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Rotary Snow Plows, Their History, Construction, Etc.

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The development of the rotary snow plow has been chiefly due to Canadians and Canadian railways. This might be invidiously explained by the amount of snow which is supposed to fall in Canada, although as a matter of fact the difficulties experienced in dealing with snow are just as great on most of the roads crossing the Rocky and Cascade Mountains in the United States as they are on those in Canada.

In both countries the rotary snow plow has been extensively used during the past 20 years, and it has proved so far to be the only effective appliance for dealing with deep drifts and snow slides that were beyond the capacity of the wedge or ordinary snow plough. The latter is still used extensively, and for drifts of moderate depth through which a reasonable speed can be maintained, it can be operated much more quickly than the rotary. When cuts are too deep, snow cannot be thrown out of them with a wedge plow, and in the case of slides the drift may contain rocks or trees, which would make the use of it exceedingly dangerous. The rotary plow can then be used to save the labor of shovelling out by hand, which would be the only resource, on account of its ability to encounter snow of any depth and throw it to a considerable distance on either side of the track.

The rotary snow plow was originally invented by J. W. Elliott, a Toronto dentist, who in 1869 took out a patent on a "compound revolving snow shovel." This invention employed a wheel having a number of flat arms supported on a shaft rotating in line with the track. The wheel was enclosed in a casing shaped at the forward end to collect the snow, and flaring backward to a cylindrical portion surrounding the wheel. This casing was open at the top to permit the snow being thrown out by the centrifugal force. The wheel was driven by a rotary engine, and while the design was obviously crude, it evidently included the principle elements of the modern plow. No practical use was, however, made of this invention, but the idea was later taken up by Jull, who improved the Elliott wheel by placing a knife or cutting wheel in front of it. This knife wheel was intended to cut the snow from the bank and pass it into the fan wheel behind it, by which it could be discharged through the top of the casing.

The Jull invention was taken up by Leslie Bros., of Orangeville, Ont., who proceeded to construct a full size working model. The fan wheel was mounted on a hollow shaft, the knife wheel being carried on a solid shaft which passed through it. Both shafts were revolved in opposite directions through a system of bevel gears driven by a two cylinder engine. This model was erected on the end of a flat car during the winter of 1883-84 at the C.P.R. shops at Parkdale, Toronto, but before its construction was completed the winter was practically over. In order to test the invention, a bank of snow and ice was shovelled into a cut through which the C.P.R. tracks ran between Queens Wharf and Parkdale. The

quantity available was limited, but it was clearly demonstrated that the Elliott principle of a revolving wheel could throw the snow clear of the tracks as both snow and ice were thrown over 200 ft. This preliminary trial also showed that it was necessary for the plow to be so constructed that snow could be thrown on either side of the track, and that a flanger was required to prevent the plow being derailed in hard snow or ice and leave a satisfactory rail after it has passed through. With the Jull knife the direction in which the snow was thrown could not be changed, as the wheel could only operate in one direction, and the opening in the top of the casing was fixed in position. Leslie Bros. then developed a wheel with reversible knife or cutters, which could be changed in position to enable them to cut in either direction, and a movable hood on the cylindrical portion of the casing through which the snow could be discharged on either side of the track. They also devised a suitable flanger or ice cutter, which was attached to the front truck of the plow. A full sized complete plow of this design was constructed for them by the Cook Locomotive Works, of Patterson, N.J., and was operated on the Chicago and North Western Ry. in Northern Iowa in 1885-86. It was then found that the principle of employing two wheels revolving in opposite directions was impracticable, as the friction caused by the snow passing between the two wheels absorbed more power than that actually required to cut away and throw the snow. It consequently had to be abandoned, but Leslie Bros. then devised a single wheel having knives or cutters directly attached to it, which automatically reversed in position according to the direction in which the wheel revolved. The plow with this wheel applied (shown in fig. 1) was tested during the same winter, before the snow had entirely disappeared, and proved that the loss of power was overcome. It was then shipped back to Patterson and rebuilt with the improvements that had been suggested by the season's experience. During the winter 1886-87, the improved plow, then known as the rotary, was given its first trial on the Oregon Short Line Division of the Union Pacific, where it proved such a complete success that the railway company not only purchased it after its first trip, but placed orders for three more of the same pattern to be furnished in time for the following winter. The introduction of the rotary progressed rapidly from that date. It was adopted by the Northern Pacific; Chicago and North Western; Chicago, Milwaukee and St. Paul, and many other roads in the United States, while in Canada eight were constructed by the C.P.R. in 1888 at its Montreal shops through the Polson Iron Works Co. of Toronto. The first of these plows, no. 101, had a wheel 9 ft. 10½ ins. in diameter, a boiler having 1,259 sq. ft. of heating surface carrying 180 lbs. pressure, and a two cylinder engine 17 ins. diameter by 24 in. stroke. The cab was of wood, and the plow without tender weighed 125,000 lbs. in working order. The main shaft was 8½ ins. diameter and the bearing 34 ins.

long. The bevel gear on the main shaft was driven by a bevel pinion keyed to the cross shaft of the engine. The joint between the casting and the one supporting the engine shaft bearings proved to be a point of weakness on account of the heavy bending strain to which it was subjected when the lower portion of the casing was forced into hard snow. The side frame was a heavy 12 in. channel running from end to end. It was tied together by the main bearing casting and engine shaft casting at the front end and from the latter two inner frames extended to the back end. These supported the cylinder saddle and the boiler carriers, and were connected to the side frames by gusset plates. The structure was fairly strong longitudinally, but as later experience proved it did not possess the necessary vertical strength for the work it was subjected to.

The wheel with which these plows were fitted was known as the square fan type, and is illustrated in figure 2. The back was a sheet of steel plate to which longitudinal gusset plates or partitions were attached, which in their turn supported the front rings and the trunnions for the knives or cutters. The action of these knives can be clearly seen from the illustration. In whichever direction the plow was turning the resistance of the snow would tend to force the knives into a position in which they would cut the snow and deliver it into the compartments. Then, on account of the centrifugal force due to the revolving wheel, it would be forced against the casing until the opening was reached, when it would fly out in a straight line. This wheel proved satisfactory when handling the dry snow found east of the Rockies, but in heavy work the partitions were not sufficiently strong to drive the knives. As the men on the plows put it—"The back ran away from the front." To overcome this and handle the damp snow found on the western slopes, Leslie Bros. introduced the scoop wheel shown in fig. 3. In this wheel the pockets or compartments are conical shaped scoops strongly secured to a cast iron or cast steel centre. The knives are carried on the edges of the scoops, and the knives on the adjacent edges of each pair of scoops are connected together by links so that as one knife is cutting the snow, the other is pressed down to afford the necessary clearances. This style of wheel entirely superseded the older square fan type and has since been used.

The construction of the plow as a whole has not changed radically, with the exception of the special plows which will be described later. The wheel has been increased in diameter, 11 ft. being now the usual size. The engine and boiler capacity have been increased, the engine to 18 ins. diameter by 26 ins. stroke, the boiler to 200 lbs. pressure, with 1,852 sq. ft. heating surface. The bevel gear drive was changed to employ two bevel pinions with independent engine shafts, the bevel gears and pinions being made of steel with cut teeth in place of the cast iron gears originally used. The knives, which were originally made of steel plates, were greatly

increased in strength and made of cast steel. Cut wideners were added to the casing to enable the banks to be cut away and the strength of the casing greatly increased, especially at the cutting edges. Fig. 4 shows a plow constructed for the C.P.R. in 1911, to which cut wideners were applied,

operated on the C.P.R., and to a great extent his opinion is no doubt correct. On the other hand, the heaviest service a plow is subjected to is when cutting its way through snow slides, and unfortunately these are met with on every road that operates to the Pacific Coast. The snow

Manager, Western Lines, C.P.R., was engaged for a considerable time in operating rotary plows, and decided that a plow was required that practically could not break down and that would have sufficient power and strength to cut its way through any snow bank. His instructions were that he wanted a plow with knives of 2 in. armor plate and the rest in proportion. Authority was given the following spring for two plows to these specifications, and arrangements were made with the Montreal Locomotive Works for their construction. J. Player, Consulting Engineer of the American Locomotive Co., was engaged to prepare the design, in collaboration with the writer, and it was decided to modify the construction of the regular rotary plows considerably. The writer had for some years believed that better results could be ob-

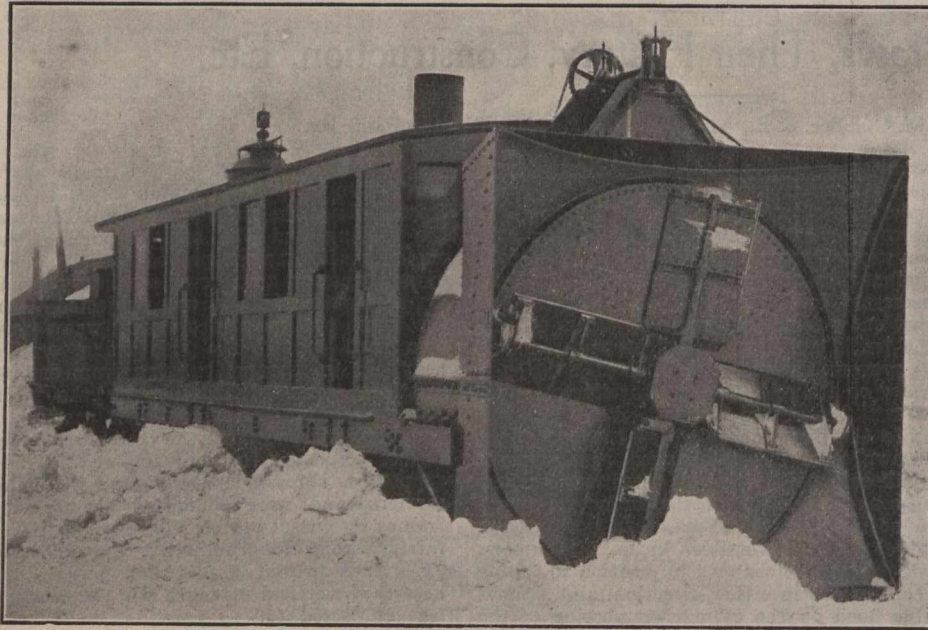


Fig. 1.—Early Leslie Type of Single Cutter Rotary Snow Plow.

which in this view are photographed in their working position. When not required they can be folded back against the sides of the casing, the rods which hold them in position being then removed.

These photographs illustrate the develop-

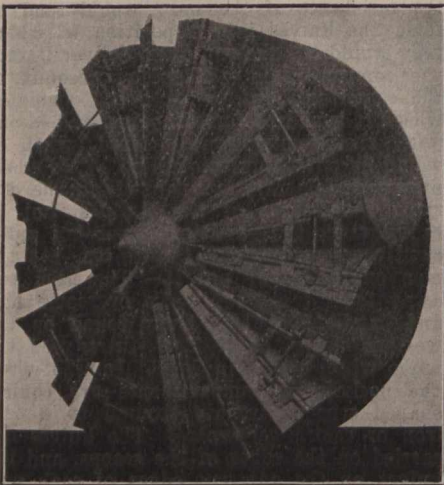


Fig. 3.—Leslie Type of Scoop Wheel for Snow Plow.

ment that has taken place in the rotary snow plow, which has without any question proved the only successful plow of this type and the means by which trains have been operated during severe winter weather. It is difficult to imagine how United States and Canadian railways could have operated without it with the amount of traffic they are now called upon to handle. There have been many attempts to develop other styles of steam driven plows, but none have been found as powerful and efficient as the rotary, and none are today in actual use. The experience on the C.P.R. showed, however, in the opinion of its officers that good as the rotary was, it was not good enough. It is only fair to Mr. Leslie to say that he does not agree that the rotary was properly

in a slide is not only packed exceedingly hard, but it is liable to contain trees and rocks which are carried with it down the mountain side. No plow can, of course, handle such obstructions, and when they are discovered they are either pulled out or blasted away. There is, however, a very strong pressure on every railway to open up the line in the shortest possible time, and to effect this the usual method of operating a rotary was to put two heavy engines behind it, run the plow engine as fast as possible and drive it into the cut at 8 or 10 miles an hour. As the plow slowed down it was drawn back, speeded

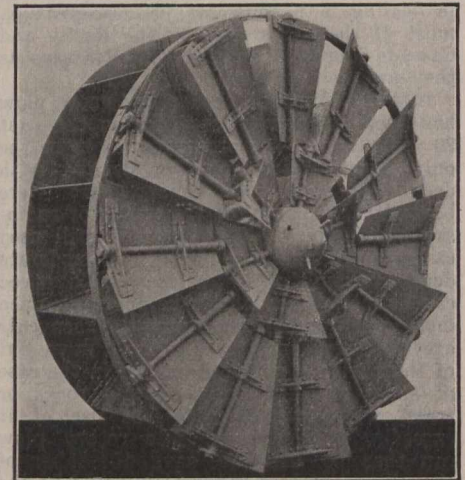


Fig. 2.—Square Fan Type of Early C. P.R. Snow Plow.

tained by driving the plow wheel direct, in marine engine style, than through the bevel gears previously used, and that the frame of the plow should resemble a bridge girder, to thoroughly support the casing or hood in place of the channel iron frame, which required bracing to prevent its bending. After some preliminary designs had been



Fig. 4.—1911 Type of C.P.R. Snow Plow with Cut Wideners.

up again and the operation repeated. If trees or rocks were met with the knives were frequently torn off or damaged, and their repair was an extremely difficult and tedious job. In addition, two points that have been referred to, the formation of ice in the casing and the weakness of the plow frame, were a constant source of trouble, apart from the time that was taken to clean out a cut of any length. During the winter of 1908-09 George Bury, then General

prepared it was decided to adopt these suggestions, and as the work progressed a number of novel features of construction developed. One of the most important questions was that of obtaining a wheel of greatly increased strength. The use of a knife blade 2 ins. thick with a corresponding construction behind it would have led to a weight that was impracticable, but the wheel as actually built is immensely strong and radically different from those previ-

ously employed. The cone shaped scoops were formed from plates of $\frac{3}{8}$ in. steel pressed into shape, and the hinges for the knife blades were riveted to their edges. To obtain the desired strength these plates would have to be increased to $1\frac{1}{4}$ in. or $1\frac{1}{2}$ in., which would make them most difficult to form and necessitate the hinge castings being fitted to them individually as it could not be expected they would be absolutely uniform in shape. It was, therefore, decided to make the entire wheel out of cast steel, casting the hinges solid with the body of the wheel. As no machinery facilities or annealing furnaces were available for handling a casting of this size in one piece, the centre was made in octagon form, 80 ins. across the flats, with 8 segments bolted to it. Fig. 5 is a front view of the centre, which shows the cast steel hinges before machining. Fig. 6 shows one of the segments which are bolted to the faces of the centre. The hinges are 6 ins. in diameter at the largest part and the hinge pin $2\frac{1}{2}$ ins. in diameter. The bottom holes in line with the hinge holes are for the $2\frac{1}{4}$ in. bolts which secured the segments to the centre. There are three of these bolts in each segment, one in line with

before the knives are attached. This view shows the band, $1\frac{1}{4}$ in. thick by 10 ins. wide, which further secures the segments in place. This band is made in sections with L-shaped lugs on each end, which fit in grooves cut in the segments (see fig. 6),

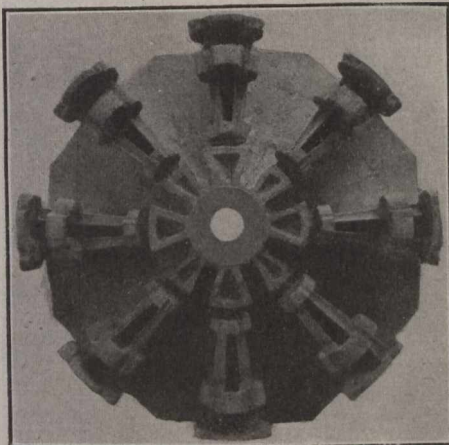


Fig. 5.—Centre Casting of New C.P.R. Snow Plow.

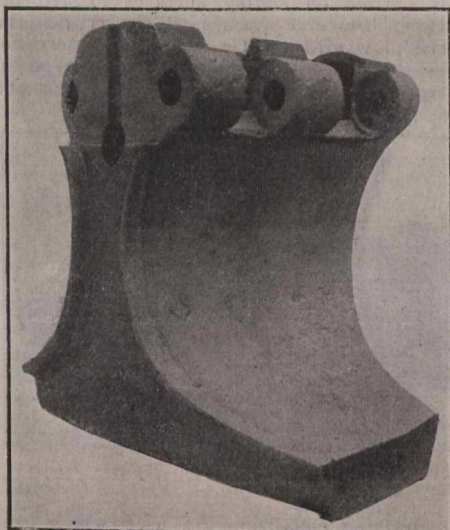


Fig. 6.—Cutter Head Segment of New C.P.R. Snow Plow.

each hinge hole and one central between the hinges. There are also 5 bolts, 2 ins. in diameter at the rear edge of the segments, and they are also bolted together through the flanges at their rear edges. It was necessary to make the fastenings between the segments and the centre of ample strength, not only to stand the shocks at the edge of the blade but the effect of

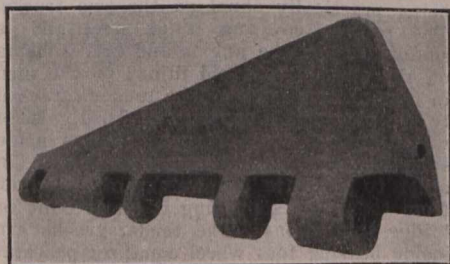


Fig. 8.—Cutter Blade of New C.P.R. Snow Plow.

centrifugal force, which at 400 revolutions a minute, the estimated maximum speed, was equal to about 275 times the weight on a diameter of 11 ft. The face of the segment bolts to the centre, each segment containing one pair of hinges and the halves of the two scoop shaped compartments. Fig. 7 is a view of the wheel assembled

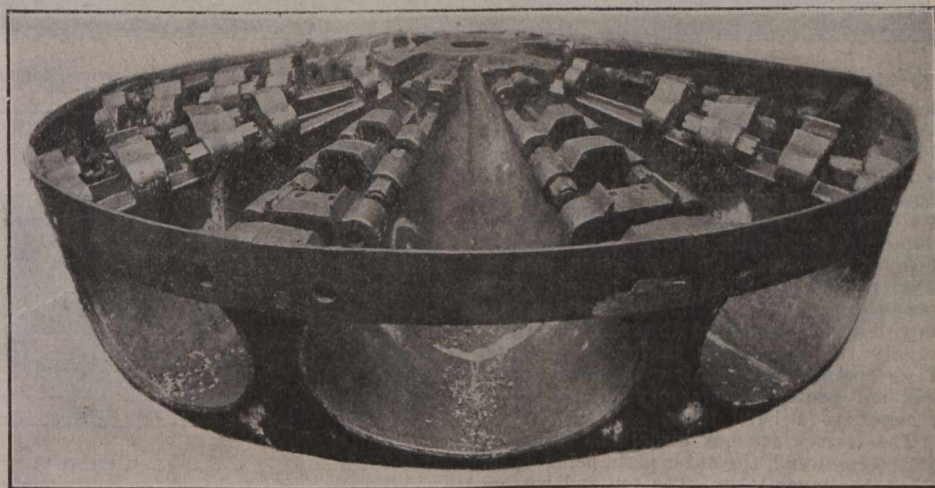


Fig. 7.—Assembled Cutter Head of New C.P.R. Snow Plow, Without Cutters.

and is also securely bolted to them. It is increased in thickness to compensate for the holes for the hinge pins and bolts. This view also shows the bolts attaching the segments to the centre and the stops for the knife blades. Fig. 8 is a view of one of the blades from the inside, and shows their massive construction. There are three hinge pins, $1\frac{3}{8}$, $1\frac{1}{2}$ and $2\frac{1}{4}$ ins. in diameter respectively. The hinges on the wheel and on the knives are sufficiently strong to shear these pins, and it was calculated that to shear the outer pin, which is the one exposed to the greatest strain, would require 400 tons at the edge of the blade. The knives are $\frac{5}{8}$ in. thick at the edge and heavily ribbed, while the stop extends from end to end and forms a strong backbone.

Fig. 9 is the nose piece which completes the centre of the wheel. The completed wheel without the nose pieces, when being balanced in the shops, weighed 24,000 lbs., and on account of the high speed at which it was required to run it was necessary to balance it most accurately. This view also shows the links connecting each pair of knives to move the rear knife into the proper position. The machined surface near the link was to permit of the attachment of clips to hold the knives in their proper position, but these were not required when the proper length of link was obtained.

Fig. 10 is a view of the plow partly assembled, but before the wheel was applied, and shows the general construction

of the casing. This was made of $\frac{3}{4}$ in. plate in two tapered courses, the front one being tapered 1 in $1\frac{1}{2}$, the back one 1 in 4. In place of making the front of the casing in a vertical plane, the taper course was cut away to bring its cross section to the shape required. By adopting this plan all flat surfaces which might lead to the formation of ice were avoided. The front casing is reinforced by a second thickness of $\frac{3}{4}$ in. plate along its lower front edge, and heavily braced with tee irons. The back of the casing is constructed of steel castings, having flanges for attachment to the gusset plates, which are securely riveted to the frame. This view also shows the taper wheel fit of the main shaft, which is $11\frac{1}{8}$ in. diameter and 12 ft. 2 ins. long over all. The front bearing is $11\frac{1}{8}$ ins. diameter by 28 ins. long. Behind this is a marine type thrust bearing having 10 collars and a rear bearing 10 ins. diameter by $16\frac{1}{2}$ ins. long. The thrust bearing was introduced on account of the conviction that the arrangements for taking the thrust were inadequate on the older plows, and in their case the thrust was actually taken by the sheet of ice which formed between the plow wheel and the casing. This has been justified by the results as the plow runs

very freely on heavy cuts. On the rear end of the main shaft is a crank disc connected to the crank pin of the engine by a drag link coupling. This was used in case of any variation between the alignment of the main shaft and the engine crank shaft

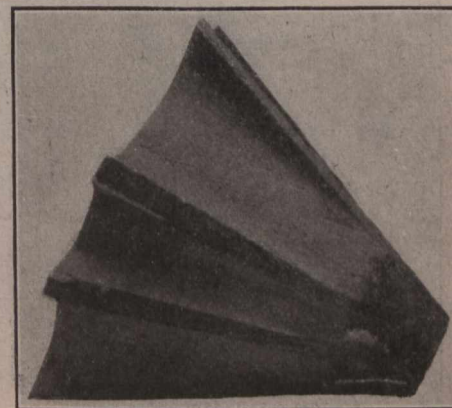


Fig. 9.—Cutter Head Nose Piece of New C.P.R. Snow Plow.

and to prevent any bending strains being transmitted from one to the other. On one plow there is actually a difference of $\frac{1}{4}$ in. which is easily taken care of in this way. The engine is of strong but light construction, the cylinders 20 ins. diameter, 24 in.

stroke, are of grey iron cast in one with the steam chest and bolted together. The columns are of cast steel and their shape was carefully worked out. On account of

together at the bottom and the shaft bearing and engine supporting angles.

There is a crank pin in front of the drag link. The pins are hollow and in many

ters and steadying blocks, all of which are operated by compressed air. The slides in the centre carry the bracket for the electric headlight, which can be lowered down into the cab when required.

The boiler applied to these plows is similar to that on the C.P.R. class M. 4 consolidation locomotives, with the exception that the superheater was omitted. It was thought that as the plows would only be used a few times each year the economy resulting from superheating was important, while the possibility of the apparatus leaking or not being perfect order when required would be objectionable. The boiler contains 2,108 sq. ft. of heating surface and 44 sq. ft. of grate area, and carries 200 lbs. pressure. It is, therefore, of far greater capacity than any previously employed on this class of work. The trucks are of the six wheel type, but of special design, having cast steel frames. The axles are the M.C.B. 50,000 lbs. standard with 7 by 12 in. journals, and the wheels 34 in. diameter with steel tires. On account of the plow having no centre frames, but simply two main longitudinal girders, no weight is carried on the centre plates, which are used simply to guide the trucks, and the weight is carried on sliding surfaces located between the side frames of the trucks and the plow girders. On account of there not being sufficient room the usual type of truck equalizer could not be applied, and

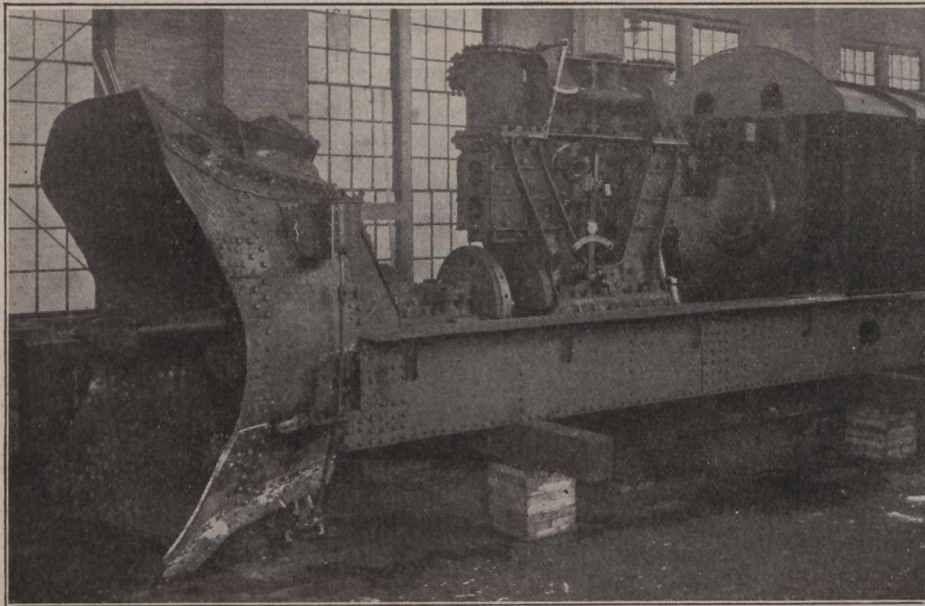


Fig. 10.—New C.P.R. Snow Plow, Partially Assembled, Showing Cut Widener and Driving Engine.

head room the length of connecting rod is very short in proportion to the stroke, only 1.87 to 1, which required ample bearing surface in the crossheads. This feature has, however, given no trouble. This view shows the reverse lever and throttle, which are in duplicate, so that the plow may be operated from either side. On the casing can be seen the steady block arrangement. This comprised a shoe on either side of the casing which can be forced down on the rail to steady the plow when taking heavy cuts. It is operated by an air cylinder, but this has not proved satisfactory and is to be changed to a hand lever.

The frames are box girders 36 ins. deep at the front end, the outer plate being $\frac{3}{8}$ in. thick, the inner $\frac{1}{2}$ in. The top and bottom flanges are 13 in. ship channels, and the frame is carried back full depth to the

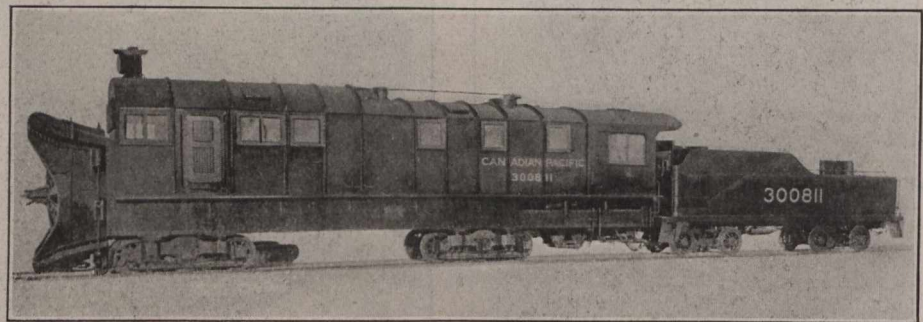


Fig. 11.—General View of New C.P.R. Snow Plow.

respects weight has been saved as much as possible. The valve in the centre of the

underhung equalizers are used which bear on pins in lugs cast on the boxes. To save weight the end pedestals are dispensed with and the frame is formed with guides, which engage with grooves on the journal boxes. This design of truck is exceedingly light for its strength, and with certain exceptions that will be referred to later, has proved satisfactory. The general appearance of the plows is shown in figs. 11 and 12. Their size may be judged from the frame being 48 ft. 4 in. long over all from the casing to the rear end. They weigh 260,000 lbs. in working order, the weight being practically equal on the two trucks. The cab or covering is of steel and is smooth inside, the angles and braces being on the outside to avoid injury to the men in case of derailment. The tender attached to the plow has a capacity of 7,000 gals. of water and 16 tons of coal. It was made specially long, 32 ft. over end frames, in order to separate the weight of the plow from the engines pushing it on account of bridge limitations. The tender trucks are inside bearing four-wheel equalizer pedestal trucks, this design being adopted to use engine truck wheels and axles of standard types.

The design of these plows was commenced in July, 1910, and a considerable amount of preliminary work was required before it was possible to decide on the general plan that would be practicable. In addition it was desired to apply the new type of wheel and casing to several of the older plows in service, and in order to do this in time the

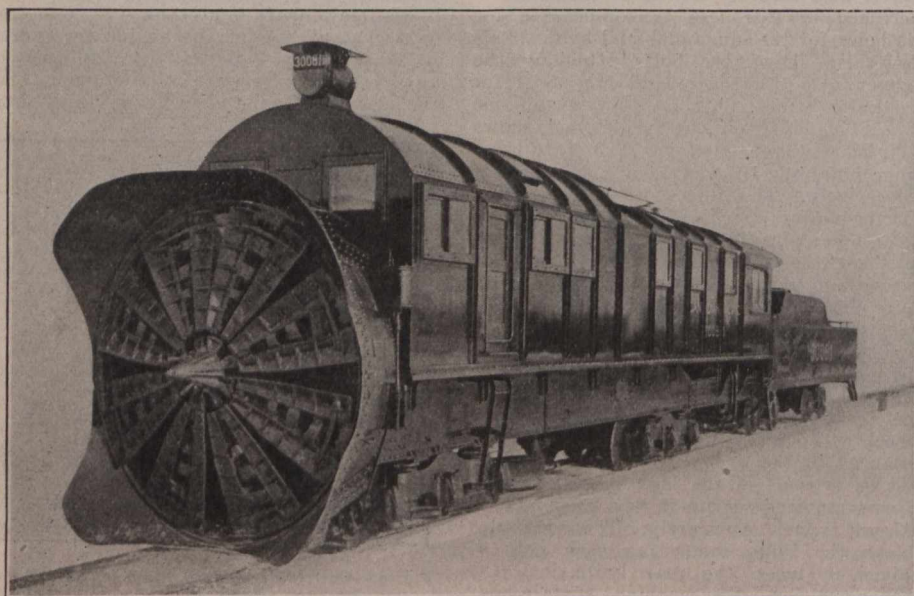


Fig. 12.—General View of New C.P.R. Snow Plow, Showing Arrangement of Cutter Head.

boiler saddle where it tapers down to 18 ins. deep at the back end. This view also shows the heavy steel front casting, the $\frac{3}{4}$ in. plate which connects the frames

operating platform is the engineer's valve of the Westinghouse air brakes, and the one above is the straight air brake valve. The other valves control the flanger, ice cut-

design of the wheel had to be completed before the balance of the work was taken up. About Oct. 1 it was possible to prepare an estimate of the weight of the complete plow, when it was found that it would greatly exceed the limits that had been allowed by the Bridge Department. The wheels, which were constructed at the Argus Shops, were by that time partly completed, so that it was necessary to revise all the other drawings and practically redesign the entire plow. In fact, there was hardly a pattern or a drawing that did not require making up anew, with the exception that the only alteration of the boiler was to shorten the barrel. In spite of this delay, the first plow was completed by the Montreal Locomotive Works on Jan. 8, 1911, and the second one a few days later, a remarkably quick piece of work in view of its size and every part being entirely new in design.

It is difficult to say whether these plows have proved entirely satisfactory in service. From the time they arrived in the mountains there has been no trouble with snow that would test their capacity. They have been run through a drift of hard packed snow about 250 yards long without slowing down, and pushed by one engine in place of requiring two, as would have been the case with the old plows. This indicates that they have ample power and steaming capacity. One of the C.P.R. western officers states that they will cut trees 4 ins. diameter, but they have not been tried on anything heavier. Last season the man in charge, while going through a cut, felt a jar and saw a car coupler which had been left in the drift, thrown out to one side. The only damage is reported to have been a semicircular piece about 2 ins. in diameter broken out of one of the blades. With these exceptions, it has been difficult to obtain any definite reliable information. The plows do, however, work exceedingly well. There is an entire absence of the noise and vibration which makes the operation of a bevel gear driven rotary so unpleasant. The plows are so strongly constructed that it is difficult to see how any obstruction could injure them, and from what experience has been obtained, it is expected that they will be of great assistance in keeping the road open under any conditions.

The only trouble that has been experienced is through derailment. When the track is badly heaved, one spring on an equalizer may be compressed until practically solid and thus change the actual fulcrum of the equalizer. This has been overcome by placing a seat between the springs and the equalizer to ensure a constant point of application of the load and placing springs between the truck frame and the supporting plates. These were required on account of the small amount the plow frame can be twisted. When supported on one side only the opposite side was found to be $\frac{1}{4}$ in. lower. This shows the stiffness of the frame construction and explains why additional spring movement was necessary to compensate for the irregularities of the track.

While during the past few years the tendency has been to depend on wedge plows rather than rotaries for the general work of clearing away snow, still the rotary is called on when the limit of the wedge plows is reached, and for work they cannot safely attempt. The energy and perseverance of the Leslies led to the practical development of the rotary snow plow, and they deserve a great deal of credit for furnishing the railways with a machine that has rendered winter operation possible.

The foregoing paper was read before the Canadian Society of Civil Engineers recently.

The Economics of Railway Location.

By W. F. Tye, M. Can. Soc. C. E.

When looking around for a subject my thoughts turn naturally to railway location, on which a great part of my professional career has been spent.

Transportation is one of Canada's greatest problems: our country is of vast area, the distances are great, the population sparse, and the traffic light; making the mileage and cost of railways high per head of population. On the other hand the growth of the country is and will continue to be rapid. A great problem is thus presented: how to build our railways that they may not be too expensive for our present requirements, and yet be capable of improvement to fit our future needs. Economics of railway location is, therefore, of even more than usual importance to Canada. The subject is so vast that it is only possible in such an address to touch its outer fringe; but it is so important to us all that even a few rudimentary remarks may be interesting.

While railways are built to serve the traffic requirements of the country, the immediate object of the promoters and builders is to make a profit, either on the construction or operation. This is undoubtedly true when built by private parties. When built by a government, it is with the end in view that the people may make money either directly through the operation of the railway, or indirectly by the reduction of rates. It is, therefore, of prime importance that the engineer, whether he be working for private parties or for a government, locate and construct the most economic road. The most economic road is not necessarily either the cheapest or most expensive, neither is it necessarily the one which may be operated at the least cost—it is in reality the one which is the most effective commercially, or the one which will enable its owners to transport the largest amount of traffic at the lowest cost.

In order to ascertain that a railway is most effective commercially, the features which underlie its commercial effectiveness should be understood. There are:—Gross earnings, operating expenses, and fixed charges; and are of importance in the order named. Gross earnings, which depend on the amount of traffic handled, is undoubtedly first. It is never advisable to build a railway unless there is or will be sufficient traffic to pay the operating expenses and the fixed charges, no matter how cheaply or how well it can be built.

In new countries, such as most Canadian railways are built through, there is rarely sufficient traffic in sight to justify the construction of a road, so the promoters—whether they be a government or private parties—must have faith in the project and must be able to justify to themselves, and to the investing public, the possibilities of paying dividends.

Engineers are sometimes, though rarely, consulted in the early stages of the project to report on the traffic possibilities of the route. The usual way is for the promoters to decide for themselves that a road between certain terminals is commercially desirable, and that there is or will be sufficient traffic on such a route to justify its construction. Engineers are then employed to survey and construct the road. The question should at once arise with the engineer—how the railway can be so located as to make it the most effective commercially, or how to get for the promoters the most profitable traffic. No matter how this problem is stated, it finally resolves itself into this:—if the promoters be

private parties, how can the road be so located and built that the most interest can be earned on the money invested—or if a government, to transport the most traffic at the least cost? The answer in either case would be the same, for, if it is so located that it may handle the most traffic at the least cost, it will, if properly managed, make the most interest on the money invested.

The first problem the engineer has thus to face is how he can so locate the road between the given terminals as to get the most profitable traffic. The route which takes in the greatest number of towns, or which goes through the best land, if the country be unsettled, should be the first examined. A mistake frequently made is to locate the road within a mile or two of an important town in order to decrease distance or avoid expense. The cost of handling traffic is the total cost from the door of the consignor to the door of the consignee, and rates on that basis must be equal. The added charge for cartage is at times so large as to wholly destroy the business of the badly placed line and give it to a competitor more favorably situated, or if it be not wholly destroyed, the additional cartage and delivery charges eat up the profits.

Where traffic is light, and train loads less than the rated capacity of the locomotive, the cost of handling additional traffic is much less than is the ordinary train mile cost. It should be figured in equating the value of a change in location which increases traffic at 50% of the usual train mile cost. In this respect it should be remembered that deviations from the direct route do not always materially add to the length of the line.

In order to locate a railway so that it may be commercially effective it is first necessary to know what the volume of traffic is likely to be, whether it is immediately available, and at what rate it is likely to grow. The best way to ascertain this is by comparison with roads through the same or a similar country. A road through a country most nearly approximating that to be traversed should be selected for examination, and its traffic for previous years studied. If, for any reason business is likely to be materially greater or less than on the road under examination, due allowance should be made.

All railways are now required to make yearly reports to the government, and such statistics should be examined as well as those published in the railway companies' annual reports. The average train load and the ruling grade should be studied, and finally the average number of trains per day should be ascertained. It must be remembered that though the traffic is rarely balanced, that is, that there is seldom as much tonnage moving one way as the other, the number of trains each way must within narrow limits be the same. It is not always easy for an outsider to ascertain the number of trains over any given railway, as railway statistics are not published in this form, but every effort should be made to arrive at it as closely as possible.

Having obtained this information, and having determined how the traffic on the proposed road will compare with that on the road under examination, some approximation of the ruling grades on the road in view should be arrived at. If different from those on the route with which comparison is being made, the number of trains per day each way on the proposed road should

be increased or diminished accordingly.

While this method of ascertaining the number of trains per day is only approximate, it is certainly much more accurate than to attempt to make an independent estimate of the gross tonnage on the new road. The rate of growth of traffic should be similarly ascertained, as a railway should be built not only to take care of the present traffic but also that of the road in the reasonably near future.

Cost per train mile is the basis of all economic comparison, as the effect of the number of trains on the cost of operation is much more direct than is the actual tonnage handled. The cost per train mile should thus be ascertained with reasonable accuracy. The annual reports published by the railway companies usually give these figures; if not, the reports of the Inter-State Commerce Commission give this information for every railway in the United States. From this mass of statistics the train mile cost of the most nearly similar road should be taken and assumed as the train mile cost of the proposed road. It must also be remembered that these costs are increasing rapidly, the average for the whole United States for the year ended June 30, 1896, being 95c., while for the year ended June 30, 1910, it had increased to \$1.49.

Equipped with this information as to the sources of traffic, the estimated average number of trains per day, and the probable cost per train mile, the engineer is ready to make a reconnaissance of the country to be traversed. The reconnaissance should always be of an area rather than a line. An area wide enough to take in any possible line should be examined. All combinations of probable lines should be studied. As the reconnaissance proceeds a map of the country should be made showing the details of the topography by contours 10 to 50 ft. apart; the elevations of controlling points should be shown with the greatest attainable accuracy. From such a map carefully prepared all lines and combinations of lines can be studied. Approximate condensed profiles can be drawn, and distances, grades and costs can be approximately ascertained. With such information, the choice of routes can usually be narrowed down to one or two, or in rare instances to three lines over which it is necessary to run surveys.

The value of a proper reconnaissance cannot be too strongly insisted upon. It is owing to the lack of it that the graver errors of location are usually due, such as the selection of an improper route or ruling grade, passing of traffic centres, etc. There is no way in which money can be so profitably spent. Great pains should be taken to secure the most expert engineer for this class of work. In engineering and economic importance, reconnaissance far outranks location or construction. It is not an exaggeration to say that for every dollar which an engineer can save on construction, he can save five on location, and ten on reconnaissance.

The really essential factor in a location made for freight traffic is the ruling grade. The maximum is not always the ruling or limiting grade, as it might be operated by the aid of a helper engine, in which case it may not limit traffic. A very long grade of a lower rate may, by taxing the boiler capacity, become the ruling grade instead of a shorter steeper one. To ascertain the economic value of any change in grade, or to compare two different grades, the number of round trips per day required to handle the given or estimated traffic should be ascertained. The difference will be the saving in trains each way per day. This multiplied by the ascertained cost per train mile,

by twice the length of the division in miles and the number of days in the year, will give the annual saving. Capitalizing at the proper interest rate will give the capitalized value of the better grade. If the additional cost is not greater than the capitalized value when properly equated for distance, rise and fall, curvature, etc., then the lighter grade is an economic one, and should be adopted.

As many items of expense will not be affected by changes in the number of trains, the saving per train mile for a train eliminated is not as great as the cost per train mile for the entire traffic. The saving is in reality in the neighborhood of 50%, and this percentage of the ascertained total train mile cost should be used in estimating the economy due to a difference in ruling grade.

In figuring on the economics of a grade reduction on an old road where the traffic and the average number of trains per day are known, it is essential that the actual loads hauled by each locomotive be determined and compared with their rated capacities. This difference is due to the inability of the operating officials to get perfect results. This "personal equation" must be taken into consideration in figuring the number of trains per day with the new grades, as they will no more be able to get the best results under the new conditions than they were with the old. In making a reduction from a high rate to a low, for instance, from 1% to a 0.3% or 0.4%, it must not be forgotten that the proportion of the actual loads to the theoretical rating will be lower on the low grades than on the high. Time is an essential factor. On a 1% grade in good weather, the actual loading may usually be made 90% of the theoretical, while on 0.3% it is unlikely that more than 75% of the rating can be hauled if time is to be made.

The proportionate amount of ruling grade on the divisions has also an important bearing on the loading of trains, the greater the proportion its length bears to the length of the division the lighter the actual train loads must be, and this, too, must be taken into consideration in determining the average number of trains per day required to handle the traffic on the proposed new grade.

Serious error would undoubtedly arise if the theoretical number of trains required to handle the traffic on the proposed new grade were compared with the actual trains on the present one.

While fixed charges—which are largely determined by the cost of construction—are of lesser consideration than operating expenses, they are still of prime importance. No road can pay dividends to stock holders, or afford to reduce freight rates until its fixed charges are met. So it is of the greatest importance that the engineer introduce no features that will increase the cost of construction without reducing the operating expenses by at least as great an amount as the interest on the added cost. The cost of moving a given tonnage being the sum of the operating expenses and the fixed charges, it follows that a reduction in the cost which does not increase the operating expenses is only of less importance than one which reduces the operating expenses without increasing the cost. Such a reduction in cost is a practical improvement to the standard of the road, as it increases the margin between receipts and expenditures, and so permits of an increase in dividends, or has a tendency to permit of a reduction in freight rates, if that be the object aimed at.

In Canada most of the new construction is through districts which at the time of completion furnish but little traffic:

much railway has been built on which the traffic did not justify even one daily freight train per day each way. It is a safe statement that 80% of the mileage constructed in Canada would not furnish at the date of completion traffic sufficient for two freight trains each way per day. Under such conditions, the receipts are low and the operating expenses high, and it is of the utmost importance that the construction cost be kept low. On the other hand, the country is growing fast, and traffic is increasing rapidly. It is thus necessary that the engineer keep always in view the almost certain necessity of a good road in the future. He should, therefore, so locate and construct his line that the first cost be low, and that the standard may be raised, when necessary, without unduly increasing the total expenditure. In order to get the very best results, the line giving best grades, alignment, etc., should always be first located. From this, as a standard, the engineer should work to the final or economic location. Working from a poor to a better is apt to lead to grave errors.

Where low construction costs are necessary, and it is probable that a high standard will be required in the future, it is much more effective and advisable to use short sections of temporary line with steep grades, sharp curves, etc., on the heavy or difficult sections, maintaining the higher standard for the light or easy portions of line, than it is to adopt a generally lower standard for the whole route. The first cost of the former will probably be less; it may be operated with helper engines as the traffic increases, and may be improved when advisable, while the cost of improving a generally poor road is frequently prohibitive.

The use of sharp curves with short tangents is often a very effective means of reducing cost without materially increasing the operating expenses.

The effect of moderately sharp curvature is essentially different from steep grades, inasmuch as it is not limiting in its effect. The use of one sharp curve does not justify the use of another just as sharp, whereas the use of one ruling grade on a division does justify another as steep.

The use of curves up to 14° does not increase the maintenance or operating expenses. A mile of road in which there are 100° of 10° curve, the balance being tangent, does not cost any more to maintain and operate than the same length of road with 100° of 2° curve—in fact, if there is any difference, it is in favor of the sharper curvature.

Unless the curvature is so sharp as to be limiting in its effect, there is no serious objection even on the best class of road to a few sharp curves where the amount saved by their use is sufficient to justify their introduction. The conditions which cause curves to be limiting are when they are so sharp as to prevent the use of the higher grades of modern equipment, and when they limit the haulage capacity of the locomotives, or their speed.

Modern equipment is so constructed as to traverse safely 14° curves, and much sharper with guard and hold up rails. The standard compensation for curvature on grades is 0.4 ft. per degree. A 10° curve is thus equivalent, as far as resistance is concerned, to a 0.4% grade; and a 15° curve to a 0.6% grade. On a 0.4% it is only necessary that the grade on a 10° curve be made level in order that the resistance be not increased. The same thing applies to a 15° curve on a 0.6% grade. It is, therefore, evident that on a road whose ruling grades are 0.4% 10° curves are not limiting to the haulage capacity of the locomotives, nor are 15° curves on a 0.6% grade.

The easy riding speed is dependent on the amount of the allowable elevation of the outer rail. If the maximum be set at 6 ins., this speed per hour would be:—

| | |
|---------------------|------------------|
| on a 3 degree curve | 60 miles an hour |
| “ 4 “ | 50 “ |
| “ 6 “ | 40 “ |
| “ 8 “ | 35 “ |
| “ 10 “ | 30 “ |

The safe or allowable speed would be 10 miles an hour greater.

With the track properly elevated, equipped with tie plates kept in good line and surface, and curves provided with proper easements, 10° curves are no more disagreeable to ride over at speed of 30 miles per hour than are 3° curves at 60 miles an hour.

The reduction in speed for one mile from 50 to 30 miles an hour only means the loss of 0.8 minutes. To take an extreme case—the Twentieth Century Limited runs from New York to Chicago, 980 miles, in 20 hours, or at an average of 49 miles an hour. The introduction of one hundred 10° curves, each one of which required a slacking of speed to 30 miles an hour for a distance of one mile would increase the running time of such a train by 80 minutes. Such an increase on a road 1,000 miles long would in nine cases out of ten have no ill effect. A 10° curve so long as to require the reduction of speed to an average of 30 miles an hour for a mile would in practice be a very rare occurrence.

It is evident the use of curves as sharp as 10° does not prohibit the employment of modern equipment or limit the haulage capacity of the locomotives. It has no effect on the speed of freight trains, or on passenger trains where the average speed including stops is not greater than 30 miles an hour. A few such curves only slightly affect the running time where speeds are high.

It is thus clear that a few curves not sharper than 10° are not objectionable on the very best roads where their use results in large savings. As they are not limiting, the use of one such curve is no justification for a second. The introduction of many of them, preventing the employment of high speeds for long distances, would certainly be objectionable, but an occasional one where large savings result is justifiable on even the highest class of road.

Wooden trestles to replace heavy rock borrow embankments should be used. Such trestles may be designed to safely carry the heaviest class of equipment. When protected by the installation of the best available water supply they are quite safe, and are good for ten years. Such temporary construction also gives time to ascertain the correct requirements for water ways in new countries where there is frequently a dearth of information as to rainfall, flow of streams, etc., and where unless unduly large water ways are left there is danger of washouts. This danger may be even greater than the danger from fire to wooden trestles. Their use instead of heavy rock borrow embankments is of great importance from an economic point of view. One dollar at 5% compound interest amounts in ten years to \$1.63. If rock borrow costs on the original construction say \$1.75 a cubic yard it will in ten years' time have amounted with interest to \$2.85, while, under anything like ordinary conditions train hauled earth embankments on an operated road, made when the trestles require replacement, do not cost over 30c. per cubic yard, or less than one ninth of the total cost of a permanent rock embankment made during construction.

Momentum grades are a great source of saving in cost, without increasing the operating expenses. The use of momentum in

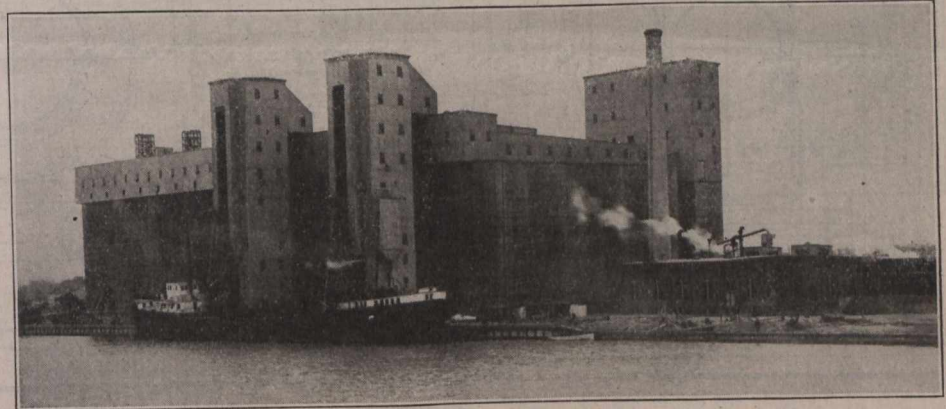
overcrowding short stretches steeper than the ordinary ruling grade is almost always justifiable. The exception is where the traffic is so congested that the possibility of a delay due to the failure of an occasional train to surmount the grade is more important than the undoubted saving in interest charges which they insure. It will probably be many years before conditions prohibiting their use prevail on any portion of our Canadian railways.

The foregoing are a few of the more important considerations which the locating engineer should keep in view. He should always remember that railways are commercial enterprises, are built for profit, and that the investors are looking for and are entitled to satisfactory interest on their money; and so far as the returns on their investments depend on location they will for a given traffic be the greatest when the sum of the operating expenses and fixed charges is the least amount.

The foregoing formed the principal portion of Mr. Tye's address, as retiring President of the Canadian Society of Civil Engineers, at its annual meeting in Montreal recently.

Canadian Pacific Railway Elevator, Etc., at Port McNicoll.

Canadian Railway and Marine World for Jan., 1912, contained a very complete illustrated description of the C.P.R.'s new Georgian Bay terminal at Port McNicoll,



C.P.R. Elevator, Power House, etc., at Port McNicoll.

Ont., including a 2,000,000 bush. elevator built in 1910. The business proved too large for the elevator by the time it had been in operation for only one year, and it was therefore decided to build an additional storage unit of the same capacity as the original elevator, making the total capacity 4,000,000 bush.

The new storage unit, which was completed in time to be entirely filled with the 1911 crop before the close of lake navigation, is a duplicate of the first. It is 179 ft. wide, and 226 ft. long, making the new length of the elevator 452 ft. Each unit contains 32 cylindrical bins 32 ft. 11 ins. in diameter, and 31 interspace bins; the bin walls are 80 ft. long. The entire structure is of steel and concrete. The two marine towers, which travel alongside the original elevator, fill the new storage in the same manner as they filled the first unit. The longitudinal conveyors receiving from the marine towers run the entire length of the two units. Grain for shipment from the new portion is conveyed through the basement of the first storage to the car shipping house. All machinery is electrically driven, power being generated in a steam plant built in connection with the original elevator.

The work was carried out under the di-

rection of J. M. R. Fairbairn, Assistant Chief Engineer C.P.R., and C.W.P. Ramsey, Engineer of Construction, C.P.R., the contractors being the John S. Metcalf Co., Ltd., Montreal, and Chicago, who also built the first storage unit of 2,000,000 bush., as well as the car shipping house with a capacity of 200 cars in 10 hours, and also the following;—1,500 h.p. power plant, about 1 1-2 miles of wharves, flour shed, 700 ft. long, freight shed, 700 ft. long, Customs house, carpenter shop, coal platform, sleeping house and eating house for freight porters, pump house, fire protection and general water supply system.

Emergency Valve Location

The Board of Railway Commissioners at its sittings in Ottawa, Jan. 7, considered the advisability of standardizing the position of the emergency valve on passenger cars. In the course of the hearing, the standards of the different lines were outlined.

On the C.P.R., the emergency valve is located in the lavatory, with the handle extending out through the bulkhead, where it is readily accessible from the body of the car, meeting the contention raised that the valve and handle are both frequently located in the lavatory. On all cars over 60 ft., there is a valve in both ends, and on the mail, express and baggage cars, a communicating cord passes from end to end of the car in case the car should be filled up.

On the G.T.R. only one valve is employed, located in the women's lavatory, with the

handle projecting through into the body of the car. When the valve is closed, the handle is in a perpendicular position, avoiding trouble from anyone hanging parcels on it and setting the brakes.

The Michigan Central places the valve in the men's lavatory, with the handle projecting through into the body of the car, a cord running through the car so that the valve may be operated from any position. In the latest type of car on that line, the whole valve is encased in metal to prevent tampering.

The Canadian Northern legal representative expressed the opinion that no objection would be raised to an order if it provided that the valve be located in the proper place where it could not be tampered with, and the handle be left accessible.

In view of the evidence submitted, the Chief Commissioner stated that there was no immediate necessity for action.

JOHN McCRAW, General Agent, Central Vermont Ry., New London, Conn., who was formerly in the Grand Trunk Railway service at Merritton, Ont., in remitting his renewal subscription, writes:—"To receive Canadian Railway and Marine World each month is just like getting a letter from home. I wish you continued success."

Improved Design of Canadian Northern Railway Locomotive Parts.

By Frederick H. Moody, B.A. Sc.

One of the earliest policies adopted by S. J. Hungerford, on his appointment as Superintendent of Motive Power on the Canadian Northern Ry., was that of standardization of rolling stock wherever possible. In this connection, the motive power received particular attention, many parts being from time to time standardized when such improvements have been introduced as would make such a course advisable. This progressive policy has been carried even further; the standards as adopted have not been considered as perfect, but when possible, still further requirements have been introduced without losing sight of the interchangeable feature so essential to standard practice.

From time to time the locomotive parts have been undergoing this standardization,

but above the lower edge of the bolt holes, the width of the crosshead casting is cut down to 7 7/8 ins., or a cut out of 1-16 in. on each side. Thus, the side plate partakes of the nature of a clamp, bearing on the lower face of the crosshead side, and on the gib, securely holding the latter in place.

The only parts of a crosshead subjected to any appreciable wear are the bearing parts on the guides, and these require frequent renewing. In this design of crosshead, the renewal of the worn parts is simple in the extreme. Without removing the crosshead from the guides, the side plates can be removed, the gibs drawn out, and new ones inserted. This is not always necessary, as the wear on the gibs, being more or less uniform, leaves a smooth sur-

face alike as to have the general design the same, making the use in both cases of identical parts. This was accomplished satisfactorily by making the forward end and cross sectional construction in both instances the same, the increased capacity of the 6,000 gal. tank being obtained by lengthening the tank to the rear.

The tanks are constructed of 1/4 in. plate throughout, using 2 x 2 x 5-16 in. angles for the most part. They are 9 1/2 ft. wide, and the 6,000 gal. tank is 25 1/2 ft. long. In all other particulars, the two sizes of tanks are the same. The coal space in the forward end is 13 1/2 ft. long, the full width of the tender at top, tapering forward and inward to a space 6 1/2 by 3 1/2 ft. at the forward end. Below the coal floor is a 19 in. water space, while the water depth at

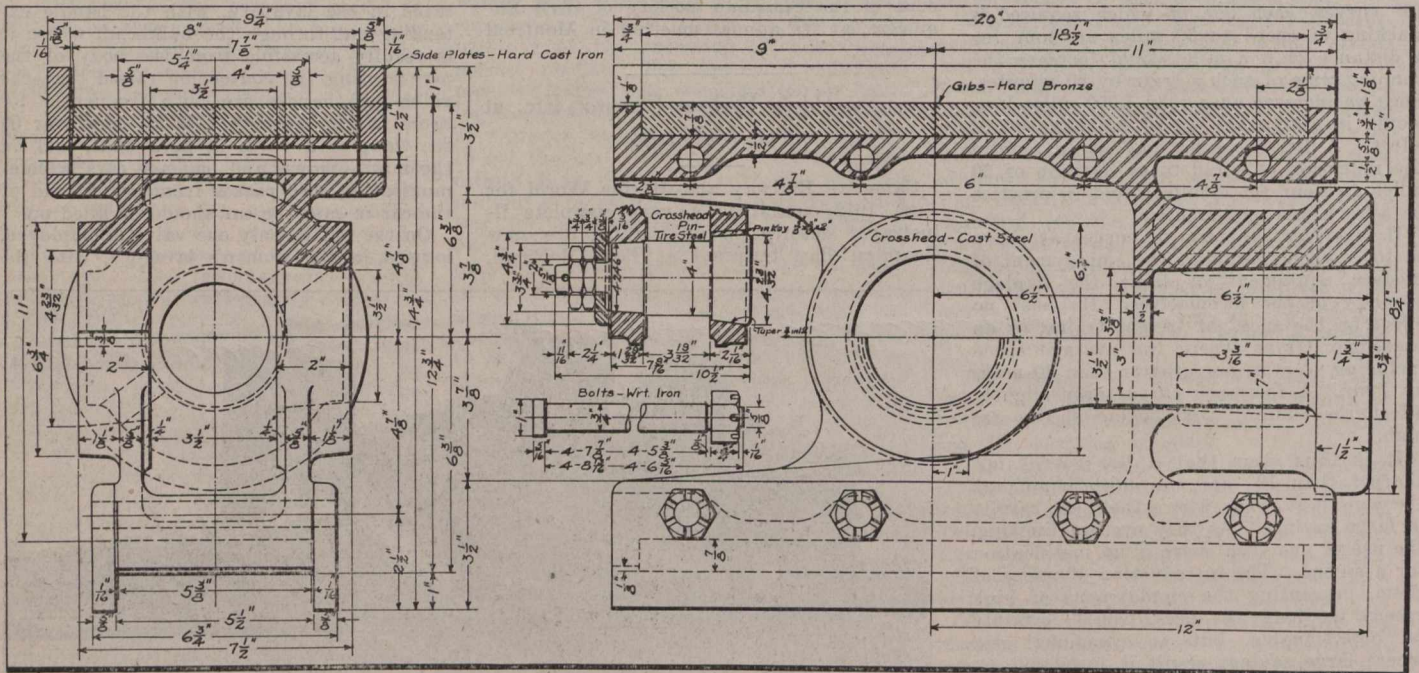


Fig. 1.—Canadian Northern Railway Standard Design of Crosshead.

and at the same time, the design has in several instances been entirely changed from conventional practice, as instanced in several of the parts to be herein described.

CROSSHEAD.—A simplified design of crosshead, of which fig. 1 is a typical example, has been developed. In general appearance, it closely resembles one of the commoner conventional designs, but it is in the factor of simplicity of repair and renewal of worn parts that this new design is worthy of comment.

The body is of cast steel, carrying a tapered wrist pin in the usual manner, and with the piston rod held in tapered opening in the rear end, with the usual diagonal flat pin. The novel feature of the design is in the manner in which the gibs are attached top and bottom. The sides and top of the crosshead are planed. The gibs are hard bronze slabs let into the face of the crosshead, projecting slightly above the end lugs of the crosshead body to allow for considerable wear. These end lugs take care of end movement, and side movement is prevented by hard cast iron side plates, held in place by 4 cross bolts through the crosshead casting.

In the upper guide of the crosshead, the width of the crosshead casting is 8 in., below the bolts; the gib width is the same,

face, which is still serviceable by packing the gib up from beneath in the recess in which it fits in the crosshead casting. The side plates are subjected to wear only on the upper inner face. All that is necessary is to take the plates to a shaper and plane over the worn face to a surface, and then replace.

It is thus apparent that the wear is confined on each guide to three simple flat pieces, on which there is no work that cannot be handled with the greatest expedition equally well at roundhouse or back shop. This crosshead is standard for a large range of locomotives; for other ranges there are crossheads of similar design. Thus the crosshead repair stock at the various divisional shops is reduced to a minimum, consisting of the different sizes of side plates and gibs, and wrist pins and their parts.

TENDER TANKS.—About two years ago, it was decided to standardize the tender tanks of C.N.R. locomotives, and use two sizes only, to hold 5,000 and 6,000 imp. gals. respectively. It was decided that these two sizes would meet all the demands of the motive power contemplated for the future. To avoid complications with too many designs, consideration was given to making the two sizes so nearly

the sides of the coal bunkers is 5 ft. 10 ins. On top of these coal sides is a flashing 20 ins. high. The rear section of the tender is 4 ft. 10 ins. deep.

A baffle extends down the centre of the tank, with 5 cross baffles at intervals down the length of the tender. The 5,000 gal. tender is made from the design of the larger size, by eliminating the rear end compartments. In addition to various standard auxiliary appliances fitted to the tender, there are coal doors, 18 ins. back from the forward end of the coal space. These doors have a clear space beneath of 16 1/8 ins. The fittings, such as ladders, steps, grab irons, water intake and outlet, tool boxes, and flag stands are all standard as well.

GRATES.—The design and arrangement of the grates and firebox fitting have also been improved on usual practice, and standardized, so that for all the locomotives on the system there are but two sizes of grates required, of the general design shown in fig. 2, which is of the larger size. The side and end grates are shown in fig. 3.

They are of the box shaker type and have been reduced to two standard sizes, 28 and 36 1/2 ins. over shoulders, covering all C.N.R. locomotives. There is nothing unusual about the grate body, which is a conven-

other emergency valve, the blow off valve being offset from it in the same casting. This emergency valve is similar to the blow off, except that it is operated by a square threaded spindle, at the valve. Normally, this valve is set wide open, with the blow

and handle are so constructed that the valve is open when the handle is in a vertical position. The gauge glass is held in the mountings at each end by packed glands. In the mountings, concentric with the hole into the boiler, are brass plugs, with a

the event of the more or less frequent breakage of the glass, the procedure would be to turn off the valves, remove the top plug, and after drawing out the glass pieces, first removing the packing, a new length of glass is introduced from the top.

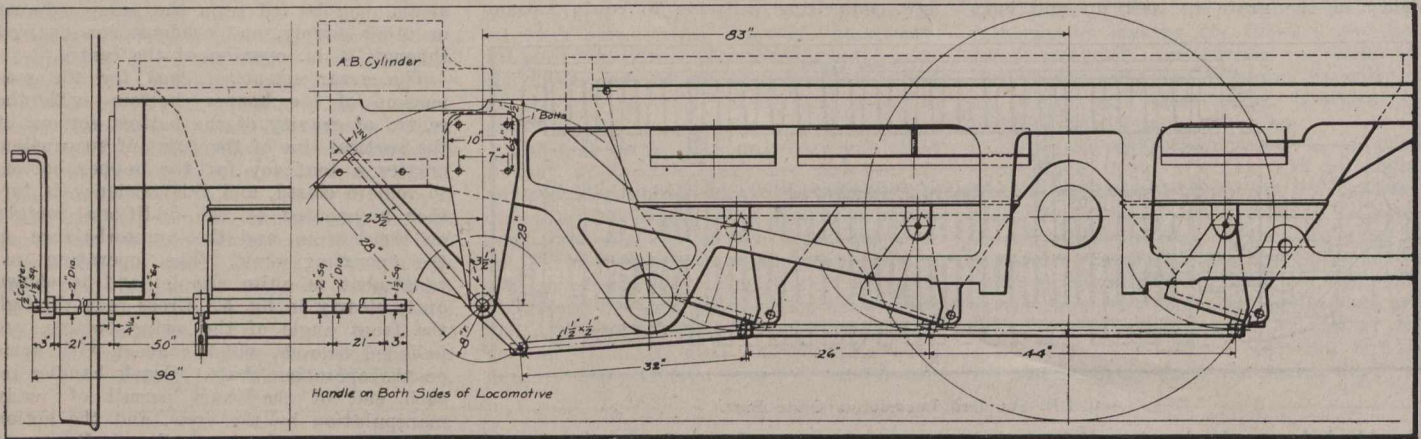


Fig. 5.—Installation of C.N.R. Standard Ashpan on an M-2-a Consolidation Locomotive.

off controlled by the blow off valve. In the event of anything going wrong with the latter, the emergency valve can be closed, and the blow off removed and repaired, without the necessity of draining the boiler. When first applied, the valve was threaded into the side of the water leg, but since then, it has been found advisable to attach the valve by a flange, with a loose ball joint ring between, thereby forming a solid tight joint that will not turn in operation.

GAUGE GLASS MOUNTINGS.—The design of gauge glass mounting used as shown in fig. 7 combines in a simple manner a convenient arrangement of fittings. The fittings to the boiler head are brass castings of almost identical design, except for inter-

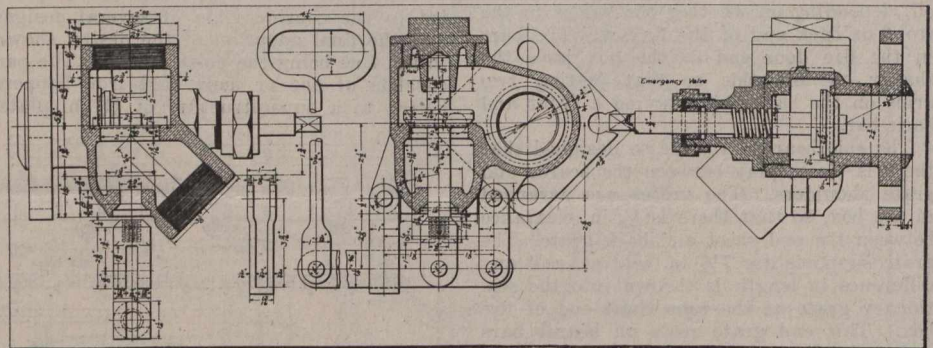


Fig. 6.—C.N.R. Standard Blow Off Valve.

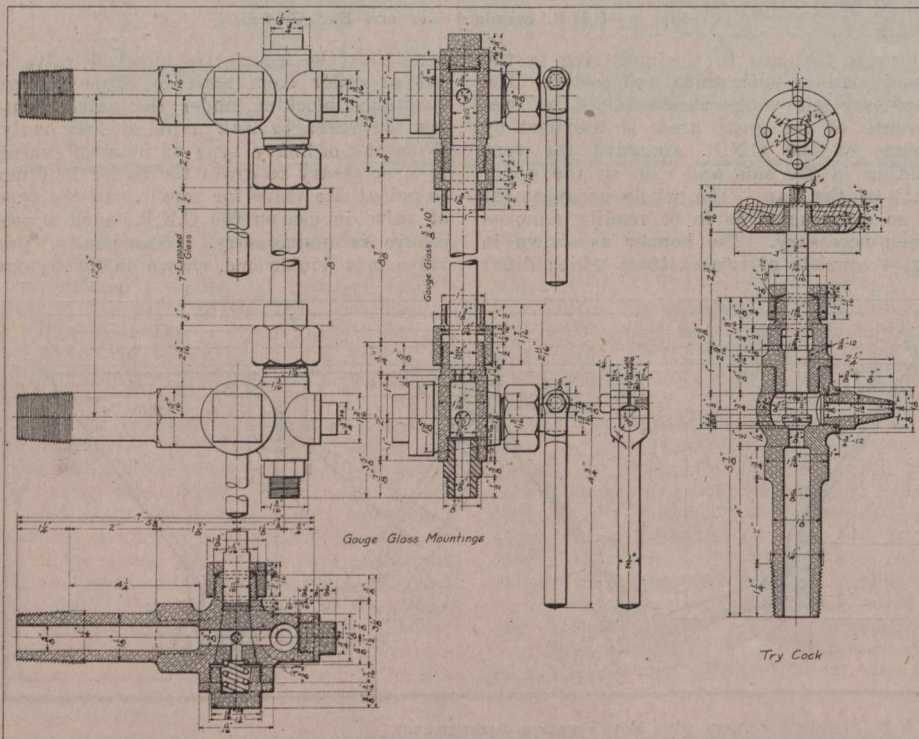


Fig. 7.—C.N.R. Standard Gauge Glass Mountings and Try Cock.

ior coring of the glass space. In the body of each is a tapered packed valve, controlled in each case by a handle on the side. The end of the valve spindle has flat sides, on which a small clamp handle is fastened by a small bolt. The parts of the valve

similar plug in the upper end of the top mounting. In the lower end of the lower mounting is a steel nipple for trying the gauge. It will be noted that the upper mounting is bored vertically slightly larger than the diameter of the gauge glass. In

After packing, replacing the top plug and turning on the valves, the glass is again complete for service.

The C.N.R. standard try cock is also shown in fig. 7.

BELL STAND.—Forcing the feed water into the side of the boiler at the forward end has been the practice for such a long time that any departure from this plan seems unusual. So successful has the scheme worked out by Mr. Hungerford proved, that a number of other lines have adopted his plan in various modified designs. The feed water is injected into the boiler through the base of the bell stand, the latter being designed as in fig. 8. The feed enters the hollow sides of the bell stand through a vertical check valve, passing on through the hollow base into the boiler. Duplicate sets are arranged on each side. As with the blow off valve, if anything happens to the main valve, pressure must be drawn in order that the difficulty can be dealt with. Consequently, for similar reasons, an emergency valve is supplied on each side between the main valve and the boiler, both emergency valves being horizontal, alongside of the boiler connection. The bell stand is also provided with a plug in the top for washing out the boiler. Like the blow off valve, it is attached to the boiler top by a flange with a loose ball ring intervening.

The method of installing is shown in fig. 9, which graphically shows the principal reason for this method of boiler feeding. In the older method, with the injector in its usual location just above the boiler centre line, the feed pipe bends down, running along above the runboard, and then up to the check valve on the boiler centre

line. In consequence, the feed pipe was always full of water, which in severe weather is a decided disadvantage, endangering the piping from freezing. With this new arrangement the feed pipe rises on a gentle slope to the bell stand, where there is an outside check valve in addition to the one in the casting. Immediately

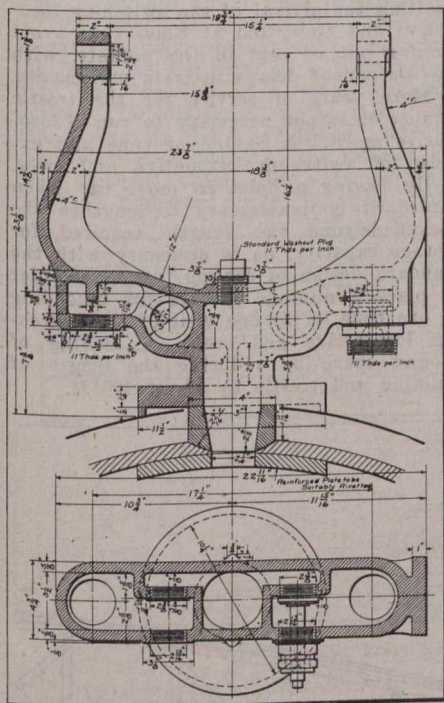


Fig. 8.—C.N.R. Bell Stand Feed Water Inlet.

the injector is shut off, the pipe drains through the injector overflow, eliminating trouble from frozen piping.

Trouble would be experienced were the cold feed water to be fed in on the hot dry pipe, so a plate shield is mounted over

Grand Trunk Railway Pacific Type Locomotives.

The G.T.R. has recently received 19 Pacific type locomotives which exert a tractive force of 33,800 lbs., and with 146,700 lbs. on driving wheels the ratio of adhesion is 4.34. The driving wheels are 69 ins. in diameter. The proportions of the design are such as to fit the locomotives for either fast freight or heavy medium speed passenger service. The advantage of the Pacific type over the 10 wheeled for work of this character lies in the increased relative steaming capacity of the former, and in

nals. All the driving springs are underhung, and every wheel under the locomotive and tender is braked.

The tender frame is composed of 10 in. steel channels, with oak bumpers. The trucks are of the arch bar type, with steel tired wheels, cast steel bolsters and triple elliptic springs. The fuel space is closed in front with metal coal gates.

The locomotives were built by the Baldwin Locomotive Works. Their principal dimensions are as follows:—

| | |
|-------------------|------------------|
| Cylinders | 23 x 28 ins. |
| Valves | balanced piston. |
| Boiler—type | straight. |
| “ “ length | 96 3/4 ins. |
| “ “ width | 75 1/4 ins. |

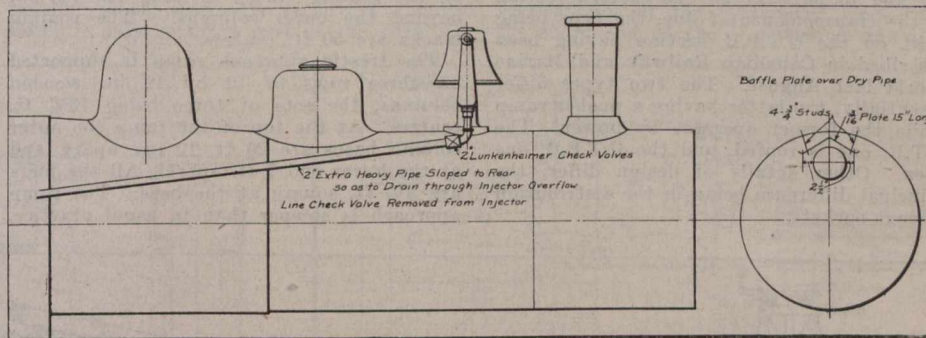
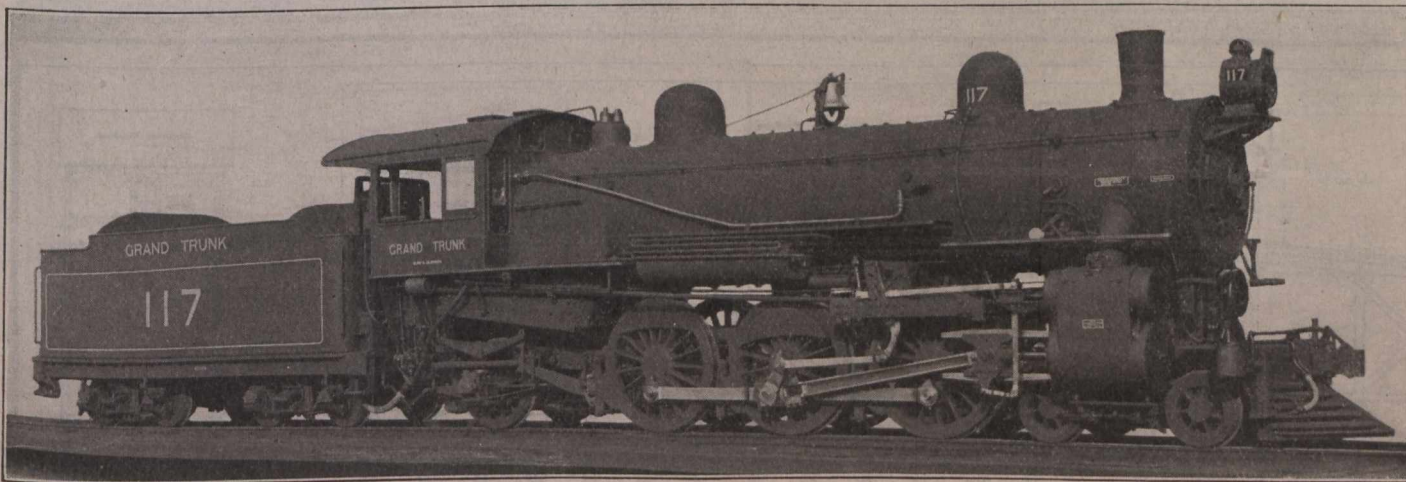


Fig. 9.—C.N.R. Standard Bell Stand Injector Arrangement.

the fact that, with a given amount of grate area, a larger furnace volume can be provided. This feature is of special value in locomotives using high volatile coal as fuel.

These locomotives are equipped with a Schmidt fire tube superheater and also with a brick arch, which is supported on four water tubes. These features have fully proved their ability to raise the efficiency of the locomotive and increase its capacity per ton of weight; and the new locomotives, as far as their proportions and construction are concerned, represent the most approved practice for engines of their type.

| | |
|-----------------------------------|------------------|
| “ “ depth, front | 72 3/4 ins. |
| “ “ depth, back | 56 1/4 ins. |
| “ “ thickness of sheets, sides .. | 3/8 in. |
| “ material | steel. |
| “ diameter | 70 1/2 ins. |
| “ thickness of sheets | 3/8 ins. |
| “ working pressure | 185 lbs. |
| “ fuel | soft coal. |
| “ staying | radial. |
| Fire box—Material | steel. |
| “ “ thickness of sheets, back .. | 3/8 in. |
| “ “ thickness of sheets, crown .. | 3/8 in. |
| “ “ thickness of sheets, tube .. | 3/8 in. |
| Water Space—front | 5 1/2 ins. |
| “ “ sides | 4 1/2 ins. |
| “ “ back | 4 1/2 ins. |
| Tubes—material | steel |
| “ thickness | 0.150-0.125 ins. |
| “ number | 24-181. |
| “ length | 20 ft. 7 ins. |



Grand Trunk Railway Pacific Type Locomotive.

the dry pipe on the inside of the boiler, shedding the water to each side. The edges of this shedding plate are bent up slightly, causing the water to spread out still further.

The foregoing examples of recent locomotive practice will give a conception of the progressive policy adopted by the C.N.R. mechanical department. They are but a few of the many examples of refinement in design, but will serve as an example of what is being done in that particular by the youngest of the great Canadian railway systems.

The details have been worked out in accordance with G.T.R. practice, and except for the changes necessary because of the application of the superheater, they are closely similar to those of engines previously built for this line. The steam pipes pass out through the sides of the smoke box and the distribution is controlled by 14 in. piston valves. These are driven by Walschaerts gear and are set with a lead of 5-16 in. The frames have single rails under the cylinder saddle, and separate rear sections which are arranged to accommodate a trailing truck with outside jour-

| | |
|--|---------------------|
| “ diameter | 5 3/4 -2 ins. |
| Heating Surface—fire box | 163 sq. ft. |
| “ “ tubes | 2,635 sq. ft. |
| “ “ firebrick tubes | 28 sq. ft. |
| “ “ total | 2,826 sq. ft. |
| “ grate area | 50.6 sq. ft. |
| Driving Wheels—diameter, outside | 69 ins. |
| “ “ diameter, centre | 62 ins. |
| “ “ journals, main and others | 9 1/2 x 12 ins. |
| Engine Truck Wheels—diameter, front .. | 31 ins. |
| “ “ “ journals .. | 6 1/2 x 10 1/2 ins. |
| “ “ “ diameter, back .. | 49 ins. |
| “ “ “ journals .. | 8 x 14 ins. |
| Wheel Base—driving | 13 ft. 4 ins. |
| “ “ rigid | 13 ft. 4 ins. |
| “ “ total engine | 33 ft. 2 ins. |
| “ “ total engine & tender .. | 62 ft. 3 1/2 ins. |

| | |
|---------------------------------|--------------|
| Weight—on driving wheels | 146,700 lbs. |
| “ on truck, front | 39,200 lbs. |
| “ on truck, back | 38,200 lbs. |
| “ total engine | 224,100 lbs. |
| “ total engine and tender | 375,000 lbs. |
| Tender—wheels, number | 8. |
| “ wheels, diameter | 34 ins. |
| “ journals | 5½ x 10 ins. |
| “ tank capacity | 8,000 gals. |
| “ fuel capacity | 10 tons. |

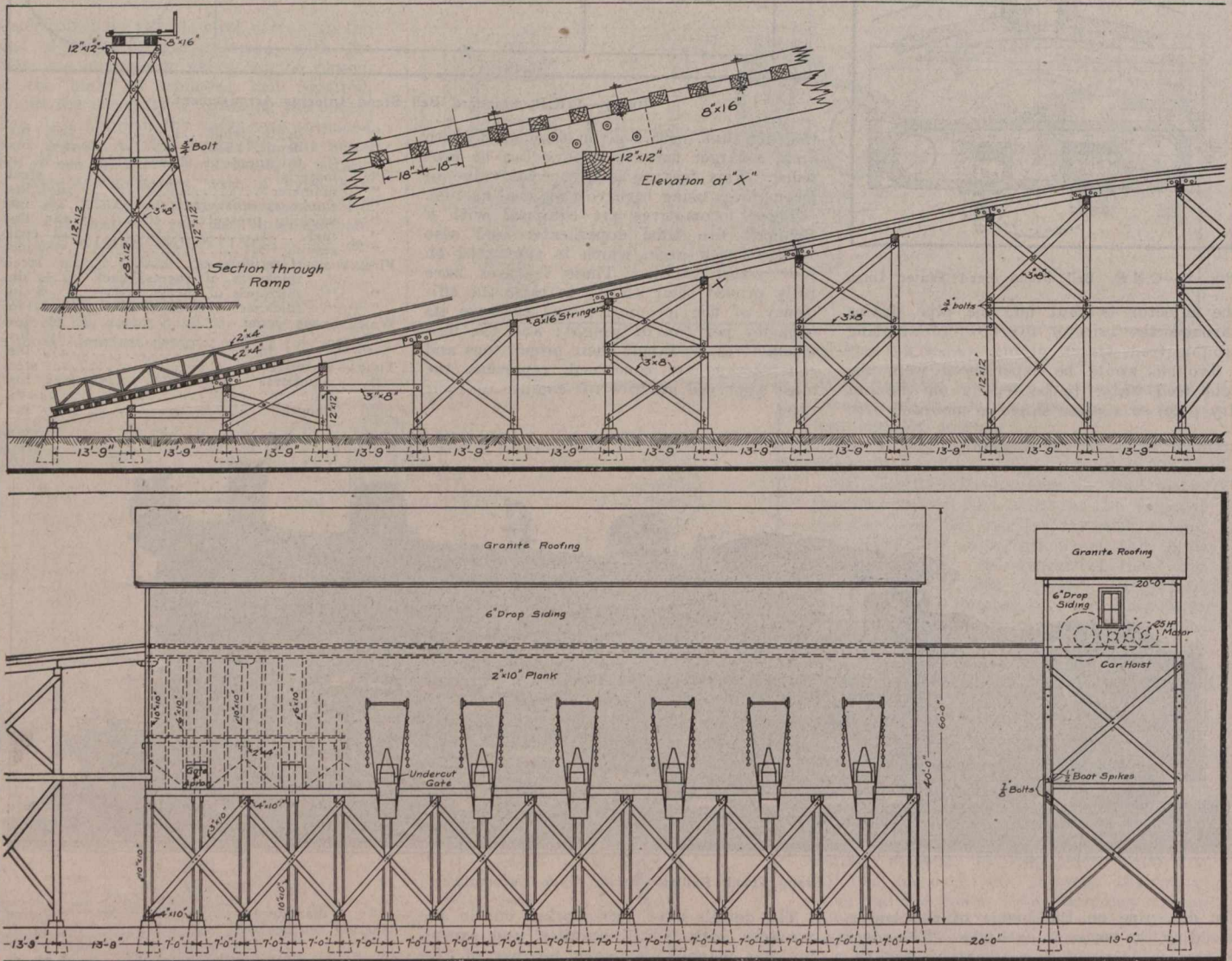
1,000 Ton Coaling Station on National Transcontinental Railway at Cochrane.

The National Transcontinental Ry.'s coaling station at Cochrane, Ont., is shown in elevation in the accompanying illustrations. It is typical of the coaling stations building and to be built on the eastern section of the transcontinental line, the type being built on the G.T.P.R. section having been described in Canadian Railway and Marine World last August. The two types differ essentially, the latter having a pusher ramp while the former operates by power. The N.T.R. one is roofed, and the G.T.P.R. one open. Other details of design differ, the principal difference being in the distribution of coal pockets.

port 62,560 lbs., and the other columns, 18 ft. long, on concrete pedestals 3½ ft. square at base, calculated to support 44,000 lbs. All piers are sunk to a depth of 5 ft. below the ground level. The inner two rows of columns slope together at the top directly under the two rails, with the outer ones forming the perpendicular sides of the coal pockets. The sides and ends of the coal pockets are sheathed with 2 by 10 in. planking, and the covered over top has 6 in. drop siding. The height to the under side of the coal pockets at the edge is 18 ft., rising in the centre on a slope of 1¼ to 1. The chutes along both sides are located 14 ft. apart, with a clear height above the rails of the coaling tracks of 14½ ft., 7½ ft. beyond the outer columns. The coaling tracks are 50 ft. centres.

The trestle approach ramp is supported on three rows of 12 by 12 in. wooden columns, the sets of three being 13¾ ft. centres. At the top of the ramp the outer column bases are 20 ft. 10 ins. apart, and at the lower end 7 ft. apart. All the piers are 3½ ft. square at the base. The ramp approach is steeper than in usual practice,

this information has been obtained. He claims for the plant the following advantages over the conventional design:—1. Elimination of liability of pushing locomotives or a string of cars over the trestle. 2. The building being under cover permits of the unloading of cars in all sorts of weather. 3. Man in charge can get any cars of coal that are on the track without awaiting the arrival of the switching locomotive and crew, and at times thus avoid running out of coal in the pockets, with the consequent delays in train movements. 4. More years of service for the trestle because it is not necessary to run a locomotive on it. 5. Saving of time and expense of switching locomotive and crew. 6. By having a hoist to move car when needed, it is unnecessary to lengthen the pocket beyond the length required for storage capacity, as is necessary with the standard design of coaling trestle in order to place a number of cars for unloading at one time, or at one visit of the switching locomotive and crew. 7. Saving of ground space by reducing the length of building and trestle by about 400 ft.



1,000 Ton Coaling Station on National Transcontinental Ry. at Cochrane, Ont.

The Cochrane plant is 112 by 30 ft., with a total height above ground of 60 ft., the coal car rail level being 40 ft. above ground. The structure is of wood throughout, and is supported on 10 by 10 in. posts, in sets of 4, at 7 ft. intervals the length of the building. The inner columns, 26 ft. long, are 14 ft. apart on concrete pedestals, 4½ ft. square at the base, calculated to sup-

which is made possible by the power hoist at the rear end of the plant. In a small cabin at this end of the plant there is housed a hoist, driven through gearing by a 25 h.p. electric motor. The coal cars are elevated on the platform up the steep ramp by this means.

The plant was designed by W. J. Press, Mechanical Engineer, N.T.R., from whom

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

| | |
|--------------------------------------|---------------|
| Calgary and Edmonton Ry. | Acres. 643.00 |
| Canadian Pacific Ry. | 4.77 |
| Qu'Appelle, Long Lake and Saskatche- | |
| wan Rd. and Steamboat Co. | 3,214.59 |
| Total | 3,862.36 |

Railway Mechanical Methods and Devices.

Air Press at Grand Trunk Pacific Railway Shops

As mentioned on previous occasions, the G.T.P.R. shops at Rivers, Man., have been operating under peculiar conditions, from the fact that the work of a large system has been handled at a plant originally equipped for divisional work only. This has, however, been remedied, as the mechanical department of the railway has been removed from Rivers to the new shops at Transcona, near Winnipeg, which

cylinder. To the lower flanges of the channels are secured flat sections of forged bar stock, bolted to square stock, which form the axles of the carrying truck. The air press truck, when required, is drawn into position beside a vacant forge, and connected to the air by a hose length. When the work is completed the truck is drawn out into the yard and does not become an encumbrance. While particularly advantageous in these shops it is a suggestion that might well be taken up by many smaller shops, where the service of a bulldozer is only required part of the time.

Hart box cars, as shown in fig. 3. The two operations are performed in the same blocks by moving from one position to another. The stationary block has a cutout in line with the direction of motion of the movable block, a tilt on the latter entering therein with the necessary stock clearance. The stock placed across the face of the stationary die is formed into a deep U, the diameter of which is slightly greater than that of the finished hinge pin. The U bent stock is then placed over a vertical pin in the stationary block, and the short end of the U flattened down on

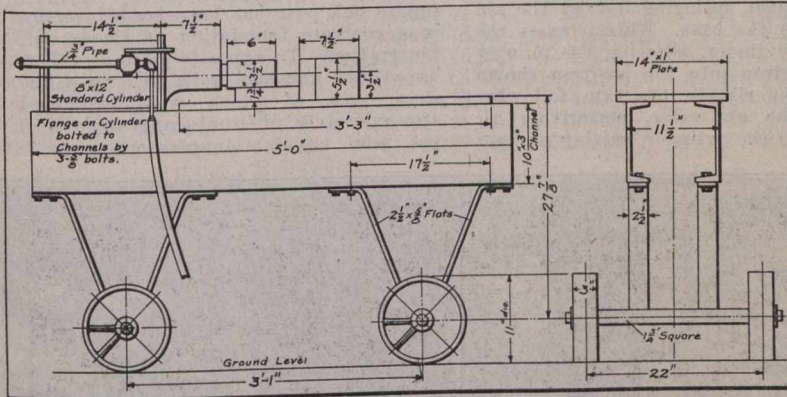


Fig. 1.—Portable Air Press for Light Bulldozer Work.

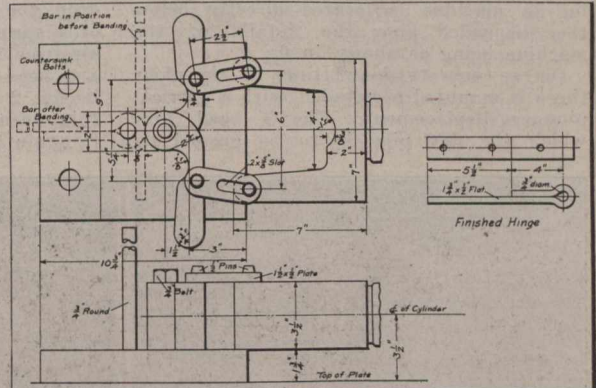


Fig. 2.—Hinge Forming Blocks for Dump Car Aprons.

were described in Canadian Railway and Marine World for Feb., 1912.

The machine shop of the Rivers plant occupies the divisional machine and blacksmith shop space, crowding out all other departments. The blacksmith shop is housed in a temporary building alongside, of frame construction of the lightest and cheapest type compatible with accommodating the work with a fair degree of efficiency. As a result the interior arrangement is very cramped, requiring many makeshifts.

Figs. 2, 3 and 4 show die blocks used in conjunction with the air press. Those in fig. 2 are for making hinges for Hart dump car aprons, the finished hinge being as shown on the right of the blocks. The stationary part of the mechanism is a cast iron block, in the centre of which is a vertical pin, the diameter of the hinge end loop. This stationary block is secured to the plate of the air press by two countersunk bolts. The movable block is of the collapsible type, comprising several parts that close together over the stock

the other arm by properly formed recesses in the two blocks.

The operation of the blocks shown in fig. 4 is somewhat similar to the last example. The articles being made are corner brackets for box cars, and require two operations, both in the same pair of blocks. The bar stock, placed across the face of the movable die, is forced into a cutout in the latter by a correspondingly shaped triangular tit, leaving the bar with an initial double bend, approximately 90 and 180 degrees, with regard to the unbent end

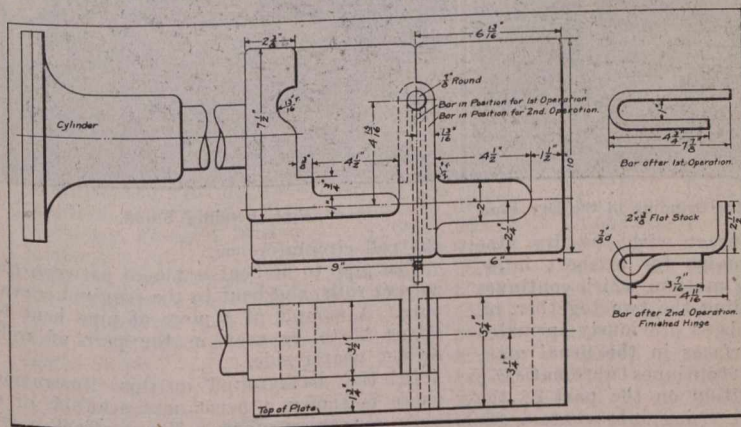


Fig. 3.—Hinge Forming Blocks for End Sill Aprons.

It was in consequence of this crowded condition that when it became necessary to build an air press as a substitute for a larger bulldozer, it was decided to make it portable, resulting in the press illustrated in fig. 1, which shows it mounted on a type of truck. On two 5 ft. lengths of 10 x 3 in. channels is mounted a standard 8 x 12 in. air cylinder, bolted by its flanges to the flanges of the channels. On the other end of the channels is secured a flat plate, on the top of which are mounted the forging and bending dies or blocks. The air plunger is the actuating medium, controlled by a handle on the side of the

being worked. Two formed arms are pinned to the top of the stationary block, directly to the rear of the vertical pin in that block, with just sufficient intervening space to accommodate the stock when in position for bending. Two slotted links connect these arms to the body of the movable block, and as the latter moves forward, the pinned arms are forced in a circular direction, closing the stock around the vertical pin, completing the job in a single stroke.

Other forging jobs require more than one operation, as for example, the blocks for making hinges for end sill aprons on

of the stock. This end is then placed in a groove in the movable block, and coming in contact with the face of the stationary block, becomes flattened to its final shape.

The Cost of Freight Car Maintenance on steam railways in the United States was reported at a meeting of the American Railway Association recently to have been 24.75 cents a car per day during 1911. This was divided between repairs, replacements and taxes, repairs costing 16.87c., replacements, including the charges which were made to renewals and depreciation, 6.78c., and taxes 1.10c.

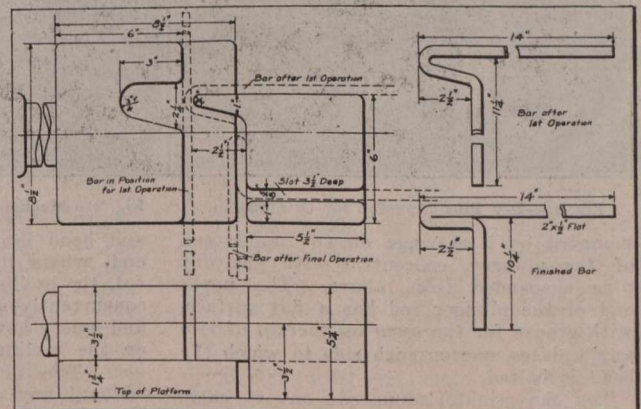


Fig. 4.—Box Car Corner Bracket Forming Blocks.

Grinding in Dry Steam Pipe End at Grand Trunk Railway Stratford Shops.

In the G.T.R. shops at Stratford, Ont., there is a machine for grinding in the ends of locomotive dry pipes to the seat in the T head connection to the cylinders, which is the same in construction as one in use at the company's Battle Creek shops, from which it was copied.

The dry pipe to be ground in has a loop connection secured over the throttle end, as at the top of the illustration in fig. 1, by which the prone pipe is raised by block and tackle and suspended from the roof girder. From two vertical posts the pipe is held in position vertically by two bands near the lower end, the lower one of which is shown at the top of fig. 2. The grinding in machine is located directly below the suspended pipe, the details of the machine being as shown in fig. 2.

On a concrete foundation in the floor there is mounted a cylinder, with a vertical plunger displacement. The T head, into which the dry pipe is to be ground, is

On the rear post, in the foreground of fig. 2, there is mounted an air valve of special design. On the forward end of this casting a combined ratchet wheel and cam wheel are mounted vertically in bearings. A short lever, with a dog playing on this ratchet wheel, oscillates on the same centre, actuated from a connecting rod driven from near the lower end of the ball and socket rod at the rear of the cylinder. Being near the stationary point of the rod, the motion is very greatly reduced.

The cam is the lower portion of the combined ratchet and cam, and in the side secured to the post there is a small plunger, part of an air valve. As the cam travels around from the motion imparted to it from the ratchet, the plunger is forced inward, and at a certain point on the circumference of the cam there is a drop, the plunger springing out by the aid of a spring in the base. This releases the air from the cylinder, allowing the plunger and head to drop into the position shown in fig. 2. The rise in the cam following this opens the air valve, permitting air to again enter the cylinder, raising plunger

Pipe Bending Stand at Grand Trunk Railway Port Huron Shops.

In a car repair shop there is required considerable bent pipe, formed to the required shape. Some shops have pipe bending machines, but these are the exceptions. In other cases the pipe is bent to shape around pins located conveniently for the purpose, but such a practice has decided objections from the fact that if the bend is anyway abrupt a ruffled inner surface is the result. Applications of the method to be here outlined are to be found elsewhere, but rarely in so complete a form.

The method under consideration is used in the passenger car department of the G.T.R. shops at Port Huron, Mich., J. L. Hodgson, Master Car Builder. A 12 in. square oak post has been bedded vertically in a concrete foundation as shown in the illustration. To opposite sides of this post have been attached rolls of two different sizes, each of which will accommodate approximately different ranges of sizes, in the semi circular annular groove around

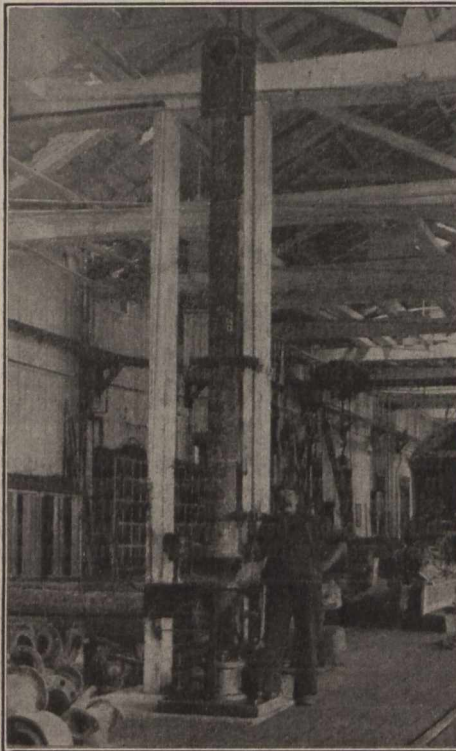


Fig. 1.—Dry Pipe Mounted for Grinding in.

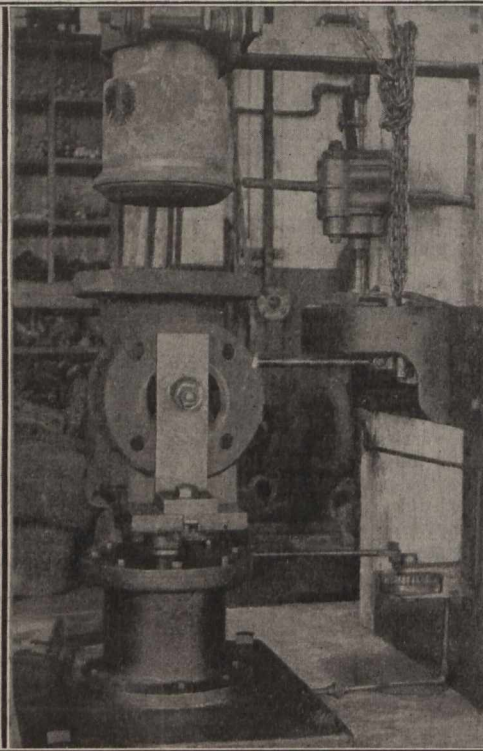
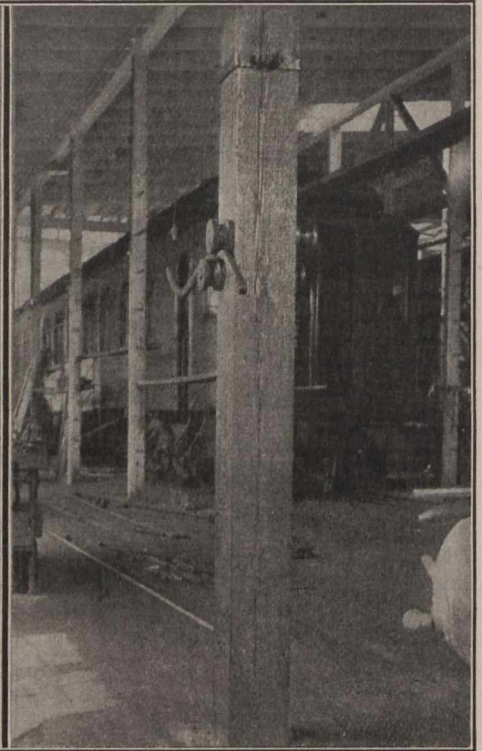


Fig. 2.—Mechanism for Grinding in the Dry Pipe.



Pipe Bending Stand.

mounted on a carriage on the upper end of the plunger, concentric with the dry pipe suspended from above. The upper end of the plunger rod has a flat surface, with groove for the securing thereto of two angle plates, one on each side to which the head is bolted.

To the right, mounted on a casting, between the two posts, there is an air motor, the casting carrying a train of gears from this motor, reducing the motion at the crank which connects to the connecting rod leading to the left. Behind the cylinder and head in fig. 2 there is a vertical rod, with ball and socket connection both at top and bottom, the bottom connection being secured to the machine bed, and the top connection to the left end of the connecting rod leading from the crank on the end of the train of gears. A forked end on the far side of the table on which the head is mounted engages with this vertical ball joint rod. As the crank revolves an oscillating motion is given to the head and plunger in the cylinder.

and head into contact with the dry pipe end, where it remains for a short interval, the oscillating motion, which continues concurrently, grinding the two together, oil and emery having been previously sprinkled on the mating surfaces in the usual manner. This action continues automatically without any attention on the part of the operator, the head rising into contact for a short interval, releasing for another short interval for the oil and emery to redistribute themselves, then into contact, continuing in this manner as long as the air motor is in operation.

The machine operates automatically, only requiring the occasional presence of an operator to feed in oil and emery.

The Board of Railway Commissioners will, on April 15, hear the application of the Montreal, Toronto, Winnipeg, and other boards of trade for reciprocal demurrage.

L. C. Fritch, Chicago, Great Western Rd., Chicago, read a paper on railway terminals before the Canadian Railway Club in Montreal, Jan. 14.

the roll circumference.

The pipe to be bent is placed between the correct rolls, and bent to the required curvature. A sample of a piece of pipe bent to shape is to be seen in the pair of rolls on the nearer side.

In the background in this illustration there is shown a permanent scaffold, of a very convenient form. The scaffold posts carry projecting pins on each side, spaced about a foot apart. On one of these the scaffold plank rests, a bracket structure on the lower surface pressing back against the rung below. The scaffold can be raised or lowered on any pair of rungs for the work in hand.

The contracting firm of James Stewart and Co., New York, has been incorporated with a capital stock of \$3,750,000. The firm of James Stewart and Co. was established in 1845 in Ottawa, Ont., by James Stewart, of Aberdeenshire, Scotland. In 1865 its headquarters were moved to St. Louis. The general office was changed in 1900 to New York.

Steam Railway Statistics for Year Ended June 30, 1912

The Table given in our last issue showed the financial results of the operations of steam railways for the year ended June 30, 1912. The following table gives the percentages and the principal statistical information compiled by the companies. The table published last issue and the one given below contain all the information given prior to 1910 in our compilation of these statistics, but the columns have been rearranged so as to combine in the first table the financial and in the second the statistical information

| Name of Railway | Proportion of total Passenger revenue to service revenue | Proportion of freight revenue plus switching revenue, &c., to total earnings | Revenue Train Mileage | Mileage of Non Revenue Trains | Earnings per Train Mile | Passengers Carried | Passengers Carried One Mile | Passenger Earnings per Train Mile | Tons of Freight Carried | Tons of Freight Carried One Mile | Freight Earnings per Train Mile |
|-------------------------------|--|--|-----------------------|-------------------------------|-------------------------|--------------------|-----------------------------|-----------------------------------|-------------------------|----------------------------------|---------------------------------|
| Alberta Ry. & Irrigation Co. | 25.13 | 70.13 | 124,323 | | \$ 3.08 | 74,215 | 3,011,316 | \$ 1.16 | 174,348 | 11,468,205 | \$ 4.52 |
| Algoma Central & Hudson Bay | 9.45 | 57.64 | 131,418 | 13,945 | 4.14 | 37,773 | 1,392,862 | .62 | 444,285 | 14,594,790 | 4.14 |
| Atlantic, Quebec & Western | 44.49 | 55.41 | 39,892 | 1,791 | .67 | 17,282 | 375,191 | .32 | 15,470 | 528,832 | .37 |
| Algoma Eastern | 1.66 | 97.16 | 19,181 | 62 | 5.09 | 4,031 | 41,618 | .08 | 505,612 | 4,703,091 | 4.94 |
| Bay of Quinte | 20.09 | 76.45 | 197,689 | | 1.20 | 108,128 | 1,594,922 | .28 | 276,509 | 9,982,033 | .93 |
| Bedlington and Nelson | 13.32 | 86.67 | 2,128 | | 1.22 | 1,201 | 8,241 | .16 | 80,553 | 3,795,513 | 1.07 |
| Brandon, Sask. & Hudson Bay | 36.01 | 63.40 | 66,232 | 1,290 | 1.25 | 27,977 | 930,129 | .68 | 3,388 | 30,521 | 2.33 |
| British Yukon | 23.70 | 75.03 | 44,325 | 960 | 6.31 | 9,396 | 591,914 | 1.59 | 24,374 | 2,038,112 | 4.96 |
| Brockville, Westport & N. W. | 51.83 | 48.05 | 59,560 | 360 | 1.26 | 74,574 | 2,237,220 | .67 | 30,596 | 1,009,668 | 1.22 |
| Canada Southern | 31.91 | 67.58 | 3,627,339 | 25,049 | 2.66 | 1,278,079 | 105,873,239 | 1.59 | 7,004,713 | 1,059,380,230 | 3.58 |
| Canadian Government Railways | | | | | | | | | | | |
| Intercolonial | 32.33 | 65.97 | 7,582,385 | 274,181 | 1.43 | 3,473,272 | 174,533,564 | 1.13 | 4,674,692 | 1,267,674,858 | 1.46 |
| Prince Edward Island | 49.45 | 47.65 | 361,496 | | 1.04 | 404,564 | 9,280,143 | .53 | 124,242 | 4,804,726 | .86 |
| Canadian Northern | 19.17 | 74.66 | 9,235,664 | 509,386 | 2.25 | 1,681,760 | 158,400,017 | 1.20 | 5,970,449 | 2,024,003,946 | 2.37 |
| Canadian Northern Ontario | 29.34 | 67.51 | 712,932 | 57,596 | 1.23 | 247,540 | 11,299,577 | .54 | 648,581 | 60,889,252 | 1.56 |
| Canadian Northern Quebec | 26.27 | 71.96 | 701,409 | 23,119 | 1.89 | 614,260 | 19,819,446 | .82 | 874,173 | 72,701,542 | 1.95 |
| Canadian Pacific | 30.19 | 68.14 | 47,020,362 | 1,960,153 | 2.47 | 13,593,569 | 1,610,251,856 | 1.64 | 25,940,238 | 10,180,782,322 | 2.89 |
| Cape Breton | 53.38 | 46.44 | 19,711 | | .47 | 7,176 | 164,848 | .25 | 6,474 | 92,064 | .16 |
| Caraquet | 32.03 | 67.97 | 47,078 | | 1.41 | 17,383 | 655,310 | .45 | 37,484 | 1,461,878 | .96 |
| Central Ontario | 29.07 | 68.67 | 223,166 | 8,571 | 1.44 | 162,761 | 3,816,871 | .53 | 269,177 | 7,493,217 | 2.35 |
| Crow's Nest Southern | 16.20 | 83.58 | 86,321 | 2,683 | 1.76 | 22,634 | 554,720 | .53 | 177,489 | 8,071,631 | 3.12 |
| Cumberland Ry. & Coal Co. | 15.72 | 84.13 | 47,034 | | 2.46 | 46,306 | 575,049 | .67 | 389,197 | 6,295,732 | 2.09 |
| Dominion Atlantic | 41.88 | 57.62 | 611,552 | 12,557 | 1.64 | 420,320 | 18,704,240 | .85 | 412,300 | 22,676,500 | 1.91 |
| Eastern British Columbia | 10.25 | 89.47 | 7,704 | | 5.48 | 7,195 | 72,840 | .56 | 140,824 | 1,501,232 | 4.90 |
| Elgin and Havelock | 31.28 | 68.72 | 19,600 | | .70 | 11,405 | 148,265 | .22 | 15,371 | 395,604 | .48 |
| Essex Terminal | | 99.26 | 19,300 | | 1.82 | | | | 120,661 | 1,206,610 | 1.81 |
| Grand Trunk | 34.77 | 64.18 | 18,934,930 | 882,607 | 1.89 | 11,506,224 | 573,956,527 | 1.43 | 17,972,015 | 3,282,187,091 | 2.13 |
| G. T. R. (Canada Atlantic) | 25.43 | 75.19 | 1,442,469 | 62,777 | 1.50 | 591,968 | 20,624,385 | .68 | 1,720,419 | 194,492,967 | 1.96 |
| Halifax and South Western | 48.58 | 50.73 | 368,910 | 18,053 | 1.29 | 215,986 | 7,192,454 | .70 | 252,442 | 11,966,755 | .87 |
| Hereford | 26.94 | 71.41 | 78,042 | 2,270 | .95 | 33,207 | 735,494 | .30 | 145,616 | 2,920,280 | 1.12 |
| Inverness Ry. and Coal Co. | 11.77 | 87.61 | 112,035 | 2,641 | 1.79 | 35,886 | 848,851 | .55 | 306,771 | 17,268,215 | 1.56 |
| Irondale, Bancroft & Ottawa | 34.18 | 63.76 | 34,344 | | .76 | 15,257 | 283,265 | .26 | 24,148 | 627,760 | .48 |
| Kent Northern | 42.05 | 57.95 | 16,902 | | 1.22 | 8,600 | 232,200 | .51 | 9,106 | 262,602 | .71 |
| Kettle Valley | 12.33 | 85.72 | 1,760 | | 2.36 | 781 | 15,043 | .29 | 2,963 | 39,082 | 2.02 |
| Kingston and Pembroke | 29.45 | 72.49 | 133,533 | | 1.52 | 98,529 | 2,561,745 | .51 | 140,922 | 6,623,334 | 1.63 |
| Klondike Mines | 3.44 | 95.88 | 7,717 | | 7.77 | 463 | 10,730 | 1.26 | 23,841 | 245,716 | 7.45 |
| Lotbiniere & Megantic | 15.72 | 82.24 | 19,707 | | 1.83 | 10,279 | 156,758 | .30 | 56,675 | 798,325 | 1.62 |
| London & Port Stanley | 32.58 | 66.66 | 121,548 | 3,589 | .97 | 172,485 | 2,815,529 | .48 | 537,798 | 8,200,468 | 1.40 |
| Maine Central | 58.03 | 41.97 | 15,795 | | 1.05 | 97,277 | 496,113 | .72 | 198,283 | 991,415 | .60 |
| Manitoba Great Northern | 6.32 | 96.61 | 51,609 | 497 | 2.38 | 10,887 | 244,297 | .23 | 194,294 | 11,997,496 | 2.69 |
| Maritime Coal Ry. & Power Co. | 11.69 | 88.31 | 22,180 | 6,520 | 2.87 | 21,191 | 198,956 | .70 | 199,417 | 2,024,240 | 2.53 |
| Massawippi Valley | 32.62 | 66.95 | 195,243 | 814 | 1.13 | 152,867 | 2,806,014 | .72 | 563,151 | 17,146,104 | 1.53 |
| Moncton and Bucouche | 36.78 | 63.02 | 21,916 | | 1.33 | 22,457 | 463,061 | .49 | 26,201 | 503,178 | .84 |
| Midland Ry. of Manitoba | 36.97 | 62.88 | 26,419 | 70 | 2.31 | 13,893 | 775,316 | 1.32 | 22,184 | 1,549,225 | 4.08 |
| Montreal Atlantic | 20.06 | 77.64 | 665,125 | 14,461 | 1.66 | 344,083 | 8,306,967 | .74 | 1,339,601 | 73,829,960 | 1.73 |
| Montreal and Province Line | 49.61 | 48.71 | 101,632 | 8,270 | 1.20 | 206,379 | 3,068,030 | .88 | 96,080 | 2,473,250 | 1.33 |
| Montreal and Vermont Jct. | 50.37 | 49.53 | 118,145 | 2,007 | 1.08 | 122,076 | 2,265,117 | .96 | 447,932 | 9,827,924 | 1.22 |
| Morrissey, Fernie & Michel | 9.53 | 90.47 | 24,668 | | 3.23 | 84,550 | 515,755 | .30 | 381,099 | 2,324,703 | 2.92 |
| Napierville Jct. | 7.97 | 91.48 | 26,714 | 216 | 2.64 | 14,723 | 188,443 | .33 | 271,534 | 7,597,803 | 2.41 |
| Nelson & Port Sheppard | 40.30 | 56.04 | 56,784 | 2,860 | 1.41 | 23,602 | 720,003 | .86 | 29,694 | 1,128,889 | 2.36 |
| New Brunswick Coal & Ry. Co. | 24.39 | 67.84 | 56,102 | | .86 | 18,640 | 389,162 | .20 | 56,906 | 2,395,879 | .58 |
| New Brunswick & P. E. I. | 34.28 | 65.41 | 59,200 | | .63 | 26,841 | 561,182 | .40 | 48,475 | 727,125 | .47 |
| New Westminster Southern | 25.51 | 65.66 | 21,657 | 32 | 2.72 | 25,166 | 297,558 | .64 | 52,277 | 694,547 | 1.78 |
| North Shore | 10.26 | 89.74 | 4,848 | | .36 | 850 | 6,800 | .04 | 14,306 | 34,448 | .35 |
| Ottawa and New York | 43.76 | 54.26 | 135,403 | 8,669 | 1.39 | 138,844 | 3,553,598 | 1.07 | 221,688 | 9,173,068 | 1.76 |
| Pere Marquette | 7.16 | 92.47 | 1,160,474 | 9,348 | 2.04 | 312,770 | 6,261,271 | .61 | 2,007,845 | 381,106,818 | 2.47 |
| Phillipsburg Ry. & Quarry Co. | | 100.00 | 6,245 | | | | | | 14,592 | 87,552 | |
| Quebec Central | 30.95 | 68.19 | 738,035 | 219,179 | 1.83 | 402,682 | 17,469,670 | .88 | 931,257 | 71,197,944 | 2.99 |
| Quebec & Lake St. John | 35.13 | 63.34 | 483,446 | 8,446 | 1.65 | 352,463 | 11,973,434 | 1.20 | 381,416 | 35,662,632 | 1.75 |
| Quebec, Montreal & Southern | 37.17 | 62.69 | 280,285 | 2,710 | 1.43 | 230,665 | 5,229,971 | .70 | 389,663 | 21,131,805 | 1.63 |
| Quebec Oriental | 44.85 | 55.09 | 94,225 | 4,975 | .96 | 26,917 | 1,354,237 | .71 | 32,314 | 2,574,978 | .65 |
| Quebec Ry., Light & Power Co. | 15.81 | 83.35 | 30,476 | 1,099 | 2.45 | 100,449 | 804,604 | 1.56 | 162,784 | 1,986,879 | 2.72 |
| Red Mountain | 18.36 | 80.35 | 13,854 | 81 | 1.41 | 8,552 | 76,748 | .54 | 27,103 | 237,120 | 1.14 |
| Rutland and Noyan | 63.53 | 36.47 | 7,874 | | 1.76 | 124,578 | 422,319 | 1.61 | 99,248 | 336,451 | 2.07 |
| Salisbury and Albert | 40.21 | 56.53 | 23,560 | 1,743 | .98 | 11,403 | 255,190 | .39 | 21,844 | 226,757 | .55 |
| Schomberg and Aurora | 46.46 | 53.37 | 23,507 | | .57 | 20,634 | 201,112 | .26 | 11,376 | 113,660 | .30 |
| Stanstead, Shefford & Chambly | 41.15 | 56.22 | 88,408 | 2,620 | 1.12 | 171,112 | 1,269,672 | .66 | 473,555 | 2,183,188 | 1.27 |
| St. Clair Tunnel | | 100.00 | | | | | | | | | |
| St. Lawrence and Adirondack | 39.88 | 59.68 | 311,003 | 8,548 | 1.90 | 627,935 | 13,378,914 | 1.26 | 866,278 | 30,766,666 | 2.86 |
| St. Martins | 32.56 | 65.27 | 17,580 | | 1.08 | 11,120 | 211,372 | .35 | 17,085 | 233,524 | .70 |
| Sydney and Louisburg | 5.48 | 92.24 | 268,590 | | 2.82 | 120,135 | 1,692,585 | 1.11 | 4,330,338 | 61,192,946 | 2.82 |
| Temiscouata | 28.66 | 69.68 | 150,211 | 7,650 | 1.42 | 68,129 | 2,127,433 | .42 | 147,951 | 6,294,509 | 1.95 |

(Continued on page 116)

Steam Railway Statistics for Year Ended June 30, 1912—(Continued from page 115)

| Name of Railway | Proportion of total Passenger service train revenue to total earnings | Proportion of freight revenue plus switching revenue, &c., to total earnings | Revenue Train Mileage | Mileage of Non Revenue Trains | Earnings per Train Mile | Passengers Carried | Passengers Carried One Mile | Passenger Earnings per Train Mile | Tons of Freight Carried | Tons of Freight Carried One Mile | Freight Earnings per Train Mile |
|-----------------------------------|---|--|-----------------------|-------------------------------|-------------------------|--------------------|-----------------------------|-----------------------------------|-------------------------|----------------------------------|---------------------------------|
| Timiskaming and Northern Ont. | 39.27 | 56.08 | 878,579 | 49,150 | 2.20 | 484,467 | 28,885,025 | 1.66 | 588,890 | 74,266,754 | 2.50 |
| Thousand Islands..... | 33.38 | 60.19 | 32,456 | ..... | 1.23 | 47,358 | 284,148 | .41 | 37,734 | 226,404 | .74 |
| Toronto, Hamilton & Buffalo.... | 25.16 | 74.17 | 477,599 | 6,337 | 3.07 | 581,302 | 17,404,896 | 1.25 | 2,341,576 | 90,979,320 | 6.01 |
| Vancouver, Victoria & Eastern.... | 32.05 | 66.15 | 307,636 | 81,259 | 2.76 | 286,776 | 8,081,508 | 1.19 | 954,608 | 27,517,107 | 3.32 |
| Victoria Terminal Ry. & Ferry Co. | 45.16 | 43.29 | 1,979 | ..... | 2.64 | 88,046 | 87,166 | 1.82 | 32,957 | 32,627 | 2.31 |
| Victoria and Sidney..... | 47.49 | 51.43 | 31,989 | ..... | 1.86 | 91,121 | 1,001,836 | 1.30 | 34,365 | 463,550 | 1.93 |
| Wabash (in Canada)..... | 28.42 | 71.38 | 1,580,322 | 22,575 | 1.44 | 584,529 | 35,095,556 | .87 | 1,317,283 | 305,235,674 | 1.90 |
| Wellington Colliery Co..... | 4.84 | 95.16 | 31,200 | ..... | 3.04 | 7,706 | 82,829 | .14 | 504,821 | 5,426,825 | 2.90 |
| York and Carleton..... | 34.97 | 65.03 | 8,573 | ..... | .66 | 6,085 | 60,850 | .23 | 14,279 | 142,790 | .43 |
| | 29.65 | 68.35 | 100,930,271 | 4,328,812 | ..... | 41,124,181 | 2,910,251,636 | ..... | 89,444,331 | 19,558,190,527 | ..... |

Orders by Board of Railway Commissioners.

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

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

18459. Jan. 9.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build across 2 highways in Brighton Tp., mileage 96.31 and 98.64, Ont.

18460. Jan. 9.—Authorizing C.P.R. to build 2 additional tracks, north and south of existing main line, across Crescent Road, Saltcoats, Sask.

18461. Jan. 9.—Authorizing G.T. Pacific Ry. to build branch from its line in Block 15, across Fourth St., through Block 10, across Inkerman Ave., and southerly through Block 11, across Waterloo Ave., into Block 12, Beechmount Subdivision, Edmonton, Alta.

18462. Jan. 8.—Approving Niagara, Welland and Lake Erie Ry. standard passenger tariff C. R.C. 1, showing a cash fare of 5c. per passenger, or 6 tickets for 25c., to apply between any 2 points on its line.

18463. Jan. 9.—Authorizing G.T. Pacific Branch Lines Co. to build highway across its Prince Albert Branch at mileage 45.9, Rural Municipality 371, Saskatoon District, Sask.

18464. Jan. 10.—Suspending Wabash Rd. tariff, C.R.C. 656 and G.T.R. supplement 11 to C.R.C. w. 113, on coal from Detroit, Mich., to Windsor and Walkerville, Ont.

18465. Jan. 7.—Extending, to June 1, time within which Esquimalt and Nanaimo Ry. shall complete its Cowichan Lake Branch from its main line at Cowichan Lake, 18 2-3 miles.

18466. Jan. 9.—Approving clearances as shown on plan, of tracks and buildings of Edmonton Portland Cement Co., in sec. 5-53-19, w. 5 m., Alta., subject to condition that trainmen be prohibited from being on sides of cars when passing company's warehouse.

18467. Jan. 8.—Dismissing application of residents of Pas, Man., for order requiring Canadian Northern Ry. to provide through sleeping car service from Winnipeg to Pas.

18468. Nov. 27, 1912.—Approving location of C.N. Ontario Ry. station on north side of track, on lot 8, east of Little St., Beachburg, Ont.

18469. Jan. 9.—Authorizing C.P.R. to build diversions of road allowances between secs. 23 and 26, 9-19, between secs. 19 and 30, 9-17, and in sec. 15-9-20, w. 4 m., at Coaldale, Alta.

18470. Jan. 3.—Authorizing C.P.R. to build spur for Saskatchewan Bridge and Iron Works, Moose Jaw, Sask.

18471. Jan. 9.—Authorizing C.P.R. to build diversion of its main line east of Brandon, Man., from sec. 20-10-18, to sec. 20-10-19, w. p. m.; and to carry it across 2 highways.

18472. Jan. 9.—Approving revised location C. P.R. Sherbrooke Subdivision, as now built at Delaire, Que.

18473. Jan. 9.—Ordering C.P.R. to build siding for Northern Electric and Mfg. Co., Calgary, Alta.

18474. Jan. 10.—Authorizing C.N. Ontario Ry. to build bridge over Timagami River, Crerar Tp., mileage 270.9 west of Ottawa.

18475. Jan. 10.—Authorizing C.P.R. to divert highway at mileage 101.98 on its Pheasant Hills Branch, Sask., to build across said diversion and to close existing crossing.

18476. Jan. 9.—Authorizing C.P.R. to build spur for City of Calgary, Alta., across road allowance on northerly limit of n. w. ¼ Sec. 34-23-1, w. 5 m.

18477. Jan. 9.—Approving location G.T. Pacific Ry. station in west half of Lot 1168, r. 5, Coast District, B.C.

18478. Jan. 10.—Approving revised location of G.T.R. siding for Pratt & Letchworth Co., Brantford, Ont.

18479. Jan. 10.—Approving proposed layout of G.T.R. tracks and station at Stoney Point, and crossing of side road between Lots 6 and 7, Con. 1, Tilbury North Tp., Ont.

18480. Jan. 10.—Authorizing C.P.R. to build three spurs for Montreal Ice Co., Hudson, Que.

18481. Jan. 10.—Authorizing C.P.R. to build spur on Gunns Packing Co.'s property, north of St. Clair Ave. and west of Gunns Road, Toronto.

18482 to 18484. Jan. 8, 9, 10.—Authorizing G. T.R. to build siding on Maisonville Ave., and across Sandwich, Windsor and Amherstburg Ry., for Ford Motor Co., Sandwich East Tp.; siding for British American Oil Co., Ashbridges Bay, Toronto; and two sidings for National Fireproofing Co., East Flamboro Tp., Ont.

18485. Jan. 4.—Authorizing Canadian Northern Ry. to build spur from Rue la Verandry, westerly to Block 4, crossing Rue St. Jean Baptiste; and spur from station 1+88 westerly, crossing Rue St. Jean Baptiste to Block 4, St. Boniface, Man.

18486. Jan. 8.—Dismissing St. John and Quebec Ry. application for connection with C.P.R.

18487. Jan. 13.—Ordering Algoma Central and Hudson Bay Ry. to restore its switch from main line to Bromley Bros.' sawmill, Sault Ste. Marie, Ont., and to put it in condition for operation within two weeks from date.

18488. Jan. 8.—Dismissing application of Abbotsford Timber and Trading Co., Abbotsford, B.C., for leave to cross Vancouver, Victoria and Eastern Ry. with its logging track in Sec. 20, Tp. 16, e. c. m.; and authorizing it to cross overhead, 1,500 ft. nearer Abbotsford than crossing applied for.

18489. Jan. 7.—Defining, until further order, the express delivery limits in Megantic, Que.

18490. Jan. 14.—Approving regulations governing opening and closing of pivotal span of railway bridge over Fraser River at New Westminster, B.C.

18491. Jan. 14.—Approving Central Ry. of Canada revised location crossing South Nation River, between mileage 27 and 29, Prescott County, Ont.

18492. Jan. 13.—Authorizing C.N. Ontario Ry. to build Y between its main line and C.N. Montreal Tunnel and Terminal Co.'s line, across Vertu Road, between Lots 258 and 359, St. Laurent Parish.

18493. Jan. 11.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build across Stanley St., to divert road allowance to connect Front and Stanley Sts., closing up portion of Ferdinand St., and to cross same with diverted road, Trenton, Ont.

18494. Jan. 14.—Authorizing G.T.R. to operate over crossing of Montreal Park and Island Ry. near Turcot, Que., between 10 a.m. and 4 p.m., and between 8 p.m. and 6 a.m.

18495. Jan. 14.—Approving proposed Supplements to Canadian Classification 15, and Supplements 1, 2, 3, and 4 thereto, to be known as Canadian Freight Classification 16, effective Mar. 1.

18496. Jan. 13.—Authorizing G.T.R. to build bridge 138, at mileage 238.02, District 2, Eastern Division, in Bagot County, Que.

18497. Jan. 14.—Authorizing G.T.R. to build siding for Cement Products, Ltd., Toronto.

18498. Jan. 14.—Approving location of C.P.R. Touchwood Hills Branch from Sec. 15-29-14, at mileage 43.15, to Sec. 34-29-22, w. 2 m., at mileage 91.90; and authorizing it to build across 35 highways, mileage 43.82 to 91.31, Sask.

18499. Jan. 13.—Approving C.P.R. plan revising design of south abutment of bridge 17.0,

Sudbury Division, to permit road diversion under the 40 ft. span.

18500. Jan. 10.—Authorizing C.N. Quebec Ry. to build siding for Canada Cement Co., Pointe aux Trembles Parish, Que., across Montreal Terminal Ry.

18501. Jan. 13.—Authorizing Canadian Northern Ry. to build spur at mileage 571.63, on lane between Industrial and Railway Aves., crossing Donald and James Sts., Battleford, Sask.

18502. Jan. 13.—Authorizing C.N. Ontario Ry. to extend spur to Canada Chemical Co.'s smelter, Parry Sound, to Standard Chemical Iron and Lumber Co.'s ore bins and plant.

18503. Jan. 9.—Approving location of G.T. Pacific Ry. station at New Hazelton, mileage 181, Prince Rupert east, in Lot 882, Group 1, Cassiar District, B.C.; work to be completed within 60 days.

18504. Jan. 14.—Ordering G.T.R., within 60 days, to install improved type of illuminated automatic electric bell at highway crossing at Kerwood, Ont.

18505. Jan. 13.—Relieving C.P.R. from further protecting crossing between Cons. 4 and 5, mileage 105.7, London Subdivision, Ont.

18506. Jan. 14.—Authorizing C.P.R. to build additional track across highway in Provincial Government Lot 433, Tp. 14, R. 3, e. c. m., at mileage 95.8, Cascade Subdivision, B.C.

18507. Jan. 8.—Authorizing Niagara, Welland and Lake Erie Ry. to open for traffic its line from near M.C.R. station, north along South Main St., crossing G.T.R. spur at Lincoln St., then east along East Main St. to G.T.R. station, Welland, Ont., 1.52 miles.

18508. Jan. 14.—Ordering Great Northern Ry. to build spur for Delta Shingle Co., near Townsend station, B.C.

18509. Jan. 14.—Relieving G.T.R. from further protecting crossing just north of Varney station, Ont.

18510. Jan. 15.—Authorizing Imperial Bank of Canada, St. Catharines, Ont., to pay cheques drawn by A. D. Cartwright, Secretary of the Board, to G.T.R. for \$1,812.96, and Clifton Sand, Gravel and Construction Co. for \$1,058.04.

18511. Jan. 15.—Authorizing C.N. Ontario Ry. to build bridge across Amable du Fond River, Pentland Tp., at mileage 188.1 from Ottawa.

18512. Jan. 7.—Ordering C.P.R. to install gates, to be operated by a man in one tower, at North Vancouver Ferry, Columbia Ave., and G.T. Pacific Ry.'s team crossings.

18513. Jan. 14.—Authorizing C.P.R. to open for traffic its double track between Hedge and Port Arthur, mileage 124.6 to 127.8, Nipigon Subdivision, except portion over bridge between mileage 125.4 and 125.5; and its double track between Ramsay and Woman River, mileage 70.9 to 86.0, Chapeau Subdivision, Ont.

18514. Jan. 7.—Authorizing C.P.R. to change location of foot bridge over its tracks on George St., Smiths Falls, Ont.

18515. Jan. 4.—Authorizing C.P.R. to build highway diversion to join road allowances on west and north boundaries of Sec. 12-11-10, w. 4 m., Alta.; and rescinding order 18265, Dec. 9, 1912.

18516. Jan. 15.—Dismissing Federation of the Quebec Chambers of Commerce application for order directing South Eastern Ry. to reopen its line between Drummondville and Sorel, Que.

18517. Jan. 15.—Authorizing G.T.R. to build siding for Lumber and Construction Co., Montreal Parish, Que.

18518. Jan. 15.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build across road allowance between Thurlow and Tyndinaga Tps., at mileage 69.98 from Glen Tay, Ont.

18519. Jan. 15.—Authorizing C.P.R. to build spur for Robinson and Black, Winnipeg.

18520. Dec. 28, 1912.—Authorizing G.T. Pacific Ry. to cross Oliver Road highway with its Lake Superior Branch, at mileage 9.8, McIntyre Tp., Ont.

18521. Jan. 15.—Authorizing C.N. Ontario Ry. to build across public road between Cons. A. and 1, Nepean Tp., at station 823 + 61, by means of a trestle; and rescinding order 16416, Apr. 29, 1912.
18522. Jan. 15.—Authorizing C.N. Ontario Ry. to build across Sturgeon River, east crossing, Pedley and Springer Tps., Nipissing District, mileage 249.9 from Ottawa.
18523. Jan. 16.—Authorizing C.P.R. to divert mill race from Carroll's pond, Ingersoll, and to take part of lot 18, Broken Front concession, West Oxford tp., Ont., 0.775 acre.
18524. Jan. 15.—Authorizing C.P.R. to build its Weyburn-Lethbridge branch across 44 highways from mileage 131.43 to 173.03.
18525. Jan. 15.—Amending order 17474, Sept. 13, 1912, re C.N. Ontario Ry. crossing near Pembroke, Ont.
18526. Jan. 16.—Authorizing C.P.R. to build extensions to two sidings for Oliver and Webster, on lot 3, r. 7, Sydenham tp., and lot 15, east side of Stavely street, Owen Sound, Ont., and to build new siding on lots 3 and 4, r. 7, Sydenham tp.
- General order 100, Jan. 16.—Prescribing regulations for transportation of explosives, to come into force March 1, and rescinding order 7881, Aug. 27, 1909.
18527. Jan. 16.—Authorizing C.P.R. to build its Weyburn-Lethbridge branch across 29 highways from mileage 78.22 to 112.08.
18528. Jan. 16.—Authorizing C.P.R. to build siding or third track across public road allowance between Divisions F and C, lot 1, r. 3, Guelph tp., Ont.
18529. Jan. 16.—Ordering that interlocking plant be installed at crossing of C.P.R. Didsbury-Kinivie branch by C.N.R. Vegreville-Calgary branch in s.e. and s.w. ¼ sec. 28-25-24, w. 4 m., Alta., by June 1, and authorizing C.N.R. to operate over said crossing for construction purposes only, until interlocker is installed.
18530. Jan. 16.—Authorizing Kingston and Pembroke Ry. (C.P.R.) to use bridges 79.2 and 87.2, authorized by orders 12035 and 12034, Oct. 18, 1910.
18531. Jan. 15.—Authorizing G.T.R. to build two sidings for Canadian Crocker-Wheeler Co., St. Catharines, Ont.
18532. Jan. 15.—Authorizing G.T.R. to rebuild 3 bridges: 228, mileage 193.75; 236, mileage 202.95, and 242, mileage 216.36, District 12, Northern Division, Ont.
18533. Jan. 15.—Authorizing G.T.R. to build 3 additional tracks, at grade, across Lusignan street, Montreal.
18534. Jan. 16.—Ordering G.T.R. to build culverts under its line on lots 22 and 23, con. 1, Humberstone tp., Ont.
18535. Jan. 16.—Approving C.N. Ontario Ry. revised location through unsurveyed territory in Sudbury District, mileage 250.37 to 254.3 from Sudbury Jct.
18536. Jan. 16.—Authorizing Canadian Northern Ry. to build across public road between secs. 20 and 21, tp. 27-8, w. 3 m., Sask.
18537. Jan. 16.—Authorizing city of Montreal to lay sewer under G.T.R. West Broadway outlet, Notre Dame de Grace.
18538. Jan. 15.—Amending order 17250, Aug. 14, 1912, re building of subway by Canadian Northern Ry. at Victoria street, North Battleford, Sask., by ordering that it build said subway by Aug. 31, maintain watchman at crossing pending construction, and be liable to \$100 a day penalty for default.
18539. Jan. 16.—Authorizing C.P.R. to open for traffic its double track between mileage 92.4 and 98.0, Man.
18540. Jan. 17.—Amending order 18356, Dec. 23, 1912, re C.P.R. crossing of Jacques Cartier Union Ry., Lachine parish, Que.
18541. Jan. 15.—Apportioning cost of installing gates at crossing of Scugog St. by Campbellford, Lake Ontario and Western Ry. (C.P.R.), in Bowmanville, Ont.
- 18542, 18543. Jan. 18.—Approving C.N. On-issing district, mileage 277.9 to 281.2 from issuing district, mileage 277.9 to 281.2 from Ottawa, and through unsurveyed territory in Sudbury district, mileage 189.1 to 192.2 from Sudbury Jct.
18544. Jan. 18.—Approving revised location of C.P.R. main line from mileage 27.051 from junction with British Columbia Southern Ry., in lot 1807, to lot 129, at mileage 32.89, Kootenay district.
18545. Jan. 17.—Extending, to Apr. 13, time within which C.P.R. shall build spur into water lots 8, 9, 10, 11 and 12, New Westminster, B.C.
18546. Jan. 15.—Ordering C.N. Ontario Ry. to build undercrossing for J. A. Brown, in Westmeath tp., Ont.
18547. Jan. 17.—Authorizing G.T. Pacific Ry. to build its Prince Albert branch across highway in n.w. ¼ sec. 34-47-26, w. 2 m., at mileage 103.2, East Saskatchewan district.
18548. Jan. 17.—Authorizing C.N. Ontario Ry. to build its branch connecting Toronto-Sudbury line with line from Ottawa to northern part of Toronto, across C.P.R., near Donlands station.
18549. Jan. 18.—Authorizing Canadian Northern Ry. to build spur from Union Supply Co.'s spur to north end of block 20, and a spur for International Harvester Co. of America at North Battleford, Sask., and to cross Railway Ave.
18550. Jan. 20.—Approving proposed location of C.P.R. station on lot 34, con. 10, Darlington tp., Ont., at mileage 58.17, Toronto subdivision.
18551. Jan. 18.—Authorizing G.T.R. to build siding, with spur for Ottawa Gas Co., Ottawa.
18552. Jan. 20.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build bridge 11.4 over Mud Lake, near Maberley, Ont.
18553. Jan. 18.—Authorizing Saskatchewan Government to build highway crossing over C.N.R., between secs. 30 and 31, tp. 34, r. 4, w. 3 m.
18554. Jan. 20.—Authorizing C.P.R. to open for freight traffic Chinook Coal Co.'s spur on its Kipp-Aldersyde Branch, mileage 0 to 6.1, Alta.
18555. Jan. 22.—Authorizing C.P.R. to build its Moose Jaw South-westerly Branch across highway adjoining north boundary of sec. 32-11-29, w. 2 m., at mileage 39.09.
18556. Jan. 22.—Authorizing C.P.R. to open for traffic portion of its double track from Caron to Mortlach, mileage 16.2 to 25.6, Sask.
18557. Jan. 22.—Relieving C.P.R., from providing further protection at second public crossing west of Lachute station, Que.
18558. Jan. 22.—Authorizing Canadian Northern Ry., to build its Craven-Humboldt Branch across C.P.R. Regina-Bulyea Branch in n.w. ¼ sec. 13-20-21, w. 2 m., Sask.
18559. Jan. 22.—Amending order 18201, Dec. 2, 1912, re overhead crossing of C.N. Ontario Ry. by Campbellford, Lake Ontario and Western Ry. (C.P.R.) at mileage 95.1 from Glen Tay.
18560. Jan. 18.—Authorizing C.N.O.R., to cross C.P.R., and G.T.R., near St. Clair Ave., Toronto, Ont.; and rescinding order 14957, Oct. 9, 1911.
- 18561, 18562. Jan. 22.—Authorizing C.P.R., to build spurs for Whitmore Bros., and Regina Development Syndicate, Regina, Sask.
18563. Jan. 23.—Authorizing Canadian Northern Ry., to build its Bienfait-Estevan Branch across 7 highways, in Saskatchewan.
18564. Jan. 24.—Postponing from Feb. 10, modification of rule 7 G.T.R. Special Freight Tariff C.R.C. No. E 2374, in Supplement 5; also modification of rule 33 C.P.R. Local Freight Tariff C.R.C. No. E. 2141, in Supplement 9; and restricting application of stopover privileges with respect to international lumber shipments to such as are destined exclusively to U.S. points.
18565. Jan. 23.—Authorizing Kingston and Pembroke Ry. (C.P.R.), to build bridge 44.86, Ont.
18566. Jan. 23.—Authorizing C.P.R., to operate bridges 20.42, 39.11, 50.73, 73.93, 45.44, 33.2, and 62.4, Nipigon Subdivision.
18567. Jan. 23.—Approving Campbellford, Lake Ontario and Western Ry. (C.P.R.) plan of overhead crossing of highway at mileage 131.23, by a 20 ft. deck plate girder span on concrete abutments.
18568. Jan. 23.—Authorizing C.P.R., to build bridge 36.5, Farnham Subdivision, Eastern Division, Que.
18569. Jan. 24.—Approving Canadian Northern Ry. location through tps. 22-25, r. 19, w. 2 m., Sask., mileage 19.66 to 43.50.
18570. Jan. 24.—Authorizing C.P.R., to build its Swift Current Northwesterly Branch across 39 highways, mileage 35.95 to 77.-6, from Swift Current, Sask.
18571. Jan. 24.—Approving revised location of G.T. Pacific Branch Lines Co.'s Regina-Boundary Branch from sec. 6-1-2, w. 2 m., to International Boundary, from mileage 153.90 to 155; and authorizing building across highway at mileage 155.
18572. Jan. 23.—Authorizing Winnipeg and Northern Ry. to build across C.P.R. in lot 101, St. Pauls parish, Man.
18573. Jan. 24.—Extending to June 1, time for installing bell at Kerwood crossing, Ont., as provided by order 18504, Jan. 14.
18574. Jan. 23.—Authorizing Toronto, Hamilton and Buffalo Ry. to build spur for J. H. Bowman Lumber Co., Ancaster tp., Ont.
18575. Jan. 24.—Authorizing Vancouver, Victoria and Eastern Ry. and Navigation Co., to build transfer track connecting with C.P.R. near Hawks Ave., Vancouver, B.C.
18576. Jan. 23.—Authorizing C.P.R., to take, for building additional team delivery track, part of lot Cadastral 252, about 0.413 acre, St. Constant parish, Que.
18577. Jan. 27.—Suspending until March 1, the tariffs of C.P.R., G.T.R., C.N. Quebec, and Temiscouata Rys., increasing rates on pulpwood from Ontario, Quebec, New Brunswick, to eastern U.S. points.
18578. Jan. 23.—Confirming order 16394, Apr. 25, 1912; and ordering that railway mileage tariffs from trans-shipment points on exlake corn in carloads, for milling purposes, be revised to provide rates on corn that shall not, in any case, exceed mileage tariff charged from same points and same distances, on exlake wheat, oats, and barley in carloads, for milling purposes; to become effective not later than Feb. 10.
18579. Jan. 25.—Authorizing G.T. Pacific Branch Lines Co., to carry traffic over its Alberta Coal Branch, between mileage 36.6 and 56.4.
18580. Jan. 24.—Ordering Canadian Northern Ry. to protect crossing at Water Ave., Winnipeg, by watchman between 6 a.m. and 12 p.m.; his wages to be paid 80% by C.N.R., and 20% by the city.
18581. Jan. 24.—Ordering that in the first Supplement to Canadian Freight Classification 16 submitted for approval paraffin wax be added to chemicals list, and also continued in oils list.
18582. Jan. 25.—Adding town of St. Lambert, Que., as a party to application of town of Greenfield Park for protection at G.T.R. crossing of Lapiniere road.
18583. Jan. 25.—Authorizing C.P.R., to take, without consent of owner, certain lands in connection with building of subway at Decarie Ave., Montreal.
18584. Jan. 27.—Approving Quebec, Montreal and Southern Ry. bylaw, cancelling authority to D. I. Roberts, formerly General Freight and Passenger Agent, and authorizing N. J. Ferguson, General Freight and Passenger Agent, to prepare and issue special freight competitive, and special passenger tariffs.
18585. Jan. 23.—Approving C.N. Ontario Ry. location from road between cons. 5 and 6, mileage 11.5, to lot 1, con. 7, mileage 13.47, South Orillia tp., and from latter point connecting with constructed line in lot 17, con. 13, North Orillia tp.
18586. Jan. 27.—Authorizing C.N. Ontario Ry. to build bridge over Dishnisk Creek, Algoma district, mileage 257 from Sudbury Jct.
18587. Jan. 28.—Authorizing Algoma Central and Hudson Bay Ry. to open for traffic its main line extension to Bruce St., Sault Ste. Marie, Ont., from near West St., 7,000 ft.
18588. Jan. 28.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.), to build across road allowance between lots 22 and 23, broken front concession Darlington tp., Ont., mileage 152.06, from Glen Tay.
18589. Jan. 27.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.), to build across road allowance between lots 2 and 3, con. 1, Hope tp., Ont.; and rescinding order 17519, Sept. 18, 1912.
18590. Jan. 29.—Ordering C.P.R. to erect fences on each side of right of way on its Sirdar subdivision, B.C., from mileage 77 to Sirdar; work to be completed by May 31.
18591. Jan. 28.—Approving C.P.R. plans showing transfer track at Midale, Sask.
18592. Jan. 29.—Ordering G.T. Pacific Ry. to stop its trains for mail and passenger service at Haysport, B.C., until opening of navigation.
18593. Jan. 7.—Authorizing city of Vancouver, B.C., to build bridge or viaduct, as a public highway, from Georgia to Harris Sts, over Vancouver, Victoria and Eastern Ry. (G.N.R.).
18594. Jan. 30.—Extending for 3 months from date, time within which B.C. Electric Ry. be allowed to appeal to Supreme Court of Canada from order 17840, as extended by order 18253.
18595. Jan. 29.—Authorizing Canadian Northern Ry. to build bridge across Seine River, Rainy River district, Ont., to replace existing bridge.
18596. Jan. 30.—Approving Campbellford, Lake Ontario and Western Ry. (C.P.R.) plan, showing general layout of Port Hope viaduct, Port Hope, Ont.; and plan showing details of piers 8 and 9 of same.
18597. Jan. 29.—Authorizing C.P.R. to build additional track on northerly side of existing main line across 3 highways, Moose Jaw subdivision, Saskatchewan division, mileage 125.075 to 127.125.
18598. Jan. 29.—Authorizing C.N. Ontario Ry. to build bridges over Beaver River (west branch), over Conklin River, over Goose River (second crossing), Algoma district, and across Macaming River (west crossing), Sudbury district.
18599. Jan. 30.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build bridge over creek near Cobourg, Ont.
18600. Jan. 30.—Authorizing G. Shearer and C. Shriff of Huntingdon, Que., to build joint crossing between their farms, over G.T.R..
18601. Jan. 30.—Approving proposed location of C.P.R. shelter station at Fesserton, Ont.
18602. Jan. 31.—Reporting, to Governor in Council for approval, Atlantic, Quebec and Western Ry. bylaws governing the operations at terminals and stations.
18603. Jan. 31.—Authorizing Canadian Northern Ry. to build across highways on its Delisle extension, Sask.
18604. Jan. 29.—Authorizing C.P.R. to build spur for St. John and Quebec Ry., on J. Palmer Co.'s property, Fredericton, N.B.
18605. Jan. 31.—Authorizing Canadian Northern Ry. to divert trail in south ¼ sec. 3-21-20, w. 2 m., Sask.
18606. Jan. 30.—Authorizing Saskatchewan Government to build highway over C.P.R. on road allowance west of sec. 30-15-14, w. 3 m.
18607. Jan. 31.—Authorizing Hamilton Radial Ry. to replace present derailing switches where it crosses G.T.R., in Burlington, Ont.
18608. Jan. 31.—Authorizing T.H. & B. Ry. to build spur for Canadian Porcelain Co., in Barton tp., Ont.
18609. Jan. 31.—Authorizing C.P.R. to build spur for J. Palmer Co., Fredericton, N.B.
18610. Jan. 31.—Authorizing Canadian Northern Ry. to build across 22 highways on its Morris-Portage branch, Man.

Changes in Gradients, and Temporary Structures, on the National Transcontinental Railway.

There has been considerable discussion in the daily press and at political meetings in regard to changes said to have been made in the N.T.R. construction by the present commission. A return presented to the House of Commons recently, giving the official correspondence on the subject, will prove of general interest to engineers, contractors, etc.

The correspondence opened with the following letter from E. J. Chamberlin, President, Grand Trunk Pacific Ry., to R. W. Leonard, Commissioner, National Transcontinental Ry., July 16, 1912:—

"I learn from our engineers that the standard of work on the portion of the N.T.R. between Lake Superior Jet. and Cochrane, which was at the outset adopted and has so far been complied with, is being departed from, and that instead of 0.4 grades and permanent structures, you have authorized grades up to 1% and the erection of temporary wooden structures. In regard to this, I would call your attention to clause 7 of the agreement of July 29, 1903, which provides that the construction of the Eastern Division shall be done according to the specifications approved by the company and shall be subject to the joint supervision, inspection and acceptance of our Chief Engineer and the Chief Engineer of the Commission. I beg to say that if this work is done in accordance with what I understand to be your recent instructions, it will not be in compliance with the agreement, nor satisfactory to this company, and cannot be accepted."

The Commissioner of the N.T.R. replied to Mr. Chamberlin on July 19, 1912, as follows:—"I find, on going over the profiles, that there are many places where a large expenditure may be saved and the line actually improved for operating purposes, and the time of completion considerably shortened, without in the least affecting the hauling capacity of locomotives, by making certain modifications, and I have given instructions to make such modifications accordingly. I am quite satisfied that the interests of the G.T. Pacific and the Government are identical in this matter, and I noted on my recent trip west that the modifications referred to are in accord with the practice of the G.T.P.R. Co. on the portions of the National Transcontinental Ry. built by that company, namely, from Winnipeg west, and from Fort William to Lake Superior Jet.

"In regard to wooden trestles, I may say that your engineers must be aware that it is absolutely necessary to put in wooden structures in some cases where the foundations are such that heavier structures, or solid embankments, cannot be constructed at present. There are points along the line where much money has been uselessly expended in futile attempts to make solid embankments, only, finally, to have to put in wooden structures, and I notice that the construction of such wooden trestles has been the practice of the G.T.P.R. on the portions of the N.T.R. above mentioned.

"I have carefully perused clause 7 of the agreement of July 29, 1903, and I fail to notice in this, or in any other agreement or act relating to the construction of the Eastern Division of the N.T.R. any provision relating to the gradients to which the line shall be built, or the nature of the structures, but it may be of satisfaction to you to have your Chief Engineer, or Assistant Chief Engineer, discuss with our Chief Engineer any proposed changes, and report to you in regard to same. It

is not necessary for me to state that this Commission welcomes any criticism or assistance from your able staff of engineers on any or all matters affecting the economical construction and operation of the road."

Mr. Chamberlin wrote again to Mr. Leonard on July 23, 1912:—"I have yours of July 19, regarding changes in grade on the N.T.R., and note the reasons you offer for the modifications contemplated. Aside altogether from this company's strict rights, to which I called attention in my letter of the 18th inst. to you, I would ask you to furnish me with profiles showing the changes proposed, so that I may consider their effect. You will, I think, agree that it would be in the interests of both the Commission and this company that no work in connection with any changes of grade should be proceeded with until our approval has been given, and I would ask you to issue instructions to this effect. On receipt of the profiles, I will let you have my views with as little delay as possible."

Mr. Leonard replied to Mr. Chamberlin on Aug. 2, 1912, as follows:—"I beg to acknowledge receipt of your letter of July 23, expressing your apprehensions regarding the modifications referred to in my letter of the 18th ult. I note you refer to your company's 'strict rights,' to which you also referred in yours of the 18th ult., for which reference I can find no authority in the various acts and agreements relating to the construction of the Eastern Division.

"You have apparently been misinformed in regard to the reported changes in grade, as no change whatever in any of the ruling grades has been contemplated, but merely such trifles as slight local sags in the grades across soft swamps, which will not in any way affect the hauling capacity of locomotives, and which, if found desirable to lift out in the future for any unforeseen reason, can be effected more cheaply than at present contract prices, and will make a more solid road bed than is being made under similar circumstances today by using the peat for embankments.

"I suggested in my letter of July 19 that your Chief Engineer, or Assistant Chief Engineer, discuss with our Chief Engineer any proposed changes and report to you in regard to same, because, you will see from the above, these are simply details too trifling to occupy either your attention or mine, and the suggestion in my letter of July 19 should be quite sufficient for your purposes, or perhaps it would be still simpler and quite as efficient for you to get your information through your district engineers, after consultation with the district engineers of the Commission, in the usual way."

On Nov. 21, 1912, Mr. Leonard wrote to the Minister of Railways as follows:—"In reference to the charges made in the newspapers that the gradients on the N.T.R. have been injuriously altered, I beg to point out, that the only change in gradients made by the Commission since Sept. 30, 1911, was to allow a few sags to remain, where there have been subsidences and across soft muskegs, which it would be inadvisable, from an engineering point of view, to fill at present, to be operated temporarily or permanently as velocity grades. The presence of such sags in the railway does not injuriously affect the economical operation of the road. The same trains, carrying the same loads, making the same time, with the same expense and the same degree of safety and comfort, can be han-

dled over a road in which such sags, or velocity grades, exist as on a road of the same ruling gradient in which there are no such sags or velocity grades.

"By introducing these sags, all of which are well within velocity grade limitation, the Commission will: 1. Save a large amount of money in the construction of the railway; 2. Expedite the completion of the road; 3. Should it become advisable, for any unforeseen reason in the future, to eliminate these sags, it can be done at one half the cost that the present contract prices call for; 4. In one case it has been found necessary to raise the grade in a cutting, the material in which is so soft and wet that it is impracticable to construct a line on the original grades, and in this instance the grade has been kept well within the limits of velocity grade practice, and the gradient can be reduced at any time, if it should ever be found desirable, by filling in the lower portion with suitable material; 5. The concensus of opinion of the following engineers, who have been in the employ of the Commission for years, in their sworn testimony before the Commission investigating the construction of the N.T.R., is that velocity grades are not only unobjectionable, but might have been introduced permanently into the railway, and would have greatly reduced the cost of the road:—G. Grant, Chief Engineer; C. O. Foss, District Engineer, District A.; A. E. Doucet, District Engineer, District B.; A. G. Macfarlane, District Engineer, District F.; G. L. Mattice, Assistant District Engineer, District D.; J. W. Porter, Assistant District Engineer, District B.; A. N. Molesworth, ex District Engineer, District C. & D.; H. L. Bucke, Division Engineer, District D. & F.

"I find that the gradients on which the original Quebec bridge was partially built were 1% on either side, and the new bridge will necessarily be built to the same grades. I also find that the gradient approaching the Quebec bridge from the east side, including the Chaudiere bridge, was 1%, which cannot be altered. In New Brunswick I find in the middle of a division a grade 13 miles long of 1.10% against east bound traffic, and in Quebec, in the middle of another division, 11 miles of 1.10% grade against west bound traffic, each of which will limit the hauling capacity of locomotives over these divisions to the same extent as if the whole division had been located on these grades.

"I am sending, herewith, for your information, five blue print profiles, showing all the changes in gradients which have been effected since Sept., 1911.

"Mr. Grant's evidence is not yet in type, but from conversation I have had with him, which is confirmed by Mr. Staunton, I know his views to be as above stated."

The return states that there have been no departures from original instructions, as regards curves and bridges or other permanent structures.

In connection with the foregoing it will be of interest to note what W. F. Tye said in his recent presidential address before the Canadian Society of Civil Engineers, and which is given in full in this issue. His remarks on momentum grades will be found on pg. 107.

It was reported at a meeting of the Public Accounts Committee of the Manitoba Legislature, Jan. 5, that the amount of taxes paid to the Province by the C.P.R. was \$100,000, and by the Canadian Northern Ry. \$40,000. The Railway Taxation Act provides that 2% on the gross earnings of railways be levied, and a resolution asking the government to enforce the act in the case of the C.P.R. and the C.N.R. was lost on the casting vote of the chairman.

Canadian Northern Railway, Construction, Betterments, Etc.

Sir Donald Mann, Vice President, returned to Toronto, Feb. 10, from the Pacific Coast. In an interview he is reported as stating that the line to Port Arthur will be completed this fall. Work on the Pacific section of the line is progressing satisfactorily; there are 17 bridges to be built on the section between the mountains and Kamloops, B.C. It is proposed to have two outlets on the Atlantic Coast, one at St. John, N.B., and the other at Halifax. It is hard to tell, he is reported as stating, at Vancouver, when trains will be running through into that city, but it is hoped to be able to start a freight and a passenger service by Aug., 1914. At Winnipeg, Sir Donald is reported as stating that he was quite satisfied with the progress of the lines in the west. It is not expected to do much in the way of new construction on branch lines this year; track will be laid on lines already graded, but the principal work will be centered on the completion of the main lines, on which construction is in progress in Ontario and British Columbia.

Montreal-Ottawa-Port Arthur Line.—Rapid progress is reported as being made with the construction of the two bridges on the Montreal-Hawkesbury section at the back of Montreal. The substructure work will be completed so as to enable the Dominion Bridge Co. to make a start with the superstructures early in the summer.

On the section between Ottawa and Pembroke, Ont., there are two large bridges under construction across the Ottawa River—one at Shaw Falls, 1,800 ft. long, the other at Portage du Fort, 1,300 ft. long.

The Board of Railway Commissioners has approved of location and revised location plans for the following sections of the line:—In Nepean Tp., mileage 5.53 to 14.3; through Jones Tp., mileage 277.9 to 281.2 from Ottawa; through North Bay, at mileage 344; and through unsurveyed territory, mileage 189.1 to 192.2 from Sudbury Jct.

Press reports, Feb. 11, stated that about 200 miles of track had been laid on the line between Sudbury and Port Arthur. Of this 70 miles are said to have been laid west of Sudbury, and 130 miles east of Port Arthur. About 60% of the grading is reported to have been completed, and it is expected to have the balance done by the end of the year, and track laid on the entire section of 450 miles.

Canadian Northern Ontario Ry.—The Board of Railway Commissioners has authorized the building of a line across the C.P.R. near Donlands station, York Tp., to connect the Toronto-Sudbury line with the Toronto-Ottawa line to the North Toronto Station at the head of Yonge St.

Sir Wm. Mackenzie, President, is reported as stating, Feb. 5, that it is expected to put a regular passenger service in operation between Toronto and Ottawa, in June or July.

Press reports state that arrangements are being made under which the C.N. Ry. interests and the G.T.R. will build a joint station and hotel in Hamilton, Ont.

An agreement was reached, Feb. 5, with the St. Catharines, Ont., City Council, under which the company will build its line between Toronto and Buffalo, through St. Catharines, erecting a general traffic bridge across the old Welland canal. The city is to grant a bonus of \$100,000.

Surveys for lines in Western Ontario are in progress at various points between Hamilton and Windsor. — Congdon has been in London for some time, and another engineer has been in St. Thomas. Mr. Congdon is quoted as stating that the pro-

jected route through London is contingent on the C.N.R. obtaining a lease of the London and Port Stanley Ry. St. Thomas papers are advocating the interests of the route through that city, and the taking over of the Pere Marquette Rd.'s Canadian lines.

Canadian Northern Ry.—Recent press reports quote Sir Wm. Mackenzie, President, as having stated that work will be started in the spring on the building of a second track between Port Arthur and Winnipeg, and the further enlargement of the terminal facilities at the head of the lakes.

The company graded 655.82 miles of track in Manitoba, Saskatchewan and Alberta, and laid 303.63 miles of track during 1912. Grading, but no tracklaying was done on the following lines:—MANITOBA—Winnipeg Northern Ry., 35.88 miles; Wroxtton to Yorkton, 28.7 miles. SASKATCHEWAN—Extension of Grosse Isle line, 35.6 miles; Canora, northerly, 19.3 miles; Craven, northeasterly, 8.00 miles; Carlton, northerly, 10.1 miles; Alsask, southeasterly, 50 miles; Vonda, northerly, 15.00 miles; Prince Albert-Battleford line, 36.66 miles; Jackfish branch, 2.34 miles. ALBERTA—Strathcona-Calgary line, 11.1 miles; Red Deer-Lacombe line, 7.8 miles; Oliver, north, 14.7 miles; Peace River line, 53 miles; Bruderheim, east, 2.5 miles; Camrose, southeasterly, 10 miles; Calgary, south, and Macleod-Pincher line, 48.3 miles.

Tracklaying and grading was done on the following mileages, part of the grading having been done in 1911:—SASKATCHEWAN—Swift Current line, grading 40.6 miles, tracklaying 9.62 miles; Melfort-Humboldt line, tracklaying 4.69 miles; Moose Jaw line, grading 1.20 miles, tracklaying 2.00 miles; Goose Lake line, grading 104.57 miles, tracklaying 100.02 miles; Delisle line, grading 4.3 miles, tracklaying 3.70 miles. ALBERTA—Brazeau line, grading 50 miles, tracklaying 45.26 miles; Canadian Northern Alberta Ry., grading 87.45 miles, tracklaying 50.42 miles; Morinville line, grading 1.90 miles, tracklaying 17 miles; Strathcona-Camrose line, grading 5.87 miles, tracklaying 46 miles; Vegreville-Calgary line, grading 0.85 mile, tracklaying 24.92 miles.

It was reported, Feb. 12, that construction work is to be started at once on the proposed cut off from near Portage la Prairie to Stuartburn, east of Morris, Man.

The Saskatchewan Minister of Railways informed the Legislature recently that the Canadian Northern Ry., under an agreement with the Government, is building an extension of the DeLisle branch from near MacRorie through the Duck Lake country, southerly and southwesterly. It is expected to complete this line this year.

The Saskatchewan Legislature has passed a measure granting the company an extension of time within which to build the lines under the contract with the Province. Under the legislation of 1908 the C.N.R. undertook to build 410 miles of line, and under the legislation of 1909 the company undertook to build a further 545 miles of branch lines, the Province in each case guaranteeing the company's bonds. Of the first mentioned mileage 310 miles are in operation, and the remaining mileage, with the exception of one branch which has been abandoned, is under construction; about 400 miles of the branches to be built under the 1909 contract are practically completed or in operation, and the remaining mileage, with the exception of the Hartney extension of 65 miles, is under contract.

Canadian Northern Western Ry.—Application is being made to the Alberta Legislature for the incorporation of a company

with this title to build the following railways:—From Taber northeasterly to Consort; from Calgary northwesterly to an already authorized line between Brazeau and Cochrane; from Calgary southwesterly to an authorized line between Cochrane and Pincher Creek; from Cardston westerly to the western boundary of the province. Short, Woods, Biggar and Shawcross, Edmonton, are solicitors for applicants.

Canadian Northern Pacific Ry.—During 1912 track was laid from Sumas to Hope, 41.64 miles, making the total track laid on the line 78.25 miles. The line from Hope to Yellowhead Pass, 421.82 miles, is under construction. On the section from Hope to Stillwater Flats, 274.91 miles, the contractors are the Northern Construction Co., Vancouver; between Stillwater Flats and the Yellowhead Pass, 146.91 miles, the contractors are the Northern Construction and Foley, Welch and Stewart. Track is reported to have been laid practically to Yale, and to have been started above Yale, for the purpose of getting in bridge material.

It is reported that Engineer J. Barthen has been transferred from Kamloops to North Bend, B.C., on construction work, and that B. A. Savage has been transferred to section 1.

A branch line from Kamloops to Vernon, Lumley and Kelowna, 132 miles, is under construction.

A contract has been let to the Northern Construction Co. for the building of a branch line from Lulu Island Bridge to Steveston, 10.2 miles. The work, which is light, is to be completed within six months. The principal feature on the line will be a trestle about a mile and a half long over the muskeg near Woodward's Slough.

Plans have been filed with the Registrar at New Westminster, B.C., for this line, mileage 5 to 15; these already having been approved by the Minister of Railways. The contract let to the Northern Construction Co. covers the grading, wooden bridges, culverts, etc., from a crossing of the north arm of the Fraser River, just west of New Westminter to Steveston, near the mouth of the Fraser River. There are no particular engineering features, the gradients being level, and no cuttings. The work is to be proceeded with at once, and finished early in the summer.

Port Mann Terminal.—J. Montgomery, Toronto, arrived in Vancouver, Feb. 7, to take charge of construction on the terminals at Port Mann. He is reported as stating that his instructions were to get all the preliminaries arranged so that construction could be started Mar. 1. He added:—"The buildings to be erected now are as follows: Fifteen stalls of what will later be enlarged to a 42 stall locomotive house, a repair shop, coaling station, oil storage, house and a general storehouse for train equipment. The buildings are to be of the most modern and permanent construction. The repair shop will be 150 by 300 ft., with room for doubling the length. With the repair shop will be a complete foundry, blacksmith shop—in fact, all the outfit needed for repair of locomotives, freight cars, and passenger coaches.

Vancouver Terminals.—Reports state that the British Columbia Government has approved plans for the entrance of the company's lines into Vancouver, the company agreeing to spend \$4,000,000 in reclaiming False Creek during the next five years. The C.N.R. will build a sea wall on the False Creek water front, then pump out the water in the flats and fill in the 200 acre area. Entry to this area will be secured through a tunnel about half a mile long. Terminal facilities will be provided at a cost of about \$4,000,-

Railway Rolling Stock Notes.

000 and a station building at a cost of \$1,500,000. The agreement made with the Vancouver City Council, which evidently was under consideration when the matter was before the Government, provides that the C.N.R. agrees within five years to procure and at all times maintain deep water wharfage facilities within the city adequate to the needs of a transcontinental railway and trans-Pacific steamship lines. The company also agrees that it will, within eight years from the date of the agreement, establish and thereafter at all times maintain a trans Pacific steamship line, both for passengers and freight, having its freight and passenger terminals and its home office for all time as effective in Vancouver as the C.P.R., or any company which may operate or control the trans Pacific steamers operated in connection with the C.P.R. from time to time makes Vancouver the passenger and freight terminals and the home port of such trans Pacific steamers for freight and passenger traffic. It is also covenanted by the C.N.R. that supplies shall be purchased for and supplied to the vessels in Vancouver in so far as they can be obtained on as favorable conditions there as elsewhere. The steamship company will make Vancouver its head office on the Canadian Pacific coast and the place in Canada for signing on the crews of any such steamers and the point at which, in so far as possible, such crews shall be discharged and paid off. The railway company will also make its western headquarters both for passenger and freight and its western terminals at Vancouver. The bylaw was passed by the Vancouver City Council, Feb. 5, and will be submitted for ratification to the taxpayers March 15.

A special message from the Lieutenant-Governor to the B. C. Legislature, Feb. 13, asked for the guarantee of \$10,000,000 of bonds, for the construction of the Lulu Island Branch, and the laying out of terminals at Vancouver, Port Mann, and Victoria.

Vancouver Island Line.—The company's line on Vancouver Island is under construction from near Victoria to Alberni, 132 miles, the contractors on the three sections being:—Grant, Smith and Co., Vancouver; Moore and Pethick, Victoria, B.C.; and Northern Construction Co., Vancouver. A. K. Warren and G. S. Mallory are reported to have been appointed to the company's engineering staff in Victoria. Press reports state that 36 miles of grading at the Victoria end are ready for the tracklaying.

Surveys are in progress for an extension of the line from Alberni to the Quinsam River, 74 miles, and from the Quinsam River to Nootka Sound, Duncan Bay and Buttler Lake, about 71 miles.

Press reports state that plans have been prepared and that tenders will shortly be asked for the construction of wharves and terminals at Union Bay. D. O. Lewis is engineer in charge of the work.

The British Columbia Minister of Railways has approved of route maps for a line starting from mileage 4.7 on the main line to Union Bay, on Saanich Inlet, at the head of Saanich Peninsula, and a map showing the general location of the line from Victoria to mileage 4.7.

Tenders are under consideration for the building of a line from the Songhees Reserve, Victoria, to near Deadman's River, about five miles; and from near Regina Ave., on the above line to Union Bay, Saanich Peninsula, 15.25 miles. The work to be done includes clearing, grubbing, grading, bridges, trestles, culverts, masonry and fencing. The first line is to give the company an entrance into the Songhees Reserve, which is to be laid out in terminal yards, in conjunction with the C.P.R., and an entrance into a union station which is to be built. (Jan., pg. 33.)

The Mineral Range Rd. is in the market for 100 steel rock cars.

P. Welch, railway contractor, Vancouver, B.C., is enquiring prices on one locomotive.

The St. Lawrence Bridge Co., which has the contract for the superstructure of the Quebec Bridge, has ordered a locomotive from the American Locomotive Co.

J. P. Jones, heretofore Manager, Empire Elevator Co., Fort William, Ont., is reported to have been appointed a member of the Dominion Grain Commission, vice F. E. Gibbs, resigned.

The Dominion Parliament is being asked to vote \$1,000,000 for new rolling stock, \$7,150 for improvement of triple valves on overbrakes, and \$24,000 for safety appliances for equipment, for the Intercolonial Ry.

Foley Bros. and Northern Construction Co. has ordered three Rodger double plough distributing cars from the Hart-Otis Car Co. Following are the chief dimensions:—

| | |
|---------------------------|---------------|
| Capacity | 30 tons. |
| Length over end sills | 32 ft. |
| Width over side sills | 8 ft. 9 ins. |
| Height from rail to floor | 4 ft. 4½ ins. |
| Truck centres | 23 ft. 8 ins. |
| Wheel base of truck | 5 ft. 2 ins. |

The C.P.R., between Jan. 13 and Feb. 12, ordered the following rolling stock:—21 stock cars, 1 second class car, 1 baggage and express car, 1 box baggage car, 7 freight refrigerator cars, and 11 vans, at its Angus shops; 6 pit cars from the Canadian Car and Foundry Co.; 7 steam shovels from Mussels, Ltd.; 2 steam shovels, 8 Jordan spreaders, 5 Rodger spreaders, and 4 ballast ploughs from F. H. Hopkins and Co.; and 13 Lidgerwood unloaders from Allis-Chalmers-Bullock, Ltd.

The C.P.R., between Jan. 13 and Feb. 12, received the following additions to rolling stock:—17 flat cars, 10 sleeping cars, 11 first class cars, 3 smoking cars, and 9 D.4 locomotives, from its Angus shops; 621 steel frame box cars from the Canadian Car and Foundry Co.; 6 steel frame box cars from the National Steel Car Co.; 108 steel frame box cars from the Standard Car Co.; 425 steel frame box cars from the American Car and Foundry Co.; and 385 steel frame box cars from the Barney and Smith Car Co.

The G.T.R., between Jan. 14 and Feb. 12, received the following additions to rolling stock:—16 Pacific type locomotives, nos. 169 to 184, 69 in. wheels, from the Montreal Locomotive Works; 3 switching locomotives, nos. 1729 to 1731, 20 by 26 in. cylinders, from the Canadian Locomotive Co.; 8 mikado locomotives, nos. 500 to 507, 27 by 30 in. cylinders, from the American Locomotive Co.; 8 refrigerator cars, from the Nova Scotia Car Works; 298 box cars, from the Canadian Car and Foundry Co.; 746 box cars, from the Pressed Steel Car Co.; and 9 tank cars, from the Mather Stock Car Co.

The Canadian Car and Foundry Co. has received orders from the C.P.R. for 6 steel underframe pit cars, 75 tons capacity; from Montreal Tramways Co., for 50 car bodies and 100 pairs of trucks; from the Hart-Otis Car Co., for 1 plough car; from the Dominion Bridge Co., for 1 pair of 75 ton trucks; from Allis-Chalmers-Bullock, Ltd., for 1 all wood Lidgerwood car; from St. Lawrence Bridge Co., for 4 steel underframe flat cars, 40 tons capacity, and 4 fifty ton trucks; and from Windsor, Essex and Lake Shore Ry., for 2 steel frame single sheath box cars, 40 tons capacity, and 4 steel underframe flat cars, 40 tons capacity.

The Reid Newfoundland Co., during 1912, built at its shops at St. John's, Nfld., 40

box cars, 40,000 lbs. capacity; 2 baggage cars, 2 first class cars and 2 ten wheel passenger locomotives. There are at present under construction there 5 ten wheel passenger locomotives, one of which was expected to be completed in January, and the remainder to be completed at intervals of about 6 weeks; 25 box cars; 6 passenger cars; 40 box cars, 40,000 lbs. capacity, and two consolidation freight locomotives, all of which will be completed and placed in service this year. It is also intended to make considerable additions to the machinery of the shops to facilitate the work under way. These additions will consist of lathes, boring mills and shapers.

Following are the chief dimensions of the 300 Hart convertible ballast and construction cars, which the Canadian Northern Ry. recently ordered from the Hart-Otis Car Co., and which are being built by the Canadian Car and Foundry Co.; and for 100 similar cars ordered by J. D. McArthur Co., and 50 similar cars ordered by the Toronto, Hamilton and Buffalo Ry., all of which have been noted in previous issues:—

| | |
|--------------------------------|----------------|
| Length over end sills | 36 ft. 8 ins. |
| Width over side sills | 8 ft. 10 ins. |
| Length inside as hoppers | 20 ft. 10 ins. |
| Length inside as gondolas | 34 ft. 8 ins. |
| Width inside | 8 ft. 8 ins. |
| Width over all | 10 ft. 2½ ins. |
| Width at top | 9 ft. 10 ins. |
| Height from rail to floor | 4 ft. 4½ ins. |
| Height from rail to top of car | 8 ft. 1¾ ins. |
| Height inside | 3 ft. 9½ ins. |
| Truck centres | 26 ft. 8 ins. |
| Wheel base of truck | 5 ft. 4 ins. |
| Length of hopper door opening | 16 ft. 8½ ins. |
| Width of hopper door opening | 2 ft. |

The Western Coal and Coke Co. has ordered one 10 wheel freight locomotive from the Montreal Locomotive Works. Following are the chief particulars:—

| | |
|----------------------------------|-----------------------|
| Cylinders, diar. and stroke | 18 by 24 ins. |
| Tractive power | 21,150 lbs. |
| Factor of adhesion | 3.97 |
| Wheel base, driving | 10 ft. 6 ins. |
| Wheel base, total | 20 ft. 8 ins. |
| Wheel base, engine and tender | 51 ft. 6 ins. |
| Weight in working order | 109,000 lbs. |
| Weight on drivers | 84,000 lbs. |
| Weight on engine truck | 25,000 lbs. |
| Weight, engine and tender | 134,000 lbs. |
| Boiler, type | Extended wagon top |
| Boiler, outside diar. first ring | 54 ins. |
| Boiler, pressure | 160 lbs. |
| Firebox | 90 3-16 by 33¼ ins. |
| Crown staying | Radial |
| Tubes, no. and diar. | 198—2 ins. |
| Tubes, length | 12 ft. 3 ins. |
| Heating surface, tubes | 1,261 sq. ft. |
| Heating surface, total | 1,376 sq. ft. |
| Heating surface, firebox | 115 sq. ft. |
| Grate area | 21 sq. ft. |
| Driving wheels, diar. | 59 ins. |
| Axles | 7½ by 9 ins. |
| Brake | Westinghouse American |
| Tank capacity, water | 5,000 imp. gals. |
| Tank capacity, coal | 8 tons |

Reinforced Concrete Telegraph Pole Tests.

—Tests of a reinforced concrete telegraph pole were recently conducted in England. The pole tested was 44½ ft. long and of a hollow section, 17 ins. square at the base, 8 ins. square at the top and of a uniform thickness of 4 ins. The reinforcement consisted of 248 high tension 3-16 in. steel wires with an ultimate strength of 80,000 lb. per sq. in. Groups of 56 wires each were assembled at each corner and were tied together with 11-16 by 1-16 in. mild steel bands spaced 2 ft. on centres. The pole was anchored 5½ ft. deep in a mass of concrete. The loading was applied at a point about 38½ ft. from the base, and the deflection and permanent set of the pole under different loadings were measured. A load of about 1,000 lbs. produced a deflection of 66 ins. and a permanent set of 21 ins. The first signs of failure were observed on the compression side at a deflection of 73 ins. and failure resulted under a deflection of 78 ins.

Mainly About Transportation People.

SIR EDMUND OSLER has been elected a trustee of the Mackay Companies, in place of the late R. A. Smith.

G. YALE, for the past six years Mechanical Superintendent, Montreal Harbor, died in Montreal, Feb. 8, aged 60.

J. P. MULLARKEY, railway contractor, arrived in Montreal, Feb. 17, from a visit of several months to Europe.

Miss R. Hill, daughter of J. J. HILL, Great Northern Ry., was married at St. Paul, Minn., Jan. 30, to Dr. E. Boeckmann.

J. B. FAIRGRIEVE, vessel owner, etc., who died in Hamilton, Ont., recently, left an estate valued at \$152,000, to be divided among relatives.

Dr. E. P. Bucke, who died at London, Ont., Feb. 15, was a brother of H. L. BUCKE, Division Engineer, G.T. Pacific Ry., Superior Jct., Ont.

C. R. HOSMER, director, C.P.R., has been elected Vice President of Canadian Cottons, Limited, succeeding the late Sir Edward Clouston.

C. O'DELL, formerly Roadmaster, G.T. R., Toronto, was presented with a fur coat, by the office staff, Feb. 1, on his transfer to Hamilton.

J. W. STEWART, President, Pacific Great Eastern Ry., arrived in Victoria, B.C., from Europe, via New York, Feb. 3. His health is reported to be fully restored.

R. W. SCOTT, who has been appointed Superintendent of G.T.R. Terminals, Montreal, is a brother of Lady Whyte, wife of Sir Wm. Whyte, director, C.P.R.

A. H. CHAVE, heretofore General Purchasing Agent, Canada Car and Foundry Co., is reported to have been appointed General Assistant to the Executive.

R. W. LEONARD, Commissioner, National Transcontinental Ry., and his wife, who left Ottawa Jan. 23 for Great Britain, are expected to return early in March.

GUY TOMBS, General Freight Agent, Canadian Northern Ry. lines east of Ottawa, and Mrs. Tombs, left Montreal, Jan. 31, for a trip to Florida and Cuba.

R. W. LEONARD, Commissioner, National Transcontinental Ry., has been elected a fellow of the Royal Colonial Institute. Mrs. Leonard has been elected an Associate.

The marriage is announced for Mar. 6, in Toronto, of Miss Mary Hanna, daughter of D. B. HANNA, Third Vice President, Canadian Northern Ry., to Victor Lewis.

W. P. ANDERSON, Chief Engineer of the Department of Marine and Fisheries, Ottawa, has been appointed a Companion of the Order of St. Michael and St. George.

P. MORRIS, a Michigan Central Rd. employe, who was killed in the yards at Windsor, Ont., Feb. 1, was a brother of H. MORRIS, Roadmaster, Pere Marquette Rd., St. Thomas, Ont.

F. S. WILEY, of Thomas Marks & Co., Port Arthur, Ont., who left there about the middle of January, with his wife and child, for the south of France, is expected to return during May.

F. E. GIBBS, formerly Chief Grain Inspector for the Dominion Government, at Fort William, Ont., and latterly a member of the Dominion Grain Commission at Winnipeg, has retired from the board.

SIR WM. VAN HORNE, is one of the four collectors of paintings, who have presented four important works of art to Dr. W. Bode, the art expert, to be handed over to the Royal Museums in Germany.

A. E. WILBY, heretofore on the engineering staff of the Esquimalt and Nanaimo

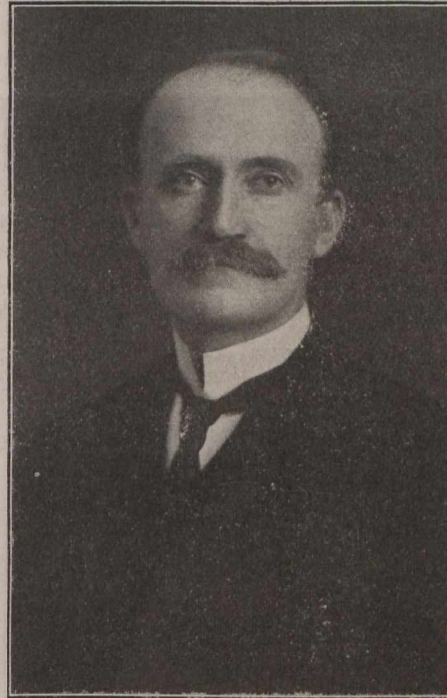
Ry., Victoria, B.C., is reported to have been appointed resident engineer in that city for the Department of Marine and Fisheries.

JOHN PATTERSON, who died in Hamilton, Ont., recently, left an estate of over \$400,000, the main portion of which is in Dominion Power and Transmission Co.'s stock. The widow is the principal legatee.

Prof. ALEX. JOHNSON, LL.D., who died at Ottawa, Feb. 10, for several years made a specialty of hydrography, and performed considerable research work in Canadian waters.

Mrs. J. P. C. Burpee, who died at St. John, N.B., Feb. 8, was mother of F. F. BURPEE, of the Eastern Steamship Co., and of G. B. BURPEE, of the C.P.R., both of St. John.

F. H. CLERGUE, the principal promoter of the North Ry., from Montreal to Hudson Bay, gave an address on "Hudson Bay and its relation to the commerce of Montreal," at the Canada Club luncheon in Montreal, Feb. 10.



F. Price,
Superintendent of Passenger Service, Grand Trunk
Railway.

G. H. PEDLAR, President of Pedlar People, Ltd., Oshawa, Ont., and his wife, have given \$10,000 to the Oshawa hospital, for the construction of a surgical wing as a memorial to their son, the late G. H. Pedlar, Jr.

G. Mc L. BROWN, European Manager, C. P.R. and F. C. Salter, European Traffic Manager, G.T.R., have been elected members of the Royal Colonial Institute's trade and industrial committee, which has been formed recently.

T. H. WATSON, Vice President and Managing Director, Canada Machinery Corporation, has bought the Toronto residence of Mrs. Hammond, widow of the late H. C. Hammond, formerly President of the Northern Navigation Co., for \$55,000.

MRS. LOGAN, wife of R. S. Logan, Vice President, G.T.R., Montreal, and her two sisters, are said to be the principal legatees under the will of their uncle, D. P. Rankin, which was filed at St. Louis, Mo., Feb. 15. The estate is valued at over \$4,500,000.

F. S. HENDERSON was presented with an address and gold headed umbrella, by the Methodist congregation at Newcastle, N. B., on his removal to Truro, N.S., where he has been appointed Chief Dispatcher, Inter-colonial Ry.

JAS. RYAN, who for some years has been chief clerk to the G.T.R. roadmaster at Hamilton, was on Feb. 1, presented with a gold watch, by the men of the department, on his promotion to be chief accountant in the Superintendent's office there.

JAS. V. WELSH, who has been for many years engaged in railway building in Canada and the United States, as a sub-contractor with Foley, Bros. and Larson, and latterly with the Canadian Northern Ry., died at Port Arthur, Ont., Feb. 1, aged, 52.

J. H. GORDON, Superintendent, Hamilton Division, A. M. Adams, Agent, and J. W. Ralston, dispatcher, G.T.R., Hamilton, Ont., were each presented with a purse of gold, Feb. 19, by their former associates at Toronto, in connection with their recent removal to Hamilton.

W. J. SPROULE, M. Can. Soc. C.E., for 30 years assistant engineer to the Montreal Harbor Commissioners, from which position he retired in 1911, died in Montreal, Feb. 6. One of his sons, G. St. G. Sproule, M.Sc., is engaged in the C.P.R. testing laboratory, Montreal.

R. MURPHY was presented with a diamond pin and a pair of diamond and pearl cuff links, by the office staff of the Canadian, National and American Express companies, Feb. 7, upon retiring from the position of general agent of these companies in Montreal.

SIR WILLIAM VAN HORNE, who was visiting in Kingston, Jamaica, recently, is reported to have been negotiating for the acquirement of a large hotel in connection with a proposed extension of the C.P.R. steamship service for the development of a tourist trade.

J. INMAN SEALBY, who was associated with his cousin, T. H. Ismay, in the founding of the White Star Line, and who retired from active connection with it, on its absorption by the International Mercantile Marine Co., died at Keswick, Eng., Feb. 9, aged 84.

JNO. H. SULLIVAN, who died Jan. 27, at Valleyfield, Que., aged 78, had charge of the exploration surveys for the Quebec and Lake St. John Ry. in 1870, and was extensively employed on surveys for public works. Of five sons three are civil engineers, one, Alfred, being in the G.T.R. employ.

G. CLARK, and G. F. Nornabell, Stratford, Ont., have each received a commission to act as a Notary Public, for the purpose of taking affidavits made necessary by any United States or Canadian law requiring evidence as to the condition of locomotives running in the United States, or entering into Canada.

G. D. SMITH, General Superintendent, Canadian Steel Foundries, died suddenly in Montreal, Jan. 30, aged 48. After serving his apprenticeship in the C.P.R. mechanical department, he became associated with K. W. Blackwell, in the enterprises which have developed into the Canadian Steel Foundries.

J. M. CURRY, for many years Secretary-Treasurer of the Rhodes, Curry Co., Amherst, N.S., was recently presented with a silver tea service by the citizens at a public dinner, on the occasion of his leaving Amherst, for Montreal, to become associated with the Canadian Car and Foundry Co.'s sales department.

C. J. McKEOUGH, whose appointment as Trainmaster, District 15, Stratford Division,

Ontario Lines, G.T.R., Stratford, was announced in our last issue, was born at St. Marys, Ont., Oct. 16, 1874, and entered G.T.R. service, Aug. 15, 1892, since when he has been, to Dec. 1, 1902, brakeman; Dec. 1, 1902, to Jan. 22, 1913, conductor.

C. BERMINGHAM, formerly Vice President and Managing Director, Canadian Locomotive Co., and his wife, who are in California, are giving to the Oliver Mowat Memorial Hospital at Kingston, Ont., a cottage at a cost of about \$5,000, to accommodate at least four persons in the incipient stages of tuberculosis.

J. B. MURPHY, who has been appointed Chief Dispatcher, Reid Newfoundland Co., St. John's, Nfld., was born at Charlottetown, P.E.I., Mar. 18, 1888, and entered Reid Newfoundland Co.'s service, June 24, 1903, since when he has been, to Jan. 24, 1910, consecutively, operator and station agent; Jan. 24, 1910, to Jan. 17, 1913, dispatcher, St. John's.

B. GOODWIN, who died in Campbellton, N.B., Feb., 5, was reported to be nearly a hundred years old. He had been a locomotive driver in England, and started work in Canada on the construction of the Windsor Branch in 1865, going to the old Windsor and Annapolis Ry. in 1867, and to the Intercolonial Ry. in 1872. He retired from active work in 1887.

W. J. ROONEY, whose appointment as Superintendent of Plant, G.T.P.R. Telegraph, Winnipeg, was announced in our last issue, was from 1896 to 1902, in Toronto Electric Light Co.'s service; 1902 to 1905, in Great North Western Telegraph Co.'s construction department; 1905 to Jan., 1913, General Foreman of Construction, G.T.P.R. Telegraphs.

J. J. ROSE, who has been appointed Canadian Passenger Agent, Union Pacific System, Toronto, was born in Toronto, and was for 25 years in C.P.R. service, as Travelling Passenger Agent, and up to about a year ago, as chief clerk in the Passenger Department, Toronto. For the past year, he has been Travelling Passenger Agent for the Robt. Reford Co., there.

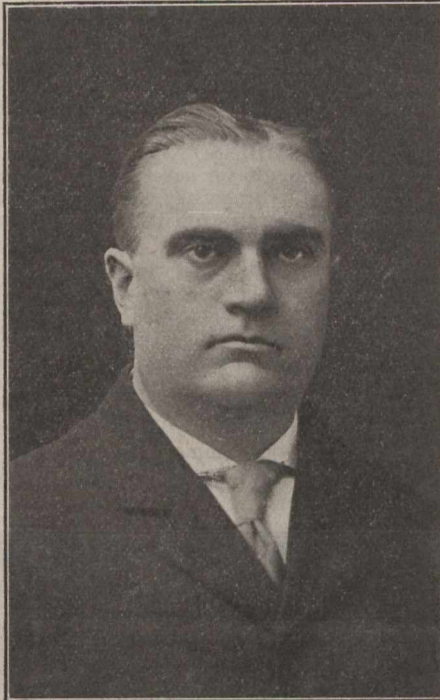
C. E. BENJAMIN, who has been appointed General Passenger Agent, C.P.R. Pacific Steamship Service, Montreal, entered C.P.R. service in 1898, as Travelling Passenger Agent at St. Louis, Mo., and in 1906 was appointed General Agent, C.P.R. Atlantic Steamship Lines, Chicago, Ill., remaining there until his transfer to Montreal, as General Tourist Agent, in 1910.

R. H. FISH, who has been appointed Trainmaster, Districts 20 and 21, Ontario Lines, G.T.R., Brantford, was born at Oakville, Ont., in 1871, and entered G.T.R. service in the Locomotive Department, Toronto, in 1890. From 1892 to 1900 he was a fireman; 1900 to Oct. 1, 1908, locomotive driver; Oct. 1, 1908, to Jan. 23, 1913, Road Foreman of Locomotives, London, Ont.

CAPTAIN LARNDER, of the cable repair steamship Mackay-Bennett, was presented with a silver loving cup, R. D. Legette, one of the officers, with a gold watch, and Jas. Hendman, boatswain's mate, with a pair of binocular glasses, by the Dominion Government, Feb. 7, in recognition of their services in rescuing the crew of the Nova Scotian schooner Caledonian.

R. WHALEY, heretofore General Superintendent, Electric Division, New York Central & Hudson River Rd., New York City, has been elected Vice President of the New York, New Haven & Hartford Rd., in charge of operation, succeeding H. J. Horn, who will give his entire attention to the operating department of the Boston & Maine Rd., of which he is also Vice President.

JOHN GRAY, whose appointment as General Agent, G.T.R., Toronto, was announced in our last issue, was born at River Beaudette, Que., Sept. 28, 1863, and entered G.T.R. service Oct., 1880, since when



C. G. Bowler,
General Superintendent, Eastern Lines, Grand
Trunk Railway.

he has been, to 1883, assistant at Parkhill, Ont.; 1883 to 1889, operator and ticket clerk at various points; 1889 to Jan., 1913, agent at Milverton, Southampton, Hespeler, Ingersoll, St. Catharines, Ont.; Buffalo,



G. A. Stokes,
Superintendent of Toronto Terminals, Grand
Trunk Railway.

N.Y., and Hamilton, Ont., successively.

H. J. RUSSELL, who has been appointed Assistant to the Superintendent, Reid Newfoundland Co., St. John's, Nfld., was born at Musgrave Harbor, Nfld., Dec. 24, 1891,

and entered Reid Newfoundland Co.'s service, Sept. 12, 1906, since when he has been, to June 25, 1907, stenographer, Newfoundland Express Co.; June 25, 1907, was appointed secretary to the General Superintendent, and just prior to his present appointment, Jan. 17, was also acting as Chief Dispatcher.

H. HULATT, whose appointment as Commercial and Traffic Superintendent, G.T. Pacific Ry. Telegraphs, Winnipeg, was announced in our last issue, was born in London, Eng., Feb. 15, 1883, and entered G.T. P.R. Telegraphs service in 1907 as secretary to the Manager, and was promoted to chief clerk, Jan. 1, 1910, since when he has been the Manager's chief assistant in the organization and operation of the G.T.P.R. commercial telegraph system and time service department.

At the recent annual meeting of the Mackay Companies at Boston, Mass., President Mackay, in alluding to the death of R. A. SMITH, of Toronto, one of the trustees of the company, which occurred last year as the result of an automobile accident, said:—"It is with the deepest regret that we record the death of one of our co trustees. His sound judgment, conservatism and unwavering support greatly aided your trustees in their deliberations, and we greatly deplore his loss."

C. M. HAYS, President, G.T.R. and G.T. P.R., who lost his life in the Titanic disaster, left an estate valued at \$762,292 almost entirely to his wife, with the exception of small legacies to his four daughters. Included in this amount are real estate in Canada and the United States, \$268,216; bonds and stocks, \$383,298.90; cash in banks, \$60,181.01. He had \$158,093 in life assurance, payable to his wife, \$25,000 payable to his sister and brother, and annuities payable to his daughters.

A. E. MACDONALD, whose appointment as General Claims Agent, Canadian Northern Ry., Winnipeg, was announced in our last issue, was born at Woolwich, Eng., Dec. 11, 1870, and was brought to Canada at an early age. He entered railway service in the spring of 1900, since when he has been, to 1901, in the yard office, C.P.R., Winnipeg; 1901 to May 17, 1903, Special Agent, C.P.R., Winnipeg; May 17, 1903, to Jan. 1, 1913, Chief Special Agent and Claim Adjuster, Canadian Northern Ry., Winnipeg.

C. FORRESTER, whose appointment as Superintendent, Stratford Division, Ontario Lines, G.T.R., Stratford, was announced in our last issue, was born at Wainstead, Ont., Mar. 5, 1876, and entered G.T.R. service, July 15, 1891, since when he has been, to Aug. 23, 1899, operator at various stations on the Middle Division; Aug. 23, 1899, to Aug. 20, 1906, dispatcher, London, Ont.; Aug., 1906, to Oct. 20, 1907, night chief dispatcher, London, Ont.; Oct. 20, 1907, to July 1, 1910, Chief Dispatcher, London, Ont.; July 1, 1910, to Jan. 22, 1913, Trainmaster, Stratford, Ont.

R. O. MACKAY, formerly in the Great Lakes vessel trade, who died in Hamilton, Ont., recently, left an estate valued at \$147,053, over \$100,000 of which is in Steel Co. of Canada stock. He also left \$11,000 life assurance, payable to his widow and willed her the household effects and \$5,000 a year. He left annuities and legacies varying from \$500 to \$10,000, to about 20 relatives, the legacies aggregating \$50,000, and \$10,000 to the Hamilton Health Association. The residue is to be divided between the Hamilton Health Association, Boys' Home, Girls' Home and the Orphan Asylum.

J. R. FITZGERALD, who has been appointed Trainmaster, Central Vermont Ry., St. Albans, Vt., was born at Northfield, Vt., and entered railway service at the age of

17, and has been, consecutively, to June 4, 1881, section man and section foreman, New York and New England Ry., and yard brakeman, Central Vermont Ry., White River Jct.; June 4, 1881, to June 24, 1882, road brakeman; June 24, 1882, to Nov. 27, 1901, freight conductor; Nov. 27, 1901, to Sept. 18, 1907, Yardmaster, White River Jct.; Sept. 18, 1907, to Feb. 10, 1913, Yardmaster, St. Albans, Vt.

F. RIOUX, whose appointment as Assistant to the President, Reid Newfoundland Co., St. John's, Nfld., was announced in our last issue, was born at Trois Pistoles, Que., Apr. 18, 1867, and entered railway service, July, 1883, since when he has been, to 1885, operator on construction, C.P.R., Mattawa, Ont.; 1885 to 1888, in operating department; 1888 to 1889, dispatcher, North Bay, Ont.; 1889 to 1898, Assistant Chief Operator, Montreal; 1898 to 1900, Chief Dispatcher, Reid Newfoundland Co.; 1900 to 1905, Assistant Superintendent; 1905 to Dec. 31, 1912, Superintendent.

F. A. GABY, Assoc. Am. Inst. E.E., who has been acting Chief Engineer of the Ontario Hydro Electric Power Commission since the resignation of P. W. Sothman, last July, has been appointed Chief Engineer. He graduated from the University of Toronto in 1903, and after several years with the Canadian Electric Co. as erecting and supervising engineer, went to Winnipeg, where he was assistant engineer on the work of preparing the designs and specifications for the municipal hydro electric plant. He has been with the Ontario Hydro Electric Power Commission since 1907, and was appointed Assistant Chief Engineer in 1908.

W. E. LADLEY, whose appointment as Superintendent of Motive Power, Reid Newfoundland Co., St. John's, Nfld., was announced in our last issue, was born at Leeds, Eng., Nov., 1875, and was educated at Port Huron, Mich. He entered transportation service in 1892, since when he has been, to 1897, machinist apprentice, G.T.R., Port Huron, Mich.; 1897 to 1905, consecutively, Machine Foreman, Erecting Foreman and General Foreman, G.T.R., Port Huron, Mich.; 1905 to 1907, General Foreman, Central Vermont Ry., St. Albans, Vt.; 1907 to 1910, assistant superintendent of various automobile factories; 1910 to Jan. 1, 1913, Master Mechanic, Chicago and Alton Rd., Bloomington, Ill.

WALTER WHITE, who has been appointed Trainmaster, Districts 22 and 23, Stratford Division, Ontario Lines, G.T.R., Palmerston, was born June 4, 1866, and entered G.T.R. service in 1882, since when he has been, to 1883, messenger to Superintendent, Toronto Union Station; 1883 to 1889, operator; 1889 to 1896, secretary and chief clerk to Assistant Superintendents, London and Toronto; and subsequently, successively, chief clerk to Superintendent, Montreal; secretary to Manager; chief clerk to Superintendent, Toronto; Superintendent of Toronto Terminals; Assistant Trainmaster, Palmerston, Ont.; Joint Agent, G.T.R. and Wabash Rd., Black Rock, N.Y., and Chief Train Dispatcher, London, Ont.

W. A. COOPER, who has been appointed Manager, Sleeping, Dining and Parlor Cars and News Service, C.P.R., Montreal, and whose portrait appears in this issue, was born at Montreal, Mar. 22, 1871, and entered railway service, Feb., 1886, since when he has been, to June, 1891, secretary to Assistant General Manager, G.T.R.; June, 1891, to Dec., 1894, chief clerk to General Superintendent, Eastern Division, C.P.R., Montreal; Dec., 1894, to July, 1897, Inspector, Sleeping and Dining Car Department, same road; July, 1897, to Dec., 1905, Assistant Superintendent, same department; Dec.,

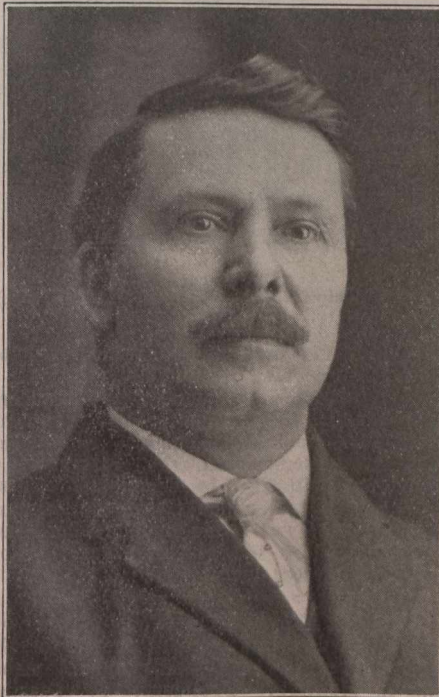
1905, to Aug., 1908, Superintendent, same department; Aug., 1908, to Feb. 1, 1913, General Superintendent, same department.

P. R. TODD, who was recently elected President, Bangor and Aroostook Rd., Ban-



J. H. Gordon,
Superintendent, Hamilton Division, Ontario Lines,
Grand Trunk Ry.

gor, Me., was born at Toronto in 1859, and educated at Ottawa. He commenced railway work as a telegraph operator with the St. Lawrence and Ottawa Ry., now part of the C.P.R., remaining there until 1875, when



J. McGillivray,
General Manager, Inverness Railway and Coal Co.

he was appointed Canadian Agent for the Ogdensburg and Lake Champlain Rd., and later was General Travelling Agent, National Despatch Line, Chicago, Ill.; Commercial Agent, New York, West Shore and

Buffalo Ry., and chief clerk to General Freight Agent, same road. From 1888 to 1891, he was General Freight and Passenger Agent, Canada Atlantic Ry., Ottawa, Ont., and since then has been in service in the U. S.

W. S. WILSON, who has been appointed Superintendent of Transportation, G.T.R., Toronto, was born in Toronto, and entered G.T.R. service in 1888, since when he has been, to 1894, operator and ticket clerk at various points west of Toronto; 1894 to 1897, dispatcher at London, Ont.; 1897 to 1901, in service of G.N.R. in Minnesota and Washington, and Pacific Coast Ry. and Pacific Coast Steamship Co.; June, 1901, to July, 1902, dispatcher, G.T.R., Island Pond, Vt.; July to Dec. 1, 1902, dispatcher, Rutland Rd., Rutland, Vt.; Dec. 1, 1902, to May 1, 1907, dispatcher, G.T.R., London, Ont.; May 1, 1907, to July 1, 1910, Chief Dispatcher, G.T.R., Stratford, Ont.; July 1, 1910, to Jan. 22, 1913, Trainmaster, G.T.R., Stratford, Ont.

A. E. DUFF, who has resigned as District Passenger Agent, G.T.R., Toronto, to enter the real estate business in Winnipeg, was born at Sherbrooke, Que., May 1, 1872, and entered G.T.R. service in 1887, since when he has been, water boy on tie train, east of Montreal; 1888 to 1889, section hand, switch man and clerk at various stations east of Montreal; 1890 to 1895, operator at St. Hilaire, Upton, Actonvale and South Durham, Que.; 1895 to 1904, agent at Beaulieu, Que.; North Stratford, N.H.; and St. Lambert, Que.; 1904 to 1907, Travelling Passenger Agent, Montreal; 1907 to 1908, General Agent, Passenger Department, Winnipeg; 1908 to 1911, General Agent, Passenger Department, G.T.R., and District Passenger Agent, G.T. Pacific Ry., Winnipeg; 1911 to Feb. 28, 1913, District Passenger Agent, G.T.R., Toronto.

PHELPS JOHNSON, who has been elected President, Canadian Society of Civil Engineers, was born in Orange County, N.J., and from 1872 to 1882 was, successively, engineer at Hawkins Iron Works, Springfield, Mass., and Assistant Engineer, Wrought Iron Bridge Co., Canton, Ohio. He came to Canada in 1882, as Manager and Engineer, Toronto Bridge Co., now Dominion Bridge Co., and in 1888 was appointed Chief Engineer, Dominion Bridge Co., Lachine, Que., and in 1892, he was appointed General Manager, which position he still holds. He is also President, St. Lawrence Bridge Co., which was formed in conjunction with the Canadian Bridge Co., for the erection of the steel superstructure of the Quebec Bridge. He has been a member of the society since 1893, and was elected a member of the council in 1911, for three years.

A. F. DION, who has been appointed Traffic Agent, Quebec Harbor Commission, was born at L'Islet, Que., Oct. 1, 1871, and entered railway service, Apr. 26, 1887, since when he has been, to Nov. 12, 1889, operator and agent, Ottawa Division, C.P.R.; Nov. 12, 1889, to Sept. 26, 1890, baggage man, Intercolonial Ry.; Sept. 26, 1890, to Aug. 15, 1893, operator and agent, New York and New England Rd.; Aug. 15, 1893, to Apr. 30, 1894, operator and freight clerk, Canada Atlantic Ry.; Apr. 30, 1894, to Nov. 4, 1900, operator and agent, Eastern Division, C.P.R.; Nov. 4, 1900, to Jan. 6, 1903, Terminal Agent, Hawkesbury and Shawinigan Falls, Great Northern Ry. of Canada; Jan. 6, 1903, to June 30, 1908, Terminal and Freight Agent, Quebec and Lake St. John Ry., Quebec; June 30, 1908, to Feb. 28, 1913, Terminal and Freight Agent, Canadian Northern Quebec Ry., Montreal.

J. E. MORAZAIN, who has been appointed Assistant Superintendent, District

3, Eastern Division, C.P.R., Que., was born at Wheatland, Que., July 31, 1875, and entered railway service, May 3, 1890, since when he has been, to Aug. 1, 1890, freight clerk, C.P.R., Drummondville, Que.; Aug. 1, 1890, to Jan. 9, 1891, night operator at Foster; Jan. 9, to Aug. 12, 1891, day operator, Richford, Vt.; Aug. 15 to Sept. 26, 1892, night operator at Sutton, Que.; Sept. 26, 1892, to Feb. 8, 1894, night and day operator, Highlands, Que.; Feb. 8 to Aug., 1894, day operator, Richford, Vt.; Aug. to Oct., 1894, relieving agent and operator; Oct., 1894, to May 27, 1895, day operator, Highlands, Que.; May 27, 1895, to Sept. 24, 1901, agent, Highlands, Que.; Sept. 24, 1901, to Nov. 15, 1908, agent, Mile End, Que.; Nov., 1908, to Feb., 1913, General Agent, Operating Department, Quebec, Que.

JOHN MCGRAW, who has been appointed acting Superintendent, Central Vermont Ry., New London, Conn., was born at Craigvale, Ont., Feb. 6, 1868, and entered railway service, Dec. 10, 1883, since when he has been, to March, 1884, relieving operator and agent, Northern and North Western Ry.; Mar., 1884, to June, 1886, agent, same road, Nottawa and Glen Huron, Ont.; June, 1886, to Apr., 1887, agent, same road, Palgrave, Ont.; Apr., 1887, to Nov., 1888, agent, same road, Sundridge, Ont., continuing in the service on the absorption of the N. & N.W.R. by the G.T.R., Feb., 1888; Nov., 1888, to July, 1898, agent, G.T.R., Hagersville, Ont.; July, 1898, to June, 1906, agent, same road, Merritton, Ont.; June, 1906, to Apr., 1907, agent, Central Vermont, Ry., St. Albans, Vt.; Apr. to Aug., 1907, agent, same road, Brattleboro, Vt.; Aug., 1907, to Jan. 29, 1913, General Agent, same road, New London, Conn.

P. J. FLYNN, who has been appointed Terminals Manager, Canadian Northern Ry., G.T. Pacific Ry. and National Transcontinental Ry., Winnipeg Joint Terminals, was born at Fishers, N.Y., Nov. 22, 1872, and entered railway service, Apr. 1, 1888, since when he has been, to Aug. 1, 1891, yard clerk, Lehigh Valley Rd., Buffalo, N. Y.; Aug. 1, 1891, to Apr. 1, 1892, night yardmaster, same road, Buffalo, N.Y.; Apr. 1, 1892, to Jan. 24, 1894, yardmaster, Tift Farm Yards, same road, Buffalo, N.Y.; Jan. 24, 1894, to Nov. 1, 1898, General Yardmaster, same road, Manchester, N.Y.; Nov. 1, 1898, to Apr. 1, 1901, Assistant Trainmaster, Pennsylvania Division, same road; Apr. 1, 1901, to Feb. 1, 1905, General Yardmaster, same road, Savre, Pa.; Feb. 1, to Aug. 1, 1905, General Yardmaster, New York, New Haven and Hartford Ry., Worcester, Mass.; Aug. 1, 1905, to Feb. 1, 1907, General Yardmaster in charge of Terminals, same road, Providence, R.I.; Feb. 1, 1907, to Oct. 1, 1908, General Yardmaster in charge of Terminals, Lehigh Valley Rd., Buffalo, N.Y.; Oct. 1, 1908, to Jan. 1, 1913, Trainmaster, same road, Buffalo, N.Y.

F. C. GAMBLE, who has been elected a Vice President of the Canadian Society of Civil Engineers, was born at Toronto, Oct. 23, 1848, and was educated at Upper Canada College, and by private tuition. He commenced his engineering career on the construction of the Intercolonial Ry. in 1869, and in 1872 was Assistant Engineer on the Great Western Ry., now a part of the G.T.R., and was subsequently appointed Resident Engineer for the contractors on the Prince Edward Island Ry.; and has acted as Assistant Engineer on construction of the Intercolonial Ry., Quebec, Montreal and Ottawa Ry., and Canadian Pacific Ry. In 1880 he was sent to British Columbia as Assistant Engineer on Government work near Yale, and was later transferred to the Dominion Department of Public Works in that province, being appointed Resident Engineer in 1887, resigning in 1897 on his ap-

pointment as Public Works Engineer and Inspector of Dykes for the B. C. Government. In 1911, he was appointed Chief Engineer, and Inspecting Engineer of Railways for the B. C. Government. He has been a member of the society since 1887, and is also a member of the Institute of Civil Engineers, England, and of the American Society of Civil Engineers.

Grand Trunk Pacific Railway Construction for 1913.

A Winnipeg press dispatch, Feb. 14, states that the G.T. Pacific Ry. construction programme includes the pushing of work on the main line. Track is laid from the east Rau Shuswap, 1,123 miles west of Winnipeg, and from the west to 195 miles east of Prince Rupert, B.C. A large amount of grading has been done from the east to 126 miles east of Fort George. Clearing has been done on this 126 miles. From the west grading has been practically completed to the Eudaka River, mileage 341 from Prince Rupert. The grading, bridge build-



A. E. Macdonald,
General Claims Agent, Canadian Northern Railway.

ing, track laying and ballasting will be pushed on as fast as possible.

It is expected to complete the branches into Brandon, Man., Moose Jaw, Weyburn, Battleford, Sask., and Calgary, Alta. The line from Regina to the International Boundary will also be completed. These lines have all been under construction during the past year. No announcement has been made as to what new construction will be entered upon.

Canadian Transfer Co.—The following officers and directors were re-elected for the current year at the recent annual meeting in Montreal:—President, C. Cassils; Directors, H. Paton, G. R. Starke, Sir Montagu Allan, F. W. Molson; General Manager and Secretary, F. M. McRobie.

A deputation waited on the Ontario Government Jan. 16 and urged the extension of the N.C. Ry. to North Timiskaming at the earliest possible date. The district proposed to be served has a population of over 7,000.

C.P.R. Eastern Lines Appropriations.

The appropriations for the work to be carried out on the C.P.R. Eastern Lines during the year have been approved by the President, Sir Thomas Shaughnessy, and will involve an expenditure of about \$16,000,000. This sum will not all be spent on new work, but at least \$10,000,000 will be utilized in completing works which were commenced last summer, including a portion of the new lake shore line, from Glen Tay to Agincourt, Ont., which is expected to be completed this year, the extension from St. John to Farnham Junction, and the Forsythe St. branch at the east end of Montreal.

The majority of the new work for which appropriations have been made is principally double tracking on various parts of the eastern lines, and this will involve the expenditure of nearly \$6,000,000. The main line from Islington to Guelph Junction, Ont., on the London Subdivision will be double tracked for 30 miles, which is necessitated by the increase of traffic and will prove a considerable relief to the depot congestion. It is contemplated to have the work finished by November. On this stretch there are a few small bridges to be built, but none of any great importance. Tenders have been called for, but contracts have not yet been let.

It is proposed to double track portions of the main line between Roxford—the junction between the main line and the Toronto-Sudbury Branch—and Port Arthur, covering about 135 miles. The total distance between those two points is 553 miles. Last summer 75 miles of this line were double tracked at the points which most facilitated operation of traffic. It is intended to eventually double track the whole of this stretch, and when completed it will be a great advantage to the haulage of grain after navigation on the Great Lakes is closed. The intention of the C. P.R. is to carry out the second tracking at various points, so as to facilitate operation of trains. The lightest work will be done first and the heavy work along the north shore of Lake Superior will be completed later on. Surveys are in progress and will be continued. The principal items of heavy work will be due to changes of alignment and grading revisions.

Another important work to be commenced this year is the double tracking of a small stretch of 15 miles between Agincourt and North Toronto. Apart from the work of erecting two steel viaducts over the Don Valley the work on this line is by no means heavy. The other work to be finished this year includes the Interprovincial and James Bay Ry. extension from from Kipawa northerly, grade revision on the Sault Ste. Marie branch from Algoma to Sudbury.

The G.T.R. Has Been Indicted at Buffalo, N.Y., for conspiracy to violate sec. 6 of the Interstate Commerce law, in connection with the transportation of theatrical companies from Detroit to Buffalo, and from Buffalo to Toronto. It is charged that by means of a contract which was ostensibly for advertising on theatre programmes, rates were unreasonably reduced. The contract for 1910-11 called for monthly payments by the G.T.R. of \$300, a sum claimed to be grossly in excess of the true value, the amount of which was reached by deducting ¼c. a mile from the regular published rate. Similar indictments were recently returned against the New York Central Lines, when a plea of guilty was entered and a fine of \$40,000 paid.

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AND
Marine World**
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NOTICE TO ADVERTISERS.
ADVERTISING RATES furnished on application.
ADVERTISING COPY must reach the publishers by the 10th of the month preceding the date of publication.

TORONTO, CANADA, MARCH, 1913.

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Index to Canadian Railway and Marine World for 1912.

At the end of this issue is a very complete index to the contents of the volume for 1912, which, as in former years, will doubtless be fully appreciated by the large number of subscribers who bind Canadian Railway and Marine World for reference purposes.

Even a casual glance over the eight pages of closely printed matter will show the tremendous range of subjects covered and the thorough manner in which this paper represents the entire transportation interests of the whole Dominion, steam railway, electric railway and marine, as well as the subsidiary express and telegraph interests and railway and canal contracting work.

Each succeeding year sees an increase in the quantity of matter published, an improvement in its quality, and a rigid adherence to the policy of accuracy which the publishers consider as one of their most valuable assets.

During 1912 our business was most satisfactory. The receipts from advertising steadily increased and there was a marked advance in circulation. More new subscriptions were received than in any previous year in the paper's history, except the year of its establishment, 1898; the number of discontinuances was again very small indeed, and the present condition of the subscription list justifies the statement, after most careful enquiry as to the circulation of other publications, that there is no other transportation paper, published in any country, which has so large a circulation as Canadian Railway and Marine World, in proportion to the population of the country of publication. The evidence in support of this statement is at the disposal of our advertising customers.

Our circulation embraces all classes of transportation officials and reaches over 90% of all the officials who have any buying power. Advertisers who use our columns therefore know that they are covering the entire field and that no other advertising is necessary to reach any portion of it.

Our subscription lists are open for inspection by present and prospective advertisers at any time.

Passenger Association Meetings at Ottawa.

At the meetings held at Ottawa recently W. S. Cookson, Assistant General Passenger Agent, G.T.R., was elected Chairman of the Niagara Frontier Summer Rate Committee for 1913, and A. J. Collins, Manager and Secretary, Magnetawan River and Lakes Steamboat Co., was elected Chairman of the Great Lake and St. Lawrence River Rate Committee. Jas. Morrison, A.G.P.A., Canadian Northern Ry., Eastern Lines, is permanent Secretary of both committees.

The International Water Lines Passenger Association elected the following officers: President, G. C. Wells, Asst. to P.T.M., Canadian Pacific Ry. S.S. Lines, Montreal; Vice President, O. H. Taylor, P.T.M., Eastern S.S. Corporation, New York; Secretary, M. R. Nelson, C.C., P.D., Northern S.S. Co., New York; Executive Committee—J. C. Conley, G.P.A., Nor. Mich. Trans. Co., Chicago, 2 years; W. P. Hinton, G.P.A., Grand Trunk S.S. Lines, Winnipeg, 1 year; C. F. Bielman, T.M., White Star Line, Detroit, Mich, 1 year.

The next meetings of the three associations will be held at Buffalo, N.Y., in Jan., 1914.

Canadian Society of Civil Engineers' Officers, Etc.

Following are officers and members of council for 1913, as elected at the recent annual meeting:—

President—Phelps Johnson, Montreal.
Vice Presidents—F. C. Gamble, Victoria, B.C.; J. G. Sullivan, Winnipeg; H. H. Vaughan, Montreal.

Past Presidents—C. H. Rust, Victoria, B. C.; H. N. Ruttan, Winnipeg; W. F. Tye, Toronto.

Treasurer—E. Marceau, Montreal. Secretary—C. H. McLeod, Montreal.

Councillors—P. S. Archibald, Moncton, N. B.; W. D. Baillairge, Quebec; F. A. Bowman, Halifax; E. E. Brydone-Jack, Winnipeg; C. E. Cartwright, Vancouver; S. J. Chapleau, Ottawa; C. R. Coutlee, Ottawa; A. E. Doucet, Quebec; W. A. Duff, Winnipeg; G. H. Duggan, Montreal; R. J. Durley, Montreal; J. M. R. Fairbairn, Montreal; C. L. Fellowes, Toronto; Walter J. Francis, Montreal; H. E. T. Haultain, Toronto; J. A. Hesketh, Winnipeg; J. C. Kennedy, Montreal; W. B. MacKenzie, Moncton, N.B.; D. MacPherson, Ottawa; C. N. Monsarrat, Montreal; P. E. Parent, Quebec; A. F. Stewart, Toronto; T. H. White, Vancouver.

Railway Department of Saskatchewan.—Heretofore the railway, telegraph and telephone lines in Saskatchewan have been under the charge of the Department of Railways, Telegraphs and Telephones. The act constituting that department has now been amended by striking out the words "railways, telegraphs and" wherever they occur, and giving the Lieut.-Governor power to assign duties to the minister who shall be placed in charge of telephones. A second act has been passed creating a Department of Railways, authorizing the appointment of a separate Minister of Railways, and providing for the appointment of a Deputy Minister, engineers, and such other officials as may be necessary.

Alberta and Great Waterways Ry.—The Imperial Privy Council has given judgment in London, Eng., allowing the appeal of the Royal Bank against the decision of the courts in Alberta in the Alberta and Great Waterways Ry. case. The Bank holds the proceeds of the \$6,000,000 bond issue of the railway, which had been guaranteed by the Province. The Legislature subsequently revoked the company's charter and directed the payment of the proceeds of the bond issue to the Provincial Treasurer. The Privy Council holds that although the Legislature had the right to revoke the charter, it could not appropriate the money, the lenders of which were entitled to claim to have it returned to them.

The G.T.R. and the Southern New England Ry.—A dispatch from Concord, N.H., Feb. 15, states that the G.T.R. has filed, in the Superior Courts of the State, a bill of equity to test the legality of the Southern New England Ry. The bill sets out that what purports to be the signature of the G.T.R. Co. by the late C. M. Hays, the President, is not the legal and binding signature of the G.T.R. Co., but was his unauthorized act and that it was beyond the power of the railway company to bind itself to the purchase of the shares of the capital stock of the alleged railway and that the act is therefore null and void.

Montreal Stock Yards Co.—The annual meeting was held at the G.T.R. offices, Montreal, Feb. 18. The following is the directorate for the current year:—W. Mann, President; W. B. Strachan, Vice President; M. M. Revnolds, J. Pullen, W. Wainwright, G. Bird, J. E. Dalrymple, A. McLaurin, J. W. Loud, F. H. Carlin is Manager, and B. D. Strachan, Secretary-Treasurer.

Canadian Pacific Railway, Construction, Betterments, Etc.

Atlantic Division.—Press reports continue to state that the C.P.R. is contemplating building a short line from Montreal to Halifax, N.S., to handle passenger and mail service.

W. Downie, General Superintendent, is reported as stating that the Fredericton Branch will be relaid with heavier rails this year.

Eastern Division.—The Board of Railway Commissioners has authorized the opening for traffic of the second track for one mile from the G.T.R. diamond at St. Johns, to St. Johns Station, Que. This completes the second track from Montreal terminal to St. Johns, on which 23.01 miles of track were laid during 1912.

A second track has also been laid from Quebec Jet. to Ste Therese, Que., 7.33 miles.

The reconstructed bridge over the St. Lawrence River at Lachine, which carries a double track line, was opened for traffic Jan. 14. It is not finally completed, as the two 408 ft. channel spans will not be floated into position until the spring.

Plans have been deposited in the Registry Office, Montreal, showing a line from the main line 750 ft. south from Fosythe St., Montreal, to lot 396, Longue Pointe, 4.35 miles.

Montreal Terminals, Etc.—Recent press reports state that a plan is being worked out for the electrification of a line from the Windsor St. station through Montreal West to a point northwest of the Mount Royal, where a new model suburban city is to be laid out. It is stated that work will be started early in the spring.

Campbellford, Lake Ontario and Western Ry.—C. W. P. Ransey, Engineer of Construction, is reported as stating, Feb. 14, that it is expected to have the line completed ready for traffic early in December next. The line, 185 miles in length, starts from the present Montreal-Toronto line near Glen Tay, runs southwesterly to the lake shore near Brighton, along the lake shore, south of the G.T.R., to Port Hope, thence parallel with the G.T.R. on the north side, to near Agincourt, where it joins the existing line into Toronto. At the end of February there were 3,100 men at work on the line, with 23 steam shovels. There are 80 bridge structures of various kinds, and 65% of the work on these has been completed. The principal bridge structures are:—A 700 ft. structure, 145 ft. high, 11 miles west of Glen Tay; a 1,600 ft. viaduct, 70 ft. high, at Trenton; a 1,700 ft. structure, 50 ft. high, at Port Hope, and a 1,000 ft. structure, 80 ft. high, at Dixey Creek. About 70% of the grading has been completed, and it is expected to begin track laying in April. This work will be started at Glen Tay, Enterprise, Belleville, Trenton, and near Agincourt. The new line has a gradient of 0.4% compensated; the maximum curvature is 4 degrees. With the exception of the first 75 miles west of Glen Tay, which was heavy rock work, the construction is average cut and fill.

Ontario Division.—We were officially advised recently in connection with press reports to the effect that plans for the immediate building of a second track between Woodstock and London, Ont., had been prepared, that nothing has been decided, and that there was no definite decision as to whether the work would be done. The data, however, for the building of a second track from Islington, where the present second track ends, 8.7 miles west of Toronto, to Guelph Jet., have been secured, and it is not improbable that this work will

be put in hand this year. In connection with this project press reports state that surveys have been made for a new double track line from Streetsville Jet. through Guelph, rejoining the main line at Galt.

The Board of Railway Commissioners has approved of location and plans for a new passenger station at Woodstock, Ont.

Lake Superior Division.—Six engineering parties are reported to be working between Sudbury and Port Arthur, Ont., completing surveys for second track work between these points. The work is in charge of D. Hillman, who opened an office at Sudbury, Ont., Feb. 1.

Manitoba Division.—The Board of Railway Commissioners has authorized the opening for traffic of the second track between mileage 92.4 and 98, from Winnipeg. This is on the second track construction from Portage la Prairie into Brandon.

We are officially advised that the branch lines under construction Dec. 31, 1912, were:—Gimli north, 26 miles; from Lauder to Boisvein, 37 miles; and a line from Virden to MacAuley, 22.5 miles.

Tenders are under consideration for the building of locomotive houses, frame stations and section houses at various points on the Pembina section. J. C. Holden's Division Engineer at Winnipeg.

Saskatchewan Division.—A second track is being built east and west of Moose Jaw, which will give a complete second track from Regina to Chaplin. Of this 35.5 miles were reported under construction Dec. 31, 1912, with track laid on 14.2 miles. A second branch is also under construction on the Swift Current subdivision, of which 38 miles were reported as being under construction, Dec. 31, with 20.2 miles of track laid thereon.

The lines under construction on the division Dec. 31, were officially reported to us as follows:—Weyburn westerly, 95 miles, on which 36.8 miles of track were laid during 1912; Estevan northwesterly, 55 miles, on which 20 miles o. track were laid during 1912; and Kerrobert north-easterly, 36 miles.

A Moose Jaw press report, Feb. 12, states that the work to be done there during the current year includes 12 miles of additional trackage in the yards, a new station, and some additions to the shops. About 40 miles of the branch line northwesterly is to be relaid with 85 lb. rails.

R. Armstrong, Superintendent, Saskatoon, is reported as stating, Feb. 4, that he expected a second track between that station and Sutherland would be built this year, and that a number of additional industrial spur lines would be laid down.

The Board of Railway Commissioners has authorized the opening for traffic of the second track from Caron to Mortlach, Sask., mileage 16.2 to 25.6.

Alberta Division.—The branch lines and extensions officially reported to us as being under construction Dec. 31, 1912, were:—An extension of the Calgary and Edmonton Ry. Lacombe Branch, for 46.7 miles easterly, on which 32.8 miles of steel had been laid; a line from Sterling on the Alberta Ry. and Irrigation Co.'s line, easterly for 25 miles; a line from Suffield south-easterly for 57.3 miles, on which 26.8 miles of track had been laid, and the Alberta Central Ry. for 65 miles west and north-west from Red Deer.

Location plans have been approved by the Board of Railway Commissioners for the following mileages on the Alberta Central Ry., west of Red Deer:—Mileage 0 to 40; mileage 60 to 65; mileage 73 to 108,

and mileage 140 to 179.42. Although there has been some grading done on the line, we are officially advised that no track was laid during 1912.

The Board of Railway Commissioners has approved of revised location of the main line from mileage 27.05, the junction with the British Columbia Southern Ry., to mileage 32.89, Kootenay District, B.C.

British Columbia Division.—The Kootenay Valley Ry. was officially reported to us on Dec. 31, to be under construction from Golden southerly for 60 miles, on which track had been laid for 41 miles, and from Colvalli northerly for 21.9 miles. The line will connect Golden on the British Columbia Division, with the Crownst branch at Colvalli, on the Alberta Division.

Track has been laid on the second track under construction east of Vancouver, from Vancouver to Pitt Meadows, 22.1 miles, and the traffic has been handled over the double track line since the end of 1912. This piece of line carries the second track as far as the head of the new yards which are being laid out at Coquitlam. The building of a second track is in progress as far east as Ruby Creek, 81 miles from Vancouver.

The excavation for the foundations of the new station at Vancouver are being made, the section of the work in progress being east of the present station on Granville St.

The following figures were given out in Vancouver, Feb. 7, as to the expenditures to be made during the current year on this division:—New terminals, etc., \$2,488,700; enlarging steamship and river service, \$360,700; bridge renewals and replacements, \$265,000; roadbed and track improvements, \$656,400; buildings, \$30,000; miscellaneous items, \$199,000.

Sir Thos. G. Shaughnessy, President, is reported as stating in New York, Feb. 5, that the new work to be undertaken on the western lines division includes the building of a four mile tunnel at the foot of the Selkirk Mountains.

On his way through Vancouver to Japan recently Vice President George Bury was reported as stating that large grain elevators would be built on the Pitt River, as a part of the development of the new yards at Coquitlam, but that the plans for this part of the development were still in the formative stage, both as regards the wharf accommodation and the elevators.

Track laying on the line on the north shore, known as the Port Moody and North Shore Ry. was reported completed Feb. 1. It is reported that it is intended to continue the line as far as the Bidwell Bay area, and then across the north arm of Burrard Inlet into North Vancouver.

Press reports state that tanks are to be built at Port Moody, Coquitlam, Mission Jet., Ruby Creek, and North Bend, for the storage of oil to be used in the engines running between Vancouver and North Bend.

The general programme for new lines, additions to existing lines, second track work, etc., on the western lines, to be undertaken during the current year were fully referred to in Canadian Railway and Marine World for February, pg. 76.

The Toronto, Hamilton and Buffalo Ry. is installing a telephone circuit for train dispatching, which is expected to be in operation in April. The dispatchers will be located at Hamilton as at present.

The Board of Railway Commissioners will take up the question of reciprocal demurrage, and its suggested application in Canada, at a sittings in Ottawa on April 15.

The Toronto, Hamilton and Buffalo Ry. is said to be arranging for telephone train dispatching.

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:—

Approval of Supplement 5 to Canadian Classification.

18495. Jan. 14. The application of Canadian Freight Association on behalf of the railway companies, under sec. 321 of the Railway Act, for an order approving of Supplement, no. 5, to Canadian Classification 15, and of a supplemental to the said no. 5, both containing certain proposed increased, reduced, and additional ratings. Notice of the proposed increased ratings having been given in the Canada Gazette, and the Board having invited consideration thereof by the Canadian Manufacturers' Association, the Montreal Chamber of Commerce, the Ontario Wholesale Grocers' Guild, and the Boards of Trade of Montreal, Toronto, Winnipeg, and Vancouver; and the increased ratings objected to having been withdrawn or modified. It is ordered that the said Supplement and Supplemental, consolidated, revised and amended, and designated "Proposed Supplement 5," filed for approval by G. C. Ransom, Chairman, Canadian Freight Association, by his letter of Dec. 2nd, 1912, and amended by his letters of Dec. 23, 1912, and Jan. 10, 1913, in lieu of those first submitted, be approved for consolidation with Canadian Classification 15, and Supplements 1, 2, 3 and 4 thereto: the new consolidated issue to be known as Canadian Freight Classification 16, and to become effective in Canada, March 1.

Export Dates on Pulpwood.

18577. Jan. 27. Re order 17286, Oct. 23, 1913, made upon the application of International Paper Co. and others, for an order disallowing tariffs of Canadian Pacific, Grand Trunk, Canadian Northern Quebec, and Temiscouata Railway Companies, increasing rates on pulpwood from Ontario, Quebec and New Brunswick to Eastern United States points, and suspending effective date of said tariffs until Feb. 4, 1913: it is ordered that the said tariffs be further suspended until March 1, 1913.

Rates on Ex-Lake Corn.

18578. Jan. 23. The application of Transportation Bureau of Montreal Board of Trade, for an order reducing the rate on ex lake corn for milling purposes from Georgian Bay ports to Montreal to the same basis as in effect on ex lake wheat, barley and oats, for milling purposes; and directing the C.P.R. to apply the mileage basis as in effect in Ontario and Quebec, as shown in its Tariff C.R.C. E1929, on corn meal shipped from Montreal to the company's points in New Brunswick. It is ordered:—1. That order 16394, dismissing the application for an order, as above stated, be confirmed. 2. That the mileage tariffs of the railway companies, from the ports of transshipment, on ex lake corn in carloads, for milling purposes, be revised so as to provide rates on the said corn that shall not, in any case, exceed the mileage tariff rates charged from the same ports of transshipment, and for the same distances, on ex lake wheat, oats, and barley in carloads, for milling purposes; the said revised tariffs to become effective not later than Feb. 10, 1913.

Classification of Paraffine Wax.

18581. Jan. 24. The application of E. A. Lesueur of Ottawa, for an order directing that paraffine wax, at present classified only under "Oils," be added also to the "Chemicals" list in Canadian Freight Classification. It is ordered that in the first supplement to Canadian Freight Classification 16 submitted for the Board's ap-

proval, paraffine wax be added to the "Chemicals" list of the said Classification, and continued in the "Oils" list as at present.

Regulations For Transportation of Explosives.

General Order 100. Jan. 16. Re application of Canadian Freight Association, on behalf of railway companies operating in Canada, for approval of the "Regulations for the Transportation of Explosives." Upon its appearing to the Board that the general public safety demands that the receiving, forwarding, and delivering of explosives by railway companies be protected by special regulations; that it is desirable that such regulations, so far as possible, be uniform with respect to shipments from a foreign country into or through Canada, or from Canada to a foreign country, as well as within Canada; and that the regulations submitted for approval are the same as those adopted by the Interstate Commerce Commission, revised and modified to conform to the provisions of the Railway Act and the requirements in Canada; and in pursuance of the powers conferred upon it by secs. 26, 30, 286, and 287 of the Act, and of all other powers possessed by the Board in that behalf—it is ordered that the said regulations, attached hereto marked "A," certified by the Chief Commissioner of the Board, be prescribed for the observance of railway companies within the legislative authority of the Parliament of Canada which accept explosives for carriage; that the said regulations come into force on March 1; and that upon and after that date order 7881, Aug. 27, 1909, be rescinded.

[Owing to the length of the regulations it is impossible to find room to print them here. Editor.]

Heated Cars for Perishable Freight.

General Order 101. Feb. 1.—Re application of Sanitaris, Limited, of Arrnprior, Ont., White & Co., of Toronto, the Board of Trade of Hamilton, and others, for an order directing railway companies to furnish during cold weather heated cars for the carriage of perishable freight: Whereas, by order 15819, Jan. 18, 1912, railway companies were directed forthwith to re-establish the system or systems in practice by them, during the winter of 1910-11, of carrying less than carload lots in heated cars, and to grant to shippers the rights and privileges of such shipping facilities in respect to such traffic as were in force upon their various lines during the said winter, until further order, or until the reasonableness of the withdrawal of such facilities could be passed upon by the Board; and whereas, by general order 98, Dec. 6, 1912, railway companies operating in Eastern Canada were required to furnish to any shipper a heated refrigerator car, or cars, for the carriage during cold weather of fruit, vegetables and eggs, in less than carload quantities, subject to certain conditions specified in the order; and whereas the C.P.R. Co. interprets the said general order as superseding order 15819, and has discontinued the heated car service in respect of freight shipments not specifically provided for in the general order, and notwithstanding the fact that it has been notified, under the direction of the Board, that the intention of the said general order was not in any way to cancel or supersede the provisions of the previous order, the company refuses to carry out the terms of order 15819; now therefore the Board orders that general order 98 shall not be taken or construed as in substitution for, or in cancellation of, order 15819, but as in addition thereto; and the C.P.R. is hereby directed forthwith to comply with and carry out the terms and requirements of order 15819.

Canadian Northern Railway Earnings, Etc.

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

| | Gross Earnings | Expenses | Net Earnings | Increase |
|-------|----------------|-------------|--------------|-----------|
| July | \$1,829,700 | \$1,335,100 | \$494,600 | \$133,000 |
| Aug. | 1,745,800 | 1,375,000 | 270,800 | 56,100 |
| Sept. | 1,671,500 | 1,248,000 | 423,500 | 4,100 |
| Oct. | 2,351,200 | 1,645,900 | 705,300 | 24,900 |
| Nov. | 2,503,700 | 1,631,900 | 877,800 | 212,600 |
| Dec. | 2,132,000 | 1,551,000 | 581,000 | 77,200 |
| | \$12,239,900 | \$8,736,900 | \$3,453,000 | \$507,900 |
| Incr. | \$1,905,200 | \$1,397,300 | \$507,900 | ..... |

The mileage operated at the end of 1912 was 4,297, against 3,856 at the end of 1911. Approximate earnings for Jan., \$1,513,400, against \$1,228,100 for Jan., 1912.

Canadian Pacific Railway Earnings, Etc.

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

| | Gross Earnings | Expenses | Net Earnings | Increase |
|-------|-----------------|-----------------|-----------------|--------------|
| July | \$12,052,398.58 | \$7,604,221.68 | \$4,448,176.90 | \$745,148.57 |
| Aug. | 12,251,715.87 | 7,533,790.21 | 4,717,925.66 | 642,354.65 |
| Sept. | 11,579,733.98 | 7,329,430.13 | 4,250,303.85 | 332,857.05 |
| Oct. | 13,060,397.80 | 7,999,510.61 | 5,060,887.19 | 379,782.44 |
| Nov. | 12,362,666.42 | 8,104,527.38 | 4,258,139.04 | 270,772.55 |
| Dec. | 12,219,278.72 | 7,823,559.21 | 4,395,719.51 | 289,989.25 |
| | \$73,596,191.37 | \$46,395,039.22 | \$27,131,152.15 | 2,660,904.51 |
| Incr. | \$10,959,825.38 | \$8,298,920.87 | \$2,660,904.51 | ..... |

Approximate earnings for Jan., \$9,519,000, against \$7,201,000 for Jan., 1912. The mileage operated was increased in Jan. to 11,458.

Grand Trunk Railway Earnings, Etc.

Subject to audit, the accounts for the half year ended Dec. 31, 1912, show the following results:—

| | |
|---|--------------|
| Gross receipts | \$22,463,849 |
| Working expenses | 16,249,476 |
| Net receipts | \$ 6,223,373 |
| Deduct debit balance on account of rentals, outside operation and car mileage | 424,177 |
| Total net revenue | \$ 5,799,196 |
| Net revenue charges for the half year, less credits | 2,473,473 |
| Balance | \$ 3,325,723 |
| Deduct C.A.R. deficit | \$344,552 |
| Deduct D.G.H. & M.R. deficit | 179,216 |
| Surplus | \$ 2,801,954 |

This surplus, added to the balance of \$41,395 from June, 1912, makes a total of \$2,843,450 available for dividend, which will admit of the payment of dividend for the half year on the 4% guaranteed stock, and first and second preference stocks, and a dividend of 2½% for the year on the third preference stock, leaving a balance of about \$61,849 to be carried forward. The accounts of the G.T. Western Ry., for the half year, after providing for the deficit of \$78,621 at June 30, 1912, show a surplus of \$24,455, which is carried forward to the current half year's accounts.

TRAFFIC RECEIPTS OF THE SYSTEM

Aggregate from Jan. 1 to Jan. 31:—

| | 1913 | 1912 | Increase |
|--------------------|-------------|-------------|-----------|
| G.T.R. | \$3,098,977 | \$2,581,543 | \$516,424 |
| C.A.R. | 176,774 | 160,910 | 15,864 |
| G.T.W.R. | 590,147 | 519,473 | 70,674 |
| D.G.H. & M.R. | 599,147 | 519,573 | 23,317 |
| Totals | \$4,051,022 | \$3,424,633 | \$626,389 |

Grand Trunk Pacific Railway Earnings.

The earnings for the portion of the line being operated by the company, viz., the Prairie Section and the Lake Superior Branch, with a mileage of 1,104 miles, for January produced a revenue of \$377,844.

In issuing the statement the company calls attention to a recent statement of the Chairman, to the effect that the results published for the first few months are for local traffic.

Press reports state that arrangements are being made for the absorption of the Esquimalt and Nanaimo Ry. into the C.P.R. system, the transfer to take place June 30. The E. and N. Ry. is owned by the C.P.R., but has so far retained its separate organization.

Birthdays of Transportation Men in March.

Many happy returns of the day to:—
 W. G. Annable, General Passenger Agent, C.P.R. Atlantic Steamship Lines, Montreal, born at Ottawa, Mar. 3, 1875.
 P. S. Archibald, M. Can. Soc. C.E., Commissioner New Brunswick Coal and Ry. Co.'s Railway, and General Manager, Elgin and Havelock Ry., Moncton, N.B., born at Truro, N.S., Mar. 21, 1848.
 George Bury, Vice President, C.P.R., Winnipeg, born at Montreal, Mar. 6, 1866.
 Allan Cameron, Superintendent, Land Branch, Department of Natural Resources, C.P.R., Calgary, Alta., born near Owen Sound, Ont., Mar. 14, 1864.
 F. G. J. Comeau, General Freight Agent, Dominion Atlantic Ry., Halifax, N.S., born at Meteghan River, N.S., Mar. 10, 1859.
 A. E. Cox, General Storekeeper, Canadian Northern Ry., Winnipeg, born at Huddersfield, Eng., Mar. 12, 1863.
 Hon. N. Curry, President, Canadian Car and Foundry Co., Montreal, born in King's county, N.S., Mar. 26, 1851.
 C. T. Delamere, Assistant District Engineer, C.N. Ontario Ry., Montreal-Port Arthur Line, Port Arthur District, Port Arthur, Ont., born at Brainerd, Minn., Mar. 18, 1881.
 Patrick Dube, Secretary-Treasurer, Montreal Tramways Co., Montreal, and President Canadian Street Railway Association, born at Montreal, Mar. 4, 1876.
 G. R. Fairhead, District Freight Agent, Canadian Northern Ry., Hamilton, Ont., born at Toronto, Mar. 6, 1882.
 C. Forrester, Superintendent, Stratford Division, Ontario Lines, G.T.R., Stratford, born at Wanstead, Ont., Mar. 5, 1876.
 C. O. Foss, M. Can. Soc. C.E., District Engineer, C.N. Ontario Ry. Montreal-Port John, N.B., born at Wentworth, N.H., Mar. 20, 1852.
 H. M. Gain, Trainmaster, Districts 6 and 7, Belleville Division, Eastern Lines, G.T.R., Belleville, Ont., born at Lindsay, Ont., Mar. 21, 1879.
 R. A. Gamble, Assistant General Yardmaster, C.P.R., Winnipeg, born at Dublin, Ireland, Mar. 1, 1876.
 H. W. Gays, General Manager, Ottawa and New York Ry., Ottawa, Ont., born at Brant, Erie Co., N.Y., Mar. 21, 1848.
 E. P. Goodwin, Inspecting Engineer, National Transcontinental Ry., Ottawa, Ont., born at Baie Verte, N.B., Mar. 17, 1865.
 J. Halstead, Division Freight Agent, C.P.R., Calgary, Alta., born at Bracebridge, Ont., Mar. 2, 1877.
 R. M. Hannaford, M. Can. Soc. C.E., Assistant Chief Engineer, Montreal Tramways Co., Montreal, born there, Mar. 22, 1865.
 C. A. Hayes, Freight Traffic Manager, G.T.R., Montreal, born at West Springfield, Mass., Mar. 10, 1865.
 H. T. Hazen, M. Can. Soc. C.E., Department of Railways and Canals, Ottawa, Ont., born at Truro, N.S., Mar. 14, 1870.
 Joseph Hobson, M. Can. Soc. C.E., Consulting Engineer, G.T.R., Hamilton, Ont., born at Guelph, Ont., Mar., 1834.
 N. J. Holden, President, The Holden Co., Ltd., Montreal, born at Nobleton, Ont., Mar. 22, 1866.
 A. R. Holtby, Master of Bridges and Buildings, Mountain Division, G.T.P.R., Prince Rupert, B.C., born at Rawdon, Que., Mar. 23, 1859.
 Frank Lee, M. Can. Soc. C.E., Principal Assistant Engineer, C.P.R., Winnipeg, born at Chicago, Ill., Mar. 7, 1873.
 R. W. Long, Division Freight Agent, G.T.R., Hamilton, Ont., born at Appin, Ont., Mar. 20, 1873.
 T. W. Lowe, General Boiler Inspector,

C.P.R. Western Lines, Winnipeg, born at Montreal, Mar. 30, 1858.

J. M. McKay, Superintendent, District 1, British Columbia Division, C.P.R., Revelstoke, born at Tiverton, Ont., Mar. 13, 1868.

Owen McKay, M. Can. Soc. C.E., Chief Engineer, Essex Terminal Ry., Walkerville, Ont., born in Ross tp., Renfrew co., Ont., Mar. 13, 1848.

H. H. McLean, K.C., M.P., Vice President, St. John Ry., St. John, N.B., born at Fredericton, N. B., Mar. 22, 1855.

Sir Donald D. Mann, Vice President, Mackenzie, Mann & Co., Ltd., and First Vice President Canadian Northern Ry., Toronto, born at Acton, Ont., Mar. 23, 1853.

D. J. Murphy, Jr., Superintendent of Transportation, Dominion Atlantic Ry., Kentville, N.S., born at Caledonia, Ont., Mar. 3, 1874.

C. B. Mutchler, Signal Engineer, G.T. Pacific Ry., Winnipeg, born at Pine Island, Minn., Mar. 8, 1879.

R. Patterson, Master Mechanic, G.T.R., Stratford, Ont., born at Brantford, Ont., Mar. 13, 1860.

F. W. Peters, General Superintendent British Columbia Division, C.P.R., Vancouver, born at St. John, N.B., Mar. 25, 1860.

E. H. Sewell, City Passenger Agent, C. P.R., Sherbrooke, Que., born at Quebec, Mar. 17, 1875.

C. J. Smith, General Manager, Richelieu and Ontario Navigation Co., Montreal, born at Hamilton, Ont., Mar. 10, 1862.

G. Somerville, agent, Canada Interlake Line, Toronto, born at Kingston, Ont., Mar. 21, 1855.

W. Y. Soper, Vice President, Ottawa Electric Ry. Co., Ottawa, Ont., born at Oldtown, Me., Mar. 9, 1854.

W. C. Starke, Travelling Car Service Agent, G.T.R., Montreal, born there, Mar. 9, 1867.

W. F. Tye, M. Can. Soc. C.E., ex-Chief Engineer, C.P.R., consulting engineer, Toronto, born at Haysville, Ont., Mar. 5, 1861.

G. W. Vaux, General Agent, Passenger Department, Union Pacific Rd., Chicago, born at Montreal, Mar. 21, 1866.

A. T. Weldon, General Freight and Passenger Agent, Black Diamond Steamship Line, Montreal, born at Dorchester, N.B., Mar. 6, 1876.

D. O. Wood, General Freight Agent for Ontario, Allan Line Steamship Co., Toronto, born at Kleinburg, Ont., Mar. 16, 1864.

Railway Finance, Meetings, Etc.

Canadian Pacific Ry.—A cable from Hamburg, Germany, states that \$5,000,000 of C. P.R. stock has been listed on the Bourse there.

Detroit River Tunnel Co.—The Windsor, Ont., City Council is seeking to have an agreement fixing the assessment of this company's tunnel and line at \$444,444.44, set aside. The agreement was only approved by the Ontario Railway and Municipal Board for one year. It was originally proposed to assess the value of the tunnel property to the water front at \$2,500,000, and it is now proposed to assess the property right to the middle of the river, making \$3,500,000 in all.

Duluth, South Shore and Atlantic Ry.—Equipment notes for \$310,000 at 4½%, dated Dec. 1, 1912, due \$31,000 half yearly from June 1, 1917, guaranteed by the C.P.R., have been placed on the New York market. These cover part cost of 400 ore cars, the total cost of which was \$391,750, the balance being paid in cash.

Maritime Coal Co.—Application was made to the New Brunswick courts, Feb. 5, for an order for the winding up of this company.

The hearing was adjourned to Mar. 5. The Von Hazen interests, controlling the company, are also interested in the North Shore Ry., running from Adamsville to Beersville, N.B., which gives an outlet for the produce of the M.C. Co.'s collieries to the Intercolonial Ry.

Minneapolis, St. Paul and Sault Ste. Marie Ry. Equipment notes, series E, for \$3,180,000, with interest at 4½%, dated Jan. 1, and due \$159,000 half yearly to Jan. 1, 1923, are being placed on the New York market at par. The equipment covered is all new and of large capacity, including 25 locomotives, 49 steel passenger and mail service cars, 1,500 steel frame box cars, 400 steel underframe ballast and flat cars, 300 ore cars and 20 cabooses.

Quebec Central Ry.—Holders of 7% income bonds, were required to surrender the same on or before Feb. 17, receiving in exchange their corresponding proportion of an issue of £338,000 of sterling 5% third mortgage bonds, redeemable in 50 years, issued under the provisions of chap 82, of the Quebec statutes of 1912. These bonds rank next after the 3½% second mortgage debentures, secured by the rental payable by the C.P.R., and principal and interest guaranteed by that company. In addition to the new bonds, the holders of the 7% income bonds, will receive a bonus of 10% of their face value in cash.

Holders of 3% second debenture stock were required to surrender the same on or before Feb. 17, receiving in exchange pound for pound, their proportion of an issue of £338,000 of 3½% second mortgage debenture stock, redeemable in 50 years. The new stock is a second charge on the company's property, and is secured by the rental payable by the C.P.R., and principal and interest is guaranteed by that company.

Toronto, Hamilton and Buffalo Ry.—There have recently been placed on the New York market, series A, 4½% equipment notes for \$1,500,000, maturing in 20 half yearly payments of \$75,000 each, to Feb. 1, 1923.

Victoria and Sidney Ry.—The Great Northern Ry. has increased its offer by \$15,000 and the Victoria, B.C., City Council has accepted it as a settlement of the claims against the V. and S. Ry. The province and the city guaranteed the company's bonds to the amount of \$300,000. The interest has been met by the province and the city for twenty years. The property was acquired by the Great Northern Ry. and negotiations have been going on as to betterments of the line. As a result of the bargain the G.N.R. will release the province and city from liability for the remaining years of the guarantee of interest, will pay the bonds on maturity, and will spend \$200,000 on betterments on the line. The amount to be paid in respect of interest already paid by the province and city is \$75,000. The agreement now only requires formal ratification.

White Pass and Yukon Route.—Gross earnings for 1912, \$1,131,501, against \$1,067,590 for 1911.

Wearing of Ear Mufflers by Trackmen.—The following circular has been issued by the General Manager of the Pennsylvania Rd. to all officers having in charge men working on tracks:—"The wearing of ear mufflers by trackmen renders their hearing less acute while being worn, and while it is not desirable to prohibit the practice of wearing mufflers, foremen should be warned to pay particular attention to the men who wear them, in regard to warning the men of approaching trains, and all foremen should be advised of this at once."

Transportation Appointments Throughout Canada.

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

Canadian Northern Ry.—JAS. H. CORMICK has been appointed Signal Engineer. Office, Winnipeg.

T. J. LOWE has been appointed Fuel Agent. Office, Winnipeg.

H. W. CULVER, heretofore locomotive driver, has been appointed Road Foreman of Locomotives, Winnipeg, vice J. A. Carroll, transferred to Winnipeg Joint Terminals' service.

J. M. BANNERMAN has been appointed Assistant to Chief Special Agent, General Claims Department, vice A. E. Macdonald, promoted. Office, Winnipeg.

P. K. MANAHAN, heretofore conductor, has been appointed Trainmaster, District 2, Western Division, vice F. W. Ross, transferred to North Battleford, Sask. Office, Saskatoon, Sask.

W. C. TURNER, heretofore Yardmaster, Saskatoon, Sask., has been appointed Assistant Trainmaster, District 2, Western Division, Saskatoon, and not Trainmaster, as mentioned in our last issue.

G. L. POUCHER has been appointed Yardmaster, Saskatoon, Sask., vice W. C. Turner, promoted.

F. W. ROSS, whose appointment as Trainmaster, District 3, Western Division, vice B. T. Chappell, was announced in our last issue, has his office at North Battleford, Sask., and not at Edmonton, Alta., as then mentioned.

F. CLARK, heretofore Assistant Locomotive Foreman, Dauphin, Man., has been appointed Locomotive Foreman at Radville, Sask., vice R. H. Mann, assigned to other duties.

R. H. MANN, heretofore Locomotive Foreman at Radville, Sask., has been appointed Night Foreman, there. This is a new position.

Canadian Pacific Ry.—N. DES BRISAY, who resigned the position of Travelling Passenger Agent, St. John, N.B., Oct. 31, 1912, to enter private business in Halifax, N.S., has resumed that position.

W. B. WAY, heretofore Assistant Superintendent, District 3, Eastern Division, Montreal, has been appointed Superintendent, District 1, Eastern Division, vice J. K. McNeillie, transferred. Office, Farnham, Que.

J. E. MORAZAIN, heretofore General Agent, Operating Department, Quebec, has been appointed Assistant Superintendent, District 3, Eastern Division, vice W. B. Way, transferred. Office, Montreal.

J. K. McNEILLIE, heretofore Superintendent, District 1, Eastern Division, Farnham, Que., has been appointed Superintendent, District 2, (Montreal Terminals), Eastern Division, vice J. R. Gilliland, transferred. Office, Montreal.

W. A. COOPER, heretofore General Superintendent, Sleeping, Dining and Parlor Cars and News Service, has been appointed Manager, same department. Office, Montreal.

A. RUTLEDGE, heretofore Assistant to General Superintendent, Sleeping, Dining and Parlor Cars and News Service, Montreal, has been appointed General Superintendent, same department, Eastern Lines. Office, Montreal.

T. G. HAWKINS, heretofore Inspector, Sleeping, Dining and Parlor Cars and News Service, has been appointed Assistant to General Superintendent, same department, Eastern Lines. Office, Montreal.

W. H. POWER, heretofore Car Agent, Sleeping, Dining and Parlor Cars and News Service, Glen Yards, Montreal, has been ap-

pointed Second Assistant Superintendent, same department. Office, Glen Yards, Montreal.

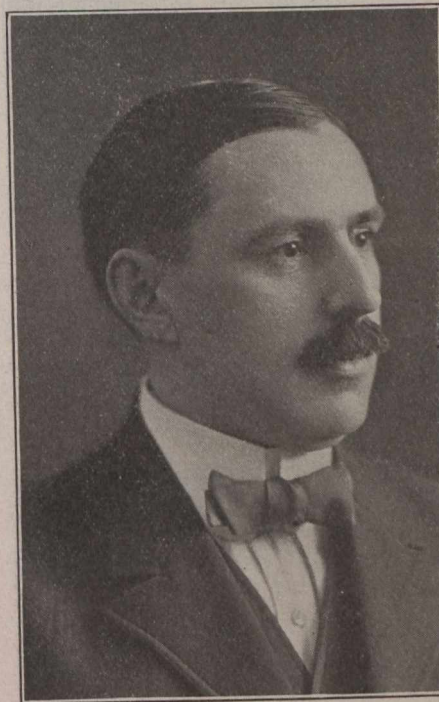
C. E. BENJAMIN, heretofore General Tourist Agent, has been appointed General Passenger Agent, Pacific Steamship Service. Office, Montreal.

J. R. GILLILAND, heretofore Superintendent, District 2, Eastern Division, Montreal, has been appointed Superintendent, District 5, Eastern Division. Office, Smiths Falls, Ont.

W. K. THOMPSON, heretofore Superintendent, District 3, Ontario Division, Toronto, has been appointed Superintendent, District 1, Ontario Division, vice T. Collins, transferred. Office, Toronto.

T. COLLINS, heretofore Superintendent, District 1, Ontario Division, Toronto, has been appointed Superintendent, District 4, Ontario Division, vice W. Coulter, transferred. Office, Toronto.

W. COULTER, heretofore Superintendent, District 4, Ontario Division, Toronto, has



W. A. Cooper,
Manager, Sleeping, Dining and Parlor Cars and
News Service, Canadian Pacific Ry.

been appointed Superintendent, District 3, Ontario Division, vice W. K. Thompson, transferred. Office, Toronto.

A. BAYARD SMITH, heretofore Relieving Agent, Sleeping, Dining and Parlor Cars and News Service, has been appointed Assistant Superintendent, same department. Office, Toronto.

P. G. CROMAR, heretofore Assistant Superintendent, District 3, Lake Superior Division, Schreiber, Ont., has been appointed General Yard Foreman, Ottawa, vice T. A. Wilson, promoted.

T. A. WILSON, heretofore General Yard Foreman, Ottawa, has been appointed Assistant Superintendent, District 3, Lake Superior Division, vice P. G. Cromar, transferred to Ottawa. Office, Schreiber, Ont.

H. F. MATHEWS, heretofore Assistant General Superintendent, has been appointed General Superintendent, Sleeping, Dining and Parlor Cars and News Service, Western Lines. Office, Winnipeg.

R. LOCKHART, heretofore Assistant Superintendent, Sleeping, Dining and Parlor

Cars and News Service, Winnipeg, has been appointed Assistant to General Superintendent, same department, Western Lines. Office, Winnipeg.

J. M. WILLARD, heretofore Inspector, has been appointed Assistant Superintendent, Sleeping, Dining and Parlor Cars and News Service, Manitoba Division, vice R. Lockhart, promoted. Office, Winnipeg.

D. S. FRASER, heretofore Inspector, has been appointed Assistant Superintendent, Sleeping, Dining and Parlor Cars and News Service, Manitoba Division. Office, Winnipeg.

A. T. SHORTT, heretofore Master Mechanic, Alberta Division, Calgary, has been appointed Superintendent of Ogdan Shops, Calgary, Alta.

G. W. WHITELEY, heretofore District Master Mechanic, Moose Jaw, Sask., has been appointed Master Mechanic, Alberta Division, vice A. T. Shortt, transferred. Office, Calgary, Alta.

J. H. McNEILL, heretofore Agent, Sleeping, Dining and Parlor Cars and News Service, Calgary, Alta., has been appointed Second Assistant Superintendent, same department, Alberta Division. Office, Calgary.

R. CUSHMAN, heretofore Soliciting Freight Agent, Winnipeg, has been appointed District Freight Agent, Saskatoon, Sask., vice E. Black, who has resumed his former position as chief clerk, Division Freight Office, Calgary, Alta.

H. G. GANSON, heretofore Superintendent, Sleeping, Dining and Parlor Cars and News Service, District 5, Vancouver, B.C., has been appointed Assistant General Superintendent, same department, Western Lines. Office, Vancouver.

F. A. TINGLEY, heretofore Assistant Superintendent, Sleeping, Dining and Parlor Cars and News Service, Vancouver, B.C., has been appointed Superintendent, same department, British Columbia Division. Office, Vancouver.

W. H. PRATT, heretofore Agent, Sleeping, Dining and Parlor Cars and News Service, Vancouver, B.C., has been appointed Assistant Superintendent, same department, British Columbia Division. Office, Vancouver.

The Dominion Express Co. will act as C.P.R. Freight and Passenger Agents for Manchester and district, Eng., reporting to London. Office, 1 Mount St., Manchester.

F. GLANZMANN & CO. are reported to have been appointed agents for the company's Austria-Canada steamship service, at Trieste, Austria.

S. ALTMAN is reported to have been appointed agent for the company's Austria-Canada steamship service, at Vienna, Austria.

Central Vermont Ry.—G. C. JONES, General Manager, has also been appointed Vice President, in charge of construction, transportation and maintenance. Office, St. Albans, Vt.

M. M. REYNOLDS, Vice President, G.T.R., and G.T.P.R., has also been appointed Vice President, C.V.R., in charge of financial and accounting departments. Office, Montreal.

S. S. RUSSELL, heretofore Superintendent of Car Service, has been appointed General Superintendent of Transportation, and his previous position has been abolished. Office, St. Albans, Vt.

T. A. SUMMERSKILL has been appointed Superintendent of Motive Power, vice J. E. Fitzsimons, acting Superintendent of Motive Power, transferred. Office, St. Albans, Vt.

J. F. KEEFE, heretofore Trainmaster, St. Albans, Vt., has been appointed Superintendent, Northern Division, vice C. E. Soule, resigned. Office, St. Albans, Vt.

J. E. FITZSIMONS, heretofore acting Superintendent of Motive Power, St. Albans,

Vt., has been appointed Master Mechanic. Office, St. Albans, Vt.

J. R. FITZGERALD, heretofore Yardmaster, has been appointed Trainmaster, Districts 3 and 4, vice J. F. Keefe, promoted. Office, St. Albans, Vt.

JOHN McCRAW, heretofore General Agent, New London, Conn., has been appointed acting Superintendent, Southern Division, vice W. E. Costello, resigned. Office, New London, Conn.

E. J. GUTHRIE, heretofore agent, Brattleboro, Vt., has been appointed agent at New London, Conn., vice J. McCraw, promoted.

C. J. GIBBS, heretofore cashier, has been appointed agent at Brattleboro, Vt., vice E. J. Guthrie, transferred.

Grand Trunk Ry.—G. H. JENKINS, heretofore chief clerk to General Purchasing Agent, has been appointed Assistant to General Purchasing Agent. Office, Montreal.

W. S. MacCULLOCH has been appointed Assistant Engineer, Montreal Division, Eastern Lines. Office, Montreal.

W. E. WEEGAR, heretofore conductor, has been appointed Passenger Trainmaster, Eastern Lines, vice H. M. Gain, whose appointment as Trainmaster, Districts 6 and 7, Belleville Division, Eastern Lines, Belleville, Ont., was announced in our last issue. Office, Montreal.

C. FRENCH, heretofore dispatcher, Belleville, Ont., has been appointed Chief Dispatcher, Belleville Division, Eastern Lines, vice T. Cushing, appointed Trainmaster, Richmond, Que., as announced in our last issue. Office, Belleville, Ont.

H. A. PALMER has been appointed Assistant Engineer, Toronto Terminals. Office, Toronto.

JOHN GRAY, whose appointment as General Agent, Toronto, was announced in our last issue, has been appointed Freight Agent, there.

D. McCOOE, heretofore Superintendent of Grade Separation, Toronto, has been appointed Superintendent of Track, Toronto Terminals.

S. L. TRUSLER, heretofore Passenger Trainmaster, Toronto, has been appointed Passenger Trainmaster, Ontario Lines. Office, Toronto.

W. J. PIGGOTT, heretofore Trainmaster, Allandale, Ont., has been appointed Trainmaster, Districts 11 and 14, including Allandale Yard, Barrie Division, Ontario Lines. Office, Allandale.

W. J. LITTLE, heretofore Passenger Trainmaster, Northern Division, Allandale, Ont., has been appointed Trainmaster, District 12, Barrie Division, Ontario Lines. His former position has been abolished. Office, Allandale.

JAS. BOYD, heretofore in Resident Engineer's Office, Toronto, has been appointed Assistant Engineer, Hamilton Division, Ontario Lines. Office, Hamilton.

J. WILSON, heretofore Foreman of Bridges and Buildings, Hamilton, Ont., has been appointed Supervisor of Bridges and Buildings, Hamilton Division, Ontario Lines. Office, Hamilton.

G. STILSON, heretofore Roadmaster, Hamilton, Ont., has been appointed Supervisor of Track, Districts 17 and 19, Hamilton Division, Ontario Lines. Office, Hamilton.

C. O'DELL, heretofore Roadmaster, Toronto, has been appointed Supervisor of Track, Districts 13 and 16, Hamilton Division, Ontario Lines. Office, Hamilton.

E. O. DUNN, heretofore dispatcher at London, Ont., has been appointed Chief Dispatcher at Brantford, Ont.

L. I. STONE has been appointed Assistant Engineer, London Division, Ontario Lines. Office, London.

W. A. SIEGNER has been appointed As-

sistant Engineer, Stratford Division, Ontario Lines. Office, Stratford.

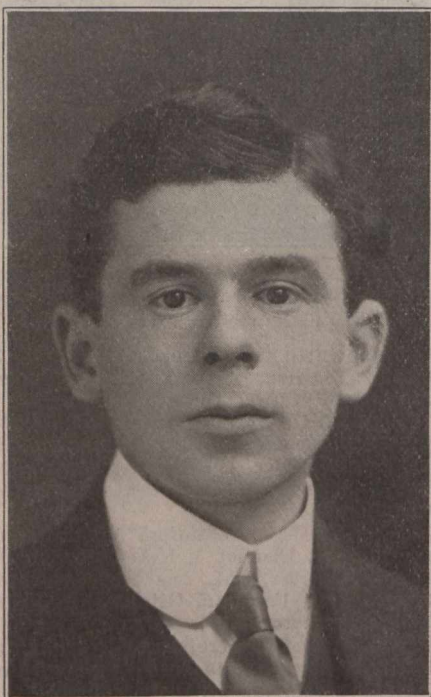
WALTER WHITE, heretofore Trainmaster, Palmerston, Ont., has been appointed Trainmaster, Districts 22 and 23, Stratford Division, Ontario Lines. Office, Palmerston,



P. J. Flynn,
Manager, Fort Garry Union Terminals, Winnipeg.

and not Stratford as stated in our last issue.

F. P. SISSON, heretofore Resident Engineer, Detroit, Mich., has been appointed Assistant Engineer, Detroit Division, Western Lines. Office, Detroit.



G. Cobb,
Superintendent, Reid Newfoundland Co.

H. G. BATTEN, heretofore draughtsman, has been appointed Supervisor of Bridges and Buildings, Detroit Division, Western Lines. Office, Detroit, Mich.

O. H. SESSIONS, heretofore Assistant Engineer, Detroit, Mich., has been appointed

Assistant Engineer, Chicago Division, Western Lines. Office, Battle Creek, Mich.

G. SANDERS, heretofore Bridge and Building Foreman, Durand, Mich., has been appointed Supervisor of Bridges and Buildings, Chicago Division, Western Lines. Office, Battle Creek, Mich.

J. COTTER, heretofore Roadmaster, Battle Creek, Mich., has been appointed Supervisor of Track, from milepost 122, District 26, to milepost 252, District 25, Chicago Division, Western Lines, and his former position has been abolished. Office, Battle Creek, Mich.

H. E. BAILES, heretofore locomotive driver, has been appointed Trainmaster, District 25, including Battle Creek Terminals and exclusive of Durand and Port Huron Terminals. Office, Battle Creek, Mich.

R. KELLEY, heretofore conductor, has been appointed Trainmaster, District 26, Chicago Division, Western Lines. Office, Battle Creek, Mich.

W. J. HOGAN, heretofore Master of Transportation, Durand, Mich., has been appointed Trainmaster, Pontiac, Oxford and Northern Ry., and District 29, exclusive of Detroit and Port Huron Terminals. His former position has been abolished. Office, Pontiac, Mich.

C. HAWKINS, heretofore Roadmaster, Pontiac, Mich., has been appointed Supervisor of Track, Pontiac, Oxford and Northern Ry., and from milepost 35 at Pontiac, to Jackson, District 29. His former position has been abolished. Office, Pontiac, Mich.

J. LOCKHART, heretofore Roadmaster, Grand Rapids, Mich., has been appointed Supervisor of Track, from milepost 79 to Grand Haven District 27, and Ashley to Muskegon, District 28. His former position has been abolished. Office, Grand Rapids, Mich.

O. F. CLARK, heretofore Trainmaster, Pontiac, Mich., has been appointed Superintendent of Transportation of Western Lines, including Districts 25, 26, 27, 28, 29, and Pontiac, Oxford and Northern Ry., with direct supervision over all matters pertaining to transportation. Office, Chicago, Ill. The position of Master of Transportation, hitherto held by W. J. Hogan, Durand, Mich., has been abolished.

H. W. MATTHEWS, heretofore Trainmaster, Port Huron, Mich., has been appointed Passenger Trainmaster, Western Lines, including Districts 25, 26, 27, 28, 29, and Pontiac, Oxford and Northern Ry. Office, Durand, Mich.

J. MULLIN, heretofore Roadmaster, Durand, Mich., has been appointed Supervisor of Track, from milepost 7 to 79, District 27, Richmond to Milepost 35 at Pontiac, District 29. His former position has been abolished. Office, Durand, Mich.

G. B. PERDUE, heretofore General Yardmaster, Sarnia Tunnel, Port Huron, Mich., has been appointed Trainmaster, Districts 27 and 28, Detroit Division, Western Lines. Office, Durand, Mich.

F. TRANZOW, heretofore Roadmaster, Durand, Mich., has been appointed Supervisor of Track, from milepost 252, District 25, to Port Huron, including C.S. & M. District 25. His former position has been abolished. Office, Durand, Mich.

H. PLOWMAN, heretofore Roadmaster, Detroit, Mich., has been appointed Supervisor of Track, from Detroit to milepost 7, District 27, including Port Huron Terminals. His former position has been abolished. Office, Milwaukee Jet., Mich.

J. NOLAN, heretofore Roadmaster, Valparaiso, Ind., has been appointed Supervisor of Track, from Chicago to milepost 122, District 26, Chicago Division, Western Lines. His former position has been abolished. Office, Valparaiso, Ind.

T. T. IRVING, heretofore Trainmaster, Durand, Mich., has been appointed Division Engineer, Western Lines. Office, Chicago, Ill.

C. O. BUSBEY, heretofore Resident Engineer, Durand, Mich., has been appointed Superintendent of Bridges and Buildings, Western Lines. Office, Chicago, Ill.

J. H. REAGAN, heretofore General Roadmaster, Battle Creek, Mich., has been appointed Superintendent of Track, Western Lines. Office, Chicago, Ill.

Grand Trunk Ry.-Wabash Road.—J. C. CROMBIE, heretofore Master of Transportation, G.T.R., London, Ont., has been appointed Joint Superintendent, G.T.R. and Wabash Rd., vice C. G. Bowker, appointed General Superintendent, Eastern Lines, G. T.R., Montreal. Office, St. Thomas, Ont.

Intercolonial Ry., Prince Edward Island Ry.—D. M. CONDON, heretofore chief clerk to General Passenger and Ticket Agent, Moncton, N.B., has been appointed acting District Passenger Agent, Halifax, N.S., vice J. B. Lambkin, resigned.

Lehigh Valley Rd.—W. H. FLETCHER has been appointed Freight Agent, Buffalo, N.Y., vice C. I. Heckman, promoted.

C. I. HECKMAN, heretofore Freight Agent, Buffalo, N.Y., has been appointed Lake Freight Agent, Tift Farm, Buffalo, N.Y., vice P. J. Fretz, transferred.

Montreal and Southern Counties Ry.—W. WAINWRIGHT, Vice President, G.T.R. and G.T. Pacific Ry., has also been appointed President, M. & S.C.R., vice E. H. Fitzhugh, resigned.

New York Central and Hudson River Rd.—MILES BRONSON, heretofore Superintendent of the Electric Division, has been appointed General Superintendent of the Electric Division, vice A. R. Whaley, resigned, and has also been appointed Terminal Manager. Office, Grand Central Terminal, New York.

GARRET H. WILSON, heretofore Assistant Superintendent, Grand Central Terminal, has been appointed Superintendent of the Electric Division, vice Miles Bronson, promoted, and has also been appointed Superintendent, Grand Central Terminal. Office, New York.

Reid Newfoundland Co.—H. J. RUSSELL has been appointed Assistant to the Superintendent, St. John's, Nfld.

J. B. MURPHY, heretofore dispatcher, has been appointed Chief Dispatcher, vice G. Cobb, appointed Superintendent, as announced in our last issue. Office, St. John's, Nfld.

J. E. ANGEL has been appointed General Foreman, Railway and Marine Shops, St. John's, Nfld.

Robt. Reford Co.—J. J. BRIGNEALL, heretofore Travelling Passenger Agent, C.P.R., Toronto, has been appointed Travelling Passenger Agent, Robt. Reford Co., Agents, Donaldson Line, Toronto, vice J. J. Rose, resigned.

Union Pacific System.—The Traffic Department representation heretofore joint with the Southern Pacific Co., was discontinued Jan. 31.

J. J. ROSE, heretofore Travelling Passenger Agent, Robt. Reford Co., Toronto, has been appointed Canadian Passenger Agent, U.P. System, vice G. W. Vaux, promoted. Office, Toronto.

D. E. BROWN & McCAULEY, Ltd., have been appointed ticket agents, Vancouver, B.C.

J. B. COURTRIGHT has been appointed Travelling Freight and Passenger Agent, Vancouver, B.C.

G. W. VAUX, heretofore Passenger Agent, Toronto, has been appointed General Agent, Passenger Department, Chicago, Ill.

J. GOODSSELL, heretofore Travelling Pas-

senger Agent, Detroit, Mich., has been appointed City Passenger and Ticket Agent, Chicago, Ill.

Wabash Rd.—J. A. SULLIVAN, heretofore Local Freight Agent, Detroit, Mich., has been appointed Division Freight Agent, there, vice E. H. B. Cull, deceased.

Winnipeg Joint Terminals (Fort Garry Union Station) Winnipeg.—J. A. CARROLL, heretofore Road Foreman of Locomotives, C.N.R., Winnipeg, has been appointed Locomotive Foreman, C.N.R., G.T.P.R., and National Transcontinental Ry. Joint Terminals, Winnipeg.

Recent Saska'chewan Legislation.

The following acts affecting transportation interests have been passed by the Saska'chewan Legislature:—

Canadian Northern Ry.—Amending previous acts guaranteeing certain securities for the construction of branch lines.

Grand Trunk Pacific Branch Lines Co.—Amending previous acts guaranteeing certain securities for building of branch lines. Also an act providing aid towards con-



S. S. Russell, General Superintendent of Transportation, Central Vermont Railway.

struction of terminals for G.T.P.B.L. Co. and G.T.P. Saska'chewan Ry. in Regina, Saska'toon and Prince Albert.

Railways.—Amending act respecting Department of Railways, Telegraphs and Telephones, and an act creating a separate Department of Railways.

Saska'chewan Co-operative Elevator Co.—Confirming agreement made Dec. 6, 1912, between the Government and the company.

Toronto, Hamilton and Buffalo Railway Earnings, Etc.

The following figures for the calendar year 1912 have been given out:—

| | 1912. | Increases. |
|-----------------------------|-------------|------------|
| Operating revenue | \$1,695,000 | \$438,988 |
| Operating expenses | 872,000 | 145,224 |
| Net earnings | \$ 823,000 | \$293,764 |
| Other income | 50,000 | 9,679 |
| Gross corporate income .. | \$ 873,000 | \$303,443 |
| Interest and equipment hire | 321,000 | 51,551 |
| Surplus | \$ 552,000 | \$251,892 |

Dominion Railway Subsidy Contracts.

The Dominion Government has entered into a contract, providing a subsidy for the construction of a line as follows:—

CENTRAL RY. OF CANADA.—Feb. 7. —From Ste. Agathe des Monts station toward Howard Tp., Argenteuil Co., Que., passing near Lake St. Joseph and St. Mary in a southerly direction, 15 miles.



DEPARTMENT OF RAILWAYS AND CANALS.

Car Ferry Terminal, Carleton Point, Prince Edward Island.

SEALED TENDERS, addressed to the undersigned, and marked "Tender for Car Ferry Terminal, Carleton Point," will be received at this office until 16 o'clock on Tuesday, March 25th, 1913.

Plans, specifications and form of contract to be entered into can be seen on or after February 20th, at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa, at the office of the Chief Engineer of the Intercolonial Railway at Moncton, N.B., and at the office of Horace McEwen, Superintendent of the Prince Edward Island Railway, Charlottetown, P.E.I.

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

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

An accepted bank cheque for the sum of \$50,000.00, 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, 18th February, 1913.

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

CANADIAN PACIFIC RAILWAY COMPANY.

North Toronto Grade Separation.

NOTICE TO CONTRACTORS.

SEALED proposals will be received by the undersigned up to 12 o'clock noon on Thursday, March 20, for the construction of the substructures of subways at Davenport Road, Spadina Road, Howland Avenue, and Bathurst Street, at North Toronto.

Plans and specifications can be seen at the office of the Engineer of Grade Separation at No. 262 Avenue Road, where proposal forms can also be obtained.

The lowest, or any tender, not necessarily accepted.

B. RIPLEY,

Engineer of Grade Separation.

Toronto, February 20th, 1913.

Electric Railway Department.

The Montreal Tramways Company's New Shops.

These shops have recently been opened for repair work, although the rolling stock department has been housed in its new offices in the shops for the last 18 months. The shops are situated near the village of Youville, a suburb of Montreal, near the Montreal Park and Island Ry's, Sault au Recollet line, about half a mile beyond the terminus of the St. Denis Street line of the city service.

The site, on Vervais Road, is about 30 acres in extent, with a frontage of 576 ft., and an average depth of about 2,000 ft. The shops are situated about half way back in this tract. The site being off the railway

trolley on a projecting platform adjoining. The runway has a cinder floor.

The building is built of brick throughout, on concrete foundations, with large window spaces on all sides. In consequence, the light penetrates into the centre of the shop at the transfer table. In addition, the skylights in the roof assist materially in making the interior light at all times during the day.

The transfer table runway is spanned by a 70 ft. truss, the nature of which is shown in figs. 1 and 2, and the interior view in fig. 4, the highest part of the building shown being the monitor that runs the full

section of the shop, the length of the car hoist, is chambered out beneath at the same level as, and parallel to, the pit. The hoist screw passes through into this lower chamber, and is supported on a vertical thrust block nut in this chamber floor. On each of the screws, just above the chamber floor, is a worm gear, engaging with a worm on a shaft near the floor, parallel with the pit. The end of the parallel shaft on each side of the pit, mesh with bevel gears on the end of a cross shaft in the pit at the transfer table end. This shaft is an old 12A (30 h.p.) motor. Between each hoist, on the column next to the transfer table,



Fig. 1.—Montreal Tramways Co.'s New Plant, viewed from the South.

line, a special spur had to be built along Vervais Road from the St. Denis Street line.

The plant consists of a main building and several minor buildings at points around it, the majority having a direct connection, making an admirable arrangement for intercommunication in cold weather. The plant, looking at the south and north sides, is shown in figs. 1 and 2, respectively, and the plan of the shops and grounds, with approaches, in fig. 3.

The dimensions of the main building are approximately 425 ft. long by 269 ft. wide.

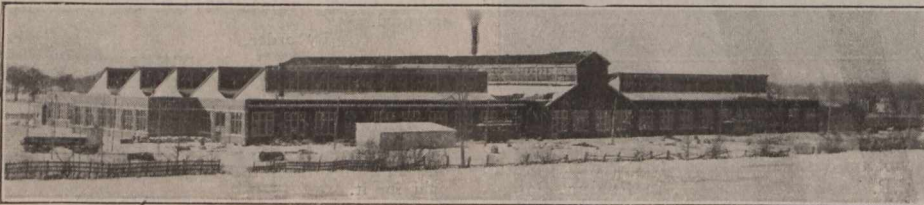


Fig. 2.—Montreal Tramways Co.'s New Plant, looking at the North Side.

Essentially, the main building consists of two units under the one roof, the two sections being separated by a transfer table down the centre between the two parts. In this particular, the shops are unique, the practice of covering in the transfer table not being usual. In the peculiar climatic conditions with which the rolling stock department is called upon to cope, an outside transfer table would be the source of a great deal of trouble from blocking up with snow in winter. The transfer table, fig. 4, 70 ft. 8 ins. wide, operates in a runway 346 ft. long, which contains three standard gauge tracks, laid with 80 lb. rails, on which the table operates. The motive power is a small, discarded electric railway motor, mounted on a projecting platform of the transfer table, and operated by a con-

length of the runway. The sides of the monitor have swing sashes, operated from one end by a shaft.

The front section of the shop is what may be termed the motive power section, as all the repairs to the running gear and motors are attended to in it. This part of the shop is further subdivided into six sub sections—car hoists, overhauling section, wheel and axle shop, blacksmith shop, machine shop, and armature shop, all these several departments centering on the overhauling department, located down the centre of this half of the building.

Cars to be overhauled enter the building by the doors at either end, the principal entry being from the door to the south. Running on the transfer table, a car is quickly spotted on the required repair track, of which there are 14, laid with 80 lb. rails. Twelve of these repair tracks are equipped with car hoists, a construction that is rather novel in Canadian car shop practice. The construction and operating mechanism of the hoist is shown in figs. 5 and 6. The hoists are ranged in a row, just far enough back from the edge of the transfer table runway to give a clear passage way along that side.

On each side of the pit, at 10 ft. centres, is a 30 ft. length of 12 by 5 in. I beam, mounted on the upper ends of two 4 in., 3/4 in. pitch, square threaded screws. This

there is an old K10 controller, above which is mounted a double throw switch, by which means either of the hoists can be operated at will.

In the use of the car hoists, it is the practice to place a section of I beam across the pit at the ends of the side I beams, under the ends of the cars, as shown in fig. 6, and by raising the screws by the motor the car body can be raised from its trucks and the latter run out, when the car body can again be lowered to a more convenient height for working, or if desired, lowered on shop trucks for removal to the paint or erecting shop, for further repairs, if the nature of the repairs is such that it would not be desirable to await the repair of the trucks before proceeding for final finishing. These car hoists have been found to be of great value in assembling new cars as received from the factory. The bodies, as received on the flat cars, can be raised, the flat car run out and the trucks run into position and the body lowered thereon.

The pits, both under the car hoists and further back in the shop, are of concrete construction throughout. Under the car hoists, there is a supporting wall under the rail, but the balance is chambered along the hoist shaft as mentioned, with a concrete floor, and a reinforced concrete main floor over top. The extension of the pit in the overhauling department is similar in construction, with the absence of the side shaft tunnel chambers. At that end of the pit, there are also steps to the level of the shop floor. The total length of the pits, hoist and overhauling, is 87 ft. 10 ins., with a depth of 4 1/2 ft. Between the hoist and overhauling sections of the pits, there is an uninterrupted passage under the tracks, where the track supporting wall is cut away, permitting access between pits. On the floor of the pit, and running the full length of each, is a 4 ft. gauge track for a small car, on which the motor and

under gear of the car can be lowered, and run along to the centre of the overhauling pit, where the parts can be raised from the pit by the jib cranes on the adjoining posts, there being a jib for each pit. The jibs and overhauling section are shown in the background in figs. 8 and 9. It will be noticed that the trucks as run out from under the cars at the hoists, are spotted over the pits in the overhauling section, shown at the far end of the pit, fig. 6, and there dismembered when required. On low benches adjoining, the motors and equipment as

transfer table and brought down the shop to this track, adjoining the wheel and axle department. Between the axle straightener and the wheel boring mill, there is a space used for the interior storage of wheels before and after machining, stacked in piles out from the wall as in the background in fig. 7. A stock of wheels for this department is maintained in a small frame building across the outside track from the side entrance.

The blacksmith shop occupies that portion of the shop in the immediate fore-

The blacksmith shop is equipped with a liberal supply of machines for the efficient handling of all classes of repair work. This equipment consists of the following: cold saw, punch and shear, 4 by 2 ft. oil furnace, air hammer, 6 ft. square oil furnace, bulldozer, dry grinder, and 6 down draft forges. The forced draft and exhaust fans for these six forges are located along the north wall, driven from the line shafting of the wheel and axle department. The exhaust from the forges is discharged through a pipe that rises to the roof directly over



Fig. 4.—Covered in Transfer Table which centrally divides the Shops.

removed may be mounted and kept conveniently together while undergoing repair. The parts that require machine or forge work can be brought across into those sections in front of the overhauling department.

Along the north wall of the shop is located the wheel and axle department. The layout of this is shown in fig. 3, and the arrangement in fig. 7. Ranged along the wall in this department are all the machines, which include a steel wheel

ground in fig. 8, an area of 71 by 66 ft. The floor of this department is of the usual cinder form, in which it differs from that in the balance of the shop, which has a more solid construction. The original intention was to have a solid concrete floor, but this plan has been modified in the constructed building, the floor consisting of a layer of concrete on a cinder bed, the concrete being superimposed with a 2 in. layer of bitulithic pavement. This covering has the advantage of

the exhaust fan. The blast and exhaust of the forges passes through pipes bedded in the concrete floor so that the whole blacksmith shop is remarkably free from overhead obstructions. The air hammer used in the department is an upright steam hammer using compressed air as the operating medium instead of steam, the exhaust discharging into the shop over top of the machine.

Something new in the manner of handling the bar iron stock in the blacksmith

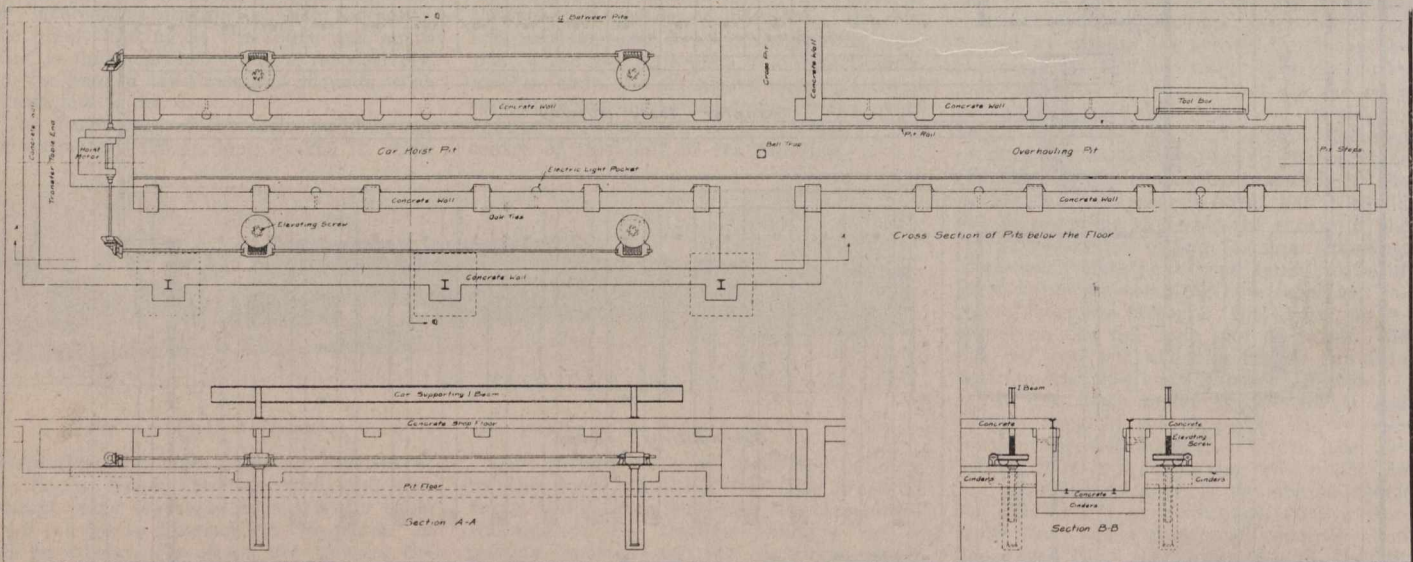


Fig. 5.—Details of One of the Twelve Car Hoists.

lathe, wet tool grinder, axle straightener, wheel boring machine, wheel press and an axle lathe. These machines are all on a group drive, with overhead shafting along the wall. In front of the boring machine and axle lathe are air hoists, suspended on an I beam parallel to the line of the machines, with local air hoists on cross I beams for the mounting of the work in the machines. Running over the first pit, there is also an air hoist for the carrying across of the axles and wheels, which are removed under the air hoist, run out on the

a longer life, and at the same time its plastic nature leaves it freer from breakage from parts falling on it, with consequent dire results to the falling parts. In the event of anything falling on the bitulithic floor, the resulting hole in the floor can be removed by the rolling over of the plastic material. A springy floor of this kind is also much easier on the operators who must stand on it all day, concrete floors being a fruitful cause of ailments, while the bitulithic, having less heat conductivity, never becomes as chilled.

shop has been introduced here. In the corner of the shop adjoining the blacksmith department, there has been constructed a bar iron rack of sufficient size to handle all the stock required to be carried for the blacksmith department. The ends of the rack are provided with expanded metal doors, of which there are three, these doors being kept normally locked. When the blacksmith requires some stock, the stores attendant is advised, and the stores attendant comes over to the rack and delivers to the black-

smith the required stock, charging it in the usual manner. The object of this arrangements is to obviate the necessity of a couple of men making several trips back and forth between the blacksmith shop and the stores department to bring over a few bars of stock, the stock being now kept in the place where it is required. It is unloaded directly from the supply car into the rack just as conveniently as in the stores building.

The machine shop adjoins the blacksmith department to the south, occupying the

the right in fig. 9, and three armature tables, one of which is in the immediate foreground, and the others in the left background. Along the west wall are fitters' benches, and along the south wall, on two benches, are mounted the taping machines, and other equipment for finishing the armature and field coils. The end of one of these latter benches is shown in the left foreground of fig. 9.

Circling the armature department is an overhead I beam trolley, shown in fig. 9, which travels around over the armature

and direct connected, and the other is 20 h.p. and geared. The air storage tank, 37 ins. diameter and 12 ft. high, is located in the corner. The compressed air from the compressors in the original installation was forced directly into the tank, but as trouble was experienced with condensed water in the air, a cooler has been introduced, consisting of two cast iron headers between which the air flows in small piping, the heat radiating, and the water distilling and collecting at the bottom, where it can be drawn off. This

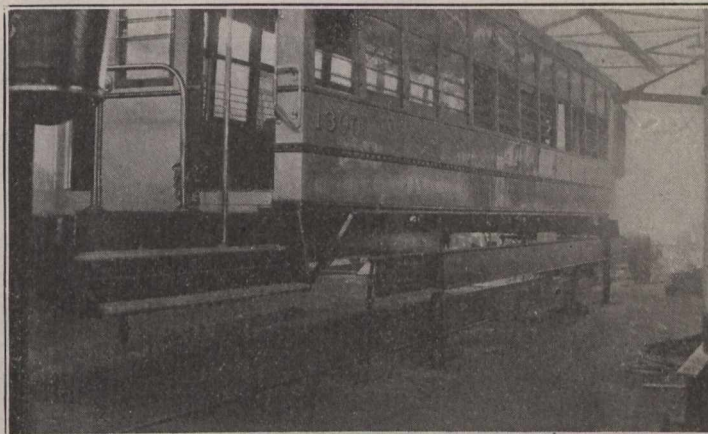


Fig. 6.—Car Hoist supporting Car Body.

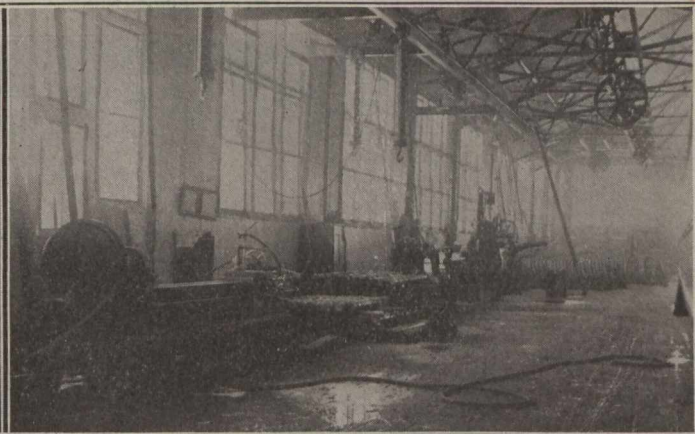


Fig. 7.—Arrangement of Wheel and Axle Shop.

whole central portion of the east side of the shop, in an area 71 by 100 ft. The machine equipment consists of the following tools: 3 spindle drill, 24 in. lathe, three 20 in. lathes, 15 in. lathe, wet tool grinder, 24 in. lathe, horizontal boring and milling machine, grindstone, power hack saw, 34 in. drill, 26 in. drill, double head bolt cutter, 20 in. drill, single head bolt cutter, 3 spindle drill, shears, 2 babbitt melting pots, two 24 in. shapers, planer, buffer, turret lathe, and speed lathe, all arranged as laid down in fig. 3. The drive for these several machines is from over-

tables and stands in the path shown in fig. 3. The armature to be repaired is brought in from the left in the direction indicated, from the track leading from the transfer table, and placed on the first armature table. The armatures from there are picked up as required, and placed on the stands, and when repaired, removed to the second armature stand, ready for removal to the point of entry, and thence to the awaiting trucks by way of the transfer table. The armatures thus make a complete belt line, with a constant forward movement.

cooler is located in the connection between the compressors and the tank on the outer wall of the room. These compressors deliver at a pressure of 80 lbs. For rivetting, 100 lbs. is required, so the shop is provided with a car set for boosting the air from the line pressure of 80 lbs. to 100 lbs.

The room adjoining is the tool room, and in addition to carrying the usual assortment of small tools, etc., contains a tool room grinder and a drill grinder. The entrance is from the shop, and in that wall, there is a delivery window for hand-

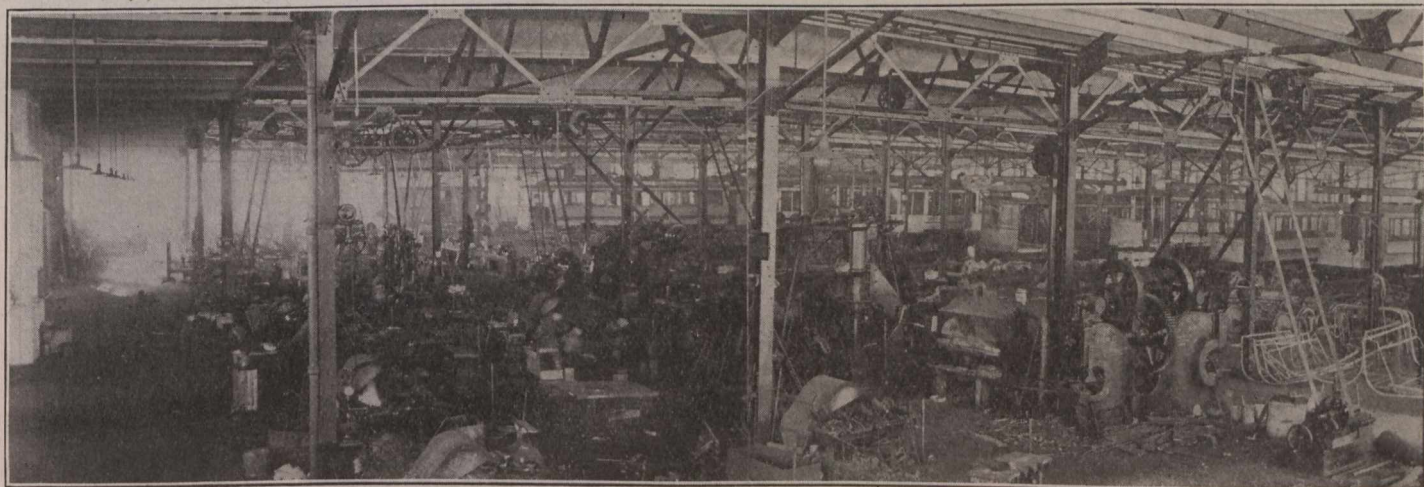


Fig. 8.—Interior View of Main Building, showing Blacksmith Shop, and Overhauling Space in Background.

head shafting, the machines arranged in groups for group drive.

The armature department occupies the south easterly section of the shop, and is the portion shown in the immediate foreground in fig. 9. The tool layout in this shop is shown in fig. 3, and includes the following machines: 18 in. lathe, 22 in. lathe, wet tool grinder, commutator slotter, 2 spindle drill, 20 in. drill armature bander, printers' cutter, and universal miller. In addition there are seven of the usual armature stands shown to

Built out from the south east corner of the shop, there is a small room containing two impregnating tanks and an oven for the treating of the armature and field coils.

About midway along the east wall, fig. 3 shows a projecting wing, which is divided off into rooms. The southerly room contains the heating equipment for the part of the shop east of the transfer table. This is made a local power room, for along the south wall of this room are located two compressors, one of which is 19 h. p.

ing out the tools.

The foreman's office is housed in the room adjoining, which it will be noticed is bayed out into the shop, giving a more comprehensive view of the shop interior. Adjoining the foreman's room to the north, is the lavatory, which is a splendid example of shop accommodation. Down the centre, next to the windows, is a double row of washbasins, provided with hot and cold water, and along each wall is a row of urinals, with the balance of the wall length taken up by closed in water

closets. The end room contains lockers.

The projecting wing on the south side of the building is for the local stores, and the accommodation of the repaired material. It is a room 69 by 26½ ft., and is known locally as the machine shop store.

The shop is equipped for oxy-acetylene welding, handled at present at the northerly end of the transfer table. A small out building is under construction for this plant, where all the repair work for the plant will be handled. The range of work at present handled is quite extensive, all manner of repairs being made to motor

ing and painting, erecting shop and mill, the latter two in one section, and the first in a separate section, the two parts being separated by a corrugated iron wall for similar reasons to that stated for the other wall.

The mill space is shown in fig. 10, a view taking in nearly the whole department. This space contains the following machines, as noted in fig. 3: Jig saw, saw gummer, tool grinder, iron drill, single and triple drum sanders, dowel machine, horizontal boring machine, band saw, tenon machine, shaper, jointer, four side moulder, sur-

necting with a central pipe through the basement to the exhaust fan, which delivers the shavings through an inclined pipe to a hopper in the power house.

In the mill space, there are no tracks, but the erecting shop in the same room contains four, each of which has a pit of the same proportions and 66 ft. long, at the transfer table end. One of these is used as a local store for the rod stock used in the erection work.

The car washing and painting shop to the north of these last departments, contains 9 tracks, the southerly three of

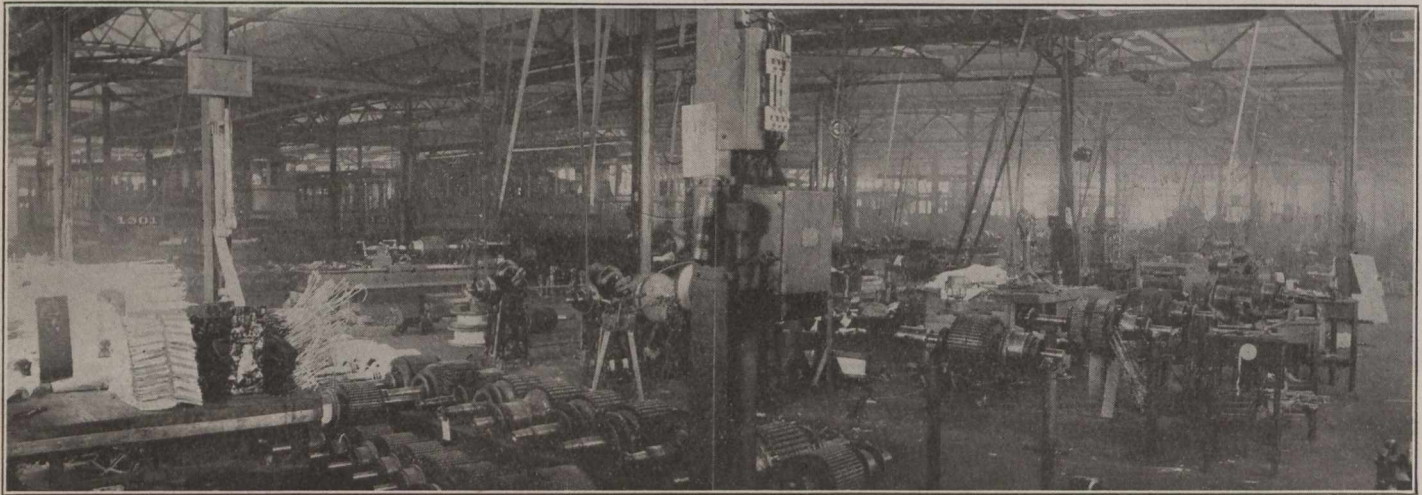


Fig. 9.—Interior View of Main Building, showing Armature Shop, with Machine Shop and Overhauling Space in Background.

casings and truck frames.

The shops are more or less symmetrically arranged around the central transfer table, and in construction the halves are similar in nearly all details. At right angles to the transfer table, there run five bays of equal width, each spanned by a roof truss, the top members of the trusses being extended on the south side so as to form a saw tooth construction with the skylight opening to the north light. This construction is shown in the views, figs. 1 and 2. All these skylight windows

facers, rip saw, solid chisel mortise, cross cut saw, pattern makers' lathe, hollow mortise, chain mortise and exhaust blower. The requirements of a mill are such as to necessitate a very clear overhead space if rapid production is much desired. In consequence, this plant has introduced the underground drive, which is becoming so popular in wood working plants. In this underground scheme, practically the whole shop where the machines are located, is chambered out to form a shallow basement, in which are located the motors, shaft-

which contain similar pits to those in the erecting shop, making 7 pits in all in the car department. This department, with an area 176¼ by 150 ft., is the larger portion of the car department, and it is in this department that the major portion of the car overhauling, consisting for the most part of repainting and general brightening up, is performed. The north wall of this section, shown in fig. 11, is the sash and door finishing section, in which all the removable parts of the car body are finished; this includes painting,

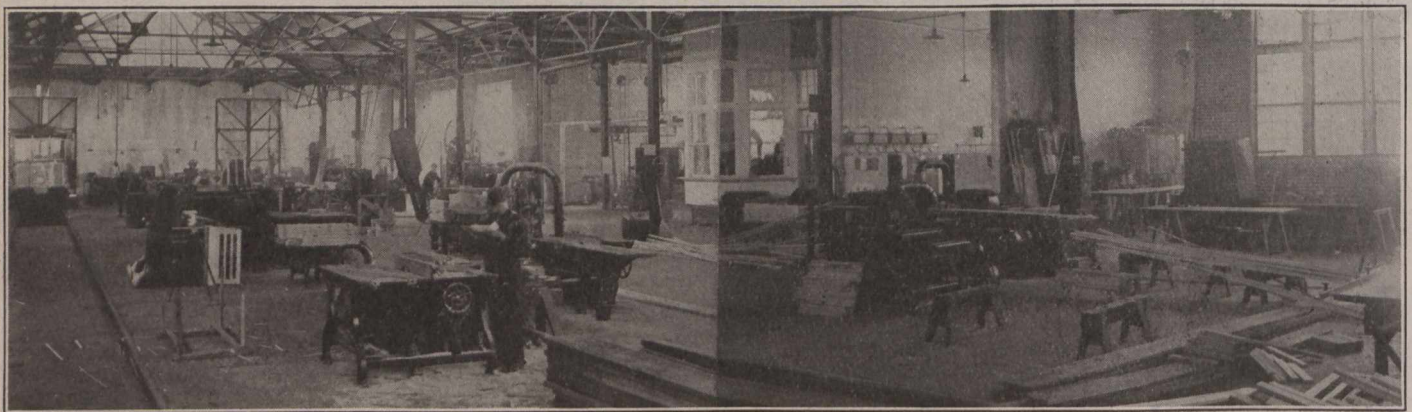


Fig. 10.—Interior View of Mill and Erecting Shop, showing Auxiliary rooms on the Right.

have controllable sashes that can be opened in unison from below.

The section of the shop to the west of the transfer table is used entirely for car body work, and on account of the inflammable nature of the material contained, it is divided off from the rest of the shop at the transfer table edge by a corrugated iron wall, as shown on the left in fig. 4. Thirteen tracks are contained in this half of the shop, located directly opposite the corresponding tracks in the machine shop section. In the car section are housed three departments—car wash-

ing and belting, the latter coming up through the floor to the machine. In fig. 10, it will be noted that there is no belting visible, the driving equipment being all located under the floor in the shallow basement, approached by steps from the right.

All the auxiliary equipment for the shop is also housed in this shallow basement, including an exhaust blower. This underground scheme is particularly advantageous for this, as the shaving and saw dust exhaust pipes at the machines, pass down through the floor into this basement, con-

necting with a central pipe through the basement to the exhaust fan, which delivers the shavings through an inclined pipe to a hopper in the power house.

A paint mixing shop, 18 by 38 ft., is located to the west of the north west corner of the shop, and is separated from the main building by a covered in passage way for fire purposes.

The dry kiln and lumber shed are located to the rear of the mill space, in narrow buildings, as shown in fig. 3.

These two buildings communicate with each other and with the mill space by a track through the buildings into the end of the mill space, which is used for the bringing in of lumber stock to the mill. The dry kiln is 52 by 16 ft., and has a projecting side wing on the south side. Communication at both ends is through tight sliding doors. In this projecting wing, on the north side, there is a heating unit consisting of a bank of pipe coils, with a 4 ft. fan direct connected to a small engine, the steam being received from the power house near by. The lumber shed to the rear is 113 by 30 ft., provided with piling racks on each side for the select woods.

Along the south side of the car department section, there is a projecting wing containing lavatories, office and heating unit, all exactly the same as the arrangement in the machine shop section.

The general stores department is the long building at the southerly end of the transfer table, communicating with the main shop at that point. The east end of the stores building is two stories high at the sides, with the upper stories for offices. On the south side is the office of the Superintendent of Rolling Stock, and on the north, that of the General Storekeeper. To the rear of this point is the stores section, the south side of which is shown in fig. 12. That side consists of a

platforms on the track sides. The west end of this floor is to be an oil barrel storage space, arranged with a frame work of iron to carry five double tiers of oil barrels, practically a carload of oil in all. The other end of the room is for a Bowser oil tank installation, the tanks for which will be located in the basement. The basement is entered by an outside stairway on the west side. In it in addition to the tanks, there will be a waste treating plant for impregnating the waste with oil and packing it in barrels for sending to the different divisional points. In the cellar entrance way, there is a hoist for lifting the barrels, with an overhead track running out in front of the building for transporting the barrels out on the stores car.

The power house is located to the west of the oil house, and is a brick structure, 52 by 58 ft., divided into boiler and transformer room by a brick partition. The boiler room contains three 175 h.p. boilers, carrying 100 lbs. of steam. To the rear of the boilers is a fuel economizer, the scraper for which is operated by a 3 by 2½ in. vertical engine. The boiler feed is provided for by a 10 by 6 by 10 in. feed pump, but under normal conditions, it is not required in service, as the city water pressure is 125 lbs.

The transformer room of the power house contains three 50 k.w., and one 30

power house. From the north east corner of the power house to the south west corner of the main building, there runs a 5 by 6 ft. concrete tunnel, with 12 in. walls, and a 6 in. reinforced concrete roof, the latter 18 in. below the level of the ground, and designed to carry a loading of 400 lbs. per sq. in. The steam and return pipes are carried on the walls of the tunnel on roller brackets secured to the walls by hooked bolts in the concrete, and located at 8 ft. centres. The tunnel along the walls of the shop through which the pipes pass is similar in design, and is the duct through which the hot air is led through the shop.

The steam from the boiler through the tunnel comes in an 8 in. main, continuing the same size to the first heating apparatus room, following the wall. From that point on along the south and east walls to a point near the second apparatus room the main is reduced to 6 ins., reducing still further to 4 ins. The return from heating the second apparatus is through a 2½ in. pipe, increasing to 3 ins. at the first apparatus room, passing through the tunnel in a 4 in. pipe. At the extreme end of this steam and return piping, i.e., at the second apparatus room, there is a 1¼ h.p. vacuum pump in a pit, for looking after the return of the condensation, sending it back to the boiler room through the return pipe.

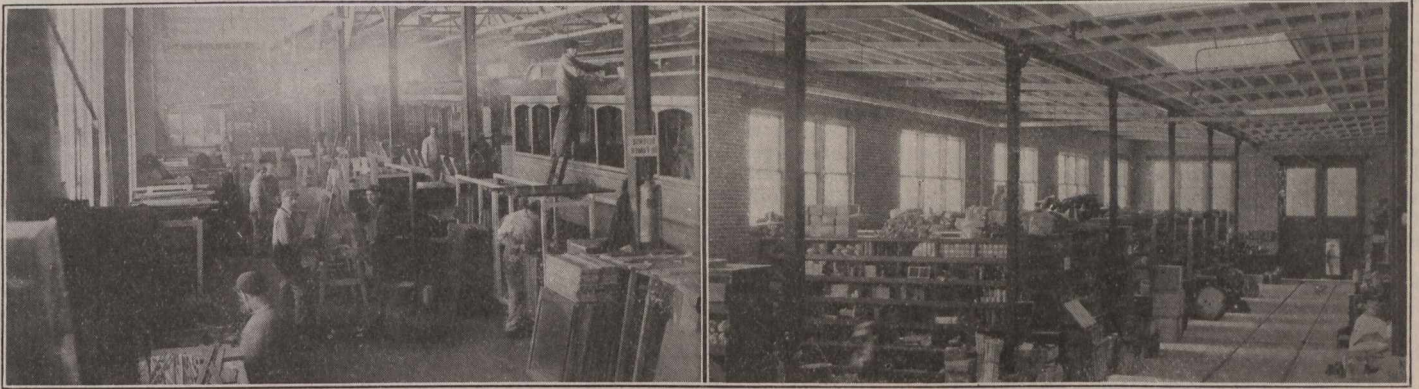


Fig. 11.—Arrangement of Paint Finishing Shop.

Fig. 12.—Arrangement of South Side of General Stores Building.

series of 11 cross tiers of store bins, and on the north side, there are lower bins for heavier stores. The north side also has an upper gallery, along which is a tier of store drawers for light parts such as screws and other stores that are required in large quantities. This gallery communicates directly with the General Storekeeper's offices and also has a stair to the floor level. At the west end of the south side, there is a vault structure, 35 by 18 ft. which is used for the storage of patterns. The rooms under the offices are for springs, gears and pinions.

Through the centre of the stores building runs a track, by which the stores can be brought directly into the building, and loaded again directly on the stores car for distribution over the system. This track to the rear leads out through scrap bins that are now under construction. These bins are arranged along both sides of the track and are covered. The bins on the south side have a narrow gauge track along the front for the passage of the scrap into the desired bin and for sorting, and midway in this track is a track scale for weighing the material.

These scrap bins extend to the oil house, a one story and basement structure, 37 by 17 ft., to the west of the stores building. Like the other buildings it is of brick, with a concrete floor. Entrance to the main floor is through sliding doors from

k.w., transformers. The former receive power from the high tension lines to the shops at 13,200 volts, dropping it to 2,200 volts for transmission to the shops. At the shops, as shown alongside the impregnating room in fig. 1, there are transformers mounted on a bracket on the machine shop stores room wall, receiving power from the power house at 2,200 volts, and dropping it to 220 volts for shop use. The fourth transformer in the power house is for dropping the 2,200 volt power to 110 volts, for the shop lighting system.

To the west of the power house is the coaling plant, consisting of a trestle ramp, open below upon which the coal cars are run and dumped. Between the trestle piles below, it is the intention to lay a narrow gauge track for a short industrial line to carry the coal into the boiler room to replace the present wheelbarrow method. An ash handling plant is under construction at the upper end of the ramp. In front of the boilers, there will be a long worm in a channel, which will carry the ashes out to an elevator at the end of the ramp, raising them to a chute projecting over the car.

HEATING SYSTEM.—Hot air is used for the heating of the main building, with the heating plants located in the south and east sides of the buildings, in projecting wings. Steam for this purpose is brought through tunnels inside the walls from the

The heating of the general stores building is by coil radiation, the steam for which is drawn off from the main along the south wall in the wing of the main building at the south end of the transfer table by a 2 in. pipe. The return from this heating system is through a 2 in. pipe leading directly to the first apparatus room through the tunnel. The dry kiln is supplied from the 8 in. main as it emerges from the boiler room tunnel, a 2½ in. pipe leading to the heating set in that building, with a 2 in. return, joining the main return at the tunnel.

In the two heating apparatus rooms is a heating unit, consisting of a 9 by 5½ by 5 ft. box, filled with 1 in. pipe, open on one side to the shop, and on the other into a 12 ft. fan, driven by a 9 by 12 in. engine, by which the heated air is forced through the heating tunnels around the shop.

The second apparatus room heats the whole of the shop east of the transfer table, and the first apparatus room the balance of the shop west of the transfer table. The central location of the second in the east wall, makes the tunnel construction in both directions along the wall under the floor practically similar. The fan delivers the heated air under the floor through a 54 by 60 in. tunnel, a deflector in the centre dividing the flow. The southward flow tunnel from that point is 46 by 42 in., reducing to 24 by 24 in. at the end

of the transfer table, while the northward tunnel is 42 ins. square, reducing to 24 ins. square at the other end of the transfer table. The southward tunnel is slightly larger, as from two points along the south wall tunnel, there are two 15 in. diameter pipes leading across the shop, under the southerly four pits at right angles to them, with outlets 10 ins. in diameter leading out into the sides of the pit, with a damper provided for each.

From the first apparatus room the major portion of the heat passes out to the north through a 54 in. square tunnel, gradually reducing in size along the west and north sides of the shop to 18 ins. square at the north end of the transfer table. The tunnel in the easterly direction from the apparatus room is 28 by 24 ins., reducing to 24 ins. square at the south end of the transfer table. Across the end of the transfer table, the two heating tunnels communicate through a 24 in. square tunnel for the passage of the steam and return mains, but have baffle plates at each end to interrupt the flow of air.

The local heating of the shop from the heating tunnel is by means of heating headers located at intervals along the wall, against which they lie flat. The majority of the headers are standard in size and construction, built of an 8 by 24 in. box of no. 12 iron, united at the corners with 1 by 1 by 1-8 in. angles, and rising to a height of 4 ft. above the floor, and projecting to the tunnel under the floor, the header being supported on the floor by a 2 by 2 by 1/4 in. angle. Near the top of the header there is a double deflecting plate, directing the air outward through both sides, through heavy netting, the opening in which is half the depth of the header. From these the air is forced out into the shop. The majority of the headers are of the 8 by 24 in. size, but there are also 8 by 15 and 8 by 18 in. sizes, used along the walls between the windows, where the headers are more closely spaced, while the larger sizes are used principally between the large doors. In the offices, smaller headers lead in from the tunnel.

The outlying buildings are all heated by direct radiation from steam coils. The only important system in the lot is that in the general stores building, where the local steam main from the main that passes along the west side of the shop, connects with a system of 1,760 ft. of 1 1/4 in. pipe, arranged in coils.

THE LIGHTING of the shops has been carefully attended to, with due consideration to the points where the maximum amount of light is required. For this purpose, the tungsten light is peculiarly adapted, having a wide range of sizes of illuminating units. In the section of the shop to the north of the transfer table, the lights are arranged in rows of 10 between the tracks. In the paint and erection shop portion of this end, the lights are all 250 watt, excepting the 9 at the transfer table end, which are all 150 watt. In the mill section the lights are nearly all 150 watt, with here and there over certain of the machines, these are increased to 250 watt. Over the transfer table is a row of five 100 watt lamps. Between each of the lifting hoists are six 100 watt lights, while down the machine shop section are four rows of 150 watt lamps, interspersed in which are a few 250 watt lights. In the general stores building there are seven 150 watt lights down the centre, with a similar row along each side of 100 watt lights. All lights are suspended from the roof girders.

FIRE PROTECTION AND WATER Supply.—The fire protection of the main building and general stores building is arranged for by a system of thermopiles

located under the roof. In the main shop there are two separate circuits, one for east of the transfer table, and the other for west of it, each containing 50 thermopiles, and the general store is on a circuit containing a fewer number of thermopiles. These three circuits connect to three galvanometers in a case on the wall at the west end of the transfer table which is the focal point of the shop, where the time clocks are located, and where the watchman is stationed. Normally, the galvanometer indicator shows a safe sign, but in the event of any abnormal heat, which would strike the roof first, the thermopiles would cause the galvanometer to deflect, the greater the heat, the greater the deflection, as the thermopiles are in series. Deflection beyond a certain point leaves the needle in the operating field of a strong magnet, which draws the needle still further out of its normal position, closing an electric circuit, and ringing an alarm bell.

In a separate case adjoining this thermopile alarm indicator, there is another alarm box for the smaller buildings, with a connection from the boiler room, oil house, lumber kiln, pattern storage and impregnating room. Local heat at any one of these points causes a hinge switch in the alarm box to trip, this action closing another switch, ringing the alarm bell.

At Youville, the city water pressure is in the neighborhood of 125 lbs. In consequence, this is ample for fire protection without further boosting through an auxiliary fire pump. The water supply enters the main building at the northeast corner, through an 8 in. water main to a water meter at that point. From there the main is divided into fire and water service pipes. All pipes are under the floor, with headers at intervals.

The fire service main, 8 in. pipe, divides near the corner, a 6 in. main running south along the second row of columns, and another 6 in. main west along the first row of columns. There is also a 4 in. main that runs back from the meter about 100 ft. from the entry corner of the building. The machine shop has six hydrant connections, three at the outer and central columns in the line of the main, and three in the line of columns centrally with the car hoists. Five of these are from the southerly main, this main also branching out to a hydrant about 100 ft. diagonally from the south east corner of the building, with another branch from a central point to a hydrant outside the centre of that side. This main terminates in two hydrants in the general stores building.

The westerly main from the entry corner contains one of the machine shop hydrants. The arrangement in the westerly half of the building is the same as in the easterly. There are six hydrants in that section with three hydrants outside to the west, at the corners and centrally. On the south there are also two outside hydrants between the general stores building and the main building, and on the north, a single hydrant centrally located on that side, making 23 in all.

Service water is piped all over the buildings in a similar manner, with connections attached to the columns at convenient points. The tiling of the building for sewage purposes is also very complete, the different interior systems all draining to a central westerly 15 in. sewer, to a large gully at the west end of the shops. On the south and east sides of the shops are five smaller gullies for draining the surrounding ground, these all connecting with the central sewer and draining into the west main gully. This passes off through

an 18 in. vitrified tile sewer, sloping to the west on a 0.4 per cent. grade, connecting 1,000 ft. to the west with the Montreal St. Denis Street relieving sewer.

CONCLUSION.—This plant is said to have been designed on the same general lines as the Plank Road shops of the Public Service Co., of New Jersey.

The general design and construction were carried out under the direction of D. E. Blair, Superintendent of Rolling Stock, who is in charge of their operation. Remelius acting as consulting engineer. The designs of the buildings were developed by Marchand and Haskell, architects, Montreal, the engineering work being done in the Montreal Tramways Co.'s engineering department, under J. D. Evans, Chief Engineer, and R. M. Hannaford, Assistant Chief Engineer.

Toronto Railway Company's Annual Report, Meeting, Etc.

Following are extracts from the report for the year 1912, which was presented at the annual meeting, Feb. 5:—

| | | |
|-----------------------------------|----------------|--------------|
| Gross earnings | \$5,448,050.36 | |
| Operating, maintenance, etc. | 2,866,550.12 | |
| Net earnings | \$2,581,500.24 | |
| Dividends | \$879,595.85 | |
| Bond interest, etc. .. | 190,992.76 | |
| | \$1,070,588.61 | |
| Payments to City: | | |
| Percentage on earnings | \$798,958.66 | |
| Pavement charges .. | 90,953.00 | |
| General taxes | 52,137.30 | |
| | \$942,048.96 | 2,012,637.57 |
| | | \$568,862.67 |

The increase in gross passenger earnings, compared with the previous year, is \$567,035.00; the earnings being \$5,367,502.48, against \$4,800,467.48 for 1911. Notwithstanding the large increase in gross earnings the surplus was reduced largely by the operation of additional cars placed in service, a higher rate of wages paid to conductors, motormen and other employes, also the cost of material of all classes having advanced in price. The charges of the year were \$2,866,550.12, compared with \$2,653,361.86 the previous year. The percentage of operating cost was 53.4% of passenger earnings.

The payments made to the City of Toronto were \$942,048.96, which was an increase of \$119,815.72, or 14.6% over 1911.

In addition to entirely renewing the battery plant at Frederick and Front Streets, there was expended during the year on capital account, \$591,484.70 in building additional rolling stock and procuring electrical equipment for same, the construction of new tracks and erection of overhead work in various sections of the city, additions to buildings, and other improvements.

On March 25 a fire occurred at the King St. East Division, completely destroying the car storage house in rear of the main building, together with about 150 cars, practically all of which were of the open, or summer type. The property was insured.

The company's agreement with its employes expired on June 15. After a number of conferences, all differences were amicably adjusted, an increase in wages was granted, and a new agreement entered into for three years.

The second drawing of the company's currency and sterling bond issues, under the terms of the mortgage deed dated Sept. 1, 1892, took place June 27, the company being obliged under the mortgage deed to redeem by drawing annually 5% of bonds issued, to be redeemed on Aug. 31 following the date of drawing, and from which date no interest is payable. The full number of bonds drawn in June, 1911, amounting to

\$168,693.33, have been presented and paid, and of the bonds drawn during 1912 \$159,500 have been presented and redeemed. The total of bonds so drawn for redemption is \$339,386.66.

Careful attention has been paid to the maintenance of the plant, rolling stock equipment, and other properties.

Your directors declared out of the accumulated surplus earnings four quarterly dividends of 2% each, all of which have been paid.

The Toronto and York Radial Ry. Co. reports that its earnings continue to show satisfactory increases. The gross earnings were \$492,922.86, compared with \$449,059.16 for the previous year, an increase of 9.76%.

INCOME ACCOUNT.

| | | |
|-----------------------------------|----------------|--------------|
| Gross earnings | \$5,448,050.36 | |
| Operating, maintenance, etc. | \$2,866,550.12 | |
| Interest on bonds, etc. | 190,992.76 | |
| Percentage on earnings | 798,958.66 | |
| Pavements, taxes | 143,090.30 | 3,999,591.84 |
| Surplus earnings | \$1,448,458.52 | |

PROFIT AND LOSS ACCOUNT.

| | | |
|---|----------------|----------------|
| Balance from 1911 | \$3,125,894.33 | |
| Surplus earnings, after payment of all expenses, interest, taxes, etc. | 1,448,458.52 | |
| Dividends, four of 2 per cent each | | \$4,574,352.85 |
| Balance from 1911. | \$3,125,894.33 | \$ 879,595.85 |
| Surplus carried forward | 568,862.67 | 3,694,757.00 |
| | | \$4,574,352.85 |

COMPARATIVE STATEMENT.

| | 1912. | 1911. |
|--|----------------|----------------|
| Gross income | \$5,448,050.36 | \$4,851,541.42 |
| Operating, maintenance charges, etc. | 2,866,550.12 | 2,653,361.86 |
| Net earnings | 2,581,500.24 | 2,198,179.56 |
| Passengers carried.. | 135,786,573 | 120,997,844 |
| Transfers | 56,176,985 | 48,730,671 |
| Percentage of charges, etc., to passenger earnings | 53.4 | 55.2 |

The officers and directors for the current year are:—President, Sir Wm. Mackenzie; Vice President, F. Nicholls; other directors, Sir Henry M. Pellatt, Sir Rodolphe Forget, Hon. G. A. Cox, W. D. Matthews and Jas. Gunn.

London Street Railway Company's Report.

Following are extracts from the report for 1912, presented at the annual meeting at London, Ont., Feb. 5:—

| EARNINGS: | 1911. | 1912. |
|------------------------------|--------------|--------------|
| Passengers | \$274,887.95 | \$301,196.62 |
| Miscellaneous | 4,718.98 | 5,034.40 |
| Gross earnings ... | \$279,606.93 | \$306,231.02 |
| EXPENSES: | | |
| Maintenance: | | |
| Way and structures | \$ 22,325.91 | \$ 23,743.37 |
| Equipment | 30,337.48 | 28,516.55 |
| Transportation: | | |
| Power plant | \$ 35,556.80 | \$ 40,015.09 |
| Car service | 74,985.98 | 86,367.60 |
| General | 29,530.59 | 31,635.58 |
| Total operating expenses ... | \$192,736.76 | \$210,278.19 |
| Net earnings | \$ 86,870.17 | \$ 95,952.83 |
| DEDUCTIONS: | | |
| Interest on bonds. | \$ 28,750.00 | \$ 28,911.00 |
| Interest on overdraft | 93.59 | |
| Total deductions.. | \$ 28,843.59 | \$ 28,911.00 |
| Net income | \$ 58,026.58 | \$ 67,041.83 |

During the year \$29,735.61 was spent on improvements and additions. Negotiations with the city for extensions resulted in an agreement for the straightening of the Wellington St. line north of St. James St. by placing the track upon Richmond St., thus making the route direct and greatly improving the service. The negotiations also provided for the building of a new line on Cheapside from Richmond to William St., and then on William from Cheapside to

Oxford St., approximately 6,000 ft.; a new line on Adelaide St. from Oxford St. to Central Ave., which will enable an additional two way belt service to be given in the north end of the city, direct to both the central and east ends and also forming a cross town line in the eastern part. The agreement made last year further provides for double tracking of congested portions on Horton St. between Wellington and Richmond, on the Hamilton Road between Mamalon and Rectory, and on York St. between Ridout St. and the river, all of which is to be credited against mileage requirements by the city. Of the above work the removal of the line from Wellington St. to Richmond was accomplished last year, as well as the construction of the line on Cheapside and William Sts. This latter line opens up a fine large section for residential purposes. Ties were renewed under several large sections of track in different parts of the city during the season, so that the maintenance of the track and roadway has been kept up in good order. Six new cars will be added to equipment during 1913, including modern trucks, motors, etc. After more than three years of negotiations with the Ontario Hydro Electric Power Commission for the use of power from Niagara Falls, it was found impossible to make any arrangement for such power that would be satisfactory, and so it was decided late in the fall to install a 500 kilowatt Corliss compound engine set. This work is now in progress and will be finished in the course of a few weeks. The addition to the shop and stores department was completed during the year, and has greatly facilitated in the work. A large lathe and wheel press were also installed, which enable the company to do its own wheel work.

Late in Dec., 1912, it was decided by the Ontario Railway and Municipal Board that a certain large section of the township east of the city limits should be added to the city. It is claimed the population thus added will undoubtedly make the population over the 50,000 required by statute before cars can be operated on Sunday, and so it may be anticipated that there will soon be a demand for this service, although we do not anticipate much profit, if any, from it.

The expected increases in gross earnings and surplus during the past year have been exceeded, and as general business prospects in the city are unusually good, our anticipations for the coming year are that it will be by far the best year in our history.

Our relations with the public continue very satisfactory, and that no litigation of very satisfactory, and no litigation of any consequence appears against the company.

STATISTICAL STATEMENT.

| | 1912. | 1911. |
|---|--------------|--------------|
| Gross earnings | \$306,231.02 | \$279,606.93 |
| Operating expenses | 210,278.19 | 192,736.76 |
| Expenses, % of earnings | 68.5 | 68.9 |
| Net earnings | 95,952.83 | 86,870.17 |
| Net income, % of capital | 12.06 | 10.51 |
| Passengers carried ... | 8,353,230 | 7,582,120 |
| Car earnings, per revenue passenger ... | 3.64 | 3.67 |
| Transfers | 1,202,705 | 1,178,885 |
| Total passengers | 9,645,935 | 8,761,005 |
| Car earnings, per passenger | 3.12 | 3.13 |
| Car mileage | 1,476,738 | 1,440,611 |
| Gross earnings, per car mile | 20.40 | 19.10 |
| Operating expenses, per car mile | 14.24 | 13.37 |
| Net earnings, per car mile | 6.50 | 6.03 |
| Number of miles of track | 33.25 | 33.25 |
| Gross earnings per mile of track | 9,209.95 | 8,409.23 |

The company's property consists of 33.25 miles of single track, covering about 26 miles of territory, 20.8 miles in the city, and 5.2 miles outside; a power house capable of generating 1,150 h.p.; storage battery

plant of 320 amp. capacity; 2 car houses; car shop and machinery; office building, and the following rolling stock:—Single truck motor cars, 34 closed, 5 open; double truck motor cars, 5 closed, 5 open; single truck trailers, 4 open; sweepers, 2; work car and snow plough, 1; emergency car, 1; line wagon, 1.

The officers and directors for the current year are:—President, H. A. Everett, Cleveland, Ohio; Vice President, T. H. Smallman, London, Ont.; other directors, P. W. D. Broderick, Toronto; H. S. Holt, Montreal; W. M. Spencer, C. H. Ivey, London, Ont.; E. W. Moore, Cleveland, Ohio.

Niagara, St. Catharines and Toronto Railway Construction, Betteiments, Etc.

Work on the extension from St. Catharines, Ont., to Niagara-on-the-Lake, is progressing rapidly, rails being laid and the trestles well under way.

The new station in Thorold is rapidly nearing completion and will be opened about March 1. Increased siding facilities have been arranged for in Merritton, Port Dalhousie and Thorold.

The Company also has in contemplation a rearrangement of track used at Niagara Falls, Ont. An effort will be made to construct a line down Bridge St. from the N.St.C. & T. junction to the G.T.R. station, thereby doing away with the use of local line tracks in Niagara Falls by main line cars.

The company has ordered in the United States four convertible double truck 4 motor cars for use on local lines at an expenditure of \$30,000, and an increased service will be put into effect on the St. Catharines, Merritton and Thorold local line in the spring.

The company has received a 750 k.w. rotary converter and transformers for the Niagara-on-the-Lake extension, which are being placed in temporary quarters near the car barn on Welland Ave., for the purpose of increasing the power supply in and about St. Catharines.

An order has also been given the Canadian General Electric Co. for two 500 k.w. rotary converters and transformers for a new power station in St. Catharines. When these machines are installed ready for operation the 750 k.w. machine now being erected will be moved to the Niagara-on-the-Lake end of the new extension. The 300 k.w. machine now in operation at the St. Catharines sub station will be moved to the Niagara Falls sub station, increasing the power capacity at that point. The expenditure involved will amount to over \$50,000. The power distribution of the system will then be as follows:

| | |
|-------------------------|----------------------|
| St. Catharines | 1,000 k.w. capacity. |
| Thorold | 1,000 " " |
| Niagara Falls, Ont. ... | 600 " " |
| Welland | 500 " " |
| Niagara-on-the-Lake .. | 750 " " |

The New York, New Haven and Hartford Rd.'s electrified zone, extending from Woodlawn to Stamford, Conn., has been in successful operation for several years. The company is now extending the zone as far as New Haven, and it is expected that this section will be open by July 1. The new work will embody such improvements as have been suggested by the experience gained in operating the existing stretch of track. One of these will be a rearrangement which will eliminate the effects of electro magnetic induction on adjacent telegraph and telephone systems, which heretofore caused much trouble and interruptions in service. The overhead line carries a pressure of 11,000 volts.

Dominion Power and Transmission Company's Annual Meeting.

This company's annual meeting was held in Hamilton, Ont., Feb. 17. The following are the only references in the report to the electric railway portion of the business:—

"The physical condition of the properties is excellent and continues to improve, large sums having been expended to that end, particularly on the power house and the street railway. A third transmission line has been built from Hamilton to the power house on our own right of way. Application has been made to Parliament for an extension of the Brantford and Hamilton charter to enable us to extend that railway to Galt."

In the financial statement the earnings, expenses, etc., of the electric railways, power and lighting departments are lumped together and no separate information is given as to the railways. Particulars of the railway earnings, etc., for the year ended June 30, 1912, were given in our February and March issues under "Electric Railway Statistics."

The company's gross earnings were \$2,563,371.38; operating expenses, \$1,359,459.34; bond interest and interest, \$352,152.75; surplus earnings, \$851,759.29. Dividends of \$362,301.24 were paid. All deferred dividends on preferred stock have now been paid.

The officers and directors for the current year are:—President, J. R. Moodie; Vice President, Jas. Dixon; Treasurer, J. Knox; Secretary, W. C. Hawkins; directors, Sir John M. Gibson, J. W. Sutherland, Lloyd Harris, and W. Southam.

Ottawa Electric Railway Company's Annual Report, Meeting, Etc.

Following are extracts from the report for 1912, as presented at the annual meeting, Feb. 3:—

The gross earnings were \$934,397.77, compared with \$840,680.52 in 1911; 21,815,798 passengers were carried, compared with 19,270,521 in 1911; the net earnings were \$400,959.07, and have been disposed of as follows:—

| | |
|--|--------------|
| Four quarterly dividends of 3% and a bonus of 3% | \$255,947.82 |
| Interest on bonds and loans..... | 21,303.66 |
| Mileage payments | 13,425.44 |
| Taxes | 9,463.16 |
| Placed to credit of contingent account to be applied to reduction of track renewal, car equipment and other accounts | 69,000.00 |
| Transferred to credit of profit and loss account | 30,908.99 |
| | \$400,959.07 |

The balance at credit of profit and loss account is now \$138,264.83, and of rest account \$200,000.00.

During the year a new 1,000 h.p. sub-station was installed on Albert St., and land has been purchased to install two more of the same capacity, one in Lower Town, and the other in the southern part of the city. A large addition to the Cobourg St. car sheds was completed, and the erection of a steam turbo generator of 4,200 h.p. on Middle St. was contracted for and is now under way. With these improvements and the delivery of 20 double truck p.a.y.e cars, under construction by the Ottawa Car Co, our earning capacity and facilities for handling the increasing traffic will be greatly augmented. Instead of erecting a new building for office accommodation, as proposed in last year's report, your directors purchased the building, 248 Albert St., which is now occupied by the headquarters and receiving office staffs. The tracks along Sparks St. and the Plaza have been renewed

with a 93 lb. rail, and a small portion of the new tracks on Queen St. from Elgin St. to Bank St., authorized by the city, completed. The remainder of the latter work will be finished early in the spring. The new bridge over the canal on Bank St. is now approaching completion, when we will be in a position to carry out the extension of our tracks to Ottawa South.

STATISTICS.

| | 1912. | 1911. |
|--|--------------|--------------|
| Gross receipts | \$934,397.77 | \$840,680.52 |
| Total expenses, including mileage payments, taxes, etc. | 578,540.96 | 545,128.87 |
| Net income | 355,856.81 | 295,551.65 |
| Passengers carried | 21,815,798 | 19,270,521 |
| Percentage of operating expenses to receipts | 57 1-5 | 57 2-5 |

The past year, from a street railway standpoint, was one of difficulty in Ottawa owing to the typhoid epidemic, the cold and wet summer, and the disturbance of traffic due to new construction on Sparks St., the Plaza, etc. The expectations are that the present year's receipts will exceed \$1,000,000, compared with \$71,000 in the company's first year of operations in 1891-2.

Only one change was made in the directorate, Jas. D. Fraser, who has been Secretary-Treasurer for many years, being elected to succeed Hon. G. A. Cox, resigned. The board, as now constituted, is:—President, T. Ahearn; Vice President, W. Y. Soper; directors, G. P. Brophy, T. Workman, T. F. Ahearn, E. N. Soper, and J. D. Fraser.

Halifax Electric Tramway Company's Annual Meeting.

The report presented at the adjourned annual meeting in Halifax, N.S., Feb. 12, shows increased gross and net earnings over previous years. The surplus account for 1912 shows a balance of \$704,119, the gain for the year being \$104,934.

Total passenger receipts were \$250,263, electric light and power earnings \$228,654, gas and product earnings \$61,035, operating expenses \$286,560; net bond interest \$30,000, net earnings \$223,393; dividends paid \$112,000, passengers carried 5,688,414, or 476,157 more than in 1911; per cent. operating expenses to income, 54.06; car mileage 984,943. The assets are \$2,827,354.

During the year the belt line was double tracked, track extended a mile on Gottingten street, new car house erected, steam turbine installed and other improvements made. A further reduction was made in electric light rates and employes' wages were increased.

Substantial progress has marked the operations for the year, resulting in increased gross and net earnings over previous years.

The construction work outlined in the last report was successfully carried to completion, including the double tracking of the Belt Line, the purchase of four closed cars, the construction of a concrete and brick car house, with accommodation for 16 cars, and the installation of a 2,000 k.w. steam turbine, this latter about doubling the capacity of the electric generating plant. Various other important additions were made to the property, including the extension of the track on Gottingten St. from Cunard St. to Young St., about a mile, the purchase of an additional sweeper, the installation of a new incandescent circuit, additions to car equipment, etc. In addition to the capital expenditure referred to above and distinct from ordinary repairs included in operating expenses, there was expended on renewals and betterments \$3,559.22.

A further reduction was made in rates for electric lighting, and the rates of wages

to employes were substantially increased, thus continuing the practice followed in the previous year of having the employes and consumers of electric current participate in the general prosperity of the company.

PROFIT AND LOSS ACCOUNT.

| | |
|---|--------------|
| Passenger receipts | \$250,263.47 |
| Electric light and power gross earnings | 217,444.83 |
| Gas department, gross earnings | 61,035.34 |
| Miscellaneous earnings (less provision for bad debts, 1912) | 11,210.09 |
| | \$539,953.73 |
| Operating expenses | \$286,560.16 |
| Interest on mortgage bonds | 30,000.00 |
| Dividends | 112,000.00 |
| Renewals and betterments | 3,559.22 |
| Dalhousie College fund | 3,000.00 |
| Balance to surplus account | 104,834.35 |
| | \$539,953.73 |

Consequent on the change of control, which has passed to Montreal people, an almost entirely new directorate was elected, O. E. Smith, of Halifax, being the only old director re-elected. The new board is as follows:—President, E. A. Robert, Montreal; 1st Vice President, J. W. McConnell, Montreal; 2nd Vice President, O. E. Smith, Halifax; other directors, J. A. Neville, H. H. Smith, W. M. P. Webster, J. E. Wood, Halifax; Sir Frederick Borden, Ottawa; P. J. McIntosh, New York; W. G. Ross and F. H. Wilson, Montreal.

Ontario Hydro Electric Commission's Projected Electric Railway.

A deputation representing the Electrical Power Union, which was formed in Toronto recently, and declared in favor of a system of municipally owned electric railways operated by hydro-electric power, waited on the Dominion Government in Ottawa, Feb. 6. The delegation asked that government aid be voted in aid of a line from Toronto to serve Markham, Uxbridge, Locust Hill, Ashburn and Port Perry, in East York, and Ontario County. Consideration was promised. We are officially advised that the proposition referred to is that of the projected Toronto, Markham, Port Perry and Uxbridge Radial Ry. It is proposed to build a line from Toronto to Markham, passing through Wexford, Ellesmere and Unionville, with a branch from Markham through Green River, Brougham, Greenwood, Brooklyn, Ashburn and Myrtle to Port Perry, and a second from Markham through Ringwood, Stouffville, Altona, Glasgow and Goodwood to Uxbridge. The line, it is proposed, shall be managed by the Ontario Hydro Electric Commission, its powers being extended for this purpose; and that the building of the line shall be financed upon bonds guaranteed proportionately by the different municipalities. The H. E. Commission has already under consideration the extension of its power lines into the district, and it would provide the power lines, sub stations and right of way, securing in return a material and permanent customer. A. F. Wilson, Markham, Ont., is the secretary in connection with the promotion of the line. (Feb., pg. 90.)

The Edmonton (Alta.) Municipal Ry. was operated at a loss of \$26,495 during 1912, and W. T. Woodroffe, Superintendent, has made a number of suggestions in regard to changes in operation to increase the revenue during the coming year. Tentative proposals have been made by him to charge a uniform rate of 5 cents, with transfer privileges, do away with the present yellow labor tickets, do away with the dollar blue book of tickets, do away with the transfer privileges, do away with the red and blue tickets and establish the price of children's tickets at 10 for 25 cents.

Electric Railway Projects, Construction, Betterments, Etc.

Battleford - North Battleford, Sask.—A project for the building of an electric railway to connect Battleford and North Battleford, Sask., has been submitted to the people of these two towns. F. P. Alywin, Ottawa, is the representative of the syndicate making the proposal, and the proposition he submitted is on the lines of the contract made between the Moose Jaw Electric Ry. Co. and the City of Moose Jaw, Sask. Mr. Alywin stated that the capital is ready for the building of the line as soon as an agreement may be entered into.

British Columbia Electric Ry.—Plans have been prepared for the building of a line along 10th Ave. to the site of the University buildings.

It is proposed to build a large car barn and a central station for the distribution of power near Hastings townsite on the Burnaby Lake line.

A site has been acquired on Douglas St. and Pandora Ave., Victoria, on which a 10 story building will be erected. The ground floor will be used as a central station for the company's suburban lines. The new branch line to the Uplands was opened for traffic, Feb. 3, and it is expected that the Saanich Peninsula line will be opened April 1. (Feb., pg. 90.)

Buffalo and Fort Erie Ferry Ry.—The Ontario Legislature is being asked to authorize an increase of capital stock, and a further issue of first mortgage and refunding sinking fund bonds for the purpose of electrifying the railway. Bicknell, Bain, Strathy and Mackellean, Toronto, are the solicitors. (Feb., 1911, pg. 282.)

Burrard-Westminster Boundary Ry. and Navigation Co.—W. McNeill, Chairman of the Company, is quoted as having stated that 20 miles of this projected railway will be built during the current year. It is proposed to start work on the line between the Stave River Falls and Pitt River in May. The question of the building of a bridge across the Pitt River at Coquitlam was discussed by Mr. McNeill and the Provincial Government, and it is said that an arrangement is about to be submitted to the Legislature providing for its construction. This bridge will form a connection between the Stave River Falls-Pitt River section of the line, and the Vancouver-Pitt River section. It is expected that the entire line will be completed within two years. Steam will be used as the motive power on the Stave River Falls-Pitt River section, until the power plant of the Western Canada Power Co., which owns the charter, has been completed. (Jan., pg. 39.)

Chestermere and Calgary Suburban Ry.—Application is being made to the Alberta Legislature for authority to increase the company's capital stock to \$750,000; to increase the bonding powers from \$12,000 to \$20,000 a mile; and to extend the time within which the lines authorized in 1910, may be built. Ryan and Wright, Calgary, are solicitors for applicants. (Jan., 1912, pg. 38.)

Eastern Ontario Electric Ry.—The Ontario Legislature is considering a bill granting an extension of time for the building of the lines authorized by chap. 134 of the statutes of 1909. The provisional directors named in the original statute are struck out and the following substituted: E. C. Rendell, H. Hastings, C. S. Foss, G. T. Taylor and G. E. Smith. (May, 1909, pg. 367.)

Edmonton Radial Ry.—We are officially advised that the city has decided not to extend the line to St. Albert, Alta., at pre-

sent. The extension may possibly be built next year, but nothing has been decided.

The Alberta Legislature has passed an act affecting the City of Edmonton, providing, among other things, for an extension of time for the building of the lines owned by the city. (Jan., pg. 39.)

Forest Hill Electric Ry.—The Ontario Legislature is being asked to incorporate a company with this title to build an electric railway from Forest Hill Road, at the northerly limit of Toronto, along Forest Hill Road and Bathurst St., to 2.5 miles north of Eglinton Ave.; from Forest Hill Road along Eglinton Ave.; to one mile west of Dufferin Ave.; and northerly along Dufferin Ave. for 2.5 miles, with branch lines or extensions as may be necessary. Mills, Raney, Lucas and Hales, Toronto, are solicitors for applicants. (May, 1912, pg. 251.)

Guelph Radial Ry.—A number of men, interested in the building of electric railways, were in Guelph, Ont., Feb. 6, looking into a project for the building of a line from Guelph to Puslinch Lake. The charter for the building of this line is held by the G.R. Ry., which is owned by the city. It is said that a desire has been expressed to take over the franchise for this line, and to extend it to Hespeler, where connection would be made with the Galt, Preston and Hespeler St. Ry., which is owned by the C.P.R. One of the party is quoted as stating that if the project goes through a large summer hotel will be built at Puslinch Lake, and other developments made there. (May, 1912, pg. 451.)

Lacombe and Blindman Valley Electric Ry.—Press reports from Lacombe, Alta., state that the right of way for this projected electric railway has been bought. The financing of the company is, it is said, being done by a British syndicate, conditionally upon the people of the locality subscribing a proportionate amount. This amount is reported to have been obtained by means of a public subscription, the company being represented in the canvass by G. R. Strathy, Toronto, one of the directors, and W. Young, the company's engineer. (Feb., pg. 90.)

Manitoba Radial Ry.—Application is being made to the Dominion Parliament to extend the time for the building of the line authorized by chap. 105 of the statutes of 1907. (June, 1911, pg. 555.)

Montreal and Southern Counties Ry.—An alternative proposal for an extension of the company's lines in Montreal, was taken under consideration by the Board of Control, Feb. 7, and was referred to the legal department and a special committee. The line at present terminates on lower McGill St., and the company desires to have an entrance to Youville Square. (Feb., pg. 90.)

Montreal Tramways Co.—E. A. Robert, President, is quoted as stating, Feb. 5, that the suggested building of underground lines is not the solution of the present congested condition in the city. What is required is that the city should consent to such extension of lines as would enable the company to work the existing lines to the maximum of their capacity. Immediate relief could be given if the city would cooperate with the company. An immediate measure of relief is necessary, and an underground system would take some years to build.

H. B. Harris, of Harris & Co., Boston and New York, who are looking after the company's financing, is quoted as stating

in Montreal, Jan. 31, that his firm was prepared to advance from \$75,000,000 to \$100,000,000 to the company for development work to be spread over 30 years, as soon as the plans were arranged. (Dec., 1912, pg. 622.)

Morrisburg and Ottawa Electric Ry.—The shareholders have been called upon to pay four calls of 10% each upon the capital stock subscribed, payable Mar. 3, May 5, July 7 and Sept. 8. R. A. Bishop, Morrisburg, Ont., is Secretary. (Jan., pg. 39.)

Niagara, St. Catharines and Toronto Ry.—The Board of Railway Commissioners has approved revised location of the line in St. Catharines, mileage 0 to 1.8. (Feb., pg. 90.)

Ottawa and St. Lawrence Electric Ry.—The Ontario Legislature is being asked to pass an act amalgamating the North Lanark Ry. Co. with the O. and St. L.E.R. Co., increasing its capital stock from \$1,000,000 to \$5,000,000, authorizing it to issue bonds for \$30,000 a mile, and extending the time for the building of the authorized railways. (Nov., 1912, pg. 574.)

Port Arthur and Fort William Electric Ry.—The Ontario Legislature is being asked to confirm bylaws sanctioning the following expenditure by the City of Port Arthur, Ont., on the portion of the railway within its bounds:—Siding to the fair grounds, \$5,600; double track on Arthur St., \$11,000; extension on Hill St., \$6,500; double track, Bay and Algoma St., \$58,500; heavier steel rails on Cumberland St., \$55,400; iron poles within certain limits, \$1,400; belt line, \$82,000; extension to Hedge siding, \$34,000; extension to Queen St., \$4,300; extension along Algoma St., \$6,550.

The Fort William City Council has decided to build a second track on Frederica St., between Edward and Young Streets, and a Y at the end of the Mission extension. (Feb., pg. 90.)

Saskatoon Municipal Ry.—The Mayor of Saskatoon, Sask., in his recent inaugural address, stated it would be necessary to spend about \$100,000 upon extensions of the city's electric railway, and in building a second track on certain streets. The engineer is preparing a report as to what is necessary to do. (Feb., pg. 91.)

Toronto and York Radial Ry.—The Ontario Legislature is being asked to pass an act giving the company the right to enter into an agreement with the city of Toronto for the building of a double track line on Yonge St. from the present southerly terminus to York mills; the right an run cars on the Metropolitan Division on Sundays; the right to build a line to connect the Metropolitan Division with the Scarboro Division on the east, and the Mimico Division on the west; power to increase the bond issue from \$20,000 to \$30,000 a mile of single track, and for an extension of line for the building of previously authorized lines. (Feb., pg. 91.)

The appeal of the City of Toronto against an order of the Ontario Railway and Municipal Board, authorizing the company to build a double track line, on a new route, off Yonge St., has been allowed by the Court of Appeal, and the City Council has taken steps to stop the construction work, which has been about half completed. It is said that the company will carry the matter to a higher court.

The city has been asked to confer with the company with respect to the plans for joining the Scarboro and the Mimico sections of the line with the Metropolitan division.

It is reported that plans are being prepared for the building of a line from Langstaff on the Metropolitan Division easterly

to Unionville and Markham. (Feb., pg. 91.)

Toronto Eastern Ry.—We are officially advised that it has been decided to use the trolley system on this line. The overhead wire will carry 1,200 volts direct current, generated at Niagara Falls. (Jan., pg. 91.)

The Vancouver Island Hydro-Electric and Tramway Co. is incorporated under the British Columbia Companies Act. The Provincial Minister of Railways has issued the company's certificate under sec. 16 of the B. C. Railway Act, 1911, approving of the route map of a projected electric railway in Nanaimo.

A bylaw has been favorably voted upon by the electors of Vancouver, granting a franchise, and the details of this are now being finally arranged between the company and the City Council. (Feb., pg. 91.)

Winnipeg Electric Ry.—The City Board of Control has passed a resolution suggesting the building of about 20 miles of extension of lines in the city, not necessarily for immediate construction, but as indicating a general policy in regard to future extensions. It was also decided to apply to the Public Utilities Board for an order for the immediate building of a second track on Arlington St., from William St. to Selkirk St., and on Mountam Ave., from Arlington St. to McGregor St.

The Manitoba Legislature is being asked to confirm an agreement between the company and the municipality of St. Vital, for the building and operation of an electric railway therein.

Electric Railway Finance, Meetings, Etc.

British Columbia Electric Ry.—Gross earnings for December, \$613,654; operating expenses, \$389,080; net operating earnings, \$224,574; renewal funds, \$51,620; net earnings, \$172,954; approximate income from investments, \$35,000; net income, \$207,954, against \$523,003 gross earnings; \$319,298 operating expenses; \$203,705 net operating earnings; \$37,935 renewal funds; \$165,770 net earnings; \$25,000 approximate income from investments; \$190,770 net income for December, 1911. Aggregate gross earnings for six months ended December 31, \$3,436,466; net earnings, \$1,190,415, against \$2,801,394 aggregate gross earnings; \$979,187 net earnings for same period 1911.

Cape Breton Electric Co.—Gross earnings for Dec., \$34,387.35; operating expenses and taxes, \$16,123.65; net earnings, \$18,263.70; interest charges, \$4,375; balance, \$13,788.70; sinking and improvement funds, \$1,206.66; net income, \$12,582.04, against \$31,417.93 gross earnings; \$15,798.21 operating expenses and taxes; \$15,619.72 net earnings; \$4,512.50 interest charges; \$11,107.22 balance; \$1,140 sinking and improvement funds; \$9,967.22 net income for Dec., 1911. Aggregate gross earnings for 12 months ended Dec. 31, 1912, \$360,176.84; operating expenses and taxes, \$194,880.74; net earnings, \$165,296.10; interest charges, \$53,825; balance, \$111,471.10; sinking and improvement funds, \$14,280; net income, \$97,191.10, against \$337,554.88 aggregate gross earnings; \$181,763.76 operating expenses and taxes; \$155,791.12 net earnings; \$54,150 interest charges; \$101,641.12 balance; \$13,680 sinking and improvement funds; \$87,961.12 net income for same period 1911. The construction charges for the year were \$23,645.08. The balance sheet for the year shows assets of \$2,989,609.26; and amounts at credit of sinking and improvement funds, of \$128,309.29, of replacement reserve, \$1,486, and of reserves and surplus, \$307,033.18.

Detroit United Ry.—Following are the directors for the current year:—F. W.

Brooks, J. C. Donnolly, J. C. Hutchins, A. Peck, G. H. Russell, J. M. Wilson, C. M. Swift, Detroit, Mich.; A. J. Ferguson, Montreal; G. W. Moore, Cleveland, Ohio; A. Potter, New York City. The company controls the Sandwich, Windsor and Amherstburg Ry. Co. in Canada, which owns the old Windsor St. Ry., the S. W. and A. Ry., and the Windsor and Tecumseh Ry.

Grand Valley Ry.—At a meeting of bondholders of the G. V. Ry. and the Brantford St. Ry. in Toronto, Jan. 30, it was reported that the outstanding bonds amounted to \$2,000,000; beside which \$26,000 was due on account of taxes, \$50,000 on local improvements in Brantford. The net income of the company after meeting operating expenses is at present \$1,000 a month. Three holders of the first mortgage bonds, and three holders of second mortgage bonds, were appointed to act with Receiver Stockdale in administering the property to the best advantage.

Halifax Electric Tramway Co.—E. A. Robert, President, is reported as stating, Feb. 12, that the company will not consider any proposition to sell out to the city at 170 a share, and will resist expropriation. A proposition to sell to the city might be made, but it had not been considered by the directors.

Hamilton St. Ry.—The stock of the H. S. Ry. Co. heretofore amounted to \$205,000. Press reports state that an additional \$700,000 has recently been sold to provide funds for betterments and extensions, and that it is proposed to put a further \$500,000 of stock on the market at an early date, for further improvement.

Gross receipts for 1912, \$548,259.10; city percentage, mileage, etc., \$51,380.56, against \$454,010.52 gross receipts, and \$43,840.68 city percentage, mileage, etc., for 1911.

International Ry.—Originals of the re-funding and improvement 5% gold mortgage made between the I. Ry. Co. and Bankers' Trust Co., Nov. 1, 1912, have been deposited with the Ontario Railway and Municipal Board and the Secretary of State at Ottawa.

A Boston, Mass., dispatch, Feb. 11, states that N. W. Harris & Co. have arranged to place a \$12,000,000 loan to enable the company to carry out plans for the improvement of the service and the betterment of its lines.

Mount McKay and Kakabeka Falls Ry.—At the recent annual meeting at Fort William, Ont., W. F. Hogarth, President, stated that the company had had a successful year, and predicted a considerable increase in traffic for the current year. During last season, 2,500 cars of sand and gravel were hauled to the city over the company's lines. The extension of the line to Kakabeka Falls is contemplated. H. James, Fort William, is Secretary.

St. John Ry.—Press reports, Feb. 13, state that A. R. Gould, President, St. John and Quebec Ry., and C. C. Poirce, Boston, Mass., have made an inspection of the St. J. Ry., with a view of acquiring it, in connection with the St. J. and Q. Ry. and the allied electric railway line in Maine.

St. Thomas St. Ry.—The receipts of this municipally owned electric railway for January were \$416.11, against \$380.03 for Jan., 1912. Passengers carried, 42,600, against 32,056 for Jan., 1912.

Saskatoon Municipal Ry.—Total receipts for January, \$8,782.15 in car fares, representing 175,353 passengers; transfers issued, 8,969. Approximate expenses for the month—wages \$6,900, stores \$750, interest on capital expenditure \$2,083, sinking fund \$743, current used \$3,910, total \$14,386. The 10 cars covered 38,808 miles, an average

of 1,437 miles a day. During the month, two cars were chartered, producing \$14.50. No schedule of rates for chartering cars has been fixed, but the following rates are awaiting approval,—for one continuous trip before midnight, \$5, and \$2.50 for the return trip; after midnight, \$7.50, and \$2.50 for the return trip.

Toronto Ry., Toronto and York Radial Ry., and allied companies.—Gross earnings for December, \$845,297; expenses, maintenance, etc., \$369,821; net earnings, \$475,476, against \$727,130 gross earnings; \$559,775 expenses, maintenance, etc.; \$167,355 net earnings for Dec., 1911. Aggregate gross earnings for 12 months ended Dec. 31, 1912, \$8,562,600; net earnings, \$4,426,980, against \$7,615,918 aggregate gross earnings; \$3,791,368 net earnings for same period 1911.

Winnipeg Electric Ry.—Gross earnings for December, \$361,700; operating expenses, \$196,220; net earnings, \$165,480, against \$319,900 gross earnings; \$169,121 operating expenses; \$150,779 net earnings for Dec., 1911. Aggregate gross earnings for 12 months ended Dec. 31, 1912, \$3,765,384; net earnings, \$1,701,236, against \$3,829,749 aggregate gross earnings; \$1,928,782 net earnings for same period 1911.

Berlin and Waterloo Street Railway Report.

The Berlin and Waterloo St. Ry., which is municipally owned, operates 3.20 miles of line in and between Berlin and Waterloo, Ont. Following is the financial statement for the year ended Nov. 30, 1912:—

| | |
|--|-------------|
| EARNINGS. | |
| Cash fares | \$19,544 75 |
| Tickets | 20,630 50 |
| Parcels | 35 70 |
| | \$40,510 95 |
| Berlin & Bridgeport Street Ry | 1,800 00 |
| Galt, Preston & Hespeler Street Ry | 1,800 00 |
| Mail contracts | 1,339 12 |
| Advertising | 558 53 |
| | \$46,008 60 |
| EXPENSES. | |
| Power purchased | \$ 7,582 50 |
| Supplies | 1,041 32 |
| Wages | 9,688 20 |
| Snow cleaning | 688 15 |
| Crossing expenses | 437 82 |
| Heating car barns | 244 46 |
| Coal | 107 47 |
| | \$19,739 51 |
| Building repairs | \$ 232 83 |
| Car and motor repairs | 3,871 70 |
| Car painting | 39 33 |
| Storage battery repairs | 621 67 |
| Track and line repairs | 1,679 30 |
| Tools | 237 43 |
| | \$ 6,742 26 |
| Debenture interest | \$ 5,536 89 |
| Debenture discount | 395 00 |
| Advertising | \$373 32 |
| Donation | 20 00 |
| Printing | 426 84 |
| Sundries | 252 41 |
| Telephones | 166 55 |
| Uniforms | 268 18 |
| | \$ 1,507 37 |
| Insurance | 1,739 30 |
| Interest | 407 31 |
| Office expenses | 48 43 |
| Rents | 597 79 |
| Salaries | 1,548 38 |
| Taxes, Berlin | \$1,226 02 |
| Taxes, Waterloo | 489 30 |
| | \$13,495 72 |
| Depreciation | 5,120 53 |
| | \$45,008 02 |
| Balance | \$ 910 58 |

The balance at credit Nov. 30, 1911, was \$2,823.33, which added to the 1912 balance of \$910.58 makes \$3,733.91, from which is deductable \$705.83 due the town of Waterloo, leaving a net balance of \$3,028.08. The total assets are given as \$148,080.73, and the liabilities as \$145,052.65, the latter including a bank overdraft of \$669.53.

During the year passengers were carried as follows:—Tickets, 560,370; cash fares, 398,380; transfers, 24,000; total, 982,750.

Electric Railway Notes.

The Mount McKay and Kakabeka Falls Ry. intends adding another steam shovel to its sand and gravel plant, to double its present output.

The Reid Newfoundland Co., St. John's, Nfld., has ordered a double equipment of Westinghouse No. 323 A. motors and 200 D 2 type control.

The London St. Ry. is in the market for six single truck, single ended, pay-as-you-enter cars, without bulkheads, but with enclosed vestibules.

R. J. Fleming, General Manager, Toronto Ry., is reported to have stated that the company will add 75 cars to its rolling stock during the current year.

The Montreal Tramways Co. has ordered 50 car bodies, in addition to the 50 mentioned in our last issue, and 100 pairs of trucks, from the Canadian Car and Foundry Co.

The Dominion Power and Transmission Co., according to press reports, has declined to quote a price to the Hamilton City Council for a sale of the Hamilton Street Railway.

The Calgary City Council has under consideration tenders for four side dump cars, 6 yards capacity, and one 42 in. double end wheel turning lathe, to bore two steel wheels at a time on axles.

The Windsor, Essex and Lake Shore Rapid Ry. has ordered 2 steel frame single sheath box cars, and 4 steel underframe flat cars, each of 40 tons capacity, from the Canadian Car and Foundry Co.

The Port Arthur City Council is asking the Ontario Legislature to confirm bylaws authorizing the purchase of three cars and two trailers for the Port Arthur and Fort William Electric Ry. within that city.

The Berlin and Waterloo Street Ry. has received 2 single ended pay-as-you-enter cars, mounted on 27 G.E. 1 trucks with Westinghouse 101B2 quadruple equipment, single end control, bodies finished in cherry, longitudinal seats upholstered in rattan, from the Preston Car and Coach Co.

The car bodies for the electric railway in Brandon, Man., are being built in the United States and the motors in Canada. Engineer Greenway reports that 10 car bodies will be delivered early in March, and that the motors will be fitted in Winnipeg or Brandon. The cars are expected to be ready in April.

The question of heating the street cars is being much discussed in Calgary, Alta. It is the intention to adopt electric heaters as the permanent method, but at present there is not sufficient power available. Pending the provision of the power, the cars have been fitted with storm windows and oil heaters are being installed.

The ratepayers of the former town of North Toronto, which has been taken into Toronto, have passed a resolution calling upon the Board of Control to consider the claims of that portion of the city for a Sunday car service. The Metropolitan Ry., owned by the Toronto and York Radial Ry., at present operating there, has no power to operate on Sundays.

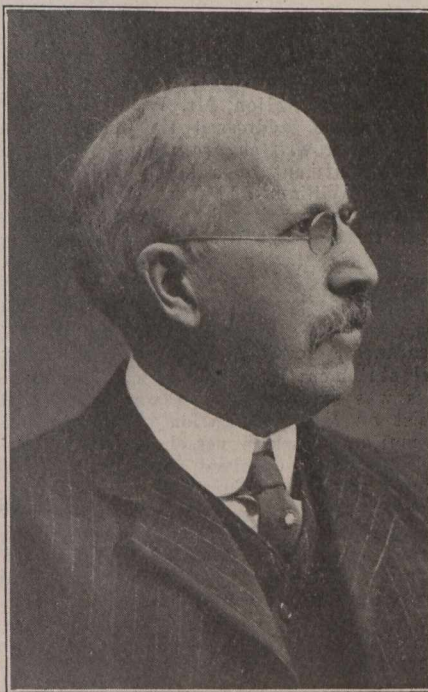
The Regina Municipal Ry. has received 8 double truck, single ended, pay-as-you-enter cars, mounted on 27 G.E.1 trucks, 4½ ft. wheel base, 4 of the cars being equipped with Westinghouse 101B.2 motors, and 4 with G. E. 80 single end controllers, from the Preston Car and Coach Co. The bodies are finished in cherry, both outside and inside, natural finish, cross seats upholstered in rattan, P.C. & C. Co.'s sand boxes, Consolidated Car Heating Co.'s buzzer system and automatic ventilators.

The Dominion Traction and Lighting Co.

has been incorporated under the Dominion Companies Act with a capital of \$12,500,000 and office at Toronto, for the purpose of producing and distributing natural and artificial gas, electricity, hydraulic, pneumatic or other power, for any and all purposes. The general powers are very wide, and include permission to promote the incorporation of, or the acquiring of any company, or an interest in any company using power. The provisional directors are:—W. A. J. Case, J. B. Taylor, C. J. Lynch, H. E. Wallace, L. W. Ward, Toronto.

Winnipeg Electric Railway Company's Annual Meeting.

The report for the year 1912 presented at the annual meeting in Winnipeg, Feb. 12, showed that the gross earnings were \$3,765,384.06, against \$3,829,749.67 in 1911. After paying four quarterly dividends for the year amounting to \$720,000, a surplus of \$474,463.12 was transferred to credit of profit and loss, making the total to the credit of this account on Dec. 31, 1912,



J. D. Fraser,
Director and Secretary-Treasurer, Ottawa Electric Railway.

\$2,091,236.37. The railway receipts for the year were \$2,114,974.

The board for the current year is constituted as follows, all the old directors having been re-elected:—President, Sir Wm. Mackenzie; Vice President, Sir Wm. Whyte; Secretary-Treasurer, F. Morton Morse; other directors, Sir Donald Mann, Sir Wm. C. Van Horne, A. M. Nanton, D. B. Hanna, Hugh Sutherland, R. J. Mackenzie.

Electric Railway Signalling in Indiana.—The Indianapolis & Cincinnati Traction Co., Indianapolis, Ind., has completed and put in operation the Simmen signal system on the remaining 22 mile section of its Greensburg division. This makes a total of 40 miles protected in this manner. The work just completed included, in addition to the cab signals, open switch protection and safeguards for east and west bound train movements. Work will be started at once on the Connersville Division which will add 55 miles more of Simmen signal protection to this road.

Personal Paragraphs.

JAS. ANDERSON, General Manager, Sandwich, Windsor and Amherstburg Ry., who is in Europe, is expected to return in April.

G. T. HOLDING, formerly of Toledo, Ohio, has been appointed Secretary-Treasurer, London St. Ry., London, Ont., vice J. W. Williams, resigned.

E. A. GRAHAM is reported to have been appointed Electrical Engineer, Winnipeg Electric Ry., vice C. R. Ross, resigned, to go into private business.

R. M. HANNAFORD, acting Chief Engineer, Montreal Tramways Co., read a paper on electric railway track construction before the Canadian Railway Club in Montreal recently.

W. WAINWRIGHT, Vice President, G. T.R. and G.T. Pacific Ry., Montreal, has also been elected President, Montreal and Southern Counties Ry., vice E. H. Fitzhugh, resigned.

T. W. WILSON, formerly General Manager, International Railway Company, Buffalo, N.Y., has been elected Vice President and General Manager, Wilmington and Philadelphia Traction Co., Wilmington, Del.

F. L. HUBBARD, heretofore secretary to the General Manager, Toronto Ry., has been appointed Assistant to the General Manager. L. Smith, heretofore assistant secretary, has been appointed secretary to the General Manager.

JOHN PATTERSON, promoter of the projected Hamilton, Waterloo and Guelph Ry., whose death was announced in our last issue, left his widow an estate valued at \$465,621, consisting chiefly of Dominion Power and Transmission Co.'s stock.

DUNCAN McDONALD, ex-General Manager, Montreal Tramways Co., is preparing a report on the street transportation question in Montreal, with a view to suggest temporary remedies for alleged congestion and for permanent improvements. This appears to be the outcome of the persistent attacks which a Montreal paper has been making on the Tramway Co.'s management for months past. The directors entered suits for libel recently and now the paper is paying the expenses of the investigation and report which Mr. McDonald is to make.

JAMES DEWAR FRASER, who has recently been elected a director of the Ottawa Electric Ry. to succeed the Hon. G. A. Cox, resigned, is a son of the late Andrew Fraser of Martintown, Glengarry. He spent his boyhood days in Glengarry, going to Ottawa in 1871, and entering the employ of W. McClymont & Co., lumber manufacturers, as accountant and telegraph operator, where he remained till 1882. He was then appointed Secretary-Treasurer of The Ottawa City Passenger Ry. Co., the old horse road, and occupied this position until 1891, when the company was merged with The Ottawa Electric St. Ry. Co., forming The Ottawa Electric Ry. Co. He has been Secretary-Treasurer of the last named company ever since. He is also a director and Secretary-Treasurer of the Ottawa Car Co., Ltd., Vice President and Secretary-Treasurer of The Wallace Realty Co., Ltd., and a member of the Canadian Street Railway Association's executive committee.

Hamilton Street Ry.—The committee of the Hamilton, Ont., city council dealing with street railway extensions in the city was informed by the company in a letter, Dec. 16, as to the conditions under which, and the time within which such extensions would be built. The city asks for extensions amounting to 50% of the present mileage. The matter is being considered.

Marine Department.

The Dominion Marine Association's Annual Meeting.

The Association's annual meeting was held in Ottawa, Feb. 6, the President, James Playfair, of Midland, Ont., in the chair. The executive committee's report showed that the total tonnage enrolled steadily increases, although the barge or sailing tonnage is becoming less, and although the figures quoted do not show the actual increase in tonnage owned by members, because vessels bought or built and placed in commission during the past season have not all been included in the tonnage statements upon which assessments were paid. The tonnage actually enrolled is 155,523 net registered tons of steam and 35,607 tons of barge or sailing vessels, making a total of 191,130 net registered tons. Adding the new vessels which will be in commission in 1913 the total should approximate 200,000 net registered tons. The report dealt in full detail with the past year's work, including the following subjects:—Chicago drainage canal, pilotage, St. Lawrence River Commission and power development schemes, the Grain Commission, Lake Shippers' Clearance Association, coasting laws, reciprocal arrangements regarding inspection of Canadian and U. S. steam vessels, immigration officers, radiotelegraphy, U. S. bill regarding seamen, conference of steamboat inspectors, rules of the road, ships articles, examinations for masters and mates, lower grade certificates for masters of tow barges, carrying passengers on tugs and wrecking steamboats, wage schedule and shipping offices, importation of bituminous coal, screening in bond, legislation at last session of Dominion Parliament, extension of period of navigation, a Canadian Lloyd's, statistics regarding water borne freight, statistics regarding interprovincial trade, wreck reports, the canals, including continuous operation, early opening, bridge tenders, ignorance of English language on part of canal employes, safety device for lock gates, protecting lock entrances, handling lines at canal entrances, widening of Lachine Canal between Cote St. Paul and bridge above lock, Lachine Canal upper entrance, Soulanges Canal dock for Cedar Rapids Manufacturing and Power Co., Murray Canal available draught in 1912, Welland Canal, G.T.R. Air Line bridge, channel at lower entrance Canadian lock at Sault Ste. Marie; Montreal Harbor, traffic regulations, elevator storage charges, extra charges for Sunday work, additional elevator capacity, jurisdiction of Commission; Livingstone channel, Detroit River, channel east of Fighting Island, Detroit River, north channel Georgian Bay to St. Mary's River, Niagara River, Kingston Harbor, Fort William and Port Arthur Harbors, Georgian Bay ports, and to navigation.

During the consideration of the report action was taken on a number of the clauses as follows:—

CHICAGO DRAINAGE CANAL.—Resolved, that the Association ask the Minister of Marine and Fisheries for action by way of protest against the continued withdrawal of an excessive amount of water by the Sanitary District of Chicago in contravention of the recent decision of the Secretary of War, and that continued efforts should be made by the Dominion Government to assist the United States federal authorities in protecting the waters of the Great Lakes against the withdrawals now

made with no authority other than that derived from the legislature of one state in the Union.

PILOTAGE.—Resolved, that a committee of the Association attend the sessions of the Pilotage Commission and present the standing complaints against the present system, asking also for amendment of the law to provide the identical treatment for vessels from Ontario that is provided by statute for vessels trading with the other provinces; the committee to consist of the Montreal members of the Association and Messrs. Playfair, Norcross, Mathews and King.

GRAIN COMMISSION.—Resolved, that an interview be sought with the Grain Commission, while the members of that body are in Ottawa, and that the whole question of loading and dispatch be discussed, the Chairman of the Commission having intimated a desire to hear the Association's views in verbal discussion.

In this connection, Mr. W. W. Jones, of Port Arthur, addressed the meeting and presented a written argument in favor of the appointment of a single vessel agent at Fort William and Port Arthur. This document was referred to the Association's grain section, and Mr. Jones was asked to join the deputation to the Grain Commission.

LAKE SHIPPERS' CLEARANCE ASSOCIATION.—The continued failure of the Clearance Association to furnish any financial statement or particulars of its business was reported, and it was resolved to insist on the presentation of the full information to which vessel owners are entitled. It was resolved also that the following committee should attend a conference to arrange a new agreement and schedule of rates, namely:—Messrs. Henderson, Playfair, Norcross, Richardson, Murphy, McLelland and King; and that the committee should endeavor to eliminate free storage, to make dispatch of vessels the basis of settlement, and to obtain a tariff based upon actual cost.

COASTING LAWS.—Resolved, that a deputation of those members able to remain in Ottawa should interview the Minister of Customs on the following day and discuss with him the regulations necessary to enforce strict compliance with the exact terms of the limited privileges granted United States vessels on Nov. 29, 1912.

SEAMEN'S UNION BILL IN UNITED STATES.—Resolved, on a report of the action taken by British interests through the British Embassy at Washington, to ask that a protest on behalf of Canadian vessels be presented in like manner, with special reference to the section of the bill rendering foreign vessels in a U. S. port subject to the laws of that country to enable a seaman to collect on demand half his wages earned up to that time.

RULES OF THE ROAD.—Resolved, to press for amendment to bring the rules on the Lakes and Upper St. Lawrence into strict conformity with the American Pilot Rules in force on these waters.

SHIPS ARTICLES.—J. V. O'Donahoe, Richelieu and Ontario Navigation Co., presented the recommendation referred to in the report, and after some discussion it was referred to the executive committee

and Messrs. O'Donahoe and Gildersleeve.

LOWER GRADE CERTIFICATES FOR Masters of Tow Barges, Carrying Passengers on Tugs and Wrecking Steamers.—Resolved to continue to press for amendment of the law in both these matters and to accept the amendment regarding passengers suggested in the annual report as a reasonable one in accord with the Merchant Shipping Act.

WAGE SCHEDULE.—W. L. Reed, T. Marks & Co., submitted the report of the special committee appointed to consider this question, recommending what the committee considered a fair schedule of wages, and it was adopted, on the understanding that the wages set out were minimum rates, and might be increased in any instance if members so desired. The report was ordered printed and circulated among members.

STATISTICS.—In this connection J. L. Payne, Comptroller of Railway and Canal Statistics, addressed the meeting asking the co-operation of members in his work.

LIVINGSTONE CHANNEL.—Resolved, that the Association's counsel, F. King, attend the session of the International Joint Commission in Detroit on Feb. 17, to represent the Association and present the views already expressed to him by members who have consulted their captains; and also that members endeavor to send navigators to give evidence in support of these opinions.

CANALS.—Resolved, that members able to remain in Ottawa on Feb. 7 wait upon the Minister of Railways and Canals and urge that the canals be opened at the earliest possible date this year on account of the various reasons rendering that desirable.

On the recommendation of S. V. McLeod, of the Algoma Central Steamship Line, instructions were given to ask for the continued dredging required on the Canadian side of the channel below the Canadian lock at Sault Ste. Marie; and also to ask for action to return to its old channel the current deflected by accumulations of material dumped on the U. S. side by the contractors working on the new Davis lock.

THE COMMITTEE ON AIDS TO NAVIGATION was reappointed, the members being S. C. Calvin, J. Donnelly, W. H. Featherstonhaugh, R. Fraser, J. B. Foote, H. H. Gildersleeve, D. Noonan, C. J. Smith and A. A. Wright.

ELECTION OF OFFICERS.—The meeting then proceeded to the election of the executive committee for 1913, and on the report that L. Henderson, H. W. Richardson, W. F. Wasley and A. A. Wright were the four retiring members, of whom Messrs. Henderson and Wright had been appointed only in 1912 to fill two vacancies caused respectively by death and resignation, it was resolved to reappoint Messrs. Henderson and Richardson and to appoint H. H. Gildersleeve and G. E. Fair, these four to hold office until 1916. J. E. McLurg, having resigned office in the Algoma Central Steamship Line, and having been succeeded by S. V. McLeod, the meeting appointed Mr. McLeod a member of the executive committee in Mr. McLurg's place to hold office for the unexpired period of the term, namely, until 1914.

The executive committee elected the fol-

lowing officers for 1913:—L. Henderson, President; A. E. Mathews, 1st Vice President, and H. W. Richardson, 2nd Vice President.

Deputation to Marine and Fisheries Committee.

The various representatives of steamship companies attending the Association's meeting appeared before the House of Commons Committee on Marine and Fisheries to discuss the bill respecting radiotelegraphy now before the house. The Minister of Marine and Fisheries, Hon. J. D. Hazen, explained that it was proposed to alter section 4 of the bill to read as follows:—

"4. From and after July 1st, 1913, no passenger steamer, whether registered in Canada or not,

"(a) Licensed to carry 50 or more persons, including passengers and crew, and plying between ports or places more than two hundred nautical miles apart, or

"(b) Licensed to carry 250 or more persons, including passengers and crew, and plying between ports or places more than 90 nautical miles apart, or

"(c) Licensed to carry 500 or more persons, including passengers and crew, and plying between ports or places more than 20 nautical miles apart—

shall leave or attempt to leave any Canadian port unless such steamer is equipped with an efficient radiotelegraph apparatus, in good working order, capable of transmitting and receiving messages over a distance of at least 100 nautical miles by night and by day, in charge of a person fully qualified to take charge of and operate such apparatus.

"2. The owner, master or other person in charge of any passenger steamer which leaves or attempts to leave any Canadian port contrary to the provisions of this section, shall, on summary conviction, be liable to a fine not exceeding \$1,000 and costs, and such fine and costs shall constitute a lien upon such passenger steamer.

"3. This section shall not apply to passenger steamers while plying on the rivers of Canada, including the River St. Lawrence as far seaward as a line drawn from Father Point to Point Orient, or on the lakes of Canada other than Lakes Ontario, Erie, Huron (including the Georgian Bay), and Superior."

The Minister having explained the bill, F. King, the Association's Counsel, said that the bill as originally introduced, which exempted passenger steamboats plying between ports not more than 200 miles apart, was satisfactory, but the proposed changes would impose a great burden on the Niagara River line and the Toronto-Hamilton Line, where were really ferries. C. J. Smith, General Manager, Richelieu and Ontario Navigation Co., supported Mr. King's contention and urged that the lines between Toronto and Niagara and Toronto and Hamilton should be exempted. H. H. Gildersleeve, Manager, Northern Navigation Co., asked exemption for vessels on Georgian Bay. J. H. Lauer, Manager Canadian Marconi Wireless Telegraph Co., explained the terms on which that company equips vessels with wireless apparatus and operates the same. After a short discussion the committee decided to amend the suggested amendments to the bill so as to exempt from its operation vessels running on the Bay of Quinte, between Toronto and Hamilton and on Georgian Bay and the north channel thereof.

Dinner at the Ottawa Golf Club.

In the evening the representatives attending the meetings, accompanied by a number of guests, went by special cars on the Hull Electric Ry., to the Ottawa Golf Club, where they enjoyed a most excellent dinner. J. Playfair, the Association's retiring President, occupied the chair. The

speakers included Hon. Frank Cochrane, Minister of Railways and Canals, who made the important announcement that a start will be made this year on the construction of the new Welland Canal and that the depth at the gates will be 30 ft. though the whole canal will not be dredged to that depth at first. The Sault Ste. Marie Canal is 24½ ft. deep; Hon. J. D. Hazen, Minister of Marine and Fisheries, who dealt with a large number of matters affecting his department and who announced in connection with the deepening of the Quebec-Montreal channel to 35 ft., that should it be found necessary to do so, compensating works would be constructed to prevent any lowering of water in Montreal Harbor and further up stream; and the Hon. S. Hughes, Minister of Militia. Among the other speakers were H. W. Richardson, Kingston, Ont.; A. A. Wright, Toronto; F. King, the Association's Counsel; F. Cook, ex-mayor of Ottawa; G. A. Tomlinson, Duluth, Minn.; W. E. Campbell, Detroit River Steamers; C. A. Magrath, International Waterways Commissioner; F. F. Pardee, M.P.; W. P. Anderson, Chief Engineer Marine and Fisheries Department; G. J. Desbarats, Deputy Minister Naval Service; J. B. Hunter, Deputy Minister Public Works; F. C. T. O'Hara, Deputy Minister Trade and Commerce; J. A. Currie, M.P., and Acton Burrows, Managing Director, Canadian Railway and Marine World.

The Farrar Transportation Company, Limited.

Following are extracts from the report for the year 1912 of this company, which has its headquarters at Collingwood, Ont., and operates the steamships Collingwood and Meaford on the upper lakes.

A dividend of 10% has been paid for the year, and a bonus of 5% from the amount received in settlement of claim against the Craig Steamship Co., Cleveland, Ohio.

The bonded indebtedness on the s.s. Collingwood has been reduced from \$108,000 to \$94,000, \$14,000 having been paid on the principal maturing in 1912 and \$5,050 interest on bond issue. These two items, aggregating \$19,050, were provided for out of earnings and equal approximately 7¾% on the capital stock.

The net profits for 1912 show an increase of 112% over 1911 and an increase of 147% over 1910.

The assets over liabilities have reached \$140,067.40, which makes the intrinsic value of the stock \$156 a share.

The s.s. Meaford went into commission May 1 and was kept steadily engaged until Dec. 3, when she went into winter quarters at Collingwood, after concluding the most successful season in her history. She carried 25,000 tons of iron ore, 3,000 tons of coal, 12,000 tons of pig iron and 1,800,000 bushels of grain, netting slightly over 20% on her cost.

The s.s. Collingwood started running May 1, and she concluded her banner year and went into winter quarters at Port Colborne, Dec. 12. She carried 145,000 tons of iron ore, 12,000 tons of coal, 2,200,000 bushels of grain, netting approximately 20¾% on her cost.

| ASSETS. | |
|-------------------------------|--------------|
| Two steamships | \$405,198.73 |
| Office furnishings | 448.84 |
| Royal Bank | 83,365.50 |
| | \$489,013.07 |
| LIABILITIES. | |
| Detroit Trust Co. | \$94,000.00 |
| Prindville and Co. | 4,945.67 |
| Shareholders | 250,000.00 |
| Assets over liabilities | 140,067.40 |
| | \$489,013.07 |

| | |
|---|-------------|
| Gross earnings for season | 173,181.35 |
| Expenses, fuel, wages, insurance, provisions, etc. | 90,582.40 |
| Net earnings | \$82,598.95 |
| General expense | \$4,314.78 |
| Interest | 4,945.64 |
| | \$9,260.42 |

Net profit

\$73,338.53
The directors for the current year are: President, T. I. Thomson, Owen Sound, Ont.; Vice President, E. R. Wayland, Fort William, Ont.; Secretary-Treasurer, G. E. Fair, Collingwood, Ont.; other directors, E. Stubbs, Sault Ste. Marie; D. D. Lewis, Lorain, Ohio; W. E. Allen, Toronto; W. T. Toner, G. R. Pearsall, Collingwood; M. Snetsinger, Thornbury, Ont.; J. Shultis, Port Colborne, Ont.

Launching of the Reid Newfoundland Company's Steamship Lintrose.

The passenger and freight steamship Lintrose, which is being built at Newcastle-on-Tyne, Eng., for the Reid Newfoundland Co., to run between Port aux Basques, Nfld., and North Sydney, N.S., was launched Jan. 21 by Miss Lois Reid, daughter of W. D. Reid, President of the R.N. Co., who was also present with his wife.

The Lintrose is 255 ft. long by 37 ft. beam. She is finely modelled, and is exceptionally strongly constructed for running through ice, which she will frequently encounter on her service. She will be fitted with single screw triple expansion engines supplied with steam by three large boilers, and the machinery is expected to propel her at a speed of 15½ knots an hour. She will be fitted with electric light, steam heating and wireless telegraph apparatus, and she is to have accommodation for over 80 first class passengers, including three special rooms for one passenger each and a ladies' room holding ten. There will be a smoking room on the promenade deck, and a dining saloon and ladies' room on the shelter deck, all amidships. In the after part there will be accommodation for 150 second class passengers. Both the promenade deck and the shelter deck will form spacious promenades for passengers.

Prince Edward Island Car Ferry.

The Minister of Railways and Canals stated in the House of Commons recently that an order in council had been passed awarding a contract to Sir W. G. Armstrong Whitworth & Co., Newcastle-on-Tyne, Eng., for the construction of a car ferry to run between New Brunswick and Prince Edward Island, the same to have 7,000 indicated horse power.

Four tenders were received as follows:—Sir W. G. Armstrong Whitworth & Co., Newcastle-on-Tyne, Eng., £138,000; Canadian Vickers, Ltd., London, Eng., two tenders, no. 1, £112,480; no. 2, £110,700; Swan, Hunter & Wigham Richardson, Wallsend-on-Tyne, Eng., £140,000.

It is expected the vessel will be completed and the service commenced some time during 1914. Plans, specifications and estimates for the necessary piers are being prepared.

In reference to the horse power above mentioned, we are officially advised as follows:—"This car ferry, being designed for use under the worst possible ice conditions to be met with in the Straits, is provided with the above mentioned high power to cope with these conditions. Under less trying conditions and in open water much less power is required. To meet these varying conditions the power is derived from three sets of engines, furnished with steam from six boilers."

Richelieu and Ontario Navigation Company's Annual Meeting.

The 67th annual meeting of the R. & O. N. Co., which was held in Montreal, February 19, was awaited with much more than usual interest, as it was known for some time previously that there would be a keen contest for the election of directors, between Sir Rodolphe Forget, the President, and his followers, and the English and Western Ontario interests, the English holding being principally the so-called Furness interests held by the British Maritime Trust Co., and the Western Ontario interests being headed by James Playfair, of Midland, Ont., who went into the R. & O. N. Co. on its absorption of the Niagara Navigation Co. and the Inland Lines, Limited.

The meeting opened at noon, Sir Rodolphe Forget in the chair, and adopted the annual report, which is given below. When the election of directors was reached a list of names was proposed in the interests of the English-Western Ontario combination, Sir Rodolphe's name being included. He objected to the list and asked to have his name dropped, but it was left on. A. H. Simms, one of the old directors, who was not included on the list, demanded a poll, and the meeting adjourned to 5 p.m. to enable this to be taken. Owing to the heavy work involved in checking the proxies, etc., it was after 6 o'clock before the result was announced.

The capital stock being \$9,963,400, there were 99,600 possible votes. Sir Rodolphe headed the poll with 94,321 votes, both factions having supported him. The following 13 candidates received 60,308 votes each:—Sir Montagu Allan, C. A. Barnard, K.C., J. R. Binning, Jas. Carruthers, W. Hanson, W. G. Morden, W. Wainwright, Montreal; C. G. Bryan, London, Eng.; F. A. McGee, Hamilton, Ont.; E. Bristol, W. D. Matthews, Toronto; Jas. Playfair, Midland, Ont.; H. W. Richardson, Kingston; H. B. Smith, Owen Sound, Ont.

Owing to some irregularity in the registering of the stock on which E. Bristol qualified, his election was held to be invalidated, and J. P. Steadman, of Hamilton, Ont., who received 36,013 votes, was declared elected. Sir Rodolphe announced that he would not sit on the board, and suggested that E. Bristol could be elected in his place when the irregularity referred to had been put right.

At a meeting of the new board, Feb. 20, Sir Rodolphe Forget's resignation as a director was accepted and E. Bristol was elected to succeed him. Sir Montagu Allan was elected chairman of the finance committee. It was decided to appoint a trust company as stock transfer agents, so that shares will be transferable in both Montreal and Toronto.

The following old directors were not re-elected:—Hon. J. P. B. Casgrain, G. Caverhill, D. O. Lesperance, C. O. Paradis, Sir Henry Pellatt and A. H. Simms.

The new board at once organized and elected the following officers:—Hon. President, Sir Trevor Dawson, who is connected with the Furness interests in England; President, Jas. Carruthers, Montreal; Vice Presidents, James Playfair, W. Wainwright.

It was announced that two advisory boards would be appointed, one for the province of Quebec and one for Ontario.

Following are extracts from the annual report:—

The statement includes earnings, expenses, etc., of the company's subsidiary lines, viz.:—Northern Navigation Co., Inland Lines, Limited; Niagara Navigation Co., R. & O. Navigation Co. of United States, St. Lawrence River Steamboat Co.,

| | |
|------------------------------------|----------------|
| Gross receipts were | \$4,495,157.48 |
| Operating expenses were | 3,345,953.12 |
| Net earnings | \$1,149,204.36 |
| Fixed charges, interest, etc. | 172,691.44 |
| Net profits | \$976,512.92 |

Four quarterly dividends of 2% each were paid.

The paid up capital having virtually reached the amount authorized, viz.: \$10,000,000, application has been made to Parliament for authority to increase it to \$15,000,000.

The company has completed the purchase of the shares of the Northern Navigation Co. and Inland Lines, Limited. The company has also acquired all the shares of the Niagara Navigation Co., St. Lawrence Steamboat Co., and Thousand Island Steamboat Co.

In view of the rapid development of the Canadian Northwest and the increasing freight and passenger traffic via Lake Superior, in order to take advantage of same and to maintain our standard of service, your directors have placed an order with the Western Dry Dock Co. of Port Arthur for a new steamship considerably larger than the Hamonic, but on similar lines.

During the year the required number of debentures of the company have been cancelled, and interest and sinking fund requirements of all subsidiary companies have been paid.

The insurance fund has been credited with \$36,000 out of the year's earnings, and \$330,361.90 now stands to the credit of this account and is invested in first mortgage bonds. This reserve fund is in addition to the general insurance carried with the insurance companies on shore properties, steamers, etc.

In September last your directors made a general inspection trip through to Fort William and Port Arthur, visiting the different docks, coal plants and terminals and a number of the principal steamships of the recently acquired lines, and were much impressed with the properties and their opportunities, and are of the opinion that with the consolidation of same your company, through its extensive ownership, traffic arrangements and connections, is now in a position to materially benefit therefrom and by the general prosperity of the country.

ASSETS.

| | |
|---|-----------------|
| Steamers, real estate, buildings, docks, wharves, etc. | \$4,785,736.45 |
| Stocks and bonds of subsidiary companies | 6,143,060.28 |
| | \$10,928,796.73 |
| Bonds in treasury ... | \$102,686.66 |
| Traffic balances, etc. ... | 216,190.96 |
| Loans to and balances due by subsidiary companies | 1,029,640.42 |
| Coal, stores, provisions, etc., on hand | 70,676.42 |
| Unexpired insurance and taxes | 22,500.00 |
| Cash on hand | 60,236.87 |
| | 1,501,931.33 |
| Insurance fund invested | 329,978.17 |
| | \$12,760,706.23 |

LIABILITIES.

| | |
|-----------------------------------|-----------------|
| Capital stock | \$9,963,400.00 |
| Bonds 5% sterling, \$1,484,333.32 | |
| Less cancelled .. | 107,553.32 |
| | 1,376,780.00 |
| | \$11,340,180.00 |
| Accounts payable | \$58,763.30 |
| Unclaimed dividends .. | 174.75 |
| Accrued fixed charges .. | 20,561.64 |
| Accrued dividends | 1,884.93 |
| Bank loans | 300,000.00 |
| | 381,384.62 |
| Insurance fund (invested) | \$330,361.90 |

| | | |
|---------------|------------|-----------------|
| Surplus | 708,779.71 | 1,039,141.61 |
| | | \$12,760,706.23 |

INCOME ACCOUNT.

| | |
|---|----------------|
| Surplus Dec. 31, 1911 | \$439,249.13 |
| Net earnings, 1912 | \$1,149,204.36 |
| Less fixed charges, interest, etc. | 172,691.44 |
| Net profit | 976,512.92 |
| | \$1,415,762.05 |
| Carried to insurance fund | 36,000.00 |
| Written off steamers, etc. | 75,817.56 |
| Dividends | 595,164.78 |
| Net Surplus | 708,779.71 |
| | \$1,415,762.05 |

The C.P.R. Austrian Steamship Service.

It is announced that the C.P.R. will commence its Canada-Austria service with the s.s. Lake Champlain, sailing from Trieste, Mar. 20, and that this will be followed by s.s. Lake Erie, sailing four weeks later. These vessels, which have been renamed Ruthenia and Tyrolia, respectively, will make Naples a port of call each way.

In connection with this service, which has been arranged by agreement with the Austrian Government, the steamship interests comprising the North Atlantic Steamship Conference, at a recent meeting in Berlin, Germany, decided to oppose the scheme, and to place a competitive service on the route.

A press dispatch from London, Eng., states that the reasoning of the C.P.R. is to the effect that if the rates are high, the company makes a substantial profit on the business, and if, on the other hand, they are low, Canada gets a large supply of cheap labor, which is induced to cross the Atlantic by reason of the cheap fares, and as the C.P.R. is the largest employer of labor in Canada, and has about 1,000 miles of railway to build during the current year, it will gain with the left hand, at the expense of its competitors, what it may lose with the right, on its own vessels. It is therefore contended that if a rate cutting policy is inaugurated, and its competitors carry passengers at a loss, they will be merely putting money into the C.P.R. treasury.

It has been officially stated that the C.P.R. has been permitted to carry on its business in Austria since 1908, and as an outcome, laid its plans before the Government there, which came to the conclusion that an opportunity was afforded for a considerable development at Trieste. In the arrangement of the transatlantic passenger trade, it was stated that only a small share, about 4%, was accorded to Trieste, and it was decided to take steps to secure a larger share of the traffic.

Press reports state that the Austro-Americana Line has decided to commence a service between Trieste, Patras and other Mediterranean ports and Canada, in March, the first vessel calling at Portland, Me., and later ones at Quebec and Montreal, and that it has fixed a rate of \$29.50 per passenger.

G. McL. Brown, European Manager, C.P.R., who attended the conference at Berlin, is reported to have stated that the conference demanded that the C.P.R. surrender its contract with the Austrian Government and pay a default, but offered no recompense of any nature.

F. Glanzmann and Co., Trieste, and S. Altman, Vienna, are reported to have been appointed agents for the service.

The Robert Reford Co., Montreal, has subscribed \$1,500 to the fund being raised for the relief of those who were dependent on the lost members of the Scott Antarctic Expedition.

Atlantic and Pacific Ocean Marine.

The C.P.R. s.s. Montford, while bound from London, Eng., to St. John, N.B., damaged one of her propellers during heavy seas, and had to complete the balance of her voyage, from Cape Race, with one screw.

The Dominion-White Star Line's s.s. Laurentic, having been utilized for an additional cruise to the West Indies, her place on the Halifax-Liverpool route, scheduled for Mar. 30, will be taken by the s.s. Arabic for one round trip.

It is reported that berthing accommodation has been arranged alongside shed 16 at the Victoria Pier, Montreal, for the forthcoming season, for the Compagnie Generale Transatlantique, for its service between French ports and Montreal.

The Austro-Americana Line, which has arranged sailings from Trieste, Austria, to Canada, for the forthcoming immigration season, is reported to have acquired the Italian s.s. Bologna, and to have chartered the s.s. Arabiana from Furness, Withy and Co. for the season. The first sailing from Trieste is scheduled for Mar. 15. Jas. Thom has been appointed agent at Montreal.

The Uranium Steamship Co.'s s.s. Uranium was recently labelled by the British s.s. Rappahannock, and the Canadian s.s. Bridgewater, for \$50,000 and \$30,000, respectively, for services in floating her off the rocks at Chebueto Head, N.S.; the Admiralty Court, however, fixed the amount of salvage in favor of the s.s. Rappahannock, at \$40,000, and on a bond being furnished for this amount, the Uranium was allowed to leave for New York.

Capt. Roberts, of the Canadian Northern Steamships' s.s. Royal Edward, has been appointed Dock Superintendent at Avonmouth, Eng., and Chief Officer Wootton of the same vessel has been promoted to the command. Capt. F. Thompson, heretofore Marine Superintendent for the company at Montreal and Halifax, who took command of the s.s. Royal George, on the suspension of Capt. Harrison, by the Dominion Wreck Commissioner, has been confirmed in that appointment.

A report from New York recently stated that the C.P.R. had been awarded the contract by the Dominion Government for a steamship service between Canada and the West Indies, and that it would receive a subsidy of \$400,000 a year. No official announcement as to the awarding of the contract had been made up to the time of going to press, and G. M. Bosworth, Vice President, C.P.R., is reported to have stated that the statement was incorrect, and that the C.P.R. had not even tendered for the service.

Details of the trip around the world by the two new C.P.R. Empress trans-Pacific steamships, the Empress of Russia and the Empress of Asia, have been completed. The Empress of Russia, which will be ready first, will take the Mediterranean route, while the Empress of Asia, will go round the Cape of Good Hope, making calls at some of the principal South African ports. The Empress of Russia will leave Liverpool April 1, calling at Gibraltar, Villefranche, Port Said, Colombo, Singapore, Hong Kong, Shanghai, Nagasaki, Kobe and Yokohama, and thence to Vancouver, arriving at the latter port June 7.

Maritime Provinces and Newfoundland.

A passenger steamboat is under construction at Chatham, N.B., for Cape Breton owners, and which it is intended to have

ready for operation by May. The dimensions will be, length 60 ft., beam 14 ft.

The s.s. St. Pierre Miquelon, owned by the Societe Anonyme la Morue Francaise, Paris, France, and which was formerly operated in the mail service between St. Pierre, Miquelon, Nova Scotia and Newfoundland, has been sold for £13,000.

The Nova Scotia Registrar of Joint Stock Companies has revoked the certificates of registration issued to the Steamship City of Ghent Co., and the Halifax and West India Steamship Co., at their request, under part 2 of the Foreign Companies Act.

The Reid Newfoundland Co. has under extensive repair at its dry dock and repair plant at St. John's, Nfld., the steamships Wilhelmina, Cynthia, Nevada and Adventure. When these repairs are completed, the company's other vessels will be overhauled in preparation for the summer's business.

The dry dock at St. John, N.B., which was originally planned to be 900 ft. long, will probably be extended to 1,150 ft. Norton Griffiths and Co., the contractors, have submitted a rough draft of such an extension to the St. John City Council, and asked for a guarantee of \$65,000 a year for 35 years, for a sinking fund for the bond issue, and offer 25% of the common stock of the company and to establish a ship-building plant in return.

A press report states that the C.P.R. is considering the question of putting a new steamship, which is to be built in Scotland, on the route between St. John, N.B., and Digby, N.S., in connection with the improvement of the Dominion Atlantic Ry. service. It is stated that the new vessel will run in conjunction with the s.s. Prince Rupert, the latter taking the morning service, while the new vessel will take the place of the s.s. Yarmouth, on the afternoon run. We are officially advised that it is not the intention to build a vessel for this service, but to acquire one ready for immediate operation.

The Department of Marine has erected a new lighthouse on Grindstone Island, in the Chignecto Channel of the Bay of Fundy. It is a hexagonal tower with six buttresses, of reinforced concrete, 59 ft. from base to top of ventilator on lantern. The tower is white, and the lantern, which is octagonal, is red. The light is occulting white of the fourth dioptric order, visible 12 seconds and eclipsed 3 seconds, alternately, burning petroleum vapor under incandescent mantle, and can be seen 15 miles from all points of approach by water. It will be put in operation on the reopening of navigation, when the temporary light will be discontinued.

Province of Quebec Marine.

A. F. Dion, heretofore Freight Agent, Canadian Northern Ry., Montreal, has been appointed Traffic Manager, Quebec Harbor Commission.

In a recent action by the C.P.R. against the Quebec Harbor Commission for \$2,478, which the C.P.R. claims was paid by it in excess of the amount due to the Commission as rental and other dues, judgment was given against the Commission.

The Marine Department has announced that the lighthouse on the south end of Ash Island, Richelieu River, has been rebuilt. It is a steel skeleton frame, 45 ft. from base to top of lantern, with fixed white catoptric light at an elevation of 44 ft.

The Dominion Department of Public Works is reported to have ordered six steel

scows, to be built at G. T. Davie and Sons' plant at Levis. The steel screw hopper dredge which is under construction there for the Marine Department is nearing completion.

The Quebec Harbor Commission has awarded the contract for the dredging of the St. Charles River, from the east end of the breakwater extension to the west end of the north embankment of the Princess Louise dock, to the Dominion Dredging Co. The work will extend to 45 ft. below low water.

Plans for development work in the Quebec harbor are in the hands of the Dominion Government for approval. The work proposed covers improvements in connection with the Princess Louise dock, the building of a bulkhead pier, grain elevator, etc., and a general development from Lampson's Cove to Point a Pizeau. The Commission has acquired Indian Cove for \$109,000, and it is the intention to use it for the building of the crib work, etc., for the general improvements, and later it may possibly be used as a site for a ship yard.

Ontario and the Great Lakes.

The name of the steamboat Charles Lemcke, no. 126058, registered at Owen Sound, has been changed by order in council to Henry Pedwell.

The Pere Marquette car ferry International, running between Port Huron and Sarnia, broke a propeller while forcing through the ice, Feb. 11.

It is announced that the Rainy River steamboat service will be resumed about June 1, two boats plying weekly between Kenora and Rainy River. The service was not operated last year, owing to low water and lack of proper dredging.

J. B. Fairgrieve, who died recently at Hamilton, aged 80, was connected with marine life for many years, and at one time controlled a number of grain carrying vessels on the Great Lakes. He retired from active connection with transportation about five years ago.

It is reported that the C.P.R. has arranged for a further addition of 2,650,000 bush. capacity to its elevator D at Fort William, which will bring the total capacity of this elevator up to 7,500,000 bush. The capacity was increased, during 1912, from 2,850,000 to 4,850,000 bush.

The Dominion Transportation Co.'s steamboat Manitou took fire at her winter berth at Owen Sound, Feb. 1, and sank. She was built at Goderich in 1903, and was screw driven with engine of 42 n.h.p. Her dimensions were, length 137.2 ft., breadth 24.2 ft., depth 9.1 ft.; tonnage, 470 gross, 297 register.

The steamboat Victoria, owned by the Pembroke Navigation Co., which has been wound up recently, has been sold to W. L. Hunter, Pembroke, Ont. She is a paddle wheel vessel with engine of 60 n.h.p., and was built at Pembroke in 1897. Her dimensions are,—length 128.7 ft., breadth 21 ft., depth 5½ ft.

The Town of Midland is applying to the Ontario Legislature for confirmation of by-law passed by the taxpayers to grant a bonus of \$25,000 to the Midland Dry Dock Co. for the construction of a floating dry dock and building berth there. Some details of this proposed construction were given in our last issue.

The Pelee and Lake Erie Navigation Co. is having a freight and passenger steamboat built at Collingwood. The dimensions will be as follows:—Length, 145 ft.; beam, 24 ft.; moulded depth, 18¼ ft. She will be

equipped with triple expansion, jet condensing engines, supplied with steam from a Scotch boiler. It is anticipated that she will be completed by July 15.

It is reported that work on the construction of the projected dry dock at Sault Ste. Marie, Ont., will be commenced Apr. 30, and that it must be completed by Oct. 1, 1914. It is stated that the financing of the enterprise has been completed in England, and that Pethick Bros., Plymouth, Eng., have undertaken the work, the cost being about \$1,000,000.

The U. S. Circuit Court at Cincinnati, Ohio, has decided that the Great Lakes Towing Co. has had a monopoly of the towing business of the 14 principal ports on the Great Lakes for the past 13 years, and that it is driving out of business the formerly numerous independent tug companies, and, having violated the anti-trust laws, must be dissolved.

During 1912, the Government elevator at Port Colborne handled 12,100,000 bush. of grain, this being the largest quantity handled by any elevator on the lakes, except the G.T.R. elevator at Tiffin, which dealt with 13,680,000 bush. The capacity of the Port Colborne elevator is 750,000 bush., and it has decided to increase it to 2,000,000 bush.

The U.S. Lake Survey reports the levels of the Great Lakes in feet above tide water, for January, as follows.—Superior 601.84; Michigan and Huron 580.08; Erie 572.27; Ontario 246.51. As compared with the average January levels for the past ten years, Superior was 0.24 ft. below; Michigan and Huron, 0.06 ft. above; Erie, 0.58 ft. above; and Ontario, 1.08 ft. above. It was anticipated that Superior would fall 0.2 ft., Michigan and Huron remain stationary, Erie fall 0.1 ft., and Ontario rise 0.1 ft., during February.

The storage capacity of grain elevators at Fort William is 24,000,000 bush., and with 57 vessels in the harbor, capable of storing another 12,000,000 bush., the available storage capacity at present is 36,000,000 bush. From information supplied, there is approximately 19,000,000 bush., now stored in the elevators and vessels, leaving available storage for a further 17,000,000 bush. We are advised that with the existing movement of grain to the seaboard by rail, it is unlikely that any grain blockade will occur at Fort William before the reopening of navigation.

The Great Waterways Union, which was inaugurated last year, with the object of keeping the claims of the St. Lawrence-Welland canal route before the Government, held its annual meeting at Berlin, Ont., Feb. 14. A resolution was adopted that in view of the early completion of the Erie barge canal and of the Panama canal, making time of great importance, the Dominion Government be urged to make larger appropriations to secure the earliest possible completion of the improved Welland canal, and to appoint a commission to report on the development of the St. Lawrence River to a depth of not less than 30 ft. for the passage of ocean vessels by the St. Lawrence and Welland canal route to the head of the lakes, and the development of waterways from Lake Superior to the western provinces, and asking that no money for construction be spent on the French River, or proposed Georgian Bay canal, until the route can be shown to be commercially practicable.

The Upper Ontario Steamboat Co. at its annual meeting at Liskeard, Feb. 9, decided that the line will not be operated during the forthcoming season, and that all the assets are to be sold immediately, and the company wound up. The report states

that the 1912 season might have been one that showed a profit had it not been for a series of serious accidents, which culminated in the sinking of the vessel S. & Y. just below Flat Rapids, in November. The result was that the revenue just about paid expenses. The advent of the Timiskaming and Northern Ontario Ry. in the Elk Lake and Montreal River territory, where the company operated, is taken to mean that navigation on the river would result in a loss to the company were it to operate for another season. The vessels are Adrelexia, Agnes, Gypsy, Geisha, S. & Y., and St. Antoine. The officers and directors who were re-elected for the current year are: President, W. J. Blair; Vice President, C. H. Fullerton; Secretary-Treasurer, F. Hardman; other directors, F. S. Bricken-den and T. McCamus.

The commissioner who was appointed to enquire into the causes of the wreck of the steamboat Mayflower, near Barrys Bay, Nov. 12, 1912, when one of the owners and 8 others lost their lives, reports gross negligence on the part of the owners, Hudson Bros., Combermere, and infringement of the Canada Shipping Act. The cause of the wreck was the parting of the seams due to heavy strain from the machinery. The timbers were sound, but alterations had weakened her. The vessel was sailed for a whole season without a certificate, and in face of repeated warnings by the Inspector of Hulls at Kingston, who had refused a certificate because there was no qualified captain aboard. The commissioner considers that the Inspector should have seized and detained the vessel, but the latter holds that that was the duty of the Customs Department, but states that the department had not been informed of the violation of the law. The remaining owner was censured for sailing without a lifeboat, which had been damaged the day before the accident and left behind, as with the lifeboat, all on board might have been saved. The crew was found to be competent, and the commissioner recommends that the Department of Marine should appoint a special official to see that no vessel not complying with the regulations shall ply Canadian waters.

Manitoba, Saskatchewan and Alberta.

The Department of Marine has established 20 spar buoys at various points on the Winnipeg River, between White Dog Island and Kenora.

British Columbia and Pacific Coast Marine.

The North Vancouver Ferry Co. is about to invite tenders for a fourth ferry steamboat, for its service between Vancouver and North Vancouver.

The Union Steamship Co. has come to an arrangement with the underwriters in connection with its wrecked steamship Vadsø, by which it receives part of the insurance money, and takes over the damaged vessel.

The Union Steamship Co.'s s.s. Cheslakee, which sank at Van Anda, Texada Island, ary, and has been taken to Esquimalt for overhauling and repairs. The sinking of the vessel caused the death of seven persons.

During January, the inward and outward bound traffic of Victoria consisted of, foreign, 295 vessels, 352,908 tons; coastwise, 484 vessels, 366,359 tons, both showing considerable increases over the figures for the same period in 1911.

The West Vancouver Ferry Board had under discussion recently, the purchase of

another ferry steamboat. A report was read on the vessel Falcon, which had been inspected and recommended for the service, but no decision was arrived at.

Capt. B. L. Johnson, who has been appointed the G.T. Pacific Coast Steamship Co.'s pilot at Vancouver, was formerly master of the company's s.s. Prince Rupert. He was recently presented with a silver service by Prince Rupert citizens.

An order in council has been passed establishing a permanent harbor headline beyond which, breakwaters, wharves, piers and other structures shall not in future be built at Prince Rupert, B.C., plan and description of which have been deposited with the Department of Public Works, Ottawa, and with the District Engineer of the Department, at Prince Rupert.

The Inland Transportation Co. has commenced a steamship service between Bellingham, Wash., and Victoria, with the s.s. San Juan II., making three trips a week. The vessel is 65 ft. long, with 14 ft. beam, equipped with engine of 100 h.p., and with a speed of about 15 knots, with accommodation for 80 passengers. Should the venture prove successful, it is the intention to put larger and additional vessels on the service.

The Department of Marine has replied to the memorial of the Vancouver Ship-Masters' Association respecting aids to navigation on the coast, that consideration would be given to the request for a modern fog signal at the outer lighthouse in Porlier Pass, Strait of Georgia, and that there was good reason to hope that a lighthouse would be placed in Brown Passage, in the near future, probably on Triple Island.

The Fraser River Ferry and Navigation Co., Ltd., has been incorporated under the B.C. Companies Act, with \$100,000 capital and office at New Westminster, to acquire a license to operate a ferry on the Fraser River between New Westminster, Annacis Island, Port Mann and Coquitlam, which was granted by the B. C. Government to C. F. Macaulay, and in connection therewith to own and operate steam and other vessels, and carry on a general ferry and navigation business.

Capt. Jas. Gaudin, agent, Department of Marine, Victoria, and who frequently conducted enquiries into marine casualties, on behalf of the department, died there recently, aged 75, after a long illness. He was born in the Channel Islands, and was for several years in Hudson's Bay Co.'s service.

An estimate furnished to the Provincial Government for the establishment of direct communication between Vancouver and the Delta country, includes, approaches, waiting rooms, etc., at Ladner and Woodwards Landing, \$19,700; ferry boat, 70 ft. long, 28 ft. beam, 4 ft. draught, capable of carrying a deck load of 70 tons, and 50 passengers, \$19,000; total cost between banks, \$38,700, and work on widening dyke from Ladner to proposed ferry approach, \$1,200. If the proposed service is decided on, work will probably be started early in April.

Cost of Concrete at Panama.—The cost per cubic yard of concrete on the Panama Canal during the past fiscal year, varies from \$4.77 at the Miraflores Locks, to \$7.75 at the Gatun Locks, a total of 1,443,570 cu. yds. having been laid in that period. The labor cost per yard varied from 84 cents to \$1.54. The big difference in cost of the concrete lies in the greater accessibility to the stores on the Pacific side, the stone and sand being only a third as costly there as on the other side. 83,760 cu. ft. of concrete piling at Gatun cost \$1.57 a foot.

Canadian Notices to Mariners.

Notice 331, Dec. 26, 1912, announcing change in color of front range light of outer range at Port Burwell, Lake Erie, has been cancelled.

Notice 11, published in our last issue, has been cancelled, and the following numbers, then given, 12 to 16, have been changed to 11 to 15.

The Department of Marine has issued the following:—

16. Jan. 23. British Columbia, Fraser River, New Westminster, railway swing bridge, regulations governing opening and closing of swing span.

17. Jan. 25. British Columbia, Strait of Georgia, Discovery Passage, Cape Mudge, fog alarm established.

18. Jan. 25. British Columbia, Arthur Passage, Herbert Reef, light to be established on beacon.

19. Jan. 25. British Columbia, Chatham Sound, Holland Island, new lighthouse, change in character of light.

20. Jan. 27. Nova Scotia, Bay of Fundy, Blackrock, light improved.

21. Jan. 27. Nova Scotia, south coast, East Ironbound Island, light improved.

22. Jan. 27. Nova Scotia, south coast, Jeddore Rock, hand fog horn at light station.

23. Jan. 27. New Brunswick, Miramichi River, Grant Beach back range light, character of illuminating apparatus.

24. Jan. 29. Quebec, River St. Lawrence, Cap de la Madeleine upper range, new front lighthouse.

25. Jan. 29. Quebec, Richelieu River, Ash Island, lighthouse rebuilt.

26. Feb. 3. Quebec, Ottawa River, north shore, Way Shoal Traverse, range lights established.

27. Feb. 3. Ontario, Lake Huron, Sauguen River, change in color of range lights

28. Feb. 8. New Brunswick, Bay of Fundy, Machias Seal Island, characteristic of light, correction.

29. Feb. 8. Nova Scotia, Cape Breton Island, south coast, Louisburg harbor entrance, wreck marked by buoy.

30. Feb. 8. Prince Edward Island, north coast, Rustico harbor, channels to be marked by bushes.

31. Feb. 11. New Brunswick, south coast, Bay of Fundy, off Chance Harbor, bell buoy established.

32. Feb. 11. Nova Scotia, south coast, Cuckold Rock, buoy established.

33. Feb. 11. Nova Scotia, south coast, approach to Halifax, inner gas and whistling buoy, erratum in List of Lights.

34. Quebec, River St. Lawrence, ship channel between Quebec and Montreal, Citrouville Point, lighthouse pier encased in concrete.

35. Feb. 14. British Columbia, Burrard Inlet, Vancouver harbor, Parthia Shoal, dredging in progress, temporary light.

36. Feb. 14. Alaska, Stephens Passage, Grave Point, light established, Stockade Point, light discontinued.

Early Opening of Canals.

A deputation from the Dominion Marine Association, which waited on the Minister of Railway and Canals, in Ottawa, Feb. 7, was told by him that he had issued instructions for all the St. Lawrence and the Great Lakes canals to open on April 15, or the earliest possible date thereafter. He is fully aware of the various reasons rendering an early opening desirable and has undertaken to see that repairs and other work shall not cause any undue delay.

Changes in Richelieu and Ontario Navigation Company's Service.

Announcement is made that, commencing with the opening of the 1913 tourist season, it has been decided to discontinue the service by the R. & O.N. Co. of the U.S., to and from Youngstown, N.Y., and Charlotte, N.Y., will be the western terminus hereafter.

The steamboats Toronto and Kingston will discontinue calling at Charlotte, N.Y., and will run direct from Toronto to Kingston, thence to Thousand Island ports and Prescott, connecting there with the company's Rapids vessels for Montreal and Quebec. Westbound vessels will follow the same route, running direct to Toronto after leaving Kingston. The vessels will leave Toronto at 6 p.m., instead of 2.30, thus affording passengers arriving at Toronto by afternoon trains and vessels, an opportunity of making connection with the vessels for Montreal. Westbound vessels will leave Kingston at 6.30 p.m. and reach Toronto early the following morning.

The Allan Line Steamships Alsatian and Calgarian.

The two steamships Alsatian and Calgarian, which are under construction at two points on the Clyde, Scotland, will, it is announced, be launched, the first about Mar. 8, and the second during April. These vessels are being built with cruiser sterns, somewhat similar to those now being completed for the C.P.R. Pacific service. They will be equipped with quadruple screw, triple expansion arrangement of turbines, of a larger type, and capable of a higher speed than the C.P.R. vessels.

The fittings and furnishings of each vessel will be of a distinctive type throughout, those of the Alsatian being of the Jacobean period, and those of the Calgarian of the Georgian period. The dimensions of the vessels will be, length 600 ft., breadth 72 ft., moulded depth 54 ft.; gross tonnage, 18,500 tons; speed, 19 knots an hour. Passenger accommodation will be arranged for 220 first class, 500 second class and 1,000 third class, and quarters for a crew of 470. Lifeboat accommodation is to be provided for all on board.

Muskoka Lakes Navigation and Hotel Co.—Some brief particulars in regard to this company's annual meeting, which was held in Toronto, Jan. 8, were given in Canadian Railway and Marine World for February. The company does not make its annual report public, but it is stated that last year's operations resulted in a profit of about \$20,000. As before stated, the company paid a 5 per cent. dividend for 1912, which is the first that has been paid for a number of years, but it is believed that the books show a credit to profit and loss of about \$250,000. The capital stock is said to be slightly under \$200,000.

Large Dipper Dredges.—The excavation of the Atlantic entrance to the Panama Canal called into service dipper dredges of unusual size and capacity. The Mindi and Chagres, which are cutting the entrance channel to a minimum depth of 42 ft. at mean tide, are working entirely in rock which has been previously broken up, and they bring the material to the surface in 5-yard dippers. The dipper handles are 62 ft. in length, and the boom supporting the shipper shaft is 50 ft. long. To facilitate the work the dredges have been equipped with steam dipper trips which have shown good results during six months of work.

Collision of s.s. Dufferin and Schooner Lavengro.

Judgment has recently been delivered by Commander H. St. G. Lindsay, Dominion Wreck Commissioner, and assented to by Capt. N. Hall and J. W. Harrison, as nautical assessors, respecting the collision of the s.s. Dufferin, owned in Sherbrooke, N.S., and the schooner Lavengro, owned in Shelburne, N.S., which occurred in Halifax harbor, N.S., June 6, 1912.

The court found that the master of the s.s. Dufferin, W. J. Murdoch, acted to the best of his judgment in trying to avoid the collision, for if he had attempted to stop, or go astern, a more serious accident would have occurred, therefore he is exonerated from all blame. The court is also of opinion that no blame for the accident can be attached to the master or crew of the schooner, who could not do anything to avoid the accident during the short time elapsing between the sighting of the steamship and the collision.

Investigation of the St. Lawrence Pilotage System.

The following is the report of a committee of the Privy Council, which was approved by the Governor-General, Jan. 23:— On a memorandum from the Minister of Marine and Fisheries, submitting that he has had under consideration the pilotage system of the River St. Lawrence with a view to taking measures for its improvement. The recent strandings of the steamships Royal George, Bellona and Gladstone in the river below Quebec have been the subject of very thorough investigations by the Wreck Commissioner. The finding of the court in each of these cases has censured the pilots who were in charge of the respective ships. Public opinion has been greatly aroused as the result of these strandings, following in rapid succession. Criticism of the pilotage system, more especially of that obtaining in the pilotage district of Quebec, has been frequent of late. The Shipping Federation of Canada recently presented to the Minister a memorial suggesting that the time was opportune for a systematic enquiry into the question of pilotage and recommending the appointment of a Royal Commission for that purpose. The Minister is of opinion that the present state of the pilotage system in the pilotage districts of Montreal and Quebec and its administration should be investigated at the earliest possible date, and he, therefore, recommends that he be authorized to appoint, under part II. of the Inquiries Act, chapter 104, Revised Statutes of Canada, three commissioners, one of whom shall be an officer of the Department of Marine and Fisheries, to enquire into and report upon the law respecting pilotage and its administration in the pilotage districts of Montreal and Quebec, and what changes, if any, are desirable therein. The Minister recommends that an honorarium of \$20 a day, while actually engaged in the investigation, be paid, in addition to reasonable living and travelling expenses, to each of the commissioners except the departmental officer, and that the said officer be allowed \$10 a day for living expenses, in addition to the reasonable travelling expenses, while absent from Ottawa on such investigation, but no honorarium.

Under the authority above given, the Minister appointed as commissioners, Commander H. St. G. Lindsay, Dominion Wreck Commissioner, chairman; Thos. Robb, Manager and Secretary, Shipping Federation; and A. Lachance, Chairman of the Corporation of Pilots of Quebec.

Collision of Ferry Steamboats Dartmouth and Chebucto at Halifax.

The following judgment has been delivered by Commander H. St. G. Lindsay, Dominion Wreck Commissioner, assented to by Capt. N. Hall and J. W. Harrison, as nautical assessors, regarding the collision of the Dartmouth Ferry Commission's steamboats Dartmouth and Chebucto in Halifax harbor, N. S., Oct. 22, 1912:—The court found that the accident was partially caused by an error of judgment on the part of the master of the Chebucto, C. Ozon, for allowing his vessel to run over too close to the Halifax side of the harbor before stopping, knowing as he did that the other vessel had not left her dock, and it severely censures him for running his vessel at full speed considering the weather conditions which prevailed, this being in direct contravention of article 16 of the International Rules of the Road. It also blames J. Allen, master of the Dartmouth, for contributory negligence in bringing his vessel out of the dock at full speed, with the full knowledge that the Chebucto was outside, waiting to dock, and severely censures him for not stopping his engines when he saw the collision was inevitable, and also for not stopping after the impact. He is also severely censured for not seeing that his helm was altered after coming out of the dock, as the court is satisfied that had this been done, his vessel would not have run into the Anita.

The court recommends that a better system of communication between the two ferry docks be established and arrangements made so that during foggy weather the boats will leave their docks at the same time, so as to avoid accidents of a like nature, and also that during fog the time table ought to be so arranged that it would not require the vessels to run at full speed to keep up the regular sailings, a speed which is in direct violation of the regulations for preventing collisions at sea.

Collision of Ferry Steamboat Halifax and Barge Glenville.

The Dominion Wreck Commissioner, Commander H. St. G. Lindsay, delivered judgment recently, assented to by Capt. N. Hall and J. W. Harrison, as nautical assessors, respecting the collision of the Dartmouth Ferry Commission's steamboat Halifax with the barge Glenville, in tow of the tug Scotsman, in Halifax harbor, N.S., Jan. 6. The court found that the collision was caused by the fact that the master of the Halifax, C. Ozon, who was at the wheel at the time, did not actually see the lights of the Scotsman until that vessel and her tow were alongside, owing to the manner in which the windows in his pilot house are fitted, and therefore blames him for not having a better lookout kept under the circumstances. It also censures the master of the Scotsman, N. E. Smith, for not showing the proper lights on his tug while employed in towing, as required by article 3 of the International Rules of the Road, but does not consider the fact of his having only one mast head light instead of two, contributory to the accident. The court recommends that the windows in the pilot house of the Halifax be altered, thereby giving the person in charge a better lookout while at the wheel, and it severely criticizes the custom which seems to be common in Halifax harbor, for vessels to proceed within those limits without exhibiting the lights called for by the regulations.

Stranding of s.s. Uranium.

Following is the text of the judgment delivered, Feb. 8, by Commander H. St. G. Lindsay, Dominion Wreck Commissioner, and assented to by Capt. N. Hall and J. Fleming, as nautical assessors, in connection with the stranding of the Uranium Steamships Co.'s s.s. Uranium, on Chebucto Head, N.S., Jan. 12:—The court found that the master, R. Eustace, after checking his position by that given by the s.s. Empress of Britain, was not justified in proceeding at such a speed as subsequent events proved he must have made, as the distance from that position, which seems to agree within a few miles of his own dead reckoning to the place of stranding, shows that the vessel must have made a speed of over 11 knots. The court considers that he showed culpable negligence in not stopping his vessel, when he had made the distance to his objective point, viz.:—the outer automatic buoy, and in depending on picking up the whistle either on the automatic buoy or at Chebucto Head, as fog signals are well known to be affected by atmospheric conditions, and are therefore not always reliable. He also trusted too much to his mechanical sounding. Had he stopped the vessel and taken an occasional cast with his deep sea lead after running to the westward of the outer buoy, the casualty might have been avoided, and it therefore suspends his certificate for three months from date. The court also severely criticizes the incomplete manner in which the deck log book was kept, with reference to the distance run by the vessel and the movements of the engines prior to the stranding.

Loss of the s.s. Evelyn.

At the formal investigation into the causes of the stranding and subsequent loss of the British s.s. Evelyn, off the coast of Cape Breton Island, N.S., Jan. 9, recently held at Halifax, N.S., before Commander H. St. G. Lindsay, Dominion Wreck Commissioner, assisted by Capt. N. Hall and J. Fleming as nautical assessors, the evidence disclosed that the vessel was thoroughly well found and equipped in every way, with the exception of charts and sailing directions. The court found that the loss of the vessel was due to an error of judgment on the part of the master, G. Higginbotham, for remaining at anchor too long in an exposed position and on a lee shore, and considered that his most prudent action would have been to have gone to sea again on finding that no pilot was available and the weather threatening, but due allowance was made for the fact that he was just off a very long and rough voyage, his vessel making water, and the coal supply exhausted, and therefore the court did not consider it necessary to deal with his certificate, although it severely criticized his action in allowing his chief officer and four men to go away in a lifeboat, thus leaving the vessel short handed, besides taking into consideration the risk of the boat being swamped. It also severely criticized the action of the pilots of Louisburg for their inactivity in not going off to the vessel in the afternoon when her signal whistle appears to have been plainly heard from that place, and suggested that an enquiry into these facts be instituted. The court also condemned the practice of vessels of this class of vessels not being supplied with proper sailing directions and charts.

Trade and Supply Notes.

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

F. H. Allison has been appointed General Purchasing Agent in charge of all office and factory supplies for the American Vanadium Co. and the Flannery Bolt Co., Pittsburgh, Pa.

THE DOMINION COAL CO. is to install at its new coal docks at St. John, N.B., four vertical submerged tubular boilers built for 150 pounds working pressure by the International Engineering Works, Ltd., Amherst, N.S.

THE CANADIAN CAR AND FOUNDRY Co. has recently purchased for its new car shops at Fort William, Ont., a 375 h.p. Robb vertical two crank compound engine for direct connection to a 250 k.w. electric generator. This engine is to operate at 360 revolutions a minute. It is being built by the International Engineering Works, Ltd., Amherst, N.S.

THE AMERICAN VANADIUM CO., Pittsburgh, Pa., announces that 25 heavy mikado type locomotives recently ordered by the Grand Trunk Ry. from the Montreal Locomotive Works, will be equipped with vanadium steel frames. These locomotives are said to be the first of their type purchased by the G.T.R., and will have a total weight in working order of 276,000 lbs.

THE CANADA FORGE CO., Welland, Ont., advised on Feb. 6 that it was rushing to completion a temporary building to replace the one recently burned, and that it would positively have a part of its forge department in operation within a week thereafter, thus enabling it to care for the delivery requirements of its customers. This building will be covered within ninety days by a modern fire proof steel construction forge shop of the most advanced type, which is especially designed for the manufacture of forgings up to 40,000 lbs. The general dimensions of this building will be 100 by 200 ft., with centre bay equipped with 20 ton electric crane, 60 ft. span; with two bays, each to be served with five ton electric crane, 20 ft. span. At the end of this building and continuing 100 ft., there will be a 50 ft. span electric crane runway, 20 ton capacity, for handling raw materials and shipping. This will insure the company against further interruptions in its production, on account of fire, and will greatly increase the scope of its work, equipped as it will be with steam hammers, hydraulic forging presses, annealing and heat treating furnaces.

A Very Large Mine Hoisting Engine is being built in the United States for the Inverness Ry. and Coal Co., of Cape Breton. The two cylinders are 34 in. in diameter with a 72 in. stroke, and the hoist has 2 drums, each equipped with clutches and post brakes enabling either drum to be operated independently. The hoist is designed to be able to lift the following load:—A train of 12 mine cars, each of which weighs 1,150 lb. and contains one long ton of coal. This train of cars has to be hauled up an incline 10,000 ft. long which has a slope of 16 degrees at the surface and 35 degrees at the bottom. The maximum stress on the hoisting cable is about 41,000 lbs.

Book Reviews.

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

THE MODERN LOCOMOTIVE.—By C. Edgar Allen. 174 pages, 5 by 6½ ins., 36 illustrations. Published by the Cambridge University Press, Cambridge, Eng. Price, 40 cts.

Some time ago, the Cambridge University Press undertook the preparation of a series of works on scientific topics, to be written in such a manner as to be intelligible to the mere layman, each work to be prepared by an expert in that sphere. This little book is one of the set thus far completed, with a lot more to follow shortly. While written in a popular manner, it contains a remarkable amount of really useful information, the essential facts being boiled down and presented in a clear and logical manner. The book is thus useful for the railway man, as it contains such a fund of information in small compass, couched in simple language. The fact that it is an English work detracts from its value in Canada to a certain degree, as consideration is given for the most part to English practice, although a keen insight is seemingly shown of the practice followed on this side of the water. The book contains a list of reference works from which much of the information was compiled.

EXTENSION OF THE DEWEY DECIMAL System of Classification Applied to the Engineering Industries.—By L. P. Breckenridge and G. A. Goodenough. 117 pages, 6 by 9 ins. Published by the University of Illinois Experiment Station, Urbana, Ill. Price, 50 cts.

In 1906, the University of Illinois Experiment Station published the first edition of this book, and so successful was its reception that it has passed through three editions, 20,000 copies in all. On a further edition becoming necessary, it was decided to revise the work, and extend the field of usefulness covered by the system. Essentially, it is a system of filing and classifying engineering data in such a form that it can be readily got at for reference. A certain numeral is given to represent a given group. The main sub groups are given this number with a following decimal, and minor groups of these sub groups, still further decimals, and so forth to the smallest group. Its application has been found most useful where properly applied, as for instance in engineering libraries. For railway engineering and allied work, there are in all some five pages of groups and subdivisions, covering all phases of railway engineering ramifications in a very thorough manner. The revision of the work has been made in accordance with the 1911 edition of "Decimal Classification" by Melvil Dewey. Unlike the previous issues, the revision is not for gratuitous distribution.

DIARY OF A ROUNDHOUSE FOREMAN.

By T. S. Reilly. 5 x 7 ins.; 158 pages. Published by Norman W. Henley Publishing Co., New York. Price, \$1.

For the average railway man of ambition, something other than the usual run of heavy reading is required to maintain the attention of the reader through the depths of railway details. For the ambitious young man working up through the mechanical department, this book is peculiarly adapted, as in a breezy style, the daily occurrences of a young mechanical engineer, in his progress from the machine shop through his first step as roundhouse foreman, are outlined, with particular stress placed on the solution of the more difficult problems that confront the handler of men. Some splendid suggestions are offered towards the efficient handling of that uncertain factor—labor. The methods of dealing with the usual mechanical difficulties that arise, display a keen insight on the part of the author of the actual operation of a railway system, and the touches of nature that run through the book make the reading very pleasurable.

Transportation Conventions in 1913.

- May.—Association of Railway Claim Agents, Baltimore, Md.
- May.—International Railway Fuel Association, Chicago, Ill.
- May 6-9.—Air Brake Association, St. Louis, Mo.
- May 19-21.—Railway Storekeepers' Association, Chicago, Ill.
- May 20.—Association of Railway Telegraph Superintendents, St. Louis, Mo.
- May 21.—American Railway Association, New York.
- May 26-29.—Master Boiler Makers' Association, Chicago, Ill.
- May 28.—Association of American Railway Accounting Officers, Atlantic City, N.J.
- June.—American Society for Testing Materials, Philadelphia, Pa.
- June.—Association of Railway Electrical Engineers, Atlantic City, N.J.
- June 11-13.—American Railway Master Mechanics' Association, Atlantic City, N.J.
- June 16-18.—Master Car Builders' Association, Atlantic City, N.J.
- June 17.—Train Despatchers' Association of America, Los Angeles, Cal.
- June 17-19.—International Association of Railway Special Agents and Police, Salt Lake City, Utah.
- June 17-20.—American Association of Freight Agents, Buffalo, N.Y.
- June 18.—Freight Claim Association, Bluff Point, N.Y.
- June 24-25.—Association of Transportation and Car Accounting Officers, Charlevoix, Mich.
- July 22-25.—International Railway General Foremen's Association, Chicago, Ill.
- Aug.—Travelling Engineers' Association, Chicago, Ill.
- Aug. 12-15.—Railway Gardening Association, Nashville, Tenn.
- Aug. 18.—International Railroad Master Blacksmiths' Association, Richmond, Va.
- Sept. 8-12.—Roadmasters' and Maintenance of Way Association, Chicago, Ill.
- Sept. 9-12.—Master Car and Locomotive Painters' Association of U.S. and Canada, Ottawa, Ont.
- Oct. 14.—Railway Signal Association, Nashville, Tenn.
- Oct. 21-23.—American Railway Bridge and Building Association, Montreal.

Transportation Associations, Clubs, Etc.

- The names of persons given below are those of the secretaries.
- Canadian Car Service Bureau, J. E. Duval, 401 St. Nicholas Building, Montreal.
- Canadian Freight Association (Eastern Lines), G. C. Ransom, Canadian Express Building, Montreal.
- Canadian Freight Association (Western Lines), W. E. Campbell, 502 Canada Building, Winnipeg.
- Canadian Railway Club, J. Powell, St. Lambert, Que. Meetings at Montreal, 2nd Tuesday each month, 8.30 p.m., except June, July and August.
- Canadian Society of Civil Engineers, C. H. McLeod, 413 Dorchester St. West, Montreal.
- Canadian Street Railway Association, Acton Burrows, 70 Bond Street, Toronto.
- Canadian Ticket Agents' Association, E. de la Hooke, London, Ont.
- Central Railway and Engineering Club of Canada, C. L. Worth, 409 Union Station, Toronto. Meetings at Toronto 3rd Tuesday each month, except June, July and August.
- Dominion Marine Association, Counsel, F. King, Kingston, Ont.
- Eastern Canadian Passenger Association, G. H. Webster, 54 Beaver Hall Hill, Montreal.
- Engineers' Club of Montreal, R. W. H. Smith, 9 Beaver Hall Square, Montreal.
- Engineers' Club of Toronto, R. B. Wolsey, 94 King St. West, Toronto.
- Great Lakes and St. Lawrence River Rate Committee, Jas. Morrison, Montreal.
- International Water Lines Passenger Association, M. R. Nelson, New York.
- Niagara Frontier Summer Rate Committee, Jas. Morrison, Montreal.
- Nova Scotia Society of Engineers, A. R. McCleave, Halifax, N.S.
- Quebec Transportation Club, J. S. Blanchet, Quebec.
- Ship Masters' Association of Canada, H. O. Jackson, 376 Huron street, Toronto.
- Shipping Federation of Canada, T. Robb, 526 Board of Trade, Montreal.
- Western Canada Railway Club, W. H. Rosevear, 25½ Princess St., Winnipeg. Meetings at Winnipeg 2nd Monday each month, except June, July and August.

CANADIAN PACIFIC RAILWAY COMPANY.

DIVIDEND NOTICE.

At a meeting of the Board of Directors held today the following dividends were declared:

- On the Preference Stock, two per cent. for the half year ended 31st Decemr last.
- On the Common Stock, two and one-half per cent. for the quarter ended 31st Decemr 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 are payable 1st April next to Shareholders of record at 1.00 p.m. on 1st March next.

By order of the Board,
W. R. BAKER,
Secretary.

Montreal, 10th February, 1912.

NOTICE is hereby given that the Annual Meeting of the Shareholders of the Victoria Rolling Stock and Realty Company of Ontario, Limited, will be held at the offices of Messrs. Osler and Hammond, 21 Jordan Street, Toronto, on Wednesday, March 5, 1913, at twelve o'clock noon, for the reception of the Annual Report and election of Directors for the ensuing year.

By order,
G. T. CHISHOLM,
Secretary.

Toronto, February 12, 1913.

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