extended. The instrument is known as the Morkrum system, and it is described as an automatic printer based on the selector system, the transmitter operating a keyboard similar to that of a typewriter at one end of the wire, the printing arrangement being at the other end, into which perforated rolls of blanks are automatically fed.

The Great North Western Telegraph Co. has opened offices at Eganville station, Ont., and Pierreville station, Que.; has re-opened its offices at Ameliasburg, Clifton House, Niagara Falls, Crystal Beach, Grimsby Beach, Petewawa camp, Royal Muskoka Hotel, Wheatley, Ont.; Abenakis Springs Hotel, Les Eboulements wharf, Manoir Richelieu Pointe au Pic and Pointe a Pic, Que.; Beaumaris, Maplehurst, Port Colborne and Rousseau, Ont.; and has closed its offices at Eganville, Morton, Florence and Lions Head, Ont., and St. Roch de Richelieu station, Que.

B. S. Jenkins, General Superintendent, C.P.R. Telegraphs, Western Lines, who was in Vancouver, Aug. 17, is reported to have stated that construction had been commenced on the erection of an additional through copper wire from Port Arthur, Ont., to Vancouver, an additional circuit from Vancouver to Revelstoke, an additional circuit from Moose Jaw to Winnipeg, an addition copper wire from Moose Jaw to Outlook, Sask., connecting with the wires to Calgary, thus giving another through alternative route from Winnipeg to Revelstoke. These extensions are additional to those authorized early in the year.



The Montreal Floating Dry-Dock, under construction, April 2, 1912.

for vessels of moderate size, and on such occasions it will not be necessary to use the whole of the dock, nor to run the machinery at its full power. In structural details everything has been done to make the dock continuously reliable. Steam heating is provided, to prevent the water in the compartment freezing. All the machinery in the dock is being supplied in duplicate, and the equipment includes every conceivable appliance to facilitate the docking of a vessel.

The completed works will occupy about 30 acres with a water frontage of 2,500 ft. and when fully working will give employment to about 2,000 men. The buildings generally will be of steel frame construction and brick, and the vessel construction berths will be so arranged that vessels up to 1,000 ft. long can be built.

After the launching ceremony, Sir A. T. Dawson, one of the directors of Canadian Vickers, Ltd., stated that in the near future the company intended to have in Canada an organization approximating generally to that existing at the Barrow works, for the building and equipping of vessels of all types. The dock should arrive in Montreal in the early part of September.

vessels may be ordered to the quarantine station at William Head. As there is a medical officer stationed at Prince Rupert, vessels can proceed direct to this port from foreign ports if they have a clean bill of health, but should a case of infectious disease, or suspicion of such, develop on the voyage, the vessel must proceed to the quarantine station at William Head before calling at any other port. The establishment of a quarantine at Prince Rupert is under consideration and on its establishment, vessels may proceed to Prince Rupert direct from any other port.

The British s.s. *Wilhelmina*, which recently ran on the rocks at Peters River, Nfld., and was considered a total loss, has been refloated. An examination is being made as to the damage sustained.

During June, five employes were killed, and one was injured, in the course of their work in connection with the navigation of Canadian waters. The deaths were all due to drowning, three being caused by falls overboard, one by falling from a wharf, and one as the result of a collision.

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.

The B. Greening Wire Co., Hamilton, Ont., has issued an illustrated catalogue of wire rope and fittings giving most complete information about the various lines they manufacture.

The American Vanadium Co., Pittsburgh, Pa., has issued "Vanadium Steels," an 80 page booklet, giving complete and up to date illustrated information on experience with vanadium steel, the various types, compositions, heat treatments and tables of tests, all of which is of considerable value to engineers and others interested in steel and iron products.

The Dominion Bridge Co., Ltd., has been incorporated under the Dominion Companies Act, with a capital of \$10,000,000 and offices at Lachine, Que., to carry on a bridge building business, and in connection therewith to build railway sidings and tramways, to own rolling stock, to own and operate steam tugs, barges, etc., and to carry on various incidental businesses.

The output of Titanium steel for 1911, according to statistics compiled by the American Iron and Steel Association, was 402,808 gross tons, comprising 252,540 tons of Titanium open hearth and crucible steel and 150,546 tons of Titanium Bessemer steel. This was a considerable increase over the output of 1910, and shows a remarkable gain for Titanium steel; in as much of the production of steel castings decreased 31.2 per cent. from the output of the previous year.

The Canadian Fairbanks-Morse Co., Ltd., has been granted supplementary letters patent increasing its capital stock to \$3,100,000, and has arranged for the issue of \$1,000,000 preferred stock, of which \$400,000 will go into plant enlargement. It has been decided to increase the manufacturing facilities at Toronto by the erection of a shop 350 ft. by 100 ft., to be used partly as a forge for making tractor trucks, and the remainder of the shop for mounting the engines on them.

The Canadian Fairbanks-Morse Co., Ltd., has secured the Canadian agency for the Orenstein-Arthur Koppel Co. of New York, consulting engineers and manufacturers of portable railways, industrial railways, narrow gauge sidings, narrow gauge public railways, and railway equipment of all descriptions, their works being located at Koppel, Pa. Their catalogue 400, which covers their lines very comprehensively, can be obtained from the Canadian Fairbanks-Morse Co., Ltd., Montreal.

M. Beatty & Sons, Ltd., manufacturers of dredges, ditchers, derricks, steam shovels, etc., Welland, Ont., have recently undergone a change of management, owing to the desire of the senior members of the Beatty family to take a less active part than heretofore. The Browning Engineering Co., of Cleveland, Ohio, has acquired control, and it is said that the plant will be considerably enlarged. R. A. Greene, heretofore Chief Engineer, Browning Engineering Co., has been appointed General Manager. A. O. Beatty, heretofore Engineer and Manager, will act in an advisory capacity as Consulting Engineer. F. H. Owen, heretofore Secretary-Treasurer, has been appointed Treasurer. G. Day, heretofore Assistant Sales Manager, Browning Engineering Co., has been appointed Secretary and Sales Manager. R. M. Beatty continues

as Superintendent of Works, and E. R. Beatty continues as Purchasing Agent.

C. H. Besly and Co., Chicago, Ill., have placed on the market a combination disc grinder and drum sander for wood pattern making. The disc wheel is of steel, 30 ins. diam., and runs at 750 r.p.m., and the working table may be tilted and locked at any angle from 75 to 135 degrees. It has also a vertical adjustment of 25 ins. The equipment includes four work table attachments, the sizing circle gauge for cylindrical and conical grinding, the sliding bevel gauge for simple and compound angle grinding, the sizing bevel gauge for simple and compound angle grinding to dimensions, and the angle plate for freehand cornering of thin work. The drum sanding arrangement has a work table 24 by 28 ins., which may be tilted and locked to any angle from 85 to 105 degrees from the axis of the sand drum. It runs at 2250 r.p.m., and has a perpendicular reciprocating motion while running. The machine is driven by a 3 h.p. motor, through sprockets and link belt attachment is chain, and the sanding attachment is driven by a self oiling friction clutch, which enables the operator to stop the sander regardless of the disc wheel. The machine is made with 30 or 40 in. diam. disc wheels, either belt or motor driven, and occupies a floor space of 54 by 84 ins.

British Columbia's Public Works Department is spending \$8,500,000 for roads, bridges and other improvements. Some of the new roads are located 1,200 to 1,500 miles north of Vancouver. J. E. Griffith, known in the west as the man who walked from Winnipeg to Vancouver while making C.P.R. location surveys, in the 80's, is chief engineer.

P. R. Gransaul, in writing us from St. Joseph, Trinidad, B.W.I., remitting renewal of subscription, says:—"I cannot close my letter without telling you of my appreciation of the Canadian Railway and Marine World. I look forward to getting it every month, and to me it is almost like receiving a personal letter."



TENDERS

TENDERS, addressed to the undersigned at Ottawa, and endorsed on the envelope, "Tender for Customs Steamer," will be received up to noon of the

Second Day of September. 1912.

for the construction of a Twin-screw Steel Steamer for Customs Service on the Atlantic Coast, to be delivered at the port of Quebec, of the following leading dimensions, namely: Length, between perpendiculars, 185 feet; breadth, 32 feet; draught, 10 feet 6 inches, and speed, 15 knots per hour.

Plans and specifications of this steamer can be seen at the Department of Customs, Ottawa, and at the offices of the Collectors of Customs, Toronto, Collingwood, Montreal, Quebec, St. John, N.B., and Halifax, N.S.

Plans and specifications can be procured upon application to the Commissioner, Department of Customs, Ottawa.

Each tender must be accompanied by an accepted bank cheque in favor of the Commissioner of Customs, equal to ten per cent. of the whole amount of the tender, which cheque will be forfeited if the successful tenderer declines to enter into a contract with the Department, or fails to complete the steamer.

Cheques accompanying unsuccessful tenders will be returned.

The Department does not bind itself to accept the lowest or any tender.

Newspapers copying this advertisement without authority from the Department will not be paid.

JOHN MCDUGALD,  
Commissioner of Customs.

Department of Customs,  
Ottawa, 19 July, 1912.



Department of Railways and Canals, Canada

HUDSON BAY RAILWAY.

NOTICE TO CONTRACTORS.

Sealed Tenders, addressed to the undersigned and endorsed "Tender for construction of The Hudson Bay Railway," will be received at this office until 16 o'clock, Thursday the 12th of September, 1912, for the section from Split Lake Junction to the Hudson Bay terminus.

Plans and profiles showing the character and extent of the work to be done, the specifications and form of contract to be entered into and other information can be seen on and after Thursday the 15th of August at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa, and at the office of the Chief Engineer of the Hudson Bay Railway, Winnipeg, at which places forms of tender may be obtained.

Separate tenders will be required covering the work enumerated in the schedule on the section from Split Lake Junction to Port Nelson, a distance of approximately 165 miles and on the section from Split Lake Junction to Port Churchill, a distance of approximately 245 miles.

The successful tenderer will be required to sign a contract covering the work from Split Lake Junction to the terminus selected and which will be announced by the Hon. Minister of Railways and Canals on his return from Hudson Bay.

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

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

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

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

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

The lowest or any tender not necessarily accepted.

By order,

L. K. JONES,

Asst. Deputy Minister and Secretary.

Department of Railways and Canals,  
Ottawa, August 14, 1912.

Newspapers inserting this advertisement without authority from the Department will not be paid for it.—271.24.

Canadian Pacific Railway Company.

Issue of \$18,000,000 Ordinary Capital Stock.

SPECIAL INTEREST PAYMENT.

As intimated in the President's circular to the Shareholders, dated January 3rd, 1912, an interest payment at 7% or \$3.18 per share, will be paid on October 15th next, on the first four instalments (\$120) from the due date of each instalment to September 30th, 1912, on the shares of the above new issue represented by the certificates of subscription, to holders of record at close of business, August 16th next, who have paid these instalments on or before their respective due dates. Notice is hereby given that this interest payment will be mailed from New York to the registered addresses of holders, or their duly appointed attorneys, on October 14th, 1912. For the purpose of this payment the certificate of subscription books will close August 16th at 3 p.m., and reopen September 16th, 1912.

W. R. BAKER.

Secretary.

**CANADIAN PACIFIC RAILWAY COMPANY.**

**Notice to Shareholders.**

The Thirty-first Annual General Meeting of the Shareholders of this Company, for the election of Directors to take the places of the retiring Directors, and for the transaction of business generally, will be held on Wednesday, the second day of October, next, at the principal office of the Company, at Montreal, at Twelve o'clock, noon.

**SPECIAL MEETING.**

The Meeting will be made Special for the purpose of authorizing the issue of Consolidated Debenture Stock of the Company to acquire the outstanding securities of the Dominion Atlantic Railway Company and also for the purpose of considering, and, if approved, of authorizing an increase of the present authorized Ordinary Capital Stock of the Company by an amount not exceeding \$60,000,000 for the purposes of the Company, such increase of Stock to be issued according to the requirements of the Company and as may be determined by the Directors, and of adopting such Resolution or By-law as may be deemed necessary in connection therewith in order to enable the Directors to give effect thereto.

The Common Stock Transfer Books will be closed in Montreal, New York and London at 1 p.m., on Saturday, the thirty-first day of August. The Preference Stock Books will be closed in London at the same time.

All books will be re-opened on Thursday, the third day of October.

By order of the Board,  
**W. R. BAKER,**  
 Secretary.

Montreal, August 12th, 1912.

**THE CANADIAN PACIFIC RAILWAY COMPANY.**

**Dividend Notice.**

At a meeting of the Board of Directors held this day, the following dividends were declared:—

On the Preference Stock, two per cent. for the half year ended 30th June last.

On the Common Stock, two and one-half per cent. for the quarter ended 30th June 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.

Both dividends will be paid on 1st October to Shareholders of record at the closing of the books in Montreal, New York, and London, at 1.00 p.m., on Saturday, 31st August next.

All books will be re-opened on Thursday, 3rd October next.

By order of the Board,  
**W. R. BAKER,**  
 Secretary.

Montreal, 12th August, 1912.

**Ontario Jockey Club**  
 Toronto

**Autumn Meeting**  
 September 21 to 28

—

**Racing**  
**Steeplechasing**

—

**General Admission, \$1.50**

**JOS. E. SEAGRAM,      W. P. FRASER,**  
 President.                      Sec'y-Treas.

**WOOD'S**  
**Flexible Nipple End**  
**Hose Protector**

For Air Brake and Signal Hose. Prevents chafing and abrasion. Guaranteeing a saving of from 40 to 50% in cost of maintenance of

**Air Brake Hose.**

**THE**  
**MONOGRAM**

Train Pipe Bracket will absolutely stop shifting and leaking of Air Brake Train Pipes.

*Correspondence Solicited.*

**GUILFORD S. WOOD**  
 Railway Necessities  
**CHICAGO**

**J-M ASBESTOS & RAILROAD SUPPLIES**  
**MAGNESIA**

Roofings Shingles Packings Gaskets Hair Felt Cements	Locomotive Lagging Air Brake Cylinder Packing Expander Ring Underground Conduit Leak-No Metallic Compound Fire Extinguishers	Pipe Coverings Smoke Jacks Asbestos Wood Fibre Conduit Insulation Metal Polish	Electrical Supplies Overhead Line Material Rail Bonds and Tools "Noark" Fuse Devices Fuse, Service and Subway Boxes, etc., etc.
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Write Nearest Branch for Catalog No. 252.

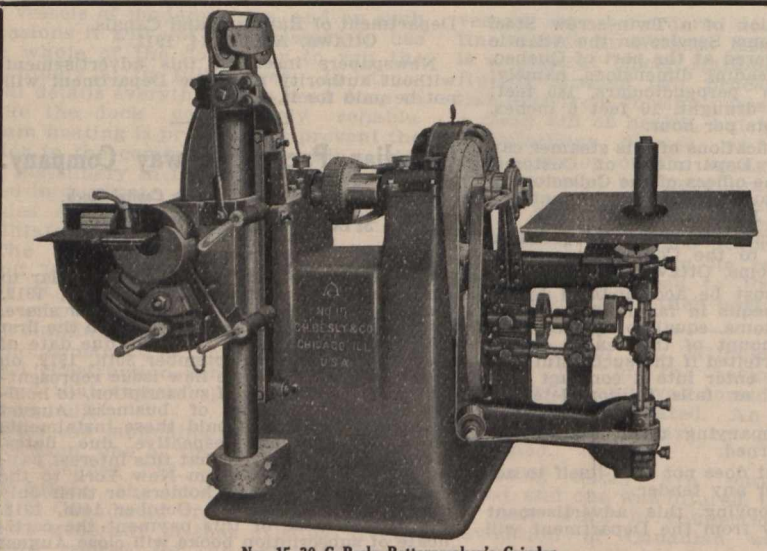
**THE CANADIAN H. W. JOHNS-MANVILLE CO., LIMITED**

Toronto, Ont.    London, Ont.    Montreal, Que.    Winnipeg, Man.    Vancouver, B.C.

**The Parry Sound Lumber Co**  
 Limited,

1315 Traders Bank Bldg., Toronto

Manufacturers of  
 PINE, HEMLOCK, LUMBER, BRIDGE  
 TIMBER, RAILWAY TIES, TELE-  
 GRAPH POLES, LATH, SHINGLES,  
 BOX SHOOKS.



No. 15-30-C Besly Patternmaker's Grinder.

**MEET US AT BUFFALO**  
 AT THE CONVENTIONS & EXHIBITS  
 OF FOUNDRY AND MACHINE SHOP  
 EQUIPMENT AND SUPPLIES.  
**SEPTEMBER 23-27, 1912**

**A Wonderful Labor  
 Saver in the Pattern  
 Shop.**

See this machine running at space 151, 170  
 and 171, Foundrymen's Convention at Buffalo.

**WRITE FOR ILLUSTRATED  
 FOLDER.**



**CHARLES H. BESLY & CO.,                      :                      CHICAGO, U.S.A.**