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See page 643.

THE JUNE RAILWAY MECHANICAL CONVENTIONS.

The two great railway conventions of the year, the American Railway Master Mechanics' Association and the Master Car Builders' Association, were held at Atlantic City, the former on June 14, 15 and 16, and the latter on June 19, 20 and 21. The most important features of these annual conventions are the reports of the standing and special committees, the principal ones of which are given on this and following pages, either in full or in abstract.

SMOKE PREVENTING DEVICES.

The Master Mechanics committee on smoke preventing devices for firing up locomotives at terminals, E. W. Pratt, Assistant Superintendent of Motive Power, C. and N.W.R., Chicago, Chairman, reported as follows:

On account of the laws and regulations of large cities, relative to the prevention of smoke, your executive committee appointed this committee to collect from the various members such information as might be obtainable with reference to the prevention of smoke during the critical period of time when locomotives are being fired up at terminals. That smoke prevention is extremely difficult at this time is evidenced by the fact that most large cities specifically exempt from violations the smoke emitted from boilers while being fired up. Although only 33 roads replied to your committee's circular of enquiry, among these were included many of the largest companies, and especially those having terminals located within the large cities where the restrictions are most severe; hence we believe this subject has been more thoroughly canvassed than might otherwise appear. The various reports and the experience of the individual members of your committee would lead to the following recommendations:

BOILER CONDITIONS BEFORE FIRING UP.—The best results are obtained by filling up locomotive boilers with hot water previous to firing up; the temperatures reported varying from 110° F. to over 200° F., the higher being preferred on account of aiding combustion and lessening the time required to raise steam in the boiler. Where hot water is not available, the temperature of water in the boiler may be raised by injecting live steam below the water line; but on account of the loss of time, the heating of the water, either before or while the boiler is being filled is recommended.

INDUCED DRAFT.—Two roads reported the use of large fans, connected with the smoke jacks above the roundhouse roof, as a means for producing draft. One of these roads advises that this device was used and tested for a considerable length of time, but was found unsatisfactory and abandoned. The other road is still experimenting along this

plan in connection with a "smoke-washer," and is not yet ready to report upon its results, except as to its difficulty in the maintenance of the plant—the metal parts having been eaten out several times during the year's experiments. All other roads report the use of a roundhouse steam blower and the locomotive blower used exclusively.

METHODS OF FIRING UP.—From the reports it would appear that almost every combination of wood, fuel, oil, shavings, cobs, coke and bituminous coal had been used, with more serious objections to

employed for kindling fires than any other fuel where the greatest effort is being made to prevent smoke at such times.

APPLY BITUMINOUS COAL CAREFULLY.—The plan of raising steam to nearly working pressure by means of wood or coke alone has been tried by many roads, but abandoned when it was found that the same results could be obtained by adding bituminous coal carefully to wood fire after the temperature in the fire-box had been somewhat raised.

In general the conclusion is that although there are many devices for reducing the amount of smoke from locomotives after steam is raised and engines are working, and while it is possible by great care and attention on the part of the roundhouse force to tend during this period, at the same time, we find no practical way to reduce the amount of smoke emitted entirely eliminate all smoke while firing up locomotives at terminals.

BEST CONSTRUCTION OF LOCOMOTIVE FRAMES.

Following is an abstract of the Master Mechanics Committee, H. T. Bentley, Assistant Superintendent Motive Power, C. and N.W.R., Chicago, Chairman.

At the convention of 1904 this subject was very ably handled by a strong committee, and in reading over the reports we find we are traveling over much the same road as they did, and notwithstanding the great increase in size of locomotives, the committee's recommendations still hold good and the frames still break. Cast steel, made to a rational specification, careful foundry manipulation, adequate and suitable annealing, was spoken of as one of the remedies for frame breakages at that time, and it still is the favorite material, if properly designed, made and annealed. The clip binder was then, and is now, more used than probably any other type, the bolt and thimble style having been discarded in modern practice, owing to stretch of bolts. The specifications suggested by the committee of steel-casting manufacturers, and submitted to the Association in 1904, are as follows:

Material, Acid open-hearth steel, .28 carbon, .05 phosphorus, .05 sulphur, .60 manganese.

Frames will be rejected that show: Less than .20 or over .35 carbon; over .06 phosphorus; over .06 sulphur; over .70 manganese.

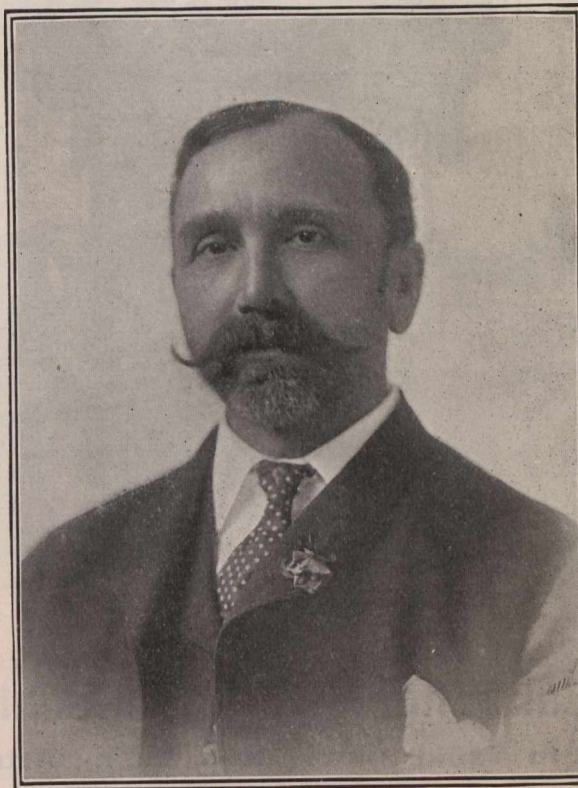
Tensile strength per square inch, not less than 55,000 lbs.

Elongation in 2 inches, not less than 15%.

All frames to be annealed.

After seven years it would be interesting to learn from the members if these specifications are entirely satisfactory, or, if not, what changes should be made to make them so.

While the breakage of a frame is a serious handicap, especially during busy



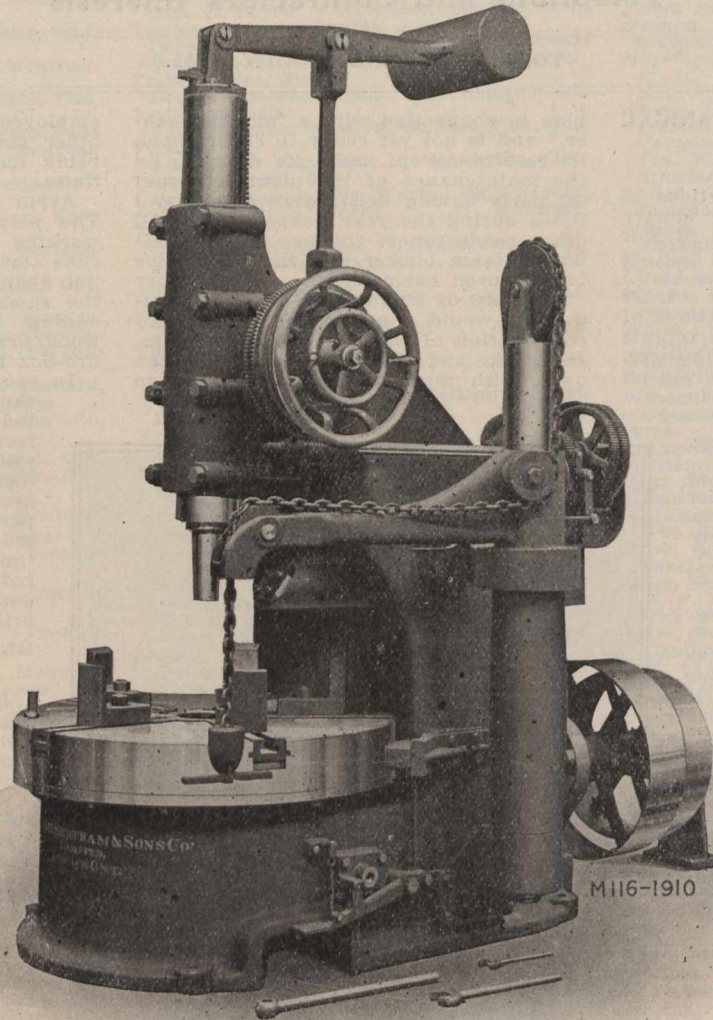
James Anderson,

General Manager, Sandwich, Windsor and Amherstburg Railway,
and President, Canadian Street Railway Association.

some than others. Several roads reported extensive trials of coke, but its use has been almost entirely abandoned because the ashes and gases emitted from the smoke jacks are much more objectionable than smoke when roundhouses are located near viaducts or high buildings; furthermore, it is almost impossible for employes to work in the roundhouse when engines have to be moved from under the smoke jacks to do necessary work, and also the cost of coke is greatly in excess of other fuels in most sections of this country. While the smoke from wood varies considerably in accordance with the size, quality and amount used, still it is more generally



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seasons, yet the work of repairing has been simplified so that it is now possible to weld them in place with Thermit, oil, etc., and what used to be a two weeks' job, when all wheels had to be removed and frame taken to blacksmith shop, can now be repaired in place by dropping one pair of wheels and using oil, etc., and engine returned to service in a few days.

Following are the committee's conclusions and recommendations:—

That frame breakage is even more general and serious than we were at first led to believe, very few roads being free from this trouble. The longer the wheel base of engine, ordinarily, in combination with a roadbed having comparatively short curves, and with frames poorly designed or of inferior metal, or engines not properly kept up, the greater the trouble will be with frames breaking. This latter factor may not be reflected until after the engine has been put in good condition, and then a frame may finally break as a result of the previous poor condition of the engine.

We believe that with frames properly designed, if made of a good quality of cast steel, thoroughly annealed, with suitable cross bracing and engines kept up in reasonably good shape, breakage will practically be overcome.

That a cast-steel, one-piece frame, properly designed, of good material and thoroughly annealed, is better than a wrought-iron frame, because of the difficulty in welding up the large section in a perfectly satisfactory manner, and also because, in a casting, bosses, lugs, etc., can be added without the necessity of bolts and studs.

That a bar frame is better than a plate frame, this being the opinion of people who have used both; the plate frame causing about as much trouble with breakage in Europe as bar frames do in America.

The strap binder appears to be the favorite form of tying frame jaws together, although the cast-steel box binder, with adjustable wedges, has a number of friends, on account of its simplicity and ease with which it can be handled. The toes at base of jaws should be of sufficient depth and size to give plenty of metal to anchor to, whichever binder is used.

Cases have been reported where frame breakage was directly traceable to expansion of boiler not being properly taken care of by the use of sliding shoes; these shoes, if too tightly fitted or cramped in bolting, or if not lubricated,

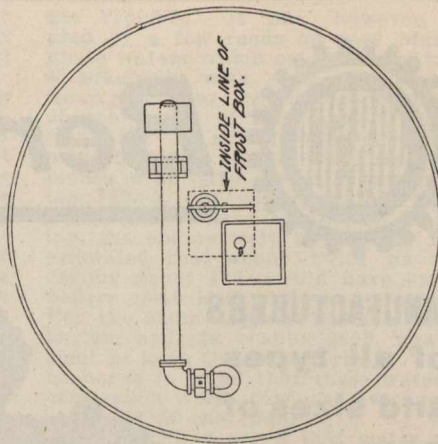
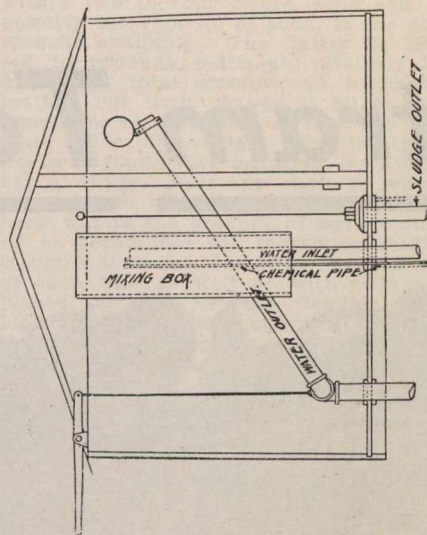


Fig. 1.

Treating Water for Locomotives. Fig. 1.

may prove unsatisfactory. Supporting boiler by means of vertical plates, if of sufficient strength, provides a satisfactory means of taking care of expansion

study of locomotive-frame casting, and the proper annealing of same, as a number of roads are using wrought iron, but would prefer steel if they could secure reliable castings.

As a general proposition, frame breakage does not ordinarily occur until engine has been in service two years or more, the older the engine the greater the trouble; we have come across cases, however, where they have broken earlier than this on account of flaws, poor welds, or other defects.

Treating Water for Locomotives.

The Master Mechanics Committee on the best method of treating water for locomotive use, when the density of traffic does not warrant water treating plants, H. E. Smith, Chemist, L.S. and M.S. Ry., Collinwood, Ohio, reported as follows:—Until within a few years, only two methods for the prevention of incrustation in steam boilers have been prominent, namely, boiler compounds and water-softening plants. The former, which include the familiar soda ash, aims to keep the incrusting substances in a soft, pulverulent condition until they can be blown or washed out of the boiler.

In locomotive service one of the difficulties connected with the use of boiler compounds is in applying them proportionally and regularly to all of the water. The plan of putting the matter in the hands of the engine crew was early found to be failure. The next step was to put the dose for a whole trip into the tender tank at the beginning of the run. This method involves a considerable and possibly harmful excess of compound at the beginning, and a corresponding deficiency near the end of the run. The obvious remedy is to transfer the base of operations from the locomotive to the wayside tank. To secure this, as well as some other advantages, separate softening plants have been adopted and have easily proved their usefulness. For small stations their use involves the difficulty of high fixed charges per unit of water treated. The small station must be able to respond to occasional heavy consumption for short periods and a softening plant having sufficient capacity for this purpose becomes expensive during normal times.

A very useful compromise between the two systems of treatment is an apparatus of simple construction which will mix the water uniformly with the proper proportion of some chemical solution which, although it will not actually remove incrusting solids, will act as

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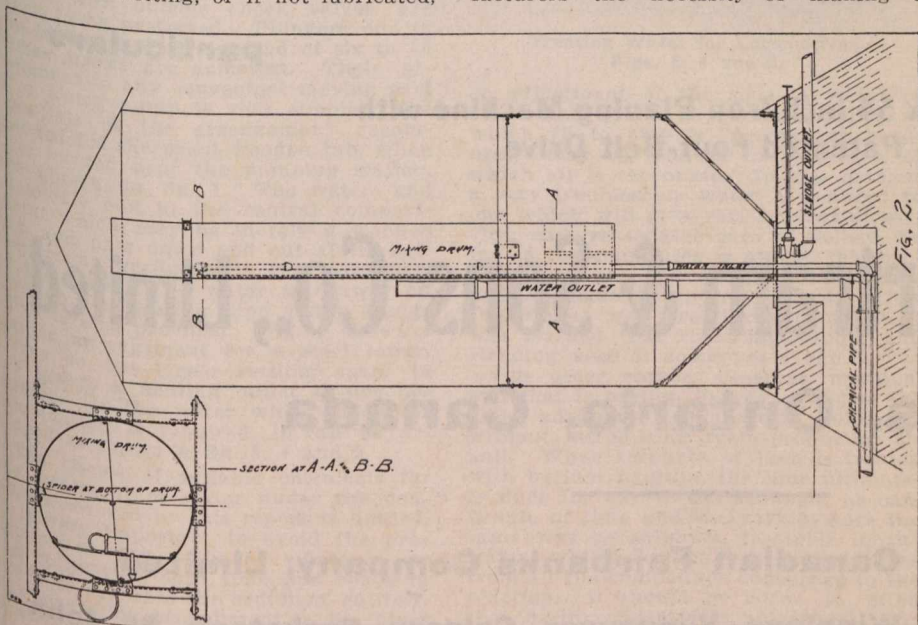
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without imposing undue strains upon the frames.

We should recommend to steel manufacturers the necessity of making a



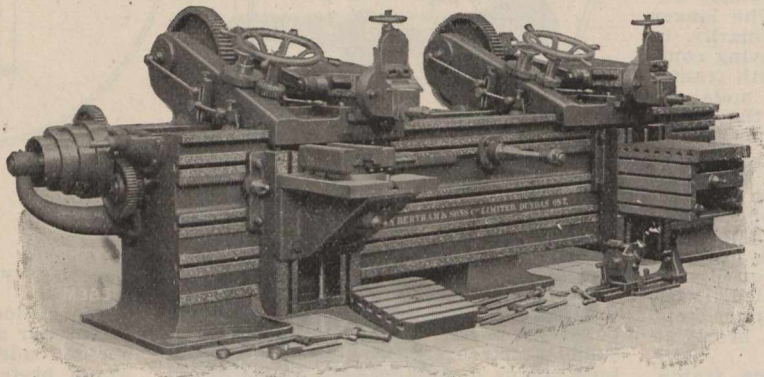
Treating Water for Locomotives. Fig. 2.



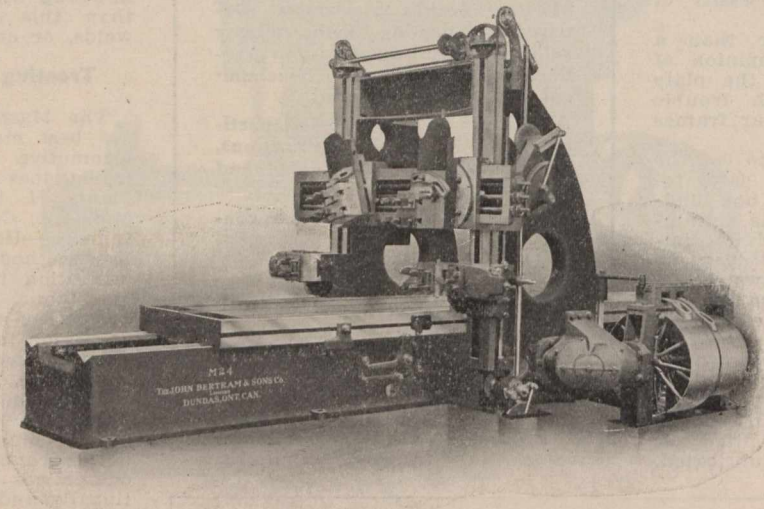
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a boiler compound in keeping them in a soft condition in the boiler. If a fair storage capacity is provided, partial removal of incrusting matter may also be effected. The work of the committee indicates that few railroad officers realize the importance of this idea or the benefits to be derived from its systematic and intelligent application.

At track-trough stations soda ash (or other material) may be thrown directly into the trough, in regulated quantity, after each train passes. This crude but fairly effective method is used on one road at four stations, pending the installation of automatic devices. Much more systematic is the plan of pumping the solution with the water. This plan is used by seven roads. A small branch may be run from the water-pump suction to a tank of solution and the flow of the latter be regulated by a valve. This method has the advantage of producing a thorough mixture during the passage through the pump, but also sometimes causes deposits on the valves of the pump which interfere with their action. It is found preferable to pump the soda with a small power pump actuated by direct connection with some moving part of the water pump, thus insuring a correct proportional feed of solution. The discharge of the chemical pump should be carried to the large water tank independently of the water. In the water tank the chemical pipe should discharge close to the main water inlet in order to produce satisfactory mixture. As it is not practicable to run the small chemical delivery pipe for long distances, this system is not desirable when the tank is more than 100 feet from the pump house. When distances are greater the chemical apparatus should be separated from the pump house and transferred to a point close to the water-storage tank or to the top of the tank itself. In such cases, the chemical pump may be actuated by a positive displacement motor or water wheel through which passes all, or a definite aliquot, of the water to be treated. While such a device has long been used in full softening plants, it is not used for the simpler treatment, so far as the committee has learned, except on one road (the L.S. and M.S.). The same arrangement is suitable when water is taken from city supplies where the railway company has no water pumps.

For pumping chemical solutions, simple single-acting outside plunger pumps with outside check valves are much to be preferred. Plungers one to two inches in diameter and of six to 10 inches stroke are sufficient. Their attachment to any convenient moving part of a water pump is very simple. The essentials of the arrangement recommended for the usual wooden tub, when it is located near the pumping station, are shown in fig. 1. The water and chemicals mix in the central compartment, which may be merely a wooden box, and pass down and out at its bottom, rising gradually in the main part of the tank. The water is drawn off through the floating pipe and a sludge valve is also provided. Fig. 2 shows a similar arrangement for a steel tower. Owing to the larger settling space in the tower, a floating outlet is not necessary. If the water wheel or motor combination is required, it can be arranged as shown in fig. 3, 4 and 5.

The choice of suitable chemicals for the treatment of water under the conditions covered by this report is limited. It is very important to avoid the production of any sediment whatever, or which to provide both time and space in which to separate the sediment entirely. The separation of sediment in the pipes must obviously be avoided. When sediment must be avoided, as in ordinary wooden tanks when the water is used

within two to four hours, soda ash, or possibly bicarbonate of soda, is the only reagent available. The latter is least apt to produce sediment. Neither reduces the total amount of incrusting matter, but both change it all to carbonate, or bicarbonates, so that the hard scale is largely avoided. This treatment has been found very beneficial on a number of roads. It is applicable to waters of moderate hardness. With very, very hard waters the amount of soda required to decompose the incrusting matter is liable to cause deposits. In this use of soda ash, as well as with soda ash placed directly in the tender tank, blowing and washing out must be done thoroughly at regular and sufficiently frequent intervals.

In the opinion of the committee the case well merits the small further elaboration of process and apparatus, sufficient to separate a considerable amount of sediment. For this purpose a steel tower, as shown, and the use of caustic soda are recommended. With correctly proportioned apparatus and prop-

are required. It has, however, been used by a few roads on very high sulphate waters which could not be treated satisfactorily with soda. Theoretically, three pounds are required to do the work of one pound of soda ash in treating sulphates. In actual work, one road reports that five engines were treated one month with 4,290 lbs. of soda ash, costing \$42.90, but, although this was all that could be used on account of foaming, the boilers were not clean. It was estimated that about twice as much, costing about \$85, would have kept the boilers clean if it could have been used. For the same engines 13,000 pounds of barium hydrate, costing \$390, was sufficient to keep the boilers clean. It must be borne in mind that these waters are very much worse than the average boiler water of the country.

Finally, it is urged that water purification of any kind should always be supervised by a competent chemist. The raw water should be analyzed occasionally and the chemical solutions, as well as the treated water, should be tested frequently.

Repair Equipment for Engine Houses.

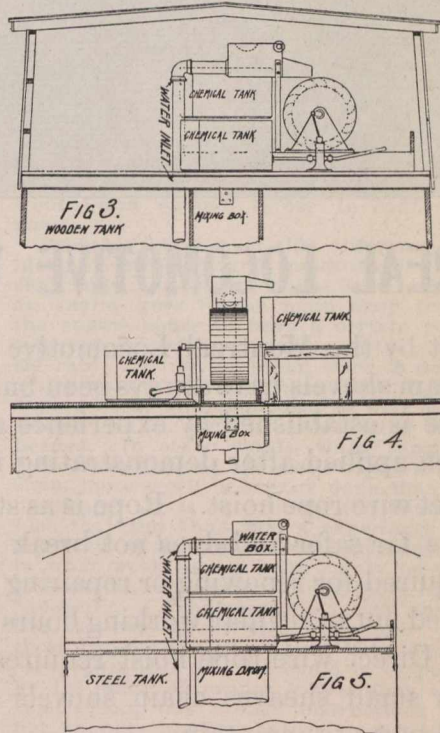
The Master Mechanics Committee, C. H. Quereau, Superintendent Electrical Equipment, New York Central Rd., New York, Chairman, reported as follows:—Your committee is impressed that this is a most important problem, worthy of careful study, and that on its correct solution efficient railroad operation depends as much as on any other single item in connection with train operation. We realize that no one solution will fit all conditions, and that each engine house should have special study. At the same time, we believe there are a few general principles which should be kept in mind in the design, personnel, equipment and management of all engine-houses.

Originally the word "roundhouse" was undoubtedly descriptive, but for a number of years it has not been. In short, there are at present few modern round-houses which are round. Though there probably has been no confusion or uncertainty arising from the use of the word, for the sake of accuracy we venture to suggest the advisability of substituting the word "engine-house."

It seems axiomatic that locomotives should be worn out in legitimate service as soon as possible. The capital invested in a locomotive represents a certain total of earning capacity, and the sooner this total earning capacity is realized the greater will be the yearly returns on the capital invested. In other words, a locomotive should be in service, earning as large a percentage of the time, and in the engine-house or shop, spending as small a percentage of time and money, as possible. It also seems self-evident that the greater the efficiency of a locomotive, both in hauling capacity and fuel consumption, the greater the earnings of the capital invested in it, so that the conclusion that it should be kept as possible at one hundred per cent efficiency seems reasonable.

If it is a sound business proposition to wear out locomotives in service in as short a time as this can be done legitimately and to keep them as near one hundred per cent. efficiency as possible, these principles should be kept in mind in determining the extent to which repairs should be made at engine-houses, and this policy, once settled, in turn largely determines the repair equipment needed. In this connection we should not overlook the fact that any repairs made at engine-houses, more than light running repairs, increase the main shop capacity to a corresponding extent.

In order to obtain an approximate estimate of the net daily earnings of a freight locomotive, the following calcu-



Treating Water for Locomotives. Figs. 3, 4 and 5.

er adjustment of the soda, a water of 20 or more grains of incrusting solids, of which 25 to 50% is "permanent hardness," may be reduced to 10 grains, of which all is carbonate. In this manner a very troublesome water is reduced to one which will give very successful service, with reasonable care of boilers. So far as the committee is aware, this process is in use only on the Lake Shore and Michigan Southern, although after this report was practically complete it was learned that the Philadelphia and Reading used it some years ago.

One other reagent deserves mention, and that is barium hydrate. It has the great advantage of treating sulphates without introducing foam-producing alkali. When sulphate of lime is treated with barium hydrate, the lime ultimately finds its way to the sediment as carbonate of lime and the barium goes the same way as sulphate, insoluble in the water, which is then left entirely free from all the compounds concerned in the reaction. It should be borne in mind that barium hydrate is poisonous. The principal objection to its use is its cost. Not only is its price per pound higher than that of soda ash, but more pounds



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lations have been made. The gross freight earnings of a trunk line for the year 1910 were divided by 365 to get the average daily gross freight earnings. This result was divided by the total number of freight engines owned, plus nine-tenths of the switch engines owned. It was assumed the operating ratio for freight service was 60%, leaving 40% net operating income. The result was that \$45 was found to be the approximate daily net operating income from each locomotive engaged in freight service. This computation assumes each freight locomotive was in service every day. This means that we could afford to invest \$900 capital at 5% in engine-house repair equipment for each extra day in service we could obtain for each freight engine owned, by making the repairs at the engine-house instead of at the main shop.

Expressed more concretely, it means that, if the engine-house repair equipment kept each of 100 freight engines in service two extra days a year, the extra net operating income would be 5% on a capital of \$180,000. This does not necessarily mean an increased net operating income, as it may, and in the end probably would, mean a smaller capital invested in freight locomotives.

While the fixed charges at main repair shops do not appear in reports showing the cost of locomotive repairs, it is evident they enter into costs and should therefore not be ignored. With a view to determining approximately the importance of this item, the figures for a shop at which no car repairs are made, repairing about 600 engines during 1910, have been taken. The average cost of repairs per engine, including labor and material, was found to be about \$1,200, so there must have been a considerable proportion of the engines which received only medium and light repairs. This plant, including land, buildings, machinery and tracks, has a book value of about \$1,000,000. Assuming that 10% of this value represents the fixed charges, these amount to \$100,000 a year, or slightly less than \$170 per year per engine receiving repairs at that point. It is interesting to note that the fixed charges amount to between 15 and 20% of the total amount charged at this shop to engine repairs for 1910.

The cost of fixed charges for another shop, at which, with the exception of some miscellaneous work, only locomotives are repaired, amount to \$234.94 per year for each engine repaired, and are 13.2% of the total value of the plant.

In all probability it will be conceded it would be a waste of time and money to run a locomotive to the main shop to have a driving-box cellar repacked or the flues cleaned. Why? Because it would involve time lost from revenue service getting the engine to, through and from the shop, reducing the yearly earnings of the engine; necessitate the use of main shop space, increasing the capital invested in shops, or reducing the main shop output; congest the shop-track movements and disarrange the shop routine, thus delaying other more important shop work. At the main shop, though the item does not appear in the statistics showing the cost of repairs, there are the shop fixed charges, including interest on the investment, repairs, taxes and insurance, a no inconsiderable item. At the engine-house the fixed charges would be very much less, as they would not include those of the engine-house proper, the tracks, turntables, ash pits, coal chutes and other facilities necessarily provided, and would cover only the comparatively small investment in the shop building and machinery provided for repair work.

There can be little room for doubt that when there is a great demand for motive power, engine-house foremen and master mechanics, rather than send engines to the main shop, though this is

near at hand, will take chances, resulting in breakdowns and delays; which would not be taken if they had repair equipment of their own. In other words, with tools and men under their immediate control and responsible for results, engine-house men will, in all probability, keep the motive power in better condition, more efficient and less liable to breakdown, and take a greater pride in making repairs quickly than when repairs must be made by an independent organization.

It is, we believe, common experience that the qualifications of engine-house employes should be quite different from those of repair-shop men. The work of the repair-shop man is steady and should be accurate, thorough and first-class in every respect, with the aim that a locomotive shall remain out of the repair shop as long as possible, and there is no pressing necessity that his job be finished by a certain minute. In contrast to this, the work of the engine-house man is spasmodic; at certain hours he is extremely busy, working under high pressure, and again has little to do. His chief care is to have the engines ready for their next run and in such condition that they will make at least a round trip successfully. If he accomplishes this, he is not criticized if his work is not exactly to blue-print or standard and rather coarse. His training makes him fertile in make-shifts to "get the engines over the road" without a breakdown or delay, which the shop man would, and should, refuse to countenance.

Probably because of this difference in ideals, viewpoint and methods of the shop man and engine-house man, when an engine goes to the main shop from the engine-house to have a certain part repaired it usually happens that a considerable amount of other work is done which would not have been done at the engine-house and could just as well have waited till a general overhauling was needed. In other words, when repairs, other than general, are made at the main shop, more work is usually done than is necessary. It is very likely the further fact that the shop man's experience is not such as to educate his judgment as to what work he can with safety let go, prompts and impels him to do more than necessary. Whatever the cause, there can be little doubt as to the fact. To those lacking the experience, it no doubt seems that this practice could be stopped by the issue of proper instructions and supervision, but proper instructions do not change human nature or life-long habits, nor does a reasonable amount of supervision seem to work the miracle.

It is commonly the case at engine-houses that tools are frequently missing or inefficient for lack of repairs, resulting in considerable useless expense not only for tools, but in time lost in hunting them and exasperating delays in making repairs. We believe the remedy for this is a tool room with some one in charge whose duty should include not only the issuing of tools on checks, but as well keeping the tools in good condition and a proper supply on hand.

If a locomotive must lay in the engine-house a day for lack of the material necessary to repair it, there follows a loss of earning power which, if expressed in dollars, would pay a good interest on a considerable investment in storeroom stock. It requires no labored argument to convince a motive-power official that a storeroom in connection with an engine-house is an essential, but not all of them appreciate its relation to the earning power of the equipment for which they are responsible. It is the opinion of your committee that a reasonable business basis on which to determine the most economical amount of stock to carry at engine-houses, assuming, of course, that stock carried is only that

needed for engine-house repairs, is its effect in increasing the earnings of the locomotives.

We believe there should be kept at all important engine-houses an ample supply of spare parts, such as air pumps, lubricators, injectors and bell ringers, which should be used to replace defective apparatus whenever it will take less time to exchange than to repair, and as a general proposition, that important repairs to such accessories can be made to the best advantage at the main shops, where special tools and machinist specialists are available. It seems evident that the interest on the investment in spare parts must be less than the loss in earnings resulting from not having them.

The conditions under which engine-house work is of necessity done are much dirtier and more inconvenient than in the repair shop, and the rates of pay usually not so attractive. It follows that to get and keep a desirable class of men, engine-house conditions should be made as attractive and convenient for them personally as possible, including good ventilation and heat, lockers, toilet and washroom accommodations kept in first-class condition. It seems to us particularly important to have a system of ventilation which will quickly and thoroughly carry off the steam and smoke, which are necessary in an engine-house, that work may be done more rapidly and efficiently than would otherwise be the case.

It is not an unusual policy in equipping important engine-houses to use worn-out and obsolete tools. We believe this is short-sighted, not only because a big shop is better able to find profitable use for such tools and better able to keep them in repair, but engine-house conditions warrant the best of tools. If a tool is not efficient enough for repair-shop work it will generally pay to scrap it.

We should, therefore, when studying the requirements of round-houses, determining the kind of work to prepare for and the repair equipment needed, have in mind the following points:

Locomotives should be held out of service for repairs as short a time as possible and should be kept as near 100% efficiency as possible.

The effect on earnings of time saved by repairs made at engine-houses.

The effect on engine efficiency of repairs made at engine-houses.

The smaller fixed charges for repairs made at the engine-house, compared with those at the main shop.

The effect of storeroom stocks on engine earnings.

Engine-house men should have ideals and methods quite different from those of shop men.

It is important that engine-house conditions and facilities should be attractive and convenient to get and keep good men and increase their efficiency.

These conclusions can be generalized in the statement that locomotive repairs and repair facilities at engine-houses are warranted when they will result in increased earnings either because of more or better engine service obtained from a given number of locomotives.

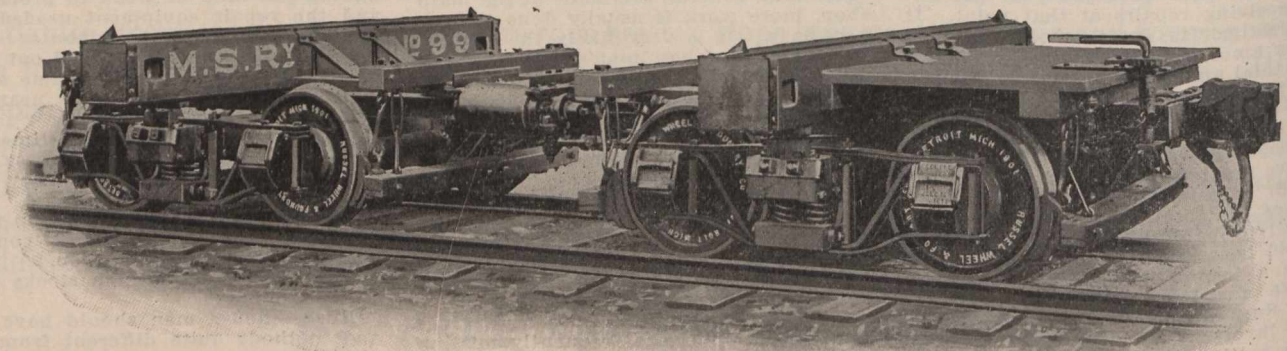
Engine-houses may conveniently be classified under three heads: Those at minor division terminals, or the outlying ends of branch lines, where only very light repairs are made; those at important division terminals, and not in connection with important repair shops, and those in connection with repair shops.

At outlying engine-houses we assume there would be no power-driven machines and suggest the following list of tools, the number and sizes to be determined by local requirements: Twist drills; drill sockets, taps—including machinists' steam-chest, pipe, wash-out,

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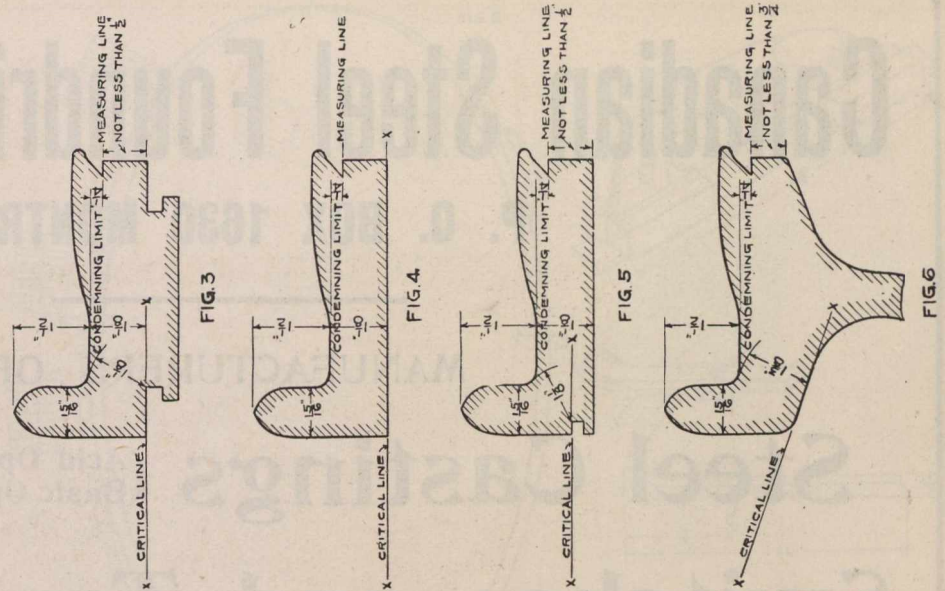
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straight and taper, stay bolt; dies to correspond; pipe stock and dies; hacksaws; straight edge; flue tools—caulking, rolls, expanders, beading; pipe cutters; jacks, sledges, drifts, crowbars, saws, brace and bits; twist drills, extra long; drill chucks, ratchets and braces; surfacer plates; tinner's bench shears; reamers, rod and taper; wrenches, socket, crowfoot, hexagon.

In considering equipment for engine-houses at important division terminals not connected with repair shops, it is assumed there will be no dissent to the opinion these should be equipped with all such tools and appliances as will expedite the movement of locomotives through the house and keep them in first-class repair as far as this can be done without a backshop overhauling. It will take but little thought to convince the inquirer that the returns on capital wisely invested in such tools will make big returns when the resulting increased earnings of the capital invested in locomotives is considered, not only because of the time otherwise lost in going to, through and from the main shop, but, as well, the fact that locomotives sent to the main shop for specific repairs almost invariably receive more than these, the additional repairs not postponing the date of the final shopping and being almost inevitably made because of the training and point of view of the repair-shop forces—men and foremen—as mentioned in a preceding paragraph. Nor should it be forgotten that engine-house repairs will reduce the delays due to breakdowns and increase engine efficiency.

As local conditions vary and as conditions should largely determine facilities, it follows that your committee's recommendations can be only general. With this understanding, we submit the following suggestions. In general, we believe an engine-house should be equipped with driving and truck wheel drop pits and tools to take care of all necessary rod work, driving-boxes, ordinary valve-gear work and the replacing of flues needed between general overhauls. In most cases it will be found that work of the nature indicated above can be done with but a very small addition to the engine-house force, because of the fact that, without this work, the men are, from the nature of the conditions, idle an appreciable part of the time. In line with this, some roads have found it



Contour of Tires. Figs. 3, 4, 5 and 6.

economical to have always at the engine-house for general repairs an engine not needing heavy boiler work.

The list of tools suggested for outlying engine-houses, to be expanded to meet the requirements of a larger terminal: Ample storeroom stock; drop pit for driving-wheels; double blacksmith forge, face plate and tools; 72-inch boring mill; driving-wheel lathe; 38-inch tire turning-lathe; planer; slotter; sensitive drill; bolt cutter; 50-ton hydraulic press; power-driven valve-setting machine; air hammers; hot-water washout facilities; drop pit for engine truck and tender wheels; portable blacksmith forges; 36-inch boring mill; 24-inch lathe; 16-inch lathe; shaper; 36-inch vertical drill; emery grinder; pipe-bending machine; punch and shear; air compressor; air motors.

For engine-houses in connection with repair shops, the committee has not been able to agree. Several of the members feel that it is economical to depend on the main shop for considerable machine work. On the other hand, the other

members believe that, except for tire turning, the equipment should be practically the same as for an independent engine-house, because of the saving of time and cost of repairs and the different training of engine-house and shop men.

Contour of Tires.

The Master Mechanics Committee on the contour of tires, W. C. A. Henry, Superintendent Motive Power, Pennsylvania Lines, Columbus, Ohio, reported as follows:—Your committee has been instructed to give consideration to the following and make recommendations:—The desirability of adopting the M.C.B. standard contour for engine truck, tender truck wheels, driving and trailing wheels,

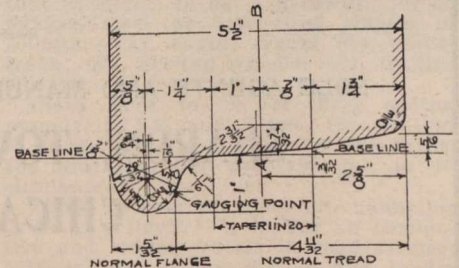


FIG. 1

also limit of wear of tread, shop and road limit of last turning, maximum height of flange, thickness of flange and gauges. As the present standard contour for cast-iron wheels of the American Railway Master Mechanics' Association is identical with the 1909 standard of the Master Car Builders' Association, we are assuming that our instructions as to contour refer to steel and steel-tired wheels only.

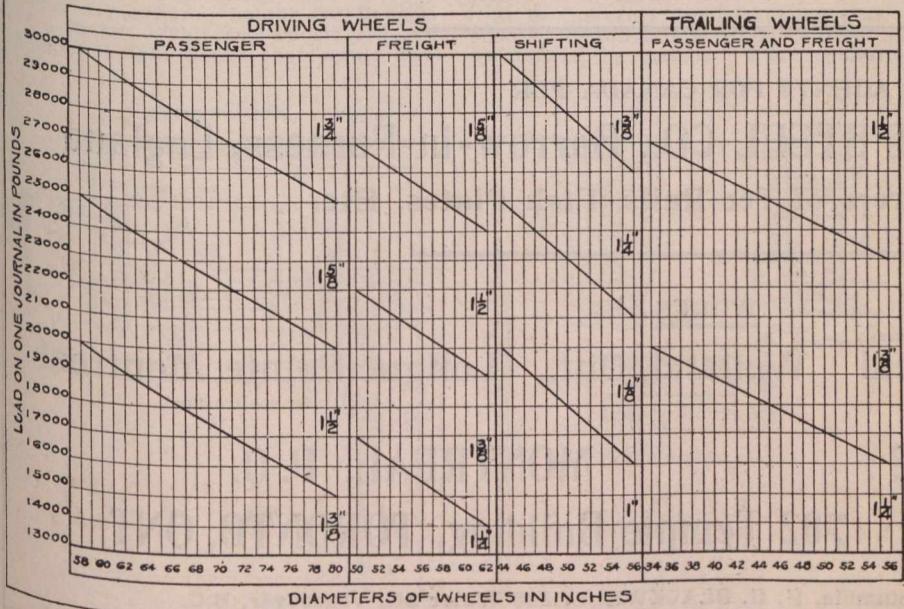
Replies to our circular of inquiry indicate that the M.C.B. 1909 contour is being very generally used for engine-truck and tender-truck wheels. Some roads have already adopted this contour for flanged driving-wheel tires as well. We feel that this contour is desirable for all flanged wheels under locomotives and tenders for the same reason that it is desirable for car wheels, in addition to which is the feature of uniformity.

The present A.R.M.M.A. standards call for six widths of flanged tires, and five widths of plain tires, as follows:—

	In.	In.	In.	In.	In.	In.
Flanged tires	.5	5 1/4	5 1/2	5 3/4	6	6 1/4
Plain tires	.6	6 1/4	6 1/2	6 3/4	7	

ROAD LIMITS OF TIRE WEAR FOR DRIVING AND TRAILING WHEELS
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FIG. 2



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Replies from the manufacturers of steel tires indicate that of the flanged tires manufactured by them, there are practically but two widths, namely, 5½ and 5¾ inches, the large majority being the former. In the case of plain tires the prevailing widths manufactured are 6, 6½ and 7½ inches, there being little demand for the 6¼ and 6¾ inch widths. It is the opinion of your committee that one standard for cast-iron and one for steel and steel-tired flanged wheels, namely, the M.C.B. 1909 standards, and three widths of the present A.R.M.M.A. contour for plain tires will meet all requirements and be to the advantage of all concerned, due to the fewer number of standards. Fig. 1 shows the contour which we recommend for steel and steel-tired wheels.

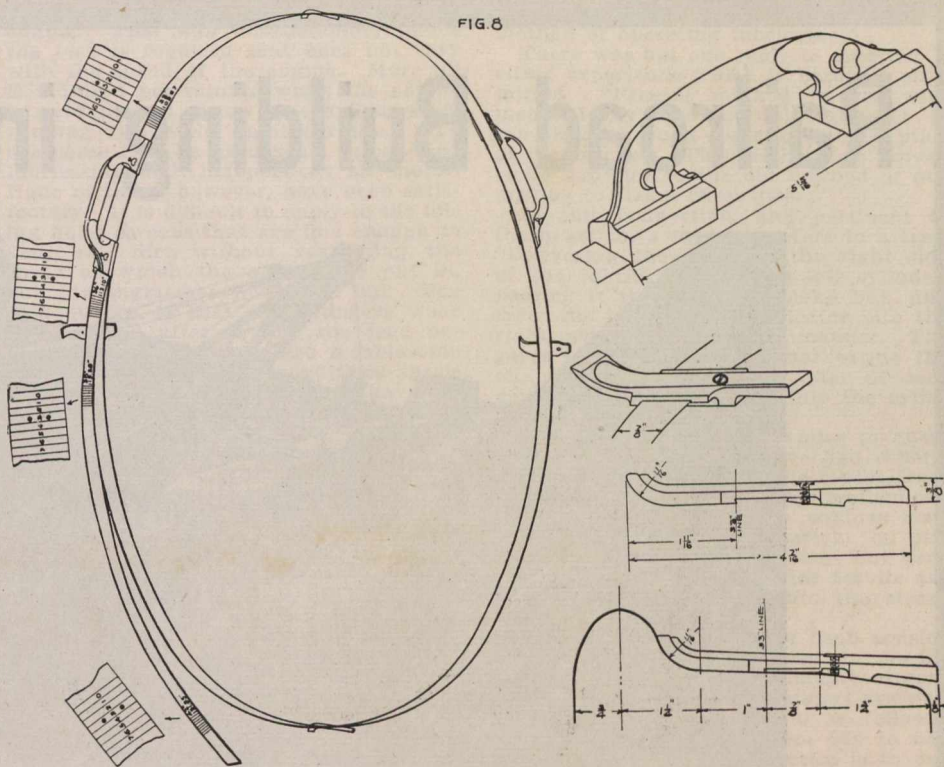
The prevailing limit of wear of tread or channeling for all wheels under locomotives and tenders is ¼ inch for locomotives in road service, and 5-16 inch for locomotives in shifting service, which we feel is good practice.

In investigating the subject of limits of wear of driving-wheel tires we have found the greatest variation. After full consideration, it does not seem possible, or advisable, to establish a minimum road limit to be followed by all roads. Where long, steep grades necessitate heavy braking, or severe weather conditions result in frozen roadbed for long periods of time, tires cannot be worn to the same degree of thinness as where these conditions do not prevail. Also, the use of retaining rings, which practice, however, is not universal, has a bearing on tire thickness. After consideration of all the data available, we feel that the limits prescribed on the chart submitted as a portion of our recommendations will be suitable for roads not having severe grades, or extremely cold weather, and not using retaining rings. Where these conditions prevail, or retaining devices are used, such deviations will have to be made as experience indicates are desirable.

The prevailing practice is to establish the shop limit of thickness of tires ¼ inch above the road limit. This limit is strictly one of economy and not safety, and will vary with the facilities for doing the work. We, therefore, hesitate to recommend a definite shop limit.

The M.C.B. limit for thickness of tire or rim for steel and steel-tired wheels is being generally followed in the case of engine truck and tender truck wheels with satisfactory results, and your committee recommends the same limits be adopted. See figs. 3, 4, 5 and 6.

The M.C.B. Association has already adopted a maximum height for flanges, of 1½ inches. This was considered the maximum height flange that would not,



Contour of Tires. Fig. 8.

in service, damage track bolts, filler blocks, etc. There is no reason why this maximum height should be deviated from.

The question of gauges is one in which there is practically no uniformity, each road apparently having gotten up a gauge to suit its individual views. We are submitting recommendations for a shop or round-house gauge on which can be read direct the important dimensions, namely, channeling of tire, height of flange, and thickness of tire.

It has been suggested that the number of brackets on standard wheel circumference measure be increased from three to four, and the length of the brackets increased so as to project ½ inch beyond the rim when brackets are in proper position. The present method of graduating the circumference measure does not provide a definite boundary for each tape size, as the tape sizes are indicated by lines.

It is, therefore, recommended that instead of defining tape sizes by lines they be defined by spaces. Your committee

is of the opinion that these changes in the size and number of brackets, as well as the markings of the circumference measure, all of which are shown in fig. 8, are desirable. As a matter of information, we wish to add that these same changes are among the recommendations of the standing committee on car wheels to be made to the M.C.B. Association at the 1911 meeting.

We recommend the M.C.B. 1909 contour as shown in fig. 1 herewith, for all flanges, steel or steel-tired wheels, as follows:—(a), engine truck; (b), tender truck; (c), driving wheels; (d), trailing wheels.

Plain tires to be of three widths, namely, 6, 6½ and 7 ins., the contour to be the same as the present standards; the widths of 6¼ and 6¾ ins. to be eliminated.

Limit of wear of tread or channeling to be as follows:—¼ in. for all locomotive and tender wheels in road service; 5-16 in. for all locomotive and tender wheels in shifting service.

Road limit for driving and trailing wheels to be as specified in chart, fig. 2.

Road limit for steel and steel-tired wheels for engine and tender trucks to be as per figs. 3, 4, 5 and 6, which is the 1909 recommended practice of the M.C.B. Association.

Maximum flange height to be 1½ inches.

Gauge to be as per fig. 7.

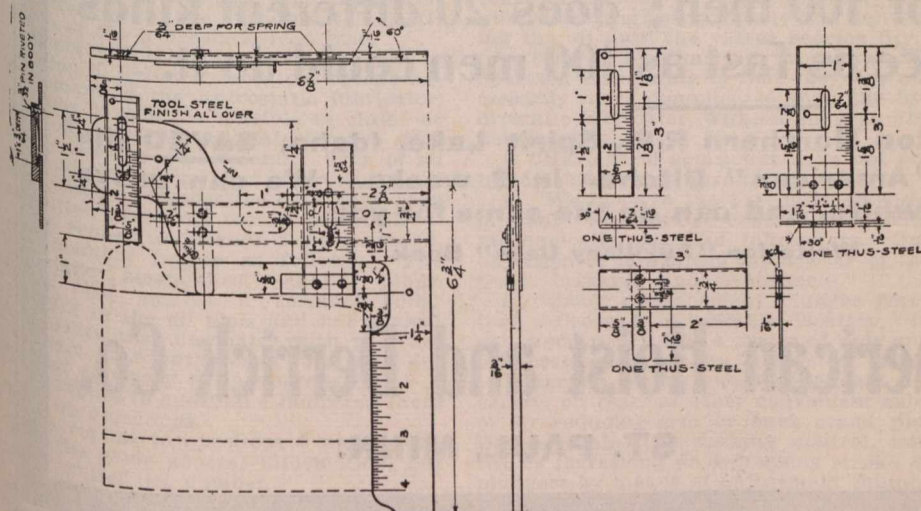
Wheel circumference measure to be modified, as per fig. 8.

Lubrication of Locomotive Cylinders.

The Master Mechanics' Committee, C. H. Rae, General Master Mechanic, L. & N.R., Louisville, Ky., Chairman, reported as follows:—

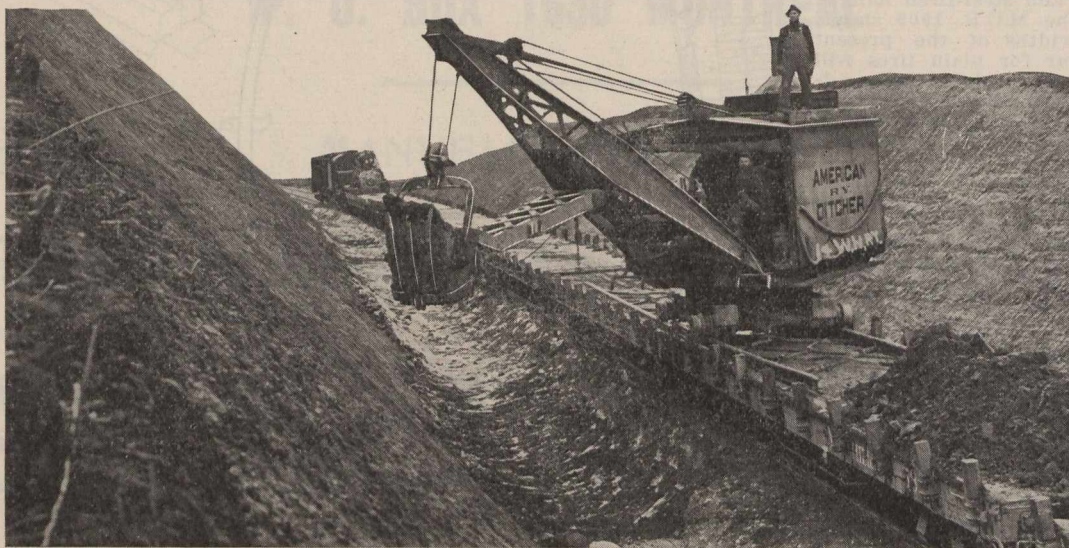
Your committee on the subject, "Lubrication of Locomotive Cylinders by up-to-date sight-feed lubricators, which operate by condensation of steam, adjustable feed, etc.; also to investigate the subject of mechanical lubricators," respectfully submits as follows:

Questions submitted to members:



Contour of Tires. Fig. 7. Tire Gauge.

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1. Have you experienced difficulty in lubricating modern passenger and freight locomotives, with steam pressures from 180 to 230 lbs., with the up-to-date lubricators which operate by condensation of steam, adjustable feed, etc., and, if so, state experience and causes for same?

2. What recent improvements have been made in the hydrostatic-feed lubricators, to add to their efficiency and economical operation? Give explanation, experience and results.

3. If familiar with any device, independent of the hydrostatic-feed lubricators as furnished by the manufacturers, which increases their efficiency or economical use, give description, principle of operation, etc.

4. For the lubrication of valves and cylinders on modern locomotives, state your objections, if any, to the up-to-date hydrostatic-feed lubricator.

5. What types of mechanically operated lubricators have you used? State method of application, principle of operation, control and regulation of feed, location of device on the locomotive, with experience and results.

6. For the lubrication of modern locomotives, valves and cylinders, state your objections, if any, to the mechanically operated lubricator.

7. Are you familiar with any method, or device, for admitting the oil into the steam before it reaches the saddle casting? If so, state details, experience and results.

8. Have you had any experience with the oil-delivery pipe attached to deliver the oil into the steam-way in the saddle casting, instead of at the steam chest or valve chamber? State results.

9. What has been your experience in the lubrication of locomotive cylinders where superheated steam has been used? In this connection, state the degrees of temperature acquired, if hydrostatic or mechanically operated lubricators were used, and the results from both, where both have been used.

10. Do you consider it necessary to lubricate cylinders of locomotives using superheated steam, independently of the valves, using any type of lubricator?

11. What is your experience with the lubrication of cylinders on Mallet compound locomotives, using superheated steam with the hydrostatic-feed lubricator? With the mechanically operated lubricator?

12. Do you consider it necessary to lubricate the valves and cylinders on the high and low pressure cylinders of Mallet compound locomotive (by lubricators of whatever type) piped independently to each valve chamber and cylinder?

The replies to question 1 were universal in expression, that there is no serious difficulty now experienced in lubricating modern passenger and freight locomotives with the "up-to-date" lubricators of the hydrostatic-feed type.

Several of the members, in reply to question 2, have referred to a recent improvement in the hydrostatic lubricator, whereby it is made possible to close or shut off feeds without interference with the feed-valve adjustments. This is an economical feature, but of such recent date that no comparative data have been submitted as to the results obtained.

The replies to question 3 were limited. One member replies as follows: "The automatic steam-chest choke plugs, which feed against a constant boiler pressure in the oil pipe, and not against a pressure that fluctuates with pressure in steam chest, will result in a high degree of efficiency in the lubricator."

All replies to question 4 indicated there were no objections.

The replies to questions 5 and 6 embody the same general information, but were limited in number.

a. "Have used several types of mechanically operated forced-feed lubricators. Three of those experimented with

were driven from a moving part of the engine. This was unsatisfactory, since the feed is required that does not vary with the speed of the engine. More oil is required per minute while the engine is worked hard at low speeds than when running fast with light throttle. To overcome this we used some forced-feed lubricators with independent air motor. None of them, however, have been satisfactory. It is difficult to apply to the filling holes screens that are fine enough to keep out dirt, without restricting the speed at which the oil can be put in, and the enginemen pull them out. The consequence is that the plungers wear rapidly, and after a time the feed becomes irregular. They are troublesome to maintain, and under conditions specified, in answer to question 1, gave no better results than the hydrostatic lubricator.

b. "We have experimented with two or three makes of mechanical-feed lubricators, but have been unsuccessful in getting as good results as we do with the hydrostatic-feed lubricators. The trouble with the mechanical-feed lubricator seems to be due to the difference in temperature; in warm weather, or during the warm part of the day, they would feed sufficient oil, but in cold weather, or at night when the weather is colder, they do not feed as well as when it is warmer."

c. "We have used two mechanical lubricating devices, which received their motion from a connection made to the valve stem and oil chamber, and regulating devices were located in the cab. Our test record shows that after considerable experimenting the device operated fairly well, but after a time gave considerable trouble and was finally removed on account of not giving satisfactory results. Mechanical means are objectionable, in that the device is so complex, and consists of so many parts, it is difficult to keep joints from leaking. To be properly installed, all pipes must be kept constantly filled and under pressure, with return valves at distributing points. On account of mechanical movements, parts will wear, and it will be more expensive to maintain, and in making repairs more oil is lost than with hydrostatic lubricators. Devices of this sort do not appear to have as yet been perfected to such an extent as to make them thoroughly reliable."

d. "Have used a force-feed lubricator with pipe connections to all driving boxes and to steam chest. Operated by mechanism deriving its motion from connection to Walschaert link. Lubricator located in the cab. While reducing friction on journal bearings, and delivering oil to steam chest, I do not consider it entirely satisfactory, for the reason that there is nothing to indicate that the pumps are working properly and delivering the oil until the valves become dry."

e. "Our objections to mechanically operated lubricators is that they are necessarily more complicated than the hydrostatic lubricator, without showing any beneficial results."

f. "Have tried some, but have not obtained satisfactory results."

g. "We have in the past used on some of our two-cylinder compound engines mechanically operated lubricators. Our objection to it was the rapid wear of the parts, leakages and annoyances."

h. "Using displacement plunger force feed. Secured in suitable location in cab, and operated by a series of rods and bell cranks, which are connected, either to eccentric blades and independent eccentric on rear, or other convenient axle, or by reducing-arm or back crank pin. Device subject to varying control, and fed by increasing or decreasing stroke of plungers by means of adjustment thumbnut."

"Results as to economy and distribution very satisfactory. Slight trouble ex-

perienced in experimental stage, due to method of operating lubricator."

There was but one reply to question 7, citing experience which is herewith submitted: "Present method in use with mechanically operated lubricator is to tap direct through dome into steam pipe, or throttle box. This method has proven to be superior to the old method of admitting to steam chest direct."

In this connection, and pertinent to the question, a member refers to a test: "Delivering the oil from the right side of the lubricator into the left cylinder, passing it through the smoke box, and from the left side of lubricator into the right cylinder in the same manner. The gases in the front end superheating the oil, and evaporating the water of condensation, putting the oil into the cylinders superheated."

The substance of the replies to question 8 from those who have had experience was in accord with the report from a member who has tried this method extensively: "On slide-valve engines consider results distinctly superior; on piston-valve engines reports vary, but general experience is that better results are obtained by putting oil into the steam passage."

Questions 9 and 10 have been considered jointly by the members. In the information submitted, the important features of this phase of the subject are well expressed in the quotation, as follows:

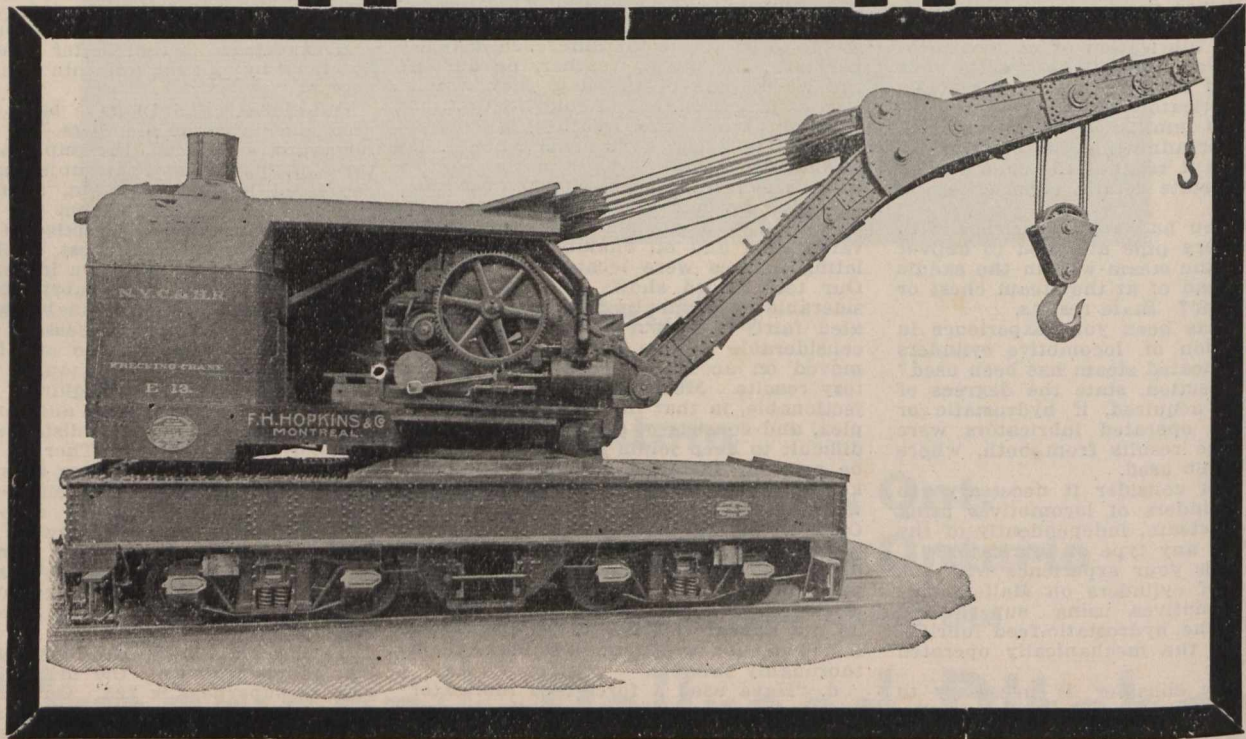
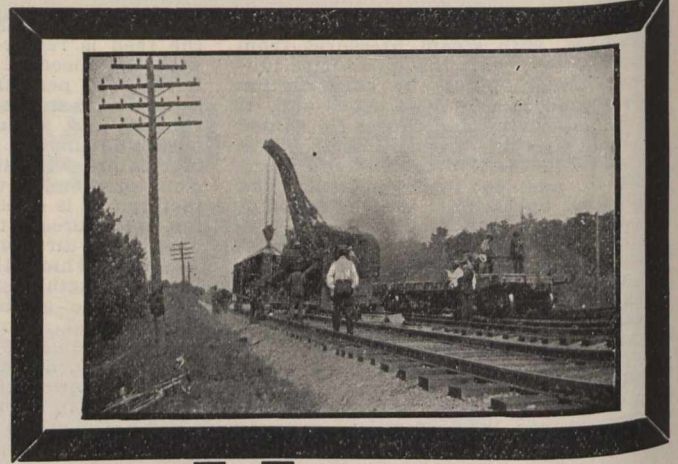
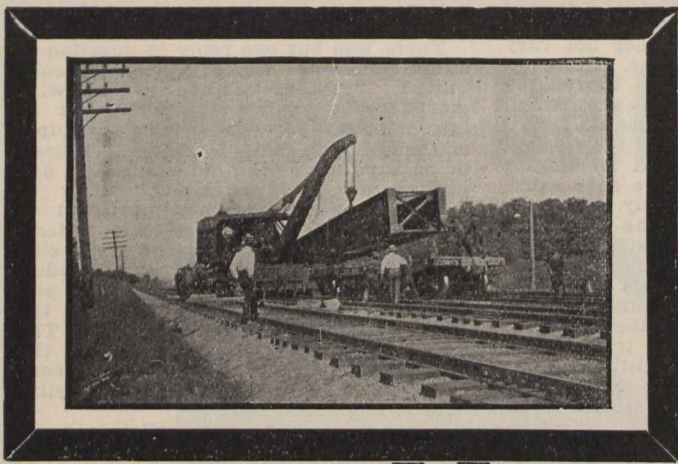
a. "Superheat varies from 550 to 580 degrees. Our regular practice is to use one feed pipe to valve chest, applying it to go to each end of valve in centre of the valve bushing. This lubricates valve very well, but it is questionable whether delivering oil to steam passage is not preferable. We also use one feed to each side of cylinder, at top in centre. This is not used unless required. When working with full throttle and long cut-offs, over considerable distances, find cylinder feed necessary. There is no difficulty whatever in obtaining satisfactory lubrication in superheater engines with hydrostatic lubricators, on account of difference of pressure between steam chest and boiler, previously mentioned. In fact, there is considerably less difficulty than on engines using saturated steam. In spite of this the piston-ring wear is far more rapid."

b. "On our superheaters we carry 170 lbs. boiler pressure; the maximum degree of superheat is 225. On a number of superheater engines we introduced oil both at the steam cavity and into the cylinder direct; found the latter connection unnecessary. The only trouble which we had with superheater engines was to get our men to use the drifting valve when the engine was shut off. If this is not done, have experienced trouble with the bushings cutting out, but on districts where the drifting valve is put on we are having very good success."

All replies to question 11 pertain to the satisfactory use of the hydrostatic lubricator. No information furnished concerning use of mechanically operated lubricators on Mallet compound locomotives using superheated steam.

Replies to question 12 were at variance as to the location of the oil pipes, but it was the consensus of opinion that piping to the high-pressure valves and cylinders only was insufficient for satisfactory lubrication.

The subject of lubrication of locomotive cylinders, though a familiar one, requires frequent consideration, to the end that the best possible results may be attained. The conditions of service are constantly changing; areas and steam pressure are increasing, and with the introduction of superheated steam and the Mallet compound locomotives, new problems, all tending toward an advanced standard of efficiency, while the demand of the hour is a decreased cost per unit of service.



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The method of lubricating valves and cylinders of the heavy power in use on railways has not been materially changed since the introduction of the hydrostatic-feed lubricator, and the use of this device has become so general, that its principle of operation, and the necessary attention for its maintenance, are familiar to all who have to do with its care and operation.

The experience of your committee, supplemented by the information received from the members of the Association, warrants the assertion that there is no serious difficulty now experienced with the use of that device.

The recent addition of a stop-feed feature is an improvement, rather tending to economical operation than to efficiency, and it behooves the manufacturers of this device to keep pace with, or in advance of, the constantly increasing demands.

The information obtained from the members, and cited in the foregoing, confirms the experience and opinion of your committee, that a properly constructed hydrostatic lubricator meets the locomotive requirements better than a mechanically operated lubricator, for the several reasons:

Familiarity with care and operation by the different classes of labor whose duties are in connection with its use.

Simplicity of design and substantial in construction; the operating parts being better protected from disarrangement or breakage.

A more accurate regulation of the amount of oil applied to the valves and cylinders under the varying conditions of service performed by the locomotive at different speeds and points of cut-off.

Because of less complication in construction and attachments, a corresponding less expense of maintenance.

The more general custom of delivering the oil to the steam chest or valve chamber is open to question, and there has been some very conclusive evidence submitted favoring the delivery of the oil into the steam at a point where it may become highly attenuated and intermingled with the steam.

The presumed effect of extreme temperatures, due to high pressure and superheat upon the oil, has been an objection to delivering the oil in the steam before it reaches the cylinder saddle. Information has been furnished and confirmed by the experience of some of the members, that the efficiency of a properly compounded mineral cylinder oil is not seriously impaired when protected by the steam. As the reports on the particular feature of the subject are indefinite, your committee recommends further consideration and experimentation.

The information obtained from the members who have had the most general and extended experience with locomotives using superheated steam confirms the experience and opinion of your committee, i.e., that the same reason advanced for the endorsement of the hydrostatic-feed lubricator on locomotives using saturated steam apply to locomotives using superheated steam.

The information submitted and quoted in the replies, pertaining to the proper location and number of oil pipes on superheated locomotives, is of much value.

The experience thus far is not sufficient to justify a decisive recommendation at this time. We would, however, particularly recommend that lib- and attention to their proper manipulation, that the temperature of the cylinders may be promptly reduced within the lubricating possibilities of the oil when exposed to the atmosphere.

The problem of satisfactorily lubricating still in process of solution. At present it seems essential to pipe independently to the high and low pressure cylinders.

However, your committee has been advised that there has been some experience, with satisfactory results by eliminating the pipes to the low-pressure valves and cylinder, substituting an auxiliary oil pipe to the receiver with the high-pressure steam connection. This carries sufficient oil over to the low-pressure cylinders to insure good service.

Increased efficiency and reduced expense of operation confronts the mechanical departments of our railways to a greater extent than ever before.

The final and most important recommendation of your committee is a continued live interest in the lubrication of locomotive cylinders."

Piston Rods and Cross Heads.

The Master Mechanics Committee on formulae for diameter of piston rods and size of cross heads of locomotives, J. A. McRae, Mechanical Engineer, Michigan Central Rd., Detroit, Mich., reports as follows:—We have obtained data from a number of the largest railways and from locomotive builders. We find several different formulae and designs in use which are giving satisfaction, therefore representative groups of the data obtained are presented, instead of recommending only one set of formulae for each part.

GROUP I.—PISTON RODS.—Let

P equal area of piston × boiler pressure.

S equal fibre stress.

A equal least area of piston rod through key-way.

Allowable working fibre stress in tension, 9,500 lbs. per square inch for steel.

Then (1)

$$P = \frac{A \cdot S}{S}$$

Piston rods to have enlarged fit in piston and in crosshead; ends to be approximately 1/4 inch greater in diameter than body of rod.

CROSSHEAD KEY.—Allowable working fibre stress, 17,000 lbs. per square inch for spring steel.

The diameter of body of piston rods, based on 9,500 lbs. fibre stress in tension at least area through key-way, with nominal diameter of cylinder and full boiler pressure for simple engines, are shown in Table I. The sizes vary by even 1/4 inches.

TABLE I.—DIAMETER OF BODY FOR PISTON RODS.

Cylinder Diameter.	Boiler Pressure.				
	180	190	200	210	220
16"	2 3/8"	2 3/8"	3"		
16 1/2"—17"	2 3/8"	3"	3"		
17 1/2"—18"	3 1/8"	3 1/8"	3 1/8"	3 1/8"	
18 1/2"—19"	3 1/8"	3 1/8"	3 1/8"	3 1/8"	
19 1/2"—20"	3 3/8"	3 3/8"	3 3/8"	3 3/8"	
20 1/2"—21"	3 3/8"	3 3/8"	3 3/8"	3 3/8"	3 3/8"
21 1/2"—22"	3 3/8"	3 3/8"	4"	4"	4"
22 1/2" ..	4"	4"	4"	4"	4"
—23"	4"	4"	4"	4"	4 1/4"
23 1/2"—24"	4 1/4"	4 1/4"	4 1/4"	4 1/4"	4 1/4"
24 1/2"—25"	4 1/4"	4 1/4"	4 1/4"	4 1/4"	4 1/4"
25 1/2"	4 1/4"	4 1/2"	4 1/2"	4 1/2"	.....

The dimensions of piston-rod end for piston rods with body diameter as shown in table I. are given in table II. and fig. 1.

The dimensions of the crosshead end are given in table III. and fig. II.

CROSSHEADS.—The formulae for figuring crossheads to be used with the above designs of piston rods were not obtained, but drawings of the crossheads were furnished. A standard formula in terms of the diameter of the rod could not be derived to cover all the sizes. The dimensions of the crosshead hubs for cast-steel crossheads of the "alligator" type are given in table IV. and fig. 3, and will probably answer in lieu of formula.

The limiting bearing pressure for crosshead pins is 4,800 lbs. per square inch. The bearing area of crosshead shoes, designed to be used with the

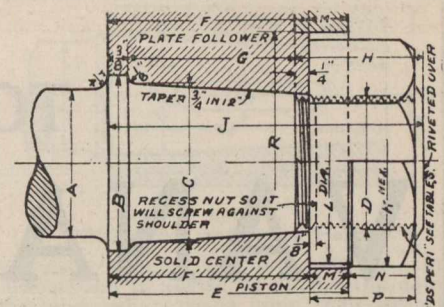


FIG. 1

TABLE II DIMENSIONS FOR PISTON END OF PISTON ROD.

A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S
2 3/4"	3 1/4"	3"	2 1/2"	4 1/2"	3 3/8"	3 3/8"	5 7/8"	3 7/8"	3 3/4"	3 3/4"	1 1/2"	2"	4 3/4"	8	
3"	3 3/4"	3 1/2"	2 3/4"	4 3/4"	3 3/8"	3 3/8"	5 7/8"	4 1/4"	4 1/4"	3 3/4"	1 1/2"	2"	5 1/4"	8	
3 1/4"	3 3/4"	3 1/2"	3"	5 1/4"	4 1/4"	4 1/4"	6 7/8"	4 1/4"	4 1/4"	3 3/4"	1 1/2"	2"	5 3/4"	8	
3 1/2"	4"	3 3/4"	3 1/2"	5 1/4"	4 1/4"	4 1/4"	7 1/8"	5"	4 3/4"	3 3/4"	1 1/2"	2 1/2"	6"	6	
3 3/4"	4 1/4"	3 3/4"	3 1/2"	5 1/4"	4 1/4"	4 1/4"	8 1/8"	5 1/4"	4 3/4"	3 3/4"	1 1/2"	2 1/2"	6 1/2"	6	
4"	4 1/2"	4 1/4"	3 3/4"	5 1/4"	4 1/4"	4 1/4"	8 1/8"	5 1/4"	4 3/4"	3 3/4"	1 1/2"	2 1/2"	6 3/8"	6	
4 1/4"	4 3/4"	4 1/4"	3 3/4"	7"	6"	5 3/8"	9 1/8"	5 1/4"	4 3/4"	3 3/4"	1 1/2"	2 1/2"	7 1/8"	6	
4 1/2"	4 3/4"	4 1/4"	4"	7"	6"	5 3/8"	9 1/8"	5 1/4"	4 3/4"	3 3/4"	1 1/2"	2 1/2"	7 1/4"	6	
4 3/4"	5"	4 1/4"	4 1/4"	7"	6"	5 3/8"	9 1/8"	5 1/4"	4 3/4"	3 3/4"	1 1/2"	2 1/2"	7 3/4"	6	

above, are: Top shoes, 7 by 24 inches, and bottom shoes, 5 1/2 by 24 inches, for piston rods 3 1/4 inches, 3 1/2 inches and 3 3/4 inches diameter; top shoe, 8 by 24 inches, and bottom shoe, 6 by 24 inches, for piston rods 4 1/4 inches and 4 1/2 inches diameter.

GROUP II.—PISTON RODS.—Let

P equal pressure per square inch on piston.

D equal diameter of cylinder in inches.

d equal diameter of piston rod.

l equal length of rod between piston-rod centre and the centre of the crosshead pin.

f equal allowable working compressive stress.

r equal radius of gyration of rod.

Then $D^2 = \frac{P \cdot l}{f \cdot d^2}$

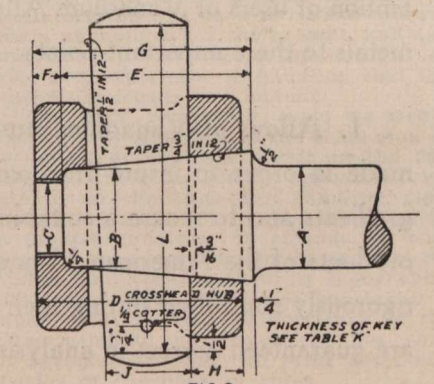


FIG. 2

TABLE III DIMENSIONS FOR CROSSHEAD END OF PISTON ROD.

A	B	C	D	E	F	G	H	J	K	L
2 3/4"	2 5/8"	1 1/8"	5 3/4"	5 1/4"	3"	6"	1 1/2"	2 3/8"	5/8"	9"
3"	2 7/8"	1 1/8"	5 3/4"	5 1/4"	3"	6"	1 1/2"	2 3/8"	5/8"	9"
3 1/4"	3 1/8"	2 1/8"	6 1/2"	6"	3"	6 3/4"	1 3/4"	2 5/8"	3/4"	9"
3 1/2"	3 3/8"	2 1/8"	6 1/2"	6"	3"	6 3/4"	1 3/4"	2 5/8"	3/4"	9"
3 3/4"	3 3/8"	2 1/8"	7"	6 1/2"	3 1/4"	7 1/4"	1 3/4"	3"	3/8"	10 1/2"
4"	3 7/8"	2 1/8"	7"	6 1/2"	3 1/4"	7 1/4"	1 3/4"	3"	3/8"	10 1/2"
4 1/4"	4 1/8"	3 1/8"	7 1/2"	7"	3 1/2"	7 3/4"	2"	3 1/4"	1"	11 1/2"
4 1/2"	4 3/8"	3 1/8"	7 1/2"	7"	3 1/2"	7 3/4"	2"	3 1/4"	1"	11 1/2"

TO THE USERS OF VANADIUM STEEL

Vanadium as a commercial metal is but a few years old, but in these few years it has revolutionized the possibilities of steel along many lines. The time has been too short, however, to enable all makers and all users of Vanadium Steel to arrive at uniform results; differences in the process of manufacture and variations in the methods of heat treatment have produced a diversity of results. Another cause for this diversity has been the opinion that Vanadium acts simply as a scavenger, and that steel in which no Vanadium is found on analysis may have been purified by just enough Vanadium to remove oxides and nitrides.

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1. Alloys of Vanadium must be very carefully made in order to insure freedom from harmful ingredients and to secure a suitable melting point. All products of the American Vanadium Company are rigorously controlled during their manufacture; they are guaranteed correct in analysis and free from im-

purities known to be injurious in the metal for which they are designed.

2. Metals that are sold as Vanadized metals *must contain Vanadium on analysis*, otherwise the advantages contributed by residual Vanadium cannot be expected.

3. Vanadium Steels respond readily to heat treatment. Properly made and properly heat treated, Vanadium Steels in their various types surpass every other known steel for similar purposes.

4. While the methods of adding Vanadium to the various metals and combinations of metals are simple and easily followed, the user must realize that these methods must be exactly observed, and that a departure from the rules determined scientifically will necessarily produce wide variations in the properties of the finished product.

5. If you fail to get superior results from metals supposed to contain Vanadium, send us small samples for chemical analysis and physical examination. Complete reports will be made free with full instructions for heat treatment. State where the material was purchased, how it was treated, where it was to be used and any other essential details to enable us to communicate with you fully.

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(2) d equals $D \sqrt{\frac{P}{d}}$

(3) P equals $\frac{d^2 f}{D^2}$

Under repeated alternate strains allow the compressive stresses given in table V. (From Pencoed experiments.)

TABLE V.
(70,000 lbs.)

$\frac{1}{r}$	$\frac{4^1}{d}$	Steel		
20	13,360	70	..... 6,520
30	9,540	80	..... 5,940
40	8,330	90	..... 5,300
50	7,760	100	..... 4,680
60	7,120	110	..... 4,220

CROSSHEADS.—The formulæ for cast-steel crosshead hubs used in connection with the above piston rods are shown in diagram fig. 4.

The allowable working fibre stresses are as follows:—

- Hub at key-way.....12,500 lbs. per sq. in.
- Key= $\frac{d}{4}$ bearing value..40,000 lbs. per sq. in.
- Key= $\frac{d}{4}$ shear ...13,400 lbs. per sq. in.

- Hub diameter = 1.6d..28,000 lbs. per sq. in.
- X = .6d shear hub..12,000 lbs. per sq. in.
- Y = .5d shear rod.. 9,400 lbs. per sq. in.

GROUP III.—PISTON RODS.—The following formulæ for piston rods are expressed in terms of the diameter of rod at root of thread on piston end. Let

- P = area of piston × boiler pressure.
- A = area of piston rod at root of thread.
- d = minimum diameter of piston rod at root of thread.
- S = working fibre stress equals 10,000 lbs. per square inch.

(1) $A = \frac{S}{P} = \frac{P}{10,000}$

(2) $d = \sqrt{\frac{A}{.7854}}$

Width of key to be less than $d \times 1.275$. The dimension for the piston rod in terms of diameter at root of thread on piston end is shown in fig. 5.

The centre part of crosshead fit is reduced 1-32-inch diameter so as to insure having bearing at ends of fit only.

CROSSHEADS.—The crossheads used

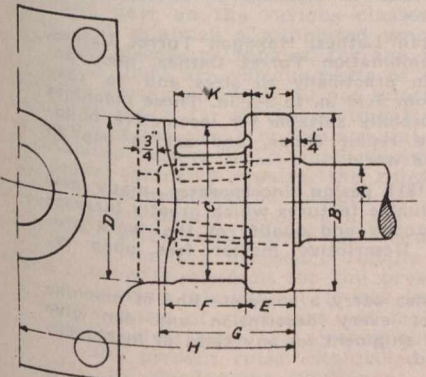


FIG. 3. TABLE IV

DIA OF ROD	A	B	C	D	E	F	G	H	J	K
2 3/4										
3		6 1/2	5 3/4	6	1 3/4	3	5	10 1/2	1 1/2	2 13/16
3 1/4										
3 1/2		7 1/4	6 1/2	7	2	3 1/4	5 3/8	12	1 3/4	3 1/8
3 3/4										
4		8	7	7 1/2	2	3 3/4	6 1/4	13	1 3/4	3 1/2
4 1/4										
4 1/2		9	8	8 1/2	2 1/4	3 3/4	6 3/4	14	2	3 3/4

with the above piston rods have following dimensions of hubs:—

$\frac{2}{d}$ —distance from end of hub to key-way

Piston pressure × .00003 = thickness of metal in outer end of crosshead hub for cast steel.

Bearing area in crosshead for crosshead pin = piston pressure divided by 12,000.

The three groups of formulæ are presented as representative of the data obtained.

Rules for Loading Material.

The Master Car Builders' Committee, A. Kearney, Asst. Supt. Motive Power, N. & W. R., Roanoke, Va., reported as follows:

Your committee begs to report it has no recommendations for changes in the present rules for loading material to present to this convention, except to correct some errors, for the most part typographical, that were made in the last issue of the rules. This conclusion has been reached as the result of the few subjects for change that have been presented during the current year, and more especially in order to give every one handling the rules more time and better opportunity to make up their minds what changes are really necessary.

First of all, we would direct your attention to rule 26 of the 1910 revision of the rules for loading material. In the 1910 issue rule 26 provides for the exclusive use of metal spacing blocks. Probably everybody will recall the discussion of this point on the floor of the convention last year, and the action taken at that time, to eliminate that modification requiring metal blocks exclusively. It was decided then to continue the use of rule 26 in its old form, that is, making the use of metal or wooden blocks optional. It was a mistake allowing rule 26 to go into the new issue of the rules in its modified form. The rule should read: "The cars must be jacked apart by placing one jack on each side of the coupler, separating the cars until the couplers are pulled out to the fullest extent, inserting hardwood or metal blocks (latter preferred) to completely fill the space between the horns of coupler and end of sill, and coupler release-rod chain disconnected, as shown in figs. 2 and 3."

There is one subject or group of rules, however, we have been asked to consider, and they are the rules governing the loading of rolled material of small sectional area, rules 98 to 103, inclusive. The suggestion has been made that there seems to be the necessity for distinction in the use of centre binders on loads of flexible material, pointing out those loads requiring centre binders and those which do not. In fact, it has been intimated that it might be more advisable to confine the use of centre binders only to the loading of small angles, channels and I-beams, and possibly setting a limit for sizes of this material which would require centre binders. While we are free to confess we have not been adverse to securing conclusive information on this subject, it would seem, in the absence of same, that in the practical handling of such loads we have not had sufficient experience to definitely specify the size of material to which centre binders should or should not be applied. Hence, it is the opinion of your committee, that for the coming year, definitely specifying the application of centre binders to flexible loads is a question on which our experience is too limited to distinguish, and for that reason the rules governing the handling of this material remain unchanged in this respect. As a matter of information, inasmuch as the question has already arisen, and is one in which we are all interested, we would

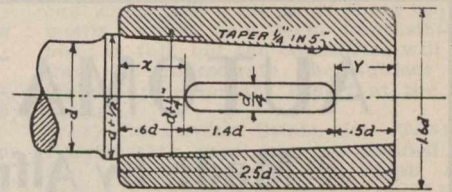


FIG. 4. Piston Rods and Cross Heads.

earnestly request the members of this Association to advise us during the coming year, what, based upon their experience, they would recommend for limits of size and shape of parts for twin or triple loads of flexible material which would require centre binders. There is one suggestion, however, to more clearly bring out the grouping of the rules governing the loading of material of small sectional area, by inserting the subheading, "Single loads," before the rules governing single loads, and the subheading, "Twin or triple loads," before the rules governing loads on two or more cars. This would seem to make the entire group of rules a little clearer, and as this is always advisable, and it does not in any way change the last issue, we have made use of the suggestions as follows: The subheading, "Single loads," comes immediately below the general heading and takes care of rules 98, 98-A and 99, while the subheading, "Twin or triple loads," comes immediately before rule 100, which is the first one in this series or group which refers to double loading. Such an arrangement certainly tends to clarify the ideas of some who interpret the general heading of rules governing the loading of rolled material of small sectional area as wrongly placed between rules 97 and 98, and think it should come between rule 99 and 100. It, however, remains a fact that rules 98 to 99, inclusive, cover the loading of the same kind of material on single cars as is spoken of in rules 100 to 103, inclusive, on two or more cars.

Again, it has been suggested that possibly rule No. 121, governing the loading of cylindrical boiler shells and tanks, be studied with a view of reducing the height of side blocking to a minimum consistent with safety. To do this, we feel, would require more information than our experience and advice from the various roads at the present time afford; therefore, we will have to let the rule remain unchanged for the present, and any modification will depend upon such advice and experience in handling that the various railroads may submit.

The only remaining topic we would call to your attention is the correction of several typographical errors in the last issue of the rules. They appeared principally in the rules for handling pipe, chiefly with respect to the cuts showing a greater number of strands of wire binders than is called for by the last revision, and viewing them as typographical errors, your committee has taken it upon itself to ask the Secretary of the Association to make such changes when it becomes necessary to print additional copies of the book of rules.

Before concluding, your committee feels constrained to again point out a disadvantage under which it is oftentimes laboring in its endeavor to put the rules for loading material in the best

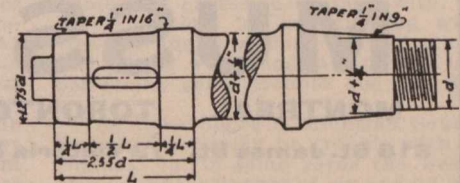
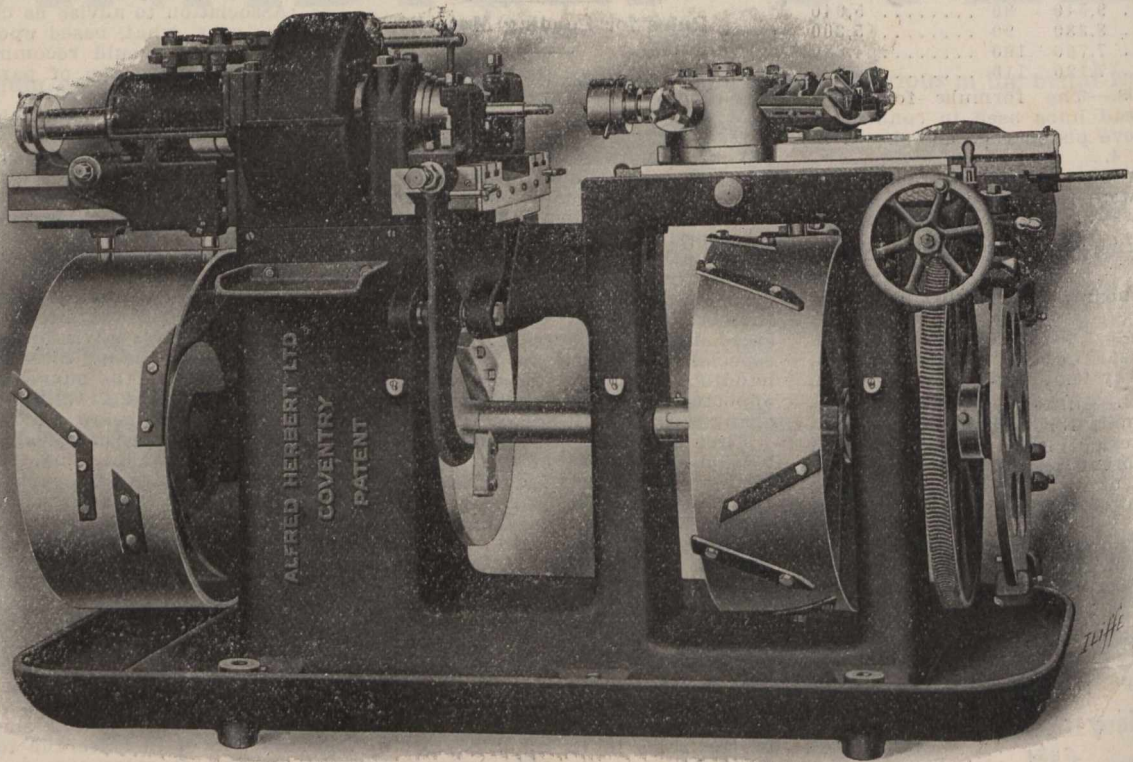


FIG. 5. Piston Rods and Cross Heads.

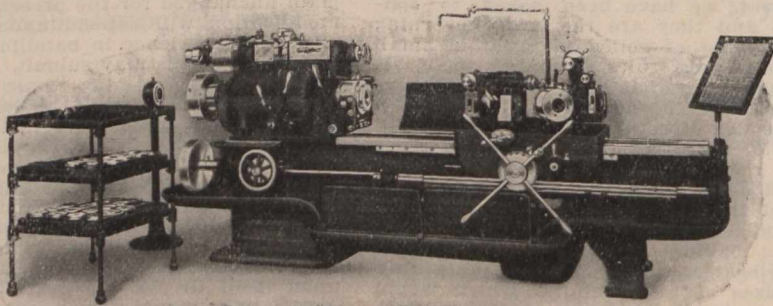
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We also carry a complete line of HIGH SPEED STEEL and steel for all purposes. Likewise a special HIGH SPEED TWISTED DRILL, which is made from special registered section steel of new composition, which we guarantee to give equal if not better results than any drill on the market to-day. Enquiries solicited.

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and most desirable shape for all concerned. This matter was brought to your attention at the last convention, but it is of such primary importance and presents so many possibilities for stimulating and increasing the efficiency of the rules, that we are sure it will do no harm to once more direct your attention to it; we refer to the great possibility for increasing the efficiency of the rules, if the committee were kept informed of practices made use of to meet local requirements in loading. It is reasonable to suppose that physical conditions and requirements bring up problems locally which are met by excellent suggestions for changes in the rules. Some may be of minor importance, while again others are of considerable moment. These oftentimes valuable remedies seldom reach us, hence we refer to the disadvantage, because the committee, less posted, perhaps, in some local situations, is endeavoring to make general and specific rules for the guidance of all.

Occasionally the Secretary will forward your committee a communication—sometimes for the interpretation of the rules covering a particular point, and again for the method of loading a particular commodity—but we are not reaping the benefit of the many good ideas arising in handling commodities under the local conditions, which knowledge would greatly tend to increase the efficiency of the committee. We are only endeavoring to bring about a plan by which your committee can derive the benefit of the broader experience, so that the rules will be still further increased in their efficiency and integrity.

Prices of Labor and Material for Steel Cars.

The Master Car Builders Committee, F. H. Clark, General Superintendent Motive Power, C.B. and Q.R., Chicago, Chairman, reported as follows:—

Your special committee has considered the subject on prices for labor and material, in connection with all-steel and composite cars for the M.C.B. Rules of Interchange, and at this time we do not think it advisable to make any radical changes in the way of submitting prices for repairs to individual parts, on account of it being impracticable to designate the extent of damage to the individual part on the various classes of cars, and establish a stipulated amount to make necessary repairs, for the reason that there are various parts of cars slightly damaged, which do not interfere with the safety for service or impair the strength of the car. On this account, we considered, where it is found necessary to make extensive repairs, the rules as now recommended to be changed on the rivet basis, hourly labor charges and material prices will cover all requirements in making necessary repairs to this class of equipment for the present. In considering this subject, it was found that the parts of steel cars not included on the rivet basis are already covered by the present rules established for repairs to wooden-car equipment and which will govern.

The recommendations of the committee are as follows:—

Eliminate all present rules on pg. 58 of the 1910 Code of Rules with reference to repairs to steel cars and substitute the following:—

"All rivets 1/2-inch diameter or over, 12c. net per rivet, which covers removal and replacing of rivets, including re-removal, fitting, punching or drilling holes when applying patches or splicing and replacing damaged parts, not to include straightening.

"All rivets 1/4-inch diameter and less than 1/2-inch diameter, 7c. net per rivet, which covers removal and replacing of rivets, including removing, fitting,

punching or drilling holes when applying patches or splicing and replacing damaged parts, not to include straightening.

"Straightening or repairing parts removed from damaged car, 60c. per 100 lbs.

"Straightening or repairing parts in place on damaged car; also any part that requires straightening, repairing or renewing, not included on rivet basis, 24c. per hour."

Paragraph showing steel-scrap credits to be eliminated from rule 111, on pg. 58; also rule 107, on pg. 51, to be eliminated, and charges and scrap credits shown in rule 104, on pg. 51, change to read as follows:—

	Charge.	Credit.
"Steel, plate and structural, per pound .....	.03	.00 1/2
"Steel, pressed and flanged, per pound .....	.04 1/2	.00 1/2"

In making repairs to cars on a rivet basis, the cost of removing and replacing fixtures not secured by rivets, but necessarily removed in order to repair or renew adjacent defective parts, should be in addition to the rivet basis; rules covering wood-car repairs to govern.

Paint applied, one-quarter-hour labor to be allowed per pound of paint applied and on the basis of rule 105.

Refrigerator Cars.

The Master Car Builders Committee, M. K. Barnum, General Superintendent of Motive Power, Illinois Central Rd., Chicago, Chairman, reported as follows:—This committee was instructed to investigate and report on three separate questions, as follows:—(1) The uniform height of refrigerator cars from the rail to the floor. (2) Adoption of standard drip cup for refrigerators. (3) Relatively small ice tanks.

(1) UNIFORM HEIGHT OF CARS.—Our investigation of this subject shows that a large majority of the refrigerators built within the last 10 years or more have the height of floor varying between 48 and 50 ins. above the rail, but the Santa Fe Refrigerator Dispatch has some 6,000 cars with floors approximately 46 1/2 ins. above the rail. We have not been able to learn of any cars which have the floor at 42 ins. above the rail, as stated in the Railroad Refrigerator Service Association circular 84, dated June 26, 1909.

We also find that all freight-house platforms of the largest roads and packing-houses vary in height from 42 to 46 ins. above the rail, and understand that the American Railway Engineering and Maintenance of Way Association has not yet adopted any standard height for freight-house platforms; we therefore suggest that the Master Car Builders' Association adopt a minimum of 48 ins. as the recommended practice for refrigerator-car floors, and that the matter be taken up with the American Railway Engineering and Maintenance of Way Association with the view of having them adopt 46 ins. as the maximum height of freight-house platforms, as we believe that this will make ample allowance between the bottom of refrigerator doors and top of platforms, so as to avoid trouble about opening the doors at freight houses.

(2) STANDARD DRIP CUP.—In circular no. 73 the Railroad Refrigerator Service Association specifies the following requirements for an ideal drip cup:—(A) It must keep the lower end of drain pipe submerged in water when tanks contain ice during summer or winter. (B) It must prevent water in drip cup from freezing in winter when cars are iced without salt. (C) It must prevent cold air from entering car in winter when cars are not iced. Your committee has not yet been able to find any drip

cup which will meet all of these requirements, which now seem impossible to meet in full, but the committee will continue to investigate the subject and make supplementary report at the convention.

(3) RELATIVELY SMALL ICE TANKS.—Refrigerator cars may be divided into two general classes: (1) Fresh meat cars. (2) Fruit and dairy cars. (1) The best and most modern refrigerators are used for shipping fresh meats, and these are provided with ice tanks which experience has proven to be amply large. Fresh meat cars use crushed ice and salt, and a total capacity of 5,000 lbs. per car has been found ample for all ordinary service conditions; the committee, therefore, recommends that tanks of 5,000 lbs. ice capacity be adopted as the minimum for such cars.

(2) For fruit and dairy refrigerators a minimum of 3,000 lbs. per tank, or 6,000 lbs. per car, is recommended. Our investigation leads us to believe that the complaints mentioned by the Railroad Refrigerator Service Association have been caused by old cars that had ice tanks much smaller than the present practice, which are rapidly disappearing from service, and we believe tanks of the size above recommended are amply large to protect shipments under all ordinary conditions.

The Traffic Department will be the first to object to encroaching any further than necessary on the loading space of the car, and there seems to be no present necessity for increasing the outside length of the car beyond about 40 feet, the present size of the largest refrigerator.

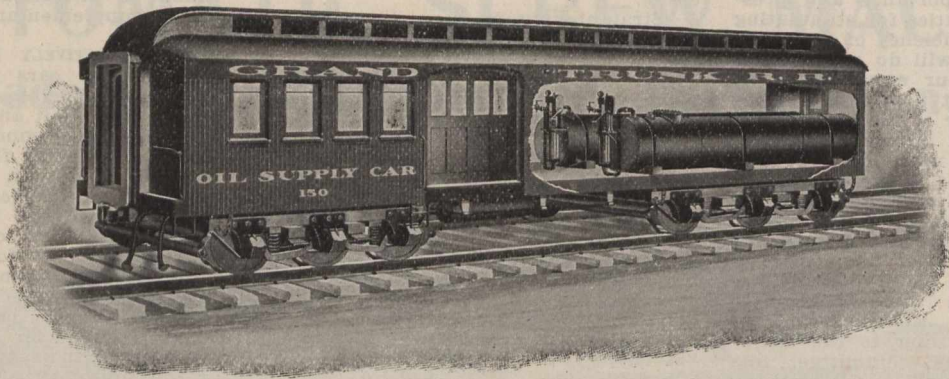
Flange Lubrication.

The Master Mechanics' Committee on flange lubrication, M. H. Haig, Mechanical Engineer, Atchison, Topeka and Santa Fe Ry., chairman, reported as follows:

It has been the purpose of your committee to obtain sufficient information to determine, (1) to what extent trouble from flange wear is experienced, (2) the lubricants and means of applying them which are in use, and (3) the effectiveness of lubrication in overcoming flange wear and its attendant evils. A circular of inquiry was issued and the committee's report is based upon the replies received from motive-power officials of about 30 railroads representing widely different grade, curvature and weather conditions of operation. The committee, therefore, feels justified in looking upon a synopsis of these replies as indicative of the flange-wear situation and, in general, the effectiveness of lubrication.

Among the detailed replies to the committee's circular, two only indicate that the officials represented are not having trouble in their territory from flange wear. In addition, five replies state that lubricators are being used or experimented with, which indicates trouble from this source. Eight answers on the other hand state that the railroads represented have no lubricators in use, and, unfortunately, no statements are made as to flange wear conditions. Among these are the Erie, in the east, and the Great Northern, in the west, both of which pass through a mountainous territory, and, therefore, have a large number of curves to contend with. The Erie, however, is investigating with a view to adopting flange lubrication, a fact which would indicate that it is experiencing some trouble due to flange wear.

The Lake Shore & Michigan Southern Ry. reports having no trouble with road engines, but in some yards the wear on driving-wheel flanges of six and 10 wheel switch engines becomes a very serious matter. The Santa Fe has had the same



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experience with six-wheel switch engines where a large percentage of the total mileage is made on curved track.

The railroads reporting flange wear are shown in table I, together with maximum curvature and grade conditions and the locomotive types most affected. This table presents a review of the flange-wear situation as complete as the data at hand will permit. It will be noticed that with one exception the curvature reaches a maximum of six degrees or more. It would seem, however, that the mileage of curved track relative to total mileage would produce more effect on flanges than the degree of curvature alone. There are a number of other conditions affecting flange wear; among them are length of rigid wheel base, speed, lateral movement and tire spacing, and the degree of stiffness of engine track.

Table II presents a list of railroads reporting, the locomotive types employed on these railroads and the locomotive types having greatest flange wear. The locomotive types reported in service on each railroad are designated by crosses (X), marked in the lines opposite the initials of the railroad and in the columns headed by the locomotive types.

Pacific in passenger service and consolidation in freight service are the types on which flange wear is most prevalent. However, where types are employed with longer wheel base than the consolidation, these are reported as being subject to greatest flange wear. In general, if other conditions are equal, it is the type with longest rigid wheel base on which flange wear is greatest. There are some notable exceptions to this rule in passenger service. One division of the Pennsylvania Rd. with engines of the Pacific type in service reports greatest flange wear on those of the Atlantic type. This is also the case on the eastern lines of the Santa Fe. While there is no statement to this effect, this condition may be due to the Atlantic type operating on a section of the road more severe on flanges because of excessive curvature.

The figures covering metal loss have been presented according to different standards and it is, therefore, difficult

TABLE II.—LOCOMOTIVE TYPES IN SERVICE AND TYPES HAVING GREATEST FLANGE WEAR

RAILROAD.	TYPES IN SERVICE.								GREATEST FLANGE WEAR.										
	4-4-0.	4-4-2.	4-6-0.	4-6-2.	2-6-2.	2-6-0.	2-8-0.	2-8-2.	2-10-0.	2-10-2.	Switch.	Mallet.	4-4-2.	4-6-0.	4-6-2.	2-8-0.	2-10-2.	Switch.	Mallet.
C. R. I. & P.			X	X			X									X			
C. P. R.—Lines West	X						X												
E. P. & S. W.			X	X	X				X										
S. P.—Salt Lake Division				X	X		X				X								
Santa Fe—Coast Lines				X	X		X										X		
Santa Fe—New Mexico Division				X	X		X												
Santa Fe—South West Lines	X	X	X	X	X		X						X						
Santa Fe—Gulf Lines	X	X	X	X	X		X								X				
Santa Fe—East Lines	X	X	X	X	X		X												
C. & S.—Narrow Gauge							X						X						
P. R. R.	X	X	X	X	X		X						X						
P. R. R. West Penn. Division	X	X	X	X	X		X								X				
*Vandalia	X	X	X	X	X		X									X			
B. & L. E.			X	X	X		X									X			
*H. V.							X												X
D. & H.							X									X			X
L. S. & M. S.							All Types											X	
W. P. T.	X		X								X	X							
I. C.	X	X	X	X			X				X							X	
A. B. & A.			X						X									X	
T. R. R. Ass'n. of St. Louis									X									X	

*Very little difference in flange wear observed on types in service.

to compare them. In some instances, the loss has been measured in radial thickness of tires, in others by weight per turning, and in still other cases by the value of metal turned off. Where stated in radial thickness, the amount varies between 1/4 and 3/4-in. Loss in weight is stated as varying between 55 and 1,150 lbs. per engine per turning, depending upon the number of wheels and the extent of flange wear. The loss of metal expressed in terms of money value for engines of various types is given as follows: Four-wheel switch, \$45; six-wheel switch, \$50; standard, \$50; ten-wheel, \$50; consolidation, \$60; mallet, \$90.

The total mileage obtained during the life of a set of tires appears to be the most satisfactory measure of tire service. On this measure as a basis, the estimate presented in table III. has been prepared to show the loss due to turning tires on account of flange wear, compared with the total mileage during the life of tires when turned for tread wear. It represents the service obtained from Atlantic type locomotives operating on the

Missouri Division of the Santa Fe. The mileage between tire turnings is computed from the average mileage per locomotive per month and the time between turnings; the average mileage per locomotive per month was obtained from records of 20 locomotives over a period of eight months. Before lubricators were applied, these locomotives averaged 18,600 miles between tire turnings before reaching the limit of 6 in. vertical flange wear. Since the adoption of flange lubrication, the same locomotives average 60,400 miles between tire turnings for tread wear. Figs. 1 and 2 graphically illustrate the method of arriving at the aggregate loss given in table III. In fig. 2 is shown the condition of tires with 5-16-in. tread wear after making 60,400 miles. To facilitate proper turning, 1/8-in. is usually removed in the lathe. The total reduction in radial thickness between successive tire turnings will, therefore, amount to 7-16-in. Fig. 1 illustrates the condition of tires when the locomotive is shopped because of sharp flanges after making only 18,600 miles.

TABLE III.—LOSS OF TIRE MILEAGE DUE TO EXCESSIVE FLANGE WEAR.

4-4-2 Type, operating on Missouri Division, A. T. & S. F. Ry.:	
Mileage between turnings—Flange wear (3/8" to 1" vertical)	18,600
Mileage between turnings—Tread wear (1/8" maximum)	60,400
Flange Worn { Metal removed to build up standard flange	3 3/8"
{ Tread wear (rate 1/8" per 60,400 mi.)	3 3/8"
Total reduction in radial thickness between turnings	7 1/2"
Tread Worn { Metal removed (To facilitate turning)	1 1/2"
{ Tread wear	1 1/2"
Total reduction in radial thickness between turnings	3"
FLANGE WORN TIRES	
Thickness of Tire	Average Mileage
New, 3 3/8"	18,600
After first turning, 3 1/8"	18,600
After second turning, 2 7/8"	18,600
After third turning, 2 3/8"	18,600
Scrap	18,600
Estimated Total	74,400
TREAD WORN TIRES	
Thickness of Tire	Average Mileage
New, 3 3/8"	60,400
After first turning, 3 1/8"	60,400
After second turning, 2 7/8"	60,400
After third turning, 2 3/8"	60,400
Scrap	60,400
Estimated total	241,600
Total loss of mileage during life of tires	
Loss per cent— "69"	

TABLE I.—RAILROADS REPORTING FLANGE WEAR ON LOCOMOTIVE DRIVING WHEELS

RAILROAD	CURVATURE	GRADE	TYPES MOST EFFECTED	MILEAGE BETWEEN TURNINGS	
				For Flange Wear	Estimated Proper
C.R.I. & P.	6°	1%	2-8-0	40,000	90,000
C.P.R.—Lines West	10°	{ Max.—5% { Much mil'ge, 2.2%	2-8-0	*	96,000 to 120,000
E.P. & S.W.	7 1/2°, 12°, 16°, 33'	1%, 3%, 5.7%		*	*
S.P.—Sacramento Div.	8' and 10'			*	*
Santa Fe—Coast Lines	10°	{ Max.—3% { 25 miles—2.2%	2-10-2	†	†
Santa Fe—N. Mex. Div.	6°, 8°, 10°, 14°	1.4% to 3.7%	4-6-2	{ 2-10-2—18,000 to 20,000 4-6-2—25,000 to 30,000	35,000 to 40,000 75,000 to 100,000
Santa Fe—S. West Lines	6°	.5%	4-4-2	{ 4-4-2—10,000 to 15,000 2-6-2—25,000	75,000 50,000
Santa Fe—Gulf Lines	6°	1% to 1 1/4%	4-6-2	60,000	75,000 to 80,000
Santa Fe—East Lines	6°, 7°-30'	.8%	2-8-0	18,600	60,000 to 70,000
C. & S. Narrow Gauge	35°	4%	4-4-2	40,000	40,000
P.R.R.	10' to 6°	.606%	4-4-2	Pass.—75,000	75,000
P.R.R.—West Penn. Div.		1% to 1.85%	2-8-0	Frt.—35,000	35,000
Vandalia	3°	.9%	4-6-2		
B. & L. E.	4° to 22°	.17% to 1.1%	0-6-0		
H. V.			All types same	40,000	70,000 to 80,000
D. & H.	2° to 14°	1.75%	2-8-0	28,000	28,000
L. S. & M. S.—Yd. Engines	10°, 12°, 17°, 20°	Light	All types same	30,000 to 35,000	60,000
W. P. T.	5°, 11°, 23'	1% to 1.45%	2-8-0	40,000	40,000
I. C.	{ Main Line—6' { Yard—32' to 50'	1 1/4%	Mallet	50,000 to 20,000	32,000 to 60,000
A. B. & A.	6°	1%	0-10-0	Average—15,000	
T. R. R. Ass'n. of St. Louis			Mallet	Pass.—90,000	120,000
				Freight—60,000	80,000
				Switch—25,000	250,000
			4-6-0	14,000 to 15,000	40,000 to 45,000
			0-6-0	4,000 to 55,000	50,000

*Tread wear mileage is obtained between shopping by shifting tires from one pair of wheels to another, thus providing new flanges at the point of severest wear.
†Tread wear mileage has been obtained between shoppings since the application of lubricators.
Two railroads report very little flange wear. Five railroads report flange lubricators in use; no other data. Eight railroads report no flange lubricators in use; no other data.

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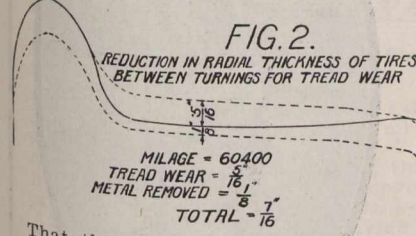
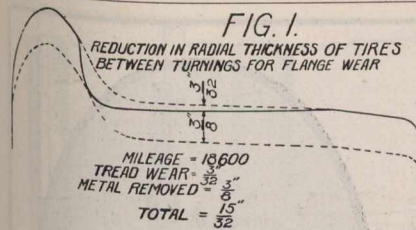
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That this estimate may be conservative, a very liberal curve has been assumed at the throat of the worn flange. In order to reproduce the standard tire contour it is necessary to turn off 3/8-in. of metal from the tread. The total reduction in radial thickness between tire turnings is 15-32-in., which is 1-32-in. greater than the total shown in fig. 2. Assuming a minimum thickness at the last turning of 2 inches, the difference under the two sets of conditions is 167,200, a loss in tire service of 69 per cent. due to flange wear.

TABLE VI-A.

Estimated saving by use of driver flange lubricators on forward drivers of mountain engines, Southern Pacific:	
Total mileage of 10 selected engines before application of flange lubricators; from Jan. 1, 1906, to date of application	629,703
Total cost of tire attention, from Jan. 1, 1906, to date of application of flange lubricators	\$6,108.00
Cost of tire attention per mile run, before application of flange lubricators	\$.0097
Number of times tires were changed from Jan. 1, 1906, to date of application of lubricators, including tire turning	71
Average mileage per change of tire, before application of lubricators	8,869
Total actual mileage of 10 selected engines since application of flange lubricators	421,513
Average mileage per change of tire since application of flange lubricators	42,151
Cost of tire attention per mile run after application of flange lubricators	\$.002041
Per cent. of increase in mileage per change of tire	375

Per cent. of decrease in cost of tire attention per mile run 79
SIXTY CONSOLIDATION ENGINES.

	Before application.	After application.
Average mileage per engine per month	2491	2635
Total mileage per year	2,062,548	2,181,780
Cost per mile run	\$.0097	\$.002041
Total cost of tire attention one year's service	\$20,006.72	\$4,453.01

The loss of revenue and the expense of turning and changing tires when locomotives are taken out of service because of worn flanges is shown by table IV. The experience of several different railroads is given and the data presented are as complete as it has been possible to obtain. In some instances, where flange wear is excessive, when the front pair of tires becomes badly flange worn, it is removed and exchanged with another pair from the same locomotive. On locomotives with four pairs of drivers, two shifts may be made. But under severe conditions, it is impossible by this means alone to keep locomotives in service until the tires become tread worn. In table VI-A, showing the estimated saving due to the use of flange lubricators on the Southern Pacific, the average mileage per change of tires necessitated by flange wear is given as 8,869. The practice was to make two shifts of tires before turning. Computed on this basis, the mileage between successive turnings for flange wear is only 26,607, while tread-wear mileage obtained since the application of lubricators is 42,151.

Since the increasing prevalence of flange wear has been forcing it to the attention of motive-power officials, many methods of lubrication have been applied in the effort to overcome this evil. Fourteen different forms of lubricators are now in use or have been tried by the railroads reporting to the committee. These may be grouped according to the kind of lubricant used into the following classes: (1) crude oil; (2) engine and car oil; (3) solid lubricant; (4) water; (5) exhaust steam.

There are four types of lubricators designed to use asphaltum base crude oil. These are the Chicago, the Southern Pacific, the Canadian Pacific and the Rock Island. Where no other name is known that of the railroad upon which the lubricator has been developed is used.

The Chicago flange oiler is designed to meet the requirements of the Elliott system of lubrication, which embodies a sight-feed oiler located on the back boiler

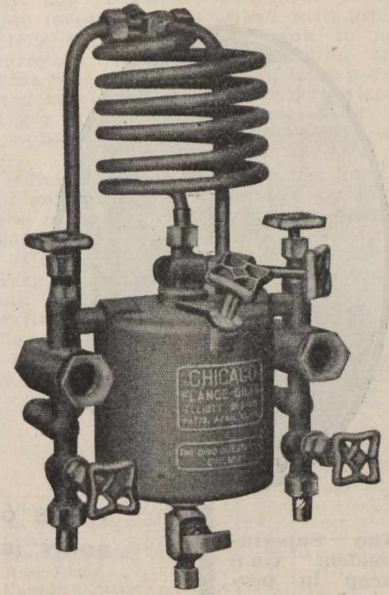


FIG. 3. Hydrostatic Flange Oiler.

head and a delivery pipe on each side of the engine leading to the flange nozzles. The oiler is similar in general appearance and principle of operation to the sight-feed valve-chamber lubricators in general use in America and is illustrated in figs. 3 and 4. The manufacturers recommend that the nozzles be located 15 ins. above the rail, 2 ins. from the flange toward the outside of the tire and close in toward the tread. (See fig. 5.) Where two pairs of nozzles are used, each delivery pipe is branched through a T pipe connection. Where more than two pairs are used either two two-feed oilers or one four-feed oiler should be provided. The manufacturer's practice is to apply one pair of nozzles in front of forward driving wheels on road engines; one pair in front of forward drivers and one pair back of rear drivers on switch engines; on Mallet engines in road service, one pair in front of forward drivers on both engines, and in pusher service one pair in front of forward drivers of both engines and a third pair back of rear drivers on high-pressure engine.

The Wabash Pittsburg Terminal Ry. applies nozzles to all drivers on standard type; to front and main drivers on ten-wheel type; to front and back drivers on consolidation type; to main and back drivers on six-wheel switch engines; and to front and back drivers of both engines on the Mallet type. A few consolidation engine trucks are also equipped.

The Lake Shore and Michigan Southern Ry. applies lubricator nozzles to all drivers on switch engines. The practice adopted by the Santa Fe is to apply nozzles to the rear of forward drivers where trouble is experienced from frozen sand pipes with nozzles placed in front of the drivers.

The lubricator illustrated in fig 6 has been developed by the Southern Pacific Co. after experiments covering the use of a number of other methods of delivering oil to the flanges. This device consists of a steam-jacketed receptacle holding about 1 1/2 pints of crude oil, which is fed by gravity through a needle valve into the 1/2 in. delivery pipe. A clamp bracket gripping the pipe just below the oil cup secures the oiler to the engine frame in front of the forward drivers. Loosely sliding upon the delivery pipe is a piece of one-inch pipe over the lower end of which is slipped a short section of one-inch rubber hose. The projecting end of the hose is shaped to fit the throat of the flange and acts as a shoe to distribute the oil. A weight rigidly attached to the upper end of the one-inch pipe holds the shoe against the flange at all times. The oil-cup jacket is supplied

TABLE IV.—LOSS OF REVENUE AND COST OF LABOR DUE TO FLANGE WEAR

RAILROAD	TIME OUT OF SERVICE WHEN SHOPPED FOR SHARP FLANGES	LOSS OF REVENUE		LABOR CHARGES	
		Per Day	Per Shopping	To Change Tires.	To Turn Tires
C.R.I. & P.				4-6-2. \$15.00	4-6-2. \$ 7.00
C.P.R.—Lines West	2 days	\$20.00	\$40.00	2-8-0. 20.00	2-8-0. 8.00
E.P. & S.W.				* 8.00	2-8-0. 3.00
S.P.—Salt Lake Div.					2-8-0. 4.20
Santa Fe—Coast Lines	**				4-6-2. 8.15
Santa Fe—S. West Lines				2-8-0. 15.00	2-8-0. 4.00
Santa Fe—Gulf Lines	48 hours	\$50.00	\$100.00	4-6-2. 2.97	2-10-2 2.25
Santa Fe—East Lines	4 days			4-4-2. 5.00	4-4-2. 3.60
P.R.R.	5 hours	\$10.00 to \$25.00		2-6-2. 7.50	2-6-2. 54.00
P.R.R.—W. Penn. Div.	18 to 20 hours	\$39.00	About \$30.00	4-6-2. 50.00	4-6-2. 350.00
Vandalia	24 hours up	\$2.50 per hour	\$60.00 up	2-8-0. 50.00	2-8-0. 400.00
B. & L.E.	2 or 3 days			4-4-2. 3.00	
H.V.	(To turn—60 hrs To change— 12 hrs.)	\$25.00	\$62.00	4-6-2. 30.92	4-6-2. 33.77
D. & H.	6 days		\$66.00	4-8-0. 20.86	3-8-0. 21.64
L.S. & M.S.	24 hours	Varies.		2-6-2. 28.05	
W.P.T.	(Shop—10 hrs R. House—2 d's)	Capital charges		2-8-0. 26.66	
I.C.	10 days	\$11.00	\$110.00	4-6-2. 6.30-19.80	4-6-2. 6.40
A.B. & A.	24 hours	\$10.00 to \$15.00	\$10.00 to \$15.00	2-8-0. 8.40†	3-8-0. 6.72
T.R.R. Ass'n of St. Louis	5 or 6 days	†\$82.00	‡\$4.40 to \$4.92	4-6-0. 13.32	4-6-0. 4.10
	2 or 3 days			2-8-0. 20.00	2-8-0. 5.20
				4-6-2. 26.05	
				2-8-0. 2.80	2-8-0. 2.80 to 3.60
				0-6-0. 6.00	0-6-0. 12.00
				Mallet 90.00	Mallet 90.05
				0-6-0. 15.50	2-8-0. 2.92
				2-8-0. 24.00	4-6-2. 2.88
				4-6-2. 30.00	
				4-6-0. 11.40	
				0-6-0. 13.68	10.00
				0-6-0. 13.80	0-6-0. 4.80

* Two pairs of tires exchanged. † \$19.80 for 4-6-2 type with retaining rings. ‡ Based on gross earning capacity.
** No engines shopped because of sharp flanges.

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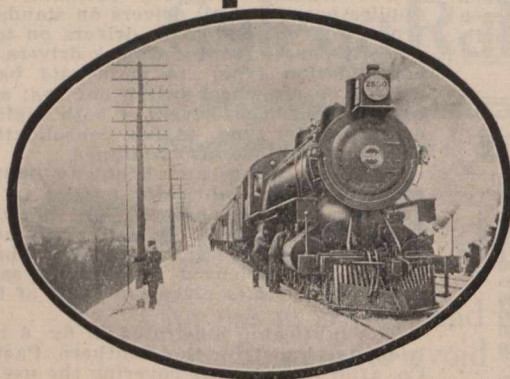
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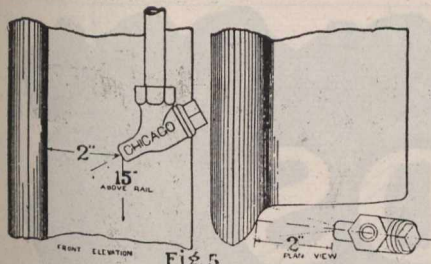


Fig. 5. Hydrostatic Oiler. Application of Flange Nozzles.

with steam from the air-pump exhaust pipe, which serves to keep the oil in a fluid state during cold weather. The drip from the jacket runs along the delivery tube tending to prevent congealing of the oil before reaching the flange.

The Canadian Pacific Ry. having tried hard grease and engine oil without success is about to try crude oil in the lubricator shown in fig. 7. This is similar to the Southern Pacific type in principle. Oil is fed through a regulating valve from the cup to the feed pipe and flange shoe, which consists of a piece of rubber hose. Steam from the air-pump exhaust pipe passing through a coil placed within the oil cup maintains the oil in a fluid state.

The Chicago, Rock Island & Pacific Ry. is using a lubricator shown in fig. 8 on two Pacific type locomotives. The oil receptacle stands upon the running board over the right cylinder. Exhaust steam passes through a pipe leading from the exhaust cavity in the cylinder casting to the oil cup. The accumulation of condensation in the oil cup lifts the lubricant into the delivery pipe, exhaust steam carrying it to the flange. The flow of oil is controlled by the engineer through a globe valve operated by a rod extending back to the cab. A check valve placed in the pipe leading from the cylinder exhaust cavity prevents a back flow of oil through this pipe.

There are two lubricators in use employing lubricant in solid forms; the Collins and the Turnbull. The Collins is illustrated in figs. 9, 10 and 11. A bracket attached to the frame supports the lubricator in position before the driver. The angle of the lubricator is adjustable to suit conditions imposed by the location of the bracket, on which it is laterally adjustable. The angle should be as nearly as possible twenty-five degrees from a line parallel to the axle and it should be placed on the horizontal centre line of the wheel. The location recommended by the manufacturers is shown in fig. 9. The lubricator itself is a tube of rectangular cross-section through which slides the lubricator block of hard grease. Below this tube is a spring-feeding device designed to keep the lubricator block pressed against the flange. Pressure from a coil spring acts through a dog engaged in one of a series of notches on the under side of the lubricator block. As the lubricant becomes worn, the spring is recompressed by means of a downward projecting trigger D, shown in fig. 10. At the same time the dog is moved back into engagement with the next notch in the lubricator block. This periodical readjustment is the only attention required to operate the lubricator.

The Turnbull lubricator embodies the same principle, spring pressure holding a cake of hard grease against the flange. The committee is informed by the manufacturer that this device is no longer marketed and a more detailed description will, therefore, be unnecessary.

Great economy in the use of lubricant is claimed for hard-grease lubricators. When the flange has become once coated there is no further deposit of lubricant until this coating is removed by contact with the rail.

The feed is automatically regulated to

suit the varying needs of the flanges. On the Colorado & Southern Ry., however, it has been found that the grease used in the Turnbull lubricator absolutely loses its merit in either wet or cold weather and its use has been abandoned. On the Canadian Pacific western lines, hard-grease lubrication has been found unsatisfactory. The committee is unable to state what type of lubricator was used.

Several methods of delivering engine and car oil to the flange have been tried. The simplest is a piece of pipe or hose secured to the frame in front of the driver in such a manner as to cause the lower end to bear against the flange. The pipe or hose is filled with oil-saturated waste, which acts as a swab more oil being supplied from time to time. This type is sometimes varied by providing a graduated feed-oil cup to supply oil to the swab. Although this simple device has proved beneficial, it has usually been abandoned for some more efficient method of lubrication. Where the waste comes in contact with the tire, if packed hard, it will glaze and cease to be effective. If loosely packed, it will be drawn out and lost.

Crude oil is being used in this manner on the Illinois Central Ry. A piece of 2-in. tube is flattened at one end and shaped to the contour of the flange. It is clamped to a hinge bracket so that the weight of the pipe itself tends to keep it in contact with the flange. The tube is packed with waste saturated with fuel oil. The shape of the opening at the flange is such that the waste will not be in contact with the tire. This device is being used to a limited extent on Pacific type engines with very little apparent benefit. It is not reliable in cold weather.

The Canadian Pacific has experimented with a siphon lubricator using engine oil, but this has proved inefficient and has been abandoned for the fuel-oil lubricator shown in fig. 7.

Another simple device has been applied to six-wheel switch engines in the Chicago yard of the Santa Fe. This is shown in detail in fig. 12 and applied to engines in fig. 13. It is simply a block of wood resting up the tire and grooved to fit the flange. A waste-filled cavity contains engine oil which feeds through a 3/8-in. hole to the flange. The block is loosely anchored, as shown in fig 13, and is usually applied to forward and back drivers.

The Chicago, Rock Island & Pacific Ry. has 10 Pacific and three consolidation locomotives arranged with piping to carry water from the tank to nozzles spraying against the leading drivers. This means of lubrication is of very limited service. The pipes run horizontally along the engine frames and cause trouble by freezing during winter weather.

The Pennsylvania Rd. has made use of exhaust steam from the air pump in the manner shown in fig. 14, with what success we are not informed.

Of the lubricators described, all are in very limited use except those using crude oil. Table V. shows the extent of application of each lubricator named. It will be noted that every railroad is using crude oil—some exclusively.

TABLE V.—SHOWING TYPES OF LUBRICATORS AND EXTENT OF APPLICATION.

TYPES	Roads Spacing in Use.	Remarks
All types.....	21..	.....
All types using crude oil....	21..	.....
Chicago.....	18..	.....
Southern Pacific.....	2..	.....
Rock Island.....	1..	.....
Canadian Pacific.....	1..	.....
Waste filled iron pipe —		
Crude oil.....	1..	Not extensively.
Swab—Engine or car oil...	3..	Two have abandoned this type.
Siphon—Engine or car oil..	1..	Has been abandoned
Wood Block—Engine oil...	1..	.....
Turnbull.....	3..	Two have abandoned this type.
Collins.....	2..	.....
Hard grease (†).....	1..	Has been abandoned
Exhaust steam—air pump..	1..	.....
Water from tank.....	1..	.....
Water from injector delivery	1	Has been abandoned

† Type not specified.

Flange lubrication on the Santa Fe has been developed to its present state after experiments covering the use of most of the simple devices, such as swabs of oil-saturated waste, water jets operated from the injectors and the block type shown in figs. 12 and 13. These have all proved to be in some manner unsatisfactory. In using the simple swab difficulty was found to keep it against the flange and the waste was frequently lost. When forced against the wheel with sufficient pressure to insure constant contact the pipe was rapidly worn away, sufficient heat often being generated to ignite the waste. The water jet caused clogging of the sand pipes. Water and engine oil have both proved too light to satisfactorily resist

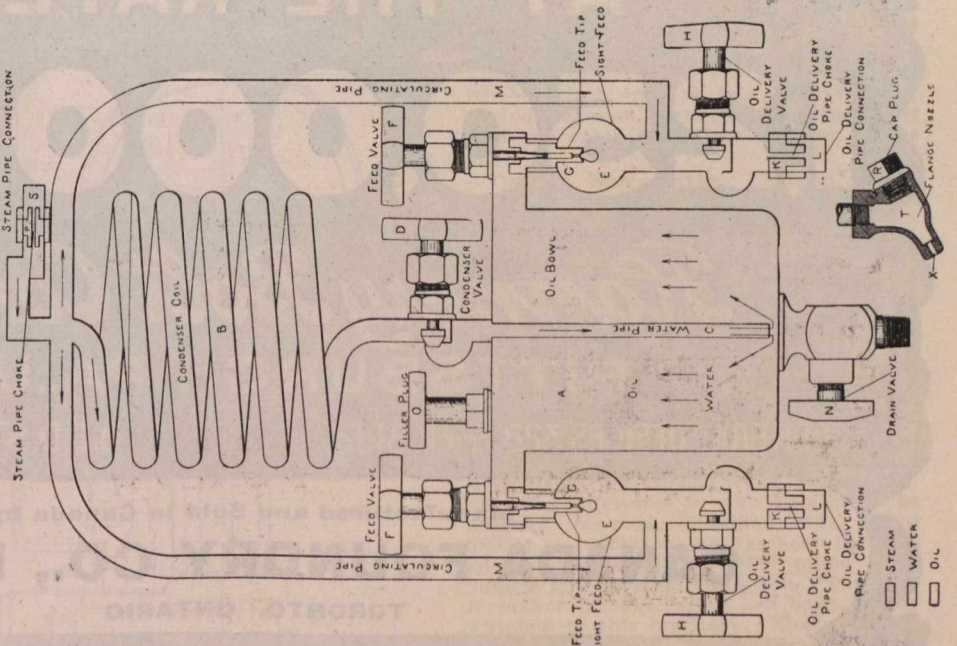


Fig. 4. Hydrostatic Flange Oiler, Diagrammatic View.



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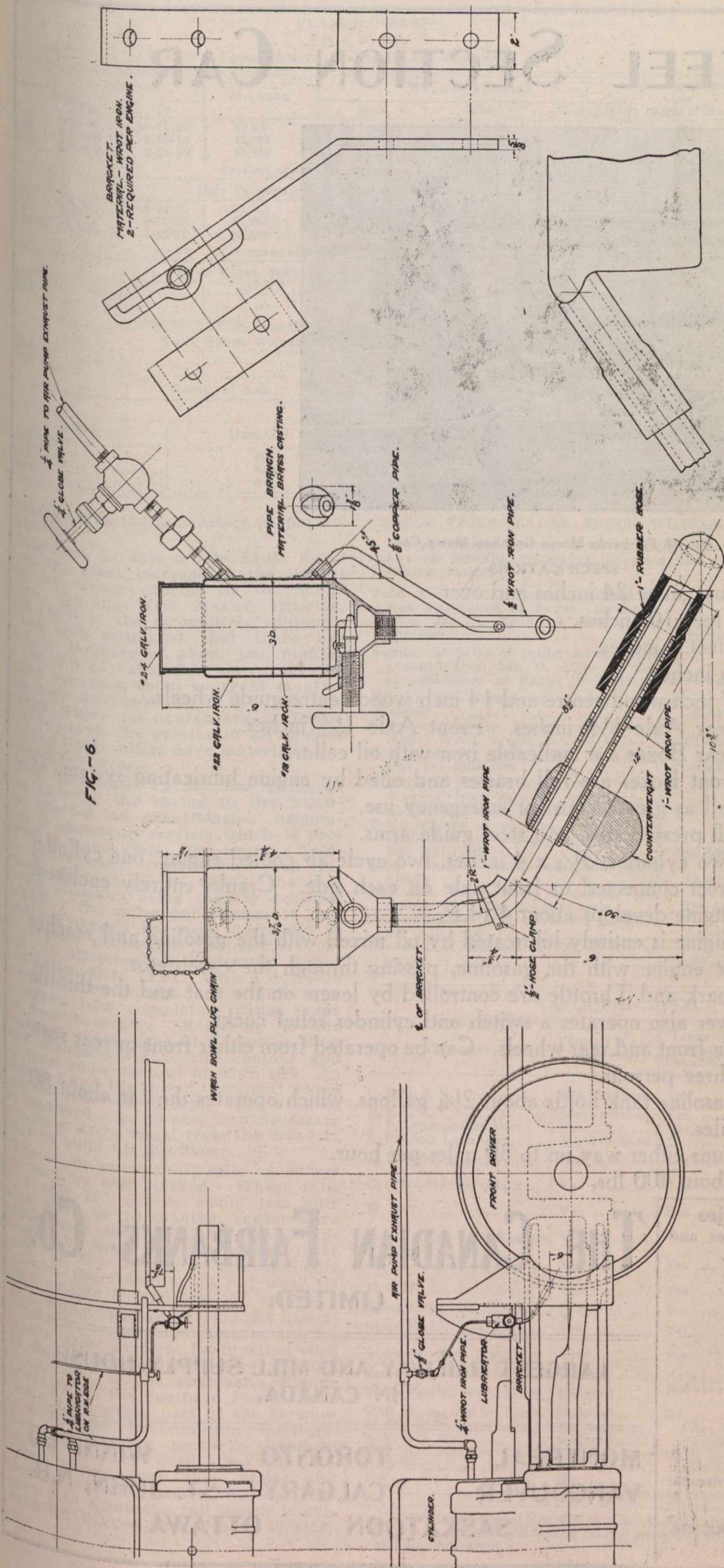


Fig. 6. Flange Oiler, Southern Pacific Co.

the action of centrifugal force, being thrown away from the throat of the flange before reaching the rail. It has been found that the wood block lubricator spreads oil over the tire tread and, consequently, tends to cause slipping of the drivers.

Crude oil is now in general use for flange lubrication on the Santa Fe. Oil from the Kansas field has not been found heavy enough to properly adhere to the flange, but that from Bakersfield, California, which is now used, has proved very satisfactory.

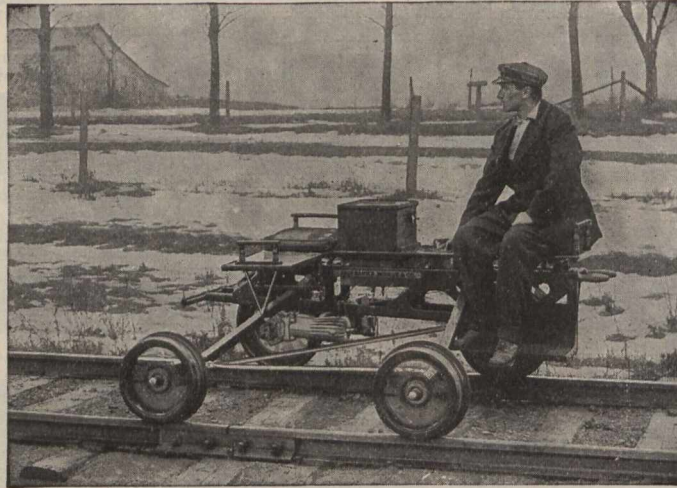
Experience indicates that the delivery of a proper lubricant to the flange will reduce the wear of both flange and rail. The committee's information is confined largely to the results obtained by lubrication with crude oil. California crude oil contains a high percentage of petroleum asphalt. When delivered to the rail by the driving-wheel flange, it forms a thin coating of paste on the inside of the ball of the rail which does not run or spread over the top. When all engines on a division are equipped with lubricators the rails on the outside of curves will become thus coated, and friction will be reduced on all wheels passing over the track. The resulting reduction in flange wear is noticeable on both passenger and freight car wheels, but data are available for locomotive driving wheels and tender truck wheels only. It necessarily follows that train resistance is much reduced on curves.

Reference has already been made to the losses due to flange wear in tables III. and IV. The record of Atlantic type locomotives referred to in table III. is a good illustration of the service of flange lubrication. These locomotives operating on the Santa Fe Ry. averaged four months with a mileage of 18,600 between tire turning due to worn flanges. The division to which they were assigned includes a large amount of curved track and to increase the mileage between tire-turning flange lubricators were applied. Since their adoption, tires on the same locomotives remain in service about 13 months, when it becomes necessary to turn them because of tread wear. During this period, the engines will average a total service of 60,400 miles. It must be added, however, that at about the time lubricators were applied, a grade revision commenced and the curvature has since been reduced on the division over which these engines were operated. But this was not completed soon enough to have any marked effect in the saving which was immediately apparent after applying lubrication.

The block lubricator previously described (figs. 12 and 13) applied to six-wheel switch engines has extended the period between turning for flange wear in some cases from two months to one year.

On the New Mexico Division, a 65-mile section, of which has 288 curves of 6, 8 and 10 degrees, it was found impossible to keep engines of the Santa Fe type in service for more than 18,000 to 20,000 miles. After one of these locomotives had made this mileage flanges were so badly worn that it was necessary to remove all wheels and turn the tires or shift them from one pair of wheels to another. At the present time with lubricators applied they are making as high as 35,000 to 40,000 miles between shoppings, with no evidence of flange cutting. On Pacific type locomotives operating through the same territory the difference is even greater. The mileage formerly obtained was about 25,000 to 30,000, which has been increased to 75,000 to 100,000 miles, with flanges still in good condition. The performance of lubricators has been closely watched in this territory. There are instances where lubrication has not entirely stopped flange wear because of the difficulty experienced in getting en-

ALL STEEL SECTION CAR



No. 28 Fairbanks Morse Gasoline Motor Car

SPECIFICATIONS

- Gauge Any gauge 24 inches and over.
- Wheel Base 3 feet 10 inches.
- Length of Car over all 7 feet 0 inches.
- Width, without Guide Arms, 26 inches.
- Wheels 17 inch wood centre and 14 inch wood centre guide wheels.
- Axles Rear Axle 1 1/8 inches. Front Axle 1 1/2 inches.
- Axle Boxes Rear Boxes are malleable iron with oil cellar.
Front Boxes are full brasses and oiled by engine lubricating system, as well as grease cups for emergency use.
- Frame All pressed steel and steel guide arms.
- Power Two cylinder, 3 1/4 x 4 inches, two cycle air cooled engine, one cylinder direct connected to front axle on each side. Cranks entirely enclosed. Engine develops about 4 H.P.
- Lubrication Engine is entirely lubricated by oil mixed with the gasoline and reaches the engine with the gasoline, passing through the carburetor.
- Control Spark and Throttle are controlled by levers on the seat and the throttle lever also operates a switch and cylinder relief cocks.
- Brake On front and rear wheels. Can be operated from either front or rear seat.
- Seating Capacity Three persons.
- Tank Gasoline tank holds about 2 1/4 gallons, which operates the car about 80 miles.
- Speed Runs either way up to 30 miles per hour.
- Weight About 400 lbs.

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TABLE VII.—RECORD OF WEAR OF FLANGES IN CONNECTION WITH TEST OF CHICAGO FLANGE OILERS.

ENGINE		IN SERVICE		MILEAGE	WEAR OF FLANGES.			Average Wear per 10,000 Miles
From	To	Max.	Min.		Average#			
1004	6-29-09	11-11-10	49,256	R-1 .36"	L-1 .04"	.170"	.034"	
1005	7-17-09	8-29-10	43,634	L-1 .27"	R-1 .07"	.156"	.036"	
1006	8-6-09	8-22-10	35,938	L-1 .22"	R-1 .02"	.126"	.032"	
Average of engines				.155"			.034"	
ENGINE		IN SERVICE		MILEAGE	WEAR OF FLANGES.			Average Wear per 10,000 Miles
From	To	Max.	Min.		Average#			
1000	8-4-09	8-12-10	36,723	R-4 .30"	L-3 .00"	.148"	.040"	
1007	7-23-09	8-11-10	40,251	R-1 .27"	L-3 .03"	.143"	.035"	
1009	9-15-09	8-18-10	35,628	L-4 .11"	R-3 .02"	.066"	.018"	
Average of engines				.151"			.031"	
ENGINE		IN SERVICE		MILEAGE	WEAR OF FLANGES.			Average Wear per 10,000 Miles
From	To	Max.	Min.		Average#			
1004				R-1 .51"	L-2 .02"	.2207"	.042"	
1005				L-3 .42"	R-3 .03"	.17"	.039"	
Average of both				.196"			.041"	
ENGINE		IN SERVICE		MILEAGE	WEAR OF FLANGES.			Average Wear per 10,000 Miles
From	To	Max.	Min.		Average#			
1000				R-3 .31"	R-4 .00"	.10"	.054"	
1009				L-3 .17"	R-4 .00"	.20"	.028"	
Average of both				.150"			.041"	
ENGINE		Used Gal.	Price, Gal.	Cost per 10,000 Miles				
1004		42	\$0.25	\$2.15				
1005		40	.25	2.29				
1006		48	.25	3.08				

SIXTY CONSOLIDATION ENGINES.

	Before application.	After application.
Average mileage per month per engine	2,491	2,559
Estimated total mileage per year	2,062,548	2,118,852
Cost per mile run	\$.0042	\$.00082
Estimated total cost of tire attention one year service	\$9,116.46	\$1,737.46

On the Wabash Pittsburg Terminal Ry. before the application of lubricators the average time between shopping for sharp flanges was eight months. A 10-wheel freight engine, working on a section having maximum curvature of 11° 28 minutes, would not run three months before developing flange wear to such an extent that tires had to be turned. Since applying the lubricator this engine working on the same section of the road was out 20 months before shopping, when tires were turned for tread wear. Since the application to all locomotives there has been no occasion to turn tires for flange wear. It has stopped almost entirely on wheels to which the oil is delivered, and oiling the drivers materially decreases the wear on engine-truck wheel flanges. In some cases, oil has been applied to the trucks where wear was unusually excessive. Mallet locomotives showed some signs of cutting the front flanges on the low pressure engine. By plugging the nozzles leading to the back drivers on this engine and delivering the same amount of oil that was previously used on both pairs to the front wheels, the cutting has been reduced and it has been found that the other wheels are sufficiently oiled. In addition to the direct benefit to the locomotive, there has been a decrease in the wear of switch points and rails on curves, as well as a decrease in the number of derailments. Flange wear has also been reduced on tender truck wheels.

The Atlanta, Birmingham and Atlantic Ry. has got as high as 50,000 miles out of locomotives that ran only 13,000 to 15,000 miles before lubrication was adopted. The average length of service for switch engines without lubricators was three or four months at 12 hours a day. Fig. 13 shows the conditions of flanges on a switch engine that ran 14 months, three months of this time at 24 hours per day, after applying the lubricator. At the time the record was taken this engine was still in ser-

TABLE VI-B.—TENDER TRUCK WHEELS.

Saving effected by use of driver flange lubricators on forward drivers of mountain engines, Southern Pacific:

Total mileage of 10 selected engines before application of flange lubricators, from Jan. 1, 1909, to date of application	629,703
Number of pairs of tender truck wheels changed from Jan. 1, 1909, to date of application of flange lubricators	148
Mileage per change of tender truck wheels	3,517
Estimated cost to change one pair of tender truck wheels	\$15.55
Cost of tender truck wheel tire attention per mile run	.00442
Number of pairs of tender truck wheels changed from date of application of flange lubricators to Dec. 31, 1908	9
Total mileage of engines from date of application of flange lubricators to Dec. 31, 1908	169,529
Miles run per change of tender truck wheels	18,837
Per cent. of increase in mileage per change of tender truck wheels	435.59
Cost of tender truck wheel tire attention per mile run	.00082
Per cent. of decrease in cost of tire attention	81.45

TABLE VIII.—EFFECT OF FLANGE LUBRICATION.

RAILROAD	FLANGE WEAR STOPPED	TIRES RUN TILL TREAD WEARS	MILES OR TIME IN SERVICE		NO. ENGINES EQUIPPED
			Before Lubrication	After Lubrication	
C. R. I. & P.	Much reduced.	Yes	One 2-6-0 3 or 4 months	Pass. Engine. 12 months	24
B. & L. E.	Much reduced.	Yes	14260	23514	2
S. P.—Sacramento Div.	Yes	Yes	See Table V.		49
S. P.—Salt Lake Div.	Much reduced.	*			25
A. B. & A.	Yes	Yes	Road—13,000 to 15,000 Switch—3 to 4 months	50,000 14 months	4
C. & S.—Narrow Gauge	Yes	Yes	6 months	General repairs, 12 months	24
W. P. T.	Yes	Yes	3 months	General repairs, 20 months	15
L. S. & M. S.—Yard Engines	Yes	Yes	Some instances. 6 weeks	6 months	2
H. V.	Yes	Yes	8,000	34,000	20
D. & H.	Yes	Yes	4 months	8 months	240
Santa Fe—Coast Lines	Yes	Yes	Tread wear life	Full life	240
Santa Fe—N. Mex. Div.	Yes	Yes	Pass.—25,000 to 30,000 Frt.—18,000 to 20,000	75,000 to 100,000 85,000 to 40,000	120
Santa Fe—East. Lines	Yes	Yes	4-4-2 18,600	60,400	30
Santa Fe—Gulf Lines	Reduced	No	60,000	75,000 to 80,000	40
Santa Fe—So. West. Lines	Reduced	Not always	10,000 to 25,000	50,000 to 75,000	13
T. R. R. Ass'n of St. Louis	Reduced	No	About 6 months	About 8 months	2
M. Ry. of St. Louis	Reduced	Applicati	on too recent to determine.		4
E. P. & S. W.	Reduced	Applicati	on too recent to determine.		40
P. R. R.—West Penn. Div.	No	No			13
N. & W.	No	See Table VI. and Figure 19.			4
I. C.	No	Experience limited.			Few
C. P. R.	Hard grease	and engine oil	unsuccessful.		Few

*Tires were turned for tread wear before lubricators were applied.

†Data apply to engines in pusher service. Increased life partly due to distribution of wear produced by turning the engines.

gineers to give the lubricators proper attention.

There are no data on the Santa Fe to show the exact increase in the life of rails on curves effected by the flange oilers. On the New Mexico Division, with 100% of the locomotives equipped, it has been estimated that there has been an increase of about two months in the life of rails, that previously required changing about every 13 months. This is an increased life of 15%. In territories where no figures are available, it is, however, the opinion of all officials that the flange oilers have materially decreased rail wear.

The Southern Pacific has gathered data showing the saving in tire attention effected on consolidation locomotives in mountain service, which is presented in table VI-B. The average mileage per change of tires has been increased from 8,869 to 42,151, the cost of tire attention being thereby decreased 79%. The miles per change of tender-truck wheels has been decreased in still greater proportion. From 3,517 before the adoption of lubrication it has been extended to 18,837, with a decrease in cost of tire attention of 81.45%. Fig. 15 shows how completely flange wear has been overcome. Referring to the diagrams there presented, dotted lines show standard M.C.B. tire contour and full lines show contour of worn tire. In exhibits 2 and 4 is shown the metal which must be removed to bring tires back to the standard. In no case is it necessary to remove extra metal from the tread in order to build up the flange.

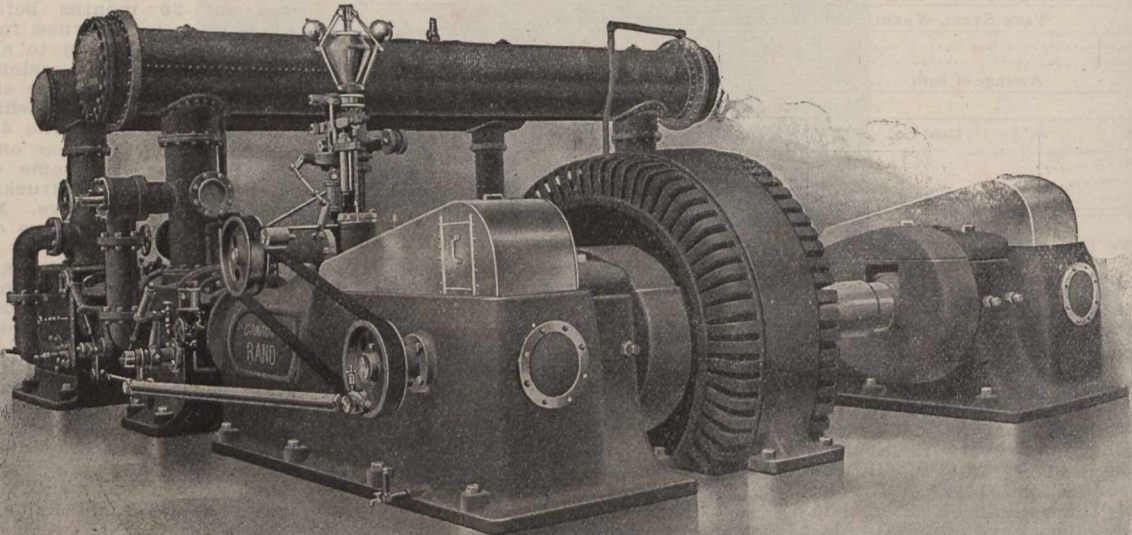
The effect on wear of rails on curves has been no less marked. Where rails on 8 and 10° curves would last only about eight or 10 months, conservative figures place the life since general application of flange oilers at about three years. In figs. 16 and 17 is graphically presented the reduction in rail wear effected on two 8° and two 10° curves.

It is a fact that any device not directly necessary to the operation of the locomotive must perform its function with the very noticeable results before winning the approval of the engineer. Flange lubricators on the Southern Pacific have become a necessary part of the locomotive equipment in mountain territory. When not working properly engineers complain seriously until they are repaired. Locomotives ride easier and smoother around curves without the tendency to climb the rail which is evident when flanges run without lubrication.

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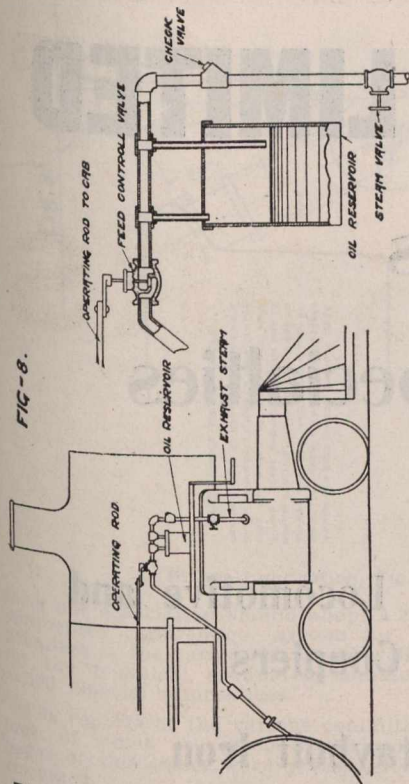


Fig. 8. Flange Oiler, C.R.I. & P. Ry.

vice. Another individual case on this road shows forcibly the effect of lubrication. A 10-wheel locomotive, weighing 130,000 lbs. on drivers, in making 18,958 miles, had cut the front flanges very badly. Owing to the rush of work it was necessary to keep the engine in service if possible. A lubricator was applied and the engine again placed in service. After making 34,495 additional miles, the flanges showed no further

wear. The tires were shifted and the engine again put into service. The condition of the front tires at the time the lubricator was applied and at the time tires were shifted is shown in fig. 19. The Elliott system is in use on this railroad. The cost of oil has been about 3c. per 100 engine miles.

The Norfolk and Western equipped four consolidation locomotives with lubricators and compared them in service with three others of the same type. The data obtained are presented in table VII., which shows, for each engine, the wheel having maximum wear, the wheel having minimum wear and the average for all wheels, which is reduced to wear per 10,000 miles for the purpose of comparison. The average wear per 10,000 miles averaged for the three locomotives without lubricators is slightly less than the same quantity shown for three engines with lubricators.

Fig. 20 shows the method used to measure the degree of flange wear, the contour being obtained by a recording device. The diagrams there shown on front tires from engine 1,009, with a mileage of 35,628 without flange oiler, indicate that flange wear was not excessive in the territory where these locomotives were working.

A service test of a yard engine was made on the Kansas City Terminal Ry. The yard where this engine worked is so located that the front and back flanges on the left side of the engine became worn to such an extent that the engine began to climb the rail after being in service about three months. It was then necessary to change tires. The engine equipped with a flange oiler was put in service with a new set of tires, and remained in service under these conditions over 13 months, when it was shopped for other repairs. The flanges were still in good condition. The results obtained were made possible by the careful attention the lubricator is reported to have received from the engineer.

The foregoing instances indicate the service of flange lubrication under some

of the worst conditions affecting flange wear reported to the committee. Further data are presented in table VIII. Opposite the initials of the railroad reporting is indicated the benefit derived from flange lubrication.

Master Mechanics Association.

The American Railway Master Mechanics Association met at Atlantic City June 14, 15 and 16. The President, C. E. Fuller, Assist. General Manager Union Pacific Rd., in his opening address, covered a wide field, including legislation respecting safety appliances, the necessity of adopting standards of practices, the importance of publicity to inform the public of the great advances in railway mechanical work and of the fact that of all the enterprises of the country no other approaches the railways in systematic and persistent study of efficiency and economy. He urged that the association should have as part of its recommended practices, mechanical plans for large and small terminals, units embodying the best practices, so that if conditions are such that these plans in their entirety are not feasible or practical it would be possible to take therefrom the best available features under which shop layouts can be designed. Many railways do not employ large expensive engineering forces and such plans would be of infinite value to them. In referring to apprentices, he said:—"A very pertinent subject in connection with the matter of increased efficiency, to my mind, is the education of our apprentices, in fact of all our employees. By what better method can we hope to increase our efficiency than by setting a high standard for the young men we are educating, from whom we must be able to draw our foremen and shop managers? Progress has been made by some of the individual lines not only in the way of educating apprentices, but also giving other employees similar advantages by instituting plans of broad scope with educational bureaus open to all employees. It is my opinion that in line with these ef-

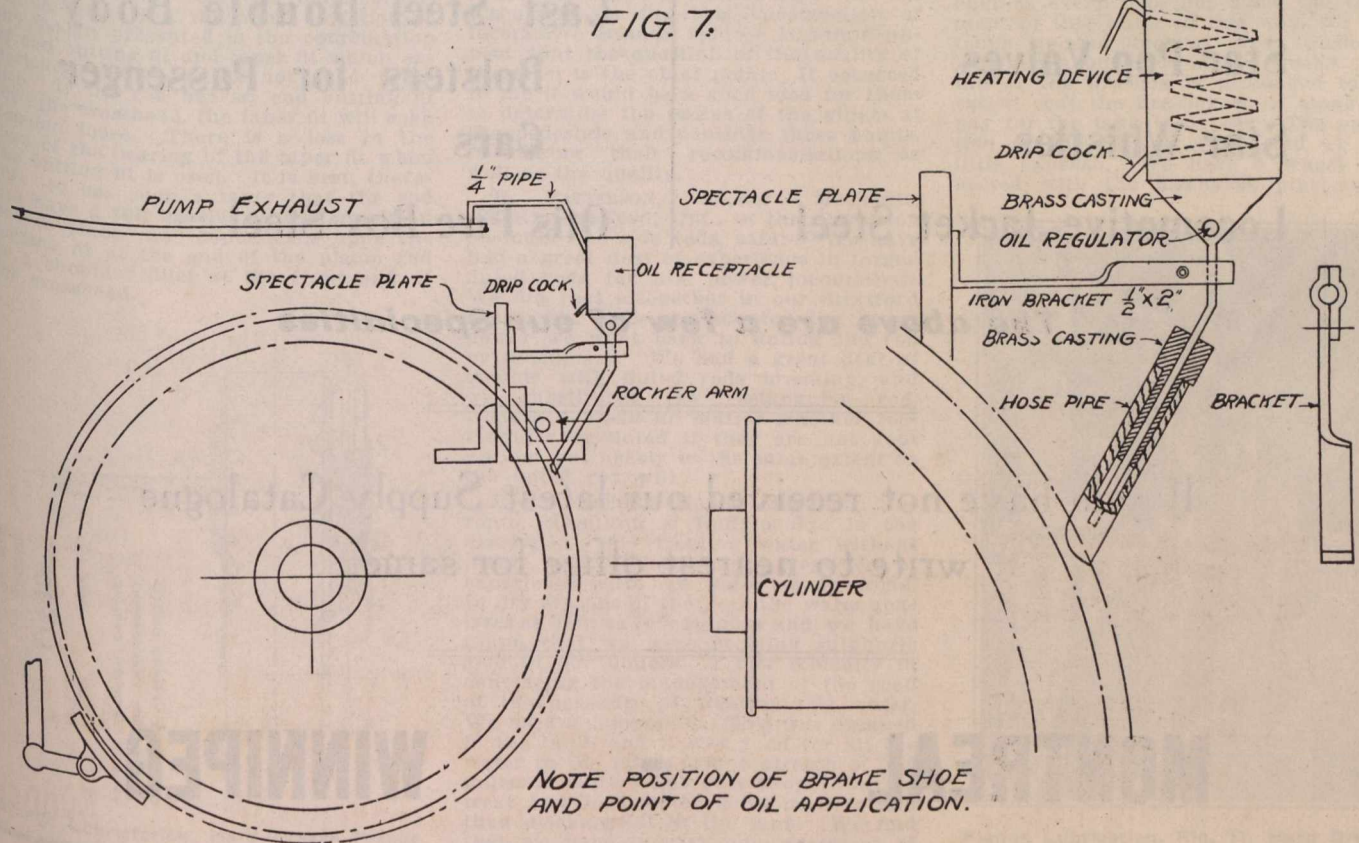


Fig. 7. Flange Oiler, Canadian Pacific Railway.

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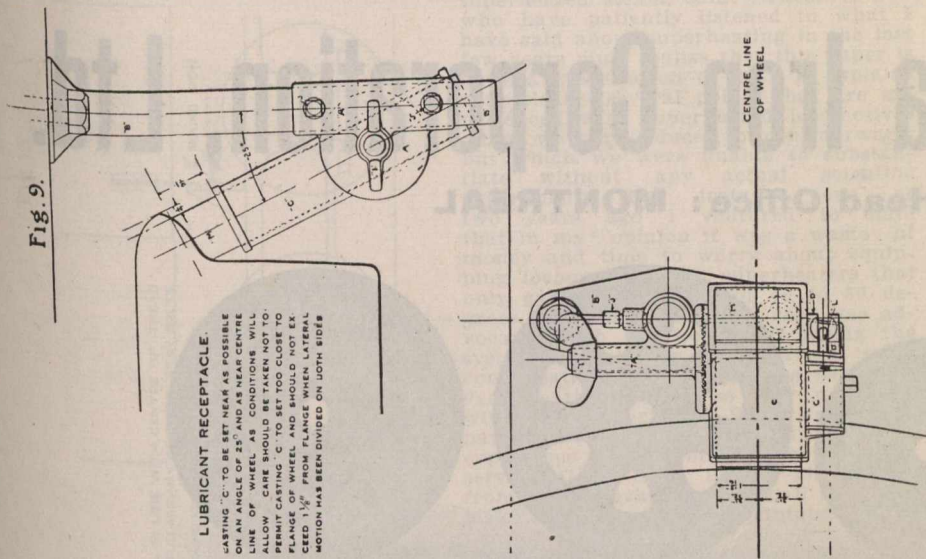
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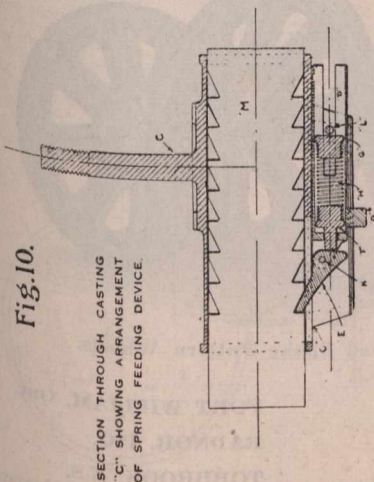


Flange Lubrication, Fig. 9. Hard Grease Flange Lubricator.

ports our association should adopt a recommended apprentice system for apprentices to the various trades as well as for the technical graduates, commonly called 'special apprentices.'

The reports of the various committees most of which are given in the earlier pages of this issue, were presented and discussed.

A number of members disagreed quite emphatically with the report of the committee on the diameter of piston rods and the size of crossheads. The title of the report required only formulae and tables giving proportions for such parts and those presented were found acceptable, but the designs for the piston rod fit in the crosshead was generally discredited. The breakage of piston rods is often due to the severe stress produced by driving in the key, and for this reason a nut fastening for the piston to the crosshead found considerable favor. But the chief objection to the design presented is the combination of end butting fit and taper fit which experience has shown is not good practice. If the rod has an end butting fit into the crosshead, the taper fit will soon become loose. There is a loss in the area of the bearing of the taper fit when the butting fit is used. It is best, therefore, to use such a taper that the rod can have a full bearing in the crosshead and to place no dependence upon the butting fit at the end of the piston rod or a shoulder fillet at the front end of the crosshead.



Flange Lubrication. Hard Grease Flange Lubricator. Section Showing Spring Feeding Device.

DISCUSSION BY CANADIAN OFFICIALS.

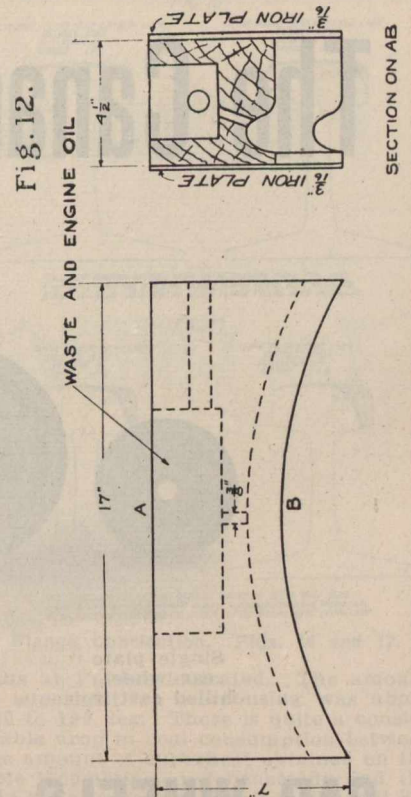
J. CHRISTOPHER, Master Mechanic, Toronto, Hamilton & Buffalo Ry., asked the experience of those using mechanical stokers, as to the front end filling up, as compared with hand firing, and whether it was necessary to clean out the front end more frequently.

T. O. Secrest, C.N.O. and T. P. Ry., replied: We have been using the stoker for the past 14 months, and at first we did experience that trouble. We have had no trouble along that line lately. We have not had any occasion to inspect engines on account of the filling up or on account of coal being drawn through the tubes, and we have watched that matter pretty closely, thinking that perhaps the coal might bank up around superheated pipes.

J. CHRISTOPHER, Master Mechanic, Toronto, Hamilton & Buffalo Ry., in the discussion on the best construction of locomotive frames, said:— It would appear that the question of the quality of the steel is the chief point. It occurred to me it would be a good idea for them to determine the radius of the fillets at the pedestals and consider those points, in making their recommendations, as well as the quality.

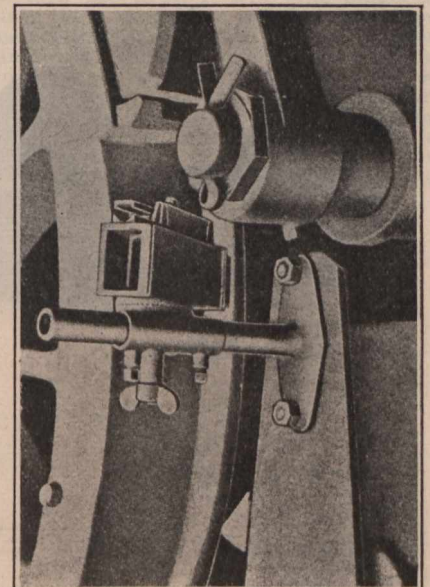
R. PATTERSON, Master Mechanic, G.T.R., Stratford, Ont., in the discussion on main and side rods, said:— We have had a great deal of experience in forged fluted rods for low power locomotives. We did that altogether in our Stratford shops, but since we adopted the heavy power we went back to fluting the rod by machinery. We had a great deal of trouble with fluted rods breaking, and we substituted the rectangular rod. Rods will break no matter whether rectangular or fluted if they are not kept up, but not nearly to the same extent as the fluted rod will.

J. CHRISTOPHER, Master Mechanic, Toronto, Hamilton & Buffalo Ry., in the discussion on treating water without plants, said:— I have had a great deal of experience with bad water on our road. In dry seasons of the year the water analyzes as high as 70% sulphur and we have found that we were creating sulphuric acid in our boilers. I had difficulty in convincing the management of the road of the necessity of treating this water. We used a compound. This was dumped in the tank, and it was good for all the water in the tanks over a stretch of 180 miles or more. The only proper way to treat bad feed water is to treat it and then discharge it in the tank. We find that we have to vary our treatment of this water as close as 48 hours. Therefore, it is quite necessary that the oper-



Flange Lubrication, Fig. 12. Simple Flange Lubricator, using engine oil.

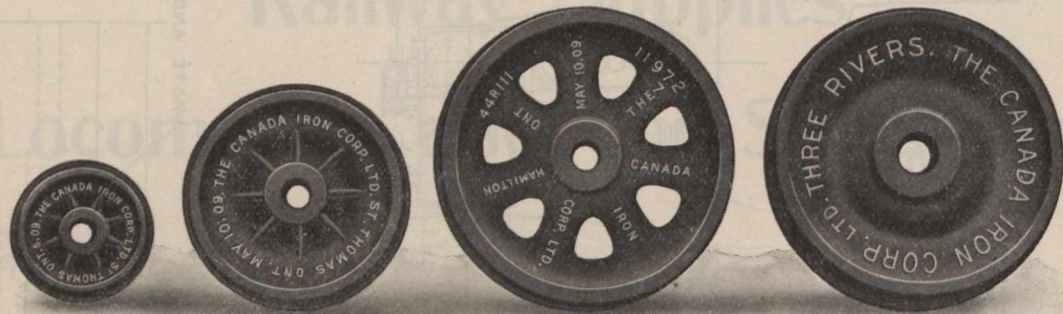
ator shall have full knowledge of the variations that are taking place in the water that is flowing into these stations. In some of the creeks I have found as high as 20 streams of sulphur water. Through the wet season with soda and hydrates of lime we reduced that as much as 80%, and then we have to run it up again, in the dry season. We have had cracked flues on our consolidation engines every trip, but since the treatment of this water in this way, we only touch up the flues at every wash-out, which is about once in two weeks. The life of the fire-box is prolonged to the extent that the fire-box work alone will pay for the tank in a year. The operation of the tank is conducted at very little expense. We have a wheel connected with the discharge pipe and a



Flange Lubrication, Fig. 11. Hard Grease Lubricator in service position on front driver of locomotive.

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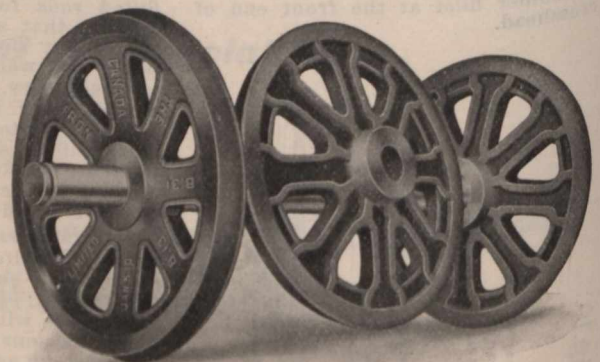
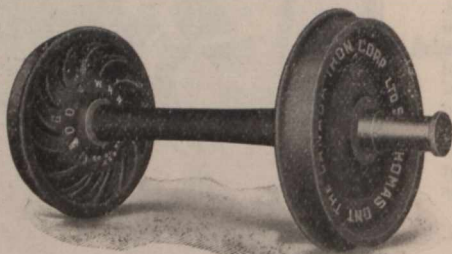
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WORKS AT

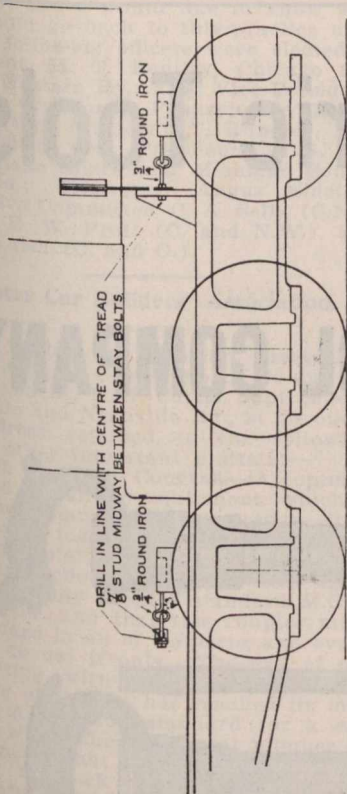
HAMILTON, Ont.
MIDLAND, Ont.
DRUMMONDVILLE, P.Q.
ST. THOMAS, Ont.

THREE RIVERS, P.Q.
LONDONDERRY, N.S.
BATHURST, N.B.

Reinforced Spoke Pattern Wheels.

FORT WILLIAM, Ont.
RADNOR, P.Q.
TORBROOK, N.S.

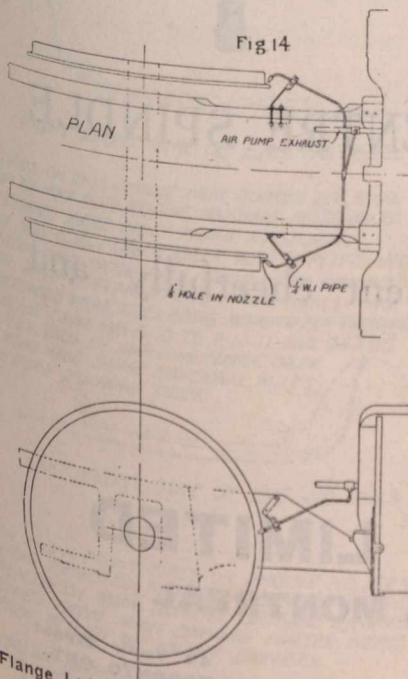
Fig. 13.



Flange Lubrication, Fig. 13. Lubricator used in Fig. 12, applied to driving wheel flanges.

current of water flowing through this discharge pipe operates a wheel which provides power for the agitator, and also at the same time drives a pump for throwing the chemical into the top of the high tank. After we began to treat our water we had great difficulty with the foaming. We got our chemist after the difficulty, and he analyzed the water, but could not seem to understand why it foamed. Many of the engine crews supplied castor oil themselves to save them annoyance and trouble in getting up heavy grades.

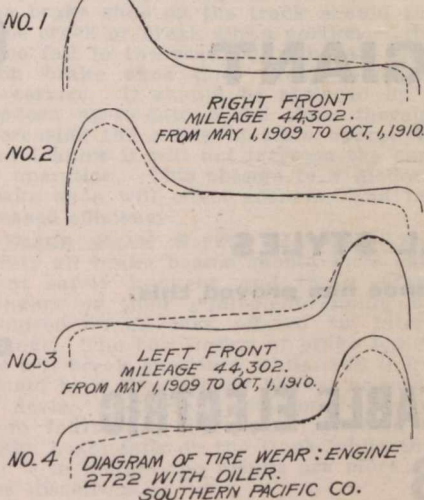
H. H. VAUGHAN, Assistant to the Vice President, Canadian Pacific Railway, in discussing Prof. Benjamin's paper on



Flange Lubrication, Fig. 14. Flange lubrication by means of exhaust steam from the air pump.

superheated steam, said:—Those of you who have patiently listened to what I have said about superheating in the last few years must realize that this paper is quite a gratification to me. It explains very clearly several points that are experienced with superheated locomotives which we were induced to bring forward, but which we were unable to substantiate without any actual scientific experiments. For instance, one or two years ago I ventured to state that in my opinion it was a waste of money and time to worry about equipping locomotives with superheaters that only gave a superheat of 40 to 80 degrees. At that time such cost was advocated with the hope that trying the system in that way would avoid some condensation and that results would be very nearly as good as they would be with high superheat. Prof. Benjamin's paper shows us very distinctly how our experience was obtained, in practical service along these lines. The saving from low superheat is so small as not to make it worth while to maintain the apparatus. You will remember that I stated that our feeling was that until we got up to 150 to 160 deg., we hardly began to realize the benefits of superheating. From what I have heard in

FIG. 15
NOTE—DOTTED LINES, STANDARD M.M. FLANGE CONTOUR.
FULL LINES SHOW TIRE WEAR WITH APPLICATION OF FLANGE LUBRICATOR.

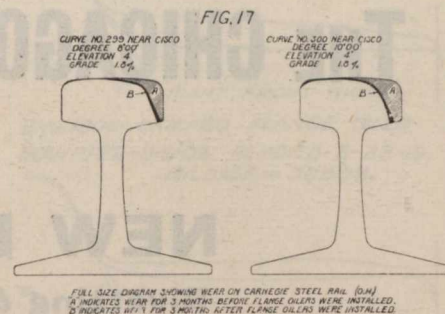
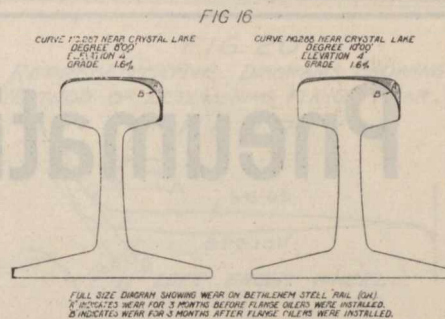


Flange Lubrication. Diagram of tire wear, locomotive 2722 with oiler, Southern Pacific Co.

the last few months of the successful results obtained with locomotives equipped with still higher degrees of superheat, I think we would have gained very much more if we had followed the practice of the Schmidt people and got a really high superheat.

A very interesting thing that strikes me in a cursory examination of this paper is a comparison of the diagrams. Fig. 7 shows how we obtain more and more economy as the superheat goes up. There is the explanation of the increased capacity that we get in actual surface upon superheater engines. We have always found that the harder you work them the more superheat you get, and the greater the saving, so that, while perhaps your coal figures will only show a 15 to 20% saving, yet, taking all the coal used, when you are working the engine hardest, you are getting the most saving per horse power. That is an increased advantage that we have always found in superheaters, and, while it has been frequently referred to, it has never been so clearly shown as in this paper.

Another thing, the last paper presented covering the results at Purdue University two years ago tried to make an explanation as to where we shall find greater economy in service than the re-

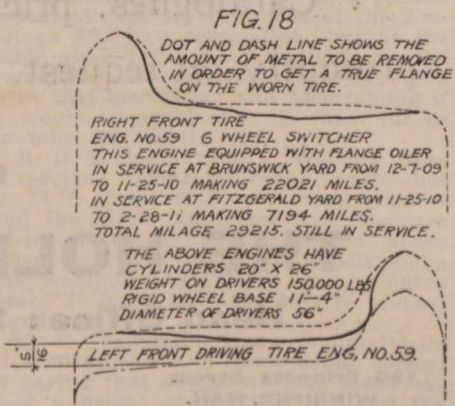


Flange Lubrication. Figs. 16 and 17.

sults at Purdue indicated. The amount of superheat we were using was about 180 to 190 deg. There is quite a considerable drop in coal consumption between the amount of superheat obtained on the Cole locomotive at Schenectady and the one we were using, and it fairly well accounts for the results which we told you about.

I do not think that superheating needs any more advocacy on the part of the C.P.R. We think it is doing very well, and we have not changed our policy, except that we are going to follow the example set in the United States and equip our engines so that we will obtain a higher degree of superheat than has been obtained in the past.

R. PATTERSON, Master Mechanic, Grand Trunk Ry., Stratford, Ont., in the discussion on the contour of tires, said:—I am rather surprised that after the years of experience which we have had in turning the tread of tires straight that a recommendation like this should come in now. Before my time that design of turning tires was abandoned. The report does not say what benefit we are to get, from tapering, over our present practice. The only thing I can see is that it is going to make it more difficult to turn the tires; it will take longer to turn them, and they will not be turned as accurately. It will only be a short time after the engine is running on the road when the tires will come to the natural flat tread, the same as we turn them now. This practice was abandoned many years ago, and was abandoned because there was no good purpose served by having the tires turned in that



Flange Lubrication, Fig. 18.

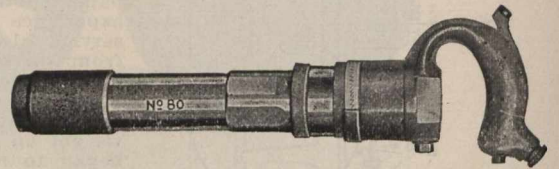
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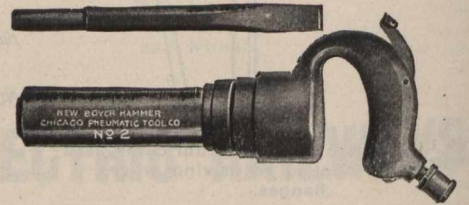
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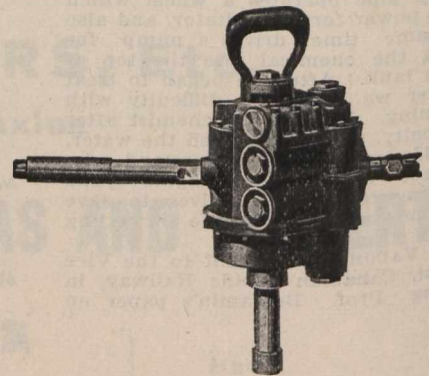
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manner, and I would like to know why we should go back to this practice now. The following officers were elected:— President, H. T. Bentley, Chicago and North Western Ry.; First Vice President, D. F. Crawford, Pennsylvania Lines; Second Vice President, T. Rumney, Erie Rd.; Third Vice President, D. R. McBain, Lake Shore and Michigan Southern Rd.; Treasurer, Angus Sinclair, Executive Committee, C. A. Selly (C.N.L. & P.), E. W. Pratt (C. and N.W.), and J. F. Walsh (C. and O.).

Master Car Builders' Association.

The Master Car Builders Association met at Atlantic City, June 19, 20 and 21. The President, T. H. Curtis, Supt. Mach., Louisville and Nashville Rd., in his opening address, referred to the following among other important matters:— M.C.B. STANDARD COUPLER.—A common standard in railway equipment, which is being interchanged, is a necessity—it is the need of today. To further profit by a common standard for equipment it is earnestly recommended that the Association speedily adopt a standard M.C.B. car coupler, and that this coupler must be standard in all of its parts, and every railway to use it only. The day of experimenting with car couplers is past, the state of the art has reached its maturity. A common standard for a car coupler will reduce the great number of repair parts that are now required to be kept in stock all over the country for repairs to the great number of different styles of the M.C.B. car coupler, which is now a standard only in its contour lines. In brief, the M.C.B. coupler of today is standard in service, but interchangeable only as a whole, as the various makes are widely different in details of construction. To facilitate the prompt movement of traffic and also raise the standard of efficiency and reduce the cost of operation, a standard M.C.B. coupler is a very present need. This subject of a standard car coupler was earnestly recommended by one of my worthy predecessors in his address to our Association.

CAR WHEELS.—The day for small or

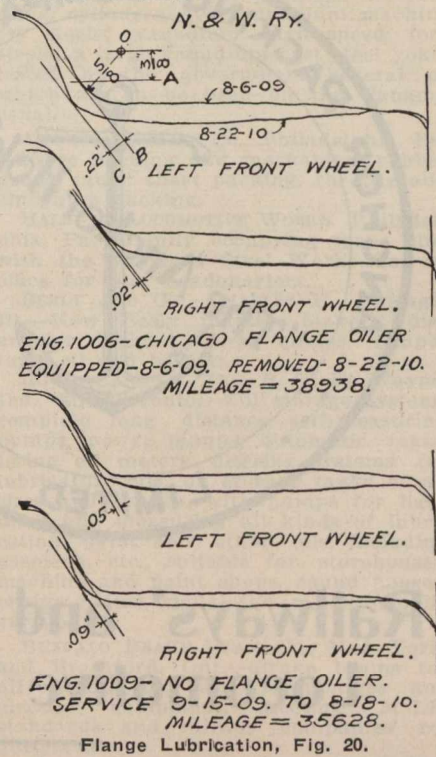
light capacity freight train cars, as well as passenger equipment cars, is about past. So-called heavy or large capacity cars are now being built extensively, and some have been in operation for a long time. In some cases the strains and stresses are possibly exceeding the limits of safety for certain kinds of material that have been heretofore commonly used. As a citation I will mention car wheels. The steel car wheel is now considered by some large railway companies to be a necessity. I will not comment on the steel car wheel or on the different kinds or makes and their mission in railway equipment of today, but will say that the time is at hand when something should be done by this Association in prescribing and requiring that under all heavy capacity cars an efficient and suitable car wheel must be used. The common cast iron car wheel of a grade used under light cars with good results needs to be materially increased in its strength and stability if it is to be used in service under heavy capacity cars of today.

BRAKE SHOES.—The increase in capacity of cars has necessarily increased the light weight of the car, and therefore made necessary the increase of the pressure on the brake shoe. For safety alone all brake shoes should have some kind of a wrought-iron or steel binding member constructed in the brake shoe to prevent the dropping of a piece of the brake shoe on the track should the shoe crack or break and a portion of the shoe fall to the roadbed. The all cast-iron brake shoe does break in pieces in service. It should be replaced by a modern up-to-date brake shoe, thereby increasing the safety of train operation, and I know it will not increase the cost of operation. This change to a modern brake shoe will effect economy and increased efficiency.

BRAKE BEAM SAFETY HANGERS.—For safety all brake beams should have efficient safety hangers, and these safety hangers or their equivalent should be required on all cars offered in interchange. The best design of brake hangers will break once in a while, and there should be a close second hanger or safety device to prevent the brake beam from falling on the track. When a brake beam falls on the track while the car is in motion the results are more or less disastrous.

AIR BRAKE HOSE.—Some contentions have arisen during the past two years or so regarding M.C.B. standard air brake hose, incident to the enforcement of the rule requiring the use of standard 1 3/4 in. air brake hose properly labeled. After the adoption of the specification and label, the day for complying with the standard was set forward on three different occasions, and it was not until Sept. 1, 1910, that it became obligatory to have the standard hose on cars offered in interchange. As it was not until about three years after the adoption of the specification and label as a standard that it was obligatory to equip cars with this hose, or, in other words, as three years' time had been allowed in which to properly equip cars with suitable hose, the officers of our Association did not feel that it would impose any sudden hardship upon the railways. However, it was a great surprise to many to learn, after having become better acquainted with the situation, that many of the roads had paid little or no attention to the purchase of hose as required by the Master Car Builders' Association. Some of the roads were placed to a large expense to apply the proper hose, which could have been obviated by buying the standard M.C.B. hose. Since Sept. 1, 1910, practically all cars have been equipped with the standard hose, and this subject may now be considered as closed, but it is hoped that all will learn the lesson of the necessity

FIG. 20
REPRESENTATIVE DIAGRAMS SHOWING
METHOD OF DETERMINING FLANGE WEAR.
N. & W. RY.



Flange Lubrication, Fig. 20.

for complying with the M.C.B. standards and avoid a recurrence of unnecessary expense due to deviating from the standards, even though the deviation may be slight.

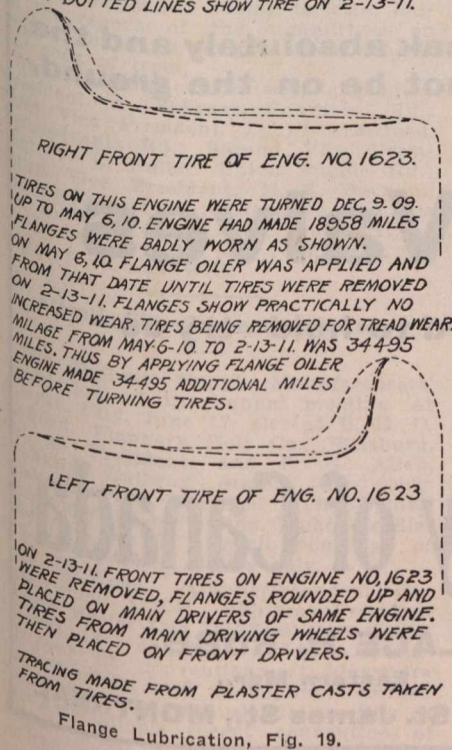
LIMITING HEIGHT OF BOX CARS.
H. H. VAUGHAN, Assistant to the Vice President, Canadian Pacific Ry., brought up this question, which was discussed as follows:— I wish to make a request that this association establish a standard or limiting the height for the running board of a standard dimension box car. I will put it in the form of a motion and move that the matter be referred to the committee on standards for its consideration. The standards of this association prescribe a height for the eaves of a box car with standard inside dimensions, but do not prescribe any standard height for the running board. The matter has been brought before the Canadian Railway Commission in connection with bridge and tunnel clearance, and, at the meeting at which it was presented to them, the question arose that this association had never established any standard height for the running board of box cars. I understand that the matter is to a certain extent already in the hands of the American Railway Association, but at the same time I see no objection to the committee on standards corresponding with that association and ascertaining if it would be satisfactory to them for us to take this matter up.

R. L. Kleine (Penna.): We now have a specified height for brake shaft—that is, 14 ft. 2 in., if I am not mistaken—and the safety appliance law requires 14-in. clearance underneath the brake wheel, and that would practically make the maximum height of the running board 13 ft. 10 in., according to present standards.

H. H. Vaughan: There is practically no difficulty, and I think I am correct in saying that almost no cars today exceed a height of 13 ft. 6 in., and the difference between that and 13 ft. 10 in. is worth having, as a matter of saving, if we can get it.

FIG. 19.

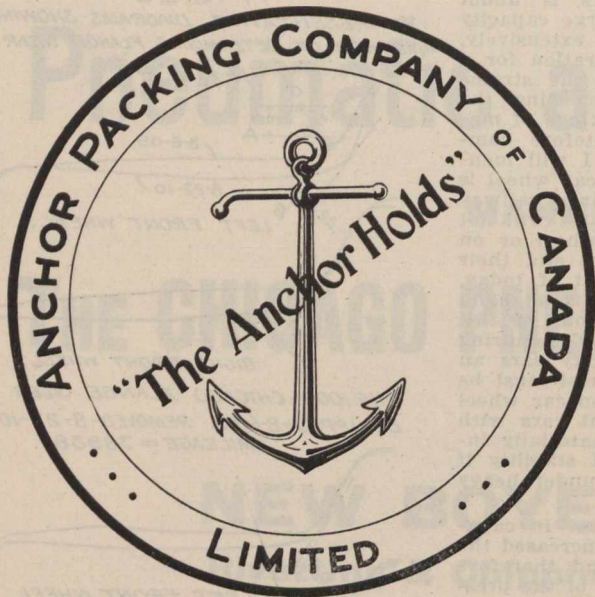
LIGHT DOTTED LINES SHOW A B & A TRUE FLANGE
DOT & DASH LINES SHOW TIRE ON MAY 6, 10.
HEAVY DOTTED LINES SHOW TIRE ON 2-13-11.



TIRES ON THIS ENGINE WERE TURNED DEC. 9, 09.
UP TO MAY 6, 10. ENGINE HAD MADE 18958 MILES
FLANGES WERE BADLY WORN AS SHOWN.
ON MAY 6, 10. FLANGE OILER WAS APPLIED AND
FROM THAT DATE UNTIL TIRES WERE REMOVED
ON 2-13-11. FLANGES SHOW PRACTICALLY NO
INCREASED WEAR. TIRES BEING REMOVED FOR TREAD WEAR.
MILEAGE FROM MAY 6-10 TO 2-13-11 WAS 34495
MILES. THIS BY APPLYING FLANGE OILER
ENGINE MADE 34495 ADDITIONAL MILES
BEFORE TURNING TIRES.

ON 2-13-11. FRONT TIRES ON ENGINE NO. 1623
WERE REMOVED, FLANGES ROUNDED UP AND
PLACED ON MAIN DRIVERS OF SAME ENGINE.
TIRES FROM MAIN DRIVING WHEELS WERE
THEN PLACED ON FRONT DRIVERS.

TRACING MADE FROM PLASTER CASTS TAKEN
FROM TIRES.
Flange Lubrication, Fig. 19.



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C. A. Schroyer (C. and N.W.): I think it is unnecessary that a committee should be appointed on that subject, because we are limited in the height of our cars by the brake wheel. We must have a clearance between the brake wheel and top of the running board, and we can go to within these limits, so that a committee appointed on that subject would not be able to accomplish anything more than is now accomplished by the limits prescribed.

C. A. Seley (C.R.I. & P.): I think what Mr. Vaughan seeks is merely a statement in the standards of the height, no matter how derived. I think that is within the province of the committee on standards to take that up and include it in their report.

R. L. Kleine: Do I understand, Mr. Vaughan, that it is the maximum height of running board that you want fixed, or is it a uniform height?

H. H. Vaughan: I think we should fix a maximum height in the standards. The height of the brake wheel does not affect this. It is the height of a man standing on the running board that we are after. In Canada there is a movement to fix the height of bridges at 22 ft. and we think they should be 20 ft., as we assume that we are not going to have brakemen who will be over 6½ ft. tall, standing on a running board 13½ ft. in height, so that everything we can get out of that is in value in grade crossing work if they are going to insist on clearances enough for a man to stand on top of an ordinary car.

When the reports of the committee on rules for loading material came up for discussion, J. J. Tatum, B. and O. Rd., pointed out that under rule 26, as it formerly read, it was optional to use either metal or wood spacing blocks. This year the report reads "inserting hardwood or metal blocks (latter preferred," etc. He moved that the rule be the same as formerly, making it optional to use metal or wooden spacing blocks. The motion carried.

The report on coupler and draft equipment evoked a long discussion, which resulted in the committee being instructed to design an M.C.B. coupler and present it to the next convention, the committee being authorized to employ a mechanical engineer or such other assistance as they may deem best.

It was decided to submit to letter ballot the reports of the committees on coupler and draft equipment car wheels and code of tests.

The following officers were elected:—
President, A. Stewart, Southern Rd.;
First Vice President, D. F. Crawford,
Pennsylvania Rd.; Second Vice President,
C. E. Fuller, Union Pacific Rd.;
Third Vice President, M. K. Barnum,
Illinois Central Rd.; Executive Committee,
F. W. Brasier, N.Y.C. and H.R.R.;
C. A. Schroyer, C. and N.W. Ry.; A.
Kearney, N. and W.R.

Atlantic City Convention Notes.

The Railway Supply Manufacturers' Association, at its annual meeting at Atlantic City, June 17, elected B. E. D. Stafford, Flannery Bolt Co., Pittsburg, Pa., as President, and S. G. Allen, Franklin Railway Supply Co., New York, as Vice President. The bylaws were amended by adding Canada to district one, which hitherto consisted of the New England States only.

W. McWood, ex-Superintendent Car Department, G.T.R., who was President of the Master Car Builders' Association in 1888, 1889 and 1890, and who presided over its conventions at Alexandria Bay, Saratoga and Old Point Comfort, received a most enthusiastic greeting at the Association's recent convention at Atlantic City, when he was introduced as the oldest living ex-president.

W. E. Fowler, ex-Master Car Builder, C.P.R., and a past president of the Master Car Builders' Association, sent the following letter, which was read at the Association's recent convention at Atlantic City:—"For the first time in many years I shall not be at the convention. Continued bad health has compelled me to make my residence in California, where I hope to partially regain my health at least. This is a beautiful section of the country. There is everything here to please the eye, but I wish I could be at Atlantic City with you. I wish the Association at its convention all possible success."

Both conventions were preceeded on the opening day of each by a grand march of the members, and the ladies accompanying them, from the headquarters hotel to the convention room on the pier. Band concerts were given daily in the entrance hall of the pier. There was an afternoon concert and an afternoon monologue entertainment at the Brighton Casino; one evening was devoted to a large bridge and euvre party, and another to a vaudeville performance. The usual baseball game, East vs. West, was played, and there were two receptions and two balls, under the auspices of the two associations.

Among those in attendance from Canada were:—E. N. Bender, General Purchasing Agent; H. H. Vaughan, Assistant to the Vice President; L. R. Johnson, Assistant Superintendent Motive Power; F. B. Zercher, Superintendent Angus shops; H. Osborne, Superintendent Angus locomotive shops; G. I. Evans, Mechanical Engineer; C. Kyle, General Master Mechanic; H. G. Reid, J. H. Mills, A. W. Horsey, Master Mechanics; A. Plow, Mechanical Inspector; S. O. Robins, Chief Draughtsman Car Shops, Canadian Pacific Ry.; Robt. Patterson, Master Mechanic; Jno. Hendry, J. L. Hodgson and T. A. Treleven, Master Car Builders; Jas. Powell, Chief Draughtsman, Grand Trunk Ry.; A. L. Graburn, Mechanical Engineer, Canadian Northern Ry.; G. R. Joughins, Superintendent Motive Power, Intercolonial Ry.; M. Goodrich, Master Mechanic, Ottawa and New York Ry.; G. Collins, General Manager, Central Ontario Ry.; J. Christopher, Master Mechanic, Toronto, Hamilton and Buffalo Ry.; W. McWood, ex-Superintendent Car Department, Grand Trunk Ry.; W. Mills, Master Car Builder, Algoma Central and Hudson Bay Ry.; Victor Curry, W. I. Atwood, Canadian Car and Foundry Co.; Arthur Allen, of the Holden Co., Thomas Arnold, of Taylor and Arnold, Ltd.; Wallace H. Noble, Anchor Packing Co. of Canada; Acton Burrows, Managing Director Railway and Marine World.

The Exhibits at Atlantic City.

A large portion of the space on Young's Million Dollar Pier was devoted to exhibits of railway supplies machinery, etc., there being about 260 exhibitors, occupying about 75,000 square feet of space. Among the principal exhibitors were the following:—

AMERICAN BRAKE SHOE AND FOUNDRY Co., Mahwah, N.J.—Locomotive driver brake shoes, flanged brake shoes for steel tired and rolled steel wheels, unflanged brake shoes for cast iron wheels, combination driver brake heads and reinforcing parts which go with these shoes.

AMERICAN LOCOMOTIVE Co., New York.—Reception booth, with photographs of locomotives.

AMERICAN VANADIUM Co., Pittsburg, Pa.—Vanadium ores and alloys, vanadium steels, both wrought and cast; and vanadium cast iron; specimens of vanadium steel and iron; locomotive parts, such as side rods, piston rods, crank pins, axles, frames, springs, tires, wheels,

tubes, safe ends, cylinders, bushings and piston rings; vanadium steel and iron automobile parts, such as crankshafts, gears, axles, frames, springs, steering arms, cylinders, etc.; vanadium machinery steels; vanadium high speed tool steels; a large vanadium cast steel yoke, tested by the government, several of which are to be used on the Panama canal.

ANCHOR PACKING Co., Philadelphia, Pa.—Fibre packing and mechanical rubber goods, tauril sheet packing, throttle and air pump packing.

BALDWIN LOCOMOTIVE WORKS, Philadelphia, Pa.—Jointly occupying space nine with the Standard Steel Works Co., as office for pier headquarters.

BESLY AND Co., CHARLES H., Chicago, Ill.—New Besly pattern makers' disc grinder, helmet spiral circles, temper taps, oil and babbit.

BOWSER AND Co., INC., S. F., Ft. Wayne, Ind., and Toronto.—Oil storage systems complete long distance self-measuring pumps, power pumps, automatic registering oil meters, filtering systems for lubricating oils, oil storage tanks of all sizes and shapes, with pumps for handling and measuring all kinds of lubricating, paint and other oils, including gasolene, etc., suitable for storehouses, machine and paint shops, round houses, engine rooms, signal towers, automobile garages.

BUFFALO BRAKE BEAM Co., New York, and Brantford, Ont.—Brake beams for all classes of cars, locomotives and electric equipment, meeting M.C.B. standards and railway companies' requirements.

CHICAGO RAILWAY EQUIPMENT Co., Chicago.—Brake beams of the "P.C." creco "E.L." creco, diamond special, diamond, national hollow, sterlingworth, ninety six; Monarch and special types monitor bolsters, creco roller side bearings, brake slack adjuster, journal box and lid; automatically adjustable brake heads, removable leg brake head; creco sliding third point brake beam support.

COMMERCIAL ACETYLENE Co., New York.—Acetylene car lighting equipment, acetylene locomotive headlight equipment, acetylene signal equipment, acetylene marine signal with sun valve, acetylene tanks for welding, tank cut open showing asbestos packing.

CONSOLIDATED CAR HEATING Co., Albany, N.Y.—Steam traps, end valves, inlet valves, thermostatic control of steam heat, steam couplers, electric heaters.

DEARBORN DRUG AND CHEMICAL WORKS, Chicago, Ill.—Booth arranged in the form of a very artistic lodge and garden.

DETROIT LUBRICATOR Co., Detroit, Mich.—No. 22 3-feed lubricator, no. 22 3-feed lubricator (sectional), no. 32 4-feed lubricator, no. 42 5-feed lubricator, no. 52 6-feed lubricator, no. 62 7-feed lubricator, no. 0 1-feed lubricator, no. 5 2-feed lubricator, no. 7 2-feed lubricator, no. 11 2-feed lubricator, Detroit transfer filler, 1-feed, 2-feed and 4-feed air cylinder lubricators, Detroit air pump lubricator, Detroit emergency valve, automatic steam chest plugs, boiler valve, guide cup, rod cut, Detroit force feed oilers.

EDISON STORAGE BATTERY Co., Orange, N.J.—Storage batteries for car lighting, signaling and ignition. Details of manufacture of batteries fully shown.

FAIRBANKS, MORSE AND Co., Chicago.—One no. 28 all-steel gasoline motor car for one, two or three passengers, two-cycle two-cylinder direct connecting engine, one no. 26 section gasoline motor car with two-cycle two-cylinder gasoline engine. Track jacks, ball bearing jack and hydraulic jacks.

FLANNERY BOLT Co., Pittsburg, Pa.—Tate flexible staybolts, radial and crown staybolts, Tate installation tools for applying the Tate bolt, staybolt tests.

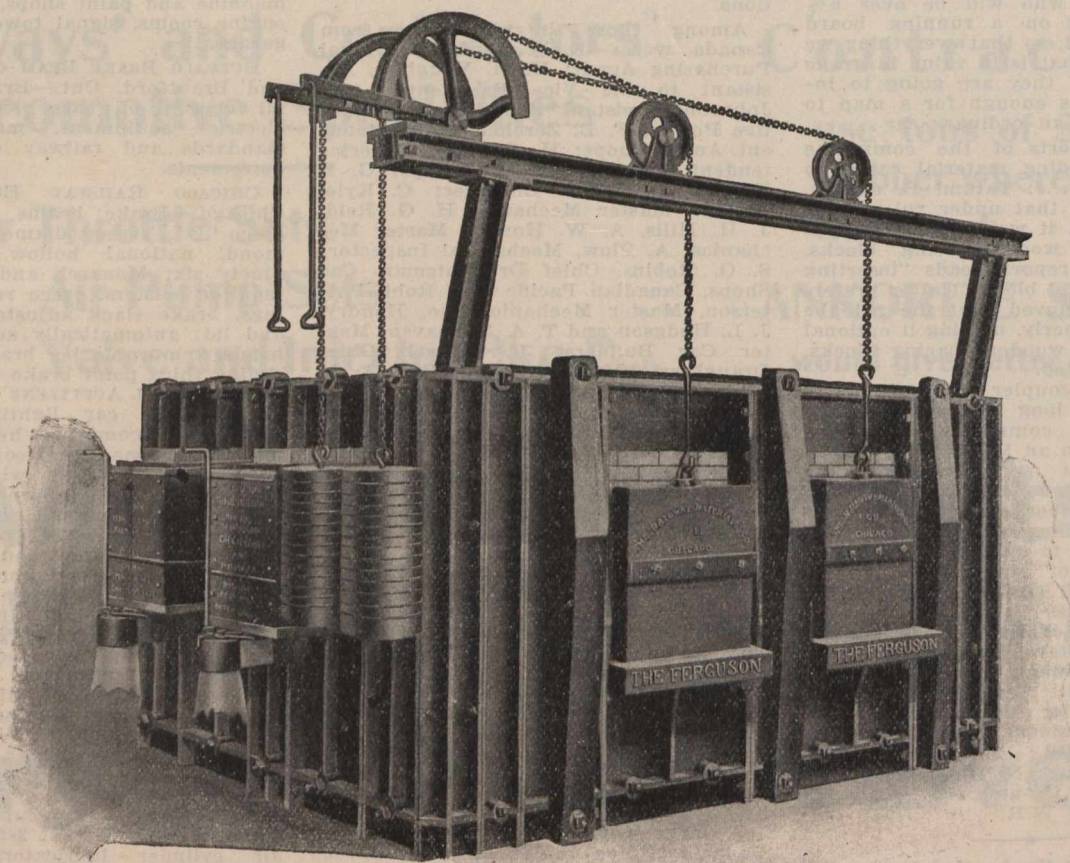
FRANKLIN RAILWAY SUPPLY Co., New York.—Booth fitted up for receiving visitors, with 300 daily newspapers on

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THE Railway Materials Co.

New York

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MADE IN CANADA

file from motive power centres throughout the United States, Canada and Mexico. Car equipped with Franklin flexible metallic car roof.

GALENA SIGNAL OIL Co.—Reception booth for guests.

GOLD CAR HEATING AND LIGHTING Co., New York.—Heating, lighting and ventilating apparatus for passenger and refrigerator cars.

GOLDSCHMIDT THERMIT Co., New York and Toronto.—Complete appliances for making thermit welds. Appliances for butt welding and wrought iron and steel pipes. Specimen welds showing amalgamation of metal obtained. Metals and alloys produced free from carbon by the thermit process. Photographs of important repairs executed by the thermit process. Samples of thermit, nickel thermit and chromium thermit.

GREENE, TWEED AND Co., New York.—Palmetto packing, round and square, for high steam pressures. Palmetto packing twill. Palmetto packing, in sets for railroad service, Manhattan packing, for low steam and hydraulic pressures. Favorite reversible ratchet wrench.

INTERNATIONAL CORRESPONDENCE Schools, Scranton, Pa.—Demonstration by apprentices of apprentice class work in classes on various railways.

H. W. JOHNS-MANVILLE Co., New York and Toronto.—Asbestos roofing, wool felt roofings, water-proofing materials, pipe covering felts, air-pump throttle, coil, spiral and sheet asbestos packings, high and low pressure pipe coverings and pipe covering felts, high temperature fire brick cements, pipe covering and boiler cements, electrical materials, boiler laggings and cements, vitribestos pipe coverings, transite asbestos shingles, asbestos wood, asbestos smoke jacks, sanitary seats and tanks, underground electrical conduit, steel car insulation, refrigerator car insulation, car roofings, locomotive cab roofing, underground sectional conduit for steam lines, air brake expander rings.

MCCONWAY AND TORLEY Co., Pittsburg, Pa.—McConway steel tired wheel, Buhoup flexible truck, Buhoup 3-stem passenger coupler, Pitt passenger coupler, Janney "X" and Penn freight couplers, steel castings.

MCCORD AND Co., Chicago.—Malleable iron, cast steel and vanadium grey iron journal boxes. Pinless lid and outside metal dust guard journal boxes, National equalizing wedges, draft gears, spring dampeners and operating locomotive force feed lubricator lubricating driving box.

MUDGE AND Co., Burton W., Chicago, Ill.—Garland System passenger car ventilation, full size models showing application Garland ventilators to monitor and arch roof cars. Ventilator registers and operating devices.

NATHAN MANUFACTURING Co., New York.—Injectors, steam valves, boiler washer and tester, oil cups, whistles, engine and boiler fittings, lubricators, boiler checks, steam fire extinguisher, water gauges and safety valves.

NORTON INC., A. O., Boston, Mass., and Coaticook, Que.—High speed ball bearing jacks.

PYLE NATIONAL ELECTRIC HEADLIGHT Co., Chicago.—Reception booth.

SAFETY CAR HEATING AND LIGHTING Co., New York.—Car heating and lighting apparatus, car lighting by Pintsch gas, axle light and vapor light, latest designs of Pintsch mantle lamps and jet direct steam and hot water with thermo jet control.

STANDARD COUPLER Co., New York.—Standard steel platforms and buffing mechanism. Sessions—Standard friction draft gears.

STANDARD STEEL WORKS Co., Philadelphia, Pa.—Driving tire, steel tired wheels, rolled steel wheel driving wheel centers, driving axles, forgings, rings and

springs.

SYMINGTON Co., THE T. H., Baltimore, Md.—Farlow draft gear, Symington journal boxes, flexible dust guards.

UNITED STATES LIGHT AND HEATING Co., THE, New York City, N.Y.—Axle electric car lighting apparatus. Axle driven generators, truck suspensions, generator regulators, lamp regulators, storage batteries for car lighting, signals, telephones and central stations.

WESTINGHOUSE AIR BRAKE Co., Pittsburg, Pa.—Empty and load brake demonstration rack, PC equipment demonstration rack, centrifugal dirt collector demonstration rack, PC equipment illuminated chart, Westinghouse brake test truck, Westinghouse enameled main reservoirs, galvanized annealed steel hose clamp, centrifugal dirt collector for 9 1/2-inch compressor.

WOOD, GUILFORD S., Chicago, Ill.—Wood's flexible nipple end protector. The monogram train pipe bracket.

C.N.R. Revision at Rainy Lake.

The Canadian Northern is now making a revision of its line across the narrows of Rainy Lake, near Fort Frances, Ont., which is unusual in several respects. The present line between Winnipeg and Port Arthur was built in 1900. It crossed Rainy River on a pile trestle two miles long. The bottom of this lake is similar in many ways to the muskogs so common in that section, and in building the trestles in the soft bottom many piles 80 ft. long were used, even these frequently going down one foot at the last blow of the hammer. In spite of these unfavorable conditions very little difficulty has been experienced in maintaining the structure, but it was necessary to take precautions continually to guard against trouble.

The greatest difficulties resulted from the ice. In the fall when the lake froze over the water was usually considerably above the late winter stage, and as it gradually fell it was necessary to keep the ice cut away from the piles to avoid its carrying them down with it and throwing the track out of surface. When the ice went out in the spring the side pressure was very great, although no actual damage from this source was met with until a year ago, when one section of the trestle was pushed quite badly out of line. While but comparatively little trouble had been met, there was always danger, and it was decided to build a new line on solid embankment when the trestle required renewal.

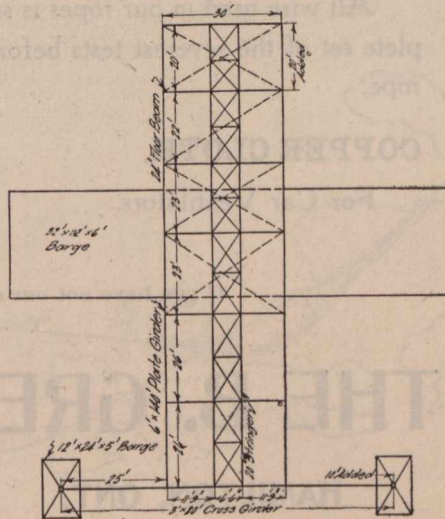
In making the location survey for this new line soundings were taken through the water and mud to rock, over a large area adjacent to the projected line. This work was started during the winter, but only fair progress was made. Much difficulty was experienced in driving down the sounding rods, as they became quickly coated with ice. The following summer the sounding was continued, a scow 22 by 34 ft. by 2 ft. deep being used, on which a hand driver with 75-lb. hammer was erected. This scow had a well in centre, through which the sounding rod, composed of extra heavy 1 1/4 in. steel pipe in 10 ft. sections, was passed. Much more satisfactory results were obtained from this summer work than from soundings in the ice and better progress was made, a maximum of 28 soundings being secured in one day. The soundings were taken in water as much as 40 ft. in depth, while below these the mud extended to a maximum depth of 50 ft. over the rock. This mud varied from a soft ooze to a compact clay in which the sounding rod would penetrate but 1/2 in. with a 4 ft. drop of the hammer. Following the taking of the soundings a contour map of the lake bottom was made. By means of this map a new line was located over the summit of a submerged hill rising nearly to the surface of the

water and at another place along a submerged side slope, very materially reducing the yardage. While introducing more curvature and lengthening the line about 900 ft., the new line was adopted because of the greatly decreased quantities of fill necessary as compared with any other line, and also to secure bridge openings at right angles.

The new line is 15,814 ft. long and provides two openings for logs and navigation; 800,000 cu. yds. of rock were required for a double track embankment, divided principally between three fills, 1,000 ft. long and requiring over 100,000 yds. each and one 3,000 ft. long requiring 400,000 yds. About 95% of this rock is secured from an 80-acre borrow pit on an adjacent island.

The contractors are using 25 tappet air drills for putting down the holes in the rock, these being drilled up to 30 ft. deep in the first lift and from 20 to 25 ft. in the second lift. Air is furnished by a pair of R. P. 2 type Canadian-Rand compound air compressors compressing 1.046 cu. ft. of free air per minute to 100 lbs. pressure. These compressors in turn are run by two 200 h.p. motors, securing power from the Rainy River Falls development at Fort Frances 2 1/2 miles distant. The holes are heavily sprung and loaded with a combination of dynamite, vinite and black powder. 300 shots being commonly fired at once. Two 95-ton Bucyrus shovels load the rock into 12-yd. standard gauge side dump cars, which are pulled by four-wheel, 35-ton switching engines.

The contractor has devised an unusual arrangement for building the fills. The first fill was made in the ordinary way, by side dumping from a trestle and raising the tracks. A great deal of difficulty was encountered owing to the many heavy settlements of the fill carrying the trestle down with it. This settlement was specially severe in the shallow water, where there was much mud. To escape from the necessity of a trestle he placed two 6-ft. plate girders 140 ft. long across a barge 32 by 112 ft. by 6 ft. deep, with one end of these girders resting on a 3-ft. plate girder 80 ft. long, which was supported in sliding braces on two smaller barges 12 by 24 ft. by 5 ft. deep. The 6-ft. girders were placed 30 ft. centre to centre and were connected by seven floor beams 24 in. deep braced diagonally and spaced 20 to 23 ft., except at the two end panels, where they are spaced 26 ft. apart. On these floor beams two 20-in. stringers were placed spaced 6 1/4 ft. centre to centre and connected with double sway braces. On these stringers a standard gauge track was laid extending on to the adjacent bank over two log stringers which reached over the end of the bridge. Cars are pushed out on to this

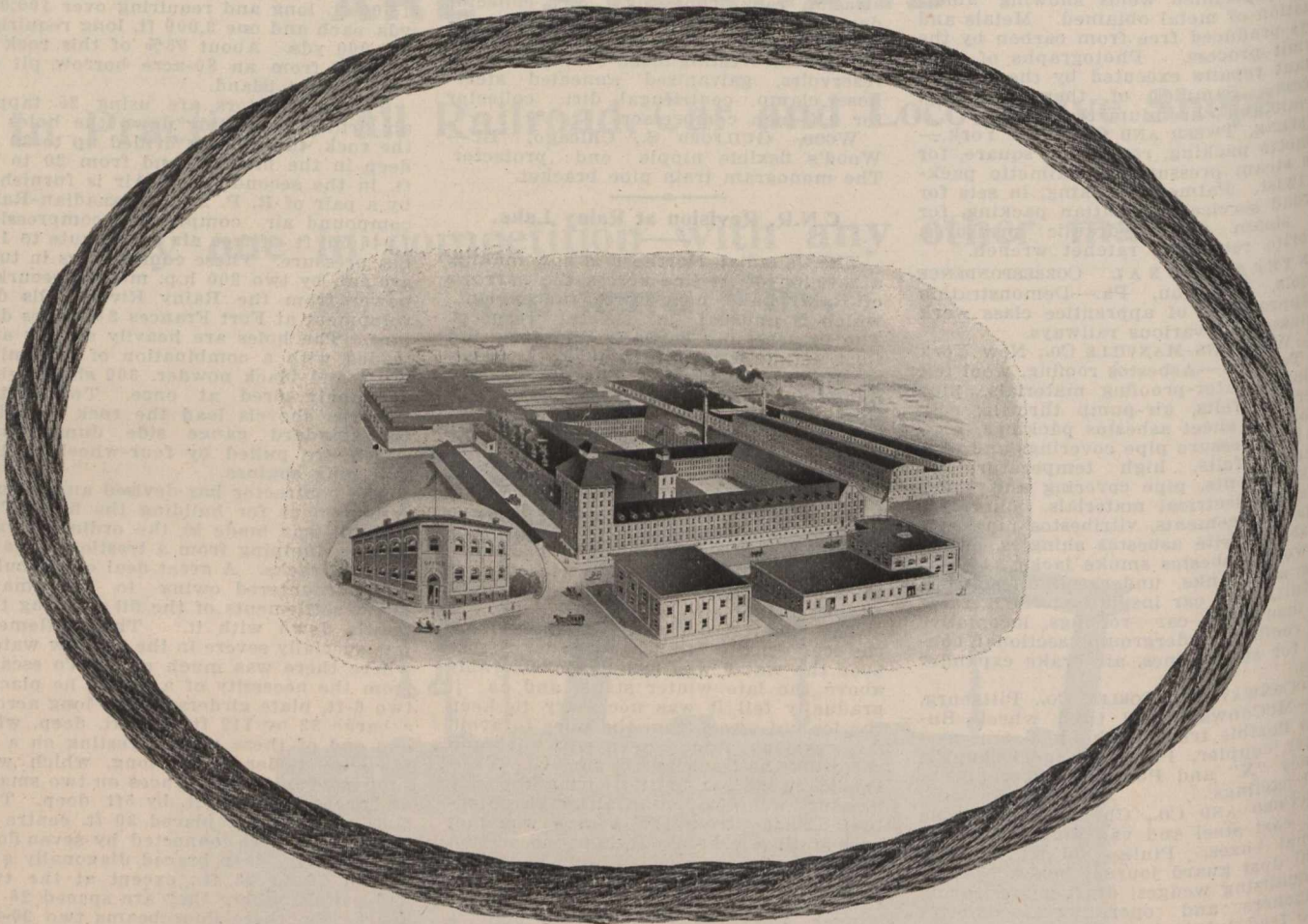


C.N.R. Rainy Lake Revision. Bridge Plan.

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bridge and dumped in the two shore panels. They are then pushed out on to the cantilever to allow others to be dumped, the cantilever acting as a tail track. As the two small barges at the shore end are placed at wide centres, the entire equipment can be pushed farther into the lake as the fill progresses. In completing the fill to grade it will be necessary to lengthen the cross girder, substitute larger barges for the 12 by 24 ft. barges, and raise the entire bridge.

This arrangement has proven entirely successful, the only objection being that the 12 by 24 ft. barges are not large enough and not far enough apart to enable the higher dump to be built at once. The barges are anchored to rock by steel cables and no difficulty has been experienced with the 3 or 4-ft. waves which are encountered. To show the advantage of this floating equipment and the impracticability of filling from a trestle on this work, on one end of the 3,000-ft. fill 1,200 cars were dumped without moving the barges, the top of the fill repeatedly reaching the level of the girders and suddenly settling, leaving the bridge stringers in mid-air and forcing the mud to within 20 ft. of the surface in front of the barges where there had previously been 40 ft. of water. A comparison of the excavation and fill quantities has shown that the rock has settled to the rock on the lake bottom.

The contractors for this work are Johnson & Carey, St. Paul, Minn., who are working under the direction of M. H. MacLeod, General Manager and Chief Engineer, C.N.R., W. L. Mackenzie, Bridge Engineer, and B. S. Remington, Assistant Engineer in charge of the work, to whom we are indebted for the foregoing information.—Railway Age Gazette.

The Canadian Westinghouse Co., Ltd., has declared a quarterly dividend of 1 1/2%, and a bonus of 1%, payable July 10 to shareholders of record June 30.

National Transcontinental Railway.

Negotiations are in progress between the G. T. Pacific Ry. and the N.T.R. Commissioners with a view of certain sections of the line being taken over and placed in operation. It is thought that the section through the St. Maurice Valley in Quebec and a section between Plaster Rock and Moncton, N.B., may be taken over this year.

According to an Ottawa press report, June 16, the Commissioners have decided not to enforce the penalty of \$5,000 a month against contractors who have failed to complete the sections let to them within the time limit, on account of the difficulty experienced in getting labor since the contracts were let.

Tenders will be received to July 15 for the erection of two terminal stations, one at Reddit, Ont., and the other at Transcona, Man.

The two mile approach of the line in St. Boniface connecting up the line from the east with the tracks of the joint terminals at Fort Garry, Winnipeg, is practically completed. The first mile of the approach is graded with sand and gravel without any trestle work; the next half mile comprises a network of trestle work, and the last half mile from Archibald St. to the river will be built on a series of concrete piers varying from 30 to 50 ft. apart. The highest point is just over Archibald St., being 30 ft. above the street level. Steel bridges are erected over five streets and there is also a steel bridge over the Seine River. The J. D. McArthur Co. is carrying out the work.

GRAND TRUNK PACIFIC RAILWAY.

In a recent interview President Hays, referring to the branch lines, said it was hoped to complete some 645 miles of new lines this season. Reports from all the lines under construction show that rapid progress is being made with grading and track laying. It was stated before the Board of Railway Commission-

ers, July 6, that the company had 215 miles of track, ready for the operation of freight trains, but of which it was impossible to make any use, as the Commissioners had put a stop to the operation of any line for any purpose whatever until it had been inspected.

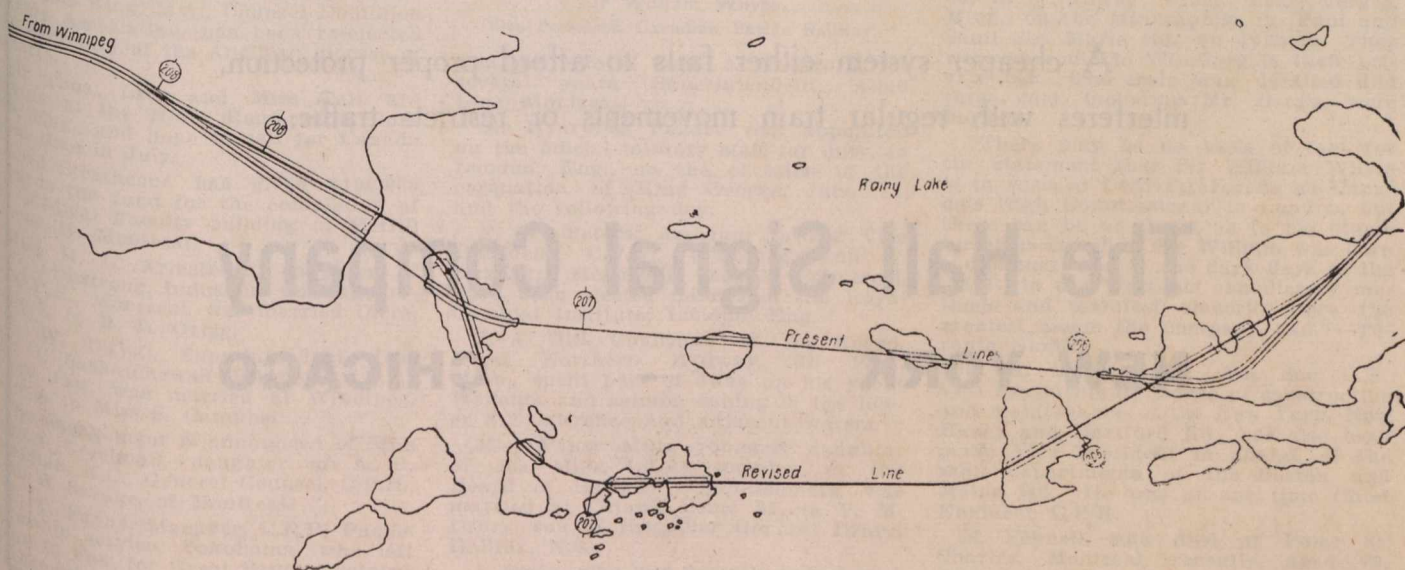
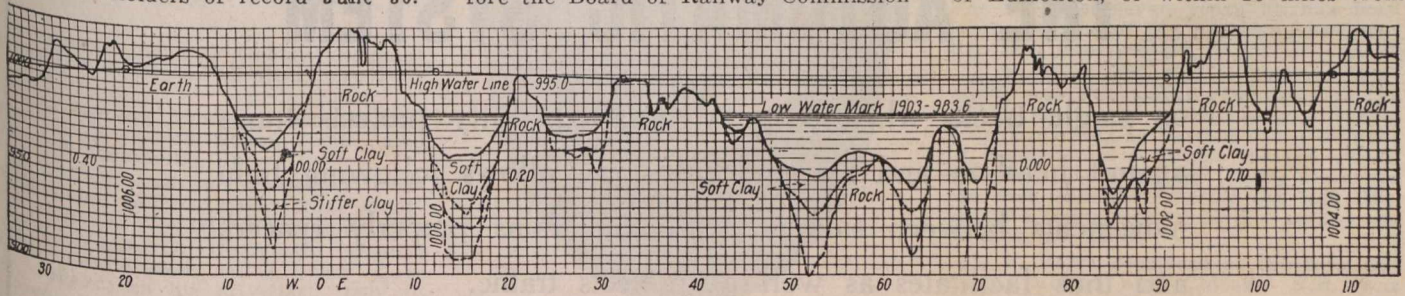
An order has been issued by the Board of Railway Commissioners approving of the location of the Melville-Regina branch from the west boundary of sec. tp. 18, range 19, west of the second meridian, at mileage 90.74 to Regina city limits, at mileage 92.62.

The revised location maps for the branch from Biggar, Sask., to the 4th meridian, 100 miles have been approved by the Minister of Railways, and the Board of Railway Commissioners has approved of location plans of the branch, from mileage 19.97 to 53.23, Sask.

The Minister of Railways has approved of the route map for three miles covering the entrance of the branch line from Tofield into Calgary, Alta. Construction on this branch was reported to have been stopped June 8, owing to an injunction having been obtained by the C.P.R. to keep the G.T.P.R. off all C.P.R. lands in the irrigation area. Construction has been stopped at Berseker, Alta., about 10 miles out of Calgary. The company's engineers are locating a line from Calgary southerly to the International boundary, just east of the Little Bow River.

The Department of Railways has approved of the route map of a line northerly from Edson, Alta., to the Pacific Northern and Omineca Ry., about 50 miles.

C. M. Hays, President, completed a trip of inspection over the line, in company with a number of other officials, June 9, when the party left Prince Rupert, B.C., on the return journey. In the course of an interview at Vancouver, Mr. Hays said better progress is being made east of the Rocky Mountains this year than in 1910. The party travelled on the company tracks for 200 miles west of Edmonton, or within 25 miles from



Canadian Northern Ry. Rainy Lake Revision. Plan and Profile.

Signal Protection

on a railroad must not restrict traffic or interfere with proper train movements in order to be effective, especially on single track lines. The only system of signals, with one exception, which does not restrict or interfere with traffic on a single track line **is the Automatic.**

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the summit of the Rocky Mountains at the Yellowhead Pass. The work is well under way to Tete Jaune Cache, B.C., to which point track should be laid in the fall. Tenders will be called for shortly, for the building of the 410 mile gap between Tete Jaune Cache, and Aldermere, B.C. "Possibly," added Mr. Hays, "Mr. Kelliher may be in a position to call for the tenders next week." It is expected to have the line completed by the end of 1913, and not until this work is done will the company take up, said Mr. Hays, the question of the building of a line from Fort George to Vancouver. On June 15, B. B. Kelliher, Chief Engineer, stated in Vancouver that contractors had been asked to send in tenders for this mileage, and he hoped to see work started on it this summer.

An agreement was approved by the Prince Rupert City Council June 8, under which the company is to give the city 100 feet of water front, and certain areas for park and cemetery purposes; build a dry dock to cost \$2,500,000; build a station and other terminal buildings to cost \$1,000,000, and a hotel to cost a similar amount, in return for a fixed payment of \$15,000 a year as taxes, for 10 years.

The Board of Railway Commissioners has authorized the company to open for traffic its line from Prince Rupert, B.C., easterly for 100 miles, the speed of the trains to be limited to 12 miles an hour.

The route map of a branch line of 3.23 miles from the wharf at Prince Rupert, B.C., northeasterly to Shawatlan's Passage, has been approved by the Minister of Railways.

A contract has been let to Mr. Dow, Seattle, Wash., for the construction of a concrete wharf and warehouse at Vancouver, B.C., for the company's steamship business; and plans are under consideration for the building of a similar wharf and warehouse at Victoria, B.C. (June, pg. 519.)

MAINLY ABOUT PEOPLE.

S. Symons, formerly General Baggage Agent, G.T.R., Montreal, died there June 6, aged 77.

H. C. Stephens, through freight foreman, C.P.R., Owen Sound, Ont., died there, of pneumonia, June 11.

G. T. Bell, Assistant Passenger Traffic Manager, G.T.R., sailed from Montreal, June 10, on a trip to Great Britain.

J. B. Laliberte, Chairman Quebec Harbor Commission, sailed from Quebec, June 2, on his fifty-sixth trip to Europe.

Francis King, M.A., Counsel Dominion Marine Association, has been re-elected Lay Secretary of the Anglican diocese of Ontario.

Sir Thos., Lady and Miss Tait are staying at the Hotel Rembrandt, London, Eng., and hope to sail for Canada some time in July.

Lord Strathcona has given \$100,000 towards the fund for the completion of the Medical Faculty building of McGill University, Montreal.

Miss M. L. Armstrong, daughter of L. O. Armstrong, Industrial Commissioner, C.P.R., Montreal, was married there, June 7, to R. L. Grigg.

E. W. DuVal, Superintendent, District 1, Saskatchewan Division, C.P.R., Moose Jaw, was married at Winnipeg, June 5, to Miss S. Campbell.

The engagement is announced of Miss Marion Creelman, daughter of A. R. Creelman, K.C., General Counsel, C.P.R., to E. B. Savage, of Montreal.

W. T. Payne, Manager, C.P.R. Pacific Steamship service, Yokohama, who left Japan in Feb. for Great Britain, returned through Canada early in June.

T. McNabb, Master Mechanic, Alberta Ry. and Irrigation Co., Lethbridge, Alta., has been elected Grand Master of the Masonic Grand Lodge of Alberta.

J. J. Hill, Chairman, Great Northern Ry., St. Paul, Minn., who is a native of Rockwood, Ont., has given \$1,000 to the Y.M.C.A. building fund at Guelph, Ont.

A. V. Redmond, of the National Transcontinental Railway engineering department, was married, June 28, to Miss E. A. Healy, of Smiths Falls, Ont.

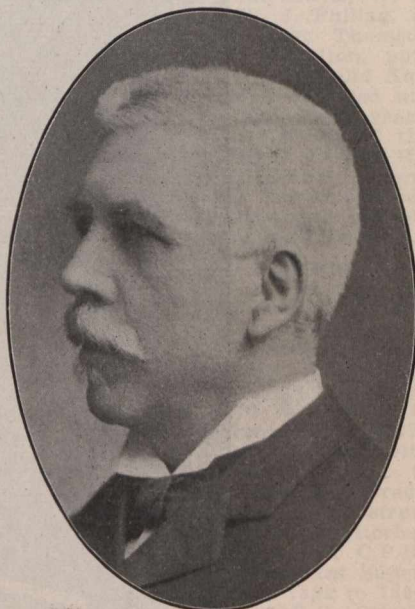
Mrs. F. H. Phippen, wife of the General Counsel, Canadian Northern Ry., left Toronto for England early in June. Mr. Phippen will probably go there in June.

E. Dunn, chief clerk C.P.R. Freight Department, London, Ont., was presented with a suit case by the staff, June 5, on his transfer to Toronto, in a similar capacity.

W. R. Baker, Secretary, C.P.R., and Assistant to the President, has been created a Companion of the Victorian Order, on the occasion of the coronation of King George.

Miss Edna K. Phippen, daughter of F. H. Phippen, General Counsel, Canadian Northern Railway, was married in Toronto, June 1, to Dr. C. R. Gilmour, of Winnipeg.

Mrs. Crawford, who was killed in a runaway accident at Montreal, June 11,



Sir William Whyte, Vice President, Canadian Pacific Railway.

was the wife of Capt. A. Crawford, for several years Superintendent, Allan Line, Montreal.

Sir Henry M. Pellatt was appointed on the official military staff for duty, in London, Eng., on the occasion of the coronation of King George, June 22, and the following day.

F. W. Peters, Assistant to the Vice President, C.P.R., Winnipeg, and T. Harling, steamship agent, Montreal, have been elected fellows of the Royal Colonial Institute, London, Eng.

J. J. Hill, Chairman of the Board, Great Northern Railway, St. Paul, Minn., spent part of June on his yacht Wacouta and salmon fishing in the lower St. Lawrence and adjacent waters.

Miss Pansy Mills, youngest daughter of Jas. Mills, L.L.D., member of the Board of Railway Commissioners, was married at Ottawa, June 21, to V. M. Drury, son of Brigadier General Drury, Halifax, N.S.

J. Irwin, who was recently transferred from Saskatoon, Sask., to Dauphin,

Man., as Superintendent, District 3, Canadian Northern Ry., was presented with a travelling companion by the staff before leaving Saskatoon.

Miss M. A. Maver, daughter of A. A. Maver, Master Mechanic, G.T.R., Montreal, was married there, June 21, to F. G. Osborn, of Westmount. Owing to her mother's recent death, immediate relatives only were present.

C. H. Wilkinson, who died in London, Eng., recently, aged 57, was Managing Director of the British Columbia Development Association, and was interested in the organization and construction of the White Pass and Yukon Ry.

E. O. Reeder, formerly Assistant Chief Engineer of the Chicago, Milwaukee and St. Paul Ry., has been appointed Chief Engineer of the Chicago, Milwaukee and Puget Sound Ry., at Seattle, Wash., succeeding E. J. Pearson, who has resigned.

Jas. Stephenson, formerly Chief Superintendent, G.T.R., Montreal, who retired from active service some years ago, and who has been living at Clevedon, Somerset, Eng., arrived in Canada at the end of May to spend a short holiday in Muskoka.

Miss Alice Shaughnessy, eldest daughter of Sir Thos. G. Shaughnessy, was married to H. W. Beauclerk, at St. Andrews, N.B., June 3. The honeymoon is being spent at Fort Tipperary, Sir Thos. Shaughnessy's summer home at St. Andrews.

Hugh Mann, who died at Acton, Ont., June 15, aged 94, was father of Sir Donald D. Mann, Vice President, Canadian Northern Ry., and also of A. R. Mann, President, Northern Construction Co., which has a number of contracts for the construction of the Canadian Northern Ry.

W. F. Drysdale, who has been appointed Mechanical Engineer, Northern Ry. of Costa Rica, at Limon, is a graduate of McGill University, Montreal, and served his apprenticeship on the G.T.R. For the past seven years he has been in the service of the American Locomotive Co., Schenectady, N.Y.

I. M. Ross, who died recently at Winnipeg, was a locomotive engineer on the C.P.R. in the seventies. In partnership with D. Grant, he carried out a number of construction contracts for the C.P.R. and Great Northern Ry. (U.S.) He drove the first locomotive across the Red River, on a temporary track laid on the ice, on Dec. 23, 1879.

L. S. Berg, President of the New Orleans, Mobile and Chicago R.R., was seriously injured, and his wife was killed, in a railway wreck near Vergas, Minn., on the Minneapolis, St. Paul and Sault Ste. Marie Rd., on June 2. They were en route to Winnipeg in their private car. The train was derailed and three cars, including Mr. Berg's, were burned.

"There may be no basis of fact for the statement that Sir William Whyte is to succeed Lord Strathcona as Canada's High Commissioner in London, but there can be no doubt as to his fitness for such an office. Sir William was born a diplomat, and in the dark days of the C.P.R. in the West his conciliatory methods and manifest sincerity were the greatest assets the company had."—Toronto Globe.

E. H. McHenry, M. Am. Soc. C.E., Vice Presidents in charge of construction and maintenance of the New York, New Haven and Hartford Rd., has also been made Vice President in charge of the same departments of the Boston and Maine Rd. He was at one time Chief Engineer C.P.R.

M. Fennell, who died at Point St. Charles, Montreal, recently, aged 79, started work on the old Lachine Ry., when that was the only railway in

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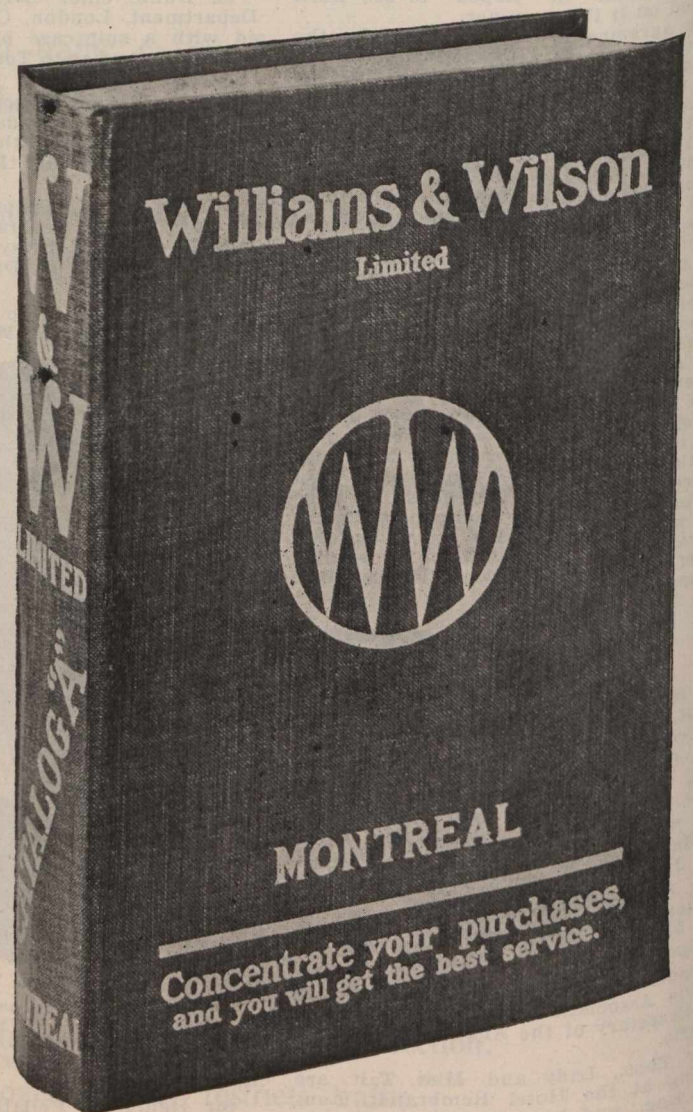
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operation on the island of Montreal. He transferred to the G.T.R., when the first named line was merged in the latter system, and retired from his work as locomotive engineer, three years ago. He was in charge of the locomotive which conveyed the late King Edward to Montreal, about 50 years ago.

Capt. Jas. Bain, who died at Quebec, June 3, aged 75, was connected with the sea from early years, and after retirement from active connection therewith, was for some time superintendent of the ship yard and floating dock at Quebec, owned by the late J. Roche. On the close of this plant owing to the decline of the industry there, he resumed command of a sailing vessel. For some years he has acted as a surveyor and adjuster of claims as regards damaged vessels, and has also assisted at wreck investigations as nautical assessor.

R. W. Drew, who has been appointed Division Freight Agent, Kootenay and Boundary Divisions, C.P.R., Nelson, B.C., was born at Kingston, Ont., Feb. 17, 1874, and entered railway service, May, 1894, since when he has been, to May, 1896, clerk in general office, operator and agent at various points, Kingston and Pembroke Ry.; June, 1896, to Sept., 1898, clerk, C.P.R., Arrowhead, B.C.; Sept., 1898, to Apr., 1903, local agent, C.P.R., Nelson, B.C.; Apr., 1903, to Apr., 1908, chief clerk, General Freight Agent's office, C.P.R., Nelson, B.C.; Apr. to June, 1908, acting General Freight Agent, Kootenay and Boundary Divisions, C.P.R., Nelson, B.C.; June, 1908, to May 30, District and Travelling Freight Agent, Saskatoon, Sask.

F. J. Thompson, who has been appointed Marine Superintendent, Canadian Northern Steamships, Ltd., Montreal, was born in Cheshire, Eng., Aug. 20, 1876, and went to sea, Oct., 1893, serving an apprenticeship on the sailing ship Gracie Beazley, trading between England, Australia, India, Cape of Good Hope and South America. He served two years as second officer of the ship Andora, three years as second and chief officer with the Caledonia Steamship Co., and served 18 months in the Navy, under Admiral Lord Charles Beresford, as Lieutenant Royal Naval Reserve. He subsequently joined the Cunard Line, and served five years, being second officer on the R.M.S. Lusitania, on her maiden voyage, and was later in command of the Uranium Steamship Co.'s s.s. Uranium, running between Halifax and Rotterdam, and in 1910, was transferred to the command of the same company's s.s. Campanello.

D. R. McBain, who has been elected Third Vice President American Railway Master Mechanics Association, was born at Queenston Heights, Ont., Oct. 23, 1861. Entered railway service Oct. 9, 1876, as machinist's apprentice, Canada Southern Ry., later serving as locomotive fireman, locomotive engineer, and travelling engineer. In 1900 he was appointed Master Mechanic, Michigan Central Rd., at Michigan City, Ind. In 1901 he was transferred to St. Thomas, Ont., and afterwards to Jackson, Mich. He was appointed Assistant Superintendent of Motive Power in July, 1906, and in April, 1908, was transferred to the same position on the New York Central and Hudson River Rd., at Albany, N.Y. In the spring of 1910 he was appointed Superintendent of Motive Power of the Chicago, Indiana and Southern, and the Indiana Harbor Belt lines, which position he still holds.

J. W. Kendrick, M. Am. Soc. C.E., Vice President in charge of operation of the Atchison, Topeka and Santa Fe Ry., has resigned. He is a graduate in

civil engineering of the Worcester Polytechnic Institute and entered railway service in 1879 as a rodman on the Yellowstone Division of the Northern Pacific Ry. Since that time he has followed railway work continuously. For five years he was Chief Engineer of the Northern Pacific Ry., after which he entered the operating department as General Manager for the receivers of the same road and of the reorganized road, later becoming Vice President in charge of operation. In 1901 he took charge of the operating department of the Atchison, Topeka and Santa Fe Ry. as Third Vice President, and has remained in charge of that department as Second Vice President and as First Vice President. In December last he was granted six months' leave of absence to regain his health.

James Anderson, who has been elected President, Canadian Street Railway Association, for the current year, and whose portrait appears on the first page of this issue, was born near Ayr, Ont., June 20, 1851. At the age of 19 he entered the old Great Western Ry. Co.'s service, and after serving a few years was appointed a conductor, which position he held until Nov., 1883, when he resigned and went into the grocery business as a member of the firm of Robinson and Anderson, which partnership was continued for 10 years. In June, 1893, he sold his interest to his partner, and associated with John Davis, W. J. Tucker, Dr. Coventry, W. J. Pulling, of Windsor, and the late Robt. Thomson and Wm. Hendrie, of Hamilton, purchased the Sandwich, Windsor and Amherstburg Ry., which was operated under that ownership for eight years. When it passed into the hands of the present owners, the Detroit United Ry. Co., in 1901, he was appointed General Manager, and the road has since been extended to Amherstburg and Tecumseh, and now operates 35 miles of line.

R. R. Jamieson, who died May 30, at New Westminster, B.C., where he had been taken owing to a complete mental and physical breakdown, was born at Westover, Ont., Dec. 12, 1856. He entered railway service in 1873, since when he was, from 1873 to 1874, telegraph operator, Great Western Ry.; 1874 to 1878, telegraph operator, G.T.R.; 1878 to 1880, on construction in Indiana with the Delphi and Chicago Ry.; 1880 to 1883, agent and train dispatcher, Credit Valley Ry.; 1883 to 1884, on construction C.P.R. in North West Territories; 1884 to 1890, train dispatcher, C.P.R., Toronto; 1890 to 1892, Assistant Superintendent, C.P.R., Toronto; 1892 to 1896, Assistant Superintendent, C.P.R., Smiths Falls, Ont.; 1896 to 1902, Superintendent, C.P.R., Farnham, Que.; 1902 to 1903, Superintendent, C.P.R., Cranbrook, B.C.; 1903 to Dec., 1907, General Superintendent, C.P.R., Calgary, Alta.; Dec., 1907, to Oct. 5, 1908, General Superintendent, Central Division, C.P.R., Winnipeg. On retiring from railway service he removed to Calgary and entered private business, being connected with several insurance companies. He served two terms as mayor of the city, during which period he was mainly responsible for the construction and organization of the Municipal St. Ry. there, which was operated by a commission, of which he was Chairman.

Sir William Whyte, who received the honor of knighthood, on the coronation of King George, was born at Charles-town, Fifeshire, Scotland, Sept. 15, 1843. He commenced his railway career with the North British Ry. in 1861, and after two years' service, came to Canada, but it was not until 1865 that he entered railway service here. For a few months he was freight brakeman on the G.T.R. at Cobourg, Ont., being transferred to Toronto in the same year. Since

then he has been, to 1867, freight clerk, G.T.R., Toronto; 1867 to 1870, yardmaster, same road, Toronto; 1870 to 1871, night station agent, same road, Toronto; 1871 to 1874, freight and station agent, same road, Stratford, Ont.; 1874 to 1881, in charge of G.T.R. business, London, Ont.; 1881, in charge of freight offices and sheds, same road, Toronto; Nov., 1881, to Sept., 1883, Assistant Superintendent, Central Division, same road; Sept., 1883, to Aug., 1884, General Superintendent, Toronto, Grey and Bruce Ry., and Aug., 1884, on the amalgamation of the T.G. and B. Ry. with the C.P.R., to May, 1885, General Superintendent, Ontario Division, C.P.R.; May, 1885, to 1886, General Superintendent, Eastern and Ontario Divisions, same road; 1886 to May, 1887, General Superintendent, Western Division, same road, Winnipeg; May, 1887, to Apr., 1901, Manager, C.P.R. lines west of Fort William to the Pacific coast; Apr., 1901, to Dec., 1903, Assistant to the President, same road. In Dec., 1903, he was appointed Second Vice President, C.P.R., in general charge of the maintenance and operation of the western lines, and, under the President's direction, of the administration of the company's affairs in the territory between Lake Superior and the Pacific Coast, and in June, 1910, on the abolition of the numerical designations to the titles of Vice President, he became Vice President, with the same duties.

Canadian Northern Pacific Ry. Contracts.

The contract for the building of the 163 mile portion of the line extending from Hope to Kamloops B.C., for which tenders were recently asked, has been let to the Northern Construction Co. and Welch. This is a combination of the N. C. Co., of which A. R. Mann is President and A. C. Mackenzie Vice President, and of Foley, Welch and Stewart. The mileage covers the line from Hope to Boston Bar, about 40 miles; Boston Bar to Lytton, about 28 miles; Lytton to Ashcroft, about 44 miles; and Ashcroft to Kamloops, about 51 miles; and includes the heaviest work on the whole line. It comprises about 20,000 feet of tunnelling and a large number of bridges across the Fraser and the Thompson rivers. The gradient is 0.4%, and the sharpest curvature is 8 degrees.

J. T. Burns, agent, Canadian Northern Ry., at Stratton, Ont., was arrested at Winnipeg, recently, for embezzlement of about \$300.

Members of the Canadian Society of Civil Engineers were asked by circular recently if they would participate in a summer excursion, either from Montreal to the Maritime Provinces, or from Montreal to Niagara Falls. Owing to the small number who expressed a willingness to go, the idea has been abandoned.

The C.P.R. has announced a number of prizes in money for farm boys in Saskatchewan, for the best collections of 25 plants of any wheat grown in the province, and later for the best plants grown from seed of the prize lots. The scheme is in connection with the C.P.R. Land Department and the provincial seed fair at Saskatoon.

During April, 11 employes were killed and 14 injured in the course of their work in the operation and construction of Canadian railways. Of the fatalities, three were due to being struck by trains, five to being run over, two to being crushed between cars, and one to scalding, while of the other accidents, two each were due to falls and to collisions, one to coupling cars, four to being run over, and one each to being crushed between cars, struck by crowbar, struck by falling material, to being burned and to being scalded.

125 Railroads in America

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Transition Curves.

By J. Leslie, Roadmaster, National Trans-continental Railway, La Tuque, Que.

I read with much interest the very valuable article in your April issue by Mr. H. J. Wicksteed, C.E., on transition curves. I am not an engineer, but a trackman of wide experience, and I fully concur with all Mr. Wicksteed has said in regard to this very important problem. Having had wide experience in track work, and subsequently further experience as roadmaster on a line pretty well interspersed with curves varying from a 1° up to 6°, and although I was under the impression that I knew all about track work before becoming a roadmaster, I found by riding on fast trains that my knowledge was far from what I had believed it to be. The disagreeable riding of curves induced me to go deeper into this matter, consequently I went to work to make improvements in the alignment of curves. I got the section foremen started to line them with a 62 ft. cord, a very simple method of lining when an engineer is not available. This cord is stretched along the inner side of the outer rail and measurements taken from the centre of the cord to the rail. This measurement in inches means the degree of the curve pretty closely. We succeeded in getting them into fairly good line, but had not got on to the method of easing the points, which was the most important part of all. I had a reverse curve, a 3° and a 4°, but I should not call it a reverse, as there was something like 160 ft. of tangent between. This was at a point where trains ran particularly fast, sometimes as high as 60 miles an hour, and I must say the riding was anything but agreeable. I frequently sent foremen to line this, but all their efforts proved ineffectual; no perceptible improvement was made. I then decided to try my hand at it, and if possible make the condition of the track conform to the speed of the trains, in which I succeeded beyond expectation. With two gangs of section men I started to line it at the point of reverse. I had not proceeded far with the work when I was struck with the idea that I might possibly ease the points with the aid of the 62 ft. cord. If I could line these two curves all round with the cord, why not ease the points with it as well? So I started easing the points, starting at 0 and increasing half an inch on each measurement until the full curvature was reached. The same process was gone through with both curves. The work when completed was highly satisfactory. In making transition curves it simply means lengthening the curve and shortening the tangent, at least it appears so to me. With reference to the two curves here referred to, I may say I took all the tangent out with the exception of a few feet. As previously stated, commencing at 0 and gradually bringing it into full curvature. The elevation was put in accordingly, and at every point was suited to the degree of curvature, or, in other words, was adapted to the degree of curvature. These two curves were lined throughout, the extreme ends as well as the point of reverse. The elevation given was one inch per degree, and I can state emphatically, that a more agreeable and pleasant riding track would be very difficult to find. I rode over it for years afterwards, and it continued to be the same, with some attention of course. This piece of track, fortunately, was better situated than some others I have known in the way of heaving and being thrown about by the action of the frost; it was good at all seasons of the year. I think this method of lining is much on the same principle as illustrated by Mr. Wicksteed, but of course necessitates much more work when the lining

is done in the manner described. The lining can be done more cheaply and quickly when the centres are given by a practical engineer, but an engineer is not always available when it is necessary to do a bit of lining, and the centres given last year cannot be relied upon as being accurate enough to line to this year. As a rule the whole track is surfaced and lined every season, and we cannot expect to get engineers' centre stakes every time we disturb the track. Although the curves may have been lined as near perfection as possible at one time, there are different agencies at work which all combine to get them somewhat out of place. The section foreman, with nothing but his eye to guide him, is one contributory cause. This is a strange assertion to make, but nevertheless it is true. I once knew an experienced foreman who had charge of a big yard, together with two miles of section, and on the section was a 3° curve. He surfaced and lined his curve as well as he knew how, and when it was completed he felt much elated, thinking it was the best piece of track on the system. To make sure that it was all it appeared to be, he went down

ly surfaced and lined track is very limited. Even a roadmaster might be deceived in this way, but his position gives him the advantage in knowing where the defective spot is located, and just what is wrong with it.

This curve question is a very difficult one to get section foremen educated in in a way which they will understand, and another drawback is the frequent changing of foremen. One foreman may have his curves in good shape, and the man who succeeds him, although taught and watched, is very apt to get them distorted in a short time, and thus it goes on year after year. It happened to be my lot last fall to line some curves in the northern country. They were principally 6° and had rather abrupt points. The centres were given by an engineer who made nice transition curves, and who, in my opinion, thoroughly understood his business (I cannot recall his name just now.) In all my experience I never lined curves with as good satisfaction. He set up a permanent stake 2 x 6 ins. at zero, indicating the point of compound curve, and another stake of the same dimension at the point of regular curve, or the point where the compound curve ceased, indicating the point of regular curve, together with degree of curve and elevation required. The distance from the p.c.c. to the regular curve for a 6° was something like 300 ft. They termed this spiralling, but call it what you like, it all amounts to the same thing when properly done.

I feel grateful to Mr. Wicksteed for explaining matters in the way he did, and every effort should be made to carry out what he has explained, and all the attention possible should be given to it. Speed demands this.

C.P.R. Mechanical Officials' Meeting.

The annual meeting of C.P.R. mechanical officials was held in Winnipeg recently, H. H. Vaughan, Assistant to the Vice President, Montreal, presiding. There were also present: Grant Hall, Superintendent of Motive Power and Car Department, Western Lines; R. W. Burnett, General Master Car Builder, Montreal; C. H. Temple, Assistant Superintendent Motive Power, Western Lines; C. Kyle, General Master Mechanic, Eastern Lines; H. Osborne, Superintendent Angus locomotive shops; W. E. Woodhouse, Superintendent Winnipeg locomotive shops; G. I. Evans, Mechanical Engineer; Allan Dixon, General Foreman, West Toronto shops, and Master Mechanics Ord, Mills, Reid, Preston, Short, Pyne and Phipps.

The meeting occupied three days, one of these being devoted to the inspection of the company's Winnipeg shops and a visit to the Canadian Northern Ry.'s new shops at Winnipeg. The subjects taken up were connected with the rules and regulations of the maintenance of cars and locomotives, and discussions as to the methods of locomotive and shop practice.

The G.T.R. offered for competition among its junior employes, or the sons of employed under 21, four free scholarships in the Faculty of Applied Science at McGill University, Montreal, at the June matriculation examinations.

The Board of Railway Commissioners has issued a circular stating that the requirements of circular 64, Apr. 3, 1911, respecting the filing of applications covering all highway and railway crossings before approval of locations or diversions under secs. 159 and 167 of the Railway Act have been modified to the extent that unopened road allowances are exempted, but the applicants must furnish a declaration that the highways shown in their applications cover all those opened or used.

From the President of the Canadian Pacific Railway.

The following letter from Sir Thomas G. Shaughnessy, K.C.V.O., President of the Canadian Pacific Railway, to our Managing Director, is highly valued by us, as the expression of the opinion of a master mind in the transportation field:—

"THE CANADIAN PACIFIC RAILWAY COMPANY.

"Office of the President,
Montreal, May 10, 1911.

"Dear Burrows.—The number of railway officials and employes, and others, who take a keen interest in railway and shipping affairs in our country, has now become so large that the usefulness of your journal is beyond question.

"While I am only able to read it from time to time, I am impressed by the accuracy of your statements and your excellent judgment in the selection of material that is interesting as well as instructive.

"I trust that the Railway and Marine World will continue to prosper.

"Yours sincerely,

"T. G. SHAUGHNESSY."

the line to the first station and boarded a passenger train for the purpose of satisfying himself that the curve in question was all right. The train when reaching this curve had attained a high rate of speed, the descending grade being great surprise, that the curve in a couple of spots was not anything like the track he thought it was. Judging from the way it rode he thought the defective spots must be very conspicuous or easily detected, but when making an effort at improvement he could not detect the spots which were so very pronounced when riding on the train at a high speed. Now, in this case the defect was certainly in the alignment, and yet his experienced eye could not detect the slight variation. If he had tried the 62 ft. cord it would have pointed out the invisible spots, but this was in the days long before lining with a cord was thought of. Section foremen as a rule take great pains with their surfacing and lining, and what appears to them to be good track may be full of little imperfections. Their knowledge in general of how a train rides over their new-

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Railway Route Plans Approved.

The Minister of Railways has approved of the following railway route plans since Aug. 6, 1910:—

ALBERTA CENTRAL RY., Oct. 6, 1910.—From Moose Jaw to sec 24, tp. 35, range 23 west of 3rd meridian; about 500 miles.

Jan. 14, 1911.—Rocky Mountain House to Yellowhead Pass, about 180 miles;

ALGOMA CENTRAL AND HUDSON BAY RY., Apr. 11, 1911.—Hawk Lake to Hobon, about 30 miles.

May 10, 1911.—Magpie Branch, about 9 miles.

BRITISH COLUMBIA SOUTHERN RY., Jan. 14, 1911.—Waldo branch. About 12 miles.

BURRARD INLET TUNNEL & BRIDGE CO.—Oct. 18, 1910.—From Eburne northerly across the Second Narrows, thence easterly to Deep Cove and westerly to Horse Shoe Bay, and from a point in Vancouver under the First Narrows to the north shore connecting with the westerly part of said railway. 32 miles.

CALGARY AND EDMONTON RY., Dec. 7, 1910.—Lacombe easterly branch. From tp. 36, r. 12, west of 4th mer., to tp. 34, range 23, west of 3rd mer. 121.9 miles.

CANADIAN NORTHERN ALBERTA RY., Nov. 8, 1910.—Revised line from sec. 26, tp. 53, r. 7, west of 5th meridian to sec. 18, tp. 45, r. 3, west of 6th meridian, (Yellowhead Pass), about 200 miles.

CANADIAN NORTHERN BRANCH LINES CO., May 10, 1911.—From Grosse Isle, on the Oak Point branch, northerly, 36 miles.

CANADIAN NORTHERN ONTARIO RY., Oct. 6, 1910.—Ottawa-Toronto line. Two small revisions between Shannonville and Portland, about 10 and 35 miles.

Nov. 21, 1910.—Entrance to Toronto, Dec. 7, 1910.—Revision between Sydenham and Perth Road, about 8 miles, about four miles.

Jan. 30, 1911.—Revision between Perth Road and Portland; about 25 miles.

Oct. 6, 1910.—Udney and Matchedash Bay line. Revision between Orillia and point near Sparrow Lake; about 16 miles.

Jan. 14, 1911.—Sudbury-Port Arthur. Revised location from Nipigon northerly, 98 miles.

Apr. 19, 1911.—Through counties of York, Peel and Halton, about 35 miles.

May 5, 1911.—Two small revisions between Deseronto and Sydenham, about 5 and 1½ miles.

May 23, 1911.—Revision between Nipigon and Port Arthur, 73.9 miles.

May 10, 1911.—Line through counties of Wentworth and Halton, including Hamilton city, about 30 miles.

CANADIAN NORTHERN RY., Aug. 9, 1910.—Stewartwyn to Rocky Mountain House, from Stewartwyn westerly to between ranges 24 and 25, tps. 39, west of 4th meridian, about 36 miles.

Oct. 6, 1910.—Springfield to sec. 35, tp. 13, range 6, east of principal meridian, Man., about 25 miles.

Oct. 6, 1910.—Prince Albert Battleford extension. Revision between sec. 23, tp. 46, r. 6, and sec. 9, tp. 44, r. 8; about 25 miles.

Oct. 13, 1910.—Regina to Moose Jaw, about 45 miles.

Nov. 8, 1910.—Oak Point extension, Man. Revision between sec. 13, tp. 29, r. 8, and sec. 35, tp. 32, r. 9, west of principal meridian; about 25 miles.

Nov. 8, 1910.—Saskatoon-Calgary line, revision of route through tps. 26-25, ranges 23-25, west of 4th meridian, about 12 miles.

Nov. 8, 1910.—Davidson westerly. From east line of tp. 26, r. 7, to tp. 30, r. 9, west of 3rd mer. About 34 miles.

Jan. 14, 1911.—Revision of route through tp. 28 and ranges 4-6, west of 4th mer., about 12 miles.

Jan. 30, 1911.—Battleford westerly, about 60 miles.

Jan. 14, 1911.—From sec. 8, tp. 15, r. 12, to sec. 18, tp. 13, r. 23, west of 2nd mer., about 70 miles.

Jan. 14, 1911.—Moose Jaw south-easterly. Revision between Moose Jaw and sec. 36, tp. 13, range 24, west of 2nd mer., about 30 miles.

Jan. 30, 1911.—From sec. 18, tp. 13, r. 23, west of 2nd mer., to sec. 1, tp. 11, r. 5, west of 3rd mer., about 70 miles.

Apr. 11, 1911.—Gravelburg to tp. 22, range 17, west of 3rd meridian, about 150 miles.

Apr. 11, 1911.—Stewartwyn southeasterly to tp. 31, range 13, west of 4th meridian, about 50 miles.

Apr. 11, 1911.—Conquest, Sask., south-westerly, about 65 miles.

May 10, 1911.—Revision of part of Davidson, Sask., westerly line, about 20 miles.

May 10, 1911.—Wassewa to Deloraine, Man., about 15 miles.

May 10, 1911.—Revision of line from Vonda, Sask., northeasterly, about 35 miles.

May 19, 1911.—Revision of Prince Albert-Battleford line between tp. 44, range 8, and Donholm, in tp. 42, range 14, west of 3rd meridian, about 40 miles.

May 31, 1911.—Entrance to union station, Winnipeg, about 0.305 miles.

CANADIAN PACIFIC RY., Oct. 6, 1910.—Hamiota to Birtle, Man., 32.7 miles.

Oct. 6, 1910.—Regina, Saskatoon and North Saskatchewan branch. Revision at Prince Albert; about 12 miles.

Dec. 7, 1911.—Brooks to Kirkcaldy, Alta., 63 miles.

Dec. 7, 1911.—Suffield to Kipp, Alberta; 91 miles.

Dec. 17, 1910.—Moose Jaw south-westerly, from Moose Jaw to sec. 25, tp. 8, r. 6, west of 3rd meridian; about 80 miles.

Jan. 14, 1911.—Stonewall branch. Revision of extension from Arbourg to Fisher Bay, 38 miles.

Jan. 14, 1911.—Swift Current to Brooks, from sec. 32, tp. 19, range 19, west of 3rd meridian to Brooks, 150 miles.

Jan. 14, 1911.—Weyburn-Lethbridge branch. Revision between sec. 3, tp. 5, range 6, and sec. 19, tp. 6, r. 8, west of 4th meridian, 24.4 miles.

Jan. 14, 1911.—Main line grade reduction between Austin and Melbourne, Man., 14 miles.

Jan. 14, 1911.—Moose Jaw north-westerly. From Outlook to sec. 12, tp. 33, range 22, west of 3rd meridian; about 92 miles.

Apr. 11, 1911.—Revision of line from Suffield to Kipp, Alta., 94.2 miles.

Apr. 11, 1911.—Swift Current to Brooks, 78.38 miles.

Apr. 11, 1911.—From Swift Current southeasterly to tp. 11, range 8, west 3rd meridian, about 50 miles.

Apr. 12, 1911.—From latter point to Gravelburg, about 20 miles.

May 10, 1911.—Revision of Swift Current southeasterly line, 45 miles.

May 10, 1911.—Revision of Langdon northerly branch, 62.1 miles.

See also Calgary and Edmonton Ry., Georgian Bay and Seaboard Ry., Kootenay Central Ry., South Ontario Pacific Ry.

GEORGIAN BAY AND SEABOARD RY., Nov. 8, 1910.—Lindsay to Bethany Village, about 18 miles.

Apr. 11, 1911.—From Bethany Village to connection with Ontario and Quebec Ry., about 1½ miles.

G.T. PACIFIC BRANCH LINES CO., Oct. 6, 1910.—Regina-Boundary branch. Revision of line from Regina southerly for about 12 miles.

Jan. 14, 1911.—Revision of line from sec. 21, tp. 7, range 10, west of 2nd meridian, to the boundary, about 65 miles.

Oct. 6, 1910.—Biggar westerly to sec. 30, tp. 36, r. 21, west of 3rd meridian; about 45 miles.

Jan. 14, 1911.—Revision and extension of same from sec. 34, tp. 36, r. 21, to sec. 1, tp. 37, r. 1, 4th meridian, about 46 miles.

Oct. 13, 1910.—Regina to Moose Jaw, about 45 miles.

Nov. 8, 1910.—Amended general location of entrance to Prince Albert, about 10 miles.

Jan. 14, 1911.—Calgary branch. Revision from sec. 2, tp. 28, r. 26, to sec. 8, tp. 26, r. 27, west of 4th mer., about 15 miles.

March 3, 1911.—Crossing of Bow River at Calgary.

Jan. 30, 1911.—Battleford westerly, about 80 miles.

Apr. 11, 1911.—Revision of Regina-Boundary branch between Frobisher and the Boundary, about 12 miles.

Apr. 12, 1911.—From Moose Jaw, northwesterly to tp. 21, range 4, west of 3rd meridian, 50 miles.

May 10, 1911.—Revision of line from Biggar to 4th meridian, about 100 miles.

May 10, 1911.—Eldon northerly to the Pacific Northern and Omenica Ry., about 50 miles.

May 10, 1911.—Entrance to Calgary, about 3 miles.

GRAND TRUNK PACIFIC RAILWAY, May 13, 1911.—From G.T.P. wharf at Prince Rupert, northeasterly to Shawatlan's Passage, 3.23 miles.

GRAND TRUNK RY., Nov. 8, 1910.—Lindsay and Port Hope line. Deviations between Reaboro and Rice Lake summit, about 28 miles.

HUDSON BAY AND PACIFIC RY., Jan. 14, 1911.—Prince Albert north-easterly, 74 miles.

INTERNATIONAL BRIDGE AND TERMINAL Co., May 16, 1911.—Proposed connection between Canadian Northern Ry., Fort Frances, Ont., and International Bridge and Terminal Co., International Falls, Minn., about 800 ft.

KOOTENAY AND ALBERTA RY., Feb. 1, 1911.—Pincher to Beaver Creek, about 15 miles.

KOOTENAY CENTRAL RY., Dec. 7, 1910.—Revision between mileage 62.5 and 93.9.

LACHINE, JACQUES CARTIER AND MAISONNEUVE Railway, May 10, 1911.—St. Catharine St., Montreal, to Jacques Cartier Jct., about 7 miles.

MANITOULIN AND NORTH SHORE RY. Jan. 14, 1911.—Sudbury to Little Current, 85.89 miles.

NAKUSP AND SLOCAN RY., Apr. 11, 1911.—Three Forks to Whitewater, B.C., 7.6 miles.

NIAGARA, WELLAND AND LAKE ERIE RY., Apr. 21, 1911.—Line on East Main St. and South Main St., Welland, Ont., about 5,000 feet.

QUEBEC AND SAGUENAY RY., Oct. 6, 1910.—Saguenay River to St. Margaret's Bay, River St. Lawrence, about 300 miles.

SOUTH ONTARIO PACIFIC RY., Feb. 28, 1911.—Guelph Jct. to Hamilton, 16 miles.

Apr. 6, 1911.—Guelph Junction to Hamilton, 16 miles.

SOUTHERN CENTRAL PACIFIC RY., Feb. 17, 1911.—For 20 miles from Burmis, Alta.

SOUTHERN CENTRAL PACIFIC RY., Apr. 11, 1911.—From 1,000 ft. north of the junction of Racehorse Creek with the North Fork of the Old Man River to near ¼ corner on the east side of sec. 17, tp. 10, range 2, west of 5th meridian, 10 miles.

TORONTO EASTERN RY., Oct. 6, 1910.—Oshawa to Lindsay, Ont., about 36 miles, and Port Hope to Peterborough, about 30 miles.

Oct. 13, 1910.—From west boundary of Pickering tp. to Cobourg, Ont., about 55 miles.

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July Birthdays.

Many happy returns of the day to—
 J. H. Black, Superintendent, Temiskaming and Northern Ontario Ry., North Bay, Ont., born near Smiths Falls, Ont., July 8, 1874.
 M. S. Blaiklock, Engineer Maintenance of Way, G.T.R., Montreal, born at Quebec, July 19, 1859.
 D. E. Blair, Superintendent of Rolling Stock, Montreal St. Ry., Montreal, born at St. Thomas de Montmagny, Que., July 25, 1877.
 D. C. Coleman, Superintendent Car Service, Western Lines, C.P.R., Winnipeg, born at Carleton Place, Ont., July 9, 1879.
 Geo. Collins, General Manager, Central Ontario Ry., Trenton, Ont., born at Kingston, Ont., July 20, 1860.
 D. D'E. Cooper, Canadian Freight Agent, Lehigh Valley Rd., Toronto, born at Buffalo, N.Y., July 8, 1862.
 John Corbett, General Foreign Freight Agent, C.P.R., Montreal, born in Lanarkshire, Scotland, July 19, 1863.
 E. J. Coyle, ex-Assistant General Passenger Agent, C.P.R., Vancouver, B.C., born at Stayner, Ont., July 23, 1870.
 S. E. Dewey, Travelling Freight Agent, G.T.R., New York City, born at Beckenham, Kent, Eng., July 4, 1879.
 J. F. Dolan, City Passenger and Ticket Agent, Richelieu and Ontario Navigation Co., Montreal, and President Canadian Ticket Agents' Association, born at Kingston, Ont., July 1, 1868.
 F. C. Foy, Canadian Passenger Agent, New York Central Lines, Toronto, born there, July 5, 1881.
 J. H. Gordon, Travelling Freight Agent, C.P.R., Winnipeg, born there, July 21, 1883.
 W. R. Haldane, ex-Division Freight Agent, Kootenay and Boundary District, C.P.R., Nelson, B.C., born at Galashiels, Scotland, July 6, 1867.
 J. H. Hanna, ex-Division Freight Agent, G.T.R. at Hamilton, Ont., now at Calgary, Alta., born at London, Ont., July 27, 1867.
 R. K. Harris, Resident Engineer, C.P.R. Orford Branch, Kingsbury, Que., born at Maitland, Ont., July 20, 1866.
 A. D. Huff, Division Freight Agent, G.T.R., Ottawa, born at Chatham, Ont., July 17, 1866.
 C. A. Jaques, General Manager, Merchants Montreal Steamship Line, Montreal and Lake Erie Steamship Co., and Montreal and Great Lakes Steamship Co., Montreal, born there July 15, 1849.
 J. P. Kavanagh, Local Manager, Ogdenburg Coal and Towing Co., Montreal, born at Plattsburg, N.Y., July 17, 1862.
 R. G. McNeillie, District Passenger Agent, C.P.R., Calgary, Alta., born at Lindsay, Ont., July 1, 1883.
 T. J. Maguire, Accountant, Quebec Central Ry., Sherbrooke, Que., born at Quebec, July 31, 1860.
 R. E. Perry, Assistant General Freight Agent and Chief of Tariff Bureau, Intercolonial Ry., Montreal, born at Drayton, Ont., July 5, 1876.
 W. S. Poole, Mechanical Superintendent, Prince Edward Island Ry., Charlottetown, P.E.I., born at Burslem, Eng., July 20, 1844.
 R. Preston, Master Mechanic, Manitoba Division, C.P.R., Winnipeg, born at Toronto, July 28, 1863.
 J. E. Quick, General Baggage Agent, G.T.R. and G.T.P.R., Toronto, born at Richmond, Ontario Co., N.Y., July 10, 1851.
 G. G. Ruel, Chief Solicitor, Canadian Northern Ry., Toronto, born at St. John, N.B., July 5, 1866.
 P. E. Ryan, Secretary, National Transcontinental Railway Commission, Ottawa, born there July 26, 1876.
 Geo. Stephen, General Freight Agent, Canadian Northern Ry., Winnipeg, born at Montreal, July 5, 1876.

R. F. Struthers, Chief Inspector of Time Service, C.P.R., Winnipeg, born at Stratford, Ont., July 31, 1879.

Sir Thos. Tait, ex-Chairman, Board of Railway Commissioners for Victoria, Australia, born at Melbourne, Que., July 24, 1864.

H. T. Wilgress, Agent C.P.R. Pacific Steamship Service, Yokohama, Japan, born at Lachine, Que., July 29, 1857.

Canadian Northern Ry. Earnings, Etc.

Gross earnings, working expenses and net profits from July 1, 1910, with increases over, or decreases from, those of 1909-10:

	Earnings.	Expenses.	Net.	Net Increase.
July	\$1,225,100	\$876,900	\$348,200	118,600
Aug.	1,093,000	830,000	263,000	58,600
Sept.	1,279,900	898,700	381,200	69,700
Oct.	1,627,800	1,047,300	580,500	99,800
Nov.	1,565,400	1,006,500	558,900	11,500
Dec.	1,255,400	896,200	359,200	24,800
Jan.	822,600	720,900	101,700	20,800
Feb.	803,100	667,300	135,800	4,800
Mar.	1,270,600	915,800	354,800	82,500
Apr.	1,345,400	984,300	361,100	29,900
	\$12,288,800	\$8,843,900	\$3,444,400	\$478,900
Inc.	\$1,920,600	\$1,441,700	\$478,900	.....

Approximate gross earnings for May \$1,445,600, and for two weeks ended June 14, \$634,100, against \$1,224,900, and \$556,600, for same periods 1910.

C.P.R. Earnings, Expenses, Etc.

Gross earnings, working expenses, net profits, increases or decreases over 1909-10, from July 1, 1910:

	Earnings.	Expenses.	Net Profits.	Net Increase or Decrease
July	\$8,869,214.32	5,384,594.73	\$3,484,619.50	1,004,748.86+
Aug.	9,255,331.67	5,563,659.34	3,691,672.33	727,614.46+
Sept.	9,315,213.07	5,408,614.03	3,911,599.04	479,710.47+
Oct.	10,229,370.77	5,724,210.25	4,505,160.52	118,863.33+
Nov.	9,413,288.22	5,676,115.96	3,737,122.26	44,784.31+
Dec.	8,705,283.99	5,418,750.10	3,286,533.87	171,110.79-
Jan.	5,740,206.34	5,084,088.47	656,117.87	660,478.52-
Feb.	6,375,576.57	5,230,869.06	1,144,707.51	342,311.73-
Mar.	8,880,640.59	5,644,074.05	3,156,566.54	445,393.15+
Apr.	8,672,024.54	5,515,049.93	3,156,974.61	175,863.48+
	\$85,376,100.68	\$54,645,025.92	\$30,731,074.76	\$2,165,298.60+
Inc.	\$7,572,542.47	\$5,407,243.87	\$2,165,298.60	.....

Approximate gross earnings for May \$9,111,000, and for two weeks ended June 14, \$4,128,000 against \$8,215,000 and \$3,743,000 for same periods 1910

DULUTH, SOUTH SHORE AND ATLANTIC RY.—Operating revenue for April, \$236,707.91; operating expenses, \$179,271.86; net revenue, \$57,436.05, against \$279,388.81 operating revenue; \$192,689.12 operating expenses; \$86,699.69 net revenue or April, 1910. Aggregate operating income for 10 months ended Apr. 30, \$2,590,504.79; operating expenses, \$1,850,706.05; net revenue, \$739,798.74, against \$2,701,054.37 aggregate operating revenue; \$1,841,618.91 operating expenses; \$89,435.46 net revenue for same period 1909-10. Approximate gross earnings for May, \$279,655, and for two weeks ended June 14, \$132,694, against \$309,595 and \$131,489 for same periods 1910.

MINERAL RANGE RD.—Operating revenue for April, \$54,445.31; operating expenses, \$49,720.02; net revenue, \$4,725.29, against \$59,738.28 operating revenue; \$61,139.06 operating expenses; \$1,400.78 net expenses or Apr., 1910. Aggregate operating revenue for 10 months ended Apr. 30, \$623,485.02; operating expenses, \$597,205.51; net revenue, \$26,279.51, against \$699,862.55 aggregate operating revenue; \$614,549.04 operating expenses; \$85,313.51 net revenue for same period 1909-10. Approximate gross earnings for May, \$60,758, and for two weeks ended June 14, \$27,638, against \$62,390, and \$29,283 for same periods 1910.

MINNEAPOLIS, ST. PAUL AND SAULT STE. MARIE RY.—Operating revenue for April, \$986,613.31; expenses and taxes, \$775,742.22; operating income, \$210,871.09, against \$1,091,150.95 operating revenue; \$745,477.11 expenses and taxes; \$345,673.84 operating income for Apr., 1910. Aggregate operating revenue for 10 months ended Apr. 30, \$10,958,589.52; expenses and taxes, \$7,606,763.36; operating income, \$3,351,826.16, against \$12,872,762.68 aggregate operating revenue; \$7,381,065.99 expenses and taxes; \$5,491,696.69 operating income for same period 1909-10. Approximate earnings for May, \$1,670,942, and for two weeks ended June 14, \$846,756, against \$1,814,356 and \$906,616 for same periods 1910.

CHICAGO DIVISION.—Operating revenue for Apr., \$662,124.89; expenses and taxes, \$586,623.99; operating income, \$75,500.90, against \$812,423.13 operating revenue; \$559,611.19 expenses and taxes; \$252,811.94 operating income for Apr., 1910. Aggregate operating revenue for 10 months ended Apr. 30, \$7,442,248.24; ex-

penses and taxes, \$5,865,912.01; operating income, \$1,576,336.23, against \$7,334,602.02 aggregate operating revenue; \$5,114,061.09 expenses and taxes; \$2,220,540.93 operating income for same period 1909-10.

Grand Trunk Ry. Earnings, Expenses, Etc.

The following figures show the earnings of the G.T.R., C.A.R., G.T. Western Ry. and D.G.H. and M. Ry. separately, for Apr., as compared with Apr., 1910:—

	1911.	1910.
Earnings	\$2,864,400	\$2,684,600
Expenses	1,973,900	1,891,300
Net earnings	\$890,500	\$793,300
CANADA ATLANTIC RAILWAY.		
	1911.	1910.
Earnings	\$164,300	\$158,400
Expenses	153,600	138,300
Net earnings	\$10,700	\$20,100
GRAND TRUNK WESTERN RAILWAY.		
	1911.	1910.
Earnings	\$558,300	\$569,600
Expenses	461,000	438,600
Net earnings	\$97,300	\$131,000
DETROIT, GRAND HAVEN AND MILWAUKEE RY.		
	1911.	1910.
Earnings	\$160,300	\$154,700
Expenses	149,700	136,600
Net earnings	\$10,600	\$18,100

Approximate gross earnings for May, \$3,942,055, against \$3,731,820 for May, 1910.

TRAFFIC RECEIPTS OF THE SYSTEM.

	1911.	1910.	Increase.
Grand Trunk Ry.	\$2,831,630	\$2,683,966	\$147,664
Can. Atlantic Ry.	163,740	156,003	7,737
G.T. Western Ry.	552,424	536,731	15,693
D.G.H. & M. Ry.	168,008	159,840	8,168
Totals	\$3,715,802	\$3,536,540	\$179,262

Accidents at Highway Crossings.

The Board of Railway Commissioners passed order 13847, May 30, as follows:—Re sec. 275 of the Railway Act, and the amending acts 8-9 Edward VII., chap. 32, sec. 13, and 9-10 Edward VII., chap. 50, sec. 15; and re sec. 292 of the Railway, and circular 60, dated Mar. 7, 1911, regarding reports of accidents at highway crossings, issued under the Board's direction. Upon the application of the Michigan Central Rd., and to more clearly define the meaning of the said circular, it is ordered that where an accident has happened subsequent to Jan. 1, 1905, or hereafter happens, at a highway crossing, by a moving train causing bodily injury or death to a person using such crossing, and the company immediately protects such crossing by a watchman, such protection will be regarded as satisfactory to the Board until the company is able to make report and the Board has the accident investigated and the crossing inspected, or until further order.

Rapid Transportation of Silk.—The C.P.R. steamship Empress of India brought to Vancouver on its last voyage from Yokohama, a cargo of silk valued at over \$700,000, consigned to firms in New York, and the long journey across the Pacific Ocean and the North American continent was made in the record time of 17 days 1 hour. The Empress of India left Yokohama May 9, and arrived at Vancouver on the afternoon of May 20. There a special train was in waiting, and as soon as the silk could be unloaded from the boat it was reloaded on the train and rushed eastward. No more stops than were absolutely necessary were made, with the result that the train arrived at New York in five hours better time than the best previous time made by silk shipments from Yokohama. The silk weighed 340 tons, and it took nine cars to transport it.

The C.P.R. has opened emigration offices at Dalny and Harbin, in Manchuria, for the purpose of securing settlers from Russian Siberia for Canada.

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Telephone Dispatching on C. P. R.

Figures supplied by W. J. Camp, Electrical Engineer, C.P.R. Telegraph Department, shows that the C.P.R. leads all the railways in America in point of the number of miles of its lines equipped with telephone train dispatching circuits. The C.P.R. has 3,955 miles of its lines equipped with the new system, which is 71 miles more than its nearest competitor—the Atchison, Topeka and Santa Fe Ry. If the C.P.R.'s subsidiary lines are taken into consideration, the Canadian road has an even greater lead on its United States rivals, as the Minneapolis, St. Paul and Sault Ste. Marie Ry. has 190 miles of its lines equipped with the system, which, added to the figures of the C.P.R. proper, gives a total of 4,140 miles.

The C.P.R.'s showing is a gratifying one when it is remembered that on the two sides of the border there are over 150 railways which are using the system on a part at least of their lines. Of course the greater part of these lines have not displayed the same aggressiveness as the C.P.R. in extending the system, but that is not to be wondered at when the huge expenditures involved in changing from the telegraph to the telephone are considered. As can be readily understood, the cost of making the change varies with different roads, but, commonly speaking, the telephone system of train dispatching is between seven and eight times more expensive to install and operate than the old system of dispatching trains by telegraph. However, the extra expense is fully justified by the greater efficiency of the telephone service.

The physical differences in the two systems are the use of two copper wires for the telephone system in place of one iron wire, and selective calling apparatus in place of the telegraph key. The operating differences are that orders are transmitted by speech instead of by Morse code, and stations are called selectively and distinctly by an electric bell in lieu of the telegraph signal. The orders are issued by the dispatchers orally, word by word, names of places and numbers being spelled letter by letter to insure accuracy. The dispatcher writes the order in his book and he dictates it to the operators, thus regulating the order to such a rate as to enable the order to be readily copied by the receiving operators. The sending of the proper calling combination from the di-



A telephone train dispatcher on the C.P.R.

spatcher's office is accomplished by an individual calling key, and each station as called by the selector gives an automatic answer back. This gives the official making the call positive assurance that the call has been received at the desired station, the distinctive combination of the station being repeated to the dispatcher.

At present 20 gangs are stringing wires, etc., in connection with this system on the C.P.R., and within the last few weeks orders for 260 selectors have been placed for use on new circuits. Of these new selectors, 192 will be placed in the company's eastern lines, and the remainder on its western lines.

Altogether in Canada and the United States there are 46,077 miles of the system in use, of which the C.P.R. and the other Canadian roads operate 4,360. The leading railways in this respect are as given in the next column.

	Miles.
Canadian Pacific	3,955
Atchison, Topeka and Santa Fe	3,884
Great Northern	3,881
Illinois Central	2,550
Chicago, Burlington, Quincy	2,353
Chicago, Rock Island and Pacific	2,249
Pennsylvania Ry.	2,137
Chicago, Milwaukee and St. Paul	1,770
Southern Pacific	1,377
Northern Pacific	1,190
Norfolk and Western	1,060
Lake Shore and Michigan Southern	958
St. Louis and San Francisco	825
Union Pacific	815
Chicago and North Western	743
Michigan Central	714
Lehigh Valley	643
Lake Erie and Western	571
N. Y. Central	521

Wire Crossing Over Railways.

The Board of Railway Commissioners passed order 13732, May 26, as follows:—Whereas, by sec. 7 of the act to amend the Railway Act, assented to May 19, 1911, sec. 4 of chap. 50 of the statutes of 1910, is repealed, and the following is enacted as sub-section 5 of sec. 246 of the principal Act:—

"5. An order of the Board shall not be required in cases in which wires or other conductors for the transmission of electrical energy are to be erected or maintained over or under a railway, or over or under wires or other conductors, for the transmission of electrical energy with the consent of the railway company or the company owning or controlling such last mentioned wires or conductors, in accordance with any general regulations, plans or specifications adopted or approved by the Board for such purposes."

Therefore it is ordered that the "Standard Conditions and Specifications for Wire Crossings," approved by order 8392, Oct. 7, 1909, be adopted and approved pursuant to the said amendment. And it is further ordered that order 10637, dated May 17, 1910, be rescinded.

The following circular has been issued to C.P.R. employes concerned, by C. Murphy, Superintendent of Transportation:—"Engines and cars when being attached to trains carrying passengers must be brought to a dead stop 6 to 10 ft. from the train to which they are to be coupled, and then, upon proper signal, the coupling made carefully, to avoid shock."

Following are particulars of the telephone dispatching circuits on the C.P.R. on May 1:

Terminal Points.	Dispatchers' Location	Miles Ckt.	No. in use	Selectors spare	Kind of Equipment	Date put in service
St. John-Vanceboro	St. John	90	17	3	Gill and N. E.	* 1911
Vanceboro-Megantic	Brownville Jct.	216	26	3	"	* 1911
Megantic-Farnham	Farnham	182	20	4	"	March 31, 1911
Newport-Montreal	"	120	28	4	"	June 2, 1908
Quebec-Montreal	"	174	29	0	"	May 14, 1911
Brockville-Ottawa and Chalk River	Montreal					
Smith's Falls-Havelock	Smiths Falls	172	27	3	"	* 1911
Havelock-Toronto	Havelock	109	14	1	"	Wire all up 1911
Toronto-London	Toronto	101	18	0	"	* 1911
St. Thomas-Pt. Burwell	London	115	22	2	"	March 1, 1911
Toronto-Mustokos	"	227	36	2	"	June 1, 1911
Musokos-S. Ste. Marie	Toronto	132	30	2	"	May 11, 1911
Chalk River-Cartier	Sudbury	312	29	7	"	Dec. 27, 1910
Mattawa-Temiskaming	"	232	27	4	"	"
Carrier-White River	Orders relayed at Mat tawa	47	0	0	Bridging Magnos	Feb. 1, 1911
White River-Fort William	White River	269	19	3	Gill and N. E.	Oct. 1, 1910
Winnipeg-Brandon	"	251	17	5	"	Sept. 1, 1909
Brandon-Broadview	Winnipeg	133	23	3	"	Aug. 17, 1909
Broadview-Moosejaw	Brandon	132	14	6	"	Nov. 5, 1910
S. Current-Swift Current	Moosejaw	135	18	4	Sandwich & Kellogg	Oct. 20, 1910
Medicine-Hat-Calgary	"	111	15	5	Gill and N. E.	Nov. 27, 1910
Calgary-Hat-Calgary	Medicine Hat	147	14	6	" Kellogg	Oct. 1, 1909
Field-Revelstroke	"	180	18	3	"	* 1911
Revelstroke-Kamloops	Calgary	186	16	3	"	* 1911
	Revelstroke	130	15	1	"	* 1911
	"	129	10	2	"	* 1911
Total		3932	502	76		
	Bridging sets			4		

* Under construction.
† May be combined in one circuit.

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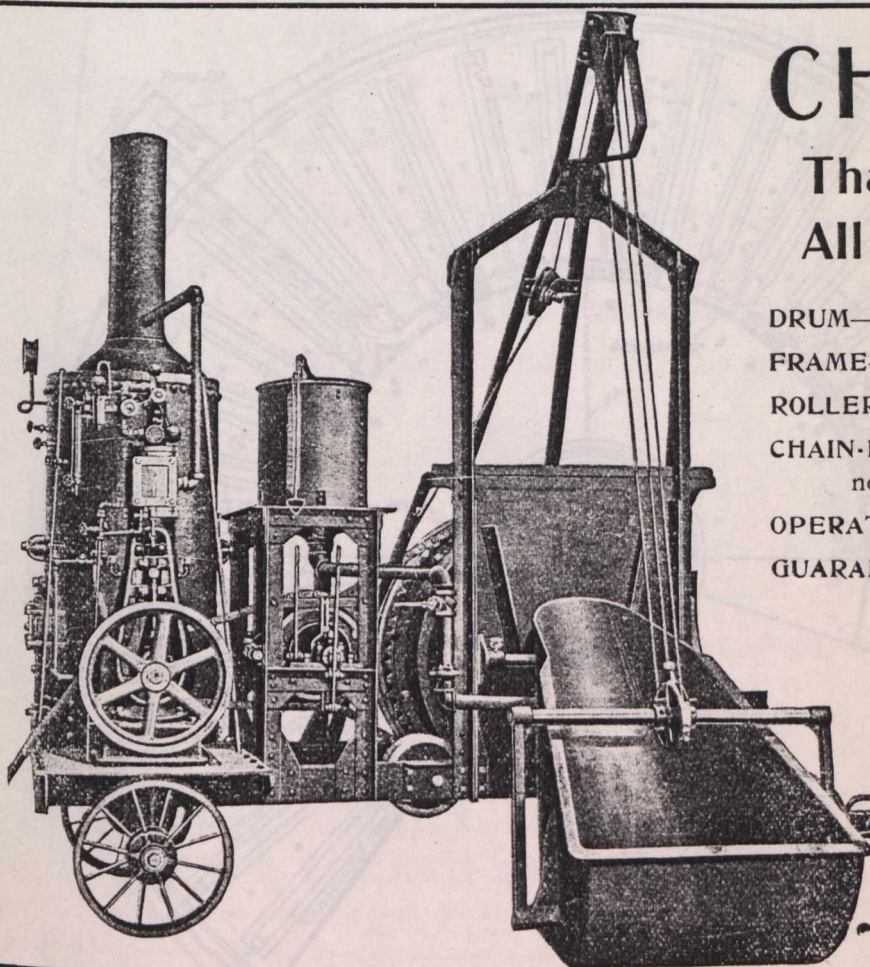
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Intercolonial Railway Roundhouse at Campbellton

In the disastrous fire which destroyed practically the whole of Campbellton, N.B., in July, 1910, the I.C.R. roundhouse was wiped out. Steps were immediately taken to restore the engine house facilities at this point, the actual work of construction being commenced on Sept. 13, 1910, and finished complete, as shown in the accompanying illustrations, early in January of this year. The building is laid out for 28 engine stalls, although the actual capacity is reduced to 25 engines because of the space of one stall being allotted to an entrance from the west, and the space equivalent to two stalls at the end of the building being devoted to the foreman's office, locker rooms and a machine and forge shop.

The radius of the inner circle is 89 ft. 2 5/8 ins. to the centre of the inside wall columns, and the distance between the inside and the outside walls is 85 ft. 6 ins. The roof is straight with a slope outwardly of 1/2 in. to the foot and is supported between walls by three concentric rows of 10 by 10 in. wooden columns set in cast iron shoes on concrete footings. The foundations of both walls and the linings of the engine pits are likewise of concrete.

The machine shop occupies the space in one corner of the building, is approximately 42 by 48 ft. in size, and is equipped with such forge and machine shop tools as are necessary to properly handle running repairs at isolated points. The space adjacent to the machine shop is divided into a locker room, the foreman's office and a larger room well adapted for use as a stock and tool room. On the second floor, above these

quarters, are stored heavy repair parts, these being handled by means of a hand-operated elevator. An industrial track runs around the building just inside the outer wall, greatly facilitating the handling of materials and parts between the pits and the shop and store room. The engine wheel drop-pits are located adjacent to the shop. The car and tender wheel drop-pit is to be changed from the location shown in the plan, next to the engine wheel pits, to pit 28 at the opposite end of the building. A turntable in the industrial track is provided opposite this pit, so as to allow of a closer approach with the industrial trucks.

The power house is a 40 by 51 ft. structure connected to the roundhouse proper by an enclosed passageway which is under the same roof with the general lavatory. The boiler room occupies a space 24 by 27 ft. in size, opposite which is the coal storage, 10 by 26 ft. in size. A chimney 4 1/2 by 4 1/2 ft. inside and 100 ft. high is erected on its own foundation, convenient to the boiler room, to which it is connected by means of an underground passage. The engine room is 38 by 22 ft. in size. The power house equipment consists of three one-hundred h.p. Robb-Mumford boilers, one 10 by 16 by 9 by 12 in. compound duplex steam pump for the main water supply and for fire protection, one 12 by 7 by 12 in. duplex end packed plunger pump for the boiler washout system, one 8 by 4 by 6 in. duplex end packed boiler feed pump, one air compressor unit supplemented by a small emergency compressor, and one 60 k.w. 250-volt Crocker Wheeler d.c. generator directly driven by a Robb Engineering Co.'s engine, for general lighting purposes.

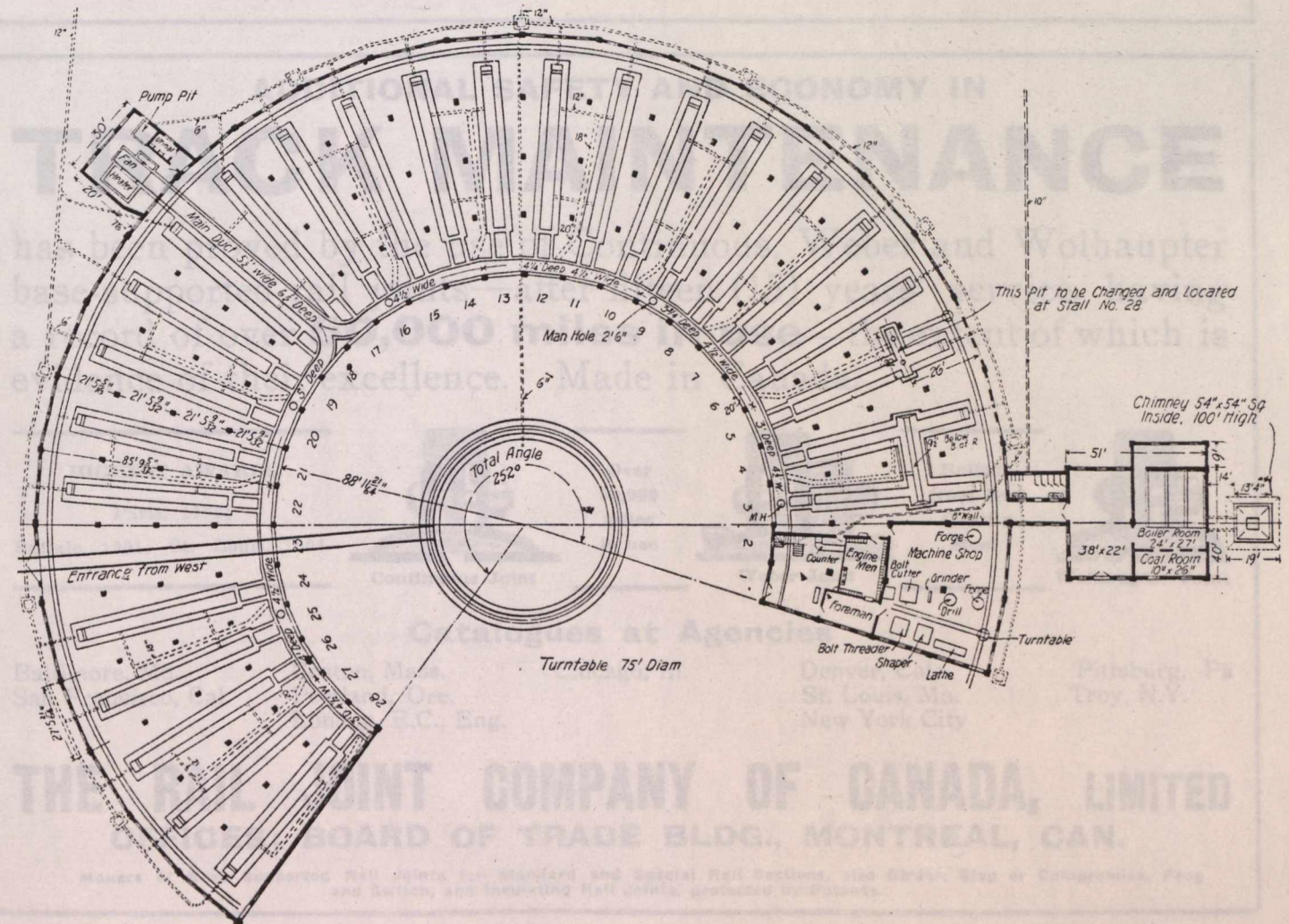
Lighting is effected by means of in-

candescent tungsten and arc lamps, the circuits for which are arranged in four divisions and are placed in conduits. Each of the four groups may be controlled from junction boxes located on the walls, so that, in case of derangement in any one group, repairs may be made without shutting off the entire system. Each line of columns carries three drop lights in addition to a hand lamp on an extension cord to be taken at will into and around the engines standing on the pits.

A hot-air heating system is provided, the main distributing duct being of concrete and located just inside the inner wall of the building, the foundation of the wall, in fact, forming one side of the duct. The fan room is about 30 ft. square and is located in a lean-to outside the building opposite pit 18. A main air duct, of concrete, 5 1/2 by 6 1/2 ft. in size, joins the fan room with the distributing duct previously mentioned. The branches from the distributing duct to the pits are made of 20 and 12 in. terra cotta pipe, each pit having two air outlets. Manholes are provided at intervals to permit access to the main duct for cleaning purposes. Drainage is provided for by means of a sewer laid just outside the building, into which a 6 in. connection from the end of each of the pits is made. An independent 10 in. drain is provided for the lavatories, both systems discharging into lower ground some distance away.

Ventilation is had through the smoke jacks and through four 4 by 4 ft. louvre ventilators on the roof near the inside wall. The smoke jacks are of cast iron. A 75 ft. turntable operated by a compressed air tractor is installed.

A boiler washout system has been installed involving the use of a 12 by 7 by



Intercolonial Railway Roundhouse at Campbellton, N.B.

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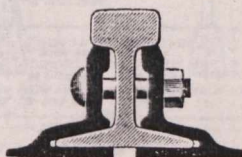
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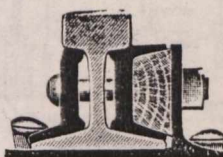
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Makers of Base Supported Rail Joints for Standard and Special Rail Sections, also Girder, Step or Compromise, Frog and Switch, and Insulating Rail Joints, protected by Patents.

Toronto Hamilton and Buffalo Ry.

The report of the directors as to the operations of the line for the year ended Dec. 31, 1910, as presented to the shareholders at the annual meeting in Toronto, June 6, shows that the company operates 79.88 miles of main line and 3.79 miles of branches. The capital stock outstanding consists of 25,000 shares of the par value of \$2,500,000, and there is also outstanding \$4,280,000 of bonds. During the financial year there was expended for additions and betterments, on account of cost of road and equipment, \$180,460.11, of which a net sum of \$92,700.49 was for new rolling stock.

The revenue from rail operation was \$1,145,769.10, against \$883,356.36 in 1909, while the expenses were \$631,285.18, against \$523,609.64. Taxes accrued amounted to \$4,700, against \$5,363.08; the income from other sources amounted to \$42,869.23, against \$36,149.25, making the gross corporate income \$552,653.15, against \$390,532.89. The total deductions from this, including the interest on funded and other indebtedness, was \$292,297.42, against \$230,805.45, leaving a surplus for the year of \$260,355.73, against \$159,722.44 for 1909. The increase of \$262,412.74 in operating revenue was largely due to an increase in tonnage of nearly all commodities handled, the largest increase being in manufactured articles. The increase of \$107,675.54 in operating expenses was mainly due to the increased volume of traffic handled. The deductions from corporate income show an increase of \$61,491.97, mainly due to the line of equipment.

The condensed balance sheet shows liabilities of \$8,384,784.54, including \$2,500,000 of common stock, \$3,280,000 of first mortgage bonds, \$1,000,000 of second mortgage bonds, \$323,100 Government and municipal aid received, \$535,195.58 working liabilities, \$17,650.87 of accrued but not due interest, etc., \$219,202.42 of appropriated surplus, and

\$509,635.67 of balance of profit and loss. The total assets include, in addition to cash in hand, etc., \$7,291,712.41 value of road and equipment June 30, 1907, and \$497,433.83 road and equipment since that date.

The statistics show:—Locomotive mileage: revenue 752,520, non revenue 20,887; train mileage: revenue 469,969, non-revenue 9,291; car mileage: freight, 4,581,219; passenger, 1,111,449; special, 4,035; total, 5,696,703; non-revenue, 129,053. Revenue freight carried, 1,829,356 tons, against 1,319,663 tons; company's freight carried, 10,998 tons; tons of freight carried one mile, 71,617,255; tons of freight carried per mile of line, 855,949; average distance of haul; average number of tons per train-mile, 380; average number of tons per loaded car mile, 23.74; average number of loaded cars per train mile, 15.31; average number of empty cars per train mile, 7.99; average amount received for each ton of freight, \$0.42; average revenue per ton per mile, 1.080 cents; average revenue per mile of road, \$9,214.30; average revenue per train mile. Interline passengers carried, 334,251; local passengers carried, 94,016; commodation passengers carried, 91,255; total revenue passengers carried, 519,522; passengers carried one mile, 15,232,249; average distance carried, 29.32 miles; average per train mile, 54.23 miles; average per car mile, 16.50; average amount received from each passenger, \$0.58; average revenue per passenger per mile, 1.989 cents.

The following directors were re-elected for the current year:—W. C. Brown, W. H. Newman, C. F. Fox, New York; H. B. Ledyard, Detroit, Mich.; Sir Thos. G. Shaughnessy, D. McNeill, Montreal; E. B. Osler, N. Kingsmill, W. P. Torrance, W. L. Scott, Toronto.

J. Madill, C.P.R. ticket agent, Windsor, Ont., was entertained to dinner there recently on his leaving for Edmonton, Alta., where he has been appointed City Agent, Canadian Northern Ry.

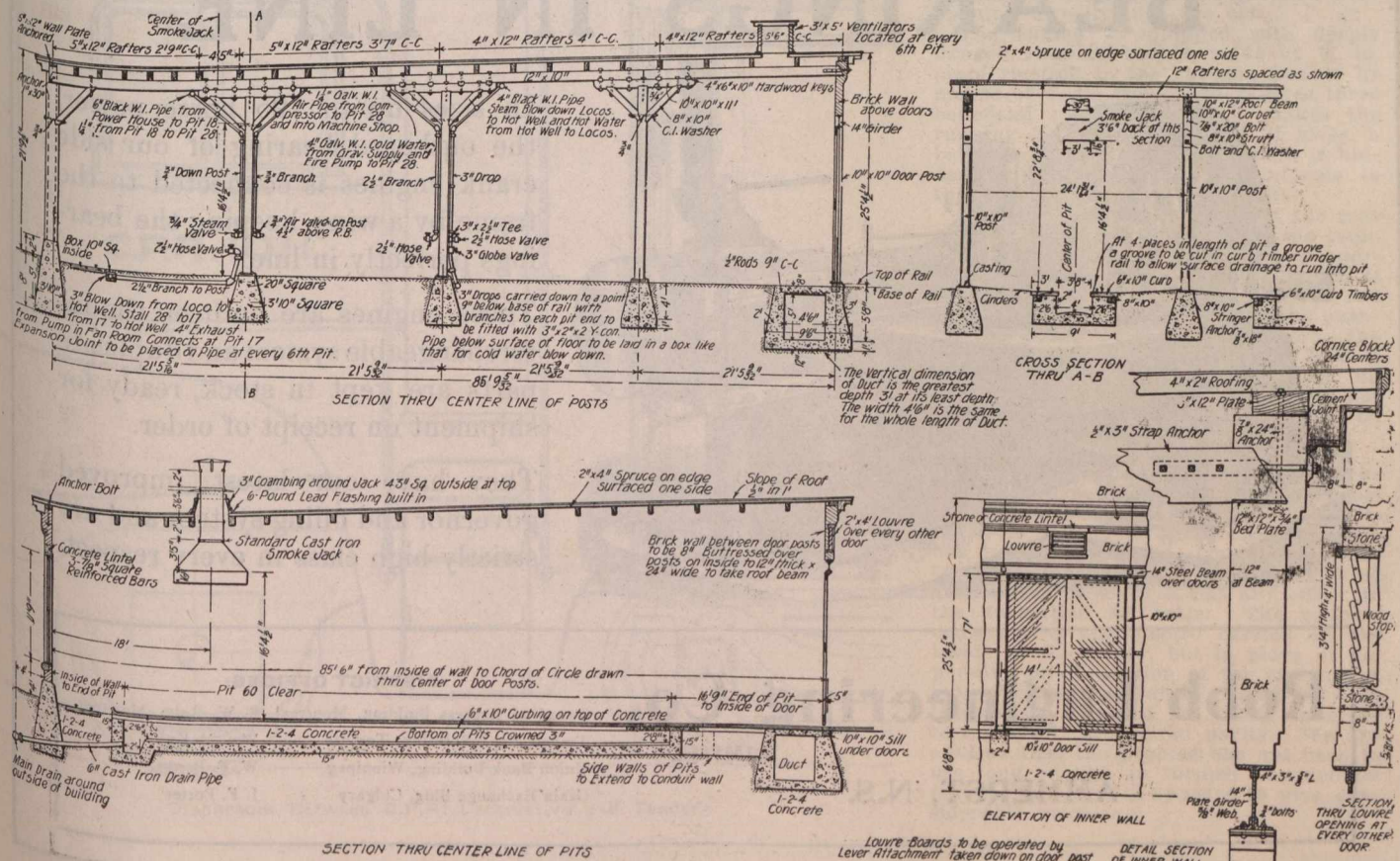
12 duplex steam pump controlled by a pressure regulator, a piping system with outlets between each pair of pits, and a blowoff pipe system with similar outlets. The pump and blowoff pipe are connected to a hot well located at the rear of the building, to which all exhausts and other drips are taken from all parts of the plant. When a boiler is washed out the water it contains is blown into the hot well through the blowoff tank pipe, the pump is started, and being controlled by the aforementioned regulator, is stopped when the pressure in the system reaches 90 lbs., and immediately starts up as the pressure decreases, due to opening any of the outlets throughout the building. In this way, a boiler can be washed out and refilled with warm water. The blowoff pipe is laid in a 10 by 10 in. spruce conduit passing around the house between the ends of the pits and the industrial track. The hot and cold water, the steam and the air pipes are suspended from the roof timbers.

For the foregoing information and the illustrations we are indebted to T. C. Burpee, Engineer of Maintenance of Way, I.C.R., under whose direction the work was devised and carried out.—
Railway and Engineering Review.

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

	Acres.
Canadian Northern Ry.	198.20
Canadian Pacific Ry.	94,794
Grand Trunk Pacific Ry.	900.82
Manitoba and North-Western Ry.	12.27
Qu'Appelle, Long Lake and Saskatchewan Rd. and Steamboat Co.	4,001.66
Total	5,207.244

J. F. Philp, City Passenger Agent, Grand Trunk Pacific Railway, Edmonton, Alberta, in remitting his subscription, writes:—"The Railway and Marine World is always a welcome visitor and keeps one in touch with the railway happenings that are of most interest."



Intercolonial Railway Roundhouse at Campbellton, N.B., Cross Sections and Details.

Why the G. P. R. North Toronto Route to Ottawa and Montreal is the Logical One

The train leaves as follows:

Leave North Parkdale	- - -	9.15 p.m.	Arrive Ottawa, 6.50 a.m.
Leave West Toronto	- - -	9.30 p.m.	Arrive Montreal 7.00 a.m.
Arrive North Toronto	- - -	9.40 p.m.	Daily except Sunday.
Leave North Toronto	- - -	10.00 p.m.	Will Stop at Westmount.

- ¶ The residents of Toronto are adjacent to either North Parkdale, West Toronto or North Toronto stations, same being easily accessible and closer to residential districts.
- ¶ The North Toronto route is over an hour faster and overcomes a long hill climb for the train out of Toronto, obviating any inconvenience and ensuring early arrival at Montreal and Ottawa.
- ¶ The roadbed has been improved till it is unexcelled in Canada.
- ¶ The equipment is "Canadian Pacific Standard," a synonym for the "best" and attentive porters, non-obsequious, ensure efficient service.

SLEEPING CAR SPACE HELD

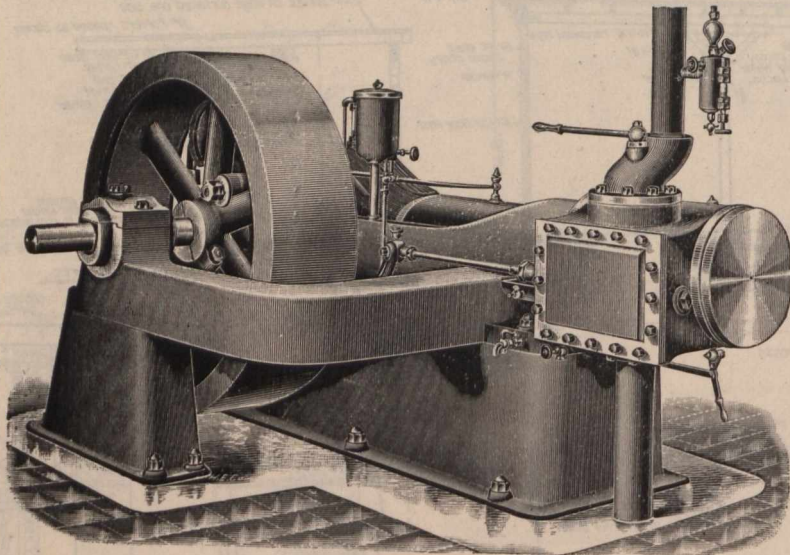
Toronto City Office, 16 King St. East

North Toronto Station

King Edward Hotel

West Toronto Station

BEARINGS IN LINE



In sizes up to 125 horse power, the outboard bearing of our side crank engines is connected to the frame by a wing, keeping the bearings perfectly in line.

These engines are built on the interchangeable system and duplicate parts are kept in stock, ready for shipment on receipt of order.

They have our latest improved governor and oiling system and are strictly high class in every respect.

Robb Engineering Co.

LIMITED

AMHERST, N.S.

DISTRICT OFFICES:

Canadian Express Building, Montreal,	R. W. Robb, Manager
Traders Bank Building, Toronto	- Wm. McKay, "
Union Bank Building, Winnipeg	- W. F. Porter, "
Grain Exchange Bldg. Calgary	- J. F. Porter, "

Improved Cabs and Diaphragms for C. P. R. Locomotives.

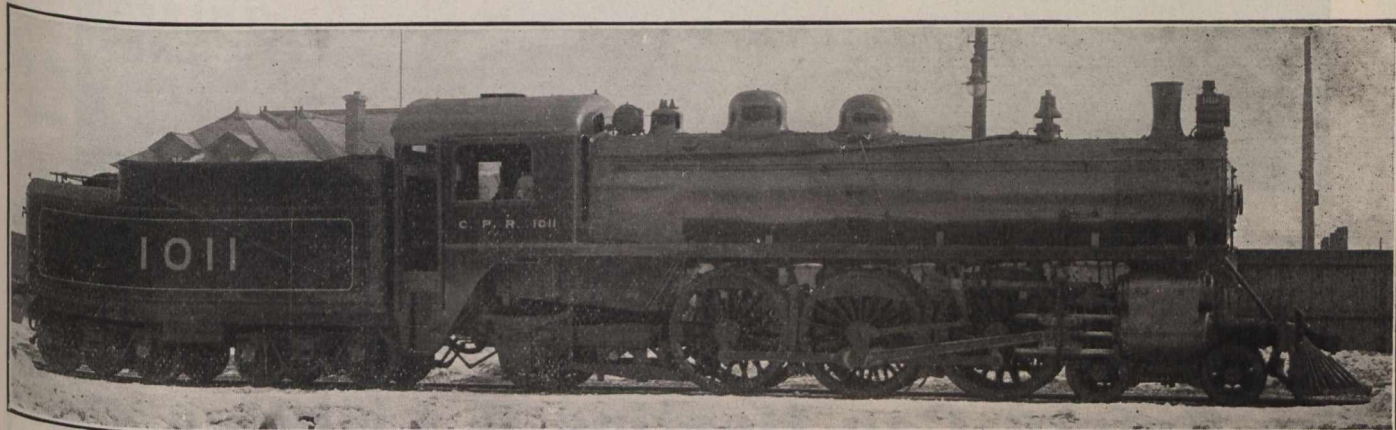
An innovation which will be much appreciated by locomotive firemen is being tested by the C.P.R. on some of its new locomotives. Hitherto the locomotives and tenders have been separated, with only canvas curtains between to protect the men from stormy weather. In the change which is being tested the principal change from the standard type of cab is that the back has been extended to within eight inches of the front of the tender tank. The tender step has been moved forward and placed on the engine directly underneath the cab door. A wall has been run across

the back of the cab, and a diaphragm connects it to the front of the tender in a similar manner to a passenger car. This allows of an entirely closed cab, as with the old type, dust and snow could be drawn in through the back curtains. The new form of cab and the diaphragm were applied experimentally to locomotive 1011, which was turned out at Angus shops, Montreal, in March. The driver, who is running this locomotive, likes the arrangement very much. The innovation is also being tried on four more passenger locomotives of the same type, and if the experiment proves satisfactory it is likely to be generally adopted by the company.

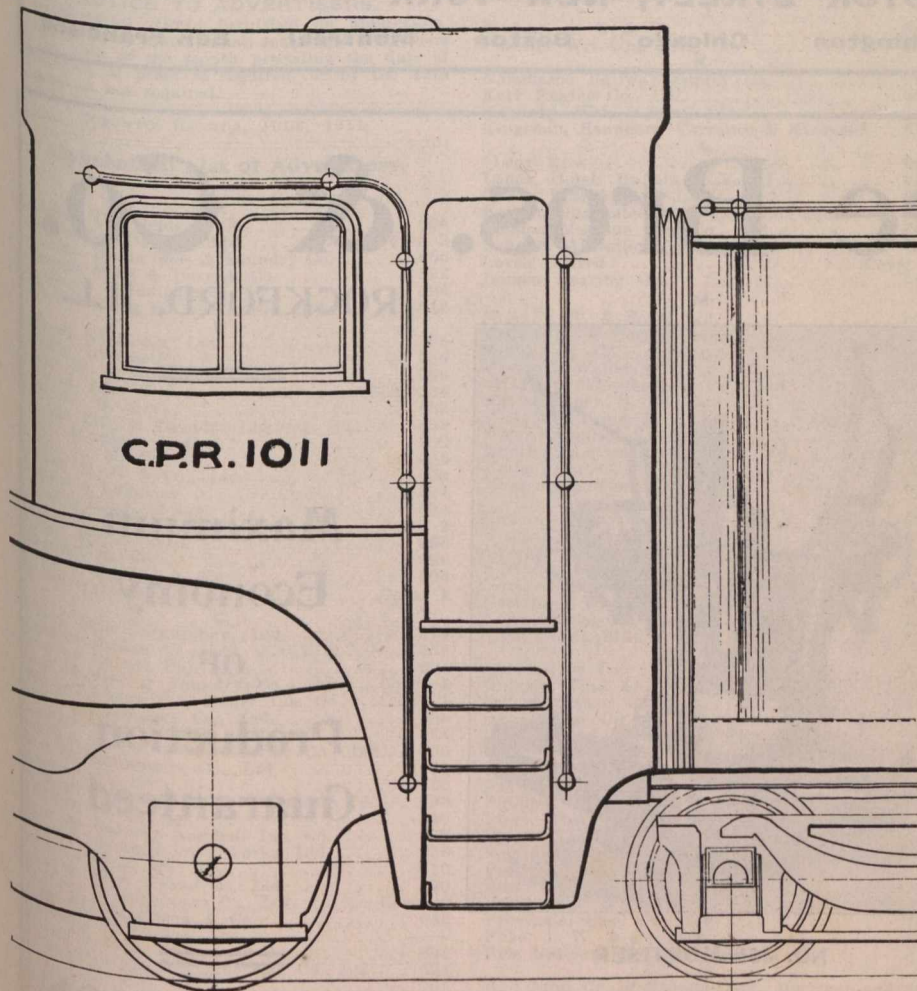
The accompanying half tone illustration gives the general appearance of the

cab, but does not clearly show the diaphragm, which is, however, shown in the accompanying line reproduction of the preliminary drawing. We are indebted to G. I. Evans, Mechanical Engineer C.P.R., for the particulars and for the photograph and drawing.

Lacey R. Johnson, Assistant Superintendent of Motive Power, C.P.R., Montreal, writes in reference to the improved cab and a coal pusher arrangement on the tender:—The cab was converted from an ordinary cab with a peak extending over the tender, and is so arranged that the peak of the cab extends a sufficient distance from the front of the tender to allow of the diaphragm being applied to take up the movement of the engine and tender. The diaphragm



Improved Cab for Canadian Pacific Railway Locomotives.



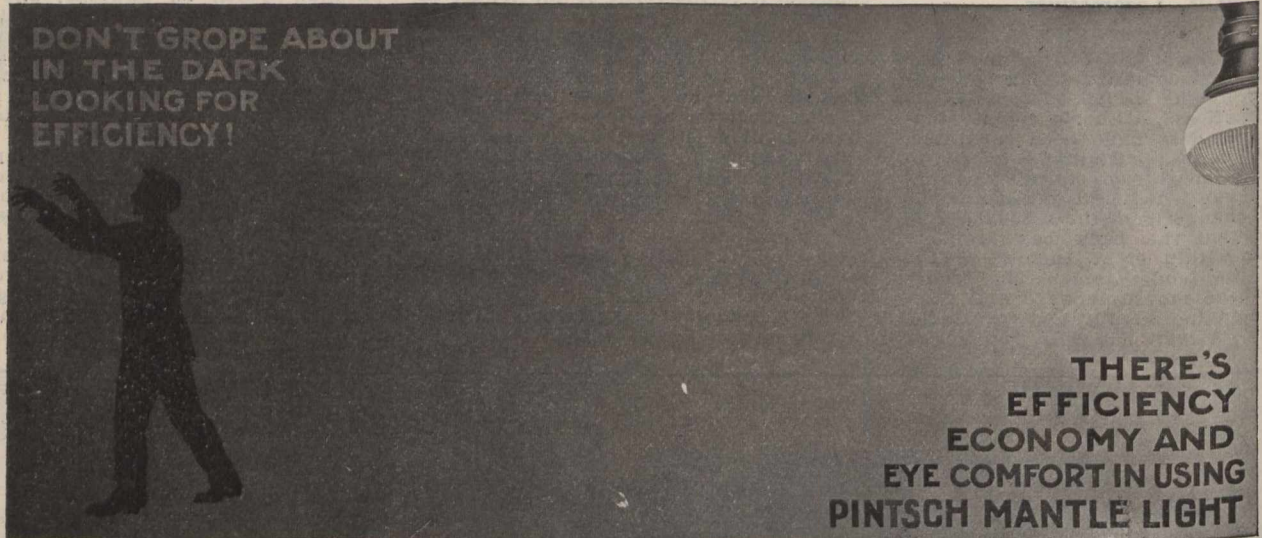
Diaphragm Between C.P.R. Locomotive and Tender.

is of the standard passenger car type, one end of which is bolted to the tender, and the other end to the friction plate, which is kept up by means of coil springs and slide on cab. Above the diaphragm is a deflector which extends from cab to coal space to prevent the coal getting into the folds of the diaphragm. This design of cab affords much more room and is more accessible from the side of the engine, owing to the door opening directly into the cab.

The engine is equipped with deeply flanged running boards made of ¼ in. plate rivetted to the running boards by means of angle irons, which gives three beneficial results. First, it makes the running board rigid; second, it gives a better hold for the piping, which is hidden from view; third, it conforms to the general design of the tender.

The coal pusher is located at the rear section of coal space on top of the tank, being hinged at the front, and is operated by means of air cylinder which is located in centre of tank. A piston rod is connected to the rear end of the pusher, the object of which is to force the coal close up to the coal gate. This is very beneficial, especially in going up heavy inclines, where the coal would not otherwise slide down to where it can be easily got at by the fireman.

Zinc Electro for Boiler Scale.—The C.P.R. is experimenting with a process on two or three feed water heaters to see if it will avoid the corrosion which has been experienced from this class of apparatus, and it is also being tried on a boiler to see if it has any effect on the formation of scale. The process comprises a zinc-electro carried on the inside of the boiler, but in place of depending on the action of the zinc alone, a very small current is passed between the zinc-electro and the boiler in order to maintain the desired parity. We are advised that the process has not been in use long enough to furnish any definite results, but that it appears to give considerable promise.



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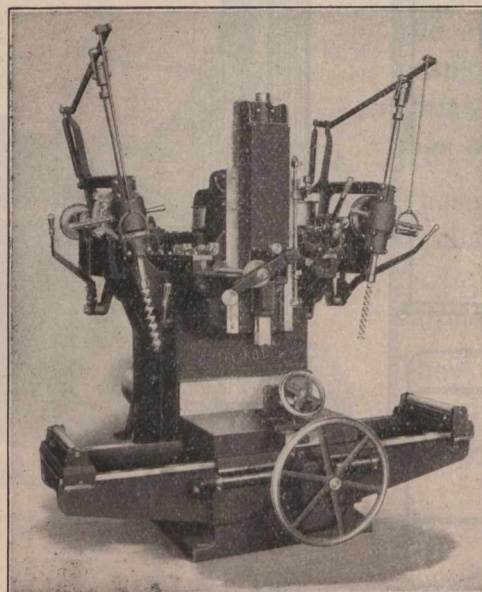
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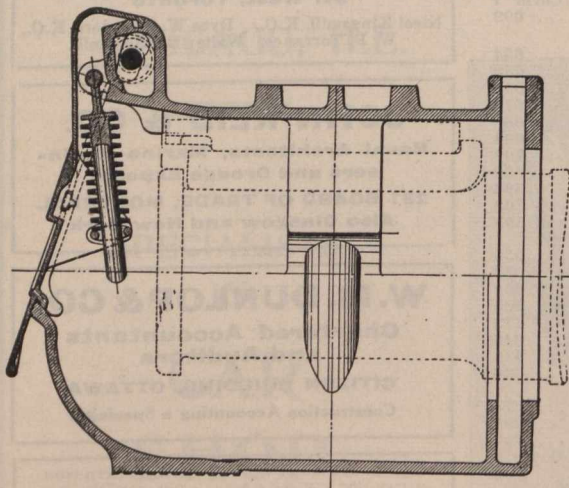
W. E. DAVIS, Passenger Traffic Manager, Montreal.

G. T. BELL, Asst. Pass. Traffic Manager, MONTREAL.

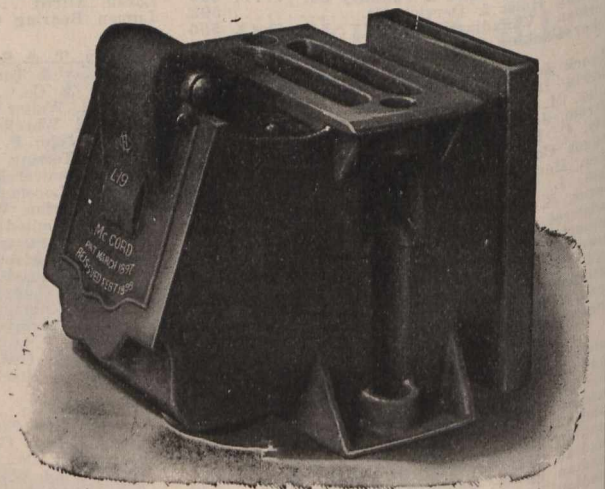
H. G. ELLIOTT, Gen. Passenger Agent, MONTREAL

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The McKIM Gasket
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THE HOLDEN CO., Limited
354 St. James Street, Montreal

RAILWAY DEVELOPMENT.

Projected Lines, Surveys, Construction, Betterments, Etc.

Albert and Moncton Ry.—The Dominion Parliament has incorporated a company with this title to build a railway from Hillsboro, via Albert Lines to Moncton, N.B. (April, pg. 319.)

Alberta Central Ry.—Reports from Red Deer, Alta., June 1, stated that nothing was being done in the way of construction on the line from that town towards the Brazeau River coal field, and that nothing would be done until the return of the Chief Engineer, J. Grant McGregor, from the east.

J. Grant McGregor, Chief Engineer, on his return to Red Deer, June 9, is quoted as having said that work will be resumed at once on the line westerly towards the Brazeau River.

The construction plans have been modified by the directors, and new tenders for the building of the line from Red Deer to Rocky Mountain House have been asked for, to be in by June 24. It is proposed to abandon all work on the eastern end of the line, and to concentrate all efforts towards getting the line through to Rocky Mountain House this year. (June, pg. 505.)

Alberta Pacific Ry.—Calgary, Alta., press dispatches, June 5, stated that the charter of the A. P. Ry. had been acquired by interests associated with the G.N.R., and this is apparently confirmed in Winnipeg papers of June 9. The charter is reported to have been held by Calgary and Winnipeg interests, and the Winnipeg dispatch stated that the company's legal representative here had stated that the charter had been sold to the Hill interests, and that construction would be started at once.

This company was formerly known as the Pincher Creek, Cardston and Montana Ry., the present title being authorized by the Alberta Legislature in Jan.

Dispatches from Pincher Creek, Alta., June 11, stated it is expected construction work will be started at an early date. J. A. Taylor, who has been prominently connected with the company for some time, always stated that the line would be built as a connecting link with the Great Northern Ry. system in Montana. A site for a station at the east end of Pincher Creek was approved by the ratepayers some time ago, but it is understood that the G.N.R. desire a more central location. (June, pg. 505.)

Alberta Ry. and Irrigation Co.—The Dominion Parliament has extended the time for building certain branch lines authorized by the act of incorporation. (Mar., pg. 205.)

Algoma Central and Hudson Bay Ry.—The Dominion Parliament has authorized the company to build a branch line from the Michipicoten line northerly for 9.5 miles, and has extended the time for the building of its projected line from the C.P.R. transcontinental line to Hudson Bay.

The Department of Railways has approved the route map of the Magpie branch, about nine miles. This is a branch of the Hyde Park Jct.-Michipicoten section, and was built in 1910. The Board of Railway Commissioners has authorized a connection with the C.P.R. at Hobon, Ont., by means of a transfer track. (June, pg. 505.)

Algoma Eastern Ry.—The Dominion Parliament has changed the name of the Manitoulin and North Shore Ry. Co. to the Algoma Eastern Ry. Co., and has extended the time for the building of its projected lines.

Plans of the revised location, connection and Y between mileage 43.64 and mileage 46.44, have been approved by

the Board of Railway Commissioners.

The Board of Railway Commissioners has authorized the company to carry its line across the C.P.R. Sault Ste. Marie branch by an overhead bridge. (See Manitoulin and North Shore Ry., May, pg. 411.)

Alsek and Yukon Ry.—The Dominion Parliament has granted an extension of time within which the company may build its projected railway from the B.C.-International boundary at Klihini River to the Yukon-Alaska boundary, between latitude 63 and 64. (Feb., pg. 155.)

Atlantic, Quebec and Western Ry.—In the course of the investigation in London, Eng., into the affairs of the Charing Cross Bank, June 14, it was stated that this railway was the most important asset. It was hoped that it would be completed this year, but the trustees would have to find the money for the work. (Mar., pg. 409.)

Brandon Transier Ry.—An order was made by the Board of Railway Commissioners, June 14, directing that the line shall be built over the route mentioned in our last issue as having been accepted by the city council. The line is to be built by the Great Northern Ry. (Brandon, Saskatchewan and Hudson Bay Ry.), which company will also have charge of its maintenance and operation. The line is to be put in operation by July 15, and the several companies using it are to pay the cost of maintenance on a wheelage basis. (June, pg. 505.)

British Columbia and Dawson Ry.—The Dominion Parliament has incorporated a company with this title to build a railway from Lytton to Fort George, B.C. and from Telegraph Creek, B.C., to Dawson, Yukon, with a branch from Ashcroft to Vancouver, B.C. (Mar., pg. 205.)

British Columbia and White River Ry.—The Dominion Parliament has incorporated a company with this title to build a railway from Bear Creek, B.C., to the Chilkut River, and on to the Yukon-Alaska boundary. (Mar., pg. 205.)

Bruce Mines and Algoma Ry.—It was stated in Sault Ste. Marie, Ont., June 5, that G. P. McCallum and H. Appleton of that place, had acquired this railway on behalf of a syndicate. The line was built in 1901-02, and was put in the hands of a receiver in 1904. It extends from Bruce Mines to Bruce Jct. and Rock Lake, Ont., 17 miles, and has been operated irregularly for both freight and passenger traffic, but no returns have been made to the Department of Railways and Canals for several years.

We are advised that the line has been taken over by the interests named above, and that when the reorganization is completed G. P. McCallum will be President, and H. Appleton Vice President and General Manager. The new company intends to complete the line through to the National Transcontinental Ry., and to make connection with the C.P.R. and Canadian Northern Ry., on the north, and to connect on the south with the C.P.R. Sudbury-Sault Ste. Marie line. It is also expected that a branch will be built into the Porcupine country. It has not been decided whether the company will do the construction work itself or will ask for tenders.

Press reports state that plans have been prepared for the extension of the line from the present terminus at Rock Lake, Ont., to the C.P.R. transcontinental line at Ridout, and on to the National Transcontinental Ry., about 100 miles west of Cochrane, with a branch line into the Porcupine country. It is reported that preliminary surveys have been made, that it is expected to have everything ready to start construction by Aug. 1, and that it is hoped to have 15

or 20 miles of the extension completed by the end of the year.

Burrard Inlet Tunnel and Bridge Co.—An announcement was made in Vancouver, June 8, that a tentative agreement had been made between the company and the Vancouver, Westminster and Yukon Ry., respecting the construction of the combined railway and general traffic bridge over the Second Narrows of Burrard Inlet. The terms, it is understood, were arranged at Ottawa, in consultation with the Minister of Railways, but these terms have not been made public. An arrangement has been made for a discussion of the matter between the V., W. and Y. Ry. and the municipalities composing the B.L.T. and B. Co., and a statement has been made that work will be started within 60 days after the agreement is approved.

Caribou, Barkerville and Willow River Ry.—The Dominion Parliament has declared the line authorized to be built under the company's act of incorporation from the British Columbia Legislature, to be a work for the general advantage of Canada (April, pg. 319.)

Chicago, Milwaukee and Puget Sound Ry.—Press reports state that preliminary surveys have been made for a line from Moncton, Wash., direct to Vancouver, B.C., and that it was the company's intention to build the line at as early a date as possible. (June, pg. 505.)

Dominion Pacific Ry.—Press reports from Pincher Creek, Alta., state that local interests behind the application to the Dominion Parliament for the incorporation of this company are the same as were behind the application for the Alberta, Peace River and Eastern Ry. There is a slight difference in the route of the line which the D.P. Ry. desires power to build. (June, pg. 543.)

Essex Terminal Ry.—The Board of Railway Commissioners has authorized the company to cross the Canada Southern Ry., and the Detroit River Tunnel Co.'s line in Windsor, Ont. (June, pg. 505.)

Great Northern Mining and Ry. Co.—Following the annual meeting held at Eastern Harbor, N.S., June 6, an extraordinary meeting of the shareholders was held to authorize the directors to obtain a special act to remove the company's head office from Eastern Harbor to Quebec. P. Leclerk is secretary. (Sept., 1910, pg. 725.)

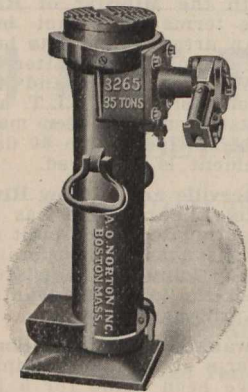
Grouse Mountain Scenic Incline Ry.—A start was made with the building of the first section of this short line, at North Vancouver, B.C., June 1, when the first sod was turned by the mayor. The starting point is at the terminal of a proposed extension of the B.C. Electric Ry. The directors are: L. C. Mills, W. H. R. Colliser, W. Manson, W. F. McGuigan, W. May. (April, pg. 319.)

Hudson Bay, Peace River and Pacific Ry.—The Dominion Parliament has incorporated a company with this title to build a railway from Fort Churchill to the Pacific Coast, and from Winnipeg to Fort Churchill.

The survey party referred to in our last issue as working from Edmonton, Alta., is in charge of D. B. McDonnell. (June, pg. 505.)

Intercolonial Ry.—We are advised that the improvements at the terminals at Halifax, N.S., for which Parliament recently voted \$600,000, will consist of the construction of three new piers, each 800 by 255 ft. They will be built throughout of cement concrete. A fourth pier will be built at a later date, according to a press dispatch. Sheds are to be built on the piers, two of them to be single story structures of reinforced concrete, and the other a two story building.

Norton's Improved HIGH SPEED JACKS

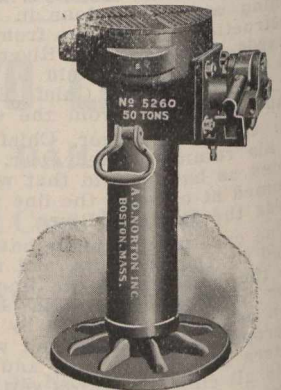


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— OFFICE AND WORK —

ESPLANADE STREET EAST, TORONTO

Plans and specifications for the proposed line in Guysboro county are being prepared, and it is reported from Ottawa that tenders will be called for the building of the lines within a few weeks.

Tenders were received to June 10 for the erection of a brick and stone passenger station at Mulgrave, N.S.

The projected line on Cape Breton Island, for which Parliament has voted \$200,000, will start from Alba, on the line to Sydney, 34.2 miles from Point Tupper on the Strait of Canso, and will cross the Grand Narrows by the Bras d'Or Lakes to Baddeck, a distance of about five miles. For some years an endeavor has been made to secure the building of a line from Orangedale, which is 4.9 miles nearer the Strait of Canso than Alba, into the coal areas of Inverness county, and subsidies were voted by the Dominion Parliament, as well as by the Nova Scotia Legislature, but nothing was done. It is expected that tenders will be asked for the building of the line at an early date.

A contract has been let to Rhodes, Curry and Co., Amherst, for the erection of an addition to the general offices at Moncton, N.B. The cost of the addition, which will double the capacity of the building, will, it is said, be about \$100,000.

The culverts between St. John and Coldbrook, N.B., a distance of three miles, are being strengthened and widened, preparatory to the laying of a second track.

We are officially advised that nothing has been decided in connection with the building of the proposed spur from Hampton station to Hampton village, N.B., for which Parliament has voted \$15,000.

A deputation of Newcastle, N.S., residents waited on the Government Railways Managing Board, June 14, and urged the extension of the Indiantown branch to Doaktown.

We were advised, June 16, that the following second track construction is being done by day labor, under the direction of the Engineer of Maintenance: between Coldbrook station and Jardine's Bridge, N.B., 1.25 miles; between New Glasgow station and the Pictou Landing branch, through a portion of New Glasgow, N.S., 0.5 mile.

Tenders are under consideration for the building of a six-stall addition to the engine-house at Stellarton, N.S.; and a passenger station at Fredericton, N.B.

Tenders will be received to July 20, for the construction of a reinforced concrete pier and sheds at the deep water terminus of the Intercolonial Ry. at Halifax.

The Managing Board informed a Moncton, N.B., deputation, June 10, that the cut-off from the new shops to Humphrey's will be built this summer, and that a new bridge would be built on St. George St. at once. A proposal to tunnel the railway crossing of Main St. is under consideration, and the deputation was informed that it was probable an order would be given at an early date for the work. (June, pg. 507.)

Joliette and Lake Manuan Colonization Ry.—The Dominion Parliament has extended the time within which the original line authorized to be built may be constructed, and has granted permission for extending the same from Joliette to Montreal.

Kaslo and Slocan Ry.—Press reports state that the local people who have secured control of the line have everything ready to start work on the repairs and reconstruction work, and are only waiting the handing over of the line by the Great Northern Ry.

The purchase of the line by the local syndicate from the Great Northern Ry. is reported to have been completed June 9. The syndicate was prepared to go on

with the reconstruction of the line, but was hampered by the reports that the C.P.R. proposed to build a line through a portion of the territory served. A deputation representing certain mining interests was endeavoring to make an arrangement with the C.P.R. as to the matter. J. L. Retallack, representing the syndicate, stated in an interview, June 9, that on all stages of the negotiations for the purchase of the line the C.P.R. officials had been consulted. (June, pg. 507.)

Kettle Valley Lines.—Location plans for the extension of the line from mileage 29 to 29.63 have been approved by the Board of Railway Commissioners. (June, pg. 507.)

The ratepayers of Penticton passed a by-law, June 2, granting municipal aid to the company in connection with the proposed wharf, etc., in the town.

Reports from Merritt, B.C., state that the first 30 miles of the extension at this end is expected to be completed early in July, and that work will be begun on the second section at once. At the Midway end good progress is being made. It was expected that a contract for the first 15 miles out of Penticton would be let by June 30. Some difficulty is being experienced in obtaining a suitable location from Trout Creek towards the Coldwater summit with the gradient required, and some new surveys are being made. It is expected that the work will be completed so that a contract may be let for a second section west of Penticton before the end of the year. The plans for the wharf at Penticton have been completed. The wharf will be 630 ft. long, and will end with an apron for landing scows carrying cars. A track will be laid along the wharf, and two spur lines will connect it with the main line. (June, pg. 507.)

Klondike Mines Ry.—A steel bridge has been built across the Klondike River, at Klondike City, Yukon, in place of the wooden trestle built when the line was constructed. (Oct., 1910, pg. 827.)

Kootenay and Alberta Ry.—A deed of mortgage securing an issue of \$600,000 of bonds upon the company's line, from the C.P.R., one mile east of Pincher station, to the Western Coal and Coke Co.'s property at Beaver Collieries, Alta., has been filed in the office of the Secretary of State, Ottawa.

Steel rails have been delivered at Pincher station, and are being hauled on to the right of way. The contractors have started additional plant on the work, and everything is going ahead rapidly. (June, pg. 507.)

Manitoulin and North Shore Ry.—See Algoma Eastern Ry.

Michigan Central Rd.—The issue of \$1,600,000 of bonds recently made in New York was for providing funds for building the new station and terminal in Detroit, Mich. The building will be 14 stories high and is estimated to cost \$2,000,000. (May, pg. 411.)

Montreal Central Terminal Co.—Resolutions were submitted to the shareholders at the annual meeting held in the C.P.R. Telegraph Building, Hospital St., Montreal, June 6, increasing the capital stock to \$20,000,000, and authorizing the directors to issue mortgage bonds. (June, pg. 507.)

New Brunswick and Prince Edward Island Ry.—The Board of Railway Commissioners has ordered the ballasting of the line from Sackville to Tormentine, N.B.; repairing of certain bridges, and the renewing of the draw span of Port Elgin bridge.

The mile spur line built by the Fawcett Manufacturing Co., Sackville, N.B., has been completed, and a connection made with the Intercolonial Ry. The extension from the factory to the quarry is nearly completed. (June, pg. 507.)

North Arm Bridge and Ry. Co.—The Dominion Parliament is being asked to

incorporate a company with this title to build a bridge across the North Arm of Burrard Inlet, Vancouver, B.C., from the Turtle's Head to the west shore on lot 575, north of White Rock Island. The bridge is to be for general traffic as well as steam and electric railways, and there are to be connected with it one or more lines not to exceed ten miles, and a line from lot 256 at the end of the C.P.R. from Port Moody, following the north shore of Burrard Inlet to Vancouver, or to connect with any other railway constructed on the north shore of Burrard Inlet. W. H. Langley, Victoria, B.C., is solicitor for applicants.

Ontario and Abitibi Ry.—The Dominion Parliament has incorporated a company with this title to build a line to connect the National Transcontinental Ry. with the Temiskaming and Northern Ontario Ry., in the vicinity of Abitibi Lake, in the provinces of Ontario and Quebec. (See New Ontario and Quebec Ry., May, pg. 409.)

Ontario-Michigan Ry.—The Dominion Parliament has incorporated a company with this title to build a line from Sarnia to Windsor, Ont., with branches, and to connect the same by car ferries with lines in the United States. (May, pg. 413.)

Pacific and Hudson Bay Ry.—Assent was given May 19 to the act passed by the Dominion Parliament for the incorporation of a company with this title to build a railway from Dean's Channel, on the Pacific Coast, easterly to Port Nelson or Fort Churchill, on Hudson Bay. (April, pg. 321.)

Pacific and Peace River Ry.—The Dominion Parliament has incorporated a company with this title to build a railway from Bella Coola, B.C., to Fort McLeod, thence through the Pine Pass to the Peace River at Dunvegan, Alta., about 480 miles. The members of the provisional directorate are Frenchmen, resident in Edmonton, Alta., and in France. The Corporations Agency, Montreal, is making investigations into the prospects of the country through which the line will pass on behalf of the company. (Mar., pg. 207.)

Quebec and New Brunswick Ry.—Application for an extension of time for the building of this projected railway was granted by the Dominion Parliament, May 18. (Feb., pg. 113.)

Quebec and Saguenay Ry.—We are advised that the contract let to O'Brien and Doheny, for the building of the first section of this line, is really a continuation of the Quebec Ry., Light and Power Co.'s line, which is built for 30 miles from Quebec to the vicinity of Cape Tourmente. The chaimage for the Q. and S.R. is continued from this point. The village of St. Jeachim is at about mileage 25 on the Q. Ry., L. and P. Co.'s line, but as the road had to be built 30 miles for subsidy purposes it was continued to near Cape Tourmente. The Quebec and Saguenay Ry. is one of the subsidiary companies of the Quebec Ry., Light, Heat and Power Co., of which the Quebec Railway, Light and Power Co. is also a subsidiary. The Q. and S.R. trains will be run through between Quebec and Cape Tourmente, both ways, over the Q.R.L. and P. Co.'s line, which at present is operated partly by steam and partly by electricity. It is proposed, though not definitely settled, to entirely electrify the Montmorency division between Quebec and Ste. Anne de Beaupre, with a divisional point at the latter place, and to operate from there to Murray Bay by steam motive power.

The point to which it is at present proposed to build the line is Pointe a Pic, 85.5 miles from Quebec.

A subcontract covering three miles of heavy work has been let to A. and W. D. Wheaton, and another section has

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been sublet to Walton and Tentles, Salisbury, N.B.

Plans have been filed with the Minister of Public Works, Quebec, showing the location of the line from mileage 85.6 to mileage 92.8 in Charlevoix county.

The contract with the Bishop Construction Co., Montreal and Toronto, calls for the building of 7.5 miles of line from the end of the O'Brien and Doheny contract, to the site of the East Canada Power and Pulp Company's works at Keeler. (June, pg. 507.)

Quinze River and Ottawa Ry.—The Dominion Parliament is being asked to incorporate a company with this title to build a railway from Kippawa, connecting with the C.P.R. Kippawa branch, northwesterly to the Quinze River, Que. Smith and Johnston, Ottawa, are solicitors for applicants.

Reid Newfoundland Ry.—Additional cargoes of steel rails have been received and the laying of track on the remaining 20 miles of the Bonaventure branch is being proceeded with. The work was expected to be finished by June 30. Work on the Waterford bridge is proceeding, and grading has been started at Bay Bulls on South Shore branch.

In the course of an interview, June 12, W. D. Reid, President, stated that of the four new branches under construction, that from Shoal Harbor to Bonavista,

of the conference it was arranged that a line is to be built from St. John to Grand Falls, N.B., and that it is to be operated by the Intercolonial Ry. The arrangement is subject to the approval of the Dominion and Provincial Governments.

Saskatoon and Hudson Bay Ry.—The Dominion Parliament has incorporated a company with this title to build a railway from Saskatoon via Melfort to Pas Mission, Sask. (Mar., pg. 207.)

Simcoe, Grey and Bruce Ry.—The Dominion Parliament has incorporated a company with this title, with the provisional directors named, and for the purposes set out in our Mar. issue, pg. 209. (May, pg. 413.)

Temiskaming and Northern Ontario Ry.—The final location surveys for the proposed diversion of the line for 40 miles northerly from North Bay, have been completed. The route selected shows a gradient of 0.75% as compared with 1.50% on the present line. It is expected that a decision will be reached at an early date as to construction.

It is understood that new station buildings are to be erected at Iroquois Falls, Matheson, Thornloe, Golden City and Swastika.

A survey party in charge of Prof. Ellis left Cochrane, June 10, to examine the country between that point and Hudson

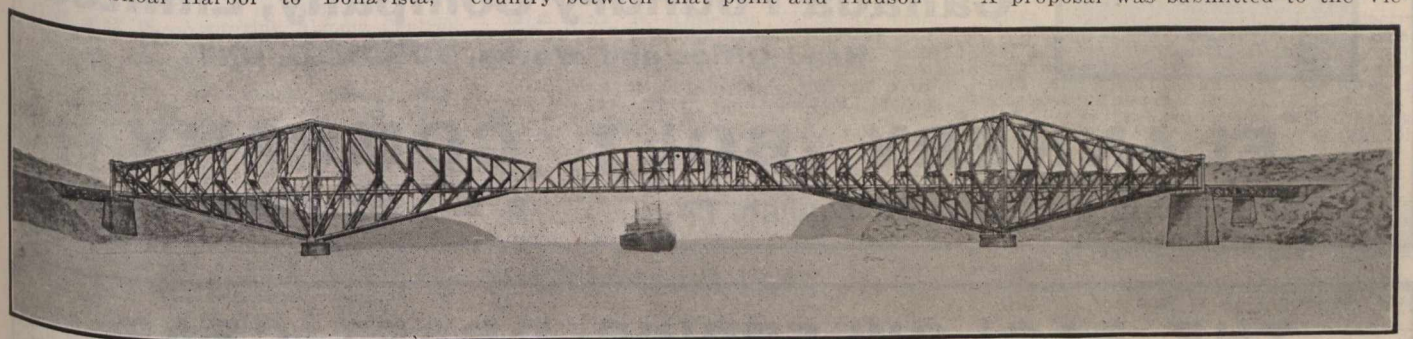
Toronto, Hamilton and Buffalo Ry.—Local press reports stated, June 14, that the company is acquiring 16 acres from the New England Co. at Brantford, Ont., for the purpose of increasing its yard and switching facilities. (June, pg. 509.)

Vancouver to Peace River.—The Vancouver, B.C. board of trade has had under discussion the necessity of building a line to the Peace River country, and favors a guarantee of the company's bonds being given by the Government. It was stated at one of the meetings recently that European capitalists were prepared to invest \$30,000,000 upon the construction of such a line if suitable arrangements could be made.

There are several charters available under which a line may be built, but neither of them are at present identified with the movement made by the board of trade.

Victoria, B.C.—Proposals are under consideration for the building of a line along the water front, from near the Outer Wharf by way of the harbor shore to Bridge St., and thence easterly to connect with the Victoria and Sidney Ry.; westerly across the Indian Reserve to connect with the railways there, and on to Esquimalt. It was stated, June 4, that the promoters expected to be in a position very shortly to place a proposition before the city council

A proposal was submitted to the Vic-



The Quebec Bridge.

Our May issue contained very full particulars in regard to the award of the contract for the Quebec Bridge, illustrated with plans of the bridge in course of construction, which collapsed, the Board of Engineers' design for the new bridge, a half elevation of the St. Lawrence Bridge Co.'s accepted design, and also several of the unaccepted designs. The illustration given above, reproduced from a perspective sketch made by the St. Lawrence Bridge Co., a photograph of which has been furnished us by the Board of Engineers, shows the bridge complete.

92 miles, will be completed this year. Trading has been started on the line from near St. John's to Trepassey, about 100 miles. Surveys are in progress on the other three branches, in preparation for construction next year.

St. John and Quebec Ry.—According to recent statements from St. John, N.B., there is behind the project for the building of St. John Valley Ry., a plan for the utilization of it in connection with the St. John and Quebec Ry., which is being promoted by a company for which A. R. Gould has secured a charter in the State of Maine. The plan, which was being discussed with the Minister of Public Works and representatives of the New Brunswick Government, June 12, is to utilize the St. John Valley Ry. to a point near the Maine boundary, make a connection with a branch of the C.P.R., running into Maine, which the St. J. and Q. Ry. has power to acquire, extend this to the Maine-Quebec boundary, and there connect with the projected Quebec and New Brunswick Ry., which has power to swing its line southerly to the Maine boundary. It is claimed that this plan shows a route of 374 miles from Quebec to St. John, and that Centreville, Wood-railway accommodation. (See St. John Valley Ry., June, pg. 541, and Aroostook Valley Electric Ry., May, pg. 453.)

Press dispatches state that as a result

Bay, with a view to determine its possibilities from an agricultural standpoint; and to look for a suitable harbor on James Bay.

Track was laid to Porcupine Lake on the new branch June 7, and the ballasting was completed from Iroquois Falls for 16 miles, and it is expected that the whole length of the branch will be completed ready for traffic by July 1. An arrangement has been made between the Commissioners and the owners of the Hollinger mine, according to a statement made May 30, by J. L. Englehart, Chairman, for the extension of the new Porcupine branch from Lakeview station, mileage 28.5, to Campbell veteran lot, mile post 33.5, just west of the Hollinger mine. Grading was started on the extension June 7. (June, pg. 507.)

Terminal Station for Toronto.—A. P. Gillies is reported to be engaged in working out plans for a terminal station building in Toronto, with tunnels under King and Queen streets from the Don River to Sunnyside, at an estimated cost of \$100,000,000. The city papers quote Mr. Gillies as stating that some of the persons interested in the Hudson terminal in New York City are joined with him in the present enterprise, for the carrying out of which authority will be asked from the Dominion Parliament. The statements made should be accepted with considerable reserve.

toria city council, June 9, by Barnard, Robertson and Heisterman, solicitors for the promoters, and it was decided to arrange for a full discussion of the matter.

Western Alberta Ry.—The Dominion Parliament has granted a further extension of time within which the company may build the lines authorized by chapter 90 of the statutes of 1898. (Feb., pg. 115.)

Transportation Conventions in 1911.

July 25-27. — International Railway General Foremen's Association, Chicago, Ill.

Sept. 19.—American Association of General Passenger and Ticket Agents, St. Paul, Minn.

Oct. 10.—Railway Signal Association.

Oct. 17-18.—American Railway Bridge and Building Association, St. Louis, Mo.

Oct. 19-21.—American Association of Dining Car Superintendents, Cincinnati, O.

Nov. 17-18.—American Association of Freight Traffic Officers, Cincinnati, O.

The C.P.R. has subscribed \$5,000 towards the expenses of the Dry Farming Congress to be held at Lethbridge, Alta., in 1912.

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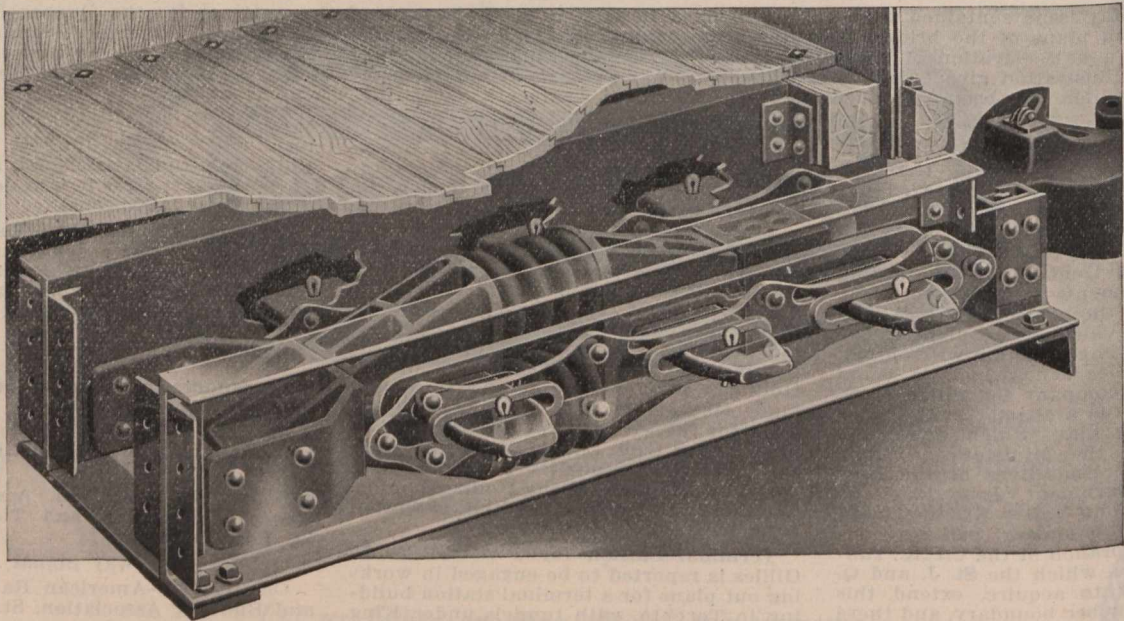
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Orders by the Railway Commissioners.

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

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

13686. May 17.—Approving standard tariffs of maximum merchandise tolls of 10 express companies, on application made through W. H. Burr, Chairman, Express Traffic Association, Toronto.

13687 to 13697. May 19, 22.—Authorizing Georgian Bay and Seaboard Ry. (C.P.R.) to cross highways in Mara, Eldon, Ops, Mariposa and Thorah tps., and to divert a highway in Thorah tp., Ont.

13698. May 19.—Authorizing C.P.R. to build second track across Pincher-McLeod trail in sec. 3, tp. 9, r. 26, w. 4 m., Alta.

13699 to 13701. May 20.—Authorizing C.N.O.R. to cross three highways and divert one in Nepean tp.

13702. May 22.—Authorizing C.N.O.R. to cross public road overhead in Portland tp.

13703. May 22.—Authorizing G.T.P. Branch Lines Co. to divert two highways on its Melville-Regina branch, Yorkton District, Sask.

13704. May 20.—Authorizing G.T.R. to build siding into Strathroy Furniture Co.'s premises, Strathroy, Ont.

13705. May 17.—Dismissing Chatham, Wallaceburg and Lake Erie Ry. application for extension of time in which to file joint tariff covering carriage of sugar beets, as required by order 12435, Oct. 14, 1910.

13706. May 16.—Approving Algoma Central and Hudson Bay Ry. bylaw authorizing H. J. Herrold, General Agent, to prepare and issue tariffs of tolls.

13707. May 22.—Authorizing Georgian Bay and Seaboard Ry. (C.P.R.) to cross highway between Ops and Fenelon tps., Ont.

13708. May 22.—Approving revised table of graduated charges for shipments weighing less than 100 lbs. contained in Supplement 1 to Express Classification for Canada 2.

13709, 13710. May 22.—Authorizing G.T.R. to build sidings to premises of William Clark, on lot 166, St. Remi, Que., and R. F. Firth and Sons, and A. Keith, Etobicoke tp., Ont.

13711. May 22.—Approving location of G.T.P. Branch Lines Co.'s Melville-Regina branch, from mileage 90.74 to Regina city limit, mileage 92.62, Sask.

13712. May 22.—Approving G.T.R. standard floor for bridges.

13713. May 22.—Authorizing Hamilton Bridge Co. to lay water pipe under G.T.R. near Trolley St., Hamilton, Ont.

13714. May 22.—Authorizing C.P.R. to build 15 bridges on its Atlantic, Eastern, Ontario, Lake Superior, Manitoba and Saskatchewan Divisions.

13715. May 22.—Authorizing C.N.O.R. to build bridge over creek at station 316-17, Haldimand tp.

13716 to 13718. May 22.—Authorizing C.N.O.R. to cross three public roads in Nepean tp.

13719. May 22.—Authorizing C.P.R. to build spur for Brackman-Ker Milling Co., Bengal, Alta.

13720. May 22.—Authorizing C.N.O.R. to build bridge over creek at station 1376-38, Brighton tp.

13721. May 22.—Authorizing Georgian Bay and Seaboard Ry. (C.P.R.) to cross town line between Mariposa and Fenelon tps., Ont.

13722. May 23.—Extending to Aug. 1, time for completion by G.T.P.R. of farm crossing for W. Smith, Huxley, Alta.

13723. May 23.—Ordering C.P.R. to carry out terms of order 13460, Apr. 19, re providing farm crossing for J. Gevart, Young, Sask., within 30 days, under penalty of \$25 a day.

13724. May 23.—Authorizing Canadian Northern Pacific Ry. to cross C.P.R. Mission branch, interlocking plant to be installed.

13725. May 23.—Authorizing C.P.R. to use bridges 30.5, 50.54 and 19.32 on its Atlantic Division, New Brunswick Southern Ry.

13726. May 23.—Extending to July 1 time for installation of gates by C.P.R. at Pacific Ave., St. Louis de Mile End, Montreal, Que.

13727. May 17.—Authorizing G.T.P. Branch Lines Co. to divert highways on its Calgary branch in n.w. ¼ sec. 11, tp. 25, r. 28, and s.w. ¼ sec. 25, tp. 35, r. 23, w. 4 m., Alta.

13728. May 17.—Ordering C.P.R. to provide level crossing at Carleton Ave., Nepean tp., Ottawa Front, Ont.

13729. May 22.—Ordering G.T.R. to build station and make changes in yard tracks at Powassan, Ont., by Nov. 1, under penalty of \$25 a day.

13730. May 26.—Authorizing Georgian Bay and Seaboard Ry. (C.P.R.) to cross road allowance in Ops tp., Ont.

13731. May 26.—Amending order 13494 re laying and maintaining of water or other pipes under railways.

13732. May 26.—Rescinding order 10637, re erection and maintenance of wire crossings over railways.

13733. May 27.—Approving location of Kettle River Valley Ry. from mileage 29 to 29.63, B.C.

13734. May 26.—Extending to Aug. 31 time for completion of crossing of Lachine Road at Rockfield, Que., by G.T.R.

13735, 13736. May 26.—Authorizing Georgian Bay and Seaboard Ry. (C.P.R.) to cross five highways in Manvers and Ops tps., Ont.

13737. May 22.—Authorizing Manitoulin and North Shore Ry. to cross C.P.R. Sault Branch overhead.

13738. May 23.—Authorizing town of Montreal West to lay pipe under G.T.R. and Montreal Park and Island Ry. at Inspector St., Montreal.

13739. May 27.—Authorizing C.N.O.R. to build through unsurveyed territory, Algoma District, mileage 280 to 300, from Sudbury Jct.

13740. May 26.—Authorizing C.N.R. to cross Main St., Souris Ave. and Manor St., Carlyle, Sask.

13741. May 27.—Approving C.N.O.R. revised location through Chatham tp., Que., mileage 7.58 to 9.12 from Hawkesbury, Ont.

13742, 13743. May 26.—Authorizing corporation of Tillsonburg, Ont., to lay sewer under G.T.R. at Coon Alley and Lisgar Ave.

13744. May 23.—Authorizing Michel Water, Light and Power Co. to lay pipe line under Crow's Nest Southern Ry. (G.N.R.) half a mile west of Michel station, B.C.

13745. May 26.—Ordering C.P.R. to build by Mar. 1, 1912, bridge with 40 ft. clear span across Buffalo Lake, on petition of residents of Rosenfeld and vicinity, Man.

13746. May 26.—Authorizing city of Winnipeg to lay sewer under C.P.R. Molson branch at Talbot Ave.

13747. May 18.—Rescinding order 5131, Aug. 5, 1908, re crossing of highways by C.P.R. in St. Antoine, Riviere du Loup, Que.

13748. May 18.—Ordering Quebec, Montreal and Southern Ry. to complete station at Sorel, Que., by Sept. 1, under penalty of \$100 a day, judgment being reserved pending investigation into complaint by resident of Sorel of unsatisfactory train service.

13749. May 19.—Extending to Sept. 15 time for completion of tunnel under C.P.R. at St. Lawrence Boulevard crossing, Montreal, without prejudice to any rights the city may have against contractor for alleged failure to complete within time specified.

13750. May 22.—Amending order 13302, Mar. 23, re location of C.P.R. spur in Port Moody, B.C.

13751. May 23.—Approving Manitoulin and North Shore Ry. bylaw authorizing H. J. Herrold, General Agent, to prepare and issue tariffs of tolls.

13752 to 13754. May 29.—Authorizing C.P.R. to use 13 bridges on its Cartier, Chapleau and White River subdivisions.

13755. May 29.—Authorizing C.P.R. to erect no. 10 standard station at Gleichen, Alta.

13756. May 29.—Authorizing C.P.R. to build spur to power house, Magog, Que.

13757. Apr. 4.—Approving C.N.O.R. location through Loughborough Storrington and Bedford tps.

13758 to 13762. May 29.—Extending to Dec. 1, tariffs of tolls of G.T.P. Telegraph, C.P.R. Telegraph, C.N.R. Telegraph, North American Telegraph and Belle Telephone Companies.

13763. May 29.—Ordering C.N.R. to provide cattle pass and farm crossing before Sept. 1, under penalty of \$100 a day, for M. Wallace, Ochre River, Man.

13764. May 29.—Approving location of South Ontario Pacific Ry. from lot 5, con. 2, Nassagaweya tp. to lot 15, con. 1, Nelson, tp.

13765. May 29.—Dismissing application of White Pass and Yukon Route and declaring it subject to a penalty of \$100 a day for every day's default in compliance with order 12783, Jan. 18, as amended by order 13292, Mar. 23, respecting tariffs. This order is given fully on another page.

13766. May 30.—Authorizing Georgian Bay and Seaboard Ry. (C.P.R.) to cross highway in Ops tp., Ont.

13767. May 30.—Authorizing C.P.R. to use bridges 0.7 and 7.1 on its Laurentian subdivision, Que.

13768, 13769. May 30.—Authorizing C.N.O.R. to cross and divert highways in Bastard tp.

13770. May 9.—Authorizing G.T.P. Branch Lines Co. to cross three highways with its Biggar-Calgary branch, Sask.

13771. May 30.—Authorizing C.N.O.R. to cross highway in Bastard, tp.

13772. May 30.—Approving location of Georgian Bay and Seaboard Ry. (C.P.R.) from lot 23, con. 9, near Bethany village, Manvers tp., at mileage 87.41, south-easterly to connect with C.P.R. in lot 2, con. 7 at mileage 91.13.

13773. May 30.—Authorizing Sherbrooke St. Ry. to change location of its crossing of C.P.R. at junction of King and Belvidere Sts., Sherbrooke, Que.

13774. May 30.—Approving location of C.P.R. station at Campbellville, Nassagaweya tp. at mileage 37.89, London subdivision, Ont.

13775. May 30.—Authorizing C.N.O.R. to cross under C.P.R. near Nipigon.

13776. May 30.—Defining portion of cost of work to be borne by the city and C.P.R. re overhead crossing Sixth Ave, Moose Jaw, Sask.

13777. May 30.—Extending to July 10, time for completion of interlocking plant at crossing of New Westminster Southern Ry. by Vancouver Power Co.'s tracks.

13778. May 19.—Ordering C.P.R. to stop at Lesage, Que., on flag, its up-passenger train on Saturdays and down-passenger train on Mondays, on application of residents of St. Jerome parish.

13779. May 18.—Ordering G.T.R. to file plans for gates at Elizabeth and St. Remi Sts., Montreal.

13780. May 30.—Authorizing Vancouver Power Co., to erect wires across C.P.R. at 4th St., Huntingdon, B.C.

13781. May 30.—Authorizing Seymour Power and Electric Co. to erect wires across Bell Telephone Co.'s wires on Kingston Rd., Hamilton, tp., Ont.

13782. May 30.—Authorizing Hamilton Cataract Power, Light and Traction Co. to erect wires across G.T.R. at lot 23, con. 3, Humberstone tp., Ont.

13783. May 30.—Authorizing B.C. Electric Ry. to erect wires across C.P.R. near Barnett.

13784. May 30.—Authorizing Seymour Power and Electric Co. to erect wires across North American Telegraph Co.'s wires at Ontario St., Colborne, Ont.

13785. Apr. 24.—Authorizing G.T.R. to take certain lands east of Cardigan St. Guelph, Ont.

13786. May 30.—Extending to Dec. 1, G.N.W. Telegraph Co.'s tariff, C.R.C. 9.

13787. May 30.—Dismissing application of town of Cobourg, Ont., for subway under C.N.O.R. at William St. and ordering C.N.O.R. to remove obstructions to view near crossing.

13788, to 13790. May 31.—Approving plans of G.T.P.R. stations at Spruce Grove, Wabamun, and Fallis, Alta.

13791. May 31.—Authorizing G.T.P.R. to open for traffic its line from Prince Rupert easterly, for 100 miles, speed limited to 12 miles an hour.

13792. May 30.—Authorizing C.P.R. to build bridges 44.5, 101.1 and 97.03 on its London, Windsor and Cartier subdivisions.

13793. May 30.—Authorizing C.P.R. to build spur for St. Clair Brothers, Galt, Ont.

13794. May 18.—Ordering C.P.R. to stop, on flag, its westbound Halifax morning train, during six months at St. Philippe, Que., and postponing application re commutation tickets to next sittings in Montreal.

13795. May 31.—Authorizing C.P.R. to take G.T.R. lands in Lindsay, Ont., being part of railway lumber yard.

13796. May 31.—Authorizing C.N.R. to cross highway between secs. 1 and 2, tp. 47, r. 20, w. 4 m., Alta.

13797. May 31.—Authorizing G.T.P. Branch Lines Co. to cross and divert certain highways on its Yorkton branch, Sask.

13798. May 31.—Approving C.P.R. plans of standard no. 4 engine house.

13799. May 31.—Authorizing C.N.O.R. to cross public road between lots 30 and 31, Con A, Tyendinaga, tp.

13800. May 30.—Authorizing C.P.R. to build spur for C. W. Trenholme, St. Vincent de Paul, parish, Que.

13801, 13803. May 31.—Authorizing Seymour Power & Electric Co. to erect wires across Bell Telephone wires in Hope tp., Cobourg, and Haldimand tps., Ont.

13804. May 31.—Authorizing C.N.O.R. to erect wires across Coulson Telephone Co.'s wires at Orone.

13805. May 30.—Authorizing Hamilton Cataract Power, Light and Traction Co. to erect wires across M.C.R. at lot 26, con. 6, Crowland tp., Ont.

13806 to 13808. May 31.—Authorizing Seymour Power & Electric Co. to erect wires across G.N.W. Telegraph Co.'s wires at Cobourg, Hamilton tp., and Colborne, Ont.

13809. Feb. 24.—Authorizing Georgian Bay & Seaboard Ry. (C.P.R.) to operate from mileage 71.68 in Ops tp. to connection with Lindsay, Bobcaygeon and Pontypool (C.P.R.) in Lindsay, Ont., mileage 72.91, and approving revised location.

13810. May 30.—Ordering M.C.R. to install improved type electric bell at crossing of Diltz Road, Moulton tp., Ont., and allowing



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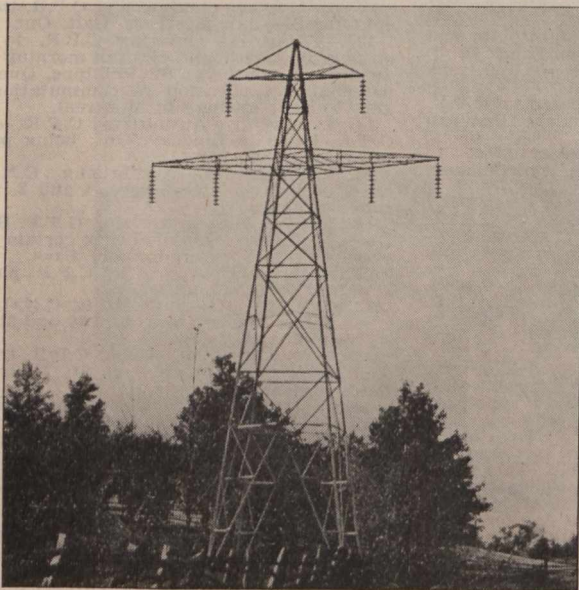
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The Canadian Bridge Co.

WALKERVILLE, ONT.

LIMITED

20% of cost from railway grade crossing fund.

13811. June 1.—Relieving C.P.R. from further protection at crossing west of Lacadie Station, Que.

13812. June 1.—Authorizing C.P.R. to build bridge 16.83 on its Cartier subdivision, Lake Superior Division.

13813. June 1.—Authorizing C.P.R. to operate trains over subway at St. Louis Boulevard Crossing, St. Louis, Montreal.

13814. June 1.—Authorizing G.T.P. Branch Lines Co. to build bridge over Battle River on its Battleford branch, Sask.

13815. June 1.—Approving St. Lawrence & Adirondack Ry. bylaw authorizing L. F. Vosburgh, G.P.A., I. H. Hubbel, G.F.A., F. E. Herriman, Coal Traffic Manager, New York, to issue tariffs.

13816. June 1.—Approving location of C.N.Q.R. station grounds at Carillon.

13817, 13818. May 31.—Authorizing city of Toronto to maintain wires across C.P.R. and G.T.R. and across G.N.W. Telegraph Co.'s wires at Queen and John Sts.

13819. June 1.—Authorizing city of Prince Albert, Sask., to maintain sewer under C.N.R. at 7th St. East.

13820. June 1.—Authorizing city of Calgary, Alta., to maintain trunk sewer under C.P.R., near 9th Ave. East.

13821. May 31.—Authorizing C.P.R. to build eight bridges on its Atlantic, Eastern, Lake Superior, Manitoba & British Columbia Divisions.

13822. May 30.—Authorizing Standard Natural Gas Co. to maintain oil line under G.T.P. in Onandaga tp., Ont.

13823. June 2.—Authorizing C.P.R. to make revision in spur to R. Laidlaw Lumber Co.'s premises, Bloor and Dundas Sts., Toronto.

13824. June 2.—Authorizing city of Calgary, Alta., to maintain sewer under C.P.R. at 15th Ave. East.

13825. June 2.—Authorizing C.P.R. to build three bridges on its Eastern, Lake Superior and Manitoba Divisions.

13826. June 1.—Authorizing C.P.R. to use bridges 30.5, 50.54 and 19.32 on its Atlantic Division (N.B. Southern Ry.).

13827. June 2.—Authorizing Manitoulin & North Shore Ry. to cross C.P.R. (Sault Branch) by subway.

13828. May 16.—Authorizing G.T.P. Branch Lines Co. to cross with its Regina-Boundary branch, five highways in Sask.

13829. June 2.—Authorizing Montreal, Park & Island Ry. to build siding to Gervais' woodyard, Sault-au-Recollet.

13830. May 22.—Authorizing G.T.P. Branch Lines Co. to cross highway with its Melville-Regina branch, at mileage 92.5, Sask.

13831. June 5.—Authorizing C.P.R. to remove its station at Winnipeg Beach, Man., to new location.

13832. June 5.—Authorizing C.P.R. to build siding across road allowance on west boundary of sec. 35, tp. 12, r. 7, e. p. m. at Beausejour, Man.

13833. June 5.—Authorizing G.T.R. to operate over bridge near Scarborough Jct., Ont., and authorizing C.N.O.R. to operate under same.

13834. June 5.—Amending order 13562, May 2, re C.P.R. Pheasant Hills branch crossing highways between mileage 254.5 and 325.3.

13835. June 5.—Approving plans of C.P.R. bridge across Sixth Ave. Moose Jaw, Sask.

13836. June 5.—Authorizing Georgian Bay & Seaboard Ry. and Lindsay, Bobcaygeon & Pontypool Ry. (C.P.R.) to build overhead crossing for three lines over Colborne St., Lindsay, Ont.

13837. June 5.—Authorizing C.P.R. to build spur for Canada Lime & Builders' Supply Co., 2.27 miles from Ste Therese, Que.

13838. June 5.—Approving revised location and Y. in mileage 43.64 to 46.44.

13839. June 5.—Extending to Dec. 1 temporary approval of tariffs of telegraph tolls for White Pass & Yukon Route.

13840. June 5.—Ordering C.N.R., under penalty of \$25 a day after 30 days from date, to build highway crossing between secs. 25-26, tp. 43, r. 20, 4 m. on application of Eberg municipality, Alta.

13841. June 5.—Extending to July 15 time for installation of gates by C.N.Q.R. at Moreau, Prefontaine and St. Germain Sts., Montreal.

13842. June 5.—Authorizing C.N.R. to operate over C.P.R. crossing near Bienfait, Sask.

13843. June 5.—Approving C.N.R. location and entrance to Union station, and crossings at River Ave. Main St. South, and Bell Ave., Winnipeg.

13844, 13845. June 5.—Authorizing C.P.R. to build bridges 58.4 and 76.11 on its Windsor subdivision, Ontario Division.

13846. June 5.—Authorizing C.P.R. to build four bridges on its Atlantic, Eastern, Lake Superior, and Saskatchewan Divisions.

13847. May 30.—General order re reports of accidents at highway crossings and cir-

cular 60. This is given in full on another page.

13848. June 5.—Authorizing C.P.R. to build spur for F. H. Wiley, near Higgins Ave. Winnipeg.

13849. May 2.—Authorizing C.N.O.R. to cross lot 2, con. 1, Thurlow tp.; compensation to be paid Belleville-Prince Edward Bridge Co.

13850. June 2.—Approving Supplement 1 to Canadian Classification 15, with exception of certain specified articles.

13851. June 6.—Authorizing G.T.R. to build spur and branch therefrom for Good-year Tire & Rubber Co., Bowmanville, Ont.

13852. June 1.—Re rates on rice between points east of and including Fort William. This order is given in full on another page.

13853. June 7.—Approving location of International Bridge & Terminal Co.'s connection with C.N.R. at Fort Frances, Ont., and crossing Rainy River to International Falls, Minn.

13854. June 7.—Authorizing C.P.R. to open for traffic the extension of Orford Mountain Ry. from Mansonville, Que., to International boundary, 3.77 miles.

13855. June 5.—Authorizing C.P.R. to build spur for Manitoba Gypsum Co., Winnipeg.

13856. June 6.—Authorizing Toronto & Eastern Ry. (C.N.R.) to cross public road between lots 16 and 17, con. 2, at mileage 13.1, Whitby East tp., Ont.

13857. June 6.—Authorizing G.T.R. to use 12 bridges on its Eastern Division.

13858. June 6.—Authorizing G.T.P. Branch Lines Co. to build five bridges over Embarrass River on its Alberta coal branch.

13859. June 6.—Authorizing G.T.P.R. to cross highway in n. w. ¼ sec. 18, tp. 44, r. 4, w. 4 m., North Alberta District.

13860. June 6.—Authorizing G.T.P. Branch Lines Co. to cross with its Melville-Regina branch, 32 highways in Saskatchewan.

13861. June 6.—Authorizing G.T.P.R. to build spur for Cushing Bros. and to cross Stephen Ave., Edmonton, Alta.

13862. June 6.—Relieving G.T.R. from further protection at crossing three miles west of Chatham, Ont.

13863. June 7.—Authorizing Algoma Central & Hudson Bay Ry. to connect by means of transfer track with C.P.R. at Hobon, Ont.

13864. June 6.—Authorizing C.P.R. to operate into Farnham military camp to June 12 pending installation of interlocking plant.

13865. June 6.—Ordering New Brunswick and Prince Edward Island Ry. to ballast its line from Sackville to Tormentine, to make repairs to certain bridges, and to renew draw of Port Elgin bridge.

13866, 13867. June 6.—Authorizing Seymour Power and Electric Co. to erect wires across C.P.R. telegraph wires, and across G.T.R. at Newcastle, and at Cavan St., Port Hope, Ont.

13868. June 6.—Authorizing Hamilton Cataract Power, Light and Traction Co. to erect wires across C.P.R. telegraph wires at lot 26, con. 6, Crowland tp., Ont.

13869. June 6.—Authorizing city of Toronto to maintain wires across C.P.R. and G.T.R. and G.N.W. Telegraph Co.'s and C.P.R. telegraph wires between King and Sudbury Sts.

13870. June 6.—Authorizing city of Medicine Hat, Alta., to lay gas main under C.P.R. at East Road allowance.

13871. June 5.—Authorizing Toronto Suburban Ry. to erect wires across C.P.R. and G.T.R., York tp., Ont.

13872. June 5.—Ordering that cost of building and maintaining crossing at Carleton Ave., Ottawa Front, over C.P.R., be paid by Neapan tp. See order 13728, May 17.

13873. June 7.—Approving Bell Telephone Co.'s bylaw authorizing F. Sise, Jr., general manager, to prepare and issue tariffs of tolls.

13874. June 7.—Approving Ottawa Electric Ry. bylaw authorizing J. D. Fraser, secretary-treasurer, to prepare and issue tariffs of tolls.

13875. June 7.—Authorizing G.T.R. to use 10 bridges on its Eastern Division.

13876. June 7.—Authorizing city of Edmonton, Alta., to lay sewer under Edmonton, Yukon and Pacific Ry. (C.N.R.) near Peace Ave.

13877. June 9. — Approving Standard Freight and Passenger, Tolls of Vancouver, Fraser Valley and Southern Ry.

13878. June 10.—Approving C.N.O.R. location through South Crosby and Bastard tps., mileage 180.51 to 195.22 from Toronto.

13879. June 9.—Authorizing Vancouver, Fraser Valley and Southern Ry. to open for passenger traffic portion of its line from Park Drive, Vancouver, to Eighth Ave., New Westminster, B.C., 10 miles.

13880. June 10.—Approving location of G.T.P. Branch Line Co.'s Calgary Branch entrance into Calgary, Alta.

13881. June 7.—Amending Scale N Express Classification C.R.C. 2, by cancelling Note 12

and substituting the following:—"Note 12 includes grain (whole or cracked), chopped feed, bran, meal, ground meat (dried), dried bone, alfalfa meal, cut clover, ground screenings, and crushed shells. Does not include condition powders, condiments, or medicated or patented articles."

13882. June 10.—Authorizing Kettle River Valley Ry. to build bridge at station 215.21, second crossing, Coldwater River, B.C.

13883. May 10.—Ordering G.T.R. to build overhead crossing at Brooker's Crossing, 2½ miles west of Mallorytown station, Ont., 20% to be paid from railway grade crossing fund, 20%, or \$700, whichever is larger amount, by Front of Escott tp.

13884. June 8.—Approving specification of Schaefer Drain under G.T.R. on lot 25, con. 5, South Easthope tp., Ontario.

13885. June 7.—Approving bylaw of Vancouver, Fraser Valley and Southern Ry. authorizing R. H. Sperling, General Manager, and Allan Purvis, Manager Interurban Division, to issue tariffs.

13886. Apr. 22.—Authorizing C.N.R. to cross with its Camrose-Strathcona Branch, 24 highways in Alberta.

13887. May 22.—Authorizing G.T.P. Branch Lines Co. to cross with its Melville-Regina Branch three highways in Saskatchewan.

13888. June 9.—Authorizing C.N.R. to extend existing footbridge over tracks at West Fort William, Ont.

13889. June 9.—Authorizing G.T.P. Branch Lines Co. to build bridge over Bow River on its Calgary Branch, mileage 198, Alta.

13890. June 9.—Authorizing C.P.R. to build bridge 24.86 on its St. John Subdivision, Atlantic Division.

13891. June 9.—Authorizing G.T.P. Branch Lines Co. to divert highway on its Prince Albert Branch in s.w. ¼ sec. 25, tp. 36, r. 27, w. 2 m., Sask.

13892. June 9.—Authorizing Toronto and Eastern Ry. to cross public road at mileage 16.3, Whitby East tp., Ont.

13893. June 8.—Authorizing G.T.P. Branch Lines Co. to build bridge over McLeod River at mileage 5.79, Alberta coal branch.

13894. June 8.—Authorizing C.P.R. to build bridge 80.7 over Little Rouge River, Toronto Subdivision, Ontario Division.

13895. June 8.—Authorizing G.T.R. to operate branch south of Tunnel and North Sts., Sarnia, Ont.

13896. June 8.—Authorizing C.N.R. to build subway known as 19th St. subway, Saskatoon, Sask.

13897. June 8.—Authorizing G.T.P.R. to cross road diversion in s.e. ¼ sec. 8, tp. 23, r. 7, w. 2 m., Sask.

13898 to 13901. June 8.—Authorizing C.N.O.R. to cross public road between lots 14 and 15, con. 2, South Elmsley tp.; to cross East, Brock, Main and George Sts., Newburgh, and to cross two public roads, one overhead, in Camden tp.

13902. June 9.—Authorizing C.N.R. to cross and divert public road between n.e. ¼ sec. 34 tp. 50, r. 23, and n.w. ¼ sec. 19, tp. 50, r. 22 w. 4 m.

13903, 13904. June 7, 9.—Authorizing Toronto and Eastern Ry. to cross five highways in Whitby, and public road at mileage 14.2, Oshawa, Ont.

13905 to 13909. June 6.—Authorizing C.P.R. to build additional track in connection with its double tracking from Montreal to Quebec Jct., across streets and public roads, St. Martin, St. Laurent and Sault aux Recollets parishes, Montreal.

13910. June 10.—Extending to July 1, time for installation of gates by C.P.R. at Westminster Ave., Montreal West, Que.

13911, 13912. June 6, 10.—Authorizing Toronto and Eastern Ry. to cross G.T.R. Port Perry Branch in Whitby; interlocking plant to be installed, and to cross public road between lots 14 and 15, con. 2, at mileage 13.7, in Whitby East tp., Ont.

13913. June 6.—Authorizing C.P.R. to build additional track, in connection with its Montreal-Quebec Jct. double track, across public road in St. Martin parish, Montreal.

13914. June 10.—Authorizing Essex Terminal Ry. to cross Canada Southern Ry. and Detroit River Tunnel Co.'s tracks, Windsor, Ont.

13915. June 7.—Authorizing city of Edmonton, Alta., to extend sewer under C.N.R. near Riverview Ave.

13916. June 8.—Authorizing Ottawa Electric Co. to maintain wires across C.P.R. at Main St., Westboro, Ont.

13917. June 10.—Authorizing town of Montreal East to build St. Jean and St. Cyr Aves. across Montreal Terminal Ry. and C.N.Q.R.

13918. June 13.—Authorizing C.P.R. to build spur to Wye's Ballast Pit across Government Road, Wylie tp., Ont.

13919 to 13921. June 13.—Authorizing Toronto and Eastern Ry. to cross 11 highways in Darlington and Whitby East tps., Ont.

13922 to 13927. June 13.—Authorizing C.N.O.R. to cross four highways in Bastard

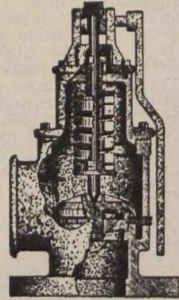
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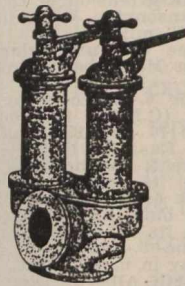
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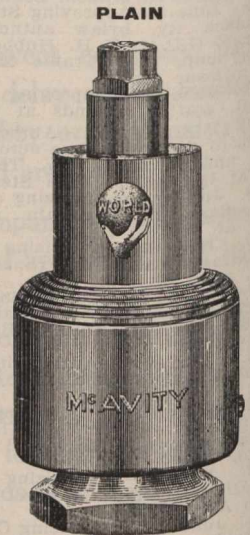
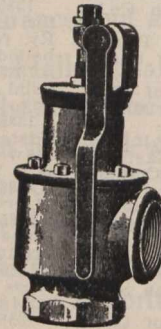
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Electric Headlight Saves Train

(From Daily Papers)

"Wednesday night B—— forgot to deliver an order to hold Eastbound Passenger Train No. 6, and only the fact that the Electric Headlight of the oncoming Passenger train was seen at a great distance by the Engineer of the Westbound Freight prevented a head end collision in the —— Canyon near ——, The warning light was seen in time to enable the freight to get back on to the siding at ——."

PYLE-NATIONAL ELECTRIC HEADLIGHT CO.

CHICAGO

tp.; eight highways in South Crosby and Loughborough tps.; public road in Goufourn tp., and two public roads in Tyendinaga tp.

13928. June 13.—Approving location of 15 G.T.P.R. stations in Western Provinces.

13929. June 13.—Authorizing G.T.R. to use five bridges on its Southern Division.

13930. June 13.—Approving G.T.P.R. Standard Freight Mileage Tariff C.R.C. 7, between stations in Alberta, Thornton and Prairie Creek, inclusive.

13931. May 19.—Authorizing G.T.P. Branch Lines Co. to cross three highways on its Prince Albert Branch, Sask.

13932. June 13.—Approving location of G.T.P. Branch Lines Co.'s station at Brewer, on its Yorkton Branch, Sask.

13933. June 13.—Approving location of G.T.P. Branch Lines Co.'s Biggar-Calgary Branch, mileage 19.97 to 50.23, Sask.

13934. June 13.—Authorizing G.T.P. Branch Lines Co. to cross 27 highways on its Regina-Boundary Branch, mileage 1.3 to 31, Sask.

13935. June 13.—Authorizing C.P.R. to open for traffic its double track from Mile End to Quebec Jct., 7.5 miles.

13936. June 13.—Authorizing C.N.O.R. to build across Opinicon Lake Road, lot 21, con. 10, Loughborough tp.

13937. June 14.—Authorizing G.T.P.R. to build four stations in Western Provinces, and approving plans for same.

13938 to 13946. June 14.—Approving C.P.R. standard plans for grain loading platforms, mail crane and clearances at and through elevator, pump house and dock track at Victoria Harbor, Ont.; standard no. 2 stock pen, double deck stock chutes, single deck stock yards, clearance of proposed verandah roof at warehouse, Toronto, and clearances standard two track coaling plant, and clearances standard sand house.

13947. June 6.—Approving location of C.P.R. double track, Mile End to Quebec Jct., mileage 5.18 to 12.68, Que.

13948. June 6.—Approving location of C.P.R. double track, Mile End to Quebec Jct., mileage 5.18 to 12.68, Que.

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13975. June 6.—Approving location of C.P.R. double track, Mile End to Quebec Jct., mileage 5.18 to 12.68, Que.

Wainwright, Second Vice President, is quoted as having stated that the company would, in the near future, build a line from Ottawa to Brockville or Kingston, Ont. The management had the matter under consideration, and a decision as to the point of junction with the main line would be made almost immediately. "Possibly," added he, "the short line between the Toronto-Montreal line and Ottawa will be double-tracked."

The company has the control of two charters for lines out of Ottawa—one the Ottawa, Smith's Falls and Kingston Ry., and the other the Ottawa, Rideau Valley and Brockville Ry.

Mallorytown Crossing.—The Board of Railway Commissioners has ordered the company to file plans for the erection of a steel overhead bridge at the highway crossing west of Mallorytown station, the cost to be apportioned between the company, the township, and the Dominion grade crossing fund.

Powassan, Ont.—The Board of Railway Commissioners has ordered the company to build a station and make changes in the yards at Powassan, Ont., by Nov. 1, under penalty of \$25 a day.

Toronto Viaduct, Etc.—E. H. Fitzburgh, First Vice President, is quoted as stating in an interview, June 1, that the company would have its plans for the Esplanade improvements and elevation of tracks in Toronto ready for submission to the Board of Railway Commissioners by Aug. 1. The plans for the Union Station would not be finally prepared until the Esplanade plans had been approved and accepted by all the parties interested.

Brock Ave. Subway.—The subway to be built under the tracks at Brock Ave., Toronto, is to be 56 ft. wide, with two 21 ft. roadway, and two sidewalks. The cost has been apportioned by the Board of Railway Commissioners as follows: G.T.R., 48%; C.P.R., 32%; \$5,000 from the Dominion grade crossing fund, and the balance by the city of Toronto.

New Station at Guelph.—The new passenger station at Guelph, Ont., was opened for business, June 2. The grounds surrounding the building are now being laid out.

Branch in Sarnia.—The Board of Railway Commissioners has authorized the operation of a branch line south of Tunnel and North Sts., Sarnia, Ont. (June, pg. 521.)

A Railway to Hudson Bay.

The Department of Railways will receive to Aug. 1 tenders for the construction of a section of about 185 miles of the projected railway to Hudson Bay, from Pas Mission to Thicket Portage. The plans and specifications were completed June 1. The work is to be done under the immediate supervision of the Department of Railways, with J. Armstrong, who has had charge of the surveys, as Chief Engineer. The amount available for work at present is \$2,000,000, that being the sum recently voted by Parliament on account of construction. It is expected that the contract will be awarded sufficiently early to enable contractors to take in supplies and plant in the fall. The section is expected to be completed by 1912.

Three survey parties are in the field working towards Hudson Bay, with a view of locating the balance of the line, and two parties are engaged in locating harbors at Fort Churchill and Port Nelson, to enable a decision to be made as to what should be chosen as the terminus. It is expected that this will be decided by the end of the year, and that tenders will be asked early in 1912 for the construction of the balance of the line. (June, pg. 513.)

Great Northern Ry. Lines in Canada.

Emerson to Winnipeg.—L. W. Hill, President, G.N.R., is quoted, June 11, as saying that the company would built its own line into Winnipeg. For some time negotiations have been in progress with the Canadian Northern Ry. for running powers over its line from the International boundary, near Emerson, to Winnipeg, but some hitch has occurred, and it is understood that even if an arrangement is made it will be only temporary.

Midland Great Northern Ry.—Under the agreement recently made with the city, the company must build a line into Winnipeg from a few miles south of the Assiniboine River. The total length is about five miles, and it will connect the C.N.R., over which the company is running its St. Paul-Winnipeg traffic, with the company's own freight station on Paulin St. The building of this line, including several subways, has to be completed by Dec. 31. A contract has been let to I. E. Guthrie and Co., St. Paul, Minn., and work was started June 9.

A pile driver was towed up the river to about 200 ft. below the C.P.R. bridge, and work started in driving piles for the bridge to be built across the river, which is to be completed by Dec. 1.

Vancouver, Victoria and Eastern Ry. and Navigation Co.—Survey parties are in the field completing location plans for the line westerly from the present end of steel to near Hope, B.C. J. H. Kennedy, Chief Engineer, is quoted as having stated that the company had definitely abandoned the idea of building a line between Sumas Landing and Hope, but would use, under an agreement, the Canadian Northern Pacific Ry. for 38 miles between these points. This suggests that the V. V. and E. Ry. surveys will link up with the C.N.P.R. near Hope, and that its trains will run on to Sumas Landing, and there be switched off again to the V. V. and E. Ry. now under construction. Tenders have been asked for the construction of 13 wooden bridges between Sumas Landing and Abbotsford, in the building of which some 5,000,000 ft. of timber will be used. These bridges are to be built over the small low lying ravines into which the Sumas River overflows. More than half of the grading between Sumas Landing and Abbotsford has been completed, and it is expected to go on with track laying at an early date.

The Board of Railway Commissioners has ordered the company to build a proper sewer through its fill from Front St. to False Creek, near George St., Vancouver. This portion of the foreshore was filled in a couple of years ago.

J. M. Gruber, General Manager, G.N.R., and other officials, visited Vancouver, recently, and inspected the work in progress. It was decided to put concrete under the tracks on Main St., and plans for other work were discussed with the city authorities.

Other officials were in Vancouver, June 7, in connection with the proposal to take over an additional 700 ft. of frontage west of the sugar refinery. This will give the company an aggregate of 1,700 ft.

Waterfront on Burrard Inlet.—It is proposed to expend a large sum upon the building of docks, piers and warehouses, the plans for which, it is expected, will be submitted to the city early in July. (June, pg. 503.)

The G. T. Pacific Ry. inaugurated a daily service between Winnipeg and Edmonton, in 26 hours running time, June 18, a week later than it was originally announced the service would be started. On June 15, a regular passenger train service was started from Prince Rupert eastwards for 150 miles.

G.T.R. Betterments, Construction, Etc.

New England Lines Proposals.—Press reports state that in connection with the plans for the extension of the Central Vermont Ry. in Rhode Island, and Massachusetts, a proposal is being prepared by Boston business men with a view to securing the Central Massachusetts Rd., so as to provide an entrance into that city.

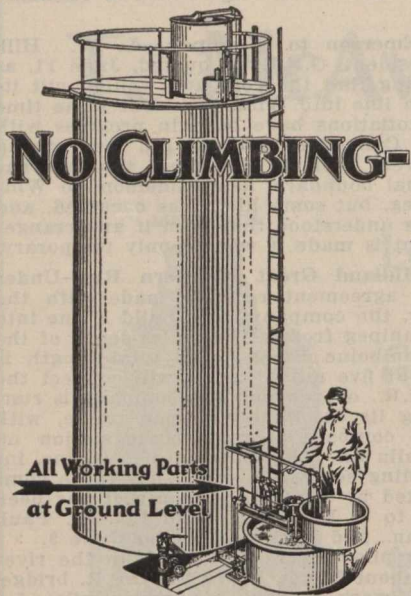
Lachine, Jacques Cartier and Maisonneuve Ry.—The route maps of the projected line from St. Catharine St., Montreal, to Jacques Cartier Jct., about seven miles, have been approved by the Department of Railways. They show a line from near Jacques Cartier Jct., north-easterly, crossing the C.P.R. and the Montreal Park and Island Ry., and thence southerly and easterly to a terminal and station on St. Catharine St., between Frontenac and Harbor St. This will give the G.T.R. a belt line round the city.

It is reported that practically all the land necessary for the line has been acquired, and that construction will be started as soon as certain matters are arranged between the company and the city to the satisfaction of the Board of Railway Commissioners.

Montreal Track Elevation.—At a meeting of the Montreal city council, June 5, objection was made to the plans submitted for the elevation of the tracks on the ground that they involved the closing of certain streets and the construction of an earthen bank instead of stone or concrete. The city asks for plans showing an elevated embankment with retaining walls of stone or concrete, and that no streets now crossing the tracks shall be closed. The city will oppose the approval of the plans before the Board of Railway Commissioners.

Ottawa Station, Etc.—Considerable progress has been made towards the completion of the station building at Ottawa, and it is expected it will be ready for occupation by the traffic staffs in Sept. The three top floors are to be occupied by the Board of Railway Commissioners and it is expected that these will be ready early in July.

Ottawa to Brockville or Kingston.—In an interview at Toronto, June 16, W.



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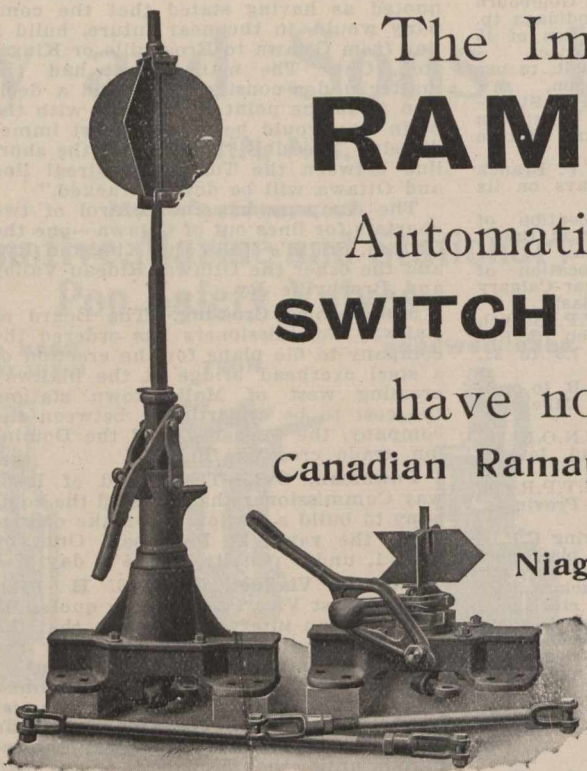
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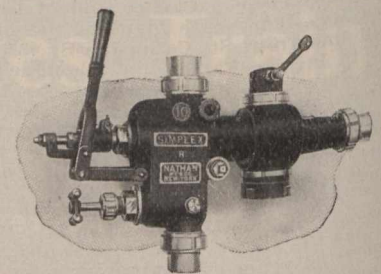
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New Brunswick Southern Ry.—The Board of Railway Commissioners has authorized the C.P.R. to use bridges 30.5, 50.54, and 19.32 on the N.B.S. section of its Atlantic Division.

Orford Mountain Ry.—The Board of Railway Commissioners has authorized the operation of trains over the extension of the line from Mansonville, Que., to the International boundary, 3.77 miles.

St. Lawrence Boulevard.—The Board of Railway Commissioners has authorized the operation of trains over the subway at St. Lawrence Boulevard crossing, St. Louis, Montreal.

Windsor St. Station.—The erection of the steel framework of the extensions at the Windsor St. Station, Montreal, has been practically completed by the Dominion Bridge Co. Good progress has also been made with the stone, concrete and other work on the structure.

Place Viger Station, Etc.—Satisfactory progress is being made with the building of the new station at Place Viger, Montreal. The work of getting in the foundations presented considerable difficulty, as the river is only a couple of blocks away, and the floor of the boiler room is only 6 ft. above low water. The building is two stories high, and the walls are strong enough to carry a higher building should it be desired to add to it at any time.

New Montreal Branch.—Application is being made to the Board of Railway Commissioners for approval of location plan from the main line west of Moreau St., easterly to lot 396, Longue Pointe, about 4.5 miles. The branch line is to serve an important manufacturing district.

Montreal to Quebec Jct. Second Track.—The Board of Railway Commissioners has authorized the building of additional tracks across various streets and highways in Montreal, St. Martin, St. Laurent, and Sault au Re collet, Que., in connection with the second track work between Montreal and Quebec Jct., 7.5 miles, and the opening of same for traffic.

Ottawa Improvements.—The Ottawa city council will, July 3, hear any persons interested in opposing the sale to the C.P.R. of the road allowance between concessions A and I, Ottawa Front, Nepean tp., and portions of Alongo and Richmond streets, for which a by-law has been under discussion.

Smith's Falls—Bathurst Second Track.—A sub-contract has been let to A. and W. D. Wheaton, for grading a section of second track work between Smith's Falls, and mileage 9, near Perth, Ont.

Georgian Bay and Seaboard Ry.—The Board of Railway Commissioners has approved the line being built across a number of highways, and location plan of the line from lot 23, con. 9, near Bethany, at mileage 87.41 south-easterly to connect with the Ontario and Quebec Ry. in lot 2, con. 7, at mileage 91.13; has authorized the operation of the line from lot 24, station 2030, con. 6, Ops tp., mileage 71.68, to a connection with the Lindsay, Bobcaygeon and Pontypool Ry., in Lindsay, at mileage 72.91, and authorizing the building of an overhead crossing for three lines at Colborne St., Lindsay.

South Ontario Pacific Ry.—The Board of Railway Commissioners has approved location plans from lot 5, con. 2, Nassawega tp., to lot 15, con. 1, Nelson tp., Ont.

Toronto.—While in Toronto, June 1, D. McNicoll, Vice President, is quoted as having stated that the viaduct and Union Station could both be built at the same

time, and there were many reasons why they should be constructed together.

The question of the plans for the new office building at the corner of King and Yonge Sts. was still unsettled, June 20. The city council desires to round off the corner, but the company is unwilling to give up the land. Expropriation was threatened, but on June 13, a suggestion was made that additional land could be secured in the rear so as to permit the widening of the street. The company is calling for tenders for the erection of the building, to enable the work to be started as soon as the plans are passed by the city authorities.

West Toronto Yards, Etc.—Considerable progress has been made with the building of the new passenger station, and the bridge over the tracks at West Toronto, and something like order is beginning to appear round about the old station. At Jane St. and adjoining streets a good deal of work is being done, getting ready for the construction of the subways and levelling up for the yard extensions. The first subway to be built will be that under Jane St., and tenders were received to June 30, for building the concrete abutments.

Tillsonburg, Lake Erie and Pacific Ry.—St. Mary's and Western Ontario Ry.—The piece of line which connects these two lines, and enables a through service to be given between Ingersoll, and Embro, St. Mary's, and other points, was opened for traffic, June 6. It connects Ingersoll Jct. and Ingersoll North.

London Improvements.—A permit for roundhouse and other buildings, value \$60,000, was issued to the C.P.R., in London, Ont., May 31. Considerable progress is reported to have been made with the work.

Stratford, Ont.—D. McNicoll, Vice President, accompanied by other officials, was in Stratford, June 1, looking over routes for the projected line from St. Mary's, through the city to connect with a branch of the Guelph and Goderich Ry.

North Bay Shops.—We are advised that there is nothing in the report that plans and estimates have been prepared for extensive additions to the company's shops at North Bay, Ont.

Lake Superior Division.—Roadmaster Coughlin reports that six extra gangs and some work trains are engaged in ballasting and other work along the division.

Port Arthur.—G. J. Bury, General Manager, Western Lines, is quoted as saying that the building of the new dock east of the C.P.R. dock, will be commenced right away. An agreement has been made with the city council by which it will be built, and it is understood that the C.P.R. will handle the Grand Trunk Pacific terminal passenger business over it.

Press reports state that it is expected contracts will be let at an early date for the erection of water tanks at Port Arthur. The supply is to be drawn from small lakes in the vicinity, and brought in by gravity.

Port Arthur—Fort William Second Track.—The grading for the second track between these two points was practically completed June 1, and track laying is proceeding. It is expected that it will be completed early in July.

Shop Enlargement at Winnipeg.—A contract is reported let to Carter-Halls-Aldinger Co., Ltd., Winnipeg, for the building of an addition to the tender and wheel shops at Western, Man. The addition will be 220 ft. by 54 ft. 8 in.

Brandon Station.—Tenders are under consideration for the erection of a new station at Brandon, Man.

Buffalo Lake Bridge.—On the petition of residents of Rosenfeld, Man., and vic-

inity, the Board of Railway Commissioners has ordered the company to build a bridge, with a 40 ft. clear span, across Buffalo Lake, by Mar. 1, 1912.

Boissevain to Lauder.—It is reported that it has been decided to proceed, this season, with the construction of a line from Boissevain, on the Deloraine branch, to Lauder, on the Souris branch.

Bredenburg, Sask.—Large gangs of men are engaged in completing the new yards, terminal buildings and water-works plants at Bredenburg, Sask., on the old Manitoba and North-Western Ry.

Regina Union Station.—A contract has been let to the James McDiarmid Co., Winnipeg, for the erection of the station building in Regina, Sask., which is to be used by the Canadian Northern Ry., under the terms of an agreement with the C.P.R. The building will be three stories high, with two wings, and is to be completed by May 1, 1912. The contractors started clearing the site June 12.

Hawarden to Saskatoon.—We are advised that a reconnaissance survey has been made from near Hawarden, Sask., on the Outlook branch running from Moose Jaw northwesterly, to the Pheasant Hills branch, on the east side of the Saskatchewan River. The survey work was done this season, but there is no possibility of any construction being done this year.

Swift Current, Southeasterly.—The Department of Railways has approved revised location maps of the branch from Swift Current, Sask., for 45 miles.

Estevan Westerly.—Press reports state that 33 miles of grading on the branch line under construction westerly and northerly from Estevan, Sask., had been completed June 8. The point of junction with the Weyburn extension had not then been determined.

Weyburn-Lethbridge Line.—The Vice President of the Lethbridge, Alta., board of trade received a letter, June 8, from Wm. Whyte, Vice President, C.P.R., to the effect that he hoped the company would be able in the near future to arrange for the construction from Lethbridge easterly to meet the extension westerly of the Weyburn branch.

Bassano to Langdon Branch.—Press reports state that a contract has been let to J. G. Hargrave & Co., Winnipeg, and J. Timothy, Edmonton, Alta., for the building of a line from Bassano, Alta., to a junction with the line running northerly from Langdon, Alta. The branch will be about 40 miles long and serve a large section of the irrigation block. This line will complete a loop through the irrigation block, between Langdon and Bassano, passing through Irricana.

Langdon Branch.—The revised route maps of the branch from Langdon, Alta., northerly, for 62.1 miles, have been approved by the Department of Railways.

Lacombe Station.—A contract has been let to J. McLaughlin, Lacombe, Alta., for the building of a station there. It is to be erected opposite Dolmage St., and will be of brick and Calgary sandstone.

Medicine Hat to Calgary.—Press reports, June 4, state that C.P.R. engineers are making surveys about 40 miles north of Taber, and south of the Bow River, Alta., for the location of a new line into Calgary. The party is in charge of J. R. Paget.

Shops in Alberta.—We are advised that the proposal to build car and other repair shops at some point in Alberta is at present under consideration. The interests of Medicine Hat, Bassano and Calgary are being advocated by residents and deputations have waited upon the company's officials. Sir Thos. G. Shaughnessy is expected to make a trip to the West shortly, when a decision will probably be reached.

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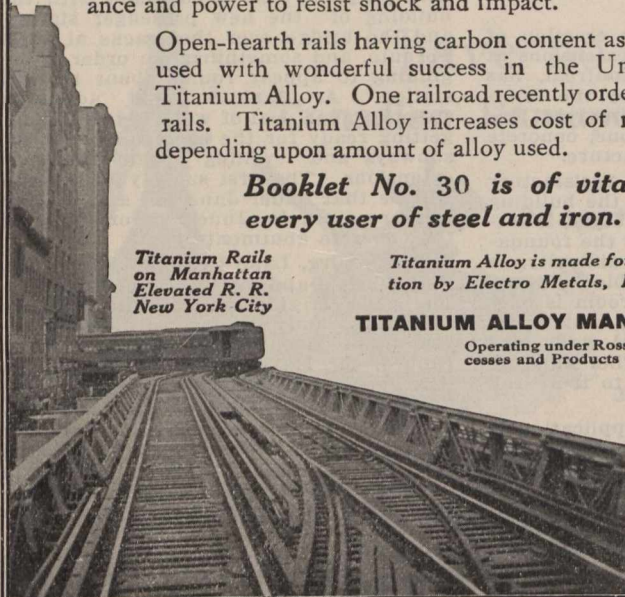
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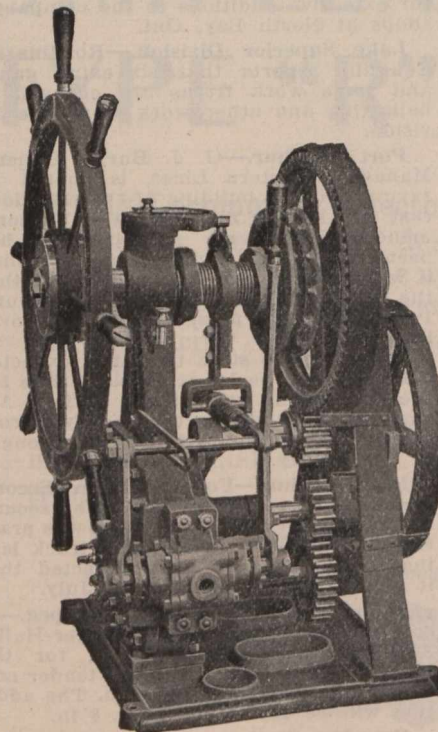
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Railway Contracts for 1911.

In his annual address to the shareholders of the Imperial Bank recently, President D. R. Wilkie said: "It must be borne in mind that the prosperity of the country at the moment is largely due to the enormous expenditures of money borrowed from abroad for railway construction. At the present moment there are no less than 1,681 miles of railway actually under construction, and no less than 10,000 men employed in the work, in addition to which a further mileage of about 3,000 will shortly be under way."

The mileage mentioned is a very conservative estimate, when the fact is taken into consideration that on the National Transcontinental Ry. alone there is some 400 miles of grading to be completed, out of the total of 1,804 miles, all of which is under contract. Up to June 20, we had been advised of the letting of contracts this season for upwards of 1,400 miles of new lines. Tenders are under consideration for the construction of over 650 miles of lines for the Canadian Northern Ry. system, and it is understood that tenders will be asked at an early date for something like 650 miles of other lines, including the 450 mile section in British Columbia to link up the prairie section of the G.T. Pacific Ry. with the section under construction easterly from Prince Rupert.

Following is a list of the contracts for new lines already let this season, with the names of the contractors:—

ALBERTA EASTERN RY.—This line was formerly known as the Manitoulin and North Shore Ry. A contract for the section from Crean Hill to White Fish Bay, 46 miles, has been let to the Lake Superior Construction Co.

CANADIAN NORTHERN QUEBEC RY.—Short line from Hawkesbury, Ont., to Montreal, 55 miles; J. P. Mullarkey, Montreal.

CANADIAN NORTHERN ONTARIO RY.—Toronto to Deseronto, Angus Sinclair; two short pieces of grade revision on Bay of Quinte Ry. between Deseronto and Sydenham, about four miles, Angus Sinclair; Sydenham to Ottawa, 163 miles; J. P. Mullarkey, except so far as the grading and timber work from mileage 180 to mileage 200, which will be done by Ewen Mackenzie.

From Gowganda Jct. northerly for 15 miles, Angus Sinclair.

Tenders were received to June 30 for the construction in three sections of the line from Port Arthur easterly to Sellwood Jct., Ont., about 500 miles, the work to be completed in 1913.

CANADIAN NORTHERN RY.—New contracts have been let as follows:—Completion of Vegreville-Calgary line, from Red Deer to Calgary, Alta., Northern Construction Co.; Brazeau extension easterly from the Vegreville-Calgary line near Stettler westerly for about 100 miles, Northern Construction Co. Completion Maryfield extension to Moose Jaw, Sask., 30 miles, Cowan Construction Co. Completion of the Rosburn extension to near Canora, Sask., about 12 miles, Molloy Bros., Winnipeg. Main line from Pembina River westerly towards Yellowhead Pass, for 100 miles, Cowan Construction Co.; from Onoway, on the main line, for 40 miles towards Peace River, Northern Construction Co.; from Morinville to Athabasca Landing, Alta., 73 miles, Northern Construction Co.

CANADIAN NORTHERN PACIFIC RY.—From Port Mann to Hope, B.C., 77 miles. The Northern Construction Co. has a considerable portion of the grading completed. Tenders were received to May 12 for the grading, etc., on 163 miles from Hope to Kamloops, B.C., but the

contracts had not been awarded on June 20.

From near Victoria for 40 miles in the direction of Alberni, Grant, Smith and Co.

CANADIAN PACIFIC RY.—In addition to second track work at Montreal and Fort William, which is being done by the company's own staff, second track work between Smiths Falls and Bathurst, Ont., under contract to Jones and Girouard, Ottawa, and easterly and westerly from Moose Jaw, in all 23 miles, under contract to J. G. Hargreave, Winnipeg, the company has put the following new lines under construction:—

GEORGIAN BAY AND SEABOARD RY.—Completion of line to Bethany Siding, Ont., 38 miles, Toronto Construction Co.

SOUTH ONTARIO PACIFIC RY.—From Hamilton to Guelph Jct., Ont., 16 miles, Toronto Construction Co.

BRANCH LINES IN WEST.—Estevan to Forward, 35 miles, J. D. McArthur. Extension of Weyburn branch towards Lethbridge, 20 miles, Foley, Welch and Stewart. Swift Current southeasterly for 45 miles, and from Swift Current southwesterly for 35 miles, Foley, Welch and Stewart; extension of Moose Jaw branch to a junction with the Lacombe branch, about 35 miles, Foley, Welch and Stewart; from Wilkie north to Cut Knife district, 25 miles, and from Wilkie south to Tramping Lake district, 25 miles, Dutton and Timson; from Castor easterly for 65 miles, Foley, Welch and Stewart.

KOOTENAY CENTRAL RY.—From 10 miles out of Golden, B.C., for 25 miles, and from 30 miles out of Galloway to Baynes Lake, B.C., 12 miles, Janse and McDonald.

GREAT NORTHERN RY. LINES IN CANADA.—Manitoba Great Northern Ry.—From Winnipeg to junction with C.N. Ry. Emerson line, four miles, A. Guthrie and Co., St. Paul, Minn. Vancouver, Victoria and Eastern Ry.—From Abbotsford to Chilliwack, B.C., 12 miles, J. W. Stewart. A contract is expected to be let shortly for the extension of the line from near Princeton, westerly to Hope.

HA HA BAY RY.—From Riviere du Moulin to La Terriere, Que., seven miles, Boulianne and Boulianne.

KOOTENAY AND ALBERTA RY.—Grading, etc., of a line at Pincher, Alta., 13 miles, Grant, Smith and Co., Spokane, Wash.

GRAND TRUNK PACIFIC RY. BRANCH LINES.—Regina to International boundary, an additional 90 miles to complete the line, J. D. McArthur, Winnipeg; Regina to Moose Jaw, to complete about 79 miles, Ringley, Hyland and Plummer; Biggar, Sask., towards Calgary, Alta., 50 miles, Foley, Welch and Stewart; Mountain Park branch of the Alberta Coal branch, 54 miles, Foley, Welch and Stewart.

PRINCE EDWARD ISLAND RY.—Branch from Harmony to Elmira, 9.9 miles, Whitehead Bros., Fredericton, N.B.

QUEBEC AND SAGUENAY RY.—From terminus of Quebec Ry. Light and Power Co.'s line near Cap Tourmente to Pointe a Pic, Que., 56 miles, O'Brien and Doheny, Quebec; from Pointe a Pic to East Canada Power and Pulp Co.'s mills, 7.5 miles, Bishop Construction Co., Montreal and Toronto.

REID NEWFOUNDLAND Co.—The company is building, under charge of its own staff, a branch from St. John's to Trepassey, about 100 miles.

TEMISKAMING AND NORTHERN ONTARIO RY.—An extension of the newly built Porcupine Branch (29 miles in length from Iroquois Falls to Porcupine Lake, Ont.) is being built by the Commissioners' staff of the Hollinger Mines, about five miles.

Calgary Station, Etc.—General Superintendent Price is quoted as stating, June 8, that contracts will be let at an early date for an extension of the station building at Calgary, Alta. The present building will be utilized for ticket offices, washing rooms, etc., and in the new wings there will be a lunch counter, express rooms, offices, etc. The west wing will be built to within 40 ft. of the proposed new hotel.

The ratepayers of Calgary voted, June 29, upon a bylaw confirming an agreement under which the city agrees to accept \$4,000 a year in lieu of all taxes upon the hotel to be built by the company, and also accepting certain sums towards street paving works.

Kaslo to Three Forks.—No definite decision, we are advised, has been reached with reference to the proposal to build a line of four miles from Kaslo to Three Forks, B.C., to serve some mines.

Wharf at New Westminster.—Plans have been filed with the Minister of Public Works at Ottawa, and at the Registry Office, New Westminster, B.C., of the new wharf which the company proposes to build on the Fraser River at New Westminster.

Kootenay Central Ry.—Work has been started on the bridge across the Kicking Horse River at Golden, B.C. Grading is also being pushed in the direction of the Crow's Nest Pass branch.

Vancouver Improvements.—In an interview at Vancouver, B.C., June 14, G. J. Bury, General Manager, Western Lines, is quoted as saying that the present plans for the station at Vancouver, have been abandoned and that the whole situation was being reviewed so that the new plans could be prepared upon a larger scale than had previously been contemplated.

W. Whyte, Vice President, who returned to Winnipeg, June 17, stated in an interview that certain improvements would have to be undertaken at Vancouver, and alternative plans were being considered. The proposed yards at Coquitlam would be sufficiently large to provide for the development of many years. The plans provide for a series of 90 tracks, paralleling the main tracks for two miles, making in all 180 miles of side tracks. On the opposite side of the track there is an area equally large for the shops with a tract a mile long on the Fraser River for industrial sites.

Victoria Wharf.—Tenders are under consideration for the building of a 240 ft. extension to the wharf at Victoria, B.C. The wharf will also be extended to 60 ft., in order to relieve the congestion of traffic.

Esquimalt and Nanaimo Ry.—We are advised that it is the company's intention to proceed immediately with the construction of the Cowicham Lake branch, a contract for which was expected to be let by the end of June.

The press reports as to the construction of the extension to Comox, we are advised, are premature, as nothing has yet been decided.

Seattle, Wash.—Negotiations are reported to have been completed by which the C.P.R. will lease pier no. 1 at Seattle, Wash., for the accommodation of its steamers, from the Northern Pacific Rd. The company has hitherto used the Pacific Coast Steamship Co.'s docks.

Minneapolis, St. Paul and Sault Ste. Marie Ry.—Track is reported laid on the bridge over the St. Croix River, west to Withrow, Minn., on the cut-off from New Richmond, Wis., and it was expected to have the whole cut-off completed by June 30. The construction of the line from Frederick, Wis., to Duluth, Minn., is being pushed forward by the contractors, Foley, Welch and Stewart, and it is expected it will be completed in the fall. (June, pg. 515.)

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Canadian Northern Ry. Construction, Etc

In an interview in London, Eng., June 8, Sir Wm. Mackenzie, President, is quoted as saying the company's construction programme for the present season was the largest yet undertaken. It will mean the addition of 700 or 800 miles of new lines or branches in the prairie provinces. These branch lines will open up large agricultural areas for settlement; the Stettler-Brazeau River line will open up large coal areas at the foot of the Rocky Mountains. During 1910 the company built about 600 miles of branch lines. The construction of the Port Arthur-Sudbury-Ottawa link would be pushed as fast as possible, and the end of 1914 would possibly see its completion.

Canadian Northern Quebec Ry.—W. A. Kingsland, Auditor, C.N.E. Ry., is quoted as stating, June 15, that it was the intention of the company to build shops at Limoilou, Que., and that land was being purchased as a site. The laying out of the plant would be proceeded with as soon as possible after the land had been acquired.

Some large purchases of land have recently been made on Montreal Island, along the route of the short line now being built from Hawkesbury, Ont., into the city. One report states that altogether some 8,000 acres has been purchased for between \$7,000,000 and \$8,000,000. One of the sellers said he had sold to the C.N.R. interests, while E. R. Decary, who does C.N.R. notarial business, states that the company had not either directly or indirectly purchased an inch of land on Montreal Island. The land is being acquired by a syndicate, a real estate agent states, the funds coming from London, Eng., but nothing is known of the purposes for which they are being acquired. The question of terminals in Montreal is yet unsettled, and it is stated that an arrangement may be made with the C.P.R. for the use of that company's terminals at Place Viger.

The revised location plans of the Hawkesbury-Montreal line through Chatham tp., Que., being mileage 7.58 to mileage 9.12 from Hawkesbury Jct., Ont., have been approved by the Board of Railway Commissioners. The contractor for the building of this line is J. P. Mullarkey, and it is understood that he has been instructed to push the line to completion as fast as possible. The work includes the building of a new bridge across the Back River, between Montreal Island and the mainland. The water is not deep at the

point of crossing, the bottom is good, and there are no engineering difficulties in the way of construction. The line is expected to be completed and in operation within two years.

Canadian Northern Ontario Ry.—A start was made at Dwyer Hill, midway between Ottawa and Smiths Falls, June 12, upon the grading of the remaining section of the Toronto-Ottawa line. At this point a subcontract covering six miles has been let to Ross and McCombe. Another subcontract is reported let to — Harrison, at Smiths Falls. Other contractors are reported to have their plants ready to move in as soon as the general contractors have assigned them mileage. The locating engineers are busy completing their work, so as to let the contractors start work.

The Board of Railway Commissioners has approved location plans for the line through Loughborough, Storrington, Bedford, South Crosby and Bastard tps. The line through these townships is an extension of the line from the terminus of the Bay of Quinte Ry. at Sydenham, towards Ottawa.

The Department of Railways has approved route maps of two small revisions of line between Deseronto and Sydenham, on the Bay of Quinte, which is being made part of the C.N.O.R. between Toronto and Ottawa. The deviations are about five miles and 1.5 miles respectively.

The Board of Railway Commissioners has dismissed the application of the ratepayers of Cobourg, Ont., for a subway under the tracks at William St., and has ordered the company to remove certain obstructions to the view near the crossing.

The Department of Railways has approved location plans for the projected lines through Wentworth and Halton counties, including Hamilton, about 30 miles.

Tenders are under consideration for the construction of that portion of the line from Port Arthur to Sellwood Jct., Ont., about 500 miles. The work is to be let in three sections, as follows: from Port Arthur to the boundary, between Thunder Bay and Algoma; from the Thunder Bay-Algoma boundary to Kapuskasing Lake, and from the latter point to Sellwood Jct., on the line from Toronto northerly. The work to be done under the contracts will include clearing, grubbing, and grading, the erection of bridges, trestles, culverts and masonry work, the fencing of the line, track-laying and ballasting, and the erection of a telegraph line. The contracts call for the completion of the work by Oct. 1, 1913. The eastern portion of this

mileage, it is reported, will run through a comparatively easy country for construction, but on the western portion there is a good deal of very rough country to be gone through, involving a good deal of rock work and bridging.

The Board of Railway Commissioners has approved the revised route maps of the line from Port Arthur to Nipigon, 73.9 miles; the proposed crossing under the C.P.R. near Nipigon, and authorized the building of the line through un-surveyed territory in Algonquin district, mileage 280 to 300 from Sudbury Jct.

It is stated that plans for the construction of 240 miles westerly from Sellwood Jct., and for 150 miles easterly from Port Arthur have been completed ready for the contractors. By a slight deviation near Sudbury connection will be made with the Algoma Eastern Ry. (formerly Manitoulin and North Shore Ry.). A Port Arthur report states that the C.N.O.R. route between Port Arthur and Nipigon is so close to the C.P.R. that it is probable that an arrangement will be made by which the two companies will run their trains, as over a double track line.

Canadian Northern Ry.—The Department of Railways has approved the route map of the proposed connection between the C.N.R. at Fort Frances, Ont., and the International Bridge and Terminal Co., about 800 ft., at International Falls, Minn., and the Board of Railway Commissioners has approved the location of the connection with the Canadian Northern Ry. at Fort Frances, Ont., and the crossing of the Rainy River to International Falls, Minn., and for the International Bridge and Terminal Co.

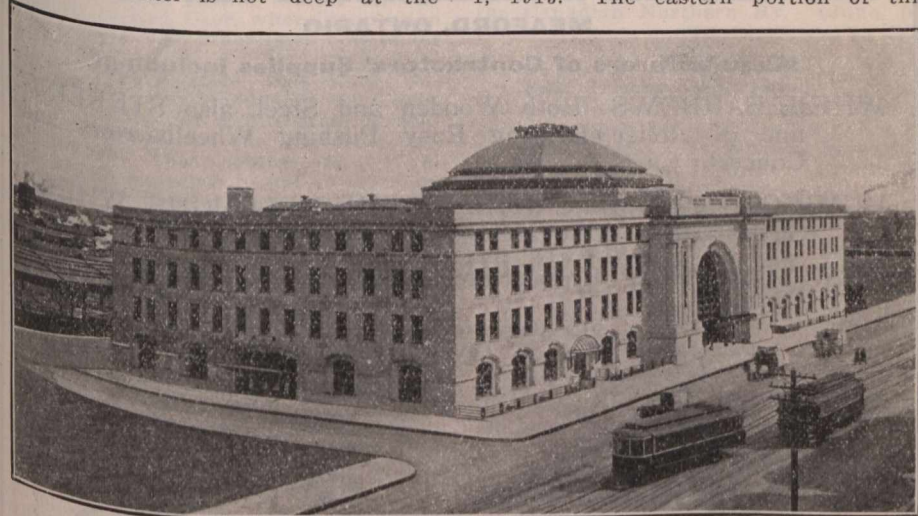
The company is desirous of securing permission from the Winnipeg city council to lay spur tracks across lots 8, 9, 10, D, and 11 of plan 208, and the city engineer has been requested to report as to the subways which would be necessary in order to secure public access to the river.

The question of the entrance to the new terminal at Fort Garry has not been settled. The city demands that the track coming from the freight yards and crossing Main St., should be elevated, so as to be brought in over the viaduct. This, the company's officials state to be impossible owing to the short distance in which to make the 15 ft. rise. As a result the building of the viaduct has been suspended, and temporary arrangements are being made for the entry of trains. The Board of Railway Commissioners has already approved plans showing location and entrance to the Union Station, and the crossings at River Ave., Main St., South and Bell Avenues, and a route map showing a piece of line 0.305 mile long, as an entrance to the Union Station, has been approved by the Department of Railways.

The question of the using of branch lines for the conveyance of freight before they had been passed for traffic by the Government officials was before the Board of Railway Commissioners at Winnipeg, June 15. J. H. Ashdown, on behalf of the board of trade stated that it had always been the custom to carry freight over new railways before they had been inspected. At present there were about 750 miles of C.N.R. lines, and 250 miles of G.T.R. lines which could be used for the freight, but which have not been inspected.

The C.N.R. mileage stated to be affected is estimated by one newspaper at 615 miles, on nine different lines. Following is a table showing the mileage laid on each of these lines, with the starting and terminal points:

	Miles
Vegreville to Munson, Alta.	162
North Battleford to Mervin	50
Maryfield to Lampman, Sask	68



Fort Garry Station, Winnipeg,

which has been built by the Canadian Northern Ry. for joint use with the Grand Trunk Pacific Ry.

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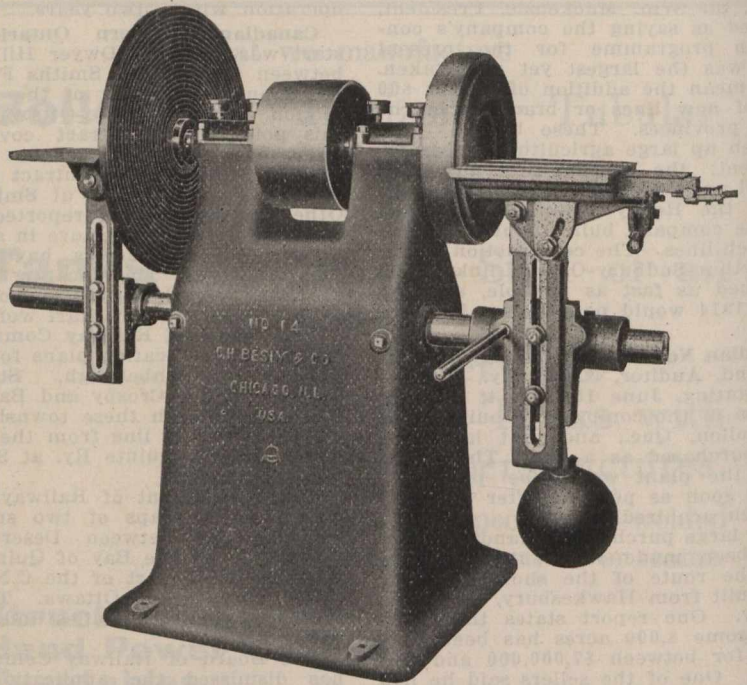
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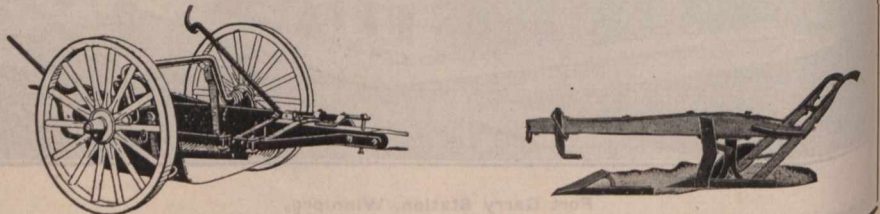
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Luxton to Bienfait, Sask. 16
 Paddington to Bird's Hill, Sask. 8
 Haliboro to Beulah, Man. 75
 Hudson Bay Jct. to Le Pas, Sask. 87
 Shellbrook to Alsack, Sask. 49
 Oak Point to Gypsumville, Man. 160

The Department of Railways has approved route maps of a line from Grosse Isle, Man., on the Oak Point branch, northerly for 36 miles; and of a line from Wassewa to Deloraine, Man., about 15 miles. It has also approved of revised route maps of part of the line from Davidson, Sask., westerly for about 20 miles, and of the line from Vonda, Sask., northeasterly for about 35 miles.

A contract has been let to Molloy Bros., Winnipeg, for the completion of the Rossburn extension to a junction with the main line at Canora, Sask., 12 miles.

A revised route map of the Prince Albert-Battleford line, between tp. 44, r. 8, and Denholm in tp. 42, r. 14, w. 3 m.; 73.9 miles has been approved by the Department of Railways.

On the Maryfield extension, which is being pushed westerly, approximately 60 miles of grading was done in 1910, and there is still about 30 miles to build. We are advised that a contract has been let to the Cowan Construction Co. for the completion of the line to Moose Jaw, Sask.

By an arrangement made, June 3, between M. H. McLeod, General Manager and Chief Engineer, the company's terminals in Calgary will be located on Seventeenth Ave. The arrangement was confirmed by the city council, June 12, and plans of the lay-out are to be submitted at an early date. The location of the line entering the city has not been finally disposed of, but it is expected that everything will be got in order so as to have the route pegged out by the fall. The company's engineers are making surveys for a line from Calgary to Lethbridge.

The Canadian Northern Alberta Ry. is being built under a Dominion charter, and being given by a guarantee of bonds to the amount of \$13,000 a mile for the first 50 miles, and \$25,000 a mile for the next 100 miles. The line proposed starts from near Strathcona, and proceeds in a generally southwesterly direction into the Brazeau River coal fields, and on to the headwaters of the McLeod River. M. H. McLeod, General Manager and Chief Engineer, in an interview at Strathcona, Alta., June 8, said construction would be started at an early date upon a line from Calgary southwesterly. The survey follows the C.P.R. for about six miles, bending northwesterly to east of Pigeon Lake, thence almost directly southerly to Red Deer, where connection will be made with other lines now under construction.

Press reports state that work was started June 1, by Macdonald and Davis, on the grading for a line from Strathcona to Camrose, on the Vegreville-Calgary branch. These contractors, it is reported, had expected to get to work on the line from Stettler, through Red Deer to the Brazeau River coal fields, but were stopped, and told to go on with the Strathcona-Camrose line.

The branch which has been in operation for some years from Edmonton to Morinville, Alta., 23 miles, is to be extended to Athabasca Landing, a further 75 miles. The contract for this has been let to the Northern Construction Co., and the work is in progress.

The line to Peace River starts at Onondaga, on the main line, west of St. Albert, and near Lac Ste. Anne, and runs northwesterly. A contract has been let to the Northern Construction Co. for building 50 miles, and it is expected that 40 miles will be completed this year.

Canadian Northern Pacific Ry.—T. H. White, Chief Engineer in charge of con-

struction and surveys, and S. H. Sykes, Assistant Chief Engineer, recently completed an inspection of the work in progress on the line under contract between Port Mann and Hope. The work is well advanced all the way and it is expected to have the track laid on the section by Nov. 1. An arrangement has been made by which the Great Northern Ry., through the Vancouver, Victoria and Eastern Ry., will connect with the C.N.P. Ry. at Sumas, run over the C.N.P. R. to Hope, 38 miles, switching off to its own line, which is now being pushed westerly from Peneticton to Hope.

We were advised, June 20, that contracts for the grading, etc., of the three sections from Hope to Kamloops, 163 miles, had not then been let.

The work of revising the surveys for the line between Kamloops and the Yellowhead Pass was begun, June 1, by a survey party in charge of W. I. Basset, who will work from the Pass to Albrida Summit, 183 miles, where he will meet a second party working easterly from Kamloops.

Vancouver Island.—A meeting has been held at Victoria, B.C., when the Minister of Public Lands and representatives of the various railways discussed the question of the utilizing of the Soughees Reserve, which has been acquired, under the authority of the Dominion Parliament for railway and other purposes.

The location surveys are reported to have been completed to Cowichan Lake, about 80 miles from Victoria, and four parties are working on the surveys between that point and the Alberni canal.

Canadian North-Eastern Ry.—We are advised that all grading and track laying will be completed to Red Cliff, B.C., mileage 13.5, the proposed terminus, by Aug. 1. The track end at June 1 was at Glacier Creek, mileage 5.7. A spur, 1,500 ft. long, to the Portland Canal concentration at Stewart, is expected to be completed July 1, when ore shipments will be started. Ore bunkers are under construction at Red Cliff, and are expected to be completed by Aug. 1. The following structures have been erected at Stewart: Station and freight shed, freight shed or wharf, engine shed, machine shop, blacksmith shop, storehouse, watertank and turntable. Freight sheds will be erected as necessity requires at Glacier Creek, Bitter Creek and Red Cliff.

A general meeting of citizens was held at Stewart, June 7, when a resolution was passed requesting the Provincial Government to aid in the building of the line from Stewart to a connection with the Canadian Northern Ry. (June, pg. 525.)

C.P.R. Hotels.—The Hotel Kootenay Lake, at Balfour, B.C., which is expected to be open for business July 1, contains 50 rooms. T. Kenna, heretofore rooming clerk at Chateau Frontenac, Quebec, and formerly manager Roberval Hotel, Roberval, Que., has been appointed manager. A new hotel will shortly be erected at Calgary, Alta., containing 250 rooms. P. Shulz, formerly connected with the Hyde Park Hotel, London, Eng., has been appointed assistant manager, Royal Alexandra Hotel, Winnipeg. G. H. Rawlins, heretofore assistant to the manager, Banff Springs Hotel, Banff, Alta., has been appointed manager. H. L. T. Pigou, heretofore at Chateau Frontenac, Quebec, has been appointed manager, Mount Stephen House, Field, B.C. F. L. Hutchinson, manager, Chateau Frontenac, Quebec, will act as assistant to Hayter Reed, Manager in Chief, C.P.R. Hotels, during the summer, in the west, and will also be succeeded, temporarily, by F. McMahon, assistant manager.

N.T.R. Shops at Transcona.

The National Transcontinental Railway Commissioners will receive to July 11, tenders for the construction of the following car shops:—

- At Transcona, near Winnipeg. Scrap Platform and storage bins, 200 by 35 ft.
- Dry kiln 40 by 70.
- Wheel and machine shop, 74¾ by 164¾ ft.
- Freight car shop, 604¾ by 199¾ ft.
- Planing mill, 304¾ by 104¾ ft.
- Paint storehouse, 39 ft. 7 ins. by 48 ft. 7 ins.
- Coach paint shop, 344¾ by 91¾ ft.
- Coach shop, 204¾ by 124¾ ft.
- Car Department office, 68 by 60 ft.
- Motive Power Department office, 68 by 60 ft.

Contractors are requested to send in a bulk price for the work. The 10 buildings, with their equipment, are estimated to cost about \$2,500,000, which will bring up the cost of the whole of the shops at this point to upwards of \$6,000,000.

A plan of the entire layout of the shop plant at Transcona was given in our issue of Sept., 1910, pg. 717, and a detailed description of the whole of the buildings was given in our issue of Aug., 1910, pg. 633. The buildings to be erected under the contract now being arranged are shown in the plans in our September issue as being north of the tracks running through the centre of the yard, north of the water tank and power house. The dimensions of certain of the buildings to be erected vary from the figures given in the article referred to, but the variation is unimportant. The contractors are also called upon to furnish an indirect heating apparatus and a yard crane runway for these buildings, together with the necessary lumber sheds.

Locomotives for Government Railways.

The Minister of Railways, in answer to a question in the House of Commons recently stated that the following locomotives had been bought from 1896 to 1910. The figures in the column after the year show the number of locomotives bought. The price mentioned is per locomotive:—

INTERCOLONIAL RAILWAY		
1898	2 Canadian Locomotive Co.	\$14,500 00
	2 Baldwin Locomotive Works	10,000 00
1899	1 Canadian Locomotive Co.	14,500 00
	2 Canadian Locomotive Co.	12,000 00
	20 Baldwin Locomotive Works.	9,700 00
1900	1 Canadian Locomotive Co.	9,788 40
	1 Canadian Locomotive Co.	12,000 00
	10 Manchester Locomotive Co.	15,500 00
1901	9 Manchester Locomotive Co.	13,500 00
	20 Canadian Locomotive Co.	19,000 00
	6 Dixon Locomotive Co.	15,000 00
	10 Richmond Locomotive Co.	14,817 65
1902	6 Dixon Locomotive Co.	15,000 00
	4 Canadian Locomotive Co.	17,681 88
1903	11 Canadian Locomotive Co.	29,270 00
1904	15 Canadian Locomotive Co.	20,270 00
	8 Canadian Locomotive Co.	17,500 00
1905	10 Canadian Locomotive Co.	20,300 00
	12 Canadian Locomotive Co.	23,950 00
1906	5 Canadian Locomotive Co.	18,430 00
	1 Canadian Locomotive Co.	21,950 00
	15 Locomotive and Machine Co.	24,000 00
1907	19 Canadian Locomotive Co.	21,950 00
1908	32 Canadian Locomotive Co.	21,950 00
	3 Canadian Locomotive Co.	18,430 00
	10 Locomotive and Machine Co.	24,000 00
1910	10 Canadian Locomotive Co.	19,600 00
	1 Locomotive and Machine Co.	22,500 00

PRINCE EDWARD ISLAND RAILWAY		
1899	2 Canadian Locomotive Co.	8,250 00
1900	2 Canadian Locomotive Co.	8,780 00
1902	2 Canadian Locomotive Co.	10,150 00
1904	4 Canadian Locomotive Co.	9,450 00
1905	1 Canadian Locomotive Co.	9,450 00
1907	4 Canadian Locomotive Co.	13,250 00

W. Fair, agent Canadian Northern Ry. at West Fort William, Ont., was arrested June 10 on a charge of embezzling about \$700.

Dearborn Feed Water Treatment

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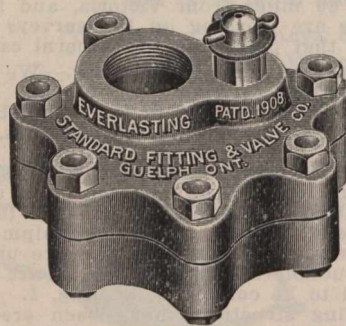
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Railway Commissioners' Traffic Orders.

Summaries of other traffic orders are given on another page under "Orders by Railway Commissioners":—

WHITE PASS AND YUKON RY. RATES.

13765. May 29. Re order 7246, June 16, 1909, made upon the application of the Board of Trade of Dawson, Yukon, directing the British Yukon Ry. Co., the British Columbia Yukon Ry. Co., the Pacific and Arctic Ry. and Navigation Co., and the White Pass and Yukon Ry. Co. to file with the Board (1) tariffs of the companies' tolls covering all through traffic received at Skagway and destined to White Horse, or to any intermediate point or points between the International boundary line between Alaska and British Columbia, upon the line of railway, and White Horse; covering all through traffic received at any point or points upon the railway between White Horse and the International boundary, and destined to Skagway. And re the tariffs filed in pursuance thereof: Upon reading the application of the companies, for an extension of time for filing the tariffs required by order 12783, Jan. 18, 1911, and order 13292, Mar. 23, 1911, and for the written reasons given, it is ordered that the application be refused, and that the companies are declared to be subject to a penalty of \$100 a day for every day's default in compliance with order 12783, as extended or amended by order 13292.

Chief Commissioner Mabee gave the following judgment:—Under the order of March 4, formally issued on March 23, the effective date for the tariffs required to be filed under the order of Jan. 18, was extended to June 1, because it was thought that the appeal to the Governor-in-Council could not be heard and disposed of before the date that the tariffs were required to be put into effect. By letter of May 23, received by me on May 28, application is now made to extend this date to Nov. 15 or Dec. 1. No reasons are given for this extension, except it is alleged that "it is quite evident now that it will be impossible to dispose of the appeal to the Governor-in-Council until some time in the autumn." Nothing whatever is said about the delay from March until the present time. On the other hand the Board learns that when it made the order extending the time to June 1, Mr. Berdoe, General Manager of the road, telegraphed to White Horse as follows: "Application of order reducing rates suspended indefinitely." This was a misfact, as the time was definitely fixed as June 1. The telegram, however, probably is an indication that it was thought the company need do was to make another application and it could get further extensions, perhaps "indefinitely." In addition to this, the company, by a general notice, withdrew after April 1 all tariffs naming through freight and passenger rates between Seattle, Tacoma, Port Townsend, Vancouver and Victoria, and points on the White Pass and Yukon Route, and connecting lines via Skagway, the result of which is disclosed by the following telegram from the Secretary of the Dawson Board of Trade, dated May 25: "Dawson Board of Trade finds White Pass Ry. tariff April 1 has from Seattle, Vancouver, to Dawson, and abolishing of commodity group rates raised freight rates from \$2 to \$15 a ton on staples mostly used in the territory over rates of last season basing steamship charges from Seattle or Vancouver to Skagway at \$10 a ton." The Board's order required tariffs filed effective April 1 reducing the tolls upon the railway by 33 1/3%. As matters now stand the extension of time already given to these companies seems to have enabled them

to increase their already burdensome tolls, as appears in the telegram from Dawson. The Board is asked to perpetuate this state of affairs until Nov. 15 or Dec. 1, if not "indefinitely." Instead of so doing an order should issue subjecting these companies to a penalty of \$100 a day for every day they are in default in filing and bringing into effect tariffs in compliance with the order of Jan. 18, 1911.

The White Pass and Yukon Ry. appealed to the Governor in Council, and a press dispatch states that the Board of Railway Commissioners has been directed to re-open the matter.

SUPPLEMENT TO CANADIAN CLASSIFICATION

13850. June 2.—Re application of Canadian Freight Association, under sec. 321 of the Railway Act, for the approval of proposed Supplement 1 to Canadian Classification 15, and re application of the Philips Manufacturing Company, Toronto, for a reduction in the present ratings of plate or mirror glass. It is ordered that the new and amended ratings embodied in the said proposed Supplement 1 to Canadian Classification 15 be approved, with the exception of the proposed ratings of the following articles, the application with respect to which is hereby refused, namely:—Common window glass, united outside measurement over 120 ins., in carloads; cathedral glass, rolled, comprising all varieties of cast or colored glass, not framed or leaded; chipped or ground glass; wired glass, not polished; tin cans, oil, with or without woodboard jackets, or not otherwise specified; loose, in carloads; tin cans, not nested, in crates, boxes, or barrels, in carloads; tinware, loose, in carloads; empty crates. And it is also ordered that the following amended or new ratings be provided, namely:—(a), Glass, ribbed or rough, cathedral (rolled, comprising all varieties of cast or colored glass, not framed or leaded), chipped or ground, and wired (not polished), at the same ratings as provided for common window glass; (b), tin cans, not nested in crates, boxes or barrels, c.l., minimum weight 20,000 lbs. per car, 5th class; (c), crate stuff, in bundles or shooks, l.c.l. 4th, c.l. 10th class; to be added to the lumber list, also, the words "set up" to be added to the present ratings for empty crates; (d), cordwood and pole saws, l.c.l., set up, 1 1/2 1st class, knocked down, 2nd class, to be added to the agricultural implement list, with permission to add also to the machinery list should the applicant so desire; (e), lead washers, in boxes, c.l., 5th class. And it is also ordered that in view of the apparent misunderstanding and lack of evidence with respect to the proposed ratings for meats, etc., in glass or earthenware, the said proposed ratings be withdrawn, with leave to renew the application after reconsideration by the applicant. And it is further ordered that the application of the Philips Manufacturing Co. for a reduction in the ratings of plate or mirror glass, not exceeding 80 united inches, from l.c.l. 1st, c.l. 3rd class, to l.c.l. 2nd, c.l. 4th class, be refused.

RATES ON RICE.

13852. June 1.—Re application of Mount Royal Milling and Manufacturing Co., of Montreal, complaining that the G.T.R. and C.P.R. Companies unjustly discriminate against rice manufactured in the province of Quebec by giving preferential rates to cleaned rice from Great Britain, arriving at Montreal by ocean steamships, and re-shipped from Montreal Wharf in competition with the product of the applicant's mills to the same Canadian destinations; and that the rates on cleaned rice from Montreal are unreasonably high in comparison with the rates from Boston to the said destinations in Canada, through Montreal. Upon the application of the Chairman of the Advisory Committee of the Canadian Freight Association, and the

consent of the applicant, and upon the recommendation of the Chief Traffic Officer of the Board, it is ordered that "Rice, not otherwise specified, in packages," as described in item 15, pg. 37, Canadian Classification 15, be carried between all points in Canada east of and including Fort William, Ont., by all railway companies subject to the jurisdiction of the Board, at 4th class rates in less than carload lots; the said rates to be provided for by special commodity tariffs to take effect not later than June 15, 1911. And it is further ordered that order 12275, April 29, 1910, be rescinded.

Trespassers on Railway Right of Way

—The following circular, signed by James Osborne, General Superintendent, Ontario Division, C.P.R., Toronto, has been issued to sectionmen, bridgemen, station and yard staff, signalmen, watchmen and constables on the division: "Government statistics having shown that 75% of the people killed in Canada during the past year were trespassers, you are hereby instructed that trespassing on the company's right of way must not be allowed, even though it may be necessary to invoke the aid of the law in suppressing it."

Manual of Statistics.—The 23rd annual issue of this valuable work of reference for investors has been issued. The new edition contains 1,092 pages of general information, and the annual reports of railway, steamship and industrial corporation, giving the latest available facts about them. The 200 pages at the end contain a large amount of information in tabular form, showing the movement of the principal stocks on the important exchanges during the year. Everything is so arranged that the information desired on any one point, or in reference to any single company, or any group of companies, is readily accessible. It is published by the Manual of Statistics Co., 20 Veysey St., New York City, and the price is \$5.

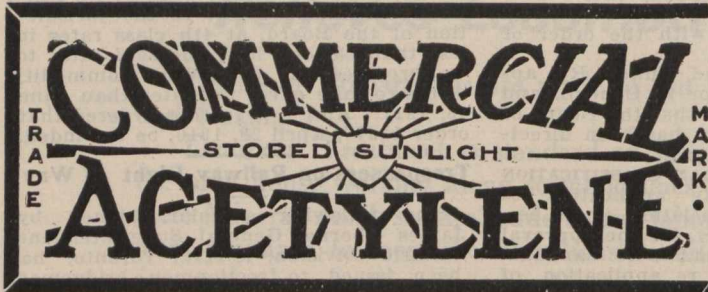
Montreal to Hudson Strait.—A London, Eng., syndicate, the Canadian end of which is headed by Sir Wm. Mackenzie, Toronto, is reported to be promoting a scheme of development in northern Quebec. The reports state that the syndicate has acquired coal mining properties in Nova Scotia, large holdings of real estate in Quebec, and mining areas in the Porcupine district of Ontario. While these will be developed, it is stated that the principal undertaking will be the building of a railway giving connection between Montreal and Bearon Point on Hudson Bay Strait, about 1,000 miles. The report adds that this will be known as the St. Lawrence and Ungava Ry.

The Dominion Steel Corporation has declared a quarterly dividend of 1%, payable July 3 to shareholders of record June 20.

The G. T. Pacific Ry. is taking action in the British Columbia courts to have various companies restrained from using the words "Grand Trunk Pacific" as part of their titles. It is alleged on behalf of the railway that the use of the words gives rise to a belief that these companies are associated and operated in connection with the G. T. Pacific Ry.

Canadian Vickers, Ltd., has been incorporated under the Dominion Companies Act, with a capital of \$5,000,000, and offices at Montreal, to carry on a general business as steel makers and manufacturers and all operations incidental thereto; also the business of shipbuilders, shipwrights, etc., and to build, repair and deal in vessels of every description, and all kinds of ordnance, arms and ammunition. The incorporators are A. Vickers, Sir A. T. Dawson, Sir V. H. P. Caillard, of Vickers, Ltd., London, Eng.; F. O. and J. G. Lewis, Sir H. Montagu Allan and P. Mackintosh, Montreal.

The Light of Day on The Right of Way



LITERATURE ON REQUEST

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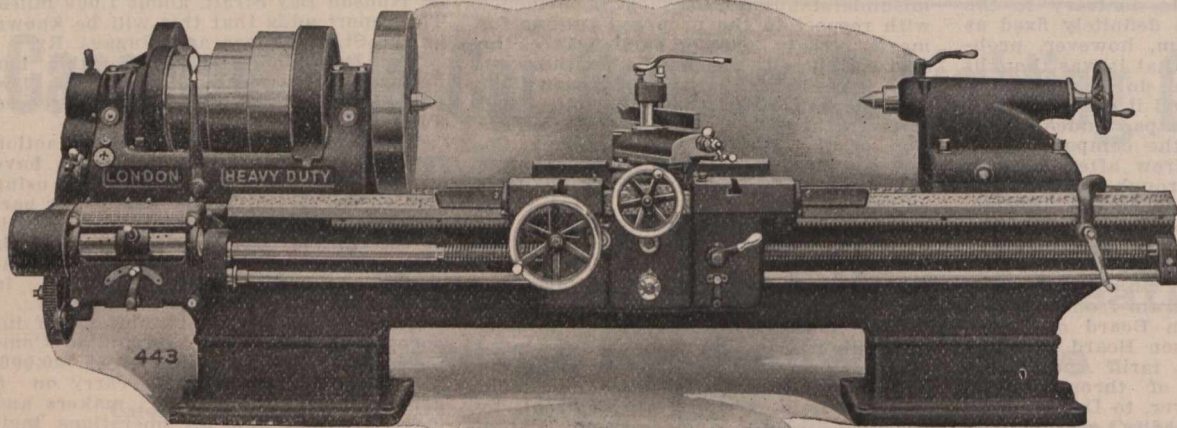
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Railway Rolling Stock Notes.

The Duluth, Winnipeg and Pacific Ry. has ordered 350 box cars and 150 flat cars in the U.S.

The Intercolonial Ry. has ordered three colonist cars from the Canadian Car and Foundry Co., Montreal.

Kennedy and McDonald, railway contractors, have received 10 flat cars from the Nova Scotia Car Works, Ltd., Halifax.

The G.T.R. has ordered 1,000 36 ft. steel under frame box cars from the Canadian Car and Foundry Co., Montreal.

The G.T.P.R. has ordered 20 consolidation, 15 Pacific type, and 10 switching locomotives from the Montreal Locomotive Works.

The G.T.P.R. has received four colonist cars, nos. 3020, 3025, 3026 and 3027, from the Canadian Car and Foundry Co., Montreal, and 10 sleeping cars from the Pullman Co.

The Grand Trunk Pacific Ry. has placed an order with the Montreal Locomotive Works, for 20 consolidation, 15 Pacific type and 10 switching locomotives, for delivery between July and October.

With reference to the report mentioned in our last issue that the C.P.R. was to build a number of observation cars for the Austrian State railway system, we are officially advised that the statement is entirely incorrect.

The C.P.R. is reported to be considering the question of installing soda fountains on its transcontinental trains. No definite decision has been arrived at, and we are advised that it is not improbable that such an innovation may be tried.

A mortgage agreement has been deposited with the Ontario Secretary, between the Algoma Central and Hudson Bay Ry., the Superior Rolling Stock Co. and the National Trust Co., regarding certain rolling stock covered by a conditional sales agreement, to secure a bond issue by the car company.

The Board of Railway Commissioners notified railway companies June 8 to file within 60 days a statement showing the number, class and weight of each locomotive on the line, and whether or not equipped with dump ash pans to avoid the necessity of men going underneath the locomotive.

The Canadian Northern Ry., between May 15 and June 15, ordered 40 flat cars, 30 tons capacity, from the Canadian Car and Foundry Co., Montreal; 10 second class coaches, from the Crossen Car Manufacturing Co., Cobourg, Ont., and 10 switching locomotives from the Montreal Locomotive Works.

In reference to the information published in our last issue as to the use of crude oil for fuel on C.P.R. locomotives on the Pacific Division, we are officially advised that it is the intention to use it between Vancouver and Revelstoke should it prove economical. The question is in abeyance at present, but will be again considered a little later on.

Following are the chief details of the 60 Hart-Otis steam shovel clay cars, which the Laprairie Brick Co. has ordered from the Hart-Otis Car Co., Montreal:

Length over end sills 8 ft. 9 ins.
 Length inside 4 ft. 9 ins.
 Width inside 4 ft. 6 ins.
 Height inside 3 ft. 9 ins.
 Height from rail to top 5 ft. 10½ ins.
 Wheel base 6 ft. 6 ins.
 Capacity 3 yds.

The Canadian Northern Ry., between May 15 and June 15, received the following additions to rolling stock: 50 box cars, five first class cars, from the Canadian Car and Foundry Co., Montreal; 190 box cars from the Nova Scotia Car

Works, Halifax; four second class cars, 65 stock cars, from the Crossen Car Manufacturing Co., Cobourg, Ont.; 60 Hart cars from the Hart-Otis Car Co., Montreal, and 14 locomotives from the Montreal Locomotive Works.

The C.P.R. is building at its Angus shops, Montreal, some parlor-buffet cars, with observation room on each. This latter feature extends the full width of the car, with 12 chairs, and communicates direct to the observation platform. The main part of the car has seating capacity for 24 persons, with writing table and lavatory accommodation. Following are the chief dimensions:—

Length of car 72 ft. 8 ins.
 Observation room 18 ft. 11½ ins.
 Main compartment 37 ft. 2 ins.

The C.P.R., between May 15 and June 12, placed the following orders for rolling stock: 12 switching locomotives, one first class car, 1,210 box cars, four freight refrigerator cars, 19 stock cars, six vans, one ore car and seven ballast cars, at its Angus shops, Montreal; 15 N. 3 locomotives, at the Montreal Locomotive Works; 500 steel frame box cars, and 13 steel flat cars at the Canadian Car and Foundry Co., Montreal; and 500 steel frame box cars, 402 steel coal cars in the U.S.

The C.P.R., between May 15 and June 12, received the following additions to rolling stock: Two D. 10 locomotives, one hump switching locomotive, one Mallet locomotive, 26 suburban cars, 230 box cars, 17 refrigerator cars (passenger), five sleeping cars, eight vans, 258 stock cars, 21 box baggage cars, and one superintendent's business car, from its Angus shops, Montreal; two D. 10 locomotives from the Canadian Locomotive Co., Kingston, Ont.; 329 steel flat cars from the Canadian Car and Foundry Co., Montreal, and one pile driver from the U.S.

Following are the chief details of the 20 Hart convertible cars, which the C.P.R. has ordered from the Hart-Otis Car Co., Montreal, and which are being built by the Canadian Car and Foundry Co., Montreal, as previously reported:

Length over end sills 36 ft. 8 ins.
 Length inside as gondola 34 ft. 8 ins.
 Length inside as hopper car 20 ft. 10 ins.
 Width over side sills 8 ft. 10 ins.
 Width inside 8 ft. 8 ins.
 Width overall 10 ft. 2¼ ins.
 Width at top 9 ft. 10 ins.
 Height from rail to top of floor 4 ft. 4¼ ins.
 Height from rail to top of car 8 ft. 1¾ ins.
 Height inside 3 ft. 9¼ ins.
 Bolsters and brake beams Simplex
 Side bearings Susemihl

Following are chief details of the 15 Hart convertible cars, which the Prince Edward Island Ry. is building at its Charlottetown shops, under license from the Hart-Otis Car Co., Montreal, as mentioned in our last issue:

Length over end sills 34 ft. 8 ins.
 Length inside as gondola 32 ft. 8 ins.
 Length inside as hopper 20 ft. 10 ins.
 Width inside 7 ft. 5½ ins.
 Width overall 9 ft. 9 ins.
 Height from rail to floor 4 ft. 1½ ins.
 Height inside 3 ft. ¼ ins.
 Height from rail to top 7 ft. 1¾ ins.
 Length of hopper opening 16 ft. 9 ins.
 Width of hopper opening 2 ft.
 Number of hopper doors 1
 Number of side doors 12
 Couplers Tower
 Brakes Hand and Westinghouse air
 Bolsters and brake beams Simplex

The C.P.R. is building, at its Angus shops, Montreal, a number of sleeping cars, each consisting of seven state rooms with the corridor along the side, with drawing room and observation room. The staterooms, each 6 ft. 2¼ ins., are equipped with complete toilet accommodation, the drawing-room is located at one end of the car, and the observation room at the other. The latter, which is 10 ft. 11½ ins. long, the full width of the car, has eight chairs, and communicates direct to the observation platform. Following are the chief dimensions:

Length of car 72 ft. 8 ins.

Length over buffer beams 78 ft. 1 in.
 Observation platform 3 ft.
 Observation room 10 ft. 11½ ins.
 State rooms, each 6 ft. 2¼ ins.
 Drawing room 6 ft. 3 ins.

Following are chief details of the 11 D-10g locomotives which the C.P.R. is building at its Angus shops, Montreal, 10 of which were mentioned in our last issue:—

Weight on drivers 142,000 lbs.
 Total weight 193,000 lbs.
 Cylinders, diar. and stroke 21 by 28 ins.
 Valves Piston, 11 ins.
 Boiler, type Extended wagon top
 Boiler, pressure 200 lbs.
 Heating surface, tubes 2,238 sq. ft.
 Heating surface, firebox 180 sq. ft.
 Heating surface, total 2,418 sq. ft.
 Heating surface superheater 409 sq. ft.
 Equivalent heating surface 3,032 sq. ft.
 Tubes, no. and diar. 240 2 ins., 24 5 ins.
 Tubes, length 14 ft. 2½ ins.
 Firebox 8 ft. 6¼ ins. by 5 ft. 9½ ins.
 Grate area 49 sq. ft.
 Capacity, coal 10 tons
 Capacity, water 5,000 galls.
 Axles, main 9½ by 12 ins.
 Axles, other 9 by 12 ins.
 Air brakes Westinghouse ET 6
 Headlight Pyle National Electric
 Valve gear Walschaert
 Superheater Vaughan and Horsey

Following are the chief details of the five consolidation and five ten-wheel locomotives (nine being mentioned in our last issue), which the Duluth, Winnipeg and Pacific Ry. (C.N.R.) has ordered from the American Locomotive Co., and the Baldwin Locomotive Works, respectively:—

Consolidation, Ten-wheel.
 Weight on drivers 165,000 lbs. 129,000 lbs.
 Weight, total 186,000 lbs. 169,000 lbs.
 Cylinders 23 by 26 ins. 22 by 26 ins.
 Boiler, type Extended wagon top
 Boiler, pressure 200 lbs.
 Heating surface, tubes 2,259 sq. ft. 1,746 sq. ft.
 Heating surface, firebox 176 sq. ft. 183 sq. ft.
 Heating surface, total 2,435 sq. ft. 1,929 sq. ft.
 Tubes, no. and diar. 185 2 ins. 26 5½ ins.
 Tubes, length 13 ft. 2½ ins. 26 5½ ins.
 Firebox 114 by 41¾ ins. 118 by 40¼ ins.
 Grate area 33.1 sq. ft. 31.6 sq. ft.
 Capacity, water 6,000 galls. 5,000 galls.
 Capacity, coal 12 tons 10 tons

The special equipment is the same in each case, as follows:—

Boiler lagging H. W. Johns-Manville Co.
 Brakes Westinghouse
 Brake beams Simplex
 Brake shoes Diamond S
 Journal boxes McCord
 Sight feed lubricators Detroit
 Springs Wrought iron
 Steam heating Gold system 2 in. pipes
 Superheater Type B
 Valve gear Walschaert

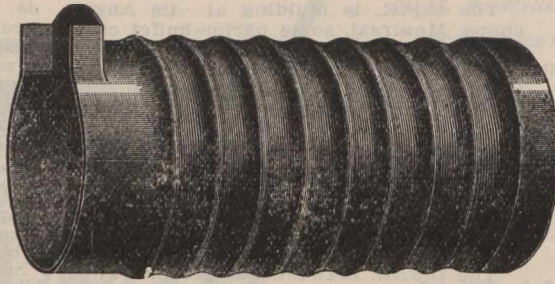
The 10 sleeping cars which the G.T.P.R. has received from the Pullman Co. will be named Africa, Australia, Bermuda, Canada, Gibraltar, India, Tasmania, Trinidad, Victoria and Wales. They have steel underframes of the fish-belly type, with cast steel platforms and bolsters combined. The framing is a combination of steel and wood of the latest improved pattern, the bulkheads being re-inforced with heavy steel framing, representing an efficient anti-telescoping construction, sufficient to take all strains in the event of collision. The berths have been arranged to have increased head room, and are longer and wider than is customary. The inside finish is of polished Cuban mahogany, and the upholstery is of a closely woven plush, so that the chances of dust collecting are reduced to a minimum. The lavatories are equipped with all the most modern and most effective sanitary appliances. The lighting is a combination of electricity and gas, and improved oscillating fans and heating equipment with increased heating surface have been installed. Following are the chief details:

Length over end sills 73 ft. 6 ins.
 Length over buffers 81 ft. 10 ins.
 Width of body at lower deck crown moulding 10 ft. 3½ ins.
 Width of upper deck 6 ft.
 Height from rail to top of lower deck crown moulding 11 ft. 7½ ins.
 Height from rail to top of roof 14 ft. 1 in.
 Height from rail to top overall 14 ft. 5 ins.
 Height from rail to centre of coupler 2 ft. 11 ins.
 Wheel base, on truck 10 ft. 6 ins.

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Strength, Unsurpassed for
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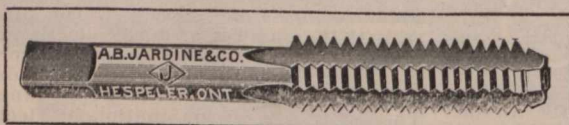
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Send us your specifications for special Taps.
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There are no better Tools than "Jardine" Tools.

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A. B. Jardine & Co.

Hespeler, Ont.

Wheel base, total	68 ft.
Length of drawing room	6 ft. 4 ins.
Width of drawing room	6 ft. 8 1/2 ins.
Smoking room	6 ft. 5 ins. by 6 ft. 6 1/2 ins.
Parlor	31 ft. 9 ins. by 9 ft. 2 1/2 ins.
Height, floor to under deck rails	.8 ft. 2 ins.
Length inside	.72 ft. 9 ins.
Width inside	.9 ft. 2 1/2 ins.
Roof	Standard
Weight	147,150 lbs.
Journals	9 ins. by 5 ins.
Journal box	McCord M.I. with steel inserts
Platforms	Steel
Couplers	Tower
Brakes	Westinghouse high speed and independent hand
Heating	Gold duplex system
Lighting	Gas and electric
Lamps	Safety Car Heating and Lighting Co.
Hoppers	Duner Co.

Railway Finance, Meetings, Etc.

Atlantic and Lake Superior Ry.—In the course of the proceedings arising out of the liquidation of the Charing Cross Bank, London, Eng., it was stated June 13, that the contract for the sale of the line to the Quebec Oriental Ry., which was financed by the bank, called for the payment of £50,000 cash to complete the purchase. It was understood that £20,000 had been paid.

Brockville, Westport and North-Western Ry.—An action has been entered in the Ontario courts by the Knickerbocker Trust Co. to recover \$450,000 alleged to be due on account of principal of the company's bond issue, and \$72,000 interest claimed to be due thereon.

The line was purchased at a foreclosure sale by U. S. interests, Jan. 20, 1903, and the company reorganized under this title, the only change from the old one being that "North-Western" replaced "Sault Ste. Marie." In June, 1910, the line was acquired by the Mackenzie, Mann and Co. interests, in connection with the development of the Canadian Northern Ontario Ry. and the Ontario and Ottawa Ry. Co. was incorporated with power to take over this as well as other lines.

Canada Southern Ry., Niagara, Grand Island Bridge Co., Niagara River Bridge Co.—The annual meeting was held at St. Thomas, Ont., June 7, under the chairmanship of N. Kingsmill, K.C. Following are the directors for the current year: W. K. Vanderbilt, F. W. Vanderbilt, C. M. Depew, W. H. Newman, W. C. Brown, J. E. Brown, E. A. Wilkes, L. C. Ledyard, New York, and H. B. Ledyard, Detroit, Mich.

Canadian Pacific Ry.—There has recently been sold on the London, Eng., market \$6,161,000 additional of the company's consolidate 4% debenture stock, to provide for the construction of 553 miles of branch line in Manitoba, Saskatchewan and Alberta.

Dominion Atlantic Ry.—Gross earnings for Apr., \$82,400, against \$86,236 for Apr., 1910. Aggregate gross earnings for 10 months ended Apr. 30, \$1,046,600, against \$1,136,171 for same period 1909-10.

Great Northern Ry.—An official announcement was made from the head office at St. Paul, Minn., May 31, of the issue of \$600,000,000 of bonds to retire bonds, and to provide for the construction of new lines, additional rolling stock, etc. J. J. Hill, Chairman of the Board, stated that it was not intended to issue this amount of bonds at once, but to spread it over a number of years, according to requirements.

Quebec and Lake St. John Ry.—Total earnings for May, \$46,881.11, against \$44,804.13 for May, 1910. Aggregate total earnings for five months ended Mar. 31, \$210,537.29, against \$213,074.84 for same period 1910.

Quebec Central Ry.—Gross earnings for April, \$103,715.54; expenses, \$66,308.80; net earnings, \$37,406.74, against \$88,518.05 gross earnings; \$57,184.77 expenses; \$31,333.28 net earnings for Apr., 1910. Aggregate gross earnings for 10 months ended Apr. 30, \$962,885.67; expenses, \$660,355.63; net earnings, \$302,529.94, against \$885,440.80 aggregate gross earnings; \$612,882.02 expenses; \$272,558.78 net earnings for same period 1909-10.

Rutland Rd.—C. S. Mellen, L. C. Ledyard, and W. Skinner have been elected directors to represent the New York, New Haven and Hartford Rd. interests.

Temiscouata Ry.—Profit on operation for April, \$5,194. Aggregate profit for four months ended Apr. 30, \$6,964.

Temiskaming and Northern Ontario Ry.—Earnings for May, \$113,515, and for week ending June 7, \$37,284, against \$116,889 and \$26,971 for same periods, 1910.

United States and Canada Rd.—Following are the officers and directors for the current year:—President, C. M. Hays; Vice President, S. W. Foster; Treasurer and Assistant Secretary, F. Scott; Secretary, J. W. Gaudion; other directors, W. Wainwright, M. M. Reynolds, G. E. Britton, H. J. Elliott, F. J. Watson.

White Pass and Yukon Ry.—Gross earnings from Jan. 1 to May 7, \$141,390, against \$163,326 for same period 1910.

York and Carleton Ry.—The annual meeting was held at Stanley, N.B., June 6. Following are the officers and directors for the current year: President, D. R. Moore; Secretary, M. W. Crathly, other directors, F. Brown, Jas. Malone and Alex. Gibson, Jr. It is expected that this line will shortly be transferred to the Dominion Government to be operated as an I.C.R. branch.

A Few Words to Ticket Agents.

The following has been contributed by W. R. Russell, Agent, Canadian Northern Railway, Humbolt, Sask., who is a member of the Canadian Ticket Agents' Association, the International Ticket Agents' Association, and the National Association of Railway Agents:—

All ticket agents have a commodity to sell. It therefore behooves us to get all the information possible for the sale of that commodity. A great many never give a thought beyond the counter over which they hand the pasteboard, that the purchaser will ever come their way again. This is a very wrong idea, no matter who they may be, they have friends, and as such will talk about the treatment received from the ticket agent at such and such a point. This will travel very fast, and if not of a very cheerful nature, will travel more rapidly than that which will tend to raise the hopes in the breast of a ticket agent, therefore see that the talk is of such a satisfactory nature that it will get to the ears of the general passenger agent and other general officers of the company you represent, and will be of such a nature as to please the most fastidious official. If you are under the impression that you are not watched by the general officers, banish that from your mind. You are watched closely, and may never know it, therefore do as well as you can, give to each passenger as pleasant a smile as you possibly can, no matter whether they are dressed in silks, satins or cotton. Rich or poor, old or young, one passenger's money is just as good as another's. Never judge people simply by the clothes they wear.

Every ticket agent should take pride in his appearance. Look neat and clean, do not let your whiskers grow for a week without a shave. If you are at a small station and have baggage, etc.,

to handle, clothe yourself accordingly; it goes a long way with the travelling public. Show the knowledge you have, and impart it to those who are in need of it; sooner or later it will be appreciated.

When you get a tariff do not throw it in any old place and say to yourself, "I will never need that." This is a wrong idea, and the sooner you drop it the better. Place the tariffs when you get them in their proper place, if at all possible, or if your time is limited at the moment, place them where they will be seen by you when the duties of train service are past, then place them where they belong. You will need to refer to them some day sooner or later, then they will be where you can find them. Read them all, they are sent to you for that purpose. When you get a letter from the general passenger agent, give him all the information possible; you are on the spot, he is not; his duties are multifarious compared to yours, help him with your knowledge, he will appreciate it; if he does not he should. Keep a file for your correspondence, no matter how small it may be; see you have a copy of it, so you can refer to it at any time. In my opinion a great many remarks in this letter will apply to freight agents as well, or to those who act as freight and ticket agents.

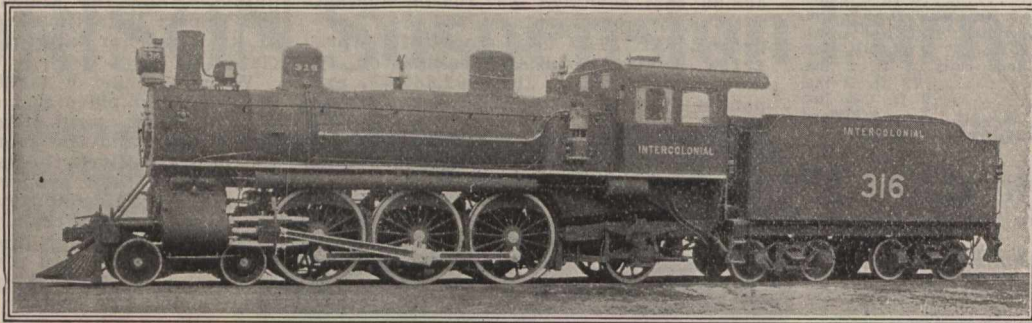
There is one thing that should be taken into consideration by the managing officials of all railways, and that is, that each superintendent should have a division agent, who would be in a position to give his experience to the more inexperienced agent, and assist him in explaining things that he does not thoroughly understand. It would in time save a vast amount of work in the general offices. By a division agent I do not mean that he would be called upon to do the work of travelling auditor, special agent, or any duties that would be a drawback to that for which his appointment was made. Make his duties so that the average station agent would greet him with pleasure, and have a very friendly talk over matters in general, and if anything should come up that would be of benefit to the company he would be in a position to lay the matter before the superintendent or other official who would require it.

I would like all ticket, freight, station agents and other employes to read the letter in the May issue of The Railway and Marine World, written by Mr. C. Murphy, General Superintendent of Transportation C.P.R. Eastern Lines, it has the right tone to it. To make a railway financially successful every employe must do his level best, and all work together, the same as all parts of a locomotive must work together, or it cannot do the work for which it is intended. All parts must work, therefore every employe must, or should do the same, to make it a paying investment for those who have their money invested. It is bread and butter for us.

The Canadian Freight Association will not have a trip in connection with its summer meeting this year, but will meet in Montreal.

The C.P.R. is offering a prize of \$1,000 for the best 100 lbs. of hard red spring or winter wheat raised by any farmer in North or South America.

Coquitlam Terminal Co.—A company has been incorporated under the British Columbia Companies Act, with a capital of \$750,000, to build electric or other tramways for the conveyance of passengers and freight; to build logging railways; to operate steam and other vessels; to build grain elevators; and to enter into agreements with companies carrying on similar enterprises. The offices of the company are to be in Victoria.



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LOCOMOTIVES

Adapted to every
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The Hudson's Bay Company



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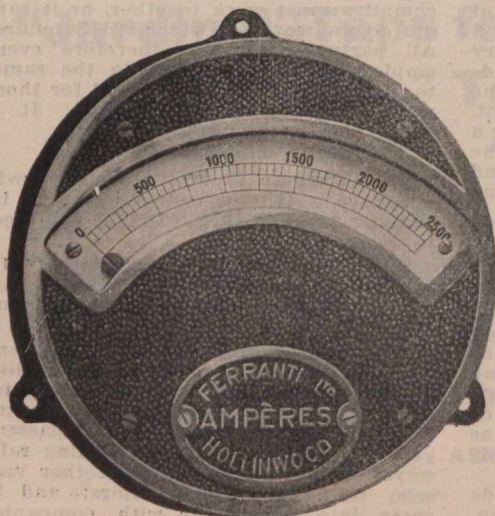
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Let us quote you on your requirements.

TRANSPORTATION APPOINTMENTS.

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.

Board of Railway Commissioners.—We were officially advised, June 14, that no appointment had then been made to fill the position of Assistant Chief Operating Officer, heretofore held by A. F. Dillinger, who has resigned.

Canadian Northern Ry.—W. Dixon, heretofore Soliciting Freight Agent, Montreal, has been appointed City Freight Agent, Montreal.

J. J. McKeown, heretofore in division freight office, C.P.R., Montreal, has been appointed Soliciting Freight Agent, C.N.R., Montreal.

R. W. Johnston, heretofore in the Freight Office, Canadian Lake Line, Montreal, has been appointed Soliciting Freight Agent, C.N.R., Montreal.

I. L. Boomer, heretofore train dispatcher at Port Arthur, Ont., has been appointed Chief Dispatcher, District 1, Port Arthur, Ont., vice W. A. Stuart, resigned to enter private business.

M. Helston, heretofore Chief Dispatcher, District 5, Saskatoon, Sask., has been appointed Chief Dispatcher, District 2, Winnipeg, Man., vice W. E. Roberts, promoted.

W. E. Roberts, heretofore Chief Dispatcher, District 2, Winnipeg, has been appointed Superintendent, District 6, with territory, Arizona Jct. to Canadian Northern Jct., Maryfield to Lampman, under construction; Luxton to Bienfait, under construction; M. & B. Jct. to Hartney Jct.; Brandon Jct. to Rossburn Jct.; Rossburn Jct. to Calder; Calder to Reihm, under construction; Hallboro to Beulah, under construction, a total of 701.1 miles. Office, Brandon, Man. This is a new district.

W. I. Munro, heretofore Chief Dispatcher, District 3, Dauphin, Man., has been appointed Chief Dispatcher, District 6, Brandon, Man. This is a new position.

F. T. Peebles, heretofore dispatcher at Dauphin, Man., has been appointed Chief Dispatcher, District 3, Dauphin, Man., vice W. I. Munro, transferred.

J. W. Crane, heretofore dispatcher at Saskatoon, Sask., has been appointed Chief Dispatcher, District 5, Saskatoon, Sask., vice M. Helston, transferred.

J. Madill, heretofore City Ticket Agent, C.P.R., Windsor, Ont., has been appointed City Passenger and Ticket Agent, C.N.R., Edmonton, Alta., vice W. C. Dadds, assigned to other duties.

Canadian Pacific Ry.—H. W. Newman has been appointed Travelling Freight Agent, Atlantic Division, St. John, N.B., vice C. J. Street, transferred to Montreal.

P. B. Motley, heretofore Assistant Engineer of Bridges, has been appointed Engineer of Bridges, vice C. N. Monsarratt, resigned, on his appointment as Chairman of the Board of Engineers in charge of the erection of the Quebec Bridge. Office, Montreal.

F. L. Ellingwood has been appointed Superintendent of Building Construction. He will have general charge, under the supervision of the Vice President, of such of the larger station buildings, hotels and other work as may be designated by the President or Vice President from time to time. He will appoint the requisite local superintendents, foremen and inspectors to insure proper workmanship on the part of contractors and others. Drawing and specifications for work under his charge will be issued through his office. Orders for extra work in connection with contracts will be issued by him and countersigned by the Architect. The circular announcing this appointment was signed by the President.

W. B. Way, heretofore Assistant

Superintendent District 3, Eastern Division, Montreal, has been appointed Assistant Superintendent, District 3, Eastern Division, with jurisdiction over Quebec, St. Gabriel, Piles, St. Maurice Valley and Berthier subdivisions. Office, Montreal.

G. Curran has been appointed Assistant Superintendent, District 3, Eastern Division, with jurisdiction over Ottawa, Laurentian, St. Lin, St. Eustache and Buckingham subdivisions. Office, Montreal.

C. J. Street, heretofore Travelling Freight Agent, Atlantic Division, St. John, N.B., has been appointed Contracting Freight Agent, Montreal, vice W. O. Bovard, resigned to enter other business.

C. W. Lott, heretofore first trick dispatcher at Smiths Falls, Ont., has been appointed Chief Dispatcher, District 2, Eastern Division, Smiths Falls, Ont.

F. W. Perry, heretofore Foreman Passenger Car Repair Shops, West Toronto, has been appointed Divisional Car Foreman, vice J. W. Kelly, assigned to other duties. Office, Toronto.

C. E. Rice, heretofore chief clerk, city ticket office, Brantford, Ont., has been appointed City Ticket Agent, Windsor, Ont., vice J. Madill, resigned to enter Canadian Northern Ry. service.

R. T. Moran, heretofore trick dispatcher, Sudbury, Ont., has been appointed Chief Dispatcher, District 1, Lake Superior Division, Sudbury, Ont., vice J. O'Meara, who has been granted extended leave of absence.

E. J. Brien has been appointed Trainmaster, District 2, Lake Superior Division, Schreiber, Ont., vice W. Bartlett, transferred.

J. H. Hughes, heretofore acting Superintendent, District 2, Lake Superior Division, during the absence of W. B. Cronk, on leave, has been appointed Superintendent, vice W. B. Cronk, resigned. Office, White River, Ont.

W. J. Fidler has been appointed Storekeeper at Kenora, Ont., vice A. J. Forrest, promoted.

W. B. Lanigan, Assistant Freight Traffic Manager, Western Lines, issued a circular, June 15, announcing the organization of the Freight Traffic Department, Western Lines, as follows:—W. B. Lanigan, Assistant Freight Traffic Manager, Winnipeg, with general supervision of freight traffic, Western Lines, including British Columbia Coast steamers and Esquimalt and Nanaimo Ry., all matters relating to freight traffic under jurisdiction of the Board of Railway Commissioners, all questions relating to rates and divisions and transcontinental rates affecting Western Lines.

W. C. Bowles, heretofore General Freight Agent, Pacific Division, Vancouver, B.C., has been appointed General Freight Agent, Western Lines, covering all lines west of and including Port Arthur, Ont., in charge of interchange of traffic with connecting lines and freight solicitation. Office, Winnipeg.

G. H. Smith, heretofore District Freight Agent, Winnipeg city and terminals, has been appointed Division Freight Agent, Manitoba Division, with territory from Port Arthur and Fort William, Ont., to Harrowby, McAuley, Kirkella, Ebor, Sinclair and Pierson, Man., inclusive, and intervening lateral lines and branches. Office, Winnipeg. The position of District Freight Agent at Winnipeg has been abolished.

T. S. Acheson, General Grain Agent, in charge of grain traffic. Office, Winnipeg.

R. G. Holmes, Chief of Tariff Bureau, in charge of freight traffic publications and distribution of same. Office, Winnipeg.

D. C. Macdonald, heretofore City Freight Agent, Winnipeg, has been appointed Division Freight Agent, Saskat-

chewan Division, with territory, Marchwell, Welwyn, Fleming, Antler, Maryfield and Gainsborough to Macklin and Cummings, Sask., inclusive, and intervening lateral lines and branches. Office, Regina, Sask.

W. H. Allison, heretofore City Freight Agent, Regina, Sask., has been appointed District Freight Agent, main line Yorkton to Macklin, Sask., inclusive, reporting to Division Freight Agent, Regina, Sask. Office, Saskatoon, Sask.

John Halstead, heretofore Division Freight Agent, Western Division, Calgary, Alta., has been appointed Division Freight Agent, Alberta Division, with territory, Hayter and Walsh to Edmonton, Laggan and Sentinel, inclusive, and intervening lateral lines and branches. Office, Calgary, Alta.

H. C. McMullen, General Live Stock Agent, in charge of live stock traffic. Office, Calgary, Alta.

R. W. Drew, heretofore District Freight Agent, Saskatoon, Sask., has been appointed Division Freight Agent, Kootenay and Boundary Divisions, with territory, Crownsnest, B.C., to Kootenay Landing, Midway, Rossland, Trout Lake City, Nakusp to Sandon, and Slocan Jct. to Slocan City, inclusive, and intervening lateral lines and branches, including Arrow and Kootenay Lakes steamers. Office, Nelson, B.C.

R. E. Larmour, heretofore Division Freight Agent, Central Division, Winnipeg, Man., has been appointed Division Freight Agent, British Columbia Division, with territory, Stephen to Vancouver, inclusive, and intervening lateral lines and branches, and Esquimalt and Nanaimo Ry., Okanagan Lake service, B.C. Coast service, and all Pacific coast freight traffic. Office, Vancouver.

A. J. Cambie has been appointed District Freight Agent, with territory, Vancouver and Westminster terminals, Okanagan branch and Lake service. Office, Vancouver.

F. H. Clendenning, District Freight Agent, B.C. Coast service and Trans-Pacific steamers. Office, Vancouver.

W. H. Gardner, District Freight Agent, Esquimalt and Nanaimo Ry., Victoria, B.C.

A. J. Forrest, heretofore storekeeper at Kenora, Ont., has been appointed Assistant Stores Inspector, Western Lines, Winnipeg. This is a new position.

A. T. McKean has been appointed City Freight Agent, Winnipeg, Man., in charge of Winnipeg and St. Boniface terminal freight traffic.

R. A. Gamble, heretofore Fuel Agent, Calgary, Alta., has been appointed Car Service and Fuel Agent, Moose Jaw, Sask., vice R. R. Smart, who has been appointed a trick dispatcher there.

S. Lenard has been appointed Locomotive Foreman at Arcola, Sask., vice J. M. Mack, transferred.

K. Hove has been appointed acting Roadmaster, Mountain West and Arrow Lake Subdivision, British Columbia Division, vice T. H. Nichols, resigned.

R. K. Scarlett, heretofore city solicitor, Vancouver, B.C., has been appointed city ticket agent at Nelson, B.C., vice H. W. Edwards, transferred.

F. H. Daly has been appointed Travelling Passenger Agent, Western Lines west of Revelstoke, B.C. Office, Vancouver, B.C.

J. H. Fox has been appointed City Freight Agent, Vancouver, B.C., in charge of city freight traffic.

H. W. Edwards, heretofore City Ticket Agent at Nelson, B.C., has been appointed city ticket agent at Seattle, Wash.

The Nordisk Reisebureau have been appointed agents for the C.P.R., with office at 19 Belshaja Kenjushenaja, St. Petersburg, Russia.

Grand Trunk Pacific Ry.—N. B. Walton, heretofore Trainmaster, Districts 4, 5 and 6, Wainwright, Alta., has also

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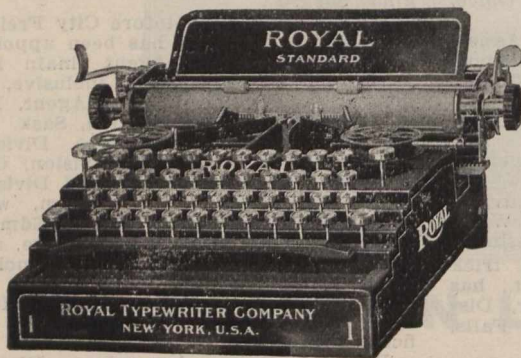
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Between Sarnia, S. S. Marie, Port Arthur, Fort William and Duluth. Through Lake Huron, St. Mary's River and Lake Superior.

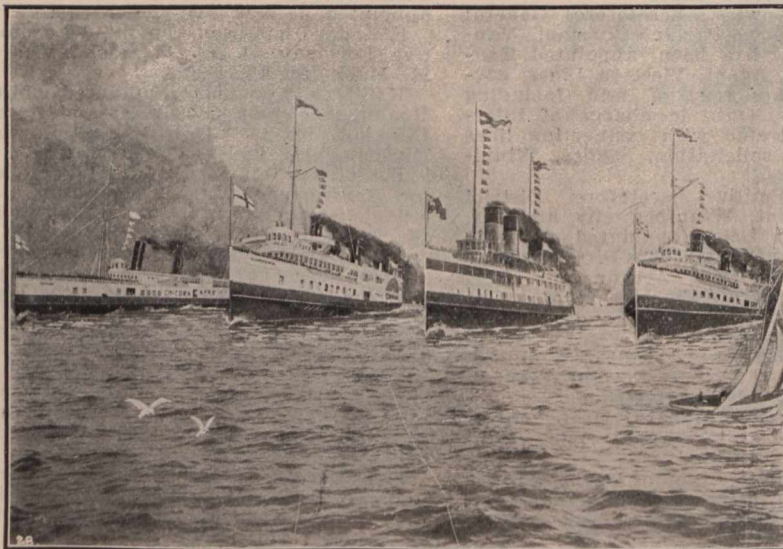
"THAT GEORGIAN BAY TRIP"

Between Parry Sound, Collingwood, Owen Sound, S. S. Marie and Mackinac Island. Through the North Channel of the Georgian Bay.

"AMONGST THE 30,000 ISLANDS"

Between Penetang and Parry Sound, through the finest scenic route in America.

Rates and Full Information from all Railway Agents, or the company at SARNIA, ONT. or COLLINGWOOD, ONT.

**Niagara River Line Steamers****Buffalo - Niagara Falls - Toronto**

Route

The Gateway to Canada

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Toronto, Canada

been appointed Assistant to General Superintendent, Office, Winnipeg.

G. S. Cooke, heretofore Trainmaster, Districts 1, 2 and 3, Melville, Sask., has been appointed Superintendent, Lines Winnipeg to Watrous, Sask., both inclusive, Office, Melville, Sask. The position of Trainmaster, Districts 1, 2 and 3, has been abolished.

H. McCall, heretofore Trainmaster, Districts 7 and 8, Edson, Alta., has been appointed Superintendent, lines west of Edmonton, Alta. Office, Edson, Alta. The position of Trainmaster, Districts 7 and 8, has been abolished.

The following agents have been appointed:—Coblentz, Sask., J. O'Leary; Camrose, Alta., C. J. Mitchell.

Grand Trunk Ry.—W. H. Sample has been appointed Master Mechanic, Ottawa Division, vice R. Cowan, assigned to other duties. Office, Ottawa, Ont.

The following agents have been appointed:—Lisgar, Que., E. D. Auclair; Stottsville, Que., J. A. Perrier; Laprairie, Que., J. P. Lazure; Findley, Ont., T. F. O'Neill; Bowmanville, Ont., E. R. Chapman (acting); North Bay, Ont., freight, R. Tyner; Toronto, Exchange, passenger, W. A. Lang; Hamilton, Stuart St., passenger, H. E. Everett; Thamesville, Ont., J. A. Pollock; Nelles Corners, Ont., C. W. Staib; Aylmer, Ont., F. H. Burthwick; Rouses Point, N.Y., passenger, J. L. O. Colomb; Kingsville, Ont., outside, C. P. Cooper.

Temiskaming and Northern Ontario Ry.—W. Oldham, heretofore Supervisor of Bridges, has been appointed Inspector of Bridges and Buildings, vice J. J. O'Neill, resigned to enter private business. Office, North Bay, Ont. The position of Supervisor of Bridges has been incorporated with that of Inspector of Bridges and Buildings.

Union Pacific Rd., Oregon Short Line Rd., Oregon-Washington Rd. and Navigation Co., Southern Pacific Co.—G. W. Vaux, formerly General Passenger Agent, G.T.R., Montreal, has been appointed Travelling Passenger Agent for the above companies; at Toronto, vice J. O. Goodsell, transferred.

J. O. Goodsell, heretofore Travelling Passenger Agent at Toronto, has been appointed Travelling Passenger Agent, Detroit, Mich.

Trade and Supply Notes.

The matter which appears under this heading is compiled, in most cases, from information supplied by the manufacturers of, or dealers in, the articles referred to, and in publishing the same we accept no responsibility. At the same time we wish our readers to distinctly understand that we are not paid for the publication of any of this matter, and that we will not consider any proposition to insert reading matter in our columns for pay or its equivalent. Advertising contracts will not be taken with any condition that accepting them will oblige us to publish reading notices. In other words, our reading columns are not for sale, either to advertisers or others.

The Detroit Lubricator Co. has issued a leaflet about its "500" lubricator for air compressors.

The Ohio Brass Co., Mansfield, Ohio, has issued Catalogue K, devoted to Ohio valves and steam specialties, including the Ohio gauge cock, water gauge and pressure regulating valve.

The Baldwin Locomotive Works, Philadelphia, Pa., has been registered in British Columbia under the Companies Act, with C. W. Stancliffe, of Vancouver, as Agent.

The Buffalo Brake Beam Co., of New York City and Buffalo, N.Y., has established a factory at Brantford, Ont., to manufacture for its Canadian trade, brake beams for all classes of locomotives and cars, steam and electric.

The Consolidated Car Heating Co. held its annual meeting, June 12, when Cornell S. Hawley, theretofore Vice President, General Manager and Treasurer,

was elected President and Treasurer, and C. C. Nuckols, theretofore Superintendent and Purchasing Agent, was appointed General Manager.

The Western Wheeled Scraper Co., Aurora, Ill., has issued a thoroughly illustrated catalogue of machinery for handling earth and stone, devoted to scrapers and plows, dump, quarry, rail and spreader cars, dump carts and wagons, ditching machines, elevating graders and wagon loaders, rock and oil crushers, and road graders.

The American Vanadium Co., Pittsburgh, Pa., in its American Vanadium Facts for May, gives a complete report of the address on vanadium in cast iron, before the American Foundrymen's Association, by G. L. Norris, the company's engineer of tests, also complete particulars of the exhibitors who co-operated in the production of cast vanadium products.

N. Curry, President Canadian Car and Foundry Co., visited Amherst, N.S., recently and arranged for the rebuilding necessary on account of the fire which occurred in May. A machine shop and grey iron foundry are to be provided for in one building 300 by 70 ft. Only a part of the forge shop was burned. This is being rebuilt; it will be 180 by 65 ft. The new buildings will be of concrete, with steel roofs, and are expected to be completed and in operation by Sept. 1. In the meantime operations are being carried on in the passenger car shop, rolling mill, axle shop, wheel shop, and malleable iron foundry.

The American Steel Foundries, Chicago, has issued a circular stating that the United States Circuit Court of Appeals for the Second Circuit has affirmed the decision of the Circuit Court in the case of the Simplex Railway Appliance Co. against the Pressed Steel Car Co. for infringement of the A.S.F. Simplex bolster patent. This makes permanent the injunction against the Pressed Steel Car Co. restraining it from the manufacture of the reliance bolster, and awards an accounting for damages for those already made. In the Circuit Court for the Northern District of Illinois, Judge Kohlsaat has entered a decree sustaining the Hardie patent, which covers the Andrews side frame, and holding that the Wolff truck frame, manufactured under the Harrington patent by the Scullin-Gallacher Iron & Steel Co. was an infringement.

Telegraph and Cable Matters.

The Canadian Northern Telegraph Co. has opened an office at Kakabeka Falls, Ont.

H. D. Windeler, heretofore at the Commercial Cable Co.'s station at Canso, N.S., has been appointed Superintendent at St. John's, Nfld.

The Order of Railway Telegraphers, which held its convention at Toronto recently, has decided to hold the next convention in 1913, in Baltimore, Md.

The C.P.R. has opened telegraph offices at French and Moffat, Ont.; Chelsea, Herbert and Ivry, Que.; Esk, Kandahar, Luseland and Salvador, Sask.

The cable steamer Mackay-Bennett recently completed the repairs to the cable between Port aux Basques, Nfld., and Canso, N.S., and proceeded to Halifax.

The Old Time Telegraphers' and Historical Association and the Society of the U.S. Military Telegraph Corps will hold their joint convention at Atlantic City, N.J., Sept. 5-7.

C. C. Wilson, President, United Wireless Telegraph Co., and four others have been sentenced to terms of imprisonment in U.S. penitentiaries for frauds in

connection with the flotation and operation of the company.

A party of Western Union Telegraph Co. officials visited Vancouver early in June for an inspection of the company's property, and to arrange for the establishment of a faster and more efficient service with eastern and southern points. A new office is to be established at New Westminster, B.C.

The annual convention of the Association of Railway Telegraph Superintendents was held at Boston, Mass., June 26-30. A number of interesting papers were read and discussed, and an article was added to the constitution regarding the submission of various questions pertaining to railway operations as recommendations to the American Railway Association.

The Nova Scotia Telephone Co. decided, June 1, to accept the offer of the Maritime Telegraph and Telephone Co., to acquire its franchises and property, as from July 14. The terms offered are \$135 for each \$100 share, or in the alternative one \$100 bond of the Maritime Telegraph and Telephone Co., at 6%, and \$35 in cash, or \$100 in 6% bonds, \$30 in 6% preferred stock, and \$30 in common stock, the option to be exercised by Sept. 20.

Press reports state that the Marconi Wireless Telegraph Co. has recently been conducting wireless telegraph communication with the west coast of Africa, by way of the Eiffel Tower in Paris, France, and that an efficient service was to be established between Canada and France. Our doubts as to the reliability of these reports have been fully justified, by an official statement, issued from the company's London, Eng., office, to the effect that no such communications have taken place, and that with the present plant, and under present conditions, the only points between which wireless communication is, and can be, efficiently carried on, across the Atlantic, are at Glace Bay, N.S., and Clifden, Ireland.

At the Imperial Conference held in London, Eng., during June, the question of cable rates and the laying of a cable between the United Kingdom and Canada, and the erection of land lines across Canada connecting with the Pacific cable, was under consideration. It was stated that the cost of laying a cable from Killala in Ireland to Newfoundland, with a connection to Nova Scotia, would be £480,000, and the cost of the land line across Canada, £120,000. The expense of operating was estimated at £215,000 and £32,500 respectively, and it was stated that there would be a saving of expense at present incurred, and an immediate revenue of about £36,000. After considerable discussion the following resolution was unanimously agreed to, on the motion of the British Postmaster General: "That in the event of considerable reductions in trans-Atlantic cable rates not being effected in the near future, it is desirable that the laying down of a State-owned cable between England and Canada be considered by a subsidiary conference."

Grain Elevator Notes.

The Goose Lake Elevator Co. is building an elevator at Wadena, Sask.

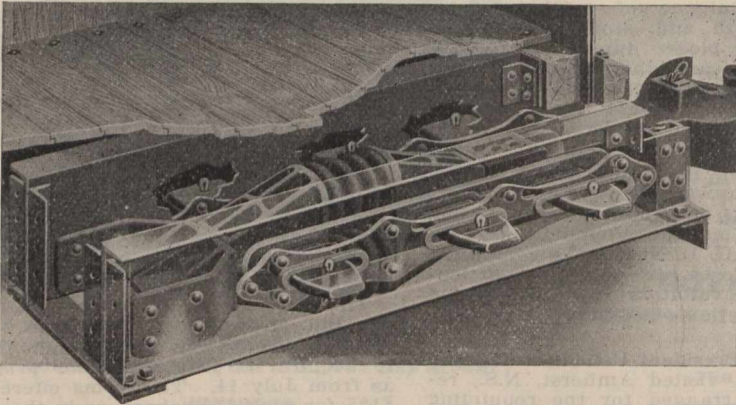
The Manitoba Elevator Commission has received tenders for dismantling the Winnipeg elevator at Roland, and rebuilding it at Jordan Siding.

The C.P.R. has awarded the contract for alterations and repairs to its Steel elevator D at Fort William, Ont., to John S. Metcalf Co., Ltd., Montreal. The work is to be completed in time for handling this year's crop.

W. White, in the employ of the John S. Metcalf Co., in the construction of

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- 4 Malleable Iron Cheek Plates
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Any Friction Device May Be Used in Combination
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positive application obtained by compression. Our personal representative will call and explain in detail on request. Write for descriptive booklet.

The Ohio Brass Co., Mansfield, Ohio, U. S. A.

the addition to the G.T.R. elevator at Windmill Point, Montreal, was presented with a travelling bag recently, on his leaving for Fort William, Ont., to take charge, for the company, of the rebuilding of the C.P.R. elevator D.

The Saskatchewan Co-operative Elevator Co. will hold its first general meeting at Moose Jaw, July 6, the necessary 25 local companies having been arranged, as provided for by the act, before the company can be permanently organized.

The Dominion Flour Mills, Ltd., has awarded a contract to John S. Metcalf Co., Ltd., Montreal, for the construction of a re-inforced concrete grain elevator in connection with its new flour mill at St. Henri, Montreal. The capacity of the new erection will be 300,000 bush., and there will be a small working house built in connection with it.

The Montreal Harbor Commissioners have entered suit against the G.T.R., for an injunction to stop the erection of the extension to the elevator system at Windmill Point, on the ground that the site is the property of the Commission, and was leased to the company on the understanding that grain conveyors only would be permitted to occupy the ground, and that the ground on which the bins are being erected, is included in the general plan of amelioration for the harbor and covers what is proposed as a new opening to the Lachine canal, when the plan is fully carried out. The G.T.R. answers that the extension is required for its own benefit and for the benefit of the harbor, and that the work should not be held up by problematical

works, to be carried out at an indefinite date. The application has been taken under consideration.

Among the Express Companies.

F. M. Smith has been appointed route agent for lines west of Fort William, Ont., with headquarters at Winnipeg, Man.

D. G. MacKenzie, heretofore Agent, Dominion Ex. Co., Calgary, Alta., has been appointed Agent at Brandon, Man., vice F. R. Jelfs, appointed to Calgary, Alta., as mentioned in our last issue.

The order of the Board of Railway Commissioners, extending the delivery limits of express companies, in cities, to the city boundaries, went into effect June 1.

Express companies in Canada are applying to the Board of Railway Commissioners to cancel section D of the classified rates, which covers general printed matter. It is stated that the hearing will not take place until the fall.

W. H. Plant, Traffic Auditor, Dominion Ex. Co., has been appointed Auditor in charge of all accounting, including the Western Ex. Co. The positions of Traffic Auditor and Auditor of Money Order Accounts have been abolished.

The Dominion Ex. Co. has announced that it has discontinued the practice of allowing shippers to use their own forms of receipt for shipments forwarded by express, and it has instructed its agents that its employes must sign no forms

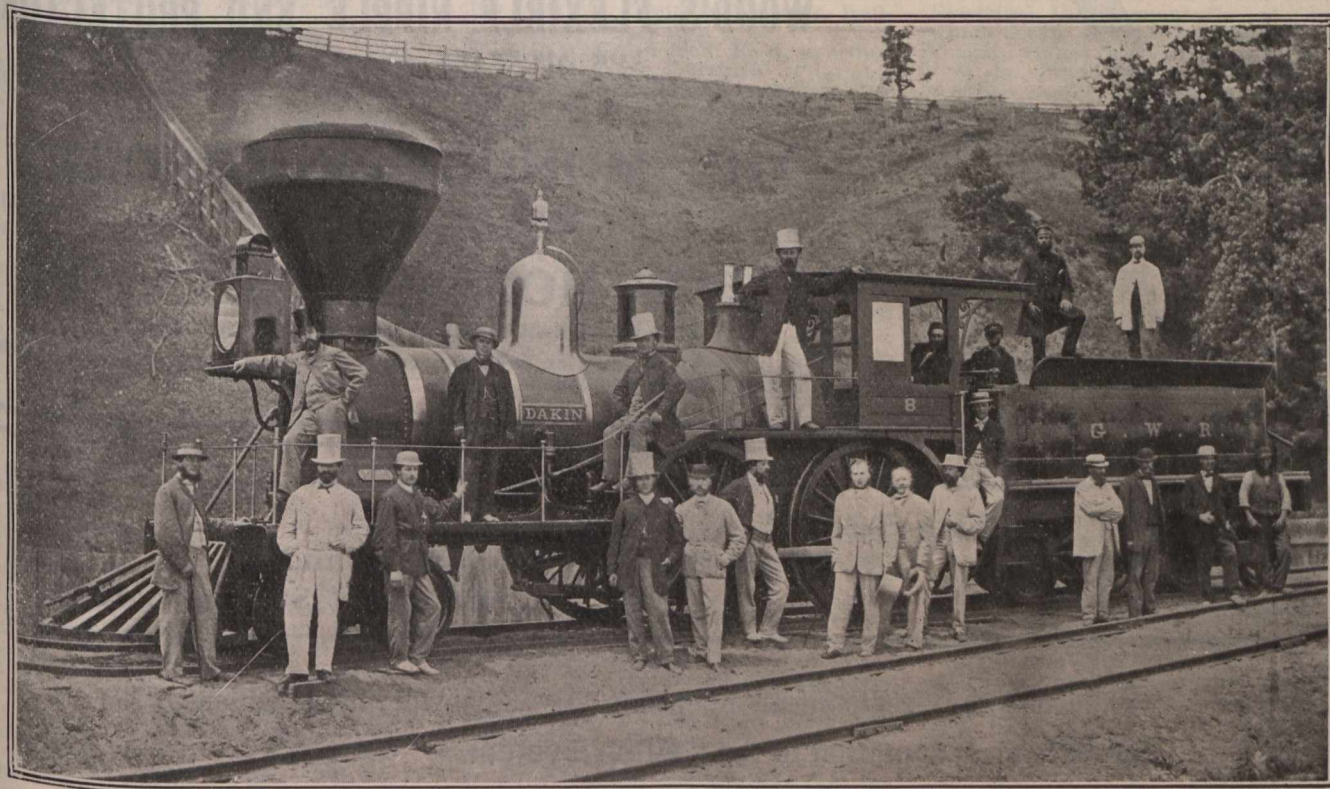
other than the regular forms supplied by the company.

The Canadian Northern Ex. Co. was fined \$1,000, at Winnipeg, Jan. 12, for not obeying the injunction of the court restraining the returning officer in the Beautiful Plains election in 1909, from sending his official return to the chief clerk of the executive council. A stay was granted for 14 days.

The U.S. Treasury Department has approved placing on express way bills of the transportation entry numbers to appear in the upper right hand corner of the carriers' special manifests, and the placing on the special manifests accompanying goods, of the numbers of the express waybills, to aid in the identification of the goods covered by waybills.

The Dominion Ex. Co. notifies that it has made arrangements for the transportation of shipments to Gowganda and Wigwam. Value shipments will be held at Elk City and the consignee notified, and c.o.d. shipments will be held at the same place until the amount has been paid, after which, it will be forwarded to destination. All shipments are waybilled to Latchford, Ont.

The Board of Railway Commissioners has issued order 13881, June 7, re Note 18 to Scale N, Express Classification C.R.C. 2, substituting the following:— Note 12, includes grain (whole or cracked), chopped feed, bran, meal, ground meat (dried), dried bone, alfalfa meal, cut clover, ground screenings and crushed shells, but does not include condition powders, condiments or medicated or patented articles.

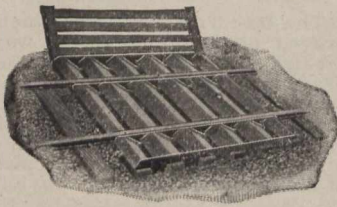


A LOCOMOTIVE ON THE GREAT WESTERN RAILWAY AT HAMILTON IN 1864.

The photograph from which this illustration is made, and for which we are indebted to the Hamilton Spectator, was taken at Hamilton in 1864, on the occasion of the visit to Canada of Sir Thos. Dakin, chairman of the G.W.R. Co., and Brackstone Baker, the Secretary, W. A. Robinson, of the D. Moore Co., Hamilton, who was then assistant mechanical superintendent of the line, has supplied the names of all the persons shown, except the conductor, whose name he cannot remember. The names are as follows:—

- Upper Row—W. A. Robinson, Assistant Mechanical Superintendent; Geo. Forsythe, general foreman locomotive shops; Wm. McMillan, fuel buyer; Samuel Sharp, Mechanical Superintendent; J. Robertson, locomotive driver; W. Paine, fireman; conductor, name forgotten; — Penny, attendant on official car.
- Lower Row—Geo. Low Reid, Engineer; W. Wallace, Traffic Agent; G. H. Howard, W. Orr, G. B. Spriggs, J. Howard, Purchasing Agent; Thos. Swinyard, General Manager; Brackstone Baker, English secretary of the company; T. Bell, J. Hall, Foreman of Running Department; J. Weatherstone, Track Superintendent; J. A. Ward, Mechanical Accountant; P. Neilson, Station Agent at Hamilton; W. Wilson, Track Foreman.

Kalamazoo "PERFECT" Steel Surface Cattle Guard
ONLY GUARD THAT ALWAYS TURNS AWAY ALL STOCK WITHOUT INJURY



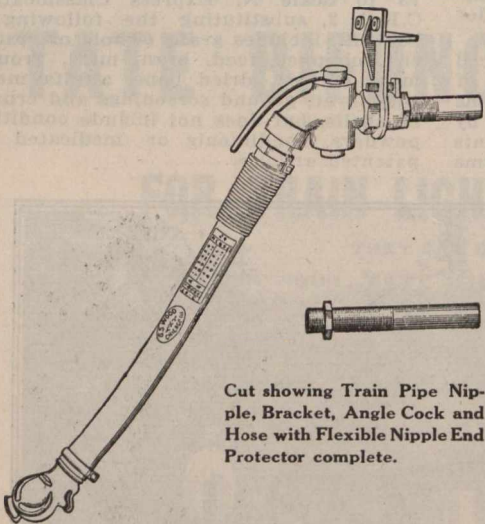
Furnished ready-to-place, saving expense of hardwood ties, much excavating and much assembling. Offers no catching points for dragging chains—readily removable during track overhauling—cannot rattle to pieces—proof against corrosion—self-cleansing of snow and rubbish. In short, this is **the perfect guard.**

Comparative trials invited. Write

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THE MONOGRAM BRACKET

will absolutely stop shifting and leaking of air-brake train pipes. All M.C.B. requirements are obtained and maintained.

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will prevent cracking of rubber cover and deterioration due to climatic changes. Easily applied.

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"National" Storage Batteries for Car Lighting or Railway Signal Service give the best service at the lowest cost.

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ELECTRIC RAILWAYS

Canadian Street Railway Association.

PRESIDENT, James Anderson, General Manager Sandwich, Windsor and Amherstburg Ry.; VICE PRESIDENT, P. Dubee, Secretary, Montreal St. Ry.; SECRETARY-TREASURER, Acton Burrows, Managing Director Railway and Marine World. ASSOCIATION'S OFFICE, 70 Bond St., Toronto. EXECUTIVE COMMITTEE.—E. P. Coleman, Manager of Railways, Dominion Power and Transmission Co.; H. M. Hopper, General Manager, St. John Ry.; J. E. Hutcheson, Superintendent, Ottawa Electric Ry.; C. B. King, Manager, London St. Ry.; D. McDonald, General Manager, Montreal St. Ry.; M. N. Todd, President, Galt, Preston and Hespeler St. Ry. ASSISTANT SECRETARY, Aubrey Acton Burrows, Secretary and Business Manager Railway and Marine World. OFFICIAL ORGAN, THE RAILWAY AND MARINE WORLD.

Canadian Street Railway Association.

The annual meeting opened at Windsor, Ont., June 6, there being a large attendance of representatives of member companies from as far east as Halifax and as far west as Vancouver. In the unavoidable absence through pressing business of the President, Duncan McDonald, General Manager, Montreal St. Ry., Montreal, the Vice President, James Anderson, General Manager Sandwich, Windsor and Amherstburg Ry., occupied the chair.

The Executive Committee having reported in favor of admission to membership of the Chatham, Wallaceburg and Lake Erie Ry. Co., the Galt, Preston and Hespeler St. Ry. Co., Ltd., the Levis County Ry. Co., and the Peterborough Radial Ry. Co., they were unanimously elected.

The Secretary-Treasurer, Acton Burrows, presented an exhaustive report dealing with the Association's work during the past year, reviewing the Dominion and Provincial legislation affecting electric railways, the actions of the Board of Railway Commissioners and the various Provincial Boards having jurisdiction over electric railways, and giving a large amount of information on various subjects which had been collected at the instance of member companies.

The following papers were read and discussed:—"Let the Public Know," by A. Dexter B. Van Zandt, Publicity Manager, Detroit United Lines; "Private Plants versus Niagara Power," by J. Milne, Consulting Engineer, Sandwich, Windsor and Amherstburg Ry.; "Notes on Distribution of Power in Street Railway Operations," by Donald S. Barton, Consulting Engineer, Quebec Railway, Light, Heat and Power Company; "Shop Accounts," by F. P. Griffith, Superintendent of Shops, Dominion Power and Transmission Company; "Checking Power Consumption on Cars," by D. E. Blair, Superintendent of Rolling Stock, Montreal Street Railway; "The Use of Tee Rails in Street Railway Construction," by F. G. Simmons, Superintendent Construction and Maintenance of Way, Milwaukee Electric Railway and Light Co.

The Board of Railway Commissioners having requested the appointment of a committee to compile a code of rules for the operation of electric railways to be submitted to the Board for approval, the following were appointed as the committee to deal with the matter:—J. Anderson, General Manager, Sandwich, Windsor and Amherstburg Railway; E. P. Coleman, Manager of Railways, Dominion Power and Transmission Co.; P. Dubee, Secretary, Montreal Street Railway; A. Eastman, General Manager, Windsor, Essex and Lake Shore Rapid Railway; G. Gordon Gale, General Superintendent, Hull Electric Co.; J. E.

Hutcheson, Superintendent, Ottawa Electric Railway; W. R. Robertson, Superintendent, Niagara, St. Catharines and Toronto Railway.

The second day's meeting was held in Detroit, Mich., when J. Kerwin, Superintendent of Tracks, Detroit United Railway, gave an address on "Modern Track Building."

Considerable time was devoted to interesting topical discussions on various questions submitted by representatives of member companies relating to operating and other matters.

The election of officers for the current year resulted unanimously as follows:—President, James Anderson, General Manager, Sandwich, Windsor and Amherstburg Ry.; Vice President, Patrick Dubee, Secretary, Montreal Street Ry.; Secretary-Treasurer, Acton Burrows, Managing Director of the Railway and Marine World.

Executive Committee.—The President and Vice President, and E. P. Coleman, Manager of Railways, Dominion Power and Transmission Co.; H. M. Hopper, General Manager, St. John Ry.; J. E. Hutcheson, Superintendent, Ottawa Electric Ry.; C. B. King, Manager, London Street Ry.; D. McDonald, General Manager, Montreal Street Ry.; M. N. Todd, President, Galt, Preston and Hespeler St. Ry.

Assistant-Secretary-Treasurer, Aubrey Acton Burrows, Business Manager, Railway and Marine World.

A letter was read from R. H. Sperling, General Manager, British Columbia Electric Ry., inviting the Association to meet in Vancouver in 1912, and was referred to the Executive Committee.

On the evening of June 6 the representatives attending the meeting were the guests of the Sandwich, Windsor and Amherstburg Railway Co., being taken over the line from Windsor to Sandwich, and from there crossing to Bois Blanc Island, in Detroit River, where they were entertained at dinner, one of the chief features of which was delicious planked white fish. On June 7, Elmer J. Smith, Secretary and Treasurer of the Peter Smith Heater Co., Detroit, entertained a number of the representatives at luncheon at the Detroit Motor Boat Club, the automobile ride to and fro being much enjoyed. Late in the afternoon of June 7 the representatives went by special car accompanied by a number of the D.U.R. officials, whose guests they were, from Detroit to Toledo, Ohio, making the 70 mile trip in a little under 2 hours, including the slow run through both city limits and a stop of some 15 minutes at Munroe, Mich., to inspect the power house. At Toledo they were charmingly entertained at dinner by the D.U.R. officials, and returned to Detroit about 10 p.m. James Anderson, General Manager, Sandwich, Windsor and Amherstburg Ry., who presided at the meetings in his capacity of Vice President, in the absence of the President, D. McDonald, and who also took the chair at the dinners at Bois Blanc and Toledo, was most assiduous in his attentions, and was ably assisted by a number of other D.U.R. officials, including H. Bullen, General Superintendent; I. Fullerton, Auditor; A. E. Peters, Assistant-Secretary; E. J. Burdick, Superintendent of Power.

The Peterboro Radial Ry. has ordered three 18½ ft. semi-convertible, pay-as-you-enter car bodies, 29½ ft. over all, mounted on 21-E trucks, and one heavy double broom electric snow sweeper from the Ottawa Car Co., Ottawa.

Toronto Suburban Railway.

The control of this company has passed into the hands of Sir William Mackenzie and associates. On June 20th an issue of £540,000 sterling 4½% debenture stock was offered in London, Eng., through the British Empire Trust Co., for the purpose of improving the existing lines and building extensions. We are advised that the present line will be relaid with heavier rails and otherwise improved and that an extension will be built from either Lambton or Weston to Guelph, so as to give a through line from the north end of Toronto to that city. A survey has already been made west as far as Brampton. Nothing is likely to be decided about construction until after Sir Wm. Mackenzie's return from England. But it is said to be likely that some work will be gone on with this year.

The company's capitalization, prior to the recent issue, was \$1,500,000 common stock. The directorate was as follows: President, Allan H. Royce; Vice President, R. L. McCormick; other directors, G. C. Royce, Dr. G. Royce, R. B. Henderson. The officials are: G. C. Royce, Secretary-Treasurer and General Manager, and Agent; J. Rankin, Engineer of Power Station; J. Boyd, Master Mechanic; D. Kinsman, Roadmaster.

The company buys its power from the Electrical Development Co. of Ontario, which is also controlled by Sir Wm. Mackenzie. It has 10.26 miles of track, 4 ft. 10¼ in. gauge and has 15 motor and 2 other cars. It owns an amusement park at Lambton Mills.

Under the provisions of the Ontario Joint Stock Companies Act, and the Street Railway Act, there was incorporated by letters patent Nov. 12, 1890, the Weston, High Park and Toronto Street Street Ry. Co., and in the following year the Legislature changed the name of the company to the City and Suburban Electric Ry. Co., with power in addition to building railways between certain points to acquire not exceeding 100 acres of land for park purposes. On Oct. 5, 1891, an agreement was signed by J. S. McMurray, President, and L. L. McMurray, Secretary and Treasurer, on behalf of the company, with the Corporation of Toronto Junction, for a franchise for the building of an electric railway on any street or highway within the municipality, except such as had been included in the franchise granted June 8, 1891, to the Davenport St. Ry. Under this agreement a specific line was to be built along Conduit St., from the city limits to Keele St., thence northerly to Humberside Ave., thence westerly along the most direct route to Elizabeth St., thence northerly to Dundas St., to city limits, also along Keele St. northerly to the north limit of the town, on or before Sept. 1, 1892; connection to be made with the Toronto Ry. as soon as that system had been extended to any point to which the company has power to build. An indenture of mortgage securing an issue of \$140,000 of 6% first mortgage bonds was given to the Trusts Corporation of Ontario, under date Feb. 1, 1893, in which it was set out that the company had built an electric railway (provided with power house and other equipment) on the following streets: Keele St., from St. Clair Ave. to Dundas St.; Dundas St., from Humberside Ave. to Lansdowne Ave.; Humberside Ave., from Dundas St. to Glendonwynne Road; Glendonwynne Road to Glenholme Drive, along Glenholme Drive to Fairview Ave., on to Louisa St., along Louisa St., to Lans-

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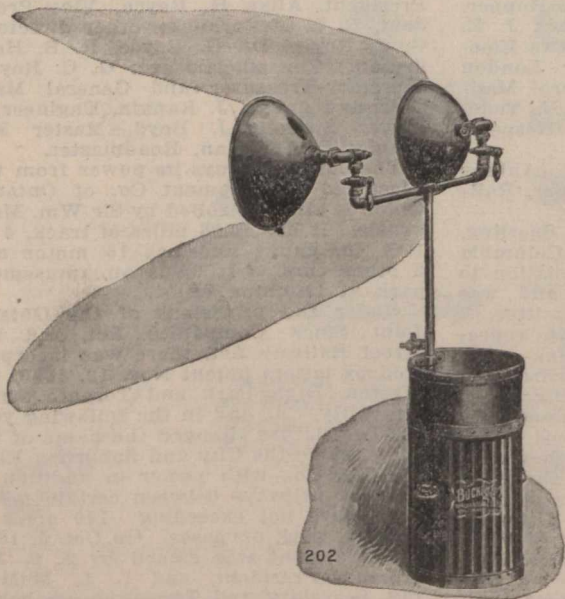
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Toronto

downe Ave., and along this avenue to Dundas St. It was also set out that the company had acquired the Davenport Street Ry., built by a company incorporated by letters patent Feb. 11, 1891, under an agreement with the township of York, and the town of Toronto Junction. This line is described in the mortgage as extending from the crossing of Bathurst St., by the C.P.R., to St. Clair Ave., thence westerly along Davenport Road to St. Clair Ave., and along that avenue to Toronto Junction; and the mortgage also covered the franchise granted within the limits of Toronto Junction. F. Turner was President and Allan Royce Vice President of the D.S. Ry. in 1891, and M. D. Barr was President in 1892. On April 20, 1893, a further agreement was made between the township of York and the D. S. Ry., by which rights of construction were granted from the southern boundary of Toronto Junction to the Lake Shore Road.

The D. S. Ry. was built by the Street Railway Construction Co., and in order to satisfy the claims of this company, a company was incorporated by the Ontario Legislature, May 5, 1894, with the title of the Toronto Suburban Street Railway Co., Limited, having power to acquire the railways, property, franchises and other assets of the two companies named, and amalgamate them under the title of the Toronto Suburban St. Ry. Co., Ltd.. The capital was fixed at \$250,000, power being given to issue bonds to the amount of \$20,000 a mile of line built. The provisional directors were: R. W. Smith, J. Torrance, A. W. Atwater, Montreal; R. H. Fraser, Toronto; H. W. Darling, Toronto, and Boston, Mass.

Having completed the amalgamation, the Toronto Suburban St. Ry. Co., Limited, operated 9.89 miles of line, extending from what was then the Toronto city boundary on Dundas St., along Dundas St. to Lambton, with a branch southerly to Evelyn Crescent; a line to Weston, branching from the Dundas St., at Keele St., and the Davenport Road line branching off from the Weston line easterly to Bathurst St. Owing to lack of patronage the Evelyn Crescent line was abandoned for some years, but traffic on it was resumed on the general revival of business. In 1899 an arrangement was made with the Toronto Ry., by which that company operated its lines to Keele St., the T. S. Ry. operating its lines in two sections, one along Dundas St. to Lambton, with the Evelyn Crescent branch, and the other along Keele St. to Weston, with the branch to Bathurst St.

In 1901, the company began to look forward to an extension of its lines, and secured authority to extend its Lambton Mills line to Hamilton, and in the following year was given a franchise through the township of Etobicoke, the extension to be completed in 1903. Nothing was done under this agreement. In 1904, the Legislature granted an extension of time for building the lines build the following additional lines: From Hamilton to Niagara Falls; a line from near Weston to Woodbridge; a line from near Lambton Mills to Brampton; and other branch lines in Niagara Peninsula. At the last session of the Legislature, an extension of time for one year was granted for the building of the line from Cooksville.

By the Act passed in 1904 the company was authorized to issue bonds to the amount of \$30,000 a mile in respect of its lines built or to be built, and in 1909, a mortgage to the National Trust Co. covering an issue of bonds to that amount was confirmed. The mortgage provided that no portion of the bond issue beyond that for the existing mileage

should be issued unless with the previous consent of two-thirds in value of shareholders present or represented at a general meeting called to authorize the issue of bonds.

Electric Ry., Finance, Meetings, Etc.

British Columbia Electric Ry.—Gross earnings for April, \$368,233; working expenses, \$243,097; net operating earnings, \$125,136; renewal funds, \$29,770; net earnings, \$95,366; approximate income from investments, \$20,000; net income, \$115,360, against \$247,307 gross earnings; \$153,776 working expenses; \$93,581 net operating earnings; \$17,852 renewal funds; \$75,679 net earnings; \$16,500 approximate income from investments; \$92,179 net income for Apr., 1910. Aggregate gross earnings for 10 months ended Apr. 30, \$3,440,733; net income, \$1,336,479, against \$2,471,631 aggregate gross earnings and \$1,047,717 net income for same period 1909-10.

Calgary Municipal St. Ry.—Total earnings for May, \$28,731.85; expenses, including a contingent account amounting to 5% of gross earnings and \$2,715.88 for interest and sinking fund, \$17,720.81; surplus, \$11,010.44.

Edmonton Radial Ry.—The report of the city auditor upon the operation of the street railway for the year 1910, forms a part of the report of the city commissioners for Edmonton, Alta., recently issued. The auditor sets out that the revenue account for the year shows a deficit of \$29,269.74, which added to the deficit of 1909, makes a total deficit of \$38,754.38. The liability for tickets sold and not collected, \$4,219.62, has been charged against revenue account. The number, 108,412, of tickets outstanding, appears to be abnormally large, but no statistics are available for comparison in this matter, with cities of similar size elsewhere. The financial loss is accounted for by the lowness of the fares charged, the high cost of labor, and the haste with which the line was built, which rendered considerable reconstruction necessary on the tracks.

The amount raised on capital account during the year was \$434,500, and after liquidating the balance of the capital expenditure for 1909, and deducting the cost of extensions during 1910, there is on hand \$247,133.06 to meet future expenditures. The amount charged by the power house department for power for street railway purposes was \$46,480.75.

The receipts for the year were \$148,294.17.

Halifax Electric Tramway.—Receipts for May, \$17,198.82, and for two weeks ended June 14, \$12,631.23, against \$15,.... and \$12,417.59 for same periods 673.97 and \$12,417.59 for same periods

London St. Ry.—A dividend of 3% for the half year was declared at the semi-annual meeting of directors, June 15.

Montreal St. Ry.—Passenger earnings for May, \$419,459.55; miscellaneous earnings, \$12,229.97; total earnings, \$431,689.52; operating expenses, \$216,730.32; net earnings, \$214,959.20; city percentage on earnings, \$38,776.01; interest on bonds and loans, \$15,963.07; rent leased lines, \$607.10; taxes, \$5,000; total charges, \$60,346.18; surplus, \$154,613.02; expenses per cent. of earnings, 50.21, against \$360,480.85 passenger earnings; \$9,753.28 miscellaneous earnings; \$370,234.13 total earnings; \$199,616.79 operating expenses; \$170,617.34 net earnings; \$29,442.27 city percentage on earnings; \$14,982.37 interest on bonds and loans; \$552.90 rent leased lines; \$4,000 taxes; \$48,977.54 total charges; \$121,639.80 surplus; 53.92 expenses per cent. of earnings for May, 1910. Aggregate total earnings for eight months ended May 31, \$3,006,913.47; operating expenses, \$1,787,921.86; net

earnings, \$1,218,991.61; total charges, \$339,889.47; surplus, \$879,102.14; expenses per cent. of earnings, 59.46, against \$2,707,235.45 aggregate total earnings, \$1,607,443.21 operating expenses; \$1,099,792.24 net earnings; \$306,147.51 total charges; \$793,644.73 surplus; 59.38 expenses per cent. of earnings for same period 1909-10.

Ottawa Electric Ry.—We are advised that while there have been repeated rumors during the last few months of a merger of the O. E. Ry., the Ottawa Light, Heat and Power Co., and the Ottawa Car Co., nothing is likely to be done in the way of bringing it about in the immediate future.

Port Arthur and Fort William Electric Ry.—Net earnings for Apr., \$4,675, against \$2,851 for Apr., 1910. Gross earnings per car mile, 23.672c.; net earnings per car mile, 8.961c.

Toronto Ry.—Gross earnings for April, \$364,458; working expenses, maintenance, etc., \$188,341; net earnings, \$176,117, against \$328,785 gross earnings; \$171,146 working expenses, maintenance, etc.; \$157,639 net earnings for Apr., 1910. Aggregate gross earnings for four months ended Apr. 30, \$1,432,422; net earnings, \$671,138, against \$1,303,050 aggregate gross earnings; \$605,102 net earnings for same period, 1910.

A quarterly dividend of 1% has been declared.

Winnipeg Electric Ry.—Gross earnings for April, \$308,113; working expenses, \$148,096; net earnings, \$160,017, against \$238,054 gross earnings; \$124,642 working expenses; \$113,412 net earnings for Apr., 1910. Aggregate gross earnings for four months ended Apr. 30, \$1,280,472; net earnings, \$615,387, against \$1,051,534 aggregate gross earnings, \$509,159 net earnings for same period 1910.

Toronto P.A.Y.E. Car Requirements.

The following Act was passed at the Ontario Legislature's recent session:

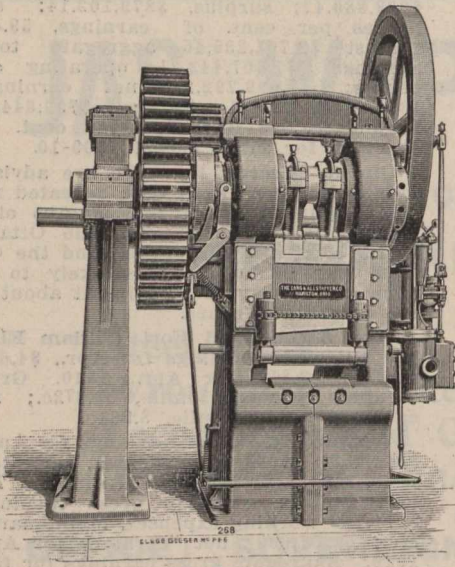
1. The Ontario Railway Act, 1906, is amended by adding the following as section 214a:

214a—(1) What is known as the "pay as you enter system" of collecting fares shall not be operated on any street railway car unless such car complies with the following requirements: (a) It must have a rear platform at least 72 ins. deep with a folding step not less than 54 ins. long. (b) The rear platform must be enclosed and properly heated, and provided with a door or doors having an aggregate width of at least 54 ins., so arranged as to permit of the entrance and exit of passengers at one and the same time. (c) If there is a partition between the rear platform and the body of the car such partition must have doors or openings so arranged as to permit of the entrance and exit of passengers at one and the same time. (d) The front platform must be enclosed and properly heated. It shall be provided with an exit door at least 30 ins. wide and a folding step of the same width. If there is a partition between this platform and the body of the car it must be provided with an exit door or opening not less than 30 ins. wide.

(2) This section shall only apply to cities having a population of 100,000 or over.

(3) Every company or person who violates the provisions of this section shall, on summary conviction therefor, incur a penalty of \$100 per day for each car operated contrary to the provisions of this section.

(4) The provisions of the preceding sub-sections may from time to time be varied or extended by the Ontario Railway and Municipal Board on any application made to the board for such purpose.



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LET THE PUBLIC KNOW

By A. Dexter B. Van Zandt, Publicity Agent
Detroit United Railway.

The following paper was read before the Canadian Street Railway Association at its meeting in Windsor, Ont., recently:—

Let the public know; tell them all about yourselves. It is a duty you owe, not only to the people, but to yourselves as well.

Of all the modern inventions of urban and suburban life developed within the past half century—inventions that are now classified as public utilities, whether in the form of transportation service, lighting service, heating service or the service of transmitting messages by wire—none has been so wonderful in its growth and ramifications as the public utility you here today represent, the electric street railway. Yet because of the misrepresentation of those with ulterior motives, supplemented by the non presentation by those who know, no other necessity of modern civic life has been subjected to such abuse as is heaped upon the calling to which you are devoting your lives.

The English speaking nations are broad, liberal minded peoples, by natural bent prone to have faith in their fellow beings, for only because of this faith in the honesty of purpose have we been able to become what we have, great nations in the uplifting of mankind. Some day there will be more of this faith in what you have done and are doing, and this confidence in your work, when it does come, will redound to your glory as well as to the peace and welfare of town and country.

Today you introduce to a municipality this wonderfully comfortable means of annihilating time and space, and you are hailed as a giver of new life, but a year from today and the same people will not be greatly adverse to placing you on the cross of carping criticism. Today you invest all the money at your command, adding to it all the credit you can obtain, in rails, cars and power, all the best products of the art, and then give a service far beyond the wildest dream of the most optimistic citizen, but a year from now your track, your cars, your power and your service are condemned as being antiquated. Your critic continues to live in his same house, use his same furniture, and eat from the same dishes, content in the belief that he is doing what is proper. He can readily see the financial folly of wiping out his investment, but he doesn't understand why you shouldn't scrap a five thousand dollar car.

Today your average citizen goes to his butcher and, asking the worth of meat, is told and believes; he goes to his tailor and, asking the worth of clothing, is told and believes; then your same citizen comes to you, and asking what it costs to make his street car ride possible is told, whereupon you are made chief in the Ananias club. This is the condition that confronts you. Why the confusion exists is, perhaps, rather hard for you to understand, and I am not certain that any one fully knows why these thistles are as common as Canadian dandelions on the farm or as dandelions on the city lawn.

As I read the history of urban and interurban railway development I take it that the prevailing opinion of the public had its origin in your own lack of comprehension of what you started out to do. In the beginning all you planned was the substitution of motors for horses. You would give, you believed, the same service—perhaps a little better service—at a less cost. Your original cars and their duplicates would do; to them you would fasten motors and string up some wires from which to secure the current of electricity and save

the cost of feed and loss of dollars by sickness, old age, or death of animal power. Coupled with these was the certainty of somewhat shortening the running time, so you figured it out that you could perform the public service of transportation not only better but cheaper. You proceeded by contractual relations to perform this service at rates that have since proven to be far less than they should have been. Others, lured by the pot of gold at the end of the rainbow, and with less knowledge than you, entered the field with even rasher promises than you believed you could fulfill. You found that the mystifying motors required larger cars, and then the larger cars required larger motors, and these in turn required larger cars. With larger cars and more powerful motors came greater speed, and greater speed and heavier equipment required rails and road beds of costly design—a constant succession of using capital and still more capital, with the scrap heap growing apace long before even a fractional portion of the original investment had been returned into the treasury from which it came.

In the meantime, as new discoveries and inventions came with startling rapidity, and they are still coming, placing into the discard today what in themselves were discoveries of but yesterday, the people have been served lavishly. You have made it possible for them to live far from the smoke and noise of shop and factory; you have given them a means of transportation within the city, faster, more frequent and more certain than human mind ever thought possible. You have spread the cities out into the country, with its free air and blessed sunshine, and you have given the man of broad acres all the peculiar joys of city life added to the beneficence of wheat field and woodland. You have done all these things, but so intent have you been with your work that even though through bitter experiences you learned that deficits are not surpluses, and depreciations must sometime be met, you have not set about it to tell the user of your street car that every five cent piece he pays is far from being all profit. I mean you have not gone about it scientifically. Today your car shops are scientifically organized; you employ engineers to do your track building; you make use of chemists; operating departments are in the hands of men of wide knowledge of the public's needs and your ability to supply these needs; you are quick to locate defects in your internal organization, but you have not yet brought to an equally high standard a public information department.

Today several of the states and provinces have begun a scientific study of the art of transportation through trained men in the employ of the railway commissions. There is more deep investigation of the problem than ever before, and as the years go by the knowledge gained will seep through to the minds of the people, but this knowledge should not all be theoretical in nature; the difficulties besetting practical men must be made known in order that there be a clear comprehension. Each railway should do an active work in properly educating the public with which it is in immediate and constant touch.

I know of no public utility that receives so much attention today in that greatest of all public utilities, the press, as is given the utility you represent. Day after day and year after year the name of your railway appears in public print, often in words of truth, often with words of falsity.

Occasionally you are being given credit for doing something for the public good and more often you are being accused of crimes you never committed. If a nagged conductor and a crabbed passenger have a quarrel, headquarters are

given the blame; if a transfer is wrongfully issued it is done on the advice of the president of the company after months of consultation with the directors, and should some one coming around the rear end of one car be run over by the car going in the opposite direction, it is, of course, all deliberately planned by the general manager. Your patron may over-sleep, and, perforce, have to snatch an unsatisfactory breakfast, but you must have the car ready for him when he reaches the corner. As a matter of fact, it is your fault the alarm clock doesn't pull him out of bed and dress him. Similarly you are to blame because you do not buy cars enough, and build tracks enough, and have an abundance of car crews on hand to take back the armies from the shop, the factory and the ball game within the space of five minutes or less. That the butcher and the grocer cannot assuage one's wants promptly is no excuse for you of public utility service—that phrase so beautifully mouthed by the man in office and the man who wants to be in office.

Why not intelligently try to direct the information that goes out broadcast among the people whom you transport? They are entitled to know what you are doing and why you are doing it. You should tell them that your prosperity means their good service, and their prosperity means still better service. Let them see that there is a proper, decent relationship between you, the common carrier, and they, the riders. Take them into your confidence, and in time they will learn that while personally you are a quiet, sedate Christian gentleman, you are not officially a cut-throat, porch-climber and leper. I, myself of newspaper training, have no hesitancy whatever in saying that you have neglected your department of publicity, that department which is the connecting link between the railway and the people who ride.

No matter what may be the motive of the man higher up in newspaper control, it should be remembered that the reader believes in what his paper tells him. His newspaper is the source of his information and his school of instruction. The very fact that a man reads a certain print is the best of evidence that he believes in it from first column to last, including, sometimes, the advertisements. Your average citizen believes his newspaper is published primarily to furnish him with local and world information, and so he necessarily believes he is being honestly dealt with, but of the real purposes of the man higher up he has never had occasion to ponder.

Make the giving of news a definite department of organization, with the same attention to it as to other departments. Let the public know what you have done and what you are doing. Let the public know of your new appointments and of your accidents. Let the public know of your schedule changes, of where you add to the service, and where you take off, and why. Municipal corporations, through their clerks and departments, let the public know what is going on, because the public is interested. You should do no less. Don't be afraid of printer's ink. Let the public know

The action brought by W. Kerley against the London and Lake Erie Ry. and Transportation Co. to recover penalties under the Lord's Day Act, for the operation of cars on Sundays, came before Chancellor Boyd at St. Thomas, Ont., June 20. The company is operating law. The Grand Valley Ry., which also that it is independent of the provincial law. The Grand Valley Rd., which also operates under a Dominion charter, is running cars between Brantford and Galt on Sundays.

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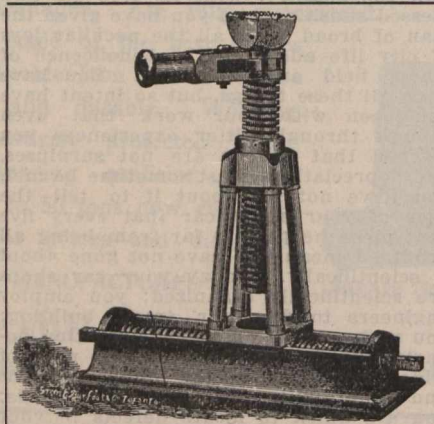
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A HISTORY OF THE PAY-AS-YOU-ENTER CAR AND ITS LESSON

The following cities are using Pay-As-You-Enter Cars: Chicago City Railway, 839 cars; Chicago Railways, 1,328; Public Service Corporation of New Jersey, 466; New York City Railway, 555; Third Avenue Railroad, New York, 550; International Railway, Buffalo, 200; Buffalo & Lake Erie Traction Co., 10; Washington Ry. & Elec. Co., Washington, D.C., 100; Capital Traction Co., Washington, D.C., 51; Municipal Traction Co., Cleveland, Ohio, 180; United Rys. Co. of St. Louis, Missouri, 310; Portland Ry., Lt. & Pwr. Co., Portland, Ore., 25; Columbus Ry. & Lt. Co., Columbus, Ohio, 10; Wichita R.R. & Lt. Co., Wichita, Kan., 14; Jacksonville Elec. Co., Jacksonville, Fla., 1; Dallas Elec. Co., Dallas, Texas, 20; Houston Elec. Co., Houston, Tex., 41; Northern Texas Trac. Co., Ft. Worth, Texas, 25; Ithaca Street Ry., Ithaca, N.Y., 2; Peoria Street Ry., Peoria, Ill., 13; Urbana & Champaign Ry., Champaign, Ill., 3; Mutual Lt. & Water Co., Brunswick, Ga., 4; Rochester Ry. Co., Rochester, N.Y., 25; Ft. Dodge, Des Moines & So. R.R. Co., 2; Muskogee Elec. Trac., Muskogee, Okla., 6; Union Traction Co., Dubuque, Ia., 4; Topeka Ry. Co., Topeka, Kas., 12; United Rys. & Elec. Co., Baltimore, Md., 32; Detroit United Ry., Detroit, Mich., 225; Cincinnati Traction Co., Ohio, 50; Montreal Street Railway, 400; British Columbia Elec. Ry., 30; Calgary Street Railway, 18; Metropolitan Street Ry., Kansas City, Mo., 50; Edmonton Radial Ry., 4; San Antonio Traction Co., San Antonio, Tex., 6; Rockford & Int. Ry., Rockford, Ill.; Cairo Street Ry. & Lt. System, 6; Des Moines City Railway, Iowa, 12; Macon Ry. & Lt. Co., Macon, Ga.; Virginia Ry. & Power Co.; Columbia Elec. St. Ry. & Lt. & Power Co., Columbia, S.C.; Aurora, Elgin & Chicago Ry., Chicago, Ill.; Wichita Falls Traction Co., Wichita Falls, Tex.; Ottawa Electric Ry. Co., Ottawa; Bloomington & Normal Ry. & Lt. Co., Bloomington, Ill.; Corsicana Transit Co., Corsicana, Tex.; Compania Electrica y de Ferrocarriles, Mexico; The Milwaukee Elec. Ry. & Lt. Co., Milwaukee, Wis.; Springfield Street Ry. Co., Springfield, Mass.; Lynchburg Traction Co., Lynchburg, Va.; Chicago & Southern Traction Co., Chicago, Ill.; Calumet & South Chicago Ry. Co., Chicago, Ill.

THE LESSON

taught by this widespread use of Pay-As-You-Enter Cars is obvious. Increased Revenue, Accident Elimination and Schedule Improvement have been demonstrated in every case. Isn't all this sufficient to show that it always pays to operate the Pay-As-You-Enter Car? Why not remodel some of your present cars?

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Projects, Construction, Betterments, Etc.

Brandon, Man.—A bylaw authorizing the construction of an electric railway in the city was passed by the ratepayers June 16. It provides for the building by the city council of about eight miles of line.

Negotiations are in progress with a syndicate represented by J. D. McGregor for the operation of the line. If these negotiations are completed the syndicate will assume the cost of the work done by the city, and complete the construction. The first lines to be built will lead to the Experimental Farm and the suburban park. (June, pg. 555.)

Brantford.—The Ontario Legislature has authorized the city council to pass bylaws for building and operating a street railway from the corner of Brant Ave. and Church St. to a point opposite the waterworks plant, and to raise \$12,000 by debentures for such purpose. The council is also authorized to lease the line to any company.

British Columbia Electric Ry.—The freight yard which the company proposes to lay out at New Westminster will have a capacity of about 300 cars and will contain over two miles of track, with room for extension. It lies between the Burnside line and the proposed cut-off from McNeiley St. to Twelfth St.

General Manager Sperling informed the New Westminster City Council June 5, that plans had been approved for an extension to Millside, and for a new line in the city.

The Board of Railway Commissioners having authorized the opening for traffic of the Vancouver, Fraser Valley and Southern Ry. from Park Drive, Vancouver, to New Westminster, 10 miles. It was opened for traffic June 12.

Proposals are being discussed prior to submission to the company for a line from Vancouver to the Delta district; from Vancouver to Ladner, 14 miles, and for a further extension of the Lulu Island line. (June, pg. 555.)

Calgary Municipal St. Ry.—The special track work at the intersections is being put in, but it is slower work than was anticipated, and it is doubtful whether the extensions will all be completed by the date for opening the exhibition. The construction of the Hillcrest loop line this year is under consideration, and it is expected the work will be put in hand at once. (June, pg. 555.)

East Calgary Corporation Co.—Press reports state that application is being made for incorporation with this title for the purpose of building an electric railway for eight miles southeasterly from the present easterly terminus of the Calgary Municipal Street Ry. Colonel Walker and P. Burns are interested in the proposal.

Grand Valley Ry.—The plant for the power house at Galt, Ont., is being installed. This power house will receive the current from the Hydro-Electric line. (Feb., pg. 167.)

Guelph Radial Ry.—The contract for the construction of the extension of the line in St Patrick's Ward, Guelph, Ont., has been let to P. H. Secord and Sons, Brantford, Ont. The overhead work will be put up by the company. (May, pg. 453.)

Halifax Electric Tramway Co.—A press report states that the directors passed a resolution June 15 consenting to the extension of the line from Green Bank to Point Pleasant Park, Halifax, N.S., asked for by the city authorities. The work will be proceeded with as soon as the city engineer gives the necessary authority, and it is expected to have it completed by Aug. (May, pg. 453.)

Hamilton, Waterloo and Guelph Ry.—A representative of a London, Eng., fin-

ancial house is expected in Hamilton, Ont., to look into the proposal for the building of this railway, according to a statement made by J. Patterson on his return from England, May 26. (April, pg. 365.)

Hamilton St. Ry.—The company has notified the Hamilton, Ont., city council that it will be unable to make any more extensions this year, but it has consented to shift its tracks on Barton St., east of Sherman St., from the side to the middle of the road. (May, pg. 453.)

Hamilton to Galt, Ont.—The General Manager of the Dominion Power and Transmission Co. is reported as stating, June 16, that the company intended to build a line from Hamilton to Galt, Ont., as soon as possible, but that its action will depend largely upon the action of the electors on the Hydro-Electric power bylaw, which is to be voted on in Hamilton at an early date. (June, pg. 555.)

Hull Electric Co.—Plans showing the car barns, repair shops and offices which it is proposed to build near Hull Jct., on the Little Farm, were filed at the city hall, Hull, Que., June 1. The estimated cost of the buildings is \$25,000. The present shops are at Deschenes, and these will be turned into car barns when the new buildings are completed. (Sept., 1910, pg. 781.)

Lake Erie and Northern Ry.—W. P. Kellett and others interested in this projected electric railway from Port Dover to Brantford, Ont., went over the route, June 6. A bylaw was passed by the Brantford City Council, June 12, granting the company permission to build its line along Newport St. and across certain streets in the city. The municipalities through which the line will pass are being asked to guarantee the company's bonds, Brantford being asked to become responsible for \$300,000, and the town of Simcoe and the village of Port Dover for \$50,000 each. (June, pg. 555.)

Medicine Hat, Alta.—The city council instructed its finance committee, June 9, to apply next session of the provincial Legislature, for a charter for an electric railway.

Montreal Street Ry.—The question of a new franchise for the M.S.R. and its allied companies is still under consideration. The President informed the Board of Control, June 15, that it would be early in July before the company would be in a position to discuss the matter. (June, pg. 557.)

Mount McKay and Kakabeka Falls Ry.—Bylaws affecting this railway as constructed in Paipoonge tp., were confirmed last session of the Ontario Legislature as follows:—exemption from taxation for 21 years from 1911; grant of \$4,000 in aid of the construction of a bridge over the Kaministikwia River at the boundary of lots 8 and 9; and a franchise for lines on any highway in the township. (Mar., pg. 259.)

Nanaimo, B.C.—A bylaw granting a franchise for the construction and operation of an electric railway in the city has been given a second reading by the council, and referred to the solicitor. Stewart and Rogers, Victoria, are solicitors for the syndicate with which the preliminary arrangement has been made. A local syndicate has submitted an offer to build a line, if the first named proposition is not carried through. (Feb., pg. 169.)

Niagara Frontier Ry.—A bylaw granting the company a 25 year franchise for an electric railway in Niagara-on-the-Lake, Ont., was passed by the taxpayers, June 6. (June, pg. 557.)

Oshawa Ry.—The Ontario Legislature has authorized the Oshawa town council to enter into an agreement with the Oshawa Ry. for the paving of the track allowance, and for the spreading of the cost over a period. (Mar., pg. 259.)

Ottawa Electric Ry.—The Ottawa City Council was authorized last session of the Ontario Legislature to borrow \$14,500 for the purpose of providing for the cost of a roadway to enable the O.E.R. to extend its line to Beechwood and Notre Dame cemeteries in Gloucester tp. Negotiations are in progress with certain property owners at the corner of Carling Ave., in order to extend the Preston St. line and form a new loop line. (June, pg. 557.)

People's Ry.—A special meeting of shareholders was held at Berlin, Ont., June 26, to create 6% preference stock of an amount not exceeding 25% of the capital from time to time authorized; to confirm a bylaw passed by the directors as to the terms of the preference stock; to authorize the issue of bonds, debentures or other securities, and to create mortgages to secure the same; to confirm and ratify contracts for the building of the railway, and to ratify the acts of the directors up to the holding of the meeting. G. A. Wanless is Secretary and the company's offices are at Berlin, Ont. (June, pg. 557.)

Port Arthur and Fort William Electric Ry.—The Ontario Legislature has confirmed bylaws authorizing the raising of \$90,000 for paying the street railway proportion of certain streets, and for the laying of 80 lb. steel rails on Cumberland St.

The taxpayers of Port Arthur will vote, July 6, on a bylaw authorizing the city council to raise \$17,250 by debentures for extending the line from the present terminus at Current River Park for 1,800 ft. along Cumberland Ave.

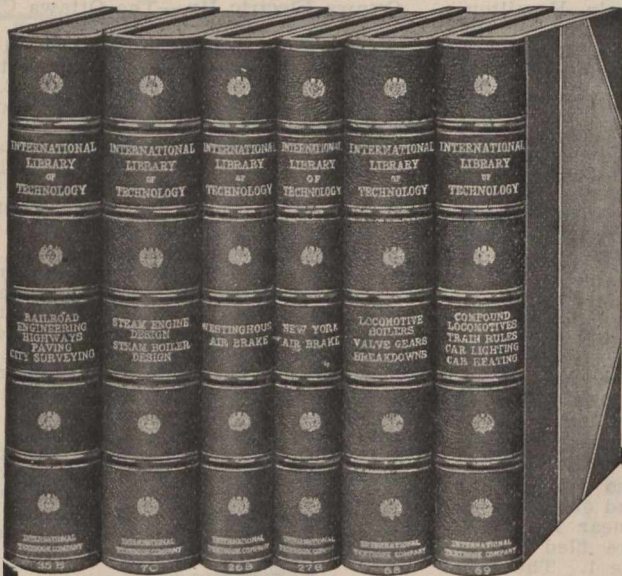
In the act respecting Fort William, passed last session of the Ontario Legislature, it is set out that the amount of the debenture debt for street railway purposes is \$372,500, in respect of which a sinking fund is being provided. The council is authorized to borrow money for the street railway's part of the cost of paving and macadamizing certain streets without obtaining the assent of the electors. The act also confirms a bylaw for borrowing \$20,000 for street paving on Victoria Ave. and Simpson St., on which the street railway is double tracked. (June, pg. 557.)

The Prince Rupert Hydro-Electric Co. has been incorporated under the Dominion Companies Act, with a capital of \$5,000,000, and offices in Montreal for electrical development purposes at Prince Rupert, B.C. The powers given to the company are general, and include the construction and operation of electric railways. The provisional directors are: O. B. MacCallum, G. V. Cousins, P. F. Brown, W. R. Ford, S. T. Mains, Montreal. This is the company which has taken over the charter of the Tsimpsonian Light and Power Co., as well as other companies interested in electrical development in the Prince Rupert district. (See Tsimpsonian Light and Power Co., June, pg. 559.)

Quebec Ry., Light and Power Co.—We are advised that it is the company's intention to electrify the Montmorency Division, between Quebec and Ste. Anne de Beaupre, but that it has not yet been decided when the work will be done. It is intended to establish a divisional point at Ste. Anne de Beaupre, and to operate the line from that point through to Murray Bay, on the Quebec and Saguenay Ry., by steam. The ownership of the Q. and S. Ry. is vested in the Quebec Ry., Light, Heat and Power Co., which owns the Q. Ry., L. and P. Co., but it will be operated as the Q. and S. Ry.

The extension to the Kent House was so far completed that a steam locomotive was run in on the new rails to the hotel grounds June 9.

Replying to a communication from the locality, R. Forget, President, has



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Department of Railways and Canals, Canada

**HUDSON BAY RAILWAY.
NOTICE TO CONTRACTORS.**

SEALED TENDERS addressed to the undersigned and endorsed "Tender for construction of Hudson Bay Railway," will be received at this office, until 16 o'clock on Tuesday, the 1st of August, for a section of about 185 miles from Pas Mission to Thicket Portage.

Plans, specifications and form of contract to be entered into can be seen on and after Wednesday, May 31, at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa, and at the office of the Chief Engineer of the Hudson Bay Railway, Winnipeg, at which places forms of tender may be obtained.

Parties tendering will be required to accept the fair wage 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 \$200,000.00 made payable to the order of the Minister of Railways and Canals must accompany each tender. It will be forfeited if the party tendering declines entering into contract for the work, at the rates stated in the offer submitted.

The cheques 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,
Secretary.

Department of Railways and Canals, Ottawa.
May 26, 1911.

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T. O. S. C. IRVING,
Gen. Man. Western Canada, Toronto.

During April, seven employes were killed and one injured in the course of their work in connection with the navigation of Canadian waters. Of the fatalities, all of which were due to drowning, six were caused by a wreck off the B.C. coast, the non-fatal accident being caused by falling machinery.

written stating that the company will undertake the construction of a line from Charlesbourg to Lorette, as an extension of its lines, if the municipalities interested will secure the necessary right of way. (June, pg. 557.)

Regina Electric Ry.—H. Doughty, who is in charge of the building of the electric railway in Regina, Sask., under L. A. Thornton, City Engineer, stated recently that the line would be completed to the exhibition ground by July 1, and would be in operation for the fourth. No definite arrangements, we are advised, have been made for the operation of the lines, but in any case the City Commissioner will have the direction of the work. (June, pg. 557.)

St. John Ry.—An extension of the line as far as Kane's Corner is under construction, and if the arrangements are completed with the municipality, the extension will be carried as far as Fernhill cemetery. An addition to the power house is to be built immediately. It will have a frontage of 30 ft. on Nelson St., St. John, N.B., and will connect at the rear with the company's offices. (May, pg. 455.)

Sandwich, Windsor and Amherstburg Ry.—The Ontario Legislature has declared that sec. 11 of chap. 97, Vict. 56, "shall not prejudice or affect the rights, powers and privileges of the said town of Sandwich existing or enjoyed by the said town of Sandwich prior to the passing of the said act." The second section limits the company's franchise to a period of two years from the present year. (Mar., pg. 261.)

Saskatoon, Sask.—The taxpayers will vote, July 6, on a bylaw to authorize the city council to grant a franchise for an electric railway. The agreement which it is proposed to ratify is made with H. M. E. Evans, Edmonton, Alta., who has acquired the property, rights and franchises of the Saskatoon Power Co., and provides, so far as the street railway is concerned, that construction is to be started within three months after the agreement is made and completed within 15 months, subject to incorporation at the next session of the Saskatchewan Legislature. Special conditions are provided to come into operation if the special act be not obtained, or if the street railway be completed before the hydro-electric plant is ready. The franchise is for 20 years, and is exclusive, covering also any areas that may be added to the city in the future. The corporation may call upon the company to build extensions at any time under certain conditions; radial lines outside the city limits may also be built. The company will pay to the city, after the line has been in operation three years, 3% of the gross earnings every year for seven years, 4% a year for the next ten years, and 5% a year thereafter until the city exercises the right of purchase under sec. 27 of the agreement. (May, pg. 455.)

Sherbrooke St. Ry.—The Board of Railway Commissioners has authorized the company to change the location of its crossing of the C.P.R. at the corner of King and Belvidere Sts., Sherbrooke, Que.

It is expected that the reconstruction of the old company's lines in the city will be completed by July 31. (May, pg. 455.)

Toronto and York Radial Ry.—The additional lines which the company is authorized to build under the Act passed last session of the Ontario Legislature include extensions and branches of the different railways forming the T. and Y. R. R. upon highways, with the consent of the municipal authorities, or upon private rights of way; a line from the Toronto and Scarboro division to Markham; and a line from the Metropolitan

Division at Sutton to Pefferlaw. The present Act does not extend the rights of the company under any existing agreement with any municipality so as to empower the company to lay double tracks upon any highway where such right does not expressly exist under such agreement.

Application is being made for the construction of additional switches on the Metropolitan division in North Toronto. The present switches are only short passing places, about 400 or 500 ft long, and the proposed new ones extend from 1,050 to 1,650 ft. in length. The municipal authorities are opposing the plans before the Ontario Railway and Municipal Board. (June, pg. 559.)

Toronto Civic Street Railway Proposals.—The Act respecting the city of Toronto passed last session of the Ontario Legislature declared that the power to acquire the part of the Toronto and York Radial Ry. in the city, as set out in schedule B., was legal, and granted power to acquire it under the terms of the agreement of Dec. 23, 1890. The piece of line mentioned is the section of the Toronto and Mimico Electric Ry. from Sunnyside to the city boundary. The council may take possession of the line, Dec 23, of the current year, and may issue debentures to pay for the cost, subject to the passage of a bylaw. The city is also given power to extend the line easterly along the Lake Shore Road so as to connect with the Toronto Ry., and may make agreements with that railway for the interchange of traffic, or for running rights over the T. Ry. as far as the St. Lawrence Market, or to other points, subject to the approval of the Ontario Railway and Municipal Board. The city's application for rights in connection with the T. Ry. is under consideration by the Ontario Railway and Municipal Board. (June, pg. 559.)

Toronto Eastern Ry.—The Board of Railway Commissioners will be asked, July 5, to recommend the Governor-in-Council to sanction an agreement made with the Canadian Northern Ontario Ry. for the running of the company's trains over C.N.O.R. tracks. A number of orders have been made by the Board of Railway Commissioners for the crossing of public highways in the townships of Darlington and Whitby East, Ont. (Apr., pg. 365.)

Toronto Ry.—Work on the new lines and new turnouts, etc., is being pushed forward, both by the company and the city, and it is expected that some of the new routes will be put in operation by the end of July. The Ontario Railway and Municipal Board has granted the company permission to lay a line on the Spadina Ave. line south to Front St., and to put in an intersection there. (June, pg. 559.)

Western Central Ry.—A special meeting of shareholders was held in Toronto, June 19, to authorize the directors to issue first mortgage bonds to the amount of \$35,000 a mile of single track, and \$55,000 a mile of double track line. J. L. McDiarmid is interim Secretary.

A. T. Drummond, who represents the company, stated June 11, that the company would agree to give over its passenger business destined to city points to the civic railway, if permitted to stop at certain points and allowed the use of certain streets to reach the civic lines. It is understood that a proposal will be submitted to the city at an early date. (June, pg. 559.)

Winnipeg Electric Ry.—The City Engineer was instructed, June 9, to get into communication with the railway officials with a view of deciding on the extensions to be built. It was announced, June 14, that the company was sending a representative to discuss extensions with the city of St. Boniface. (June, pg. 559.)

Electric Railway Notes.

The Pay-as-you-Enter Car Corporation has taken out patents in China.

Mrs. Butler, who died in Montreal, May 28, was wife of J. W. Butler, Supervisor of the Montreal Street Ry.

The Port Arthur and Fort William Electric Ry. has added to its rolling stock a baggage car, built at its own barns.

The Moose Jaw Electric Ry. has received two 21 ft. cars, 31½ ft. long over all, mounted on 21-E trucks, from the Ottawa Car Co., Ottawa.

N. C. Pilcher, General Manager, Sherbrooke Ry. and Power Co., has been gazetted provisional lieutenant in the Sherbrooke Regiment.

The Winnipeg Electric Ry. has completed two large open type cars, and has nearly completed a number of closed type cars at its shops.

The Toronto Ry. employes, at a meeting, June 10, instructed a committee to wait on the management and present a list of grievances, with a request for redress.

The Edmonton Radial Ry. has received two 28 ft. pay-as-you-enter cars, 44½ ft. long over all, mounted on 27-G-1 trucks, from the Ottawa Car Co., Ottawa, Ont.

The Montreal and Southern Counties Ry. is being asked to deliver 800 shares of stock to the Bank of Quebec. Argument was heard June 19, and judgment reserved.

The Montreal Street Railway on July 1 made a voluntary increase of wages of motormen and conductors of 1c. per hour, making the wages 20, 21 and 22c., according to length of service.

W. Meredith, Consulting Engineer, British Columbia Electric Ry., Vancouver, has been chosen by the Victoria city council as engineer to supervise the construction of the Sooke Lake power plant.

The British Columbia Electric Ry. has organized a publicity department. This has been deemed necessary on account of the expansion of the railway in the past year, and in view of prospective development.

G. H. Millar has been appointed Master Mechanic in charge of shops and sub stations, London and Lake Erie Ry. and Transportation Co., London, Ont., vice C. Johns, who resigned on his appointment as Superintendent in charge of hydro-electric power plant at St. Thomas, Ont.

Joseph D. Evans has been appointed Superintendent of Construction and Supervising Engineer, Montreal Street Railway. He was for a number of years in the J. G. White Company's service, and recently was in charge of the Canadian Power Company's construction at St. Timothee, Que.

The British Columbia Electric Ry. has ordered two 45 ton 0-4-0 locomotives, with quadruple equipment, 301D inter-pole railway motors, arranged for forced ventilation, from the Westinghouse Co. Following are chief details: cab arranged for double end operation; adhesive weight 90,000 lbs. on driving wheels; diameter of driving wheels, 36 ins.; arched wheel base, 6 ft. 8 ins.; length between coupler knuckles, 31 ft. 1 in.; nominal ratings, each motor 150 h.p. on 500 volts; unit switch, electro-pneumatic, hand accelerating control; brake equipment, Westinghouse type E.L.; continuous tractive effort with blower, 6,800 lbs.; tractive effort at 17½ miles an hour, for one hour, 12,800 lbs.; maximum tractive effort up to 15 miles an hour, 20,000 lbs., with 500 volts at the motors; momentary tractive effort with sand, 26,000 lbs.; motors arranged for working voltage of 600; car ratio, 17:60.

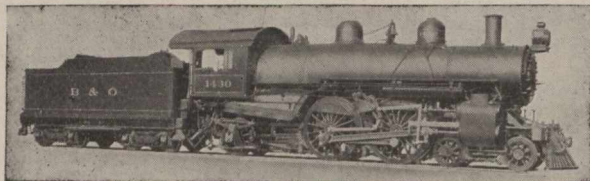
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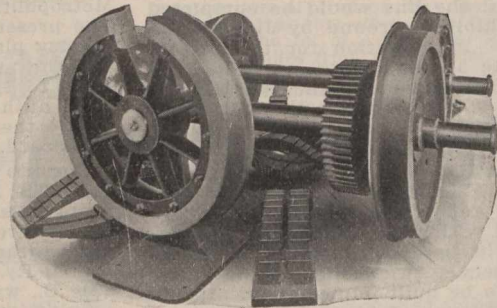
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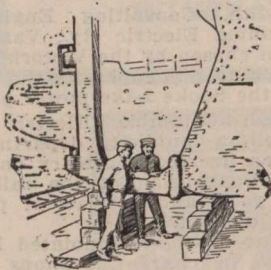
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The accompanying illustrations show four different labor and cost-saving methods devised by W. H. Horton, electrical engineer N., St. C. & T. Ry., St. Catharines, Ont., and used in the shops of that company. Fig. 1 is a commutator slotter made on the principle of a common slide rest. It carries a cutter made of an old file which is operated by a hand lever and link, as shown. With this slotter 99-bar commutators can easily be undercut in 15 minutes. Fig. 2 shows this device installed on the slide rest of a lathe.

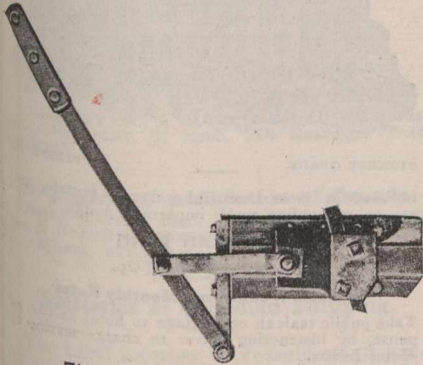


Fig. 1.—Commutator Slotter.

For boring armature and axle bearings the company uses a simple cylindrical chuck which is screwed on to the lathe spindle, as illustrated in fig. 3. This has proved a very satisfactory device since the bearing requires no centreing; all that is necessary is to push the bearing into the chuck and clamp it with the set screw. Bushings are used for odd-sized bearings, the single set screw passing through a clear hole in the bushing to clamp both the bushing and the bearing. No armature binding has been experienced with bearings bored in this chuck because the inner side, when bored, must be parallel with the outer side of the shell. One man can bore many bearings in a day with this chuck, as no time is lost in centreing. A large number of bearings can be bored, say 1-32 in. small, for stock, and when armatures require bearings the latter can be fitted with this chuck without disturbing the original alignment.

Fig. 4 shows an armature bander which was made of a 15-in. diameter double-flange, cast-iron pulley, 1½ in. wide between the flanges. The banding wire is led from the spool seven or eight turns around the pulley, after which the

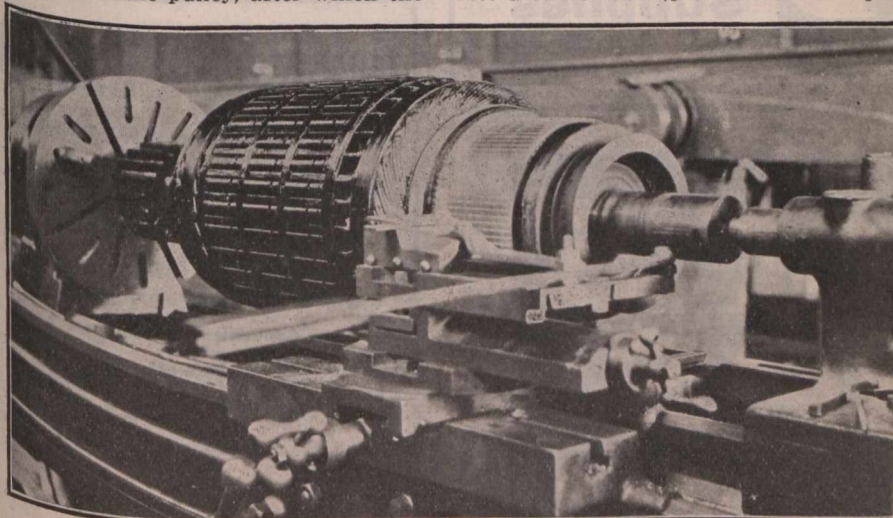


Fig. 2.—Commutator Slotter mounted on slide rest of lathe.

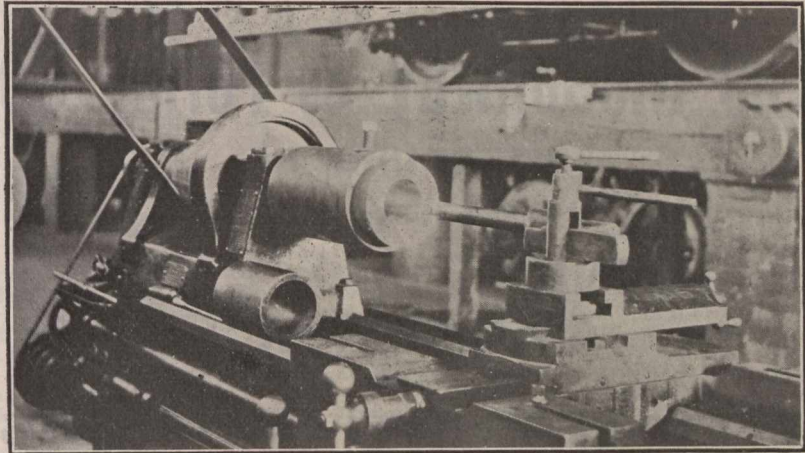


Fig. 3.—Armature Bearing Chuck.

wire is led in the right direction by the lower right-hand trolley wheel which serves for the sheave. A piece of trolley rope over the pulley is used for a brake. This rope is fastened to a bracket at one end and is kept taut by cast-iron weights at its free end. The tension of the wire is increased simply by

drilled all around on the inside. Natural gas for heating is supplied through the valve on the left and air is furnished through the valve on the right from a forge blower driven by a 1 h.p. motor. The pipe circle rests on a 3-in. thick cast-iron ring which is surfaced on the upper side and ribbed on the lower

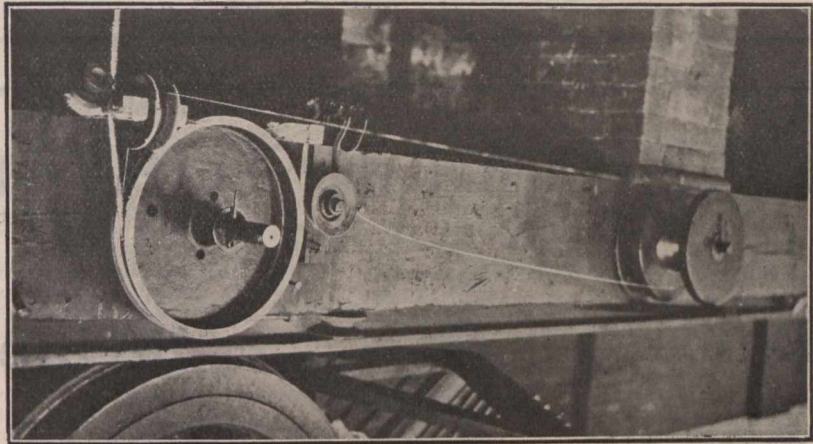


Fig. 4.—Armature Bander Wire Tighteners.

adding more weight on the end of this rope. This banding outfit has been found efficient and simple and does as good work as more costly devices used for the same purpose.

Fig. 5 shows a car wheel tire-heater consisting of a piece of 1½ in. pipe bent into a circle with ½-in. holes 1 in. apart

side. The brick foundation has a large centre hole through which the water used for cooling the tire is drained away. A 2-ton chain hoist suspended from a trolley running on I-beams is used to lift the wheels and axles in position over the tire. When the tire is heated sufficiently the wheel is lowered into it and the tire cooled off. This apparatus has been found to be very satisfactory. For instance, four old tires have been taken off and four new tires put on for a total gas consumption of 830 cu. ft., the natural gas costing 30 cents per 1,000 cu. ft. The time taken to remove an old tire varied from 6 minutes 25 seconds to 10 minutes. The time taken to apply a new tire varied from 21 minutes 30 seconds to 25 minutes.

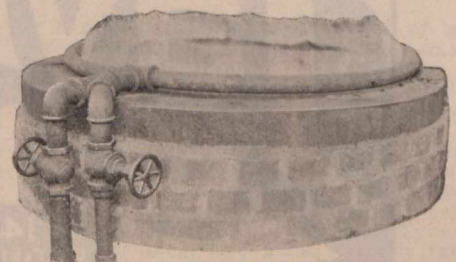


Fig. 5.—Tire Heater for Car Wheels.

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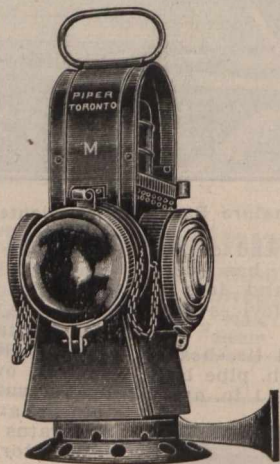
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Statistics of Canadian Shipping.

The total number of vessels of all kinds on the Canadian register at Dec. 31, 1910, was 7,904, representing 750,929 tons, an increase of 136 vessels and 32,376 tons over the previous year. Of this number, 3,332 are steamers with a gross tonnage of 554,974. With an assumed average value of \$30 a ton, the net registered tonnage of shipping on the register is valued at \$22,527,870. The number of new vessels built and registered during 1910 was 294, measuring 22,233 ton net register, which at an estimated value of \$45 a ton amount to \$1,002,735. During the year 247 vessels were removed from the register for a variety of causes, details of which, with the vessels registered, we have published each month. The number of vessels and their tonnage, according to provinces, is as follows:—

	Sailing ships and steamers.	Steamers.	Gross tonnage of steamers.	Net tonnage of sailing ships and steamers.
Ontario	2,027	1,485	240,658	227,457
Quebec	1,499	479	124,573	189,945
Nova Scotia	2,054	267	34,217	149,737
Brit. Columbia	1,109	781	93,693	105,414
New Brunswick	951	198	46,201	59,637
P. E. Island	150	20	4,465	10,100
Manitoba	94	85	7,673	5,565
Yukon District	16	14	3,213	2,784
Saskatchewan	4	3	281	290
Totals	7,904	3,332	554,974	750,929
Totals, 1909	7,768	3,229	513,962	718,553

Ports of registry are distributed as follows: Ontario 38, Nova Scotia 21, New Brunswick 7, Quebec 6, British Columbia 4, Prince Edward Island, Manitoba, Saskatchewan and Yukon District one each. No provision has been made for the registry of vessels in Alberta, though several vessels have been built, and are operating on the provincial waters. The chief vessels thus operating are registered at Kenora, Ont. The ports having a net tonnage of 10,000 and over are as follows:—

	Vessels.	Net tonnage.
Montreal	789	136,407
Victoria	307	60,089
Toronto	344	52,324
Quebec	625	46,271
St. John, N.B.	332	43,933
Vancouver, B.C.	607	35,175
Ottawa	394	31,297
Windsor, N.S.	78	26,222
Lunenburg, N.S.	279	22,751
Halifax, N.S.	424	21,875
Kingston, Ont.	204	21,839
Parrsboro, N.S.	95	17,726

Yarmouth, N.S.	311	34	15,906
Collingwood, Ont.	81	76	15,770
Hamilton, Ont.	41	33	14,936
Midland, Ont.	30	25	11,879
S. S. Marie, Ont.	68	58	11,298
Charlottetown, P.E.I.	150	20	10,100

Of the 247 vessels which were removed from the register, during the year, 13 were sold to foreigners; 26 wrecked; 8 stranded; 10 lost; 85 broken up; 6 abandoned at sea; 1 lost in collision; 7 foundered; 17 burnt; 3 condemned; 11 transferred to Newfoundland; 7 transferred to Barbadoes; 46 reported out of existence; 1 sank, and 6 were dismantled. During the same period, the names of 34 vessels were changed by orders in council.

The new vessels built and added to the register during the year, according to provinces, are as follows:—

	Vessels.	Tonnage.
Quebec	58	7,012
Nova Scotia	82	5,572
British Columbia	84	5,177
Ontario	46	3,612
Manitoba	5	490
New Brunswick	17	397
Prince Edward Island	2	23
Totals	294	22,283
Totals, 1909	327	25,806

C.P.R. Steamship Princess Alice.

The s.s. Princess Alice, which is being built for the C.P.R. service between Vancouver and Victoria, B.C., and Seattle, Wash., was launched at Wallsend-on-Tyne, Eng., May 29, being christened by Mrs. Arthur Piers, wife of the Manager C.P.R. Steamships.

The Princess Alice is about 300 ft. long and 46 ft. broad. She is built to the highest class of Lloyds and in accordance with the Dominion Government's requirements for passengers in channel or Pacific Coast service. In many respects she is similar to several vessels previously built for the same and other owners for service on the Pacific Coast.

The main engines will be triple expansion, with four cranks balanced to eliminate vibration. The vessel is designed for a speed of close on 18 knots an hour. In addition to the ordinary coal bunkers, she will carry fuel oil and the boilers will be fitted with a complete installation of oil-burning apparatus.

The arrangements for the accommodation and comfort of the passengers have been planned so as to be second to none in a vessel of this class. Both the ventilation and lighting of saloons, corridors, staterooms, kitchens, and so forth have been carefully studied and lavishly executed. The various public rooms and also the staterooms will be handsomely furnished, particular care being taken that the upholstery and all fittings are of the finest quality. In addition to the commodious cabins extending the whole length of both the upper and promenade decks, there will be several suites of bridal chambers. On the main deck aft will be the dining room, panelled in beautiful Italian walnut and finished with decorations in white enamel and gold. Below the dining room will be a restaurant with seating accommodation for about a hundred persons at small tables. On the promenade deck forward will be the observation room with large plate glass windows on three sides. This will be a particularly comfortable apartment provided with couches and easy chairs, from which may be had an interrupted view of the magnificent scenery through which the vessel will pass. At the after end of the same deck will be the first

class smokeroom furnished in fumed oak. This will be another handsome and comfortable room, with wide and lofty windows and surmounted by a stained glass dome. The oak walls are to be relieved with hammered copper panels beautifully designed and representing scenes of North American Indian life and various Canadian subjects. On the upper deck, both forward and aft of the engine and funnel casing, will be large social halls or musicrooms. The corridors of the promenade deck will be specially lofty and well lighted by having a coach roof extending over their full length. This will be designed with a celerstory, which will be finished with panels of stained glass.

Grounding of the s.s. General Wolfe.

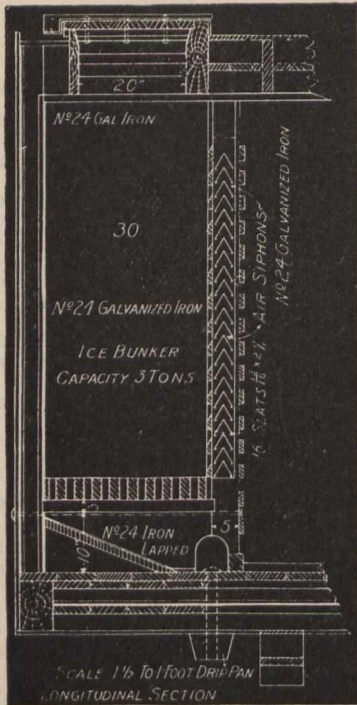
Following is the judgment delivered by Capt. L. A. Demers, F.R.A.S., Wreck Commissioner, June 2, concurred in by J. Bartlett and Capt. T. McGough, assessors, relating to the grounding of the s.s. General Wolfe in Harrington Harbor, Saguenay, Que., Nov. 6, 1910:

The court finds the testimony given by the captain and A. Gagne, second mate, somewhat contradictory, and holds that Capt. Young in transmitting his orders to the mate and second mate failed to make them sufficiently explicit and his conduct is therefore deserving of criticism, all the more so in view of the admitted deficiency of the second mate, who was given charge of the deck, and the court further holds that he was somewhat lax when in finding fault with the mode of keeping the log book; he failed to insist upon what he considered a desirable change being made. On the other hand the court is of opinion that the captain acted in a commendable manner subsequent to the stranding and by his judicious actions saved the ship from incurring more serious injury than she sustained.

As regards A. Gagne the court holds that he failed to carry out explicitly the orders he received, but in view of the fact that these orders themselves were somewhat inexplicit it will confine itself to severely reprimanding him for his lack of duty and informing him that should he again appear before this court, his certificate will be dealt with. He is furthermore instructed, in view of the reports made regarding his defective eyesight, that he be subjected by Dr. Page to the three sight tests, the retention of his certificate depending upon his successfully passing these tests. Capt. Young is warned to exercise more discretion in future and to insist upon what he considers a needed reform on his ship being acted upon by his officers and actually put into effect, or as master of a ship he must recognize that he is responsible for the doings on board and the line of conduct of the men under his command.

The Vessel Toiler's Oil Engines.

A great deal has been written of late about vessels, both large and small, driven by oil engines. As a matter of fact, the number of oil engine propelled seagoing vessels probably does not as yet number more than two or three, and by far the largest of these is the Toiler, built in England for the Canadian lake trade, which has already been described in these columns, and which has recently completed a voyage from the Tyne to Calais, France, and back. She is fitted with two sets of oil engines, as the speed on the canals, being limited, engines of



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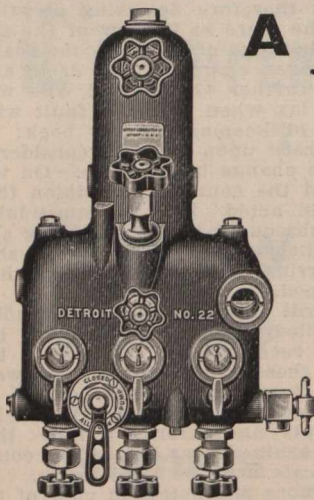
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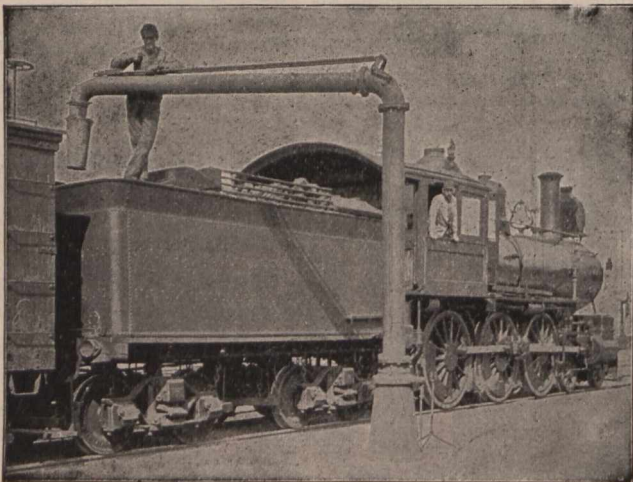
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The Toiler is a twin screw vessel, 248 ft. p.p. by 42½ ft. beam by 19 ft. depth moulded, propelled by two sets of two-cycle reversible Diesel engines of a combined b.h.p. of 360, equal to about 400 i.h.p., working at about 250 revs.

On her voyage to Calais the Toiler was loaded with 2,650 tons deadweight of coal cargo, besides about 40 tons of oil fuel, fresh water and stores, a total deadweight of nearly 2,700 tons on a mean draft of 14 ft. She left the Tyne in very rough weather, notwithstanding which the engines are reported to have worked perfectly satisfactorily, and she completed her voyage to Calais at an average speed of 5.9 knots (or 6¾ miles). On her return voyage, light in ballast, the average speed was 8.2 knots (or 9½ miles). The consumption of oil fuel for the round voyage, including auxiliary compressor, was 6½ tons, say 1.65 to 1.75 tons per day.

It is claimed that in many ways the Toiler is more economical than a steam driven boat. She has a greater deadweight capacity, owing to the fact that the oil engines are much lighter than steam engines and boilers, the amount in this vessel being about 60 tons; the cubic capacity for cargo is also greater, as the boiler space is saved, and besides the oil fuel can be carried in the double bottom in place of water ballast, thus saving bunker space.

The consumption of oil is much less in weight than the consumption of coal for steam engines. In the Toiler the consumption at full speed does not exceed 1.75 tons per day of fuel oil of 18,000 b.t.u. calorific value, whereas with steam engines of equal power the consumption of coal would not be less than eight tons per day. The actual difference in cost depends, of course, upon the relative prices of coal and oil in the district where the vessel may be trading.

Not only is the economy of this vessel shown in the increased deadweight of cargo carried, the increased cubic capacity, and the low fuel consumption, but the staff on board to attend to the oil engines is less than the staff required for steam engines and boilers, the engine room staff being about the same, whilst firemen are not required.

The deck machinery and engine room accessories of the Toiler are driven by compressed air, being furnished by a compressor driven by a small oil engine. The electric light, with which the vessel is fitted, obtains its power from a small paraffin engine. The accommodation is heated by hot water, and the heat is obtained either from the exhaust gases of the main engine or by means of a coal fire. There is thus no steam on board the boat.

Blue Book of American Shipping.—In issuing this standard marine directory the publishers announce that for the future it will be issued biennially instead of annually. While the volume aims at covering the marine interests of North America, and does so pretty thoroughly, it gives special attention to the marine interests of the Great Lakes. This field, which constitutes the largest feeders of the railways, and has an important bearing, particularly on the Atlantic Ocean trade, is thoroughly covered. This trade is of growing importance, and the statistics compiled in reference to it are of special value. The lists of vessels, owners, etc., and of shipbuilding and repairing yards, dry docks, and of the various interests connected with the owning and operation of vessels are complete. The Blue Book is published at \$5 by the Pen-ton Publishing Co., Cleveland, Ohio, and copies may be obtained from the Railway and Marine World Book Department.

Grounding of the s.s. Manchester Spinner.

An investigation into the cause of the grounding of the Manchester Liners, Ltd., s.s. Manchester Spinner on White Island reef, recently, was held at Quebec, June 16, before Capt. L. A. Demers, F.R.A.S., Wreck Commissioner, assisted by Capt. Cliff and Nash as nautical assessors. Following is the text of the judgment:

The court having fully weighed the evidence adduced finds that Pilot Lachance committed two errors of judgment, in the first instance by his neglect in concentrating his mind upon the location of the light ship, which he should have relied upon as a guide for his course, and secondly by his action in leaving such a wide margin between his vessel and the light ship, when he finally discovered his error and attempted to pass through the channel of half or three-quarters of a mile between the light ship and the reef, and the court holds that he should have kept in closer proximity to the light ship, thus permitting his vessel to pass clear of the reef, or that he should have starboarded his helm, turned his ship to the eastward and passed to the north and eastward of the light ship for the north channel, which, under the circumstances, would have been the most judicious course for him to have pursued. In view of the errors on his part above set forth, the court finds it incumbent upon it to condemn the pilot to a fine of \$100, to be paid in two monthly installments, he, however, being allowed to retain his branch.

The court, furthermore, finds it necessary to issue a warning to Second Officer R. Stoker that he exercise better discretion in the future, and to realize that although there may be a pilot on the bridge that he is, nevertheless, the representative of the captain and as such assumes full responsibility for the happenings on the vessel throughout the period that he is in charge of the bridge.

Great Lakes Wireless Telegraphy

With reference to the information on this subject published in our last issue, we are officially advised by the radio-telegraph branch of the Naval Service Department that it has been decided that the Dominion Government will install its own wireless telegraph system on the Great Lakes. There is already a station at Port Arthur, and other western stations will be established first. Sites have been secured at the following points, at which stations will first be built:—Sarnia, Midland, in the neighborhood of Cape Hurd, and at Sault Ste. Marie, Ont. Other stations will later on be established in the neighborhoods of Kingston, Port Colborne, and Port Stanley, and at Toronto. Tenders for the erection of these stations will be invited immediately. The stations will all be of the most up to date type and provided with duplicate apparatus.

The system, when completed, will form the western end of a chain of stations extending from Belle Isle Straits, Cape Race, or St. John, N.B., as the case may be, to Port Arthur, Ont. The chain will be a continuous one, and it will be possible to file a message in Port Arthur for delivery to a ship located anywhere between Port Arthur and 500 miles east of Cape Race or Belle Isle, the message being handled by wireless all the way.

We are officially advised that the C.P.R. intends to equip its steamboats on Lakes Huron and Superior with wireless apparatus, but that this will not be done until the necessary land stations are established.

Notices to Mariners.

The Department of Marine has issued the following:—

52. May 26. 127.—British Columbia, Clayoquot sound, Templar channel, Deadman passage, and Tofino, hydrographic information, uncharted rocks.

53. May 26. 128.—Ontario, Lake Ontario, Bay of Quinte, Telegraph narrows, shoal water in newly dredged channel, caution.

54. May 26. 129.—Nova Scotia, south coast, off Three Fathom harbor, gas and bell buoy established. 130. Nova Scotia, south coast, Petpeswick inlet, buoys established. 131. Prince Edward Island, south coast, Bedeque bay, Miscouche shoal, buoy established, change in color of gas and whistling buoy. 132. Prince Edward Island, North point reef, color of whistling buoy.

55. May 27. 133.—Newfoundland, east coast, Cape St. Francis, change in character of light. 134. Newfoundland, east coast, St. John's harbor entrance, Fort Amherst, change in character of light. 135. Newfoundland, east coast, Cape Spear, change in character of light. 136. Newfoundland, west coast, Flat island, non-existence of shoal westward of. 137. England, south coast, Needles channel, light buoy established.

56. June 2. 138.—Quebec, Gulf of St. Lawrence, position of telegraph cable between Great Fox river, Gaspé coast and southwest point Anticosti. 139. Newfoundland, Strait of Belle Isle, Flower island, explosive fog signal.

57. June 7. 140.—Quebec, Gulf of St. Lawrence, Magdalen islands, Alright island, Pointe Basse, light established on wharf. 141. Quebec, Gulf of St. Lawrence, Magdalen islands, Amherst island, Pleasant bay, Amherst, light established on wharf.

58. June 8. 142.—Ontario, Georgian Bay, Byng inlet, hydrographic notes, buoyage, day beacons, sailing directions.

59. June 13. 143. Prince Edward Island, south coast, Bedeque bay, Miscouche shoal, position of buoy. 144. Prince Edward Island, Northumberland strait, West reef, position of gas and whistling buoy. 145. Prince Edward Island, north coast, Cascumpeque harbor, Alberton, range lights not in operation. 146. New Brunswick, east coast, Northumberland Strait, Kouchibouguac bay, St. Louis gully, Kouchibouguacis river, change in position of back range light.

60. June 14. 147. Quebec, River St. Lawrence, channel between Lachine Rapids and Victoria Bridge, shoal spot above Nuns Island. 148. Quebec, Ottawa river, Lake of Two Mountains, Pointe a Cadieux, light improved. 149. Quebec, River St. Lawrence, Lake St. Francis, St. Amicet, hand fog horn at light station. 150. Ontario, Georgian bay, Thornbury, temporary front range light. 151. Ontario, Georgian bay, Victoria Harbor, Flat point, color of buoy.

An order in council has been passed granting permission to register the s.s. Scot, formerly registered at Southampton, Eng., at Toronto, under the name of Oceana. She is owned by the Bermuda Atlantic Steamship Co., Toronto, and has been purchased from the Hamburg-American Line, which acquired her from British owners in 1895. The name is to be changed again in a year if the Government require the company to do so.

A strike of British seamen in the early part of June caused a number of Canadian vessels to be held at British ports. C.P.R. and White Star-Dominion vessels were somewhat delayed. An increase of \$5 a month was demanded, the C.P.R. compromising, June 15, on an increase of \$3.75 a month.



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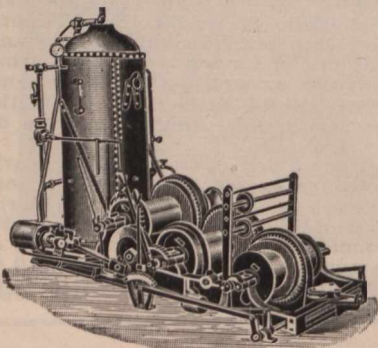
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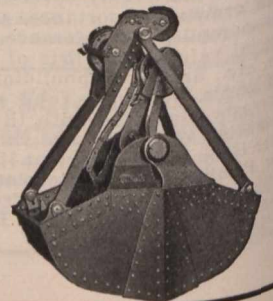
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Richelieu & Ontario Navigation Co., Ltd.

The Dominion Parliament amended the company's act of incorporation recently by giving the shareholders power to increase the capital stock to an amount not exceeding \$10,000,000. At a special meeting of shareholders on June 26 it was decided to increase the stock from \$5,000,000 to \$10,000,000, the new shares to be issued as decided by the directors. It was also decided to confirm the agreement made by the directors with the British Maritime Trust Co., Ltd., and others, providing for the purchase of a majority of the shares of the Northern Navigation Co., Ltd., and of the Inland Lines, Ltd., to be paid for by the issue of fully paid up R. & O.N. stock. Five additional directors were elected, the full board being: Hon. President, Lord Furness, of Grantley; President, R. Forget, M.P.; Vice President, W. Wainwright, Second Vice President, G.T.R.; G. Caverhill, Sir Henry M. Pellatt, E. Bristol, K.C., M.P.; W. Hanson, Jas. Playfair, C. O. Paradis, Hon. J. P. B. Casgrain, Hon. E. B. Garneau, H. M. Molson, C. A. Barnard, K.C.; A. H. Sims, J. R. Binning and W. G. Morden. The head office will remain at Montreal, and C. J. Smith will be retained as General Manager.

The Northern Navigation Co. of Ontario, Ltd., was organized in 1899, with a capital of \$1,000,000, being an amalgamation of the Great Northern Transit Co. and the North Shore Navigation Co., and later the control of the Northwest Transportation Co. was obtained. A year or two ago the words "of Ontario" were dropped from the title. In the early part of this year, Jas. Playfair, President, Inland Lines, Ltd., made an offer, on behalf of himself and associates, chiefly the Furness interests, to purchase a controlling interest in the stock, and all but a small percentage of it was so acquired. The company has an agreement with the G.T.R. respecting traffic on the Great Lakes, and under this agreement, it has to build an additional steamship by the fall of 1912. Full details of the matters connected with the transfer of the stock, etc., were given in our Feb. and Mar. issues.

Inland Lines, Ltd., was incorporated under the Dominion Companies Act, May, 1910, with a capital of \$3,500,000, and office at Hamilton, Ont., to take over the Inland Navigation Co., formerly operated under the name of R. O. and A. B. Mackay, together with the New Ontario Dock and Coal Co.'s wharf and coal business at Sault Ste. Marie, Ont.; R. O. and A. B. Mackay's wharf, cartage and coal business at Hamilton, Ont., and their wharf, shed and wharf privileges at Montreal; the property of the Midland Navigation Co., Midland, Ont., and the property of the Empress Transportation Co., Midland, Ont.

The R. and O.N. Co.'s combined fleet is now composed as follows:—Berthier, Belleville, Boucherville, Kingston, Longueuil, Montreal, Murray Bay, Quebec, Rapids King, Rapids Prince, Rapids Queen, St. Irene, Saguenay (now en route to Canada, from England), Tadoussac, Terrebonne, Trois Rivières, Toronto, operated by the R. and O.N. Co.; Rochester, operated by the Richelieu and Ontario Navigation Co. of the United States; City of Midland, Doric, Hattic, Huroic, Germanic, Ionic, Majestic, Waubic, operated by the Northern Navigation Co.; Donnacoma, Dundee, Dundurn, Emperor, Empress of Fort William, Empress of Midland, Glenellah, Midland King, Midland Prince, Midland Queen, Neepawah, Rosedale, Stadacona, Strathcona, Wahcomdah and Winona, operated by Inland Lines, Ltd.

Since the foregoing was put in type the s.s. Saguenay has arrived at Quebec.

Atlantic and Pacific Ocean Marine.

The Red Star Line s.s. Samland, which has been transferred to the Canadian Line, arrived at Montreal, June 3, on her first trip up the St. Lawrence.

The s.s. Sinbad, which recently arrived at Montreal, from Middlesbrough, Eng., with a cargo of scoria blocks, will, it is stated, be utilized in the Canadian river and lake trade. She is 533 tons register.

The Union Steamship Co., of New Zealand, which secured the Canadian mail contract recently, for a monthly service between Vancouver and New Zealand, is reported to be about to order the construction of an additional vessel of about 10,000 tons, for the service.

The Manchester Liners, Ltd., s.s. Manchester Spinner, ran aground at White Island, June 2, while on the way up to Montreal. She floated off with the tide and was taken to Quebec, where she was docked. Her tanks were found to be leaking badly, and repairs were made. An enquiry into the grounding has been held, and the judgment in the matter is given on another page.

G. M. Bosworth, Vice President, C.P.R., while in London, Eng., is reported to have stated that the C.P.R. had no intention of withdrawing from the North Atlantic Conference. The agreement expire June 30, and he saw no reason why it should not be renewed on the old basis. He continued that there were no serious differences between the various lines concerned and there was no likelihood of a rate war.

A press despatch from Rome, Italy, states that a parliamentary commission has reported favorably on the proposed law to establish a steamship service between Italy and Canada, and continues that Canada has offered a subsidy on condition that fast vessels of a certain tonnage be put into operation, and that certain ports be included in the route. It is expected that the line will be inaugurated this year, or early next.

Press reports from London, Eng., state that the Canadian Northern Ry. is moving towards the adoption of fast mail service between Great Britain and the Orient, by way of Canada, on the lines of what has become known as the all red route. It is also stated that as regards the Atlantic portion of the route, it has been well known for some time that vessels are under construction at Wallsend, which will cut down the time from land to land, to 3½ days.

Judgment in the cross cases of the C.P.R. as owners of the s.s. Montcalm, and J. Bryde, of Safuafjord, Norway, owner of the s.s. Kromprinz Olaf, each suing the other for damages sustained by the vessels, when in collision in the River St. Lawrence, Sept. 24, 1910, was delivered, June 13, to the effect that both vessels were in fault, and that damages arising out of the collision shall be borne equally by the two vessels, each party to the actions to bear their own costs.

G. M. Bosworth, Vice President, C.P.R., in an interview in London, Eng., early in June, stated nothing had been done regarding the building of any additional vessels for the Atlantic service, and as regards those for the Pacific service, he stated that although the contracts had not been definitely awarded, new vessels of from 14,000 to 15,000 tons would be ready for the Pacific in the early part of 1913. Each vessel will have accommodation for about 1,500 passengers, and be well adapted for the service.

C. M. Hays, President, G.T.R. and G.T.P.R., is reported to have stated recently that it is the company's intention to consider the question of establishing a steamship service on the Pacific Ocean

in the near future, with Prince Rupert as the Canadian terminal point.

The Dominion Government has awarded a contract to Pickford and Black for one year from June 30, for a steamship service every 22 days from St. John, N.B., and Halifax, N.S., to the West Indies. A service between these points was previously operated on a joint subsidy by the British and Dominion Governments, but the former has now withdrawn.

The Cunard Line's s.s. Ascania arrived in Montreal, June 3, on her maiden trip, from Southampton, Eng. This vessel, which was acquired from the Cairn Steamship Line, recently, while it was under construction at Wallsend, Eng., under the name of Gerona, is of the following dimensions: Length, between perpendiculars, 466 ft.; beam, 56 ft.; depth to upper deck, 32 ft.; with a gross tonnage of 10,000. The machinery consists of triple expansion engines, with cylinders 26, 42 and 69 ins. diam., by 48 ins. stroke, of 4,400 i.h.p. There are four multitubular boilers. The equipment includes Marconi wireless telegraph apparatus, submarine signalling apparatus and complete electric lighting equipment. The vessel has been arranged for two classes only, and has accommodation for 200 cabin and 1,000 third class passengers.

At the Imperial Conference in London, Eng., early in June, it was proposed that it is desirable that Great Britain should be connected with Canada, and through Canada, with Australia and New Zealand, by the best mail service available, and that a mail service be established on the Pacific, between Vancouver, Fiji, Auckland and Sydney, of first class steamers of not less than 10,000 tons, capable of 16 knots, and in addition that fast service be established between Canada and Great Britain, the financial support for both purposes to be contributed by Great Britain, Canada, Australia and New Zealand in equitable proportions. A fast line of steamers was also proposed between Great Britain, Newfoundland and Canada, with a subsidy contributed on the basis of population, wealth and trade interests. After considerable discussion, the matter was left to be dealt with by a Royal Commission.

Maritime Provinces and Newfoundland.

The Department of Railways and Canals will receive tenders to July 20 for the construction of piers and sheds at Halifax, N.S.

The contract for the construction of a breakwater at Little Anse, N.S., at a cost of \$21,500, has been awarded to T. D. Morrison, D'Escousse, N.S.

Browning Bros'. sealing steamer Aurora, which was built at Dundee, Scotland, in 1876, and has since operated out of St. John's, Nfld., has been sold to English parties.

The Labrador Whaling Co.'s steam whaler Cachelot, built at Christiania, Norway, to replace the vessel of the same name, wrecked at Belle Isle last year, arrived at St. John's, Nfld., June 6.

The Dartmouth, N.S., Ferry Commission, June 13, referred the matter of obtaining complete plans for remodelling the Halifax terminal to a committee, with power to make all necessary plans and specifications.

The British s.s. Ben Earn, under charter to the Dominion Coal Co., ran ashore on Half Moon ledge, off Baccharre Point, near Barrington, N.S., June 18, while bound from Sydney to St. John.

The Halifax Dry Dock Co. has filed plans with the Public Works Department for an extension of 50 ft., making 650 ft.

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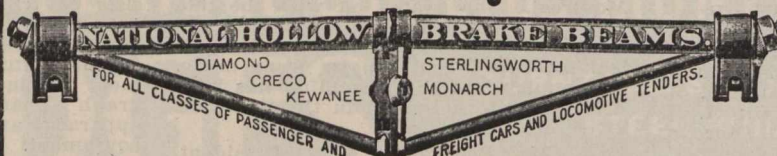
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Our "PC Creco" Brake Beams are for use on new heavy steel passenger equipment and withstand a load of **40,000** lbs. with 1-16 in. deflection. Greater capacity if desired, without increase in Diamond Special depth of strut or change of adjustable brake head.

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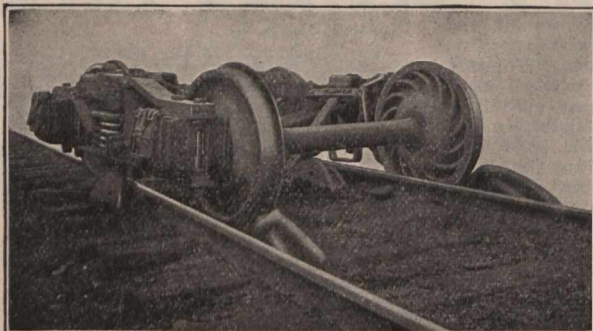
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TIMBER, RAILWAY TIES, TELE-
GRAPH POLES, LATH, SHINGLES,
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in all. It is stated that the work will be put in hand as soon as the plans are approved.

The Department of Public Works is calling for tenders for the construction of a breakwater, wharves, dry dock and shipbuilding plant at St. John, N.B., and for dredging and piling. The cost is estimated at from \$6,000,000 to \$8,000,000.

Hon. J. C. Crosbie, St. John's, Nfld., has ordered a sealing steamer to be built in Dundee, Scotland, for delivery by Dec. 31. She will be 175 ft. long, 28 ft. wide and 13 ft. deep, with accommodation for 50 saloon passengers, and space for 25,000 seals.

The Reid Newfoundland Co. has purchased the British s.s. Solway for use in its Labrador service. She was built in 1881, but has since been overhauled, and recently re-engined. She is 836 tons gross and 427 tons register, with a speed of about 12 knots an hour. She was expected to sail from Glasgow, Scotland, for St. John's, Nfld., June 20.

Job Bros., St. John's, Nfld., have placed an order at Wallsend, Eng., for the construction of a sealing steamer, to be called Nascopie. She will be equipped with electric searchlight, and be fitted with special hatches for the quick loading and discharging of cargo. The contract calls for completion by Dec. 31, so that she may reach Newfoundland in January, 1912.

The British s.s. Appenine, recently took to Portland, Me., from Dalhousie, N.B., what is stated to be the largest cargo of pulpwood ever landed there from any one vessel, being over 2,700 cords. She is under charter to the International Paper Co., and it is stated that another vessel is to be chartered to run in connection with her, from Chatham and Dalhousie, N.B.

The Reid Newfoundland Co.'s s.s. Bruce, which is under construction at Glasgow, Scotland, to take the place of the s.s. Bruce wrecked recently, will be of the following dimensions: length, 250 ft.; breadth, 36 ft.; depth, 18.3 ft., with accommodation for 75 passengers. W. D. Reid, President, while on a visit to St. John's, Nfld., June 10, stated that she would be in operation by Sept., or possibly earlier.

The British Canadian Shipbuilding and Dock Co., recently organized to build a dry dock and shipbuilding plant at Sydney, N.S., is reported to have acquired 300 acres as a site, and will be prepared to start work at once, if, as is anticipated, it is successful in obtaining the contract for the building of vessels for the Canadian navy. Among those interested in the scheme are Sir Henry M. Pellatt, Toronto; Hon. J. M. Gibson, Lieut.-Governor of Ontario, and Sir Charles Ellis, chairman John Brown & Co., Clydebank, Scotland. It is also stated that the company proposes to establish a fast line of steamships between Sydney and Fishguard, Great Britain.

Province of Quebec Marine.

The Department of Railways and Canals received tenders June 27, for protection works on the Soulanges canal.

J. M. Nelson, Assistant Engineer to the Montreal Harbor Commission, has resigned after 22 years' service, on account of ill health.

The Department of Marine has issued an order that all vessels must slacken speed when passing the Quebec bridge site.

The Richelieu and Ontario Navigation Co. it is reported, is considering negotiations with a view to the adoption of oil as fuel on its vessels.

The Montreal Harbor Commissioners are erecting an electric hoist capable of lifting 15 tons, between sheds 7 and 8,

The work is expected to be completed early in Aug.

During May over 6,500,000 bush. of grain in about 150 vessels passed through the Lachine canal, in addition to 4,704 cases of eggs, 580 packages of butter, and 15,270 packages of cheese.

The Richelieu and Ontario Navigation Co.'s s.s. Quebec was driven ashore during a windstorm at Sorel, recently, and her rudder was torn away and the steering gear disarranged.

The quarantine steamboat Polana, which the Government has had built at Kingston, for the service at Grosse Isle, has been delivered and placed in service.

The Montreal Harbor Commissioners recently received tenders for a number of improvements in the harbor, at an approximate cost of \$1,000,000. The works include the erection of four piers, each 800 ft. long and 235 ft. wide.

An order in council has been passed granting permission to re-register at Quebec, the recently wrecked steamship King Edward, formerly registered at Hull, Eng., under the name of Laurentian, all the legal requirements having been complied with.

At a luncheon on the Cunard Line s.s. Ascania, June 6, on her arrival at Montreal on her maiden trip from England, it was stated that the day was not far distant when Montreal would be created a free port.

The Montreal city authorities have issued instructions to the assessors to assess for taxation property under the jurisdiction of the Montreal Harbor Commission, which has always been claimed to be exempt, as Government property.

The Lake Champlain and St. Lawrence Ship Canal Co. has filed plans with the Public Works Department for a proposed 12 ft. waterway between Montreal and New York, involving the construction of about 21 miles of new canal through Chambly, St. Johns and La Prairie counties, Que.

Work is reported to have been commenced at Barrow-in-Furness, Eng., on the floating dry dock, which it is proposed to install at Montreal. A large force of men is engaged in preparing the site at Montreal, which, it is expected, will be completed during next year. The work is being carried out by Canadian Vickers, Ltd., recently incorporated for the purpose.

The Three Rivers Ferry Co., Ltd., has been incorporated under the Quebec Companies Act, with a capital of \$49,

000, and office at Three Rivers, to purchase the steamboat Glacial from the town of Three Rivers, and to own the steamboat Sorel, both of which it is intended to operate between Three Rivers, St. Angele de Laval, St. Francois du Lac, Nicolet and other points. The town of Three Rivers is paying an annual bonus for the service. The incorporators are F. J. Ritchie, L. P. Bellefeuille, M. Lewis, and C. Salva, Three Rivers.

Ontario and the Great Lakes.

The Department of Public Works has awarded the contract for dredging in the River Thames to W. E. Phin, Welland.

The Public Works Department will issue tenders to July 5 for the construction of a breakwater at Bare Point, Port Arthur.

The steamboat City of New York, owned in Cobourg, is reported to have been sold to Toronto parties for use in the sand trade.

The contract for dredging from the eastern channel into Ashbridge's Bay, Toronto, has been awarded to R. Weddell and Co., Trenton.

The Ontario and Quebec Navigation Co., Ltd., has been licensed to carry on its business in Ontario with B. H. Hepburn, Picton, as its attorney.

The Dundas board of works received tenders, June 25, for the dredging of the Desjardins canal, involving the removal of 27,500 cub. yds. of material, the work to be completed by Sept. 1.

The Inland Lines steamboat Dunelm, which ran ashore towards the close of navigation last year, has been completely repaired and overhauled at Port Arthur, and left the dry dock June 8.

The Buffalo, Lockport and Rochester Ry.'s steamboat Olcott arrived at Toronto for the first time, June 3. She is making two trips daily between Toronto and Olcott Beach, connecting with the company's lines to Rochester and Buffalo, N.Y.

M. J. Haney has applied to the Toronto city council for an extension of his lease from 21 years from Oct. 1, 1908, of the waterfront property between Jarvis and West Market Sts., at an annual rental of \$667.20. He proposes to add to the wharf, at a cost of \$25,000.

The annual meeting of the Thousand Islands Steamboat Co. was held at Cape Vincent, N.Y., June 6. R. Crawford, President, was appointed also General Manager in place of W. J. Douglas, re-

Lake Grain Shipments

The following statement, prepared by F. E. Gibbs, Grain Inspector, Fort William, Ont., shows the bushels of grain shipped by vessels from Fort William and Port Arthur, of the 1910 crop, from the close of navigation to May 31. The last two figures in each column represent lbs.

Destination	Wheat	Oats	Barley	Flax
Canadian ports:				
Depot Harbor	318,518.20	34,000.00		
Goderich	882,502.10	461,372.12	34,901.00	
Kingston	1,644,214.00	655,458.30	204,223.08	50,627.38
Montreal	1,017,264.50	2,220,009.02		
Meaford	105,000.00			
Owen Sound	144,903.10	99,541.74	10,005.30	
Port Colborne	1,294,478.20	166,147.12		
Point Edward	185,630.00	40,000.00	9,727.32	15,053.45
Quebec	86,959.04			
Tiffin	1,655,426.00	315,000.00		
Victoria Harbor	148,417.40			
Walkerville	57,370.00			
	7,513,724.30	4,078,488.06	258,857.22	65,681.27
Foreign ports:				
Buffalo	6,774,579.50	247,392.24	195,000.00	194,414.08
	14,228,304.20	4,325,880.30	453,857.22	260,095.35
Same period 1910	8,384,297.10	5,165,190.05	330,872.11	795,691.1

Note.—In the table of grain shipments given in our last month's issue, by a mistake in our office, the returns for Depot Harbor were included in those relating to foreign ports.

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3 inches to 60 inches diameter

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HAMILTON, ONT.**

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Water Turbines**
Steel or Iron
Propellor Wheels
Heavy Gearing
Steel Castings
and
Marine Repairs

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OWEN SOUND, ONT.

WHITE STAR DOMINION SERVICE-LARGEST STEAMERS CANADA FROM CANADA

Weekly Sailings Between Montreal, Quebec and Liverpool

By the Twin and
Triple-Screw Royal
Mail Steamers

**LAURENTIC, MEGANTIC
TEUTONIC, CANADA**

{ July 8, July 22
August 5
July 1
July 15, July 29

Maintaining a service of exceptional merit and offering latest devices for comfort and safety. Rates and sailings on application. Phone Main 954.

**WORLD'S LARGEST AND
FINEST STEAMER, NEW OLYMPIC, 45,000 TONS, SAILS JUNE 28**

American

New York, Plymouth, Cherbourg,
Southampton

St. Paul ... July 1 | St. Louis ... July 15
Philadelphia ... July 8 | New York ... July 22

Atlantic Transport

New York—London Direct

Minnewaska ... July 1 | Minnetonka ... July 15
Minneapolis ... July 8 | Minnehaha ... July 22

Red Star

London, Paris, via Dover—Antwerp

Finland ... July 1 | Lapland ... July 15

H. G. THORLEY, Passenger Agent 41 King Street East, Toronto.

White Star

New York—Queenstown—Liverpool

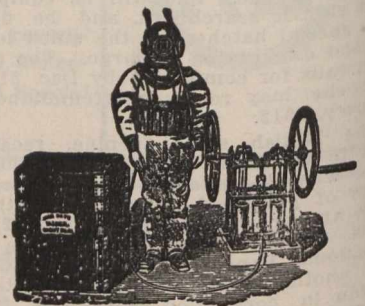
Baltic ... July 1 | Arabic ... July 15
Celtic ... July 8 | Cedric ... July 22

New York, Plymouth, Cherbourg,
Southampton

Olympic ... June 28 | Oceanic ... July 19
Adriatic ... July 12 | Olympic ... July 26

To the MEDITERRANEAN

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JOHN DATE

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RAILWAY FEEDER AND TROLLEY WIRE

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HAND, MACHINE AND TAPPER TAPS, STAY BOLT TAPS, BOILER AND
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of every description.

TANK CARS

Steam Shovels, Rails, Locomotives
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Immediate and Prompt Deliveries
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BRITISH COLUMBIA
Fir, Spruce and Cedar Lumber
and Cedar Shingles
Long Fir Timbers a specialty

Imperial Timber & Trading Co. Ltd.
Vancouver, B.C.

signed, and the other officers were re-elected.

W. J. Douglas, heretofore General Manager, Thousand Islands Steamboat Co., and St. Lawrence River Steamboat Co., Kingston, is reported to have been appointed General Freight Agent, Southern Pacific Co.'s Steamship Department at Seattle, Wash.

The Trotter Wrecking Co., Amherstburg, has been awarded \$7,500 for salvaging the Superior Charcoal Iron Co.'s steamboat Chauncey Hurlbut, after grounding near Amherstburg in 1906. The matter has been before the courts for some time.

The Public Works Department is reported to have purchased the lower end of Victoria Island, in the Ottawa River for the construction of a shipyard for building barges, tugs, etc., for its business on the Ottawa and St. Lawrence Rivers and the Great Lakes.

The Niagara, St. Catharines and Toronto Navigation Co.'s steamboat Lake-side has been sold to M. J. Hogan, contractor, Port Colborne. The price paid is said to be \$10,000. She will be used for conveying supplies in connection with various lake improvement contracts.

The Montreal Transportation Co.'s steamboat George Davy struck on the lighthouse shoal near Clayton, N.Y., June 13, and sank in 50 ft. of water. The cargo of 50,000 bush. of grain has been pumped out, and the vessel is to be raised. Divers reported that several plates were pierced.

The Public Works Department has commenced surveys in reference to the proposed power development plants at Cedar Rapids and other points on the St. Lawrence. Data are to be collected and a commission appointed to report on the effect such plants will have on navigation generally.

The Toronto board of control had under consideration, June 7, the formation of a new Harbor Commission under the recent legislation. A number of names were submitted, but as it was stated that no work to improve the harbor could be undertaken this year, the whole matter was deferred.

Surveys are under way providing for a route for the proposed new Welland canal. It is proposed to deepen the waterway from Port Colborne to the height of land and then run west to the present canal along the ravine and through St. Catharines to Port Dalhousie. Plans and estimates are expected to be ready in the fall.

The Cornwall and Montreal Navigation Co.'s steamboat Filgate was destroyed by fire recently at Valleyfield, Que. She was built in 1879, and was originally used by the C.P.R. as a ferry between Caughnawaga and Lachine, and was later used between Montreal and St. Helen's Island. She was valued at about \$25,000, and was insured for \$5,000.

The Rainy River Navigation Co.'s steamboats Keenora and Agwinde commenced operations for the season between Kenora and Fort Frances June 17. The running of these vessels has been considerably interfered with during the past two years owing to low water at the mouth of the Rainy River, but a large amount of dredging has been carried out there recently.

The Lake Carriers' Association announced the opening of a new channel to relieve congestion in the main channel of the Detroit River during dredging. Masters of vessels are instructed not to exceed a draught of 15.5 ft. either up or down, over Ballard's reef, and to take the new channel, which is 200 ft. wide, east of the main channel, and marked by five spar buoys.

Muir Bros. Dry Dock Co., Ltd., has been incorporated under the Ontario

Companies Act, with a capital of \$90,000, and office at Port Dalhousie, to carry on the business of building, owning and operating dry docks and vessels of all descriptions. The incorporators are W. C. and J. F. Muir, Port Dalhousie; G. P. Muir, Gleichen, Alta.; R. M. Muir, Detroit, Mich.; A. B. Muir, New York City, and H. D. O. Kingstone, Montreal.

The Northern Steamship Co.'s s.s. North West, which runs between Buffalo, Chicago and Duluth, in conjunction with the s.s. North Land, was heavily damaged by fire while moored at her dock in Buffalo, N.Y., June 3. She was being overhauled for the season's business. Reports state that the interior was destroyed, leaving only the steel hull, and that the damage amounts to about \$500,000.

The Department of Railways and Canals has awarded the contract for improving the Port Colborne entrance to the Welland canal to M. J. Hogan, Port Colborne. The work consists of widening the 22 ft. channel into the inner harbor, and the lengthening of the mooring dock west of the Government elevator. The widening of the channel consists entirely of rock excavation. The material taken out will be used to widen the piling at the rear of the west pier.

The U.S. Lake Survey reports the levels of the Great Lakes, in feet above tidewater, for May, as follows:—Superior, 600.90; Michigan and Huron, 579.70; Erie, 571.87; Ontario, 245.60. As compared with the average May levels for the past 10 years, Superior was 1.34 ft. below; Michigan and Huron, 1.16 ft. below; Erie, 0.76 ft. below, and Ontario, 1.13 ft. below. During June it was anticipated that Superior would rise 0.3 ft., Michigan, Huron and Erie 0.2 ft., and Ontario 0.1 ft.

The Ontario and Quebec Navigation Co.'s steamboat Geronia was launched at Collingwood June 7. She is of the following dimensions: length, 219½ ft.; breadth, 42 ft.; depth, 11½ ft., and is of steel throughout, sheathed with rock elm at the bottom. The hull is divided into six watertight compartments. The staterooms are all outside rooms, and the dining salon has seating capacity for 120. The machinery, which is located amidships, consists of quadruple expansion engines, supplied with steam by two Scotch marine boilers at 250 lbs. pressure, driving a screw.

The Dalhousie Navigation Co., Ltd., the incorporation of which we announce-

ed in our last issue, was formed for the purpose of owning the steamboat Dalhousie City, which will be operated under lease by the Niagara, St. Catharines and Toronto Navigation Co. The companies mentioned are controlled by Mackenzie, Mann and Co., Ltd., Toronto.

The steamboat Dalhousie City, a detailed description of which was given in our last issue, was launched at Collingwood, June 24, the christening ceremony being performed by Miss Mary Hanna, daughter of D. B. Hanna, Third Vice President, C.N.R., and President, Niagara, St. Catharines and Toronto Navigation Co.

Manitoba, Saskatchewan and Alberta.

The Arctic Ice Co. is reported to have decided to build four or five large barges this year, each of about 400 tons capacity.

The Lake Winnipeg Supply Co. is building a wharf on the Red River, north of Broadway bridge, and is also building a second barge, with a third one under consideration.

The Hyland Navigation and Trading Co. renewed its complaint, June 18, to the Winnipeg board of control regarding the delay caused to vessels owing to the city not having men on the spot to open the bridges to allow vessels to pass. It was stated that the matter would be taken in hand at once.

Manitoba Quarries, Ltd., has been incorporated under the Manitoba Companies Act, with a capital of \$750,000 and office at Winnipeg, to carry on a general quarrying business, and in connection therewith to build and operate steamboats, tugs, barges, etc. The incorporators are, A. N. Williams, T. Kelly, G. N. Young, Winnipeg; J. Gunn, E. Williams and E. J. Williams, Stone-wall, Man.

The Hudson's Bay Co. is operating vessels as follows, during the season:—Port Simpson, from Prince Rupert to Hazleton, B.C., captain, J. P. Bucey; chief engineer, R. Denniston; Peace River, on Peace River, from Vermilion to Hudson's Hope, Alta.; captain, J. Gullion; chief engineer, J. Sutherland; Inenew, on James Bay; captain, —, Mc-Glashan; chief engineer, J. Love; Primrose, to and from points on Lake Athabasca, and Churchill, to Beaver River, Isle a la Crosse Lake, and Buffalo Lake. The steamboat Saskatchewan will not be operated.

SAULT STE. MARIE CANALS TRAFFIC

The following commerce passed through the Sault Ste. Marie Canals in May:

ARTICLES	CANADIAN CANAL	U. S. CANAL	TOTAL
Copper	1,575	14,986	16,561
Grain	4,823,990	1,340,727	6,164,717
Building stone	612	612	612
Flour	260,700	530,367	791,067
Iron ore	2,796,888	652,837	3,449,675
Pig iron	2,950	4,648	7,598
Lumber	5,355	71,748	77,103
Silver ore	9,967,015	1,750,923	11,717,938
Wheat	707	8,633	9,340
General merchandise	799	867	1,666
Passengers			
Coal, hard	102,787	111,092	213,879
Coal, soft	843,896	661,960	1,505,856
Flour			
Grain			
Manufactured iron	28,279	29,591	57,870
Iron ore	3,130		3,130
Salt	32,181	116,727	148,908
General merchandise	91,610	69,461	161,071
Passengers	1,787	508	2,295
Vessel passages	916	1,351	2,267
Registered tonnage	2,568,400	2,342,662	4,911,062
Freight—Eastbound	3,232,777	923,331	4,156,108
—Westbound	1,074,300	889,610	1,963,910
Total freight	4,307,077	1,812,941	6,120,018

Short tons are tons of 2,000 pounds

B.C. and Pacific Coast Marine

Navigation on the Yukon River opened June 9, when the steamboat White Horse left White Horse for Dawson.

Capt. Jas. Gaudin, Victoria, has been appointed Wreck Commissioner and Examiner of Masters and Mates for British Columbia.

The G.T.P. Coast Steamship Co.'s s.s. Prince Rupert has been taken to Seattle, where her boilers are to be remodelled

THE ALGOMA CENTRAL AND HUDSON BAY RAILWAY COMPANY.

Tender for Railway Construction.

Sealed tenders for the construction of the Algoma Central Railway extension from Hobon on the C.P.R., northerly to the National Transcontinental Railway at a point approximately 142 miles west of Cochrane, a distance of 101 miles, will be received up to noon July 15th, 1911.

The work includes all construction work to sub-grade, and in addition, track laying and ballasting in accordance with plans, profiles, forms of tender and specifications at the office of the Chief Engineer, Sault Ste. Marie, Ontario.

All tenders to be marked "Tender for Construction" and to be addressed to R. S. McCormick, Chief Engineer, Algoma Central Railway, Sault Ste. Marie, Ontario.

The lowest or any tender not necessarily accepted.

and forced draught put in.

G. J.R. Robertson, formerly captain of the G.T.P. Coast Steamship Co.'s s.s. Prince George, has been appointed agent, Department of Marine at Victoria, and commenced his duties, June 1.

The C.P.R. Coast Service s.s. Amur, which ran ashore at Wrangel Narrows, Alaska, recently, was built in Sunderland, Eng., in 1890, and is of 570 tons register. She is valued at £10,725.

A. A. Sears, master and part owner of the s.s. Iroquois, which sank off Sidney, Apr. 10, and who was recently charged with manslaughter in connection with the disaster, was acquitted of the charge, June 8.

The material for the construction of a steel barge which the C.P.R. is to

operate on the Kootenay Lakes, has arrived at Nelson, B.C., where it is to be put together. It was made by the Polson Iron Works, Ltd., Toronto.

The rock crushing dredge, which was recently built in Scotland, and shipped to Victoria, in sections, where it is being erected, was recently launched at Victoria. It was expected that she would be ready for operation by the end of June.

The Canadian North Pacific Fisheries, Ltd., s.s. Paterson, was launched at Seattle, Wash., June 10. She is about 100

DIVIDEND NOTICE

Niagara Navigation Company, Limited.

Notice is hereby given that an interim dividend of four per cent. (being at the rate of eight per cent. for the year) has been declared upon the Capital Stock of this Company, and the same will be payable on the 3rd of July, 1911.

The Transfer Books will be closed from June 15th to June 30th, 1911, both days inclusive.

By order of the Board.

B. W. FOLGER, General Manager.

LEGG BROS. ENGRAVING CO.

MAKERS FINE 1/2 TONES OF LINE ENGRAVINGS WOOD CUTS, ELECTROS

DESIGNERS, ILLUSTRATORS

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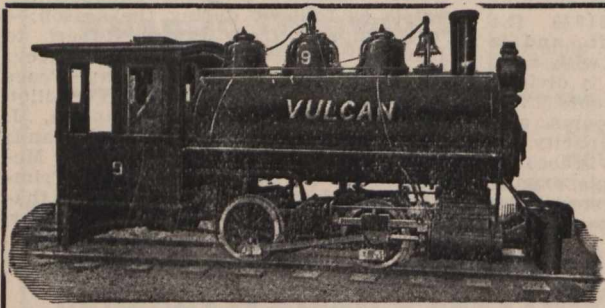
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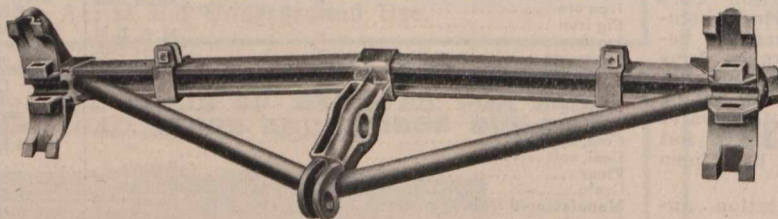
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Brake Beams for All Classes of Cars, Locomotives and Electric Equipment

ft. long over all, of steel construction, driven by oil fuel at a speed of 12 knots an hour. She will be registered in the U.S.

The paddle wheel steamboat La France, which recently struck a rock and sank in Lake Labarge, Yukon, was built at Lower Labarge, Yukon, in 1902. Her dimensions are: Length 99.8 ft., breadth 19.4 ft., depth 3.4 ft., tonnage 201 gross, 169 register.

The North Vancouver ferry committee, is calling for tenders for the construction of a wharf on the Vancouver side of the inlet, at an estimated cost of \$27,000. The plans show 16 pontoons similar to those at the North Vancouver floating wharf.

The G.T.P. Coast Steamship Co.'s s.s. Prince John, formerly Amethyst, which is expected to arrive on the coast, early in July, was built last year, and subsequently purchased by the company. She has seven water tight bulkheads with double bottom, and is equipped with

triple expansion engines, designed for a speed of 12 knots an hour. There is accommodation for 150 steerage passengers and good first class accommodation, and capacity for 450 tons of cargo. She will be operated on the Queen Charlotte Islands route.

C. M. Hays, President, G.T.P.R., was in Prince Rupert during the first week of June, in company with E. F. Donnelly, to look over the site of the proposed dry dock there. It was announced that an agreement had been reached with the city, and a bylaw was being prepared for submission to the ratepayers. The plans for the dry dock, which have been prepared, allow for a lifting capacity of 20,000 tons, and built for later expansion, if necessary.

The dredge tender, which is being built at North Vancouver for the Dominion Public Works Department, has the following dimensions: Length over all 100 ft., molded beam 37½ ft., molded depth 15½ ft., draft forward 11 ft., aft 12½ ft.

She is equipped with fore and aft compound surface condensing engines, with cylinders 17 and 40 ins. diam., by 27 ins. stroke, built in Glasgow, Scotland. The boiler is of the Scotch marine type, 14 ft. diam., by 12 ft. long, fitted with Morrison corrugated furnaces. The cost is about \$65,000.

The Northern Steamship Co.'s s.s. British Empire, arrived at Vancouver, June 11, from Scotland, having taken 141 days on the voyage. She was immediately docked and overhauled, and placed on the run between Victoria, Vancouver and Prince Rupert. She was detained at St. Vincent, for some time owing to her engines breaking down, to wait for repair parts from Scotland. She was built at Garston, Eng., in 1902, and is of the following dimensions: Length 167 ft., breadth 26 ft., depth 11½ ft., tonnage 562 gross, 252 register. She was acquired from T. J. Sharpe and Co., Liverpool, Eng., to replace the s.s. Petriana, which was sold to the Canadian North Pacific Fisheries, Ltd.

The Purchasing Agents' Guide

To the Manufacturers of and Dealers in Steam and Electric Railway, Marine, Grain Elevator, Express, Telegraph, Telephone and Contractors' Supplies, &c.

Accountants and Auditors
W. M. Dunlop and Co.Ottawa

Acetylene
Commercial Acetylene Co.....Toronto.

Aerated Waters
E. L. DrewryWinnipeg.

Air Brakes and Fittings
Allis-Chalmers-Bullock Ltd.Montreal.
Canadian Westinghouse Co. Hamilton, Ont.

Alloys
E. L. DrewryWinnipeg.

American Vanadium Co....Pittsburg, Pa.
Titanium Alloy Mfg. Co....Pittsburgh, Pa.

Angle Bars
Nova Scotia S. & C. Co., New Glasgow, N.S.
Steel Co. of Canada, Ltd., Hamilton, Ont.

Anti Rail Creepers
The Holden Co., Ltd.....Montreal.

Asbestos
Canadian H. W. Johns-Manville Co.,
Ltd.Toronto

Automobiles
Preston Car & Coach Co...Preston, Ont.

Axes
James Smart Mfg. Co....Brockville, Ont.

Axles
Canadian Car & Foundry Co...Montreal.
James Hutton & Co.Montreal.
Nova Scotia S. & C. Co., New Glasgow, N.S.
Jas. W. Pyke & Co.....Montreal.
Steel Co. of Canada, Ltd., Hamilton, Ont.

Babbit Metal
C. H. Besly Co.Chicago, Ill.
Tallman Brass & Metal Co., Hamilton, Ont.

Battery Boards
Geo. C. RoyceWest Toronto, Ont.

Beacons
International Marine Signal Co....Ottawa.

Bearings, Slide
Canadian Car & Foundry Co...Montreal.
Chicago Railway Equipment Co..Chicago.

Blankets and Bedding
The Hudson's Bay Co.

Blasting Powder
Curtis's & Harvey (Canada) Ltd..Montreal

Boiler Checks
Nathan Manufacturing Co.....New York.

Boilers
Babcock & Wilcox, Ltd.....Montreal.
Polson Iron Works, Ltd.....Toronto.
Robb Engineering Co., Ltd..Amherst, N.S.

Boilers, Portable
Babcock & Wilcox, Ltd.....Montreal.
Polson Iron Works, Ltd.....Toronto.
Robb Engineering Co., Ltd..Amherst, N.S.

Boilers, Stationary and Marine
Babcock & Wilcox, Ltd.....Montreal.
Polson Iron Works, Ltd.....Toronto.
Robb Engineering Co., Ltd..Amherst, N.S.

Boilers, Steam
Babcock & Wilcox, Ltd.....Montreal.
Polson Iron Works, Ltd.....Toronto.
Robb Engineering Co., Ltd..Amherst, N.S.

Boilers, Water Tube
Babcock & Wilcox, Ltd.....Montreal.
Polson Iron Works, Ltd.....Toronto.
Robb Engineering Co., Ltd..Amherst, N.S.

Bolsters
Canadian Car & Foundry Co....Montreal.
Canadian Ry. Equipment Co., Welland, Ont.
Whyte Railway Signal Co.Toronto

Bolt Cutters
London Machine Tool Co., Ltd., Hamilton.

Bolts and Nuts
Steel Co. of Canada, Ltd..Hamilton, Ont.

Bolts, Track
Nova Scotia S. & C. Co., New Glasgow, N.S.

Borers, Car Wheel
John Bertram & Sons Co....Dundas, Ont.

Boring Mills
London Machine Tool Co., Ltd., Hamilton.

Brake Beams
Canadian Car & Foundry Co...Montreal.
Chicago Railway Equipment Co..Chicago.

Brake Shoes
Am. Brake Shoe & F'dry Co., Mahwah, N.J.
Canada Iron Corporation, Ltd..Montreal.
The Holden Co., Ltd.....Montreal.

Brake Shoes, Locomotive Driver
Am. Brake Shoe & F'dry Co., Mahwah, N.J.
Canada Iron Corporation, Ltd..Montreal.
Dorner Railway Equip. Co....Chicago, Ill.
Railway Materials Co.New York.

Brass
C. H. Besly Co.Chicago, Ill.

Brasses, Car
T. McAvity & SonsSt. John, N.B.

Bridge Numbers
Acton Burrows, LimitedToronto.

Bridges
Canadian Bridge Co....Walkerville, Ont.
Cleveland Bridge & E. Co. Darlington, Eng.
Dominion Bridge Co.....Montreal.

Bronze
American Vanadium Co....Pittsburg, Pa.
Titanium Alloy Mfg. Co....Pittsburgh, Pa.

Buckets, Coal, Ore and Concrete
M. Beatty & Sons, Ltd....Welland, Ont.
Brown Hoisting Machinery Co., Cleveland.
Williams & Wilson, LtdMontreal.

Buildings, Steel
Canadian Bridge Co....Walkerville, Ont.
Cleveland Bridge & E. Co. Darlington, Eng.
Dominion Bridge Co.....Montreal.

Bumping Posts
Dominion Equip. & Supply Co., Winnipeg.
The Holden Co., Ltd.....Montreal.
McCord & Co.Chicago, Ill.

Buoys
International Marine Signal Co....Ottawa.

Cables, Electric and Feeder
Chapman & Walker, Ltd.....Toronto.
E. F. Phillips Electrical Works, Montreal.
The Wire and Cable Co.....Montreal.

Capstans
Dake Engine Co. Grand Haven, Mich.

Caps, Uniform
W. H. CoddingtonHamilton, Ont.

Car Furnishings
Gulfport S. Wood.....Chicago, Ill.

Car Loaders, Box
Mussens, Ltd.Montreal.

Car Movers
F. H. Hopkins & Co.....Montreal.
Mussens, Ltd.Montreal.

Cars
Crossen Car Mfg. Co.....Cobourg, Ont.
Canadian Car & Foundry Co...Montreal.
Dorner Railway Equip. Co. . Chicago, Ill.
J. T. GardnerChicago, Ill.
Hart-Otis Car Co., Ltd.....Montreal.
Ottawa Car Co., Ltd.....Ottawa.
Pay-As-You-Enter Car Co....New York.
Preston Car and Coach Co., Ltd..Preston,

Russel Wheel & Fdry Co...Detroit, Mich.
Western Wheeled Scraper Co. Aurora, Ill.

Car Signal Systems
Ohio Brass Co. Mansfield, Ohio

Cars, Logging
Russel Wheel & Fdry Co...Detroit, Mich.

Castings
American Vanadium Co....Pittsburg, Pa.
Canadian Car & Foundry Co...Montreal.
Crossen Car Mfg Co.....Cobourg, Ont.
Lumen Bearing Co....West Toronto, Ont.
Russel Wheel & Fdry Co..Detroit, Mich.
Standard Steel Works Co..Philadelphia, Pa.
Titanium Alloy Mfg Co ..Pittsburgh, Pa.

Castings, Brass
Canadian Bronze Co.Montreal.
Canada Iron Corporation, Ltd...Montreal.
Kerr Engine Co.Walkerville, Ont.
Lumen Bearing Co....West Toronto, Ont.
Tallman Brass & Metal Co., Ltd.Hamilton.

Castings, Car
Am. Brake Shoe & F'dry Co., Mahwah, N.J.
Canada Iron Corporation, Ltd...Montreal.
Russel Wheel & Fdry.. Co..Detroit, Mich.

Castings, Iron
Allis-Chalmers-Bullock Ltd.Montreal.
Canada Iron Corporation, Ltd...Montreal.
Kerr Engine Co.....Walkerville, Ont.
Russel Wheel & Fdry.. Co..Detroit, Mich.

Castings, Iron and Steel
Am. Brake Shoe & F'dry Co., Mahwah, N.J.

Castings, Malleable
Taylor & ArnoldMontreal.

Castings, Manganese Steel
Canadian Steel Foundries, Ltd., Montreal
Lumen Bearing Co....West Toronto, Ont.

Castings, Steel
American Vanadium Co....Pittsburg, Pa.
Canada Iron Corporation, Ltd..Montreal.
Canadian Steel Foundries, Ltd., Montreal
W. Kennedy & Sons, Ltd., Owen So'd, Ont.
Titanium Alloy Mfg. Co....Pittsburgh, Pa.

Catenary materials
Ohio Brass Co. Mansfield, Ohio

Chains
B. J. Coghlin & Co.....Montreal.

Circuit Breakers
Geo. C. RoyceWest Toronto, Ont.

Closets, Car
Duner Co.Chicago, Ill.

Coal
Nova Scotia S. & C. Co., New Glasgow, N.S.

Compressors, Air
Allis-Chalmers-Bullock Ltd.Montreal.
The American Well Works...Aurora, Ill.
Canadian Rand Co.Montreal.
The Holden Co., Ltd.....Montreal.

Concrete Mixers and Rock Crushers
F. H. Hopkins & Co.....Montreal.
Mussens LimitedMontreal.

Contractors' Supplies
American Hoist & Der. Co.St. Paul, Minn.
F. H. Hopkins & Co.....Montreal.
Rice Lewis & Son.....Toronto.
Russel Wheel & Fdry.. Co..Detroit, Mich.
Western Wheeled Scraper Co..Aurora, Ill.
Williams & Wilson, Ltd Montreal.

Conveyors, Coal and Ash
Babcock & Wilcox, Ltd.....Montreal.
Williams & Wilson, LtdMontreal.

Copper
C. H. Besly Co.Chicago, Ill.

- Copying Presses
James Smart Mfg. Co....Brockville, Ont
- Couplers, Car and Locomotive
Canadian Car & Foundry Co..Montreal.
Canadian Steel Foundries, Ltd., Montreal
McConway & Torley Co....Pittsburg, Pa.
Ohio Brass Co. Mansfield, Ohio
Taylor & ArnoldMontreal.
- Couplers, Steam
Consolidated Car Heating Co., Albany, N.Y.
- Cranes
Brown Hoisting Machinery Co..Cleveland.
Northern Engineering Wks..Detroit, Mich.
Williams & Wilson, LtdMontreal.
- Cranes, Electric
Babcock & WilcoxMontreal.
Dominion Bridge Co.Montreal.
Mussens, LimitedMontreal.
Northern Engineering Wks, Detroit, Mich.
- Cranes, Locomotive
American Hoist & Derrick Co., St. Paul, M.
- Cranes, Wrecking
Mussens, LimitedMontreal.
- Crowbars
B. J. Coghlin & Co.....Montreal.
- Curtains and Fixtures, Car
The Holden Co., Ltd.....Montreal.
Preston Car & Coach Co..Preston, Ont.
- Cuts
Acton Burrows, LimitedToronto.
- Cylinders
American Vanadium Co..Pittsburg, Pa.
Titanium Alloy Mfg. Co..Pittsburgh, Pa.
- Derricks
American Hoist & Derrick Co., St. Paul, M.
M. Beatty & SonsWelland, Ont.
Mussens, LimitedMontreal.
- Derricks, Car
American Hoist & Der. Co.St. Paul, Minn.
- Diaphragms, Vestibule
Guliford S. Wood.....Chicago, Ill.
- Dies
Butterfield & Co.Rock Island, Que.
A. B. Jardine & Co.Hespeler, Ont.
- Ditchers
American Hoist & Der. Co.St. Paul, Minn.
M. Beatty & SonsWelland, Ont.
- Diving Outfits
John DateMontreal.
Mussens, LimitedMontreal.
- Doors, Steel Rolling
Mussens, LimitedMontreal.
- Door Signs
Acton Burrows, LimitedToronto.
- Draft Gear
The Holden Co., Ltd.....Montreal.
McCord & Co.Chicago, Ill.
Standard Coupler Co....New York City.
T. H. Symington & Co....Baltimore, Md.
- Draughtsmen's Supplies
John A. Hart & Co.Winnipeg.
- Dredges
M. Beatty & SonsWelland, Ont.
Polson Iron Works, Ltd.....Toronto.
- Drills, Air
Canadian Rand Co.....Montreal.
- Drills, Radial
London Machine Tool Co., Ltd., Hamilton.
- Dry Goods
The Hudson's Bay Co.....Toronto.
- Dump Cars, Contractors'
Dominion Equip. & Supply Co., Winnipeg.
F. H. Hopkins & Co.....Montreal.
Western Wheeled Scraper Co..Aurora, Ill.
- Dump Cars, Hand
Meaford Wheelbarrow Co., Ltd., Meaf'd, Ont.
- Dynamos
Northern Electric & Mfg. Co....Montreal.
- Dynamo and Electric Castings
Am. Brake Shoe & Fdry Co., Mahwah, N.J.
- Economizers
Babcock & Wilcox, Ltd.....Montreal.
- Electric Apparatus
Allis-Chalmers-Bullock Ltd.Montreal.
Chapman & Walker, Ltd.....Toronto.
Northern Electric & Mfg. Co....Montreal.
- Electric Car Route Signs
Acton Burrows, LimitedToronto.
Preston Car & Coach Co..Preston, Ont.
- Electric Light Plant
Allis-Chalmers-Bullock Ltd.Montreal.
- Elevators, Grain
John S. Metcalf Co.Chicago, Ill.
- Enameled Iron Signs
Acton Burrows, LimitedToronto.
- Engines, Automatic
Polson Iron Works, Ltd.....Toronto.
Robb Engineering Co., Ltd..Amherst, N.S.
- Engines, Corliss
Russell Wheel & Fdry Co..Detroit, Mich.
- Engines, Gas
Allis-Chalmers-Bullock Ltd.Montreal.
Robb Engineering Co., Ltd..Amherst, N.S.
- Engines, Gasoline
Allis-Chalmers-Bullock Ltd.Montreal.
Williams & Wilson, LtdMontreal.
- Engines, Gasoline
Canadian Fairbanks Co., Ltd..Montreal.
Ontario Wind Engine & Pump Co. Toronto.
- Engines, Hoisting
Allis-Chalmers-Bullock Ltd.Montreal.
American Hoist & Derrick Co., St. Paul, M.
M. Beatty & SonsWelland, Ont.
Dominion Equip. & Supply Co., Winnipeg.
Polson Iron Works, Ltd.....Toronto.
Russell Wheel & Fdry Co..Detroit, Mich.
Williams & Wilson, LtdMontreal.
- Engines, Stationary and Marine
Polson Iron Works, Ltd.....Toronto.
Robb Engineering Co., Ltd..Amherst, N.S.
- Engines, Stationary, Appliances
Nathan Manufacturing Co....New York.
- Engines, Steam
Allis-Chalmers-Bullock Ltd.Montreal.
Engineers, Consulting
Alfred LovellPhiladelphia, Pa.
- Explosives
Curtis's & Harvey (Canada) Ltd..Montreal
- Express Office Signs
Acton Burrows, LimitedToronto.
- Fencing
Owen Sound Wire Fence Co., Ltd., O'n S'd.
- Ferro-Vanadium
American Vanadium Co. ..Pittsburg, Pa.
- Fire extinguishers
Miller Chemical Engine Co. ..Chicago, Ill.
- Flags
The Hudson's Bay Co.....Toronto.
- Flour
The Hudson's Bay Co.....Toronto.
- Forgings
American Vanadium Co. ..Pittsburg, Pa.
Canadian Car & Foundry Co..Montreal.
Cleveland City Forge & Iron Co., Cleveland.
Crossen Car Mfg. Co.....Cobourg, Ont.
Nova Scotia S. & C. Co., New Glasgow, N.S.
Standard Steel Works Co., Philadelphia, Pa.
Steel Co. of Canada, Ltd. ..Hamilton, Ont.
Titanium Alloy Mfg. Co..Pittsburgh, Pa.
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C. H. Besly Co.Chicago, Ill.
Goldschmidt Thermit Co.Toronto.
Ont. Wind Eng. & Pump Co., Ltd., Toronto.
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Canadian Ramapo Iron Wks.Niagara Falls.
Johnson. Wrecking Frog Co..Cleveland, O.
- Furnaces, Corrugated
Continental Iron Works...Brooklyn, N.Y.
- Furnaces, Oil
Railway Materials Co.New York.
- Furnaces, Shop
Railway Materials Co.New York.
- Fuse Batteries
Curtis's & Harvey (Canada) Ltd..Montreal
- Fuse Detonators
Curtis's & Harvey (Canada) Ltd..Montreal
- Fuses, Electric
Curtis's & Harvey (Canada) Ltd..Montreal
- Gaskets
The Holden Co., Ltd.....Montreal.
McCord & Co.Chicago, Ill.
- Gates
Owen Sound Wire Fence Co., Ltd., O'n S'd.
- Gates, Crossing
The N. L. Piper Ry. Supply Co..Toronto.
Whyte Railway Signal Co.Toronto
- Gauge Cocks
Nathan Manufacturing Co....New York.
Ohio Brass Co. Mansfield, Ohio
- Gauges, Locomotive
Taylor & ArnoldMontreal.
- Gauges, Water
Detroit Lubricator Co. Detroit, Mich.
Nathan Manufacturing Co....New York.
Ohio Brass Co. Mansfield, Ohio
- Gears
American Vanadium Co. ..Pittsburg, Pa.
Titanium Alloy Mfg. Co..Pittsburgh, Pa.
- Generators, Electric
Dorner Railway Equip. Co....Chicago, Ill.
Northern Electric & Mfg. Co....Montreal.
- Graders and Ditchers
Western Wheeled Scraper Co..Aurora, Ill.
- Grates, Shaking
Babcock & Wilcox, Ltd.....Montreal.
Polson Iron Works, Ltd.....Toronto.
Grinders, Disc, for Wood and Metal
C. H. Besly Co.Chicago, Ill.
- Groceries
The Hudson's Bay Co.....Toronto.
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American Brake Shoe & Fdry Co.Mahwah.
James Smart Mfg. Co....Brockville, Ont.
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Canadian Fairbanks Co., Ltd..Montreal.
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Dominion Equip. & Supply Co., Winnipeg.
F. H. Hopkins & Co.....Montreal.
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Whyte Railway Signal Co.Toronto
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The Hudson's Bay Co.....Toronto.
Rice Lewis & Son.....Toronto.
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W. H. Coddington.....Hamilton, Ont.
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Commercial Acetylene Co.....Toronto.
The N. L. Piper Ry. Supply Co..Toronto.
Pyle National Elec. Headlight Co..Chicago.
- Headlinings
Crossen Car Mfg. Co.....Cobourg, Ont.
- Heaters, Feedwater
Robb Engineering Co., Ltd..Amherst, N.S.
- Heating, Car
Canadian Gold Car H'g & L'g Co.Montreal.
Consolidated Car Heating Co., Albany, N.Y.
Safety Car Heating & L'ting Co.New York.
United States Light & Heat. Co.New York
- Holsts
Dake Engine Co.Grand Haven, Mich.
- Holsts, Electric
American Hoist & Derrick Co., St. Paul, M.
- Holsts, Pneumatic
Taylor & ArnoldMontreal.
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Can. Casualty & Boiler Ins. Co..Toronto.
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Blaugas Co. of Canada, Ltd....Montreal
Canadian Gold Car H'g & L'g Co.Montreal.
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Safety Car Heating & L'ting Co.New York.
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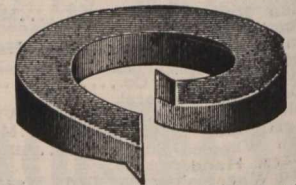
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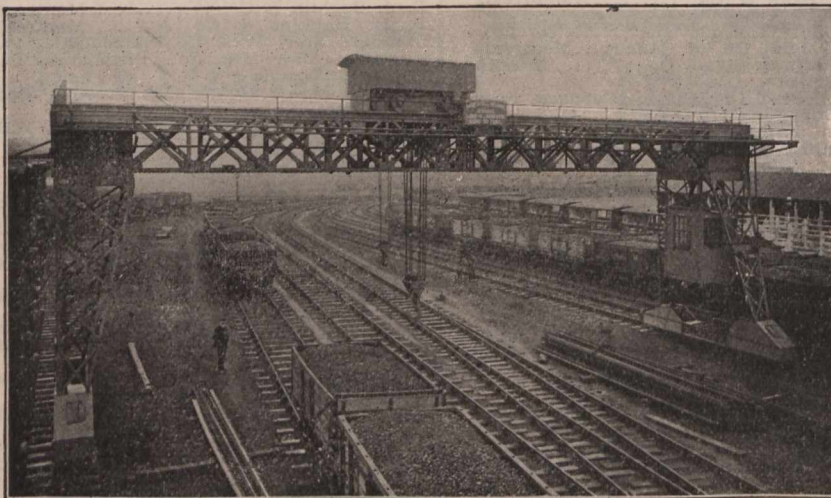
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Standard Steel Wks. Co.,Philadelphia, Pa.
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Canadian Fairbanks Co., Ltd....Montreal.
Jas. Smart Mfg. Co.Brockville, Ont.
A. B. Jardine & Co.,Hespeler, Ont.
Pratt & Whitney Co.Dundas, Ont.
Williams & Wilson, LtdMontreal.
- Tools, Track**
John Bertram & Sons Co. ..Dundas, Ont.
Canadian Steel Foundries, Ltd..Montreal.
B. J. Coghlin & Co.Montreal.
F. H. Hopkins & Co., Montreal.
Mussens, LimitedMontreal.
- Tools, Pneumatic**
The Holden Co., Ltd.Montreal.
- Tools, Cast Steel Track**
American Brake Shoe & Fdry. Co. Mahwah
- Track Equipment**
Can. Ramapo Iron Wks. Ltd. Niagara Falls
- Tramway Equipment**
J. J. GartshoreToronto.
- Transformers**
Allis-Chalmers-Bullock LtdMontreal.
Geo. C. RoyceWest Toronto, Ont.
- Transmission Appliances**
Canadian Fairbanks Co., Ltd....Montreal.
Williams & Wilson, LtdMontreal.
- Trolley guards**
Ohio Brass Co. Mansfield, Ohio
- Trolley Poles, Steel**
Dorner Railway Equip. Co..Chicago, Ill.
- Trolley Wheels**
Tallman Brass & Metal Co..Hamilton, Ont.
- Trucks**
Jas. Smart Mfg. Co.Brockville, Ont.
- Trucks, Electric Car**
Baldwin Locomotive Works..Philadelphia.
Canadian Steel Foundries, Ltd..Montreal
- Trusses, Roof**
Canadian Bridge Co.Walkerville, Ont.
Cleveland Bridge & Eng. Co., Ltd.,
Dominion Bridge Co.Montreal.
- Tubes, Boiler**
Jas. W. Pyke & Co.,Montreal.
- Turbines, Steam**
Allis-Chalmers-Bullock LtdMontreal.
- Turnbuckles**
Canadian Steel Foundries, Ltd..Montreal
- Turntables**
Canadian Bridge Co.Walkerville, Ont.
Dominion Bridge Co.Montreal.
- Typewriters**
Royal Typewriter Co.New York
- Valves**
Consolidated Car Heating Co. Albany, N.Y.
Detroit Lubricator Co. Detroit, Mich.
Williams & Wilson, Ltd.Montreal.
- Valves, Angle and Globe**
Detroit Lubricator Co. Detroit, Mich.
Kerr Engine Co.Walkerville, Ont.
Nathan Manufacturing Co.New York.
- Valves, Brass Gate**
Detroit Lubricator Co. Detroit, Mich.
Kerr Engine Co.Walkerville, Ont.
- Valves, Check**
Nathan Manufacturing Co.New York.
- Valves, Iron and Brass**
Canadian Fairbanks Co., Ltd....Montreal.
- Valves, Iron Gate**
Detroit Lubricator Co. Detroit, Mich.
Kerr Engine Co.Walkerville, Ont.
- Valves, Locomotive Pop**
T. McAvity & SonsSt. John, N.B.
Taylor & ArnoldMontreal.
- Valves, Steam**
Detroit Lubricator Co. Detroit, Mich.
Nathan Manufacturing Co.New York.
- Vanadium Steels**
American Vanadium CoPittsburg, Pa.
- Varnishes**
The Dougal Varnish Co., Ltd....Montreal.
- Velocipedes**
Kalamazoo Ry. Sup. Co..Kalamazoo, Mich.
- Ventilators, Car**
Burton W. Mudge & Co.Chicago, Ill.
- Vessels**
Polson Iron Works, LtdToronto
- Wagons, Dump**
Western Wheeled Scraper Co..Aurora, Ill.
- Washers**
Steel Co. of Canada, Ltd..Hamilton, Ont.
- Waste**
B. J. Coghlin & Co.Montreal.
N. L. Piper Railway Supply Co..Toronto.
- Water Softeners**
Babcock & Wilcox, LtdMontreal.
L. M. Booth Co.Chicago, Ill.
Dearborn Drug & Chemical Co., Chicago.
- Welding**
Goldschmidt Thermit Co.Toronto.
- Wheelbarrows**
F. H. Hopkins & Co.....Montreal.
Meaford Wheelbarrow Co. Ltd. Meaf'd, Ont.
- Wheels, Car**
Canada Iron Corporation, Ltd., Montreal.
Canadian Car & Foundry Co....Montreal.
Jas. W. Pyke & Co.,Montreal.
Standard Steel Wks. Co.,Philadelphia, Pa.
- Wheels, Locomotive**
Canada Iron Corporation, Ltd., Montreal.
- Wheels, Re-inforced Pressed Steel**
Kalamazoo Ry. Sup. Co.Kalamazoo, Mich.
- Wheels, Rolled, solid Forged**
Standard Steel Wks. Co.,Philadelphia, Pa.
- Wheels, Steel Tired**
Standard Steel Wks. Co.,Philadelphia, Pa.
- White Lead**
Steel Co. of Canada, Ltd..Hamilton, Ont.
- Windlasses**
Dake Engine Co.Grand Haven, Mich.
- Windmills**
Ontario Wind Engine & Pump Co.Toronto.
- Wire**
American Vanadium Co.Pittsburg, Pa.
Titanium Alloy Mfg. Co..Pittsburgh, Pa.
- Wire and Wire Rope**
Dominion Wire Rope Co.Montreal.
Mussens, LimitedMontreal.
The Wire & Cable Co.Montreal.
- Wire, Brass, Iron and Steel**
Steel Co. of Canada, Ltd..Hamilton, Ont.
- Wire, Copper**
E. F. Phillips Elec. Works, Ltd. Montreal.
The Wire & Cable Co.Montreal.
- Wire, Electric**
Chapman & Walker, Ltd. Toronto.
E. F. Phillips Elec. Works, Ltd. Montreal.
The Wire & Cable Co.Montreal.
- Wire Goods, Bright**
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- Wire, Insulated, Copper**
E. F. Phillips Elec. Works, Ltd. Montreal.
The Wire & Cable Co.Montreal.
- Wire Rope Clips**
American Hoist & Der. Co.St. Paul, Minn.
- Wire, Telegraph and Telephone**
Chapman & Walker, Ltd. Toronto.
E. F. Phillips Elec. Works, Ltd. Montreal.
The Wire & Cable Co.Montreal.
- Wire, Transmission and Trolley**
Chapman & Walker, Ltd. Toronto.
The Wire & Cable Co.Montreal.
- Wrenches, Cast Steel**
American Brake Shoe & Fdry. Co. Mahwah
- Yachts**
Polson Iron Works, LtdToronto



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