Canadian Railway and Marine World

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The June Railway Mechanical Conventions at Atlantic City.

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

Use of Powdered Fuel in Locomotives.

The American Railway Master Mechanics' Association committee, C. H. Hogan, Asst. Supt. Motive Power, New York Central Lines, East of Buffalo, chairman, reported as follows:—The use of powdered fuel in manufacturing plants has proved quite successful and has passed beyond the experimental stage. After years of experimental and development work, apparatus for the drying and pulverizing of coal has been perfected. The problems to be encountered in the use of powdered fuel in locomotives are more serious, on account of the necessity for storage of powdered fuel and the limited restrictions of space available on a locomotive. The first application of such a device for burning powdered fuel on a steam locomotive was made about a year ago, and special apparatus had to be designed, tested, improved and perfected to make it adaptable to locomotive practice, therefore discouragement should not be felt because in so short a time there are not a large number of locomotives in regular successful service burning powdered fuel.

None better than the members of this Association know the great difference in the burning of run-of-mine coal from different sections of this country, and even different mines in the same section; therefore they will readily appreciate at least that similar difficulties must be encountered and overcome in burning in powdered form the same coals containing various amounts of moisture, ash, etc., besides the added process of actually pulverizing the fuel. It is easily within the memory of all as to the difficulties at first experienced in the burning of oil in the limited confines of a locomotive fire box, and the apparatus used successfully; therefore today it would hardly be recognizable to the early designers and experimenters therein.

Perhaps most would agree today that but for the difficulty in obtaining fuel oil, and its excessive cost, the use thereof would be much greater than it is; nor is the end of increased cost of oil in sight, since methods have been devised for producing gasoline therefrom; hence it is believed that the perfection of apparatus for burning powdered fuel with equal advantage offers an acceptable substitute, and on account of the greater supply of coal and its less cost, particularly the smaller sizes, many of which at present are entirely wasted, the field for the use of powdered fuel would appear to be much more extensive. The results to be obtained from successful use of pulverized fuel in locomotives may be briefly summarized as follows: Operation free from smoke, cinders and sparks; ready maintenance of fuel boiler pressure, increased boiler efficiency, decreased fuel cost, saving of manual labor in stoking, elimination of grates, as well as ash pit delays and expense.

The New York Central locomotive, being the first equipped for burning powdered fuel, has been used chiefly for the development and improvement of apparatus necessary for supplying powdered fuel to the fire box and in drafting the locomotive. This is a 10 wheel superheater engine, and has been used in helper and in freight service. Its leading features are as follows:—

Weight on drivers, 158,000 lb.
Tractive power, 31,000 lb.
Cylinders, 22 by 26 in.
Driving wheels, 69 in. diam.
Boiler pressure, 200 lb.
Grate area, 54 ft. 9 in.
Superheater heating surface, 540 sq. ft.
Total boiler heating surface, 3,188 sq. ft.

The Chicago & North Western locomotive, equipped less than a year ago, is Atlantic type, superheated, and of the following general description:

Weight on drivers, 96,000 lb.
Tractive power, 21,850 lb.
Cylinders, 20 by 26 in.
Driving wheels, 81 in. diam.
Boiler pressure, 185 lb.
Grate area, 46.3 sq. ft.
Superheater heating surface, 428 sq. ft.
Total boiler heating surface, 2,187 sq. ft.

This locomotive has been used in regular local and through passenger service, and a comparative test made with a duplicate locomotive burning coal on grates has thus far proved favorable to the powdered fuel, especially in saving fuel in firing up, movement at terminals, dead time, etc. This can readily be appreciated when it is recalled that on most locomotive coal tests it has been found that about 20% was used for work other than while pulling the train, or left in the fire box at the end of the run.

The Delaware & Hudson Co. has just received from the builders a consolidated locomotive equipped for the burning of powdered fuel, the following being a general description of same:—

Weight on drivers, 267,500 lb.
Tracive power, 61,400 lb.
Cylinders, 27 by 32 in.
Driving wheels, 63 in.
Boiler pressure, 195 lb.
Grate area, 99.8 sq. ft.
Superheater heating surface, 793 sq. ft.
Total boiler heating surface, 3,814 sq. ft.

It was hardly to be expected that your committee would be able to render at this time a comprehensive or conclusive report on the burning of pulverized fuel in locomotives, a matter so new to the art in locomotive practice; however, we wish it understood that not a little advancement has taken place in this very short period of time and submit the above merely as a report of progress and ask for the continuance of the committee.

Report of Committee on Car Construction.

The Master Car Builders' Association committee, W. F. Keisel, Jr., Asst. Mechanical Engineer, Pennsylvania Rd., Altoona, Pa., chairman, reported as follows: In the report made in June, 1915, a box car design was submitted and a request made that before Dec. 1, 1915, recommendations for changes and other criticisms, or approval of design, be sent to the chairman. Replies to this invitation were quite meagre, but indicated a desire on the part of railway companies to await the results of the development of the box car design which was under way by the American Railway Association subcommittee.

As members of your committee were also acting in an advisory capacity with the American Railway Association subcommittee it was deemed advisable to do nothing for the present in the development of the Master Car Builders' design of box car, but to assist, as far as possible, in perfecting the American Railway Association box car design in line with the work already accomplished on the proposed M. C. B. box car. In regard to this subject, we can only report progress. No other subjects were before your committee during the past year, as all of the items covered by our previous report, with the exception of one small item, were, by letter ballot, adopted by you as Recommended Practice.

The proper distance between centre sills of steel cars is one that will require serious consideration, as we should adopt either the present spacing generally in use, which is 12⅞ in., or determine on some other spacing that can be considered fixed for a number of years. The spacing of 12⅞ in. permits a car 40 ft. long to pass around a curve having 50 ft. radius without interference between the wheel flanges and centre sill flanges. It will readily be seen that if the distance between centre sills is increased, or if the distance between centres of trucks is increased, the radius of curvature around which car will pass will have to be greater. The distance between centre sills affects the work of the Coupler Committee and Draft Gear Committee, in addition to that of the Committee on Car Construction. We would recommend that the present spacing of 12⅞ in. be adopted as Recommended Practice, and that draft gear and couplers be made for this spacing of centre sills.

Dimensions for Flange and Screw Couplings for Injectors.

The American Railway Master Mechanics' Association committee, M. H. Haig, Mechanical Engineer, Atchison, Topeka and Santa Fe, chairman, reported as follows: The report of the committee presented before the 1915 convention, was referred back for further consideration. The original members of the committee were continued and the committee was

enlarged by the addition of two new members. After further and careful consideration, the committee confirms the report presented at the last convention.

Because of the difference in size of couplings and number of threads used by the several manufacturers, it is not possible to select a set of common standards which will interchange with all the individual standards of the several manufacturers. Realizing this, the committee selected a set of dimensions representing practices most common to the greatest number of railways and based its original report on these dimensions. There is no doubt that the proposed dimensions are thoroughly satisfactory in providing for mechanical strength and in meeting all injector conditions, for a large proportion of the roads are now using couplings conforming practically to the dimensions proposed. The principal differences between the proposed standards and the 10-thread couplings commonly used is in the shape of the thread, and the proposed shape was selected because of its interchanging most satisfactorily with all other shapes used.

It is not unusual for the principal manufacturers to make injectors to suit connections of different standards, and at least some, if not all of the manufacturers now have injector connections in service which will interchange with the proposed common standards.

It is not to be expected that manufacturers could immediately discontinue their individual standards in favor of a common standard or that the different railways would attempt to modify the couplings on present injectors to conform to a new common standard. It would be more natural to expect the gradual adoption of a common standard as new injectors are applied to locomotives under construction and to some lesser extent as old injectors are replaced by new ones during repairs. It is, therefore, a matter of the pleasure of the Association to decide whether a common standard should be adopted for flange and screw couplings for injectors. At the 1914 convention a motion was made to appoint a committee "with a view to preparing a standard and recommended practice." This committee has investigated the subject and has been guided in its recommendation by the information submitted by the railways. It has been the duty of the committee to analyze this information and place the facts before the Association, and the committee feels that it is now the office of the Association to decide whether it wishes a standard.

Settlement Prices for Reinforced Wooden Cars.

The Master Car Builders' Association committee, John McMullen, Mechanical Superintendent, Erie Rd., Meadville, Pa., chairman, reported as follows:—Your committee recommends that rules 115, 116 (except that part relating to trucks), 117 and 118 of the Code of 1915, be eliminated, and that new rules be substituted therefor, covering the settlement for cars destroyed on foreign lines.

Your committee further recommends the following in connection with determination of prices and depreciation:

(a) The original cost of a unit of equipment, inclusive of body, trucks and air brakes, shall be used as the basis for settlement, from which will be deducted depreciation figured from the date of the original cost to the date of destruction. If, however, betterments have been added during the life of the car, and added to the book cost, depreciation on such betterments shall be figured from the date when made and deducted from the cost of such betterments. The total of the depreciated first cost and of the depreciated betterment cost will be the amount to be paid in settlement for the destroyed car.

(b) A car will be considered as new when written out of service and rebuilt, when the cost of renewals (repairs, renewals or betterments made at the same time) constitutes the major portion of its value as renewed, and settlement will be made as in the case of a new car. In no case shall the charge for the rebuilt car exceed the cost at current market prices for labor and material of new equipment of similar type, equal capacity and equal expectation of life in service, less a suitable allowance on account of the second-hand parts remaining therein.

(c) In order to provide uniform rates of depreciation for the settlement of cars destroyed on foreign roads, your committee would recommend the following:

Wooden cars, all classes, except refrigerator cars .....5 per cent.
All-steel cars, all classes, including steel tanks of tank cars .....3 per cent.
Wooden cars, steel-framed or steel-underframed, or both .....4 per cent.
Refrigerator cars, all wood .....7 per cent.
Refrigerator cars, steel-framed or steel-underframed, or both .....6 per cent.

The above rates are to be applied on the so-called straight depreciation basis. For example, the depreciation on a wooden car, 10 years old, at the rate given above (5%), which cost originally $1,000, would be $500. These rates apply to body, trucks and air brakes; but depreciation shall in no case exceed 80% of the value upon which it is based.

(d) In order to provide for settlements for trucks, when trucks only are destroyed, prices headed "Trucks," rule 116, page 204, 1915 Code of Rules, and paragraphs of the rule following the table, should be retained. Depreciation to be figured at the rate established for the type of car the trucks were under when destroyed.

(e) Rules 112, 114 and 120 to be rewritten by the arbitration committee to conform to the recommendation in this report.

Report of Committee on Mechanical Stokers.

The American Railway Master Mechanics' Association committee, A. Kearney, Assistant Superintendent, Motive Power, Norfolk & Western Ry., chairman, reported as follows:—Your committee a year ago shared the opinion of your executives that it would be interesting and none the less valuable if further data could be secured (preferably on a laboratory test plant) to show the relative efficiency of at least the prominent types of locomotive stokers, using the different grades of fuel under the usual range of operation; at the same time they fully realized that to make the work complete a great deal of time and labor would be necessary—perhaps much more than any railway officer not having a plant could afford to spare. Your committee has given this matter a great deal of thought without being able to determine as yet where and how the work could be undertaken, but further than that they feel confident that even if the opportunity presented itself it would be better and very much more satisfactory in the end to postpone the work until the machines more nearly approach standard designs.

Relative fuel consumption and cost figures would, of course, be pertinent, but as the records already obtained in connection with the general performance of stokers under service conditions (a good deal of which has found its way into print), is not only complete but comprehensive, embracing considerable information upon the efficiency as affected by the use of many of the grades of coal commonly offered for fuel purposes, some tests being conducted to show fuels especially prepared with respect to their condition—a factor of considerable importance—and figures pertaining to the cost of maintenance and durability being available, your committee, after taking all things into consideration at this time, does not deem it expedient to advocate going to the expense of getting figures for any of the machines in their present transitory stages, especially since so many of the extensive improvements now under way may materially alter their standing for accurate comparative purposes.

Furthermore, the stoker field is gradually narrowing itself down to a few types. Those that have withstood the storm and continue to show merit are practically embraced in the Street, Hanna, Standard and Crawford machines; at the same time even these machines are undergoing alterations for higher efficiency and greater range of adaptability, though not necessarily departing from the general principles upon which the machines were originally laid down. The first three machines, the Street, Hanna and Standard, belong to the scatter or overfed group, while the Crawford is the only distinctly underfeed machine in the field.

As time and opportunity have shown wonderful advances in nearly every known device, it is safe to assert confidently that the full development of the mechanical stoker has not yet been reached. At the same time some of the original designs of the four prominent types mentioned have been in service some four or five years, or longer, and are still doing good work. As of April 1, 1916, the following number of machines of the four named types were in service and on order:

	In service April 1, 1916	On order April 1, 1916
Street	866	152
Crawford	413	63
Hanna	39	39
Standard	100	125
Total	1418	379

In order to show the headway made in stoker designs and improvements during the past four years records of those in service have been prepared as shown in tabulation. The figures are interesting as they show how the number of machines in service has increased by years to date. The following table shows the total of all mechanical stokers in service as of April 1, 1916. As mentioned in your committee's last year's report there are other machines in service undergoing trial, still others in contemplation, but your committee has been advised of none beyond those alluded to in their last report.

Year.	Street.	Crawford.	Hanna.	Standard.	Ttl.
1910	5	1	..	..	6
1911	10	1	1	..	12
1912	165	46	1	..	212
1913	173	153	2	..	328
1914	418	301	3	2	724
1915	531	301	18	22	873
1916	866	413	39	100	1418

The practicability of the stoker, as well as its range of value and adaptability, depending upon local conditions of opera-

tion, is no longer a matter of conjecture, as standard designs are to be found on the market which are being applied in fairly large orders, as the records show. Still, the manufacturers are working zealously and satisfactorily for higher merit.

Generally speaking, the progress in the stoker designs during the past year has been quite encouraging. Since our last report the Locomotive Stoker Co. has brought out its duplex machine, which has for its object the conservation and efficient utilization of a greater amount of the finer produce in the fuel heretofore subject to more or less loss with any of the scatter type machines.

Much time is being devoted to the study of pushing coal through open and closed ducts and troughs, to ascertain the range of possibility and necessary mechanical conditions, also the effect of grinding and further pulverizing the fuel in its passage from the tank to the fire box through the helicoid screw in the horizontal or vertical planes, as well as the general effect through the pressure zones, the fruits of which it must be realized can only be obtained as developments are carried forward.

The Street Co.'s regular type C stoker, like other machines on the market, continues to do excellent work, and is showing improvement in durability. The Street Co. has recently designed and constructed two machines of a type known as the duplex, one of which has been applied to a Mallet locomotive on the Norfolk & Western, and the other to a locomotive of a similar type on the C. & O. R. The Hanna and Standard companies have both been pushing with much earnestness the introduction of a number of detail improvements in their machines for greater durability of parts, as well as higher efficiency in their operating engine and controlling mechanism, none of which, however, materially alters the original principle upon which the machines are constructed. All of this work requires a great deal of time and experimenting. We are informed that many improvements in detail have been made in the Crawford stoker which forecast substantial progress, efficiency in operation, and lower cost in maintenance.

Your committee, cognizant of what has been done and what is in contemplation, deems it premature at this time to attempt any elaborate efficiency tests, but suggests that the work be deferred until designs and improvements become more permanent, especially since data necessary for all practical purposes have either been reported or are readily obtainable by those who may be seriously considering their use. Furthermore, by the time the present machines reach a more favorable stage for a comparative test the opportunity for such an investigation, which at best is going to be very expensive and require a great deal of time, may be more opportune than at present.

Report of Committee on Car Trucks.

The Master Car Builders' Association committee, J. T. Wallis, General Superintendent Motive Power, Pennsylvania Rd., chairman, and of which L. C. Ord, formerly Assistant Works Manager, Car Shops, C. P. R., Montreal, who is now on active military service, was a member, reported as follows:—On acocunt of the American Railway Association committee on design of standard box car having under consideration some minor changes in the design of truck bolsters, involving probable slight changes in the limiting dimensions of cast steel truck sides, your committee deems it advisable to await the final conclusions of that committee before recommending any changes in the present Recommended Practices.

The committee on brake shoe and brake beam equipment submitted to the car truck committee a proposed design of brake beam hanger and manner of fastening to truck which received the approval of the car truck committee, inasmuch as the hanger conformed in length and location to the limiting dimensions for cast steel truck sides, now a Recommended Practice of the Association. Subsequent to this, criticisms have been made of the manner of securing the brake beam hanger to the truck and of the design of the hanger, involving changes in the hanger where it enters the brake head and modifications of the hanger hole in the brake head. Your committee, therefore, recommends that the design of brake hanger and its fastening to the truck be held over until next year, when the question of truck design for standard box car will be settled by the American Railway Association standard box car committee, and when this is concluded the committee on car trucks will confer further with the committee on brake shoe and brake beam equipment on desirable changes in the tentative design of the brake beam hanger and its fastening to the truck.

Report of Committee on Superheater Locomotives.

The American Railway Master Mechanics' Association committee, W. J. Tollerton, General Mechanical Superintendent, Chicago, Rock Island and Pacific Rd., chairman, reported as follows:—As of Jan. 1, 1916, there were 15,666 superheater locomotives in service in the United States and Canada, practically all of the fire-tube type, as follows:

Superheaters applied at time of construction of locomotive	9,900
Superheaters applied to locomotives already in service	5,766
	15,666

With the exception of one prominent railway, very few locomotives, originally equipped with slide valves, have been changed to piston valve and had superheaters applied. With the exception of 142 Mallet locomotives, equipped with superheaters, having slide valves on the low pressure cylinders, very few superheater locoomtives are equipped with slide valves. The railways on which these Mallet locomotives are operating is experimenting with a view of applying piston valves. Therefore, your committee does not feel this subject can be thoroughly discussed at this time.

Of the railway reporting, 99% of the superheater locomotives were equipped with brick arches. The use of brick arches is specially recommended on superheater locomotives, where practicable, as it causes more perfect combustion, better distribution of heat in the fire box, protects the flues and sheets and effects a reduction in smoke and sparks and cinders in flues and front end. In extreme bad water districts, the application of arches should be determined by local conditions.

It is recommended that a programme be adopted for the application of superheaters to existing power on a monthly schedule. This will enable the railways to place orders in advance for the necessary material and thereby avoid delay to locomotives undergoing repairs, awaiting superheater material.

There is a decided difference of opinion as to the advisability of equipping switching locomotives with superheaters, as follows,—Some railways maintain the same relative economies are effected through superheating switching locomotives as are obtained by superheating road locomotives. Others will not give consideration to superheating switching locomotives until all available road locomotives have been equipped, owing to the greater returns to be obtained. Your committee commends the application of superheaters to switching locomotives, but considers their application to road locomotives as being generally of greater importance.

It is felt no set rule can be formulated covering the application of superheaters to existing locomotives, as age, general condition, capacity and further service to be secured must govern. Several railways reported having superheated locomotives 10 to 15 years old.

From replies received, it is apparent that the superheater will be specified on all road and many switching locomotives purchased in the future.

The return tube, top header, double loop superheater is the type most generally used.

In view of the many complete reports which have already been rendered on tests covering the economies effected through the application of superheater, and superheater and brick arch, your committee does not believe it necessary to publish further data in this report. However, on a conservative basis, it is felt that an economy of 15 to 25% in fuel and 20 to 30% in water consumption can be expected in every-day operation through use of the superheater and brick arch. Numerous tests have shown greater economies. On a number of railways the application of superheaters has reduced the time of freight trains on the road 10 to 15% and eliminated one stop for coal and two stops for water over one freight engine division.

It is generally felt by all, and proved by some careful comparative tests, that the cost of repairs (maintenance of equipment) is greater for locomotives equipped with the superheater and brick arch. However, for the railways as a whole, the reductions effected in the cost of coal and water and the increased general efficiency (conducting transportation), offset this many times over.

As a general proposition, no changes are necessary in the front end arrangement, due to the application of superheater, aside from those made an account of superheater elements, header and damper. Replies received indicate no great variation in the size of exhaust nozzle tip between saturated and superheated locomotives of the same general characteristics.

The committee feels that the best results will be obtained in operating superheater locomotives by carrying about two gauges of water, with full throttle on short cut-offs, so far as operating conditions will permit. The engineers should also be required to crack the throttle when drifting.

The investigation develops that the majority of superheater locomotives are equipped with hydrostatic lubricators without booster, although a considerable number of railways are using the hydrostatic lubricator with the booster attach-

ment. The booster is of value if the hydrostatic lubricator has a restricted equalizing passage. If the hydrostatic lubricator is designed with the proper size equalizing passage, the booster attachment is unnecessary, as its principal function is to compensate for the restricting equalizing passage. The use of the force feed lubricator is very limited, but a number of railroads are experimenting with this type at the present time. The use of an independent feed for lubricating the cylinders is limited. It is the opinion of your committee that this is unnecessary and should be discontinued, as it is very questionable if any benefits are being derived therefrom.

The majority of railways are now using a superheat oil for the lubrication of superheater locomotives, stating that it does not carbonize and better results are obtained. It generally has been necessary to increase the valve oil allowance 20 to 25% for the superheater locomotives over the allowance for saturated locomotives of similar type and size. However, this does not apply in the same proportions to bad water districts, where superheating has reduced the foaming and eliminated water being carried over into the cylinder, in which cases no increase in oil allowance has been necessary.

Various methods have been tried for the use of graphite on superheater locomotives, but the replies received indicate the majority are not using graphite for lubricating superheater locomotives.

Trouble has been experienced with carbonization of oil in valve spools, and piston heads, this has been remedied by decreasing the amount of oxygen drawn into the cylinder, by drifting with a partially open throttle or drifting valve. The use of superheat oil will also decrease the trouble.

The application of superheaters to locomotives equipped with slide valves has been so limited, the committee does not feel warranted in discussing the system of lubrication for that type of locomotive at this time.

Vacuum relief valves are generally used, although there is some question as to what benefit, if any, results. The majority of replies received indicate that the by-pass valve is not in general use on superheater locomotives. These have only been advocated for large cylindered locomotives, to take care of the high compression in the cylinders.

A number of railways are now using, and others are experimenting with, drifting valves, either manually or automatically operated. When drifting is done with the throttle valve, on superheated locomotives, superheated steam is used. When drifting valve is used, either manually or automatically operated, saturated steam is used. Generally, no distinction is made as to size of drifting valve or steam connections between large and small locomotives in passenger and freight service, and for the sake of standardization such practice is desirable. When locomotives are not equipped with by-pass, automatic or manually operated drifting valve, or other drifting valve in the cab, the throttle should be cracked while drifting a sufficient amount to prevent the admission of air. This will decrease carbonization.

Very little experimenting has been done in the application of pyrometers to locomotives, outside of special tests, but the committee believes it is desirable to make tests from time to time to ascertain the degree of efficiency being obtained. In view of the initial cost, it is felt that portable instruments would answer the requirements, a certain number for each division, to be transferred from one locomotive to another. The pyrometers should be adjusted at regular intervals, in order to obtain accurate readings.

Some difficulty has been experienced due to superheater headers cracking, units leaking and packing melting. As a general proposition, however, the trouble has not been serious from these sources. There are no comparable data available as regards locomotive failures as between superheated and saturated locomotives. Better design or foundry practice is recommended as a remedy for the trouble with the headers and better workmanship for the units. The standard set of tools as recommended by the superheater manufacturers is recommended for adoption as standard for the care and maintenance of superheaters. At present there are a number of railways which have no printed instructions for roundhouse forces, back shop employes and enginemen on the operation and maintenance of superheater locomotives. In order that the greatest efficiency may be obtained, it is very necessary that all employes be fully conversant with these features. For the guidance of roundhouse and back shop employes, a standard practice card, embodying the instructions as recommended by the superheater manufacturers, should be issued.

A number of railways are welding all flues in the back flue sheet successfully, the welding being done with the ordinary types of welding equipment.

With the exception of one prominent railway, all railways reporting are using superheater dampers in the front end satisfactorily.

The investigation develops that a number of railways have had more cracked cylinders and saddles with superheater locomotives. They have now adopted outside steam pipes, which involved change in design of cylinders, on superheater locomotives.

Welding of Cast Steel Truck Side Frames and Bolsters.

The Master Car Builders' Association committee, W. O. Thompson, Superintendent, Rolling Stock, New York Central Lines, East of Buffalo, chairman, reported as follows:—Your committee desires to submit the following recommendations, one member of the committee dissenting.

Cast steel truck side frames must not be welded if cracks extend more than 1 in. from edge of any rib or flange.

Cast steel truck bolsters must not be welded if cracks extend more than 1½ in. from edge of rib or flange, unless bolster is reinforced at place of failure by addition of plates, either welded or riveted, to bolster.

J. T. Wallis, General Superintendent of Motive Power Pennsylvania Rd., Altoona, Pa., presented the following minority report:—I cannot concur in the report of the majority of the committee permitting welding of cast steel truck side frames and bolsters, as I consider the practice of welding cracks in these members, by either acetylene, electric or any other present known methods, unsafe, for the reason that the fractures indicate weakness in design, and the welding will not add to the strength, but introduces a condition of further weakness by improper workmanship. It is a well known fact that a large number of cast steel truck side frames and bolsters, especially the former, are failing as a result of weakness in design. Where the proper sections are used, and the design proved, these cracks do not appear. I cannot, therefore, subscribe to a practice of continuing in service such vital parts of car construction which, as evidence by fracturing, are inherently weak, or to a method of repairs which in no way strengthens the part, but, on the contrary, introduces another chance for failure, and consequently is unsafe.

Report of Committee on Safety Appliances.

The Master Car Builders' Association committee, D. R. MacBain, Superintendent Motive Power, New York Central Rd., Cleveland, Ohio, chairman, reported as follows:—From the title of this committee about the only matter that can be reported on is the progress that is being made in the equipment of freight cars with safety appliances to comply with the law, and your committee is pleased to state that in a general way, notwithstanding the strenuous conditions with which railways have had to contend, fairly satisfactory progress has been made in our efforts to comply with the requirements of the law. From information received from railways operating 2,505,159 freight cars, of which, according to reports, 1,905,929 were put in service prior to July 1, 1911, between the periods July 1, 1911, and Dec. 31, 1915 (the latest data available), 1,303,906 cars built prior to July 1, 1911, have been equipped with safety appliances, or an average of 289,757 cars per year. The actual total each year has been as follows:

Half year ended Dec. 31, 1911	37,667
Year ended Dec. 31, 1912	223,137
Year ended Dec. 31, 1913	331,846
Year ended Dec. 31, 1914	338,321
Year ended Dec. 31, 1915	372,935
	1,303,906

Of cars built prior to July 1, 1911, there remained to be equipped on Dec. 31, 1915, 681,571 cars. To complete the equipment of these cars by the time set by the Interstate Commerce Commission will require a great deal of effort on the part of the railways, especially in view of the difficulty of getting the cars home from foreign roads and the procurement of materials with which to do the work. In order to expedite the movement of cars home for this purpose, the Arbitration Committee has proposed, with the approval of the Executive Committee, the incorporation in rule 4 of the following:

"After Jan. 1, 1917, no car will be received from owner unless properly equipped with U. S. Safety Appliances or U. S. Safety Appliances Standard."

The committee feels that this matter should be given the closest attention possible, that there should be co-operation on the part of the railways to the end that on July 1, 1917, we may say to the Interstate Commerce Commission that practically all of the cars in the country have been equipped in accordance with the requirements of the law.

Air Brake Association.—The following officers were elected for the current year at the recent convention at Atlanta, Ga.: President, T. W. Dow, Erie; First Vice President, C. H. Weaver, N.Y.C. west of Buffalo; Second Vice President, C. W. Martin, Pennsylvania; Third Vice President, F. J. Barry, New York, Ontario and Western; Secretary, F. M. Nellis, Pittsburg, Pa., and Treasurer, O. Best, New York.

The Best Design and Materials for Pistons, Valves, Rings and Bushings.

The American Railway Master Mechanics' Association Committee, Joseph Chidley, Assistant Superintendent of Motive Power, New York Central Rd., Lines West of Buffalo, chairman, reported as follows: Your committee was requested by the secretary to cover the subject of extension piston rods and also the matter of lubrication, in accordance with action taken by the Executive Committee. The committee has not attempted to cover the matter of lubrication, on account of this subject being covered quite thoroughly by the report issued by the Superheater Committee. The committee issued a circular of inquiry to members with regard to the materials and designs used by the various railways for pistons, valves, rings and bushings, with a view of ascertaining the prevailing standards of material and design. This was also intended to bring out the changes, if any, which have been necessitated by the very general change from the use of saturated steam to superheated steam in the last few years. The committee has received replies from 34 railways, representing about 37,000 locomotives. In general, we may say that most roads make no distinction between saturated and superheater locomotives in the design of pistons, valves, rings and bushings, on locomotives equipped with piston valves. Many railways are using Hunt-Spiller gun iron for pistons, valves, rings and bushings for both superheater and saturated locomotives, while a smaller number use ordinary cast iron for the purpose; a number of roads use Hunt-Spiller iron for superheater locomotives and ordinary cast iron for saturated locomotives. Throughout this report the words "Hunt-Spiller," or the letters "H.-S.," denote Hunt-Spiller gun iron, and the words "Cast Iron," or the letters "C. I.," denote other varieties of cast iron.

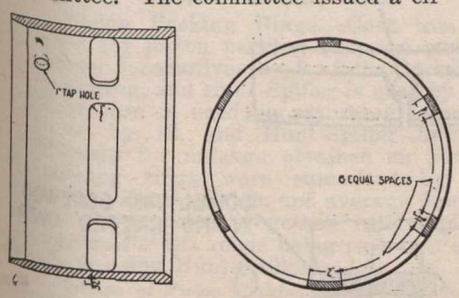


Fig. 1. Piston Valve Bushing.

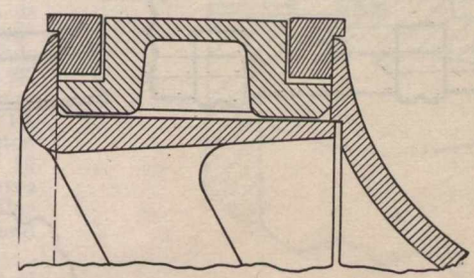


Fig. 2. Piston Valve L Ring

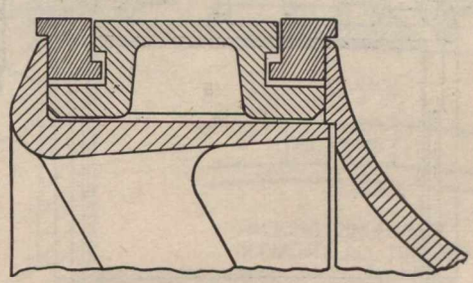


Fig. 3. Piston Valve Z Ring.

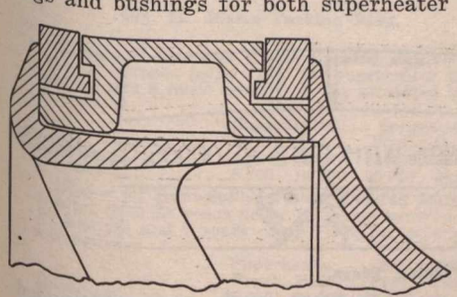


Fig. 4. Piston Valve Anchor Ring.

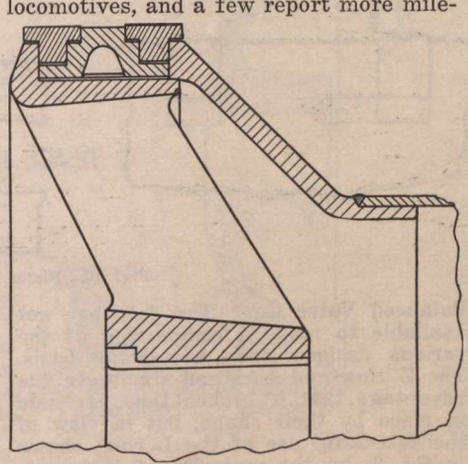


Fig. 5. Piston Valve T Ring

The committee asked for data regarding the mileage obtained for different designs and materials in passenger and freight service on superheater and saturated locomotives. Mileage figures were submitted by something less than half of the roads reporting. The variation in mileage is so great, according to the replies received, that the committee hesitated to draw any conclusions from considerations of mileage. The mileage obtained depends not only on the material and design, but also on the efficiency of lubrication, the class of service and maintenance. A road traversing level country should obtain more mileage from the different parts than could be obtained by a mountain railway. This is equally true of roads traversing bad water districts, compared with those in good water districts. A road on which much drifting is done will obtain more mileage if its locomotives are equipped with automatic drifting and by-pass device. The service for which heavy, modern types of locomotives are used is generally more severe than that of older and lighter types, which would be expected to give more mileage, other things being equal. The replies received by the committee indicate the difficulty of making a comparison between the service of the various parts on superheater and saturated locomotives. Most modern locomotives are equipped with superheaters, while the saturated type of locomotives is represented for the most part by a lighter class of locomotives, built, as a rule, a number of years ago, and not to be classed as types of modern locomotive construction. Several roads state that they find no difference in the mileage of the various parts under discussion on superheater and saturated engines, others obtain more mileage with the saturated locomotives, and a few report more mileage with superheater locomotives. By the term "mileage," as used in this report, we refer in all cases to the mileage obtained between renewals for the parts under discussion. It is worthy of notice that of the 34 railways replying to the circular, some use Hunt-Spiller gun iron, some merely state that they use cast iron, others use a special grade of cast iron, some roads giving their own specifications for cast iron, and none state that they follow the specifications of the A.R.M.M.A., which were adopted in 1906 and revised in 1915.

Piston Valve Bushings.—Of the 34 roads reporting, 8 use cast iron for piston valve bushings on superheater locomotives and 26 use Hunt-Spiller gun iron. Cast iron is used on saturated locomotives by 17 roads, Hunt-Spiller gun iron is used by 10 roads and 7 roads have no saturated locomotives with piston valves. Short bushings are used by 26 roads, while 6 roads favor long bushings, extending across the exhaust passages to the steam-chest cover.

The number of roads using an even number of ports is about the same as those using an odd number. Apparently not much attention has been paid to this feature of the design, although several roads are now changing from an odd to an even number of ports, which seems to be the preferable design. The object in having an even number is to have the bridges come near enough to being opposite each other so that the bushings can be readily calipered over the bridges to measure the amount of wear. The minimum width of bridges varies from 17-32 in. to 1¼ in. The committee favors a small number of bridges, with sufficient metal in them to give the necessary strength to the bushing. The usual form of steam ports is rectangular, although several roads report the use of diagonal bridges, forming diamond shaped ports. The committee has no evidence as to the advantages or disadvantages of this style of port. Sixteen roads use a fillet in all corners of ports in piston valve bushings, and 15 provide no fillet in the corners of the ports, or provide fillets only on the exhaust edge of the steam ports.

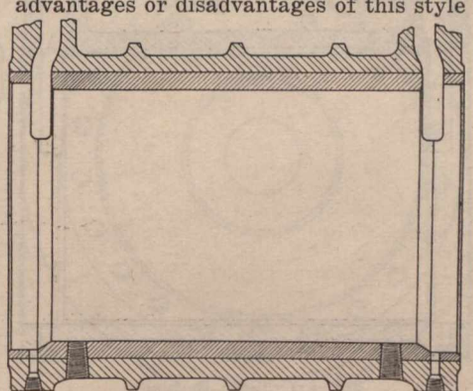


Fig. 6. Cylinder Bushing.

The committee asked the members to report on the mileage between renewals of piston valve bushings, but it is evident from a consideration of the replies that in some cases mileage is given between borings. The largest mileage reported between renewals on superheater locomotives is 300,000 miles, obtained in both freight and passenger service on one of the standard trunk roads with the use of short Hunt-Spiller gun-iron bushings. The maximum mileage reported between

renewals on saturated engines is reported by the same road as being 360,000 miles in both passenger and freight service, using short Hunt-Spiller gun-iron bushings. The committee recommends the use of short piston valve bushings with an even number of ports and bridges, and with a small number of ports and bridges, not more than eight, and preferably six in number. The committee also recommends the use of a fillet in all corners of piston valve bushing ports. A ½-in. radius is recommended as the standard size of fillet. Rectangular ports are to be preferred to diagonal bridges and diamond shaped ports, in view of the

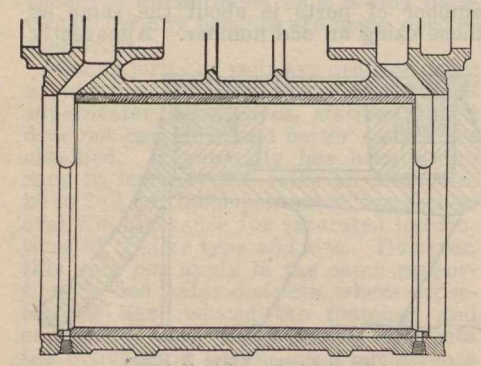


Fig. 7. Cylinder Bushing.

practice of the majority of the members. Fig. 1 is an illustration of what the committee considers the best general design of piston valve bushing. The bushing is to be forced in, and the bridges are turned 1-32 in. smaller diameter on outside than the rest of the bushing, in order to allow the bushing to be forced into position without cracking or burring the edges of the ports.

Piston Valve Packing Rings.—Cast iron is used for piston valve packing rings on superheater locomotives by 5 of the 34 roads reporting; Hunt-Spiller is used by 27 roads; bronze is used by one road, and one road does not state. Cast iron is used on saturated locomotives by

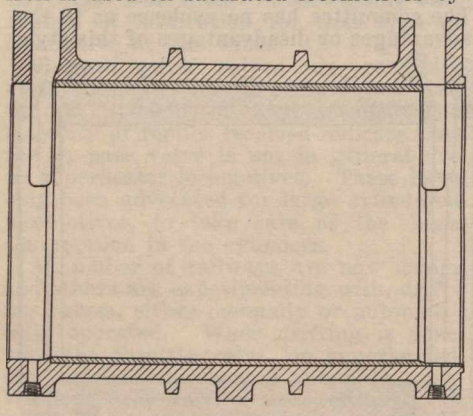


Fig. 8 Cylinder Bushing.

13 roads, and Hunt-Spiller is used by 14 roads. The committee has information from one road using bronze piston valve packing rings, indicating there may be a field for further experiment.

Figures for the mileage obtained by the use of different materials and designs were submitted by 16 roads. Although these figures vary widely among themselves, we have taken the average figures as representing the results obtained in the United States and Canada. These average figures are here given, together with the maximum figures received, and similar figures for the roads using cast iron and those using Hunt-Spiller.

Mileage of Piston Valve Packing Rings—Average of replies from 16 roads:

	Superheater. Frgt.	Pass.	Saturated. Frgt.	Pass.
Maximum	60 000	100 000	90 000	100 000
Average	30 900	40 000	34 200	43 500

Mileage of Cast-iron Piston Valve Packing Rings—Replies from 4 roads using C. I. for superheater locomotives and 6 roads using C. I. for saturated locomotives:

	Superheater. Frgt.	Pass.	Saturated. Frgt.	Pass.
Maximum	27 500	34 750	30 000	49 800
Average	16 400	23 200	20 300	33 200

Mileage of Hunt-Spiller Piston Valve Packing Rings—Replies from 10 roads using H.-S. for superheater locomotives and 6 roads using H.-S. for saturated locomotives:

	Superheater. Frgt.	Pass.	Saturated. Frgt.	Pass.
Maximum	60 000	100 000	90 000	100 000
Average	35 900	50 800	48 300	53 800

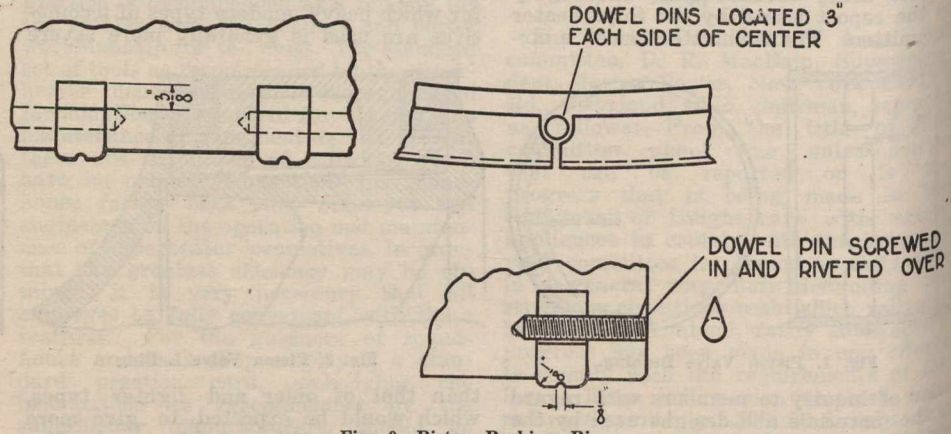


Fig. 9 Piston Packing Rings.

These figures indicate that better results are obtained by the use of Hunt-Spiller gun iron for piston valve packing rings than is obtained by the use of other varieties of cast iron.

The arrangement of piston valve bull ring and packing rings in most common use is shown in fig. 2. This shows the old familiar L ring, which is used by the greatest number of the roads reporting. Several roads also use the Z ring and anchored ring, shown in figs. 3 and 4, respectively. Two large roads use a T ring, as shown in fig. 5. Several roads use the standard designs of the American

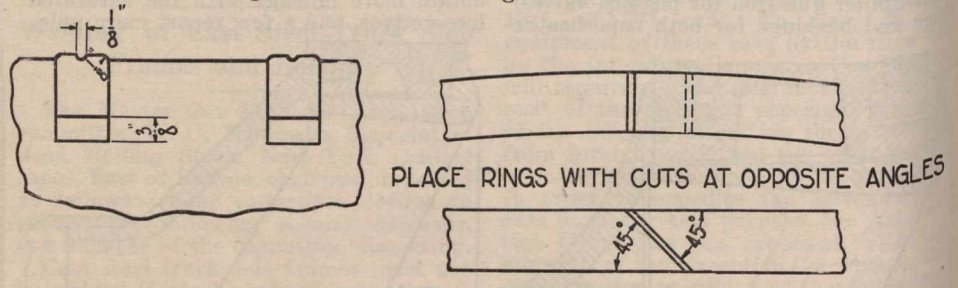


Fig. 10. Piston Packing Rings.

Balanced Valve Co. The data are not available to make a comparison of the various designs upon a mileage basis. The Z ring and anchored ring have the advantage that if broken they are held in place by their shape, but in view of the successful use of the L ring, shown in fig. 2, by the majority of the roads reporting, the committee believes this to be the best design of piston valve packing ring.

Piston Valve Bull Rings.—Cast iron is used for piston valve bull rings on superheater locomotives by 22 roads out of the 34 reporting; Hunt-Spiller gun iron is used by 10; cast steel is used by one, and one does not state. Cast iron is used on saturated locomotives by 21 roads, and Hunt-Spiller is used by 6. Figures for the mileage obtained on piston valve bull rings were submitted by 13 roads. We give below the maximum and average of all the replies received, and similar figures for the roads using cast iron and those using Hunt-Spiller.

Mileage of Piston Valve Bull Rings—Average of replies from 13 roads:

	Superheater. Frgt.	Pass.	Saturated. Frgt.	Pass.
Maximum	150 000	200 000	120 000	165 000
Average	73 400	102 700	69 200	92 400

Mileage of Cast-iron Piston Valve Bull Rings—Replies from 9 roads using C. I. for superheater locomotives and 7 roads using C. I. for saturated locomotives:

	Superheater. Frgt.	Pass.	Saturated. Frgt.	Pass.
Maximum	150 000	120 000	120 000	165 000
Average	72 000	78 500	64 700	93 100

Mileage of Hunt-Spiller Piston Valve Bull Rings—Replies from 4 roads using H.-S. for superheater locomotives and 2 roads using H.-S. for saturated locomotives:

	Superheater. Frgt.	Pass.	Saturated. Frgt.	Pass.
Maximum	135 000	200 000	90 000	100 000
Average	76 500	145 000	85 000	90 000

Fig. 2 shows the bull ring used in connection with the L type packing ring, and is considered the best design by the committee. Figs. 3, 4 and 5 show other styles of bull rings used with Z rings, anchored rings and T rings.

Cylinder Bushings.—Cast iron is used for cylinder bushings on superheater locomotives by 10 of the 34 roads reporting. Hunt-Spiller is used by 24. One of these roads uses Hunt-Spiller for passenger locomotives and steeled cast iron for freight locomotives. Cast iron is used on saturated locomotives by 20 roads; Hunt-Spiller is used by 12, and 2 do not state. The replies were very meagre and incomplete with regard to mileage, only 9 roads giving any figures. A number of the figures received are obviously mileage between borings instead of mileage between renewals, as asked for in the circular.

The thickness of cylinder bushings as shown on the drawings submitted, varies from ⅝ in. to 1½ in. Fig. 6 shows a design of cylinder bushing that is in quite general use. This is a straight bushing extending from the front cylinder head to the back cylinder head. The steam opening at each end may consist of a single opening, as shown, or may have one or two bridges. Fig. 7 shows a design of cylinder bushing used by several roads. This is a straight bushing, with the ends cut away at the top to provide

steam passages. This bushing is placed in position from the front. and is held in position at the back end by a shoulder in the cylinder casting. Fig. 8 shows another style of straight cylinder bushing, terminating at the inside of the port at the back end. The straight bushing seems to be preferred by most of the members, only one road reporting the use of a bushing with a shoulder. One road uses a bushing made in two sections, each section being pressed in from the cylinder ends. The committee has no knowledge of the advantage of this arrangement. All the bushings illustrated are considered good, but in the opinion of the committee the simplest and best is shown in fig. 7.

Piston Packing Rings.—Cast iron is used for piston packing rings on superheater locomotives by 6 of the 34 roads reporting, and Hunt-Spiller is used by 28. Cast iron is used on saturated locomotives by 18, and Hunt-Spiller by 16. Figures for mileage obtained on piston packing rings were submitted by 15 roads. The maximum and average figures are given below, together with similar figures for the roads using cast iron and those using Hunt-Spiller.

Mileage of Piston Packing Rings—Average of replies from 16 roads:

	Superheater.		Saturated.	
	Frgt.	Pass.	Frgt.	Pass.
Maximum	45 000	60 000	60 000	70 000
Average	18 300	22 700	26 400	33 800

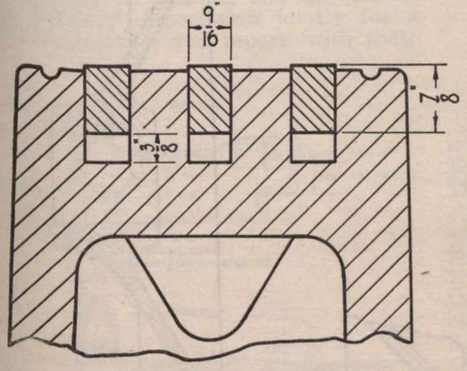


Fig. 11. Piston Packing Ring.

Mileage of Cast-iron Piston Packing Rings—Replies of 4 roads using C. I. for superheater locomotives and 8 roads using C. I. for saturated locomotives:

	Superheater.		Saturated.	
	Frgt.	Pass.	Frgt.	Pass.
Maximum	14 000	20 000	32 500	49 800
Average	8 200	14 900	20 800	30 900

Mileage of Hunt-Spiller Piston Packing Rings—Replies from 11 roads using H.-S. for superheater locomotives and 7 roads using H.-S. for saturated locomotives:

	Superheater.		Saturated.	
	Frgt.	Pass.	Frgt.	Pass.
Maximum	45 000	60 000	60 000	70 000
Average	21 900	25 700	38 600	37 600

Four roads report using Dunbar type packing, the others using the ordinary snap rings. The data in possession of the committee are such that at the present time no recommendation is made as to advantage of either, but offer sketches of some designs of rings, as shown. See figs. 9, 10, 11, 12.

Piston Heads and Bull Rings.—Cast iron is used for piston heads or bull rings on superheater locomotives by 16 of the roads reporting, and Hunt-Spiller is used by 16. Two roads are experimenting with pistons having a brass or bronze wearing face cast on the periphery of the piston. Twelve roads submitted figures for the mileage obtained on piston heads and bull rings. We give below the maximum and average of all the replies received, together with similar figures for the roads using cast iron and those using Hunt-Spiller.

Mileage of Piston Heads and All Bull Rings—Average of replies from 12 roads:

	Superheater.		Saturated.	
	Frgt.	Pass.	Frgt.	Pass.
Maximum	135 000	180 000	135 000	180 000
Average	58 600	70 800	58 200	79 400

Mileage of Cast-iron Piston Heads and Bull Rings—Replied from 3 roads using cast-iron on superheater locomotives and 7 roads using cast-iron on saturated locomotives:

	Superheater.		Saturated.	
	Frgt.	Pass.	Frgt.	Pass.
Maximum	72 000	98 000	62 500	100 000
Average	45 000	61 700	40 700	63 400

Mileage of Hunt-Spiller Piston Heads and Bull Rings—Replies from 6 roads using H.-S. on superheater locomotives and 3 roads using H.-S. on saturated locomotives:

	Superheater.		Saturated.	
	Frgt.	Pass.	Frgt.	Pass.
Maximum	135 000	180 000	135 000	180 000
Average	69 300	81 300	98 300	113 300

The piston shown in fig. 13 is an illustration of a box type piston, which is the type of piston in most general use in this country. Fig. 14 is an illustration of a steel plate type piston with a bull ring increased in width at the bottom, thus affording larger bearing area, where bearing area is needed. Fig. 15 shows a solid steel plate type piston recommended for use in connection with extended piston rods.

The committee feels that fig. 13 is representative of the best design of solid box type pistons. It is believed, however, that plate type pistons will be more generally used in the future, and the committee considers fig. 14 to be representative of the best design of plate type piston and bull ring.

The committee submitted the question of the desirability of providing extra long piston rods on new locomotives, or in rebuilding old locomotives, in order that the piston head can be moved forward enough to replace cylinder packing without disconnecting cross-head. The opinion expressed by reports received is almost unanimous in favor of this practice for new locomotives. Most of the reports also favor this practice in the cast of rebuilding old locomotives, if it is practical to do so.

The committee can substantiate that part of the report of the committee on the maintenance of superheater locomotives, page 239, Proceedings A.R.M.M.A., 1912: "A metal suitable for use as cylinder and steam-chest bushings of superheater locomotives should be homogeneous, close grained, tough and of good wearing quality, combined with sufficient strength. It should be tough in order to resist wear, but at the same time it must be of such composition that it can be readily machined." The qualities described are necessary not only for valve and cylinder bushings, but also for piston valve packing rings and bull rings, piston packing rings, and piston heads or bull rings.

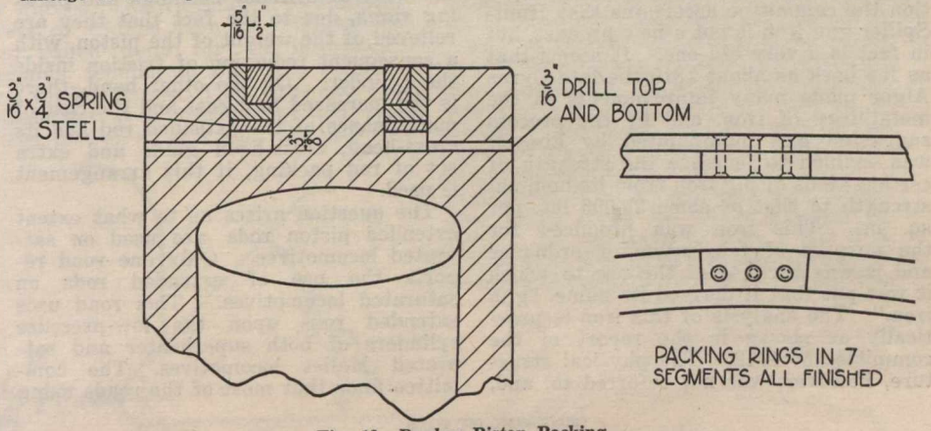


Fig. 12. Dunbar Piston Packing.

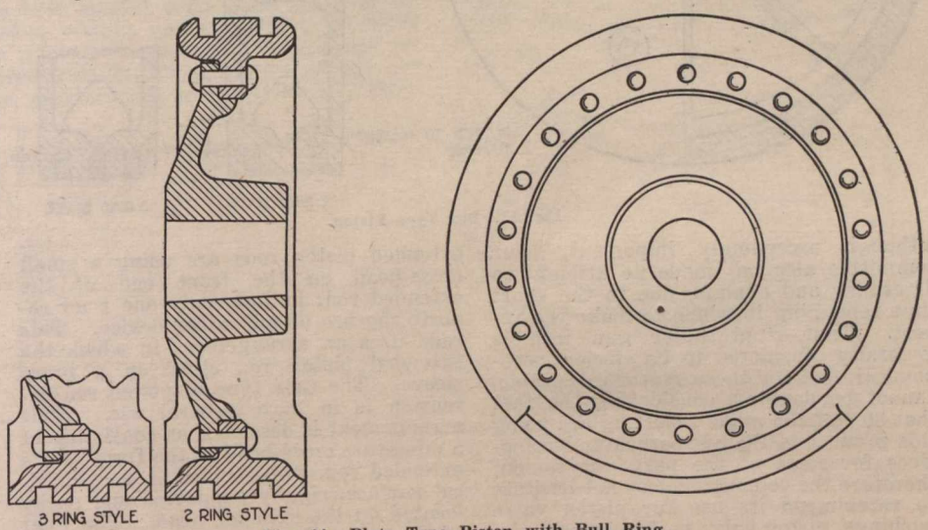


Fig. 14. Plate Type Piston with Bull Ring.

We present here a summary of the percentage of the roads reporting that use Hunt-Spiller gun iron for the various parts on superheater and saturated locomotives:

Percentage of the Roads Reporting That Use H.-S.

Name of part.	For superheater locomotives, Per cent.	For saturated locomotives, per cent.
Piston valve bushings	76	37
Piston valve packing rings.	79	52
Piston valve bull rings. . . .	29	22
Cylinder bushings	71	35
Piston packing rings.	82	47
Piston heads or bull rings.	47	21

The large number of roads using Hunt-Spiller gun iron leads the committee to an investigation of what this product is. We

quote from the report of the Committee on Maintenance of Superheater Locomotives for 1912, as follows: "Replies to the circular of inquiry indicate that Hunt-Spiller gun iron has been used on many railways with excellent results. This is said to be an air furnace charcoal iron, and the process of manufacture, combined with the proper chemical composition, seems to result in a metal which is well adapted for use with highly superheated steam." Upon further investigation the committee ascertains that Hunt-Spiller gun iron is not a new product, but in fact is a very old one. It seems that as far back as about 1810 the late Cyrus Alger made many improvements in the metallurgy of iron, and by the process suggested and manipulated by himself was enabled to increase the strength of certain kinds of pig iron from its nominal strength to that of some 35,000 lbs. per sq. in. This iron was produced for the purpose of fabrication of ordnance and it was because of the use to which it was put that it derived its name, "gun iron." The analysis of this iron is practically as shown in the report of the committee of 1912. The physical structure, however, was not referred to, and, although exceedingly important, your committee also has made no attempt to determine and explain, due to the short time remaining in which to make the report. That Hunt-Spiller gun iron is generally considered to be efficient, economical, and for these reasons desirable, cannot be doubted, considering the fact that 80% of the roads reporting are using this product in their superheater locomotives for some of the parts mentioned; therefore the committee does not hesitate to recommend its use for piston valve bushings, piston valve packing rings, piston valve bull rings, cylinder bushings, piston packing rings, and pistons or piston bull rings.

Extended Piston Rods.—The committee included in its circular of inquiry a list of questions on the use of extended piston rods. Eighteen roads report experience with extended piston rods. A great diversity of experience and opinion has been expressed. Three roads out of the 18 have entirely discontinued the use of extended piston rods as a result of their experience, and several others find them to be of no advantage. On the other hand, several roads state that a saving is effected by the use of the extended piston rods. For comparison it may be noted that the report of the Committee on the Maintenance of Superheater Locomotives for 1912 shows that 18 out of 36 roads replying to the circular had locomotives equipped with extended piston rods, but 3 of these were eliminating them. It is seen, therefore, that there has apparently been no increase in the use of extended piston rods since that time. It is the contention of some that the use of extended piston rods reduces the wear of cylinder bushings and packing rings, due to the fact that they are relieved of the weight of the piston, with a consequent reduction of friction inside the cylinder. On the other hand, there is the increased first cost and the cost of maintenance of the extended rod and its cross-head, cross-head guide and extra set of rod packing, if this arrangement is used.

The question arises as to what extent extended piston rods are used on saturated locomotives. Only one road reports the use of extended rods on saturated locomotives. This road uses extended rods upon the low-pressure cylinders of both superheater and saturated Mallet locomotives. The committee finds that most of the roads using extended piston rods are using a small cross-head on the front end of the extended rod; in fact, only one road reports the use of any other device. This road uses an arrangement in which the extended piston rod slides in a brass sleeve. The Cole type of piston rod extension is in most general use. This arrangement is described as consisting of a miniature cross-head at the front of the extended rod, which slides on a cylindrical surface, rigidly supported and easily located on the cylinder head. The wear of the extension cross-head on the guide is taken care of by lining up between the small cross-head shoe and its body. The packing on the extended rod is easy of access and can be repaired without difficulty. The extension guide is self-centered on a circular flange of the cylinder head, and requires no adjustment in service, as it cannot get out of position. The guide is made with an open top, so that when it is necessary to remove the guide it can be dropped from the rod.

Twelve roads have reported the minimum size of cylinders used in connection with extension piston rods. The minimum diameter of high-pressure cylinders varies from 20½ in. to 29 in., the average being over 24½ in. With regard to the tendency of the extended piston rod to spring, reports show that 5 roads find this tendency. Nine roads sate that there is no increase in expense of maintaining rod packing with extended piston rods, and 3 roads state that the expense is increased. One road states that the expense of maintaining piston rod packing is doubled by the use of the extended piston rod. Lubrication by oil cups is almost universal, only one road using the splash system for extended piston rods. Open-hearth steel is very generally used for extended piston rods. Experiments with vanadium steel or other special alloy steels have not developed to a point where the committee can recommend them for this purpose.

From a careful consideration of the replies, the committee concludes that there is no particular necessity for the use of extended piston rods, except where railways traverse hilly country where long stretches of drifting is usual. However, where its use is desired, we advise the necessity of such a diameter of extended rod as to prevent springing, and are of the opinion that in no event is the extended rod necessary on cylinders of 20 in. diameter and less.

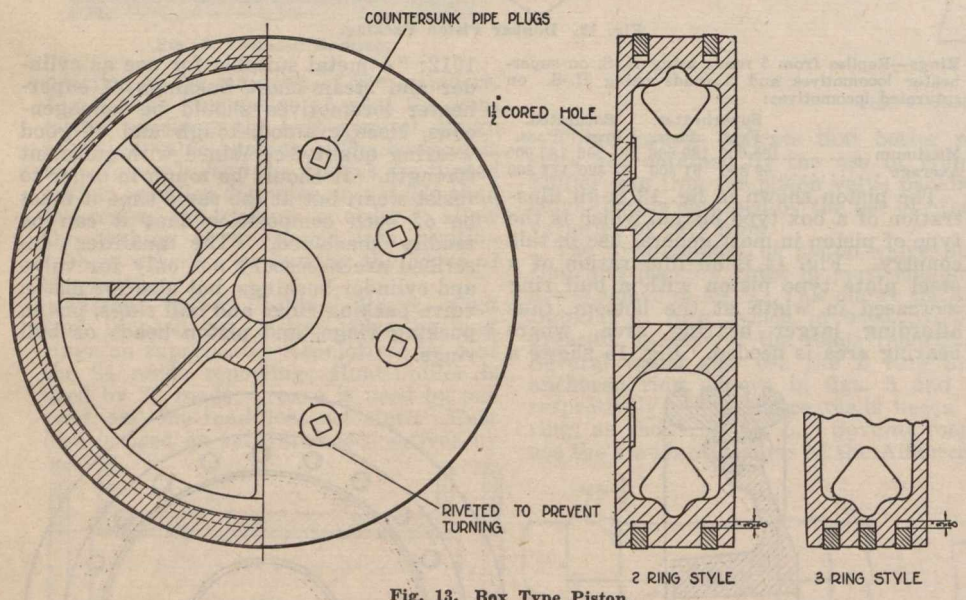


Fig. 13. Box Type Piston.

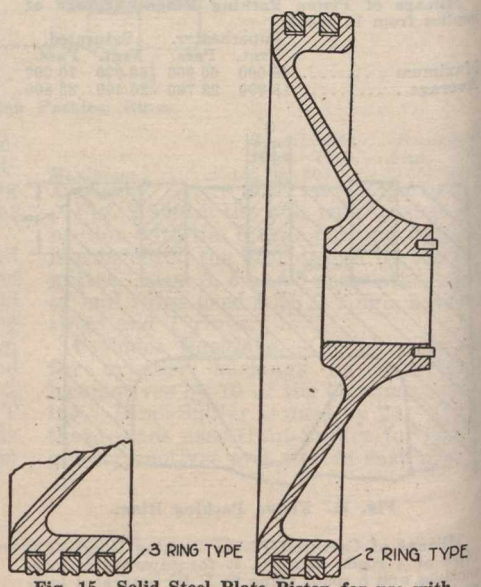


Fig. 15. Solid Steel Plate Piston for use with extended piston rod.

International Railway Fuel Association.—At the annual convention at Chicago, Ill., recently, it was announced that there was a total membership of 636. During the meetings 68 new members were enrolled. The officers for the current year are: President, W. H. Averell, Baltimore and Ohio; Vice Presidents, E. W. Pratt, Chicago and North Western; L. R. Pyle, Minneapolis, St. Paul and Sault Ste. Marie; W. L. Robinson, Baltimore and Ohio. The convention for 1917 will be held at Chicago.

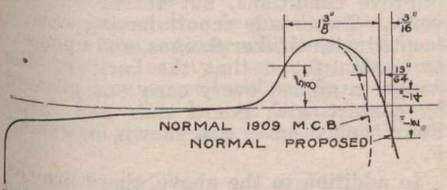
Railway Storekeepers' Association.—The officers for the current year, elected at the recent annual convention, are: President, W. A. Summerhayes, Illinois Central; First Vice President, H. S. Burr, Erie; Second Vice President, E. J. Roth, Chicago, Indianapolis and Louisville; Third Vice President, J. N. Shaw, Delaware, Lackawanna and Western; Treasurer, J. P. Murphy, New York Central.

In machining operations the speed and the feed are settled upon in the works planning department, and are based on the power of the machine and the character of the metal to be machined. These have been worked out after careful study, and for efficiency displace the old method of relying on the workman's judgment.

Report of Committee on Car Wheels.

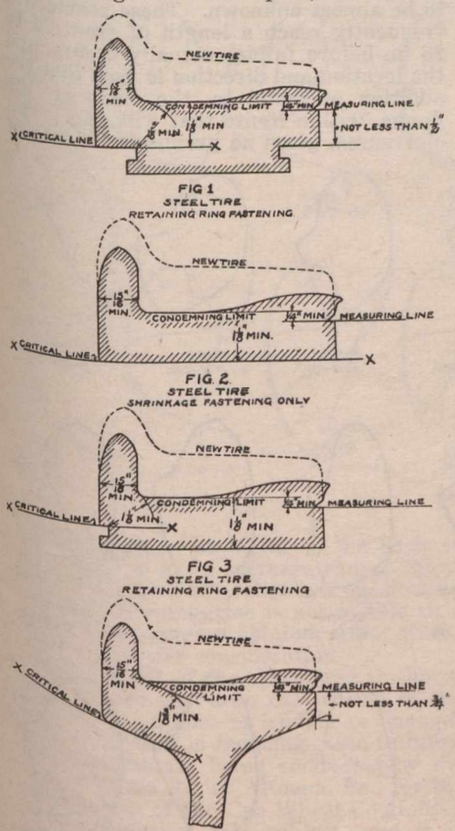
The Master Car Builders' Association committee, W. C. A. Henry, Superintendent Motive Power, Pennsylvania Lines, Columbus, Ohio, chairman, and of which L. C. Ord, Assistant Works Manager, Car Shops, Angus Works, Canadian Pacific Railway, Montreal, now on active military service. was a member, reported as follows:

The following resolution of the American Railway Association's Committee on Maintenance was forwarded Nov. 7, 1913, by the General Secretary of that association to the Secretary of the M.C.B.A.:



Thickness of Flange for All Chilled Iron Car Wheels Recommended by Association of Manufacturers of Chilled Iron Car Wheels.

"Resolved, That the subject of the contour of chilled car wheels and the throat clearance for frogs, guard rails and crossings be referred to the American Railway Engineering Association and the Master Car Builders' Association jointly for a full investigation and report, with their



recommendations for any change that they may conclude is desirable."

This subject, having been referred to the Committee on Car Wheels, has been investigated jointly with the American Railway Engineering Association's Committee on Track. This subject was originally brought up by the Association of Manufacturers of Chilled Car Wheels, that association arguing that the strength of the flange of the chilled iron car wheel has not kept pace with the increase in the load, and that the wheels under cars, especially of the higher capacities, should have the flanges thickened. The following diagram shows the thickness of the flange recommended by them for all chilled iron car wheels. The Association of Manufacturers of Chilled Iron Car Wheels has been called upon for all information available, tending to show the necessity for a thicker flange. They have also been represented at a meeting of our committee, as well as at a joint meeting with

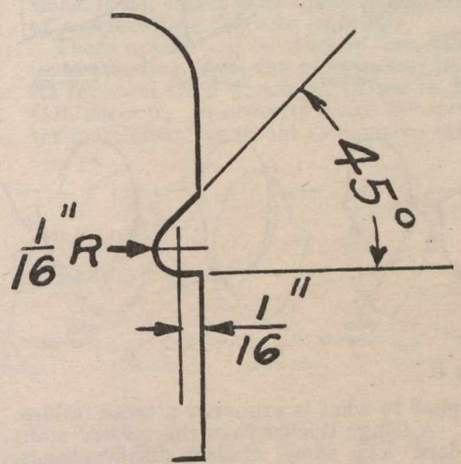


Figure 5.

a subcommittee of the American Railway Engineering Association's Committee on Track.

On May 1, 1914, a circular was sent to all M.C.B. Association members, requesting that special reports be made of all broken wheels, and explaining in detail the information desired. Replies were received from 33 railways and 1 private car line, representing an ownership of 1,297,-

WT. OF WHL LBS	YEAR CAST	NUMBER BROKEN FLANGES REPORTED. THICKNESS OF FLANGE AT A POINT 3/8" ABOVE TREAD: LESS THAN 15/16"	15/16" TO 1"	OVER 1" TO 1 1/16"	OVER 1 1/16" TO 1 1/8"	OVER 1 1/8" TO 1 3/16"	OVER 1 3/16" TO 1 1/4"	OVER 1 1/4"	TOTALS.
625	1915								1
	1914	1						1	1
	1913								
	1912	1			2		2		5
	1911							1	1
	1910				1			1	2
	1909		1						1
	TOTAL	2	1		3		2	3	11
675	1915						1		1
	1914						2		6
	1913		2	1	1		2		6
	1912			1	1	2	2		6
	1911			1					1
	1910		2						2
	1909			3					3
	TOTAL		4	6	2	2	5		19
725	1915								
	1914			2	1	2		2	7
	1913	2	2	5	6	2	2		19
	1912	1	11	5	3	5			25
	1911	1	4		1	2			8
	1910		6	1	3	2	2		14
	1909								
	TOTAL		4	25	12	15	11	6	73

Exhibit A. Summary of Flange and Tread Failures.

909 cars, approximately 46.2% of the cars owned or controlled by railways or individual companies, members of the M.C.B. Association.

Exhibit A is a tabulation of replies received to this circular, covering all M.C.B. wheels of the present standard cast from 1909 to 1915, having broken flanges and for which the flange thickness was given. For each of the three standard weights of wheels the information has been grouped so as to show the year cast and the thickness of the flange, measured at a point three-eighth inch above the tread. In addition to the 103 cases shown on this tabulation, there were four 625-lb., five 675-lb., and seventeen 725-lb. wheels reported, a total of 26 for which the thickness of flange was not shown.

Exhibit B shows the location and direction of the fracture for such of the wheels shown in Fig. 2, for which this information was furnished. Of the 103 cases shown in Fig. 2, 62 were reported as the result of seams, 3 due to worn flange, 2 to defective castings, 1 to worn tread, 1 overheated, 3 thick chill, no reason whatever being given for the remaining 31 cases. By referring to Figs 2 and 3 it will be seen that these failures are not by any means confined to wheels having the

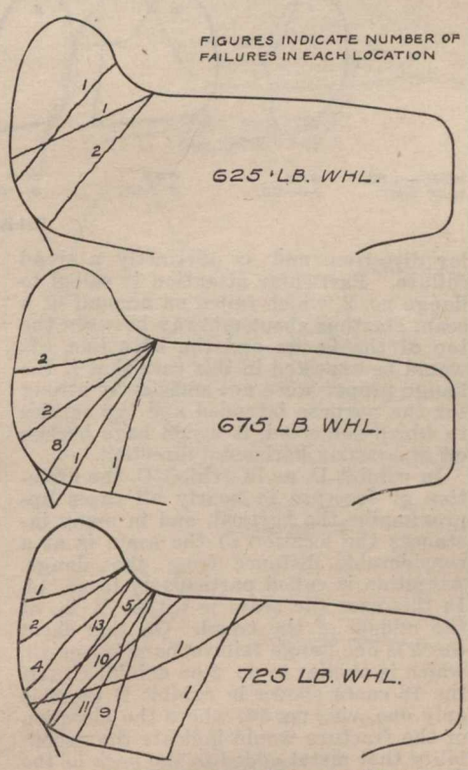


Exhibit B. Location of Flange and Tread Failures.

thinner flanges, and that of the 103 cases, 27 occurred with a flange thickness over one and three-sixteenth inches, or above the minimum thickness for a new flange. The location and direction of the fracture in nearly all cases more nearly approaches the vertical than the horizontal, and does not occur through the minimum section of metal.

One of the roads represented on this committee has obtained the exact contour and dimensions of the flanges of all cast iron wheels that were withdrawn from service on account of seams in the tread at or near the throat of the flange during a period of twelve months. These are accurately shown on Exhibits C, D and E for the three sizes of wheels; also the outline of the flange and a portion of the tread of the M.C.B. standard cast iron wheel of the three nominal weights are shown. In obtaining these specimens in each case the flange back of the seam was broken off with a sledge, and the outline traced from a section cut from same at the middle of the seam. The

depth of the seam is indicated by the heavy line extending downward from the tread. All of these cases, if not detected by inspection and the wheel withdrawn from service, would have finally resulted in a so-called broken flange, and for purposes of study are of the same value as if actually broken off in service.

Of the 12 cases shown on Exhibit C there are no fractures in even an approximately horizontal direction across the flange, while in a number of cases the fracture extends in an almost perpendicular direction, and is distinctly a tread failure. Particular attention is called to flange no. 2, which failed on account of a seam starting about midway between the top of the flange and the base line. It would be expected in this case that if the flange proper were not sufficiently strong for the purpose intended and the service to which subjected, it would have broken off in a nearly horizontal direction.

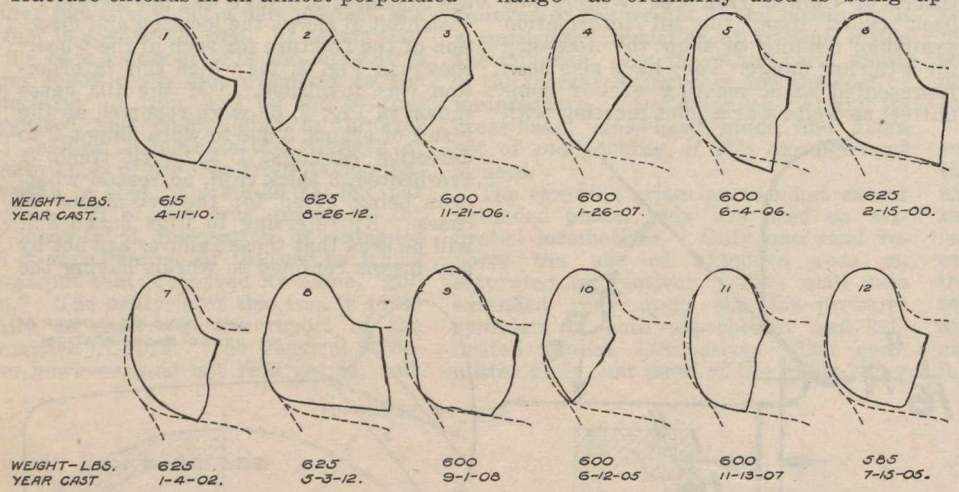


Exhibit C.

In exhibit D, as in exhibit C, the direction of fracture in nearly all cases approximates the vertical, and in many instances the location of the seam is at a considerable distance from the flange. Attention is called particularly to no. 14. In this case the seam is within ¼ in. of the middle of the tread. On this sheet there is one flange failure, namely, no. 15, which is similar to no. 2 on exhibit C. Of the 18 cases shown in exhibit D there is only one, viz., no. 16, where the direction of the fracture would indicate the probability that metal added to the back of the flange might have prevented the fracture.

In the case of exhibit E, on which are tabulated the heavy wheels, the location and direction of fracture is about the same as for the lighter wheels. Particular attention is called to flanges nos. 7 and 8. The former was obtained from a wheel of special design, weighing 750 lb., cast in Jan., 1913. The flange of this wheel was reinforced by the addition of considerable metal at the back and below the base line. Attention is called to the seam which was found in this wheel, and which occurred in the characteristic location. The direction of the same, as well as the line of fracture when breaking off the flange, differ in no respect from the majority of the others. The back of the flange of this wheel has been worn or grooved considerably by contact with guard rails and in passing through frogs, the original contour at this point being shown by dotted lines. Flange no. 8, which was obtained from a 700-lb. wheel cast in Mar., 1906, is the only one among the 15 on this sheet that might have been helped by the addition of metal to the back of this flange, although this would be at such point as not to affect in any way track clearances.

It is most apparent from a study of the thickness of the flanges as shown on exhibit A, the location and direction of the fractures as shown on exhibit B to E, inclusive, that the flange thickness at or near the base line, or for such distance from the base line as would affect rail clearances, can have little or no bearing on failures of this nature, as in the majority of cases the original failure occurs in the tread, and the term "broken flange" as ordinarily used is being applied to what is primarily a tread failure.

A flange thicker than the present standard has some distinct disadvantages. One of the strongest arguments offered for the adoption of the present taper of tread of 1 in. in 20 in. was the opportunity afforded a pair of wheels to move laterally until both run upon a common diameter, this condition tending to keep flanges away from the rail, thereby not only decreasing the flange and rail wear, but train resistance as well. Unless the whole track structure is changed a thicker flange would reduce or eliminate entirely this opportunity for lateral motion. Confirming the above, we would cite the case of one railway on which a trial was made, under tenders, of special cast iron wheels having a flange of ⅛ in. greater thickness than the present M.C.B. standard. These wheels were mounted 4 ft. 8 in. throat to throat, or 5-16 in. wider than standard. The average age of 203 of these wheels when condemned was 11 months. Of a like number of M.C.B. wheels in the same service, the average age when condemned was 11.1 months. Of the special wheels, 28% were condemned on account of worn flange, the average age of which was 12.5 months. Of the M.C.B. wheels, but 15.2% were condemned on account of worn flanges, the average age in this instance being 13.7 months. These figures indicate that the thicker flange did not improve conditions, but rather the reverse. Two roads report having experimented with thicker flanges, and upon examination found that the back of the flange in almost every case was grooved by contact with guard rails and frogs. Four typical cases are shown on exhibit F.

In addition to the above, there are the further minor objections to heavier flanges: of increased weight and a slightly increased cost; although these latter objections are not worthy of consideration if the thicker flange gave indications of adding anything to the safety or life of the wheel.

Failures of flanges of cast iron wheels, under fair usage, other than those caused by circumferential seams, are so rare as to be almost unknown. These seams will frequently reach a length of from 24 to 28 in. before failure actually occurs, and the location and direction is such that the addition of metal to the back of the flange, within limits that will affect rail clearances, gives no promise whatever of affording any relief from so called flange failures. A study of the information available does not indicate that under the present standards for new flanges and the condemning limits for thin flanges, the horizontal thickness of the flange has anything to do with failures of the kind under consideration.

Under date of March 14, 1916, your

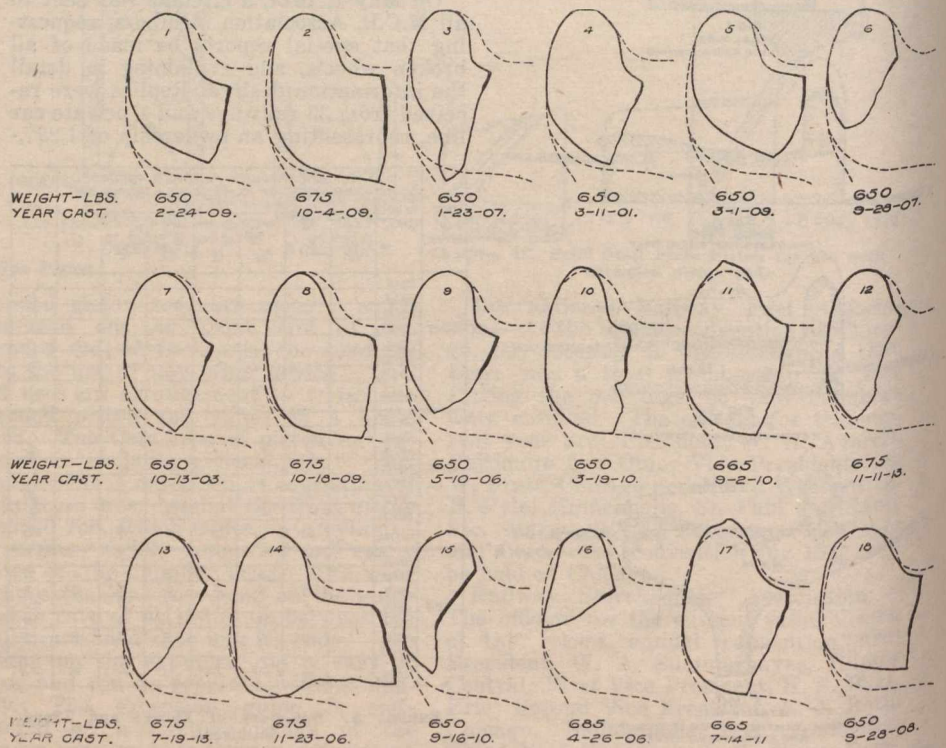


Exhibit D.

committee addressed a communication to the American Railway Engineering Association's subcommittee on track, advising that it was the unanimous opinion of our committee, after a thorough study of flange failures and so called flange failures that the addition of metal to the back of the flange within any limits that would alter the relation of the flange to the track would have no effect whatever on flange failures; furthermore, that we saw no reason for recommending any changes for throat clearances for frogs, guard rails and crossings, and that it was our recommendation that there be no change in the dimensions and contour of flanges of car wheels or throat clearances for frogs, guard rails and crossings, as adopted in 1909.

Your committee is unanimously of the opinion that nothing will be gained in the interests of safety or economy by adding metal to any portion of the flange of cast iron car wheels in such location as will in any way affect track clearances. Whether the addition of metal to the back of the tread so as to increase throat thickness will afford any relief is a question on which your committee is not at this time ready to express an opinion, although the matter is under consideration.

The subject of the shape and thickness of plate for cast iron car wheels is one that gives promise of leading to changes that will result in reducing plate failures. Experiments are being conducted by the Pennsylvania Rd. at Altoona, Pa., for the information of the Car Wheel Committee in investigating this subject, and it is hoped that we will be in a position to make report to the next convention.

The question of design and specifications for a cast iron wheel for use with the 6 by 11 in. axle is under consideration, and will be made the subject of a future report.

It has been recommended that this association should have standard maximum and minimum pressures for mounting wrought steel and cast iron wheels on axles of the different sizes, and the following table is hereby submitted for consideration, with the recommendation that it be adopted as recommended practice:

MOUNTING PRESSURE IN TONS.

Axle.	Wheel seat Diam.	Cast iron wheels. Min.	Max.	Steel wheels. Min.	Max.
A	5⅛ in.	30	45	45	60
B	5¾ in.	35	50	50	70
C	6½ in.	40	60	60	80
D	7 in.	45	65	65	85
E	7⅝ in.	50	70	70	95

The following change should be made in specification governing dimensions and tolerances for solid wrought steel wheels:

Paragraph "3g. Limit of Wear Groove —The limit of wear groove to be located as shown on sheets M.C.B.—R, S and T."

This change is a correction, as M.C.B. sheet C, referred to in present specifications, is not intended to apply in the case of specifications for new wheels.

There appears to be more or less misunderstanding as to the condemning limits for steel tired wheels as shown on M. C.B. sheet C. In order to make the matter more clear, we would recommend that figs. 1, 2, 3 and 4 be changed, as shown herewith, the change consisting in removing reference to the flange height, which has no bearing on this subject, removing the words "Not less than ½ in." from fig. 3, and indicate that certain other dimensions affected by wear are all minimum dimensions.

We have received complaint that it is extremely difficult to maintain tools for turning the limit of wear groove for steel and steel tired wheels, as shown on M.C. B. sheets C, R, S and T, and it has been recommended that to correct this trouble the shape of the limit of wear groove be slightly modified so that there will be a fillet at the bottom of the grove instead of the present sharp angle.

It is therefore recommended that the shape of the limit of wear groove be changed in accordance with fig. 5, and that it be shown on sheets C, R, S and T, and to such scale as to make the shape and dimensions plain. The Secretary is requested to make corrections and changes in M.C.B. sheets C, R, S and T, referred to above.

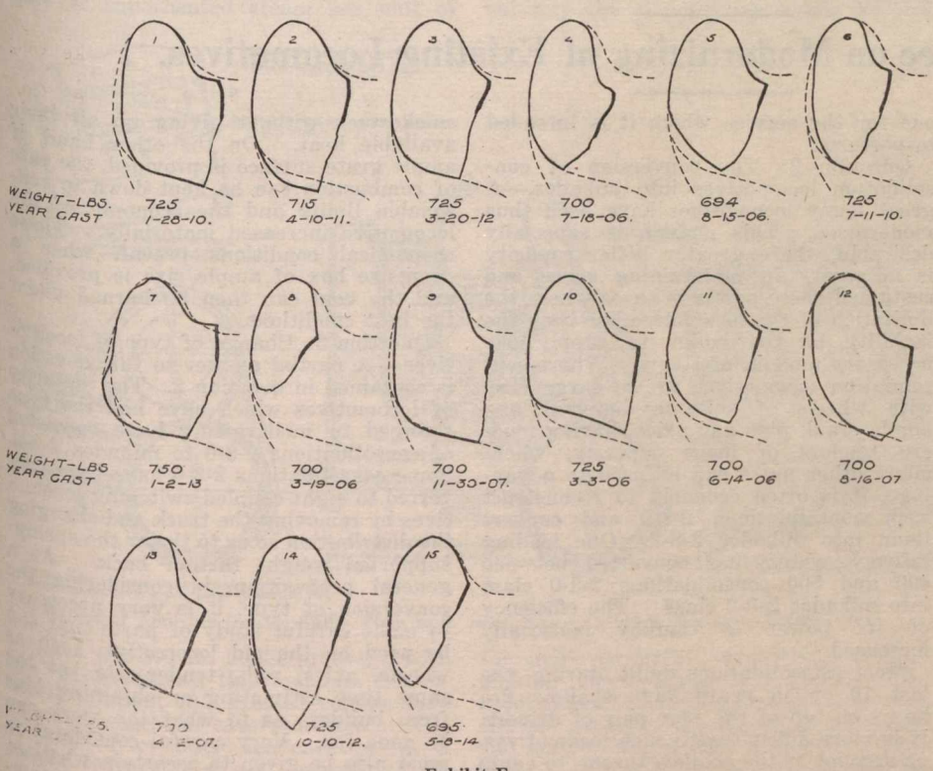


Exhibit E.

Railway Supply Exhibits at the Atlantic City Conventions.

The Railway Supply Manufacturers' Association exhibit was, as usual, of a very comprehensive nature, larger than in 1915 but not as large as in 1914. Among the principal exhibitors were the following:—

American Brake Shoe & Foundry Co., Mahwah, N.J.—Reception booth.

American Locomotive Co., New York, N.Y.—Reception booth.

Anchor Packing Co., Philadelphia, Pa. —General locomotive packings.

Buffalo Brake Beam Co., New York, N.Y.—Freight brake beams for all classes and capacities of equipment; truss beams with either malleable iron or forged steel struts to M.C.B. standards; also beams for E. & L. equipment and all classes and capacities of tenders and electrical equipment for standard broad and narrow gauge; Buffalo passenger brake beams for all classes of service, including L.N. & P.C. equipment with automatically adjustable heads and safety locks.

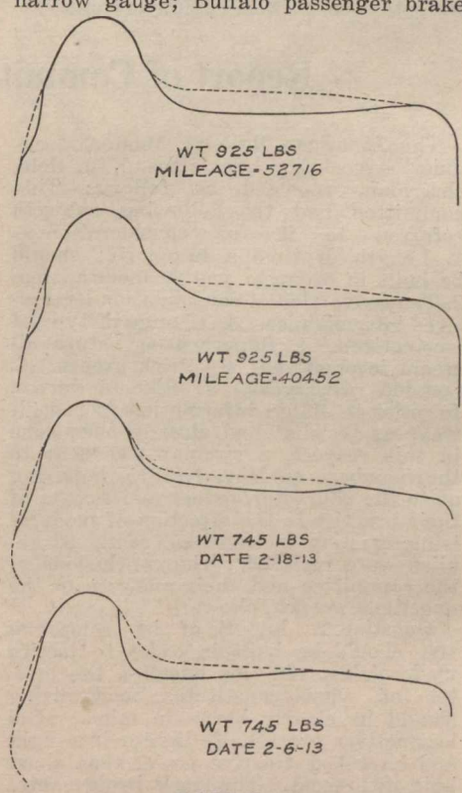


Exhibit F.

Chicago Car Heating Co., Chicago, Ill. —Car heating apparatus.

Consolidated Car-Heating Co., Albany, N.Y.—Nine foot section of one side of a passenger car in which all the specialties used in a modern steel car are installed; Thermo-vapor temperature regulator, whereby a constant temperature is maintained; automatic attachment whereby temperatures in sleeping and private cars can be so controlled that they will maintain a 70 deg. temperature in the day time and 60 deg. temperature at night.

Dearborn Chemical Co., Chicago, Ill.— Boiler feed water treatment scientifically prepared to meet requirements shown by analyses of the waters used.

Detroit Lubricator Co., Detroit, Mich.— Detroit locomotive lubricators; flange oilers, and air cylinder lubricators; Detroit lubricators; force feed oilers; packless radiator valves; Stewart carburetors.

Du Pont Fabrikoid Co., Wilmington, Del.—Fabrikoid; superior leather substi-

tute; travel goods; bookbinding novelties.

Fairbanks Morse & Co., Chicago, Ill.—50 h.p. 2 phase, 60 cycle, 220 volt, 900 r.p.m. type H electric motor with special insulation treatment; 25 h.p. 3 phase, 60 cycle, 220 volt, 1,200 r.p.m. type KHV motor with special insulation treatment; 15 h.p. 3 phase, 60 cycle, 220 volt, 900 r.p.m. type H motor with special insulation treatment and CC starter; Rotor complete with half bearing arm for large type H motor; CP type ball bearing motor with secial water proof insulation treatment.

Flannery Bolt Co., Pittsburgh, Pa.—Tate flexible staybolts; Tate radial staybolts; installation tools for application of Tate flexible staybolts.

Franklin Railway Supply Co., New York, N.Y.—Franklin automatic adjustable driving box wedge; Franklin fire door; Franklin single water joint; Stone-Franklin lighting equipment.

Galena-Signal Oil Co., Franklin, Pa.—Reception booth with samples of oils.

Garlock, Packing Co., Palmyra, N.Y.—Garlock air pump and throttle packing; superheat sheet and gaskets; packings for general shop purposes.

Goldschmidt Thermit Co., New York, N.Y.—Thermit and appliances for Thermit welding; sample welds; samples of carbonfree metals and alloys produced by Thermit process; large sample weld on a 9 in. crank shaft; materials and appliances for demonstrating pipe welding for the purpose of welding locomotive superheater units; sample of superheater unit welded by Thermit process.

Hunt-Spiller Manufacturing Corpn., So. Boston, Mass.—Cylinder packing; cylinder bushings; piston heads; valve packing; valve bushings; valve bull rings; side rod bushings; knuckle pin bushings; air pump packing; air pump bushings; eccentrics; eccentric straps; crosshead shoes; slide valves; valve strips; pedestal shoes; pedestal wedges; driving boxes.

Locomotive Superheater Co., New York, N.Y.—Pictures illustrating methods and process used in manufacture and superheater units and headers at plant at East Chicago, Indiana.

Norton, A. O., Inc., Boston, Mass.—Self lowering high speed jacks.

Standard Coupler Co., New York, N.Y.

Westinghouse Air Brake Co., Pittsburgh, Pa.—Reception booth.

Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa.—Reception booth.

Westinghouse Friction Draft Gear Co., Pittsburgh, Pa.—Reception booth.

Westinghouse Lamp Co., Pittsburgh, Pa.—Reception booth.

Westinghouse Lamp Co., Pittsburgh, Pa.—Reception booth.

Westinghouse Pacific Coast rake Co., Emeryville, Cal.—Reception booth.

Westinghouse Traction Brake Co., Pittsburgh, Pa.—Reception booth.

Wheel Truing Brake Shoe Co., Detroit, Mich.—All kinds of abrasive brake shoes for operating upon locomotive tires and car wheels.

Report of Committee on Modernizing of Existing Locomotives.

The American Railway Master Mechanics' Association committee, F. J. Cole, chairman, reported as follows:—This committee had the following subjects referred to it for consideration:—1. Length of time a locomotive should be built in order to justify modernizing. 2. The conversion of consolidation locomotives into mikados. 3. Change of type of locomotives. 4. Superheating saturated-steam locomotives. 5. Brick arches. 6. Outside valve gear. 7. Size of valves. In order to obtain information from railways as to what had already been done in this respect, a circular was sent to the members on Nov. 1, 1915, inquiring as to the character, extent and results of their practice in the direction of modernizing existing locomotives. Only 32 replies were received. The conclusions of the committee and their answers to the questions are as follows:

Question 1. Length of time a locomotive should be built in order to justify modernizing.—In this question the matter of what constitutes modernizing should be clearly borne in mind. Old locomotives are usually lighter in weight and have less tractive power than those built at present. The track, bridges, etc., have been increased in strength on most railways, so that higher axle loads and greater total weights can be borne with safety than in previous years. In many instances, however, the capacity, weight and condition of old locomotives would justify the application of many improvements, such as superheating, etc., which make for economy and increase in capacity.

When consideration is given to the question of changing the type of locomotives, as for instance changing the wheel arrangement of consolidation 2-8-0 into mikado 2-8-2, the matter of weight and capacity is the vital issue. Will the locomotive, after a large amount of money, say 50% of its cost, has been spent, be modern in all respects, and will it perform the work in the most satisfactory and economical manner? In other words, will it, when rebuilt, be a thoroughly up-to-date locomotive as could be purchased for this particular service? The matter, therefore, resolves itself into one of judgment as to how much should be spent upon an old locomotive and whether the old locomotive after being rebuilt or modernized is a thoroughly satisfactory one for the service which it is intended to perform.

Question 2. The conversion of consolidation locomotives into mikados.—A great many locomotives have been thus modernized. This change is especially desirable where greater boiler capacity is necessary in maintaining speed and sustained horse power in cases where the limitation of the locomotive has been the inability of the boiler to supply the necessary amount of steam. Where consolidation locomotives are of large size, with wheels of suitable diameter and ample crank pins and axles, having modern tenders of large capacity, where many other parts can be used to advantage, it is often economy to reconstruct such consolidations 2-8-0 and convert them into mikados 2-8-2. One leading railway system has converted between 400 and 500 consolidations 2-8-0 class into mikados 2-8-2 class. The efficiency of its power is thereby materially increased.

Most consolidations built during the last 10 or 15 years have shallow fire boxes on top of the rear pair of drivers. It is more difficult with such locomotives, on account of the shallow throat, to equip them in a satisfactory manner with brick arches. When they are converted into mikados a fire box of any size and depth can be used and brick arches applied in a most satisfactory manner. Flues may be increased in length and smoke box temperatures, that is the heat of the escaping gases, may be decreased correspondingly. The longer bodies also permit the use of combustion chambers, if desired.

A mikado locomotive can at times be operated at much longer cut off without lowering the steam pressure too much, the boiler being ample to provide an adequate amount of steam under the most exacting conditions.

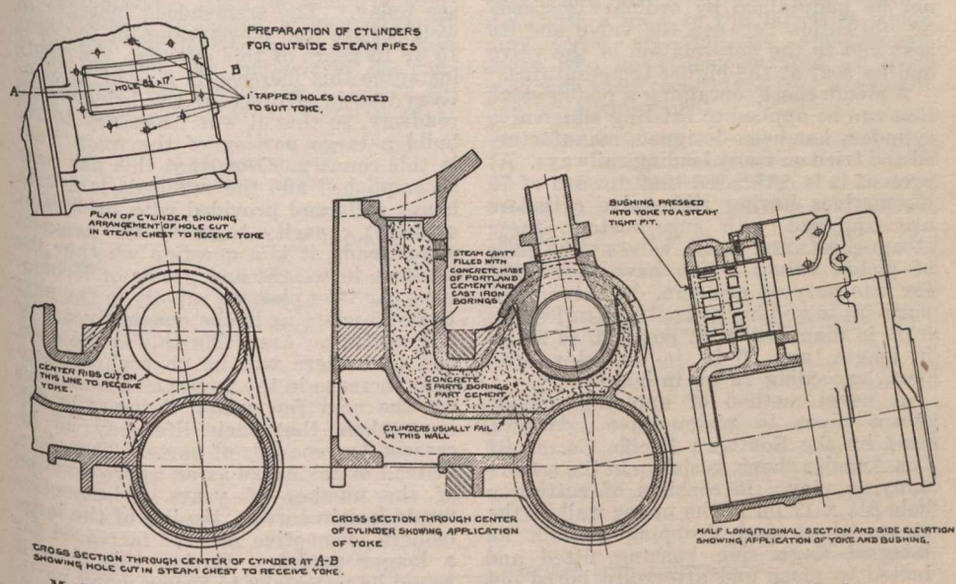
As a general proposition, a locomotive boiler cannot be made too large. It often is made too small. Therefore, one of the most satisfactory means of increasing economy and capacity is to increase the boiler capacity. Fuel is burned on many old locomotives at the rate of 180 to 200 lb. per sq. ft. of grate per hour, but this practice is very uneconomical, as the rate of combustion is so high that a great deal of unburned products of combustion are passed through the flues and smokestack without giving up all their available heat. On the other hand, if ample grate surface is provided, the rate of combustion can be kept down to reasonable limits and the economy of the locomotive increased materially. These economical conditions prevail when a deep fire box of ample size is provided, and the coal can then be burned under the best conditions.

Question 3. Change of type of locomotives.—A partial answer to this question is contained in question 2. The majority of locomotives which have had the type changed in modernizing have consisted of consolidations 2-8-0 to mikados 2-8-2. Some consolidations 2-8-0 have been converted to eight-coupled switching locomotives by removing the truck and changing the distribution so as to throw the spring-supported weight farther back. As a general proposition, in considering the conversion of type, it is very necessary to make careful study of parts that can be used on the old locomotive, such as wheels, axles, rods, tender, etc., at the same time estimating or obtaining bids from builders as to what the work can be done for. Very careful consideration must also be given to ascertain whether, after the rebuilding has been accomplished, the railway would be in possession of a really modern locomotive best adapted to perform the service for which it is intended.

Question 4. Superheating saturated steam locomotives.—The advantages gained from the use of superheated steam on locomotives are now so widely recognized that no special argument in its favor is necessary in this report. At present, nearly all new locomotives are equipped with superheaters. Thousands are being applied every year to old locomotives, and in the near future the majority of the 68,000, or thereabouts, of locomotives in the United States and Canada will be so equipped. At present it is estimated that 15,500 locomotives in the United States and Canada have superheaters applied. Superheated steam is a much better working medium in steam engines than saturated steam. The expression, "dry, saturated steam," is often used, but in practice it is seldom realized, because the steam before it enters the cylinders contains a certain percentage of moisture, and when in contact with the cylinder walls much more heat is given

up, so that at the time of actually moving the pistons it contains a large amount of moisture.

Steam is said to be superheated when its temperature is higher than the boiling point corresponding to the pressure. Steam cannot be superheated in contact with the water from which it was generated. In order to receive additional heat, it must be separated from its liquid and subjected to still higher temperatures. Saturated steam is an unstable fluid or vapor. When in contact with its liquid at any given pressure, it is evident that a narrow margin of heat divides the liquid from the vapor. Any abstraction, therefore, of heat causes one of two things: either a portion will become liquefied or the pressure will be decreased. Superheating affords the only means of adding heat to the steam without increasing its pressure. The economy of highly superheated steam for locomotives is obtained, 1st, in its freedom from condensation losses in the cylinders and steam pipes; 2nd, from the increased volume of superheated steam per unit of



Method of Applying Outside Steam Pipes to P iston Valve Cylinder, Southern Pacific Co.

weight. At 200 lb. boiler pressure, with 250° of superheat, this amounts theoretically to about 40% greater volume than an equal weight of saturated steam. The amount of cylinder condensation in a simple saturated-steam locomotive is estimated to be from 35% at 20½% cut-off, to 12% at 70% cut-off. Assuming that each 1% of moisture will require about 7.5° of superheat to entirely prevent condensation, it follows that with 25% of moisture a superheat of at least 187° will be required, and more is advantageous.

In considering the advantages of superheated steam for locomotives, two general conditions may be noted. 1. The economy in coal and water from the use of superheated steam. 2. The additional power made available by the more economical operation of the locomotive. If a simple locomotive, using highly superheated steam, consumes on an average 25% less fuel in the same service than the same locomotive using saturated steam, then 75 lb. of coal consumed with superheated steam will do the same work as 100 lb. used with saturated steam. There will be, therefore, an increase in indicated horse-power of $\frac{100 - 75}{75} \times 100$ = 33 per cent. in favor of the superheater, and the actual gain in tractive power delivered at the drawbar will be even greater than this increase in indicated horse-power. The reason of this is that at the running speeds of trains about 40% of the i. h. p. is absorbed by the internal friction of the engine and tender, leaving only about 60% to be transmitted to the drawbar. Consequently an increase of 33% of i. h. p. represents a much greater gain in dynamometer horse-power. Therefore, the friction of the locomotive being fairly constant, a much greater drawbar pull than 33% is available at the critical points.

This large addition to the hauling capacity of a highly superheated steam locomotive may be applied either to the hauling of heavier trains or to higher speeds, or to both. An increase in total weight or wheel load due to the application of the superheater is relatively small, say 3000 to 4000 lb. Consequently increased tractive power is obtained without material addition to the weight.

Superheating affords the most available means of meeting in a very economical way the steadily increasing demand for more powerful locomotives without making them abnormally heavy. The application, to existing locomotives, of an efficient superheater capable of producing and maintaining a high degree of superheat, is equivalent to a considerable increase in boiler capacity, which is usually equivalent to a large increase in the hauling capacity of a locomotive. Not only is there considerable fuel economy, ranging from 20 to 25%, in the use of superheated steam, but the general efficiency of the locomotive is so increased as to make it a necessary part of the equipment of all new locomotives and in many cases on old ones. By reducing the amount of fuel required for a given amount of work, the superheater increases the capacity of the boiler. Most locomotives, especially the older ones, are limited in their service by the amount of steam which the boiler will generate, so that a device which will do the same amount of work with, say, 25% less fuel, will obviously make a marked improvement, not only in economy and efficiency, but in the hauling power of the locomotive.

From a very large number of locomotives now equipped with superheaters in the United States, data are available which show conclusively their advantages. On many railways records exist showing that with the use of superheated steam several hundred tons of additional hauling capacity can be obtained from the same locomotive. The limitation of locomotives in many instances is the inability to supply them with coal in sufficient quantities and at the proper time; therefore, any device which reduces the amount of coal necessary to be fed to the furnace is a long step toward improving the general efficiency of the engine.

When new fire boxes or fire box tube sheets are required, it is desirable to consider the application of superheaters to such locomotives, the boilers of which are otherwise in good condition, whose age does not exceed, say, 15 years, or where new boilers are required on locomotives which otherwise can be used with advantage for some particular service. In such instances the application of superheaters to old locomotives is one which will well repay the outlay.

Question 5. Brick arches.—On the majority of locomotives a brick arch, properly installed and maintained in good condition, will produce a substantial saving in fuel, and also, by doing the work with smaller amount of coal, improve the general efficiency of the locomotive. Probably a saving of about 5 to 10% can often be made by the application of brick arches. It therefore follows that if without the arch it takes 100 lb. of coal to do a certain amount of work, that with a saving of 10% and the same amount of coal is fed to the fire box, an increase in the steaming capacity of 11% will be produced. The brick arch, by increasing the length of flameway in the fire box and preventing the gases and unburnt coal from entering directly into the boiler tubes before complete combustion has taken place, adds materially to the steaming capacity of the boiler and reduces the amount of coal necessary to be fired. Much benefit will also be derived from its use by preventing the formation of black smoke.

Question 6. Outside valve gear.—Few locomotives at present are built with the inside or Stephenson valve gear. The size of locomotive has increased to such an extent that it is very difficult to maintain the eccentrics and the inside portions of the moving parts of a Stephenson gear in a satisfactory condition. The outside gears are much easier to lubricate, maintain and inspect. Their moving parts consist mostly of articulations, provided with case-hardened pins and bushings in place of the large rubbing wearing surfaces, such as eccentrics and straps. The repairs and maintenance of outside valve gears to keep them in good condition are much easier and cheaper than the Stephenson. Furthermore, the reduced wear of the outside valve gear, by reason of its case hardened pins and bushings, does not distort the gear to the extent that the wear of the eccentrics and straps does on the Stephenson gear. This is a very important matter, since the outside gear requires but little or no adjustment or resetting of valves from time to time, it being the custom on many railways to make the gear what is termed "a blacksmith job," that is, provided with no means of adjustment, so that any change required in valve-setting must be made by upsetting or lengthening the rods in a blacksmith shop. Since there is no distortion due to wear with the outside gear, except that caused by the wearing of the main box in the pedestals, the position of the wedge, or wear of the shoe, it follows that the outside gear can be left alone without tinkering or adjustment to a greater extent than is possible with the Stephenson or inside gears. Another advantage of the outside valve gear is that transverse bracing can be used between the frames to maintain them in proper

vertical alignment and also for distributing the stresses.

Question 7. Sizes of valves.—With superheated steam it is possible to use a smaller diameter of piston valve for the same size of cylinders than would be necessary for saturated steam. This is largely on account of the lightness of the superheated steam, which permits it to traverse the passages and ports at a much higher velocity. The sizes of piston valves used by a prominent locomotive builder in this country are as follows:

Valve Diam.	Cylinder Diameter. Saturated Steam.	Superheated Steam.
10 in.	17 in. to 18 in.	18 in. to 19 in.
11 in.	18½ in. to 20 in.	19½ in. to 21 in.
12 in.	20½ in. to 22 in.	21½ in. to 23 in.
14 in.	22½ in. to 24 in.	23½ in. to 27 in.
16 in.	24½ in. upward	27½ in. upward

Extensive tests were made by the Pennsylvania Rd. on the locomotive testing plant at Altoona to determine the limitations in the use of piston valves varying from 7 to 16 in. in diameter, on locomotives having 22, 24 and 25 in. diam. of cylinders. In all cases these tests were made with locomotives using superheated steam. The conclusions drawn from these tests led the Pennsylvania to adopt 12 in. diam. of valves for cylinders between 20 and 27 in. in diam., and for cylinders 20 in. and less, 8 in. diam. valves. Some of the conclusions drawn from these tests, are as follows:

"To establish a relation between the valve and cylinder so that the valve may be standardized, it may be stated generally that the diameter of the valve in inches for superheated steam should not be less than $0.016D^2$ where D = the diameter of cylinder in inches. The 12-in. valve is now used for cylinders between 20 and 27 in. in diameter, while for cylinders of 20 in. or less an 8-in. valve is used. Cylinders above 27 in. diameter have not been used for any class of locomotive of which there is more than one example, and a valve diameter for such cylinders need not be considered at present. Decreasing the valve diameter on a locomotive necessitates increasing the percentage of cut-off to obtain the same power at the same speed. This causes a longer valve travel."

From a maintenance point of view, it is of course desirable and economical for a railway to carry in stock as few diameters of piston valves as possible. These considerations doubtless led the Pennsylvania to adopt the 8 and 12 in. valves as standard to be used in new construction and reconstruction wherever possible. These sizes adopted by the Pennsylvania are so much smaller than required by current locomotive practice in the United States, that some caution should be observed in adopting them without due consideration. For instance: The statement in the last paragraph of the conclusion, viz., calling attention to the necessity of an increase in percentage of cut-off with the smaller valve diameter in order to obtain the same power at the same speed, is significant, since it necessarily follows that the expansive force of the steam is not utilized as advantageously, and it would therefore appear that some decrease in economy would result.

The question of size of piston valves is of interest in the modernizing of existing locomotives, since many railways were committed to the use of slide valves because of their many recognized good qualities. With the general introduction of the superheater and its recognized necessity for modern locomotives difficulty was experienced in applying superheaters to locomotives equipped with slide valves, because a film of oil could not be maintained by ordinary methods of lubrication between the valve and its seat and to the deformation of the valve and its seat at the higher temperatures.

A steam chest containing a piston valve that can be applied to existing slide-valve cylinders has been designed, manufactured and tried on many leading railways. At present it is estimated that upward of 75 locomotives having slide-valve cylinders are equipped with superheaters, these steam chests and piston valves. The sizes of piston valves which have been used for this purpose are 8 in. diameter, with ports up to and including 19 in. in length; 9 in. in diameter, with ports 20 to 22 in. in length, and 10 in. in diameter, with ports exceeding 22 in. in length.

A novel method of applying outside steam pipes to piston-valve cylinders, used by the Southern Pacific Co. at its Los Angeles shops, is shown in the accompanying plan. It consists of cutting a hole 8¼ x 17 in. in the upper wall of the steam chest and dropping therein an integral finger-ring bushing fitted and bolted to place and afterward bored out for the bushings. The only steam-tight joint necessary for this finger-ring casting is where the bushings are pressed in. The fitting between the finger-ring bushing and the outside wall of the steam chest need not be steam-tight; only a solid bearing for bolting is required. We understand that a number of different methods have been used for a similar purpose by other railways.

The report then reproduces the replies to the different questions received from the railways answering, and proceeds as follows:

Will the cutting up or scrapping of old locomotives continue at the same rate as in the past? This matter is related to the modernizing of existing locomotives, since the length of time that a locomotive can be economically kept in good working order is dependent largely upon its weight and capacity. A locomotive can be kept in working condition indefinitely by renewing worn out parts such as boilers, fire boxes, frames, cylinders, wheels, axles, etc. Thus a locomotive can be maintained in good serviceable condition, so that it would not be called worn-out, if renewals are made when necessary. Such a method of continuous replacement is economically possible, provided the locomotive is suitable and powerful enough for service. Before the end of the last century there were no large locomotives such as we are accustomed to see today. The tremendous increase in weight, size and power came in the first 15 or 16 years of this century. In many instances this increase in size of locomotives was in advance of the bridges and roadway, so that it was necessary to rebuild a large portion of the main lines in this country. Now that this has been accomplished and the roadbeds laid with heavy rails and provided with bridges of sufficient capacity to carry the heaviest wheel loads, it is a question whether the increase in weight and power of locomotives can take place as rapidly in the next 10 or 15 years as in the opening years of this century. Assuming this is the case, and that there will be no such tremendous increase in the power of locomotives for the next few years, it logically follows, then, that their life may be increased by renewals of parts. Therefore, instead of taking 20 as an approximation of the number of years a locomotive would last in service, the life of the large modern locomotive may be increased for a longer period. During this time it would be necessary to renew many parts, and it is also probable that many economical devices which would fall under the head of modernizing of existing locomotives could also be applied. It is therefore quite possible that a greater proportion of locomotives will be rebuilt or modernized in the future than in the past.

Report on Fuel Economy and Smoke Prevention.

The American Railway Master Mechanics' Association committee, William Schlafge, General Mechanical Superintendent, Erie Rd., reported as follows:—In its first report on fuel economy, your committee considered the subject generally, indicating the chief elements influencing the fuel supply cost, giving typical outlines of organizations for road supervision and briefly touching upon the effects of special appliances. The second report was chiefly devoted to instructions for enginemen and firemen, the other elements of the problem being touched upon lightly. In continuation of the subject, and as a logical sequence of the rules presented last year, it is proposed to consider the means through which the rules are to be applied and how the road supervision is to be selected, instructed and developed. In its last report your committee presented a pamphlet on "Fuel Economy on Locomotives," which covers the fundamentals of all instruction methods, and, in order to make it practical and easily understood, it was made free from technicalities. But much of the advantage that should arise from rules and instructions will be lost if they are simply memorized without a thorough understanding of what they mean and how the principles are to be applied.

The road supervision must point out the results of improper methods and the advantage derived from an observance of the rules. The inexperienced fireman must be shown the effects of good firing, that he may learn through his own observation that the methods outlined produce the best results. He can then be instructed concerning the abstract theories of combustion, and it should naturally follow that practical application of these principles will be unconsciously made. It should be the aim of the organization to accomplish its purposes through appeal to the man's appreciation of his increased efficiency, to the intelligent completion of his task and to that feeling of self-respect which arises from a sense of personal capability. If these measures fail, obedience to the rules for the routine performance of the fireman's task must be secured through the employment of such disciplinary measures as may be required. Fuel costs the railways in excess of $170,000,000 annually and its use must be conserved.

Having outlined in a general way the course to be pursued, the question arises, What should govern the selection of a superintendent of locomotive operation, a travelling engineer, travelling fireman, or other road supervision. It seems trite to say that the effective instructor must have a knowledge of methods and pro-

cesses involved, and that he will be most efficient who has learned by the same means that he will employ in teaching others. Nor can any man pretend to occupy such a position who does not inform himself upon the best methods of producing the results sought, upon the underlying principles of his work and upon the advances that are made by other men in his line. The true instructor must be capable of placing himself in the position of the learner, must appreciate his difficulties and possess the ability to approach his task as though he were himself a novice. Knowledge of men is, of course, a prime essential. No leader can hope to succeed who is incapable of appreciating the problem introduced by the human element with which he has to deal. By familiarity with his duties, by the exercise of patient perseverance and by tactful consideration, the confidence of the men must be inspired. Co-operation must be secured or failure will result. The efficient instructor must be capable of overcoming his prejudices and conforming his ideas to progressive methods and appliances. His views must be sufficiently liberal to permit acknowledgment of his own deficiencies and to enable him to see wherein the methods of his contemporaries are productive of better results. This presupposes an active interest in the development of these devices that effect fuel economy and reasonable familiarity with the work of others in his field. A man occupying any supervising position must be of high moral character, for, no matter what his other qualifications may be, if he is immoral—if his time outside regular working hours is devoted to intemperance or to other vices that are the accompaniment of late hours and bad habits—his condition mentally and physically will fail to meet the standard of efficiency demanded of a high-grade organization and he will not command the respect of the men, which is essential to his success.

It should be unnecessary to say that your committee recognizes the fact that no one man combines in himself all the knowledge, experience and executive ability suggested as essential, but final selection must be governed by: Physical fitness, personal character, practical experience, knowledge of underlying principles, ability to demonstrate, capacity to impart information, and ability to adapt himself to progressive methods and appliances. Having enumerated the qualifications which the members of a high grade organization should possess, it is proposed to inquire in which manner the ideal may be approximated in actual development and training. That there is opportunity for such a discussion is indicated by the replies to your committee's circular of inquiry, which showed that in general there were no definite methods of training road supervision, and this means that men are assigned to duty as road foremen or supervisors and left largely to their own resources, their work being judged by mechanical standards, to the exclusion of those features of economical operation which are daily becoming more pressing. The successful road foreman must produce reasonable economies in those expenditures for which he is properly responsible.

The lack of definite methods of selection is emphasized by the lapse of time which frequently occurs between the date of a vacancy and the appointment which follows, indicating that the question of succession had received little or no thought and that the qualifications of the candidates required review before the vacancy could be filled. In those circumstances, it is not surprising that mistakes are made which subsequently become embarrassing and are corrected with difficulty. The requirements of effective organization demand that local officers shall know and study individual enginemen with a view to the vacancies which may occur, selecting for appointment those who have demonstrated by their work and their record that they are qualified for advancement.

A. B. C. RAILROAD CO.
Road Report—Engineer.

Division _____ Date _____

Eng. No._____Train No._____Service_____

Engineer _____

RATING.

From	To	Reverse Lever.	Throttle Lever.	Injectors.	Locomotive Maintenance.	Condition of Engine.

(Perforate on this line.)

REMARKS.

Title of Officer Making Report.

A. B. C. RAILROAD CO.
Road Report—Fireman.

Division _____ Date _____

Eng. No._____Train No._____Service_____

Fireman _____

RATING.

From	To	Condition of Fire.	Method of Firing.	Smoke.	Tidiness.	Steam Pressure.	Safety Valves.

(Perforate on this line.)

REMARKS.

Title of Officer Making Report.

1—Very Good. 2—Good. 3—Medium. 4—Poor.

Having made a tentative decision as to those giving the greatest promise of development, special effort is required in following up the candidate, in checking his work and judging his efficiency. For this purpose the road foreman's trip report blank appearing in the appendix should be of assistance. This has been prepared in convenient form for the pocket with leaves in two sections, one for the engineer and one for the fireman, the pages being perforated to facilitate detachment so that they may be filed alphabetically. They will thus form a continuous and permanent record of the individual, from which his progress and relative standing may be judged. The forms have been prepared with the requirements of fuel economy in view, but other items may be added if desired. It is recommended that these reports be filed in the local division office of the road foreman, supervisor or master mechanic.

The final selection will be governed by a knowledge of the men, gained through personal contact and through occasional staff meetings. This will afford opportunity to determine the position of the men with respect to those policies for efficiency and economy which it is the aim of the company to promote. The subjects for staff meetings should be announced in advance, so that opportunity may be given for preparation. One or more engineers or firemen should be requested to come prepared to discuss one of the subjects of the meeting, prospective candidates for promotion being occasionally designated. These meetings, being of general educational value, may be made to serve a useful purpose in training future road supervision through the opportunity offered for presenting the aims and methods of the company with respect to the practical problems of economical locomotive operation; for a discussion of specific problems, with details of the sources of information bearing upon them and extracts therefrom, and for the correction of individual weaknesses by indirect methods, in order that character and efficiency may be developed.

On large systems, appointments to minor road positions, in order to obtain knowledge of the capabilities of the prospective candidates for appointment, can, and are, usually made by placing the men on special duty, and the results in this way should be followed up and the first few trips should be made in company with the road foreman or his assistant in order to observe the methods used in directing firemen and enginemen and the means employed to secure the co-operation of the men. On these trips the candidate should make the prescribed report, which can be checked and criticized privately by the officer whom he accompanied. After a number of such trips and an appointment has been made, the new supervisor should be accompanied by his immediate superior, who should, at the proper time, advise and counsel his subordinate concerning his work on these trips, particularly his manner of dealing with the men. Many men are ill fitted by temperament to occupy any supervisory position and, unfortunately, this in many cases can be determined only after trial, but it should be determined while the man is on probation and before appointment. Practical instruction should be accompanied by instruction in classes, which may include prospective candidates from two or more divisions, the respective road foremen acting as instructors. This work should include the special subjects that must subsequently be covered by the road foremen with the men, such as the details of the book on "Fuel Economy on Locomotives," the principles of combustion, locomotive design, the operation of special devices, care of the locomotive, and other related subjects. The head of the fuel department should be present at these instruction classes as often as possible, in order that his active interest may be appreciated and that he may counsel and advise his subordinates.

On the larger roads the employment of an expert instructor on locomotive operation and fuel economy is recommended, who should come under the head of the motive power department, and under his direction a special course should be provided for road foremen. The efficiency of such an instructor would probably be improved if he were provided with a car equipped for lecture purposes with a stereopticon and moving-picture machine, and such other apparatus as may be required to perform the simple experiments in combustion that are ordinarily used to illustrate the principles of good firing. On the smaller roads such instruction could be given by the head of the fuel department, the general road foreman of engines, or other officer of corresponding jurisdiction. The advantage in the use of lantern slides and classroom instruction arises not only because of the added interest aroused, but because it is easier to follow the lecturer, particularly where any statistics are presented. The fol-

lowing are offered as typical subjects for treatment by lantern slides: Enginemen's work reports on arrival at terminals, showing actual samples of those properly made out with full information and those improperly made out. The diagrams on pages 10 and 11 of "Fuel Economy on Locomotives," including correct methods of cross-firing. Diagrams on pages 13 to 16, inclusive, of "Fuel Economy on Locomotives." These should be colored to bring out the effects of improper firing. Photographs of locomotives in operation, emitting dense volumes of smoke, indicating poor combustion. Photographs of locomotives with pops open, with rod packing blowing, and other miscellaneous steam leaks. Photographs of tenders properly and improperly coaled and trimmed. Charts and diagrams showing the relation of valve events to corresponding points on the indicator diagram. Indicator diagrams showing the coal and water consumed for equal work done with locomotives operating with full throttle and short cut-off, and with throttle partly closed and corresponding increased cut-off, so that the advantage of increased steam expansion can be clearly brought out. The chart on page 23 of "Fuel Economy on Locomotives," showing the variation in coal consumption with varying superheat at different cut-offs. Moving pictures may be made to indicate the correct methods of preparing fires, firing locomotives, and the results of improper practices in these particulars. Pictures of locomtives in operation, showing the influence of proper and improper firing upon the smoke emitted, may also be made extremely instructive.

The instructions given by the chief instructor on "Locomotive Operation and Fuel Economy" should cover the road foremen, assistant road foreman, travelling enginemen, etc., and at these instruction meetings the policies and aims of the organization should be formulated and the opportunity taken for a general discussion of important topics, as for example: Standards of divisional performance, and individual performance if possible; improved methods to be pursued; improvements of standard; methods of inducing employes to attain the standard; legitimate troubles experienced by the men; demonstration of methods to be employed, especially devices that produce economy.

It is the duty of the head of the organization to establish the standards by which the results of the divisions are measured, and to do this successfully it is necessary to have complete and accurate statements as to what can be done Where individual performance sheets are employed, they might properly form the basis for divisional statements prepared on a gross ton-mile basis, or in the case of passenger service on a straight mileage basis. In all cases the best previous record must constitute the measure by which the results are gauged, and they must be interpreted with due regard for unusual conditions. It must be granted that results cannot be secured without comparisons. They are needed by the individual road foreman as a measure of his work and by the head of the department as a spur to the organization.

Every road foreman should be required to read at least one periodical monthly, dealing with railway matters, and the officer in general charge should have a list of the magazines to which his subordinates subscribe. This will permit special attention to be drawn to an article of unusual value appearing in any particular paper. Interest will be stimulated if an opinion is occasionally asked on some article in a current number of a periodical and, when occasion affords, singe marked copies may be distributed with a similar request. By this means each man should increase his knowledge, keep up with the developments in his line and acquire new ideas for instruction work.

Whenever possible, the head of the fuel department should attend meetings of the associations, particularly the Travelling Engineers and the Fuel Association, dealing with the subjects in which they are interested. He should be encouraged to take part in the proceedings, accept committee assignments and actively engage in the work of the associations. The advantages derived from attendance at association meetings require no elaboration in a paper before a convention whose membership is wholly in sympathy with the work of related organizations.

Finally, the road work must be constantly reviewed. It is necessary that a check be kept upon the road supervision and upon the locomotive crews. The trip reports should be examined and questioned, that effort may be stimulated and efficiency increased. To successfully effect the desired fuel economies, it is necessary that confidence and enthusiasm be developed, and this must be obtained through the influence of the general officers and the local supervision.

The subject of education and training for railway service has received no little attention from editorial writers and essayists, but there has been no general movement among the railways themselves for specific instruction of supervision in the operating department. The training of supervision constitutes preparation for subsequent increased efficiency. When a corporation undertakes to produce a commodity on a commercial basis, the processes of manufacture are carefully planned in advance, elaborate study is given the required equipment and the means through which the maximum efficiency may be realized. The results secured will be proportional to the care exercised in these preliminaries, as well as to subsequent operating efficiency. It is equally true of special education and training. The net results will depend upon the care with which the system is planned, the time spent in preparation of the supervision and the manner in which the preliminary training is subsequently applied. As the burden of railway operating expenses becomes constantly heavier, the necessity for economies becomes increasingly urgent, and the tendency is to restrict expenditures in those directions yielding direct results. The rapidity with which the transportation systems have developed has naturally resulted in obscuring the possibilities for indirect influence upon net returns, but your committee is confident that training for supervision in road service will receive that consideration to which it is entitled by reason of the relation which locomotive operation and fuel economy bear to the total operating expenses.

Smoke Prevention.—In connection with the problem of smoke prevention, your committee directs attention to the report of the committee of the Chicago Association of Commerce, on "Smoke Abatement and Electrification." The investigations conducted by this committee were continued over more than four years and reduced the subject to a scientific basis where the influence of locomotive operation upon smoke emission may be judged in its true proportion. There is given below a table abstracted from the report, indicating the various classes of service responsible for air pollution.

Responsibility of Each Service for Smoke Pollution Within Chicago, on Percentage Basis.

	Visible smoke, Per cent.	Solids of smoke, Per cent.	Total of smoke, Per cent.	Gaseous carbon, Per cent.	Gaseous sulphur, Per cent.
Steam locomotives ..	22.06	7.47	10.31	10.11	18.22
Steam vessels	0.74	0.33	0.60	0.55	0.45
High pressure steam stationary power and heating plants	44.49	19.34	44.96	40.68	53.70
Low pressure steam and other stationary heating plants.	3.93	8.60	23.00	23.06	19.73
Gas and coke plants.	0.15	.....	.....	.....	.....
Furnaces for metallurgical, manufacturing and other processes	28.63	64.26	21.13	25.60	7.90

One-third of all air pollution is due to dirt other than that of combustion. These percentages refer to the remaining two-thirds. From this table it will be observed that steam locomotives contribute to:

	Per cent.
Visible smoke	22.06
Solid constituents of smoke	7.47
Gaseous constituents of smoke	10.31

The portion of the total visible smoke of Chicago which is chargeable to different locomotive services is interesting, and is as follows:

	Per cent.
Yard	10.25
Road freight	2.01
Freight transfer	4.59
Passenger transfer	.19
Through passenger	2.07
Suburban passenger	1.54
Locomotives at locomotive terminals	1.41
Total for steam locomotives	22.06

The proportions, while applicable only to Chicago, nevertheless indicate in a way the relations existing at other large terminals, and while the above report shows that the visible smoke produced by steam locomotives was only 22.06%, it suggests the necessity for further study in connection with the abatement of the smoke nuisance on engines in switching service. Your committee takes occasion to again draw attention to the recommendations contained in its report of 1913, wherein a type of apparatus for smoke prevention was described which had proved successful in extended practice. It is believed that the apparatus should at least be employed on all yard and transfer engines operating in congested city districts.

Canadian Railway Officials at Atlantic City.

Among the railway officials in attendance were the following:

Canadian Government Railways:—G. R. Joughins, Superintendent Motive Power, Moncton, N.B.

Canadian Northern:—W. C. Lancaster, Electrical Engineer, Montreal; A. L. Graburn, Assistant Superintendent Rolling Stock, Toronto.

Canadian Pacific:—H. H. Vaughan, Consulting Engineer, Montreal; C. W. Van Buren, General Master Car Builder, Montreal; T. G. Armstrong, Master Car Builder, Winnipeg; D. T. Main, Superintendent Motive Power, Montreal.

Central Vermont:—W. Gillespie, Mechanical Superintendent, St. Albans, Vermont.

Grand Trunk:—W. D. Robb, Superintendent Motive Power; J. Coleman, Superintendent Car Department; J. Hendry, Master Car Builder; A. A. Maver, Master Mechanic, K. F. Nystrom, Chief Draftsman, Locomotive Department, Montreal; T. Treleavan, Master Car Builder, London, Ont.; W. H. Sample, Master Mechanic, Battle Creek, Mich.; A. Copony, Master Car Builder, Elsdon, Ill.

Report of Committee on Design and Maintenance of Locomotive Boilers.

The American Railway Master Mechanics' Association committee, C. E. Fuller, Superintendent Motive Power, Union Pacific Rd., chairman, reported as follows:—This committee has been continued from last year's committee on design, construction and inspection of locomotive boilers. Last year a report was presented on methods of figuring stresses in locomotive boilers, which has since been adopted as Recommended Practice, bringing about for the first time a uniform and harmonious method of calculating the various stresses and safety factors on new locomotive boilers. That there may be misunderstanding as to the true intent of this work, the committee wishes to state that these formulæ are obviously intended for use in connection with designing new construction only, where there are no restrictions, and do not apply to existing boilers. This year circular K was issued, and replies received from 31 roads, which replies were tabulated and grouped for further study and analysis, the result of which your committee now presents for consideration in connection with the design and maintenance of locomotive boilers.

The modern locomotive being called upon to maintain high speed, with heavy and increasing train loads, and to meet greater demands for steam, the design and maintenance of boilers would seem to take precedence over any other part of the locomotive. That locomotive designers are aware of this seems evident from many of the replies received to the circular of inquiry, and the various means by which a number of roads are endeavoring to meet these conditions. Among the many devices tending to show the efforts in this direction may be mentioned a fire box which consists of squared water tubes, expanded into water and steam drums at the top and a water leg at the bottom, eliminating staybolts on the sides of fire box; a corrugated fire box; also the several types of water tube locomotive boilers; devices to improve the circulation around the fire box; various forms and adaptations of combustion chambers, either of the ordinary type or of special construction, having a bridge wall with air inlets. In some cases the adoption of combustion chambers has been due to a desire to avoid excessively long flues, while others have considered that the construction is desirable from its being inducive to longer flame travel, increasing fire-box temperatures on account of the more complete combustion obtained. The increase in the ratio of fire box volume and grate area is held to be beneficial, producing better steaming boilers, while the improved combustion has the effect of eliminating black smoke. It does not appear that the maintenance and repair with combustion chambers is greater than is the case with the ordinary construction, while the life of the flues is greatly increased by their use. There appears to be little experimental data on the relative evaporative performance of boilers with or without combustion chambers.

The fire box design being recognized as of paramount importance, there has been a general trend toward wider water spaces, about 4½ to 5 in. for the sides and 5½ to 6 in. at the front, being representative practice. Fire box door flanges have been given considerable attention, the majority of opinion favoring flanging the sheets toward each other; the joint in many cases being welded, with beneficial results, from the elimination of rivets, with their tendency to collect mud. Some state that the welded method is cheaper than the riveted joint.

From the replies it is found that cross braces are used as a matter of necessity on Belpaire fire boxes and boilers with flattened surfaces, and to some extent on crown bar boilers.

The use of flexible staybolts, instead of tee bars and sling stays, to support the front end of fire box has become quite general, and the results have been satisfactory. In order to obtain proper bearing for flexible radial stays which are at a sharp angle with the wrapper sheet, one road reports having pressed out bosses in the sheet, while another road builds up bosses by autogenous welding. The results, giving sufficient full threads through the sheets for the bolts, have been very satisfactory.

Regarding venting crown sheet in case of low water, two members report that on coal-burning locomotives they omit the button heads on four front transverse rows of stays. Another member reports omitting button heads on the 6th, 7th, 8th and 9th rows back from the back flue sheets for the same purpose. The majority, however, do not make any allowance for this contingency.

Regarding the relative value of fire box and tube heating surface, there appears to be little data derived from tests. However, the accepted value assigned to fire box and flues, respectively, averages about 6 to 1, with special designs of fire box claiming a ratio as high as 12 to 1. The most effective ratio of fire box volume to grate area is indicated by the reports to be approximately from 5.5 or 6 to 1 for bituminous coal, and 4.5 or 4.85 to 1 for anthracite coal.

The use of long flues is not favored, for, while the total evaporative capacity of the boiler may be increased by their use, the rate of evaporation per unit area of heating surface is lower, and discounts the theoretical increase in capacity. In this connection tests show conclusively that there is a great variation in the evaporative value of the boiler tube, about one-half of the heat being transmitted in the first quarter of the tube length. It appears that a proportion of tube length to diameter of 100 times the inside diameter is most satisfactory. Longer tubes do not require any greater spacing than reasonably short tubes.

The addition of superheaters is practically unanimous, and all replies indicate that members will use superheaters on all new equipment, with the possible exception of some few roads which are not certain about switch engines. The ratio of superheating surface to total saturated heating surface seems to vary from .198 to .29, the average for modern power being about .27 to .29 for boilers with combustion chambers and .20 to .22 for boilers without combustion chambers.

In a general way it may be deduced that in modern practice the built up type of dome is being generally abandoned in favor of one piece pressed-steel domes. In regard to the elimination of boiler seams, no general effort has been made, although one member reports satisfactory results from combining the throat sheet and bottom half of last course. In almost all cases fire box sheets, as well as wrapper sheets, are made in one piece.

There does not appear to be any development along the lines of welding circumferential seams.

The support of the back end of the boiler above frames seems to be satisfactorily met by either expansion plates or by expansion shoes.

The use of cylinder volume as a basis in designing locomotive boilers, as outlined by this Association in the Proceedings of 1897, has, with the development of new and larger types of locomotives and superheaters, proved unsatisfactory, and your committee is of the opinion that better results are obtainable from ratios based on cylinder horse power.

The most interesting feature brought out by the committee in connection with boiler maintenance is the wide adoption of autogenous welding. The welding of flues into flue sheets, of fire box seams, and the application of patches varying in size from small crack and pitting repair plates to half side sheets and back heads, marks a radical and economical means of handling what has heretofore been a difficult and expensive problem. Both electric and acetylene welding processes have been used. but we are unable to determine which method gives the best results, as it seems to be largely a matter of opinion. Fire box seams have been welded successfully, one member reporting 14 engines with all seams welded by the acetylene process. Several roads report having side sheet seams welded, with little or no trouble experienced. Occasionally it has been necessary to reweld a seam, on account of opening up.

Among the other uses to which the electric and oxy-acetylene processes have been put is in cutting off old smoke boxes, burning off stay bolts, instead of nicking and breaking them, and to loosen the caps on flexible staybolts to permit of easy removal without damaging threads. The autogenous processes of welding have recently been used to quite an extent for patching in fire boxes. Some of the replies indicate that welding can be done at about 40% of the cost of riveting; others report very little difference in cost. The methods of patching are still an experiment on most roads; others are reporting satisfactory results. The methods preferred seem to be a matter of opinion; the patches are of all shapes and sizes; some are welding by lapping the plates, others by beveling the patch and plate and filling in the groove, and others report patches being boxed out or bulged with a corrugation for expansion; but from the replies it is impossible to draw a conclusion as to the best way or method. Fire door openings have also been replaced by welding, with success.

The practice of welding cracks in the knuckle of flue sheet is quite extensively used, in most cases the welding being done on both sides of sheet. Two members cut out the crack and weld in a patch, but in the majority of cases the crack is filled up without patching. While some roads report welding in half side sheets and half back heads with satisfactory results, the practice has not yet become general. One member reports welding brick arch studs on side sheets of fire box, with success, but no welding-in of arch tubes has been reported.

The methods of safe-ending superheater flues, as reported, are rather uniform, the usual way being to cut off at the small end, scarf, apply safe end, and weld in flue welding machine. A few members report that they have welded safe ends by the electric or oxy-acetylene process. In this method, after scarfing, the flue and safe end are separated about

⅛ in. and the opening filled up, rotating the flue during the process. It seems to be accepted practice to avoid the use of more than one weld in a superheater flue at a time, which is accomplished by increasing the length of safe ends in successive applications, the old weld being cut off and a longer safe end used. Few roads weld safe ends to the enlarged portion of the flues. Results are in most cases reported as being satisfactory. The usual practice in setting tubes appears to be, for the back end, to insert a copper ferrule in the hole, then roll, expand and bead the flue, after which the point is cleaned and welded lightly on the edge of the bead. One member reports that copper ferrules are not used, nor flue beaded, but welded in by the electric process, which is indicated to be the most generally used in this class of work. Flues in the front flue sheet are not welded, but rolled, and about 10% beaded.

While a few roads are rebuilding old locomotives and converting consolidation types to mikados, and prairie types to Pacific types, there is no general trend in this direction. Many roads are applying superheaters to their more modern types of saturated locomotives, and in some cases at the same time eliminate old styles of staying, bracing, etc. The application of combustion chambers, brick arches and outside valve gear has been reported by several members. On engines having cylinders smaller than 20 in. diameter, it has not as a rule been considered advisable to apply superheaters.

In view of the development of the locomotive, it is our opinion that the ratios of 1897, being unsuitable, should be superseded by a method of calculation which will meet the variable conditions imposed by modern practice. The reports indicate a wide departure from the Recommended Practice of 1897. Ratio of grate area in square feet to volume of two cylinders in cubic feet, for simple passenger or freight locomotives, should not be less than: 4 for large anthracite coal. 9 for small anthracite coal. 3 for bituminous coal. From the replies received, for modern power these ratios have been increased 23%. The ratio of heating surface in square feet to grate area in square feet, for simple passenger and freight locomotives, should not be less than: 40 for large anthracite coal. 20 for small anthracite coal. 60 for bituminous coal. From the replies received, for modern power these rations have been increased 28%. The ratio of heating surface in square feet to volume of two cylinders in cubic feet, for simple passenger or freight locomotives, should not be less than: 180 for large anthracite coal. 200 for small anthracite coal. 200 for bituminous coal. From replies received, these ratios for modern power have been increased 34%. We would, therefore, submit for adoption as Recommended Practice the following ratios based on cylinder horse-power: D, Diameter of cylinder. P. Boiler pressure. A. Area one cylinder diameter. H.-p. Horse-power. TP. Tractive power. d. Diameter of drivers. S. Stroke in inches.

1. From weight limitation on drivers, and from service, type, etc., obtain the required tractive power.

2. From tractive power, boiler pressure, stroke and size of drivers obtain diameter of cylinder.

$$D = \sqrt{\frac{TP \times d}{.85 \times P \times S}}$$

H.-p.= .02120 × P × A — saturated steam.

H.-p.= .02290 × P × A — superheated steam.

Maximum horse-power assumed to be reached at the following piston speeds:
Saturated steam ... 700 ft. per minute.
Superheated steam.. 1000 ft. per minute.

The following figures are based on reports from various testing plants and road tests made under different conditions, and are liberal and can be more than met under favorable conditions:

3. Estimate total steam per hour from:
H-p. × 27.0—saturated steam.
H-p. × 20.8—superheated steam.

4. Estimate total coal per hour from:
H-p. × 4.00 lb.—saturated steam
H-p. × 3.25 lb.—superheated steam, based on coal containing 14,000 b.t.u. per pound, using a percentage factor for poorer or better grades of coal.

5. Estimate size of grate from total coal divided by 120, or

$$\text{Grate area} = \frac{\text{H-p.}}{30} \text{ — saturated steam.}$$

$$\text{Grate area} = \frac{\text{H-p.}}{36.9} \text{ — superheated steam.}$$

6. Estimate evaporation of fire box, including combustion chamber and arch tubes, if used:

Sq. ft. fire-box heating surface × 55 = evaporation in lb. per hr.

7. Subtract (6) from (3) to obtain tube and flue evaporation required. Base evaporation on 10 lb. water per hr. per sq. ft.

8. To obtain percentage of boiler, divide total pounds of steam proposed boiler will evaporate by these formulæ pounds of steam required.

9. The ratio of fire-box volume to grate area should be about 5.5 or 6 to 1, for bituminous coal; 4.5 or 4.85 to 1, for anthracite coal.

The ratio of length to diameter for tubes should be about 100 to 1 × internal diameter, which for 2-in. tubes would give a length of about 16 ft. and for 2¼-in. tubes about 18 ft.

The ratio of superheating surface to total saturated heating surface should be, without combustion chamber, about .22, and with combustion chamber about .29.

The methods of figuring stresses in locomotive boilers, adopted as Recommended Practice last year, with the ratios submitted in this report, will place in the hands of the members a basis for locomotive boiler design which, meeting all modern conditions, will doubtless have the effect of improving the present variation in methods.

Your committee has been greatly impressed by the possibilities of the processes of autogenous welding for boiler maintenance. We would offer as a suggestion that a committee of this Association be appointed for the purpose of assembling and analyzing all available information on this important subject, with a view to arriving at standard methods of using the processes, and to develop further the present largely experimental work along this line.

In conclusion, your committee wishes to express its appreciation for the assistance which the members have given them in furnishing information relative to their practice.

C.P.R. employes on the Ontario Division have subscribed a further $800 to the Toronto and York County Patriotic Fund, making a total of $8,600 since Sept. 1915. A large number of the employes are also subscribing four days pay during the year. which it is expected will realize about $55,000.

Election of Railway Mechanical Association Officials.

The following elections took place at Atlantic City:

American Railway Master Mechanics' Association. — President, Wm. Schlafge, Erie, Rd.; 1st Vice President, F. H. Clark, Baltimore and Ohio; 2nd Vice President, W. J. Tollerton, Chicago, Rock Island and Pacific; 3rd Vice President, C. F. Giles, Louisville and Nashville; Treasurer, Angus Sinclair. Executive Committee: J. Purcell, Atcheson, Topeka and Santa Fe; M. K. Barnum, Baltimore and Ohio, and W. E. Dunham, Chicago and Northwestern. M. A. Kinney, Hocking Valley, was elected to serve on the executive committee during J. F. De Voy's unexpired term.

Master Car Builders Association.— President, C. E. Chambers, Superintendent Motive Power, Central Rd. of N.J.; 1st Vice President, T. W. Demarest, Superintendent Motive Power, Pennsylvania Lines West, Northwest System; 2nd Vice President, James Coleman, Superintendent, Car Department, Grand Trunk; 3rd Vice President, G. W. Wildin, Mechanical Superintendent, New York, New Haven & Hartford; Treasurer, J. S. Lentz, Master Car Builder, Lehigh Valley. Executive Committee: S. Lynn, Master Car Builder, Pittsburg & Lake Erie; J. C. Fritts, Master Car Builder, Delaware, Lackawanna & Western; C. B. Young, Mechanical Engineer, Chicago, Burlington & Quincy.

Railway Supply Manufacturers Association.—President, E. H. Walker, Standard Coupler Co.; Vice President, Le G. Parish, American Arch Co.; Executive Committee: W. Beaver, Yale & Towne Mfg. Co.; G. Thompson, Edison Storage Battery Co.; W. McConway, Jr., McConway & Torley Co., G. A. Cooper, Frost Railway Supply Co., R. Carr, Dearborn Chemical Co.

St. John & Quebec Ry. Contractor's Suit.——A Quebec court on June 14, dismissed the action brought by F. A. Hibbard against A. D. Gould, President, St. John & Quebec Ry., before it was taken over by the New Brunswick Government, to recover $10,000, being the amount of the transfer of his interests in the Hibbard Construction Co., and the St. John & Quebec Ry. Co. for the construction of a part of the railway between Fredericton and Woodstock. The defendant had refused to complete his contract, claiming that the representations made by Hibbard were incorrect. After hearing evidence the court dismissed the action.

Comparative Average Railways Costs. —There are 198,554 miles of railway in Europe, with a total capital cost of $25,059,644,889, showing an average cost per mile of $126,211. The United States has 235,815 miles, with total capital cost of $15,719,696,925, or an average cost per mile of $66,661. The U.S. mileage only included railways with $100,000 or more gross annual income, so that a further 8,440 miles may be added, with $197,486,000 capital cost, reducing the average capital cost to $65,166 per mile.—Bureau of Railway News and Statistics.

The C.P.R. General Superintendent's office at Calgary had, when war began, a staff of 23 male clerks and several female clerks and stenographers. Fifteen of the men have enlisted, 10 of them are at the front, 1 is in England and 3 are training in Calgary battalions, 2 are lieutenants in British regiments, 2 are staff sergeants, 2 are corporals and the others are privates.

Examinations Among G.T.R. Motive Power Department Apprentices.

The annual examination of apprentices employed in the G.T.R. motive power department has been completed recently, and awards made in the various competitions connected therewith. For the purpost of fair competition, the 26 stations at which instruction is given throughout the year were divided into four groups, according to the number of apprentices employed at each station. Each group competed for class and individual prizes aggregating $450. The examinations were set in drawing and mathematics, according to the year of apprenticeship, and were based as nearly as possible upon problems likely to arise throughout the shop work. The following questions are taken from each of the five papers, and serve to convey an idea of the work accomplished:

"A ⅝ in. drill when drilling cast iron should make 608 r.p.m. At what speed should a 1⅜ in. drill be run to give the same cutting speed?

"A power plant used 4 tons of coal in one day, 9 lbs. of water being evaporated by 1lb. of coal. The feed water consumption was 25% greater on this day than on the preceeding day. How much water was evaporated during the preceeding day?

"How much weight can an air hoist lift whose efficiency is 79% if the cylinder is 18 in. dia., and the air pressure is 75 lb. per sq. in?

"The ratio of 2 pulleys is as 5 to 3. The first makes 105 r.p.m. How many r.p.m. does the second one make? If the second pulley is 27 in. dia. find belt velocity.

"What diameter safety valve is required in order that it acts when a pressure of 200 lb. per sq. in. is reached the total pressure then upon the valve being 1790 lb.?"

Detailed blue prints of parts of a locomotive were given in the drawing competitions, and it was required to make a complete assembled drawing from the details.

To the individual in each year who made the highest combined score a special capital prize was awarded, and in one case a score of 196, out of a possible 200, made up of 98 marks in each subject, won the prize. In one or other of the subjects there were scores of 100, but lower points in the other subject prevented these scores capturing the high prize.

The winning stations in the various groups were as follows:—Group A: 1st, Stratford; 2nd, Battle Creek. Group B: 1st, Sarnia; 2nd, Toronto. Group C: 1st, Allandale; 2nd, Belleville. Group D: 1st, Port Huron; 2nd, Hamilton.

The capital prize winners in group A (main shops) in the different years are as follows:—1st Year: A. Anderson, Stratford. 2nd Year: W. Leask, Montreal. 3rd Year: W. Davis, Stratford. 4th Year: A. McDowell, Stratford. 5th Year: N. Smith, Montreal.

In addition to the above, apprentices in groups B, C and D (roundhouse classes) competed for capital prizes for highest combined scores; W. Hess, of Port Huron, coming 1st, and C. O'Neill, Sarnia; W. Pearce, Belleville; and C. Foss, Island Pond, coming next in the order named.

These competitions are eagerly looked forward to and are the means of encouraging closer studies on the part of the boys, in order that their respective stations may have the honor of coming out ahead. The keen interest taken in everything pertaining to apprentice matters, by the officials of the motive power department, permeates the whole system, and means that an apprentiec serving his time with the G.T.R. is insured of a practical as well as a thorough theoretical training.

Canadian Northern Railway Station for Vancouver.

The new station about to be erected by the Canadian Northern Pacific Ry. at False Creek, in the centre of the City of Vancouver, will be fireproof and up to date in every respect. It has been designed along dignified classic lines, with a strong central arched feature and supporting features at the extreme corners. The total frontage will be 321 ft. with a depth of 105 ft. It will contain a basement and three stories above street grade.

The ground floor will contain a large general waiting room and ticket lobby, immediately adjacent to which and entering directly from it, will be waiting rooms for men and women, dining room and lunch counter, barber shop, ticket office for rail and steamship, commercial telegraphs, hand baggage, general baggage, government mail, express and sleeping and dining car departments, etc. The two upper floors will accommodate the company's general offices in Vancouver. There will be elevator service to all floors.

Directly in front of the main entrance, on the opposite or rear side of the station, will be situated doors leading to a covered concourse 50 ft. wide, running along the entire length of the rear of building. From this concourse access to the various train platforms will be had. These platforms will also be covered. In all there will be 16 tracks leading into the station and the average of the platforms will be about 1200 ft.

The building will be amply supplied at all points with natural light and ventilation, the form of the building on the upper floors, permitting of direct light and air to all rooms and corridors. The large waiting room, which will have a lofty ceiling, will be lit not only from the top but also by means of clerestory lights on three sides, which will also afford splendid natural ventilation.

Externally the front and both side walls will be constructed of granite up to base, and above, in stone, both of which materials will be procured locally. The general waiting room will be finished in marble about 6 ft. up, above which Caen stone will be used to ceiling, the latter to be panelled in ornamental plaster. The floors will be finished in terazzo. Marble will also be used in all corridors and lavatories, with terazzo floors. It is the intention as far as practical to use British Columbia materials in the construction.

The general scheme also calls for the construction at once of freight offices, with freight shed, and the usual trackage and teamway facilities for the rapid handling of this branch of the business.

The cost of the passenger station, with its concourse and platforms, will be about $1,000,000. The arhcitects are Pratt & Ross, of Winnipeg and Vancouver.

Auditing of Railway Accounts. In connection with the loans to the Canadian Northern and Grand Trunk Pacific Railways, authorized at the Dominion Parliament's last session, the Dominion Government has appointed Marwick, Mitchell, Peat & Co., to audit the C.N.R. accounts, and Price, Waterhouse & Co. to audit the G.T.P.R. accounts.

Railway Accomodation for Camp Borden.

The laying out by the Dominion Government of the new military camp, named after the Premier of the Dominion, in Simcoe County, has necessitated the building into it of two spur lines, one from the C.P.R. and the other from the G.T.R. The camp lies in the section of Simcoe County through which the Pine River runs, north and east of the G.T.R. line from Beeton to Collingwood, south and west of the G.T.R. line from Allandale to Collingwood, and west of the C.P.R. Toronto-Sudbury line. The two last mentioned lines are the most convenient for access to the camp.

The C.P.R. has built its spur line from Ypres, 57.3 miles from Toronto. It runs for 1.75 miles on the company's own right of way, and then for 2 miles on the Government lands, connecting up with the Government tracks. The building of the line was an exceedingly simple piece of work, there being no gradients to amount to anything, and no bridgework of importance. It was done by the company's own forces. A station building and siding accommodation is being provided. From Toronto to the camp there are 4 trains each week day, 3 extra trains on Saturdays, 1 extra train on Tuesdays and Thursdays, and 3 trains on Sundays. From Camp Borden to Toronto there are 4 trains each week day, 2 extra trains on Saturdays, 1 extra train on Mondays and Thursdays, and 4 trains on Sundays. The running time varies from 1¾ hr. to 2 hr. 40 min.

The G.T.R. spur line starts from Angus, 10.60 miles from Allandale, and is 4 miles long, the station being 2.6 miles from Angus. Two sidings, each half a mile long, have been laid at the station; there are also 5 spur tracks for the Ordnance and Army Service Corps, each spur being about 1,600 ft. long, and a 1,900 ft. Y at Angus for turning trains. There is a summer station 400 ft. long, with platforms 800 ft. long, nearing completion. Construction work was started May 11, and was reported to be practically completed June 15. A train service was put in operation June 1, consisting of the Camp Special, leaving Toronto at 6.40 a. m., reaching the camp at 9.10 a.m. and returning at 6 p.m., reaching Toronto at 8.30 p.m. Additional service was to be put on during the march. Special trains are being operated between Allandale and the camp and between Collingwood and the camp.

The Government lines include a belt line round the central part of the location, with spur sidings as required, with which both the C.P.R. and the G.T.R. lines are connected.

A G.T.R. Conductor's Appeal.—Judgment has been reserved in the appeal of Conductor Sinclair against a conviction in the Toronto police court last March for theft of money from the company. The appeal was based on the ground that the conductor received cash from persons travelling on the trains, as a bribe, and not for fares, and it was contended that, if that were so, the cash was not the property of the company, and was therefore not stolen.

Ticket Agent Found Guilty of Treason.—Israel Schaefer, a general ticket agent at Montreal, after a second trial was found guilty of treason there, June 20, having supplied tickets to Austrian subjects at the outbreak of the war, thereby "assisting the King's enemies."

Collection of Demurrage at Destination.

S. J. McLean, one of the commissioners of the Board of Railway Commissioners, gave the following judgment recently:

The Security Traffic Bureau of St. Paul, Minn., submits papers in connection with a claim which it has presented to the Canadian Freight Association on behalf of one of its clients. The essence of the claim is this: At the time the shipment moved in 1912 the car service charge was $1 a day. Subsequent to the date of shipment, the Board's order 18178 of Nov. 30, 1912, was issued. This authorized for a limited period a car service charge of $2 for the first 24 hours or any part thereof, and $3 for each succeeding 24 hours or any part thereof, for delay beyond the free time allowed for loading and unloading the cars. Applicant contends that the charge should be $1 a day, it being stated that this was the authorized rate in effect at the time the bills of lading were issued. Applicant points out that the bills of lading contain the provision—"Received, subject to the classification in tariff 'in effect on day of issue of this original bill of lading.'"

Under the Car Service Rules, free time is allowed for loading and unloading as well as for certain other services therein specified, and provision is made as to when the free time shall begin. The carrier is obligated under the contract of carriage to take the car to a given destination. When the notice has been given or the car has been placed and such free time has been allowed as the Board under the Car Service Rules has approved as being reasonable for the purposes of loading or unloading, etc., the obligations of the carrier under its contract of carriage have ceased. The car service charges for the excess time are, therefore, independent of the tariff applying on the shipment, and, consequently in the case presented, the car was liable to the car service charge in force at the time of its arrival at destination.

Reference may be made to the practice of the Interstate Commerce Commission under its Conference Ruling 405, where it provides in respect of demurrage rules that the rules in effect at the time the shipment arrived at demurrage point must control. By its Conference Ruling 473, it provides that demurrage and storage in transit are controlled by the tariff in effect when the initial movement begins, but that demurrage and track storage at destination are controlled by the tariff in effect when the car is actually or constructively set for unloading.

The Canadian Northern Ry. appeal to the Supreme Court at Ottawa against the award of Judge Cassels in the Exchequer Court of $166,000 as damages against the Dominion in connection with the entry of the National Transcontinental Ry. into St. Boniface, Man., has been dismissed. The C.N.R. claimed that the lands it owned at St. Boniface had been depreciated in value to the extent of from $2,500,000 to $10,000,000 by the construction of the N. T.R. The appeal was argued at Ottawa May 2.

The Minister of Labor has informed the machinists and other striking employes of the Toronto, Hamilton & Buffalo Ry., that the representatives of the men, the company and the Government having agreed upon an award, under an arbitration in conformity with the act, the Department can do no more, and that it is the duty of the men and the company to get together.

Transportation Course and Scholarships at McGill University.

A circular issued by George Bury, Vice President, C.P.R., in reference to 2 free scholarships covering 4 years tuition in the Faculty of Applied Science in McGill University, Montreal, which are offered, subject to competitive examination, to apprentices and other employes enrolled on the company's permanent staff and under 20 years of age, and to minor sons of employes, was published in Canadian Railway and Marine World for June. For some years the C.P.R. has been giving a course at McGill to 5 of its employes, or sons of its officers or employes, and after the session of 1916-17 this will be increased to 10. All the students taking advantage of this course will be required hereafter to qualify in chemistry, civil, mechanical or electrical engineering. The company will bear the expense of these courses, and they will be open to any employe or the son of any official or employe who may qualify.

For some years past the Canadian Pacific and Grand Trunk have contributed largely to the expense of the transportation course at McGill, which will come to an end with the session of 1916-17. The G.T.R. has withdrawn its grant this year, and it is said that the C.P.R. will do the same. The course will be given next session only to 4th year students, who will be allowed to finish their course.

Litigation Respecting the Pacific Great Eastern Railway.

A unique action has been taken by the leader of the opposition in the British Columbia Legislature, in connection with the legislative action respecting the P.G.E.R. He first submitted a motion to the Legislature asking that legal proceedings be taken by the Attorney General against certain persons, under the Criminal Code, sec. 160, for the manner in which the money received for the sale of the P.G.E.R. guaranteed securities had been paid out. The statute guaranteeing the securities provided that their proceeds should be paid out as the work progressed "in the proportion of work done and materials and supplies purchased for the said railway as compared with the whole work done and to be done thereon, pending completion of the said line," and the motion submitted alleged that $18,035,198.53, the entire amount received from the sales of the guaranteed securities, had been paid over while $18,803,805.59 had been expended on the line, which was only partially completed. The motion was defeated by 30 votes to 4; and a subsequent motion, asking that the Lieutenant Governor appoint a royal commission to investigate all matters connected with the construction of the railway, was also negatived. In the writ, issued June 1, it is alleged that the act granting a loan of $6,000,000 to the company to complete the line is invalid on the ground that the Legislature legally expired Mar. 15; and that the payment of a large portion of the $18,000,000 odd to the company was a breach of trust. The action is regarded as a move in the provincial political game.

The Train Dispatchers' Association of America held its 29th annual convention at Toronto, June 20 to 22. About 200 members were present on the opening day, and were given a civic reception by the Mayor and council.

Canadian Northern Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, for Western Lines, compared with those of 1914-15, from July 1, 1915:

	Gross Earnings	Expenses	Net Earnings	Increase or Decrease
July	$1,206,100	$921,000	$285,100	x$145,400
Aug.	1,192,800	954,000	238,800	x5,900
Sept.	2,014,500	1,358,000	661,600	1,900
	$4,413,600	$3,227,000	$1,186,600	x$79,300
Decr.	$658,300	$579,000	$79,300	.....

x Decrease.

Mileage in operation at Sept. 30, 1915, 4,965, against 4,670 at Sept. 30, 1914.

Commencing with October, the figures show the earnings of the entire system, both eastern and western lines.

	Gross Earnings	Expenses	Net Earnings	Increase
Oct.	$3,678,500	$2,421,500	$1,257,000	$537,800
Nov.	3,535,200	2,323,800	1,211,400	618,400
Dec.	3,435,600	2,233,500	1,202,100	768,900
Jan.	2,086,800	1,831,400	255,400	88,100
Feb.	2,089,200	1,959,800	129,400	x193,500
Mar.	2,607,000	2,240,600	366,400	x134,800
Apr.	2,824,300	2,274,400	549,900	5,500
	$26,958,900	$20,133,300	$6,825,600	$1,847,700
Inc.	$5,906,200	$4,058,500	$1,847,700	.....

x Decrease.

Average mileage in operation at Apr. 30, 7,824, against 6,974 for the same period of 1914-15.

Approximate earnings for May, $3,088,900, against $2,721,400 for May, 1915, and for three weeks ended June 21, $2,254,400, against $1,226,700 for the same period 1915.

Canadian Pacific Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, compared with those of 1914-15, from July 1, 1915:

	Gross Earnings	Expenses	Net Earnings	Increase
July	$7,895,375.47	$5,094,972.35	$2,800,403.12	$978,042.71
Aug.	8,801,451.52	5,359,136.80	3,442,314.72	79,157.02
Sept.	10,273,165.45	5,527,864.81	4,475,300.64	378,252.25
Oct.	13,433,206.88	6,863,780.29	6,579,434.15	3,258,105.79
Nov.	13,351,283.51	6,996,870.48	6,354,413.03	3,710,340.86
Dec.	12,705,673.45	7,003,351.97	5,702,231.48	3,502,797.67
Jan.	8,588,826.04	6,498,417.81	2,090,408.23	954,174.93
Feb.	8,795,830.30	6,501,487.56	2,294,342.74	315,328.12
Mar.	10,380,981.98	6,959,651.62	3,421,330.36	448,315.63
Apr.	10,881,306.37	7,147,570.40	3,733,735.97	1,045,980.76
	$105,117,108.53	$63,953,104.09	$41,164,004.44	$12,170,410.32
Inc.	$21,025,428.31	$8,315,017.99	$12,710,410.32	.....

Approximate earnings for May, $12,187,000, against $6,996,000 for May, 1915, and for three weeks ended June 21, $7,934,000, against $4,827,000 for same period 1915.

Grand Trunk Railway Earnings.

Following are the earnings and expenses for the G.T.R., including the Canada Atlantic Ry., the G.T.W.R. and D.G.H. and M.R., for April, compared with those for April, 1915:—

Grand Trunk Railway.

	1916.	1915.
Earnings	$3,585,000	$3,200,000
Expenses	2,344,000	2,032,800
Net earnings	$1,241,000	$1,167,500

Grand Trunk Western Railway.

Earnings	$ 820,700	$ 609,250
Expenses	571,400	590,500
Net earnings	$249,300	$17,750

Detroit, Grand Haven and Milwaukee Ry.

Earnings	$ 280,000	$ 197,200
Expenses	252,200	205,000
Net earnings	$27,800*	$7,800

*Deficit.

TRAFFIC RECEIPTS OF THE SYSTEM.

Aggregate from Jan. 1 to Mas 31,—

	1916	1915	Increase
G.T.R	$17,128,159	$14,971,617	$1,157,142
G.T.W.R.	3,738,626	2,850,836	887,790
D.G.H.&M.R.	1,310,609	961,518	349,091
	$22,177,964	$18,783,971	$3,394,023

Grand Trunk Pacific Railway Earnings.

The approximate earnings of the Prairie Section, 916 miles, for May, were $422,385, against $211,772 for May, 1915, and the aggregate for five months ended May 31 was $1,941,586, against $1,135,445 for same period 1915.

Final Judgment in the Rogers Pass Tunnel Suit.

The case of McIlwee vs. Foley et al is of such great importance to engineers and contractors generally that we feel it important to devote considerable space to it. The plaintiffs are J. A. McIlwee & Sons, of Denver, Col., and the defendants Foiey, Welch & Stewart, to whom the C.P.R. let a contract with the defendants for boring connecting lines at Rogers Pass, B.C. In the particulars of claim published in Canadian Railway and Marine World for Dec., 1914, pg. 542, the plaintiffs set out that as sub contractors they entered into a contract with the deefndants for boring a five mile tunnel, the defendants to provide tools, mules, equipment, air for ventilation and other drilling purposes and to make monthly advances on account of work done. The plaintiffs undertook to drive 900 ft. a month and were to receive a bonus of $1,000 for every foot of tunnel driven beyond the 900 ft. a month, the total bonus to be earned not to exceed $250,000. Work was started April 2, 1914, and so much was done that early in September plaintiffs claimed to have earned $215,076 on bonus account. The plaintiffs allege that the defendants then began to hinder them in their work and that after considerable friction the general contractors annulled the sub contract Sept. 24. Plaintiffs' claim was made up as follows: Bonus earned, $215,076; bonus which they were prevented from earning, $34,924; loss of profit on contract for pioneer tunnel, $125,325; loss of profit on contract for centre tracking, $164,036. When the case was heard before Mr. Justice Clement, plaintiffs were awarded $32,000 as damages, at the rate of $600 a day unearned profits from the time of stoppage of work until Oct. 9, 1914.

Both the plaintiffs and defendants appealed from the judgment and the B. C. Court of Appeal on Aug. 10, 1915, allowed the McIlwee appeal in full with costs and dismissed defendants' appeal. A majority of the court found that McIlwee & Sons were entitled to the full amount of the bonus claimed and also to all the damages for loss of profits they could show on reference to the trial judge. Subsequently leave was granted to amend the statement of claim in accordance with this finding and this was done, the total claimed for bonus and damages being put at over $800,000. Foley, Welch & Stewart then appealed to the Judicial Committee of the Imperial Privy Council, which has unanimously sustained the B.C. Court of Appeal's judgment.

The Privy Council's Judgment.

The appeal to the Judicial Committee of the Imperial Privy Council was heard by Earl Loreburn, Lords Atkinson, Parker of Waddington and Sumner. Earl Loreburn delivered the committee's judgment as follows:

"This is a dispute arising out of a contract between Foley Brothers and McIlwee and Sons. Messrs. McIlwee, who are the plaintiffs, agreed to construct a tunnel some 5 miles long. It would be necessary to make the tunnel from both ends. In Sept. 1914, a quarrel arose between Mr. Dennis, who was acting on behalf of Foley Brothers, and Mr. McIlwee, acting on behalf of his firm. Mr. Dennis in his haste sent a notice cancelling, at all events, part of the contract, and he also thereupon stopped the supply of air which was necessary to enable the work to continue. After some fruitless interviews, Mr. McIlwee broke up his staff, and treated the contract as ended, inasmuch as the action and the notice of Mr. Dennis went to the very root of the contract. Their Lordships feel no doubt that the letter of Sept. 24 containing the notice and the action of Foley Bros. through Mr. Dennis justified Messrs. McIlwee in treating the contract as having been repudiated in respect of matters going to the root of it. The work was in fact discontinued by Messrs. McIlwee because of the action of and the notice that had been given by Mr. Dennis. An argument was addressed to the Board to the effect that the discontinuance of the work and the cancellation or annulment of the contract was due to a common agreement by both sides. This view seems to be quite untenable. It did not commend itself either to the trial judge or the Court of Appeal, and it is not necessary to elaborate the facts bearing upon that issue.

"Messrs. McIlwee thereupon brought an action, and certainly are entitled to damages; but an important question has been raised upon what principle those damages ought to be assessed. With regard to that matter, the trial judge, Mr. Justice Clement, and the Court of Appeal differed, and it is desirable to explain how that difference arose. The unwise letter of Sept. 24 had hardly been written, and action hardly taken, before the author of it appeared to have had some misgivings, and he wished and his principals wished that the contract should be continued. Messrs. McIlwee, for obvious reasons, were anxious to continue the contract, but seem to have been annoyed at the treatment they thought they had unjustly received. Thereupon two offers were made by Mr. Dennis on behalf of Foley Bros. He offered upon Oct. 9 that the work should be continued, and that Foley Bros. should pay damages up to date. At this time the workmen originally engaged had been discharged by Messrs. McIlwee and part of the staff—nearly all apparently—had been disbanded. Of course, the damage arising from the breach of contract might continue beyond the date of Oct. 9. Messrs. McIlwee professed to be ready to renew the contract, but were uncertain as to whether the terms of the offer included damage which might occur after Oct. 9. They could not obtain any assurance that this was intended, or that this was offered, and they would not renew the contract without being satisfied upon that point. The Court of Appeal thought this was reasonable; their Lordships agree with that view, and must regard the letter of Oct. 9 as being, to say the least, doubtful in construction.

"The second offer was made upon Nov-10, by which time five more weeks had elapsed, and Messrs. McIlwee had now been kept from work for six weeks. The offer by Foley Bros. amounted to this—that they would pay all damage of every kind arisen or to arise from the breach, and would restore the terms of the old contract. By this time it had become necessary that considerable modifications should be made in the old contract to meet the new situation, as regards the time, for example, and other matters. Messrs. McIlwee expressed their demands in a letter of Nov. 11. If any legal adviser, by which is meant any person competent to give an impartial opinion upon this contract, had been asked in regard to this letter of Nov. 11, their Lordships think he would have said there must be considerable modification in the contract before any renewal could be advised, and that he could not advise a renewal unless the points raised in that letter were cleared up and satisfactorily settled. In point of fact when the letter was received it was not treated as being a basis of settlement, and the offer of Nov. 10 came to nothing. The Court of Appeal thought that this was not unreasonable conduct on the part of Messrs. McIlwee, and their Lordships are not prepared in any way to differ from that opinion.

"Perhaps it would be advisable to say one or two words in view of some of the expressions that have been made use of in the judgments. Their Lordships think that the quotation by Mr. Justice Galliher from the judgment of Lord Chief Justice Cockburn in the case of Frost v. Knight, L.R. 7 Ex. 111, 41 L.J. Ex. 78, truly expresses the law. The Lord Chief Justice, in speaking of the event of one person treating a contract as broken and suing at once for breach of it, says: 'He will be entitled to such damages as would have arisen from the non-performance of the contract at the appointed time * * * and in assessing the damages for breach of performance a jury will of course take into account whatever the plaintiff has done, or has had the means of doing, and, as a prudent man, ought in reason to have done, whereby his loss has been, or would have been, diminished.'

"In many cases the nature of the contract, or its circumstances may make it extremely difficult, if not impossible, to apply any such rule, but that rule of law seems applicable to all contracts where it can practically take effect. Under these circumstances, their Lordships will humbly advise His Majesty that this appeal ought to be dismissed with costs."

McIlwee & Sons' Offer.

The letter of Nov. 11, 1914 referred to in the above judgment was written by S. S. Taylor, K.C., counsel for McIlwee & Sons, to Foley Bros., solicitors as follows: "We have yours of today stating that yours of yesterday is not 'without prejudice' which, of course, also means that the letter of Foley Bros., Welch & Stewart, of Oct. 9, 1914, is also not 'without prejudice.' Our clients are, and always have been, willing and anxious to do anything within reason; their conduct in the face of Mr. Dennis' unreasonable behavior at the time of cancellation showed plainly that they were most anxious to proceed with the work. They complain most bitterly against the treatment accorded them by Mr. Dennis and even after the indefinite letter of Oct. 9, 1914, referred to above, they complain that Mr. Dennis strongly intimated to them that it would not be well for them to return to work; these peculiar things have upset their confidence, because on the one hand Foley Bros., Welch & Stewart invite them in an indefinite letter, but nevertheless in writing, to return to work, whilst on the other hand, verbally, the man who represents Foley Bros., Welch & Stewart intimates to the contrary. In view of the above, and in any event, if they are to have the opportunity to return to work there must now be a very definite understanding. My clients are unquestionably the largest tunnel contractors upon this continent, and have very large contracts elsewhere, hence are not in the position of people looking for a job, nor of those having got one to suffer to be knocked out one day and taken back the next.

"I may say that they are willing to attempt to arrive at a definite under-

standing with your clients, the basis of which will need to be somewhat as follows: 1. The present contract stands.

"2. Your clients' conduct has completely broken up the entire organization of McIlwee & Sons at Rogers Pass. Their foreman, sub-foreman and workmen are distributed all over Canada and the United States, and it will be impossible to get many of them together again. This condition existed even on Oct. 9, 1914. This means that considerable provision must be made in allowance of time to permit McIlwee & Sons to again get together an organization as efficient and capable of handling this work as the organization existing in Sept. 1914, so that the work can be carried on at the least possible cost to our client and at the greatest possible speed per month; our statement of claim herein shows that every month, by reason of their weeding out process and retaining the best men, they were able to accomplish faster and better work and at a greater profit and do more lineal feet per month, thus demonstrating all I have claimed for them. Inasmuch as this condition of affairs must again be worked up through the process of several months at great expense and disadvantage and loss, your clients must agree to pay that loss, which must be arrived at in a lump sum before we can again consider going back to work, and provision must be made for early payment of this loss. This damage, of course, will embrace all expense connected with Mr. McIlwee's own office staff and organization as well as that of his workmen.

"3. The number of feet required to be done per month before the lineal feet constituting the basis for bonus calculations shall be counted, must be less than heretofore, for such number of months after recommencing the work as will permit of the perfecting of organization, etc., to the standard existing at the time of cancellation of the contract. The same, of course, applies to all other maximum requirements of the existing contract.

"4. Tunnel equipment conditions must be as favorable as they were during the first week of Sept., 1914, and the equipment for carrying out ventilation and the supply of power must be put in first class shape and be operated to the fullest extent reasonably required by McIlwee & Sons or any person representing them. In other words, as to ventilation, the workings must be kept clear at all times from gas and the workings supplied with pure air and no delays must occur on this account nor by reason of any lack of power. You can readily see that if our clients return to work these things could be neglected or done in such a way that it would be impossible for our clients to make any profit out of their work. There must be full, fair dealing in the future. Nothing unreasonable is asked. Our clients must be given the very best and most honest opportunity of carrying out the work at the highest pitch of speed that they are capable of. The new agreement will make ample provision for this, so that the existing agreement will be honestly and fairly carried out and not left to the quirk of any engineer.

"5. Your clients have, also, done a great deal of the rock work since the date of cancellation, which rock work was embraced in our clients' contract, and our clients have lost the profit that they otherwise would have made upon this work. This profit must be fixed and paid to them.

"6. Our clients will lose for some time to come the rate of profit that they could have made had they not been interfered with and their organization disrupted. A definite agreement must be made to provide for this lost opportunity for profit and, as definite a sum as can possibly be fixed, must be fixed and paid.

"7. Our clients have been greatly damaged in the earning of the bonus in respect of which at the time of cancellation they show an average entitling them to $215,000; provision must be made to protect this and the balance of the bonus, and to provide for the payment. My own opinion is that the basis for earning this bonus has been so wrecked by the action of your clients through their cancellation proceedings, that this amount should be now fixed definitely and paid. However, that can be a matter of negotiation, but I do think that it is unfair to entirely disrupt their organization upon which the earning of this bonus so directly depended and now to throw the average upon which it is based into jeopardy with an entirely new organization and under new conditions. I think it only fair that this should be disposed of finally. This item is a very heavy one and certainly must be adequately protected.

"8. Our clients must first inspect the tunnel and see the present conditions and view the work that has been done by your clients since cancellation, and also the present ventilation plant and the plant for the supply of power, the bunk houses and the boarding house accommodations, because it may be that your plant and working conditions there have so changed that our clients could not possibly hope to succeed to carry out the work profitably.

"9. Your clients must make provision for fair treatment to be accorded our clients by your engineers; in other words, you know it is difficult to anticipate everything that a person can do to hamper a contractor. All that we ask is absolute fair treatment.

"The above will give you an idea of the difficulties to be surmounted in this matter, and I am sending a copy of this letter to my clients tonight so that if you wish to further discuss the matter, we will very soon be in a position to carry on that discussion."

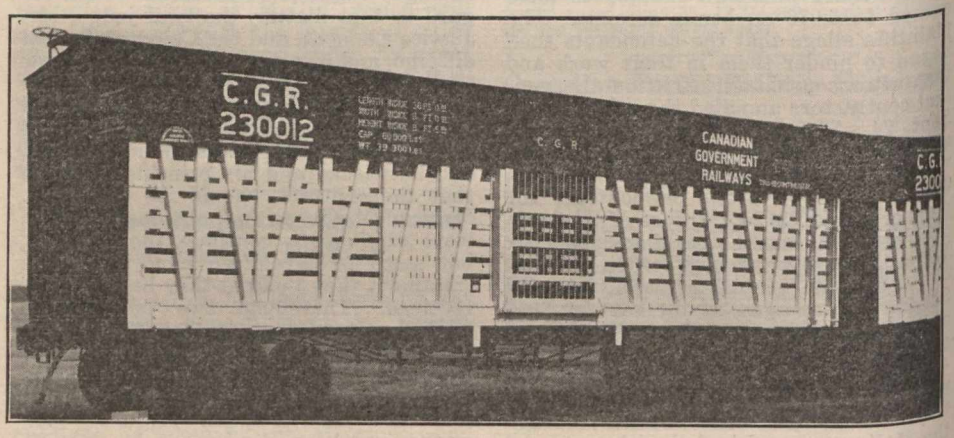
Canadian Northern Ry. Contractors' Suits.—Suits have been entered by the Johnston & Carey Co., railway contractors, St. Paul, Minn., against the Canadian Northern Ry. and Foley, Welch & Stewart, for $250,000, $19,000 and $47,000, in respect of certain contracts for railway construction in the neighborhood of Fort Frances, Ont.

Stock Cars for Canadian Government Railways.

As stated in Canadian Railway and Marine World for February, 200 wood frame stock cars are being added to Canadian Government Railways rolling stock. The principal dimensions are:

Capacity	60,000 lbs.
Length over end sills	36 ft. 9⅝ in.
Width over side sills	9 ft.
Height top of sill to underside of plate, 7 ft.,	10¾ in.
Length inside	36 ft.
Width inside	8 ft.
Height top of floor to underside carlin	8 ft.
Door openings, side	5 ft.
Door opening, end	2 ft.
Distance between centre of trucks	26 ft. 9⅝ in.

As shown by the accompanying illustration the design is of the standard construction for wood stock cars. Instead, however, of having the wood draft sills with the standard draft gear for wood cars, these cars are equipped with the Intercolonial standard metal draft arms, which are composed of steel plates and shapes rivetted together, and when applied to the cars, the capacity of the draft gear equals that of the steel frame car. The cars, some of which have already been delivered, are being built by Canadian Car & Foundry Co., at Amherst, N.S.



Stock Car for Canadian Government Railways.

The Pennsylvania Railroad's Elevator Buffalo, N.Y., is to be improved by an additional marine leg and extensions of the weighing and car loading apparatus so as to make it possible to unload grain from a vessel at the rate of 40,000 bush. an hour and pour it into cars out of stores at the rate of 45,000 bush. an hour.

G.T.R. employes have made a further contribution to the Canadian Patriotic Fund, of pay for one day in May, representing over $20,000. The amount contributed at the commencement of this year, was $135,000, and during this year, four days pay, one day each quarter, will be contributed.

Four German locomotives, originally intended for use on the Bagdad Railway, are being used on the Egyptian State Railways, having been captured, together with a German vessel, early in the war, and condemned by a prize court at Alexandria.

The Montreal Harbor Commission has it is reported decided not to proceed any further at present with the project to electrify its railway lines.

C.N.R. Toronto Employes Picnic.—The annual picnic of the Canadian Northern Ry. Toronto employes was held at Orillia, Ont., June 17.

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Associate Editors
JOHN KEIR AND DONALD F. KEIR

Canadian Business Representative, W. H. HEWITT, 70 Bond Street, Toronto

United States. Business Representative, A. FENTON WALKER, 143 Liberty St., New York

European Business Representative, J. MEREDITH MCKIM, 16 Regent St., London, Eng.

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NOTICE TO ADVERTISERS.

ADVERTISING RATES furnished on application.

ADVERTISING COPY must reach the publishers by the 10th of the month preceding the date of publication.

TORONTO, CANADA, JULY, 1916.

PRINCIPAL CONTENTS

Extension of Time for Installing Safety Appliances.

The Board of Railway Commisisoners passed general order 166 May 29, as follows: Re general order 102, Feb. 17, 1913, prescribing Rules and Regulations Respecting Safety Appliances on railway trains, and general order 128, July 20, 1914, granting an extension of time until July 1, 1916, within which the railway companies shall make certain changes, as set forth in the order, upon reading what is filed on behalf of the railway companies it is ordered that they be granted an extension of time until July 1, 1917, within which to make the changes required under general order 128.

In a circular transmitting the order to railway companies it is stated that the Board expects rapid progress to be made with the work and that monthly reports be forwarded to its Chief Operating Officer as to the equipment of the cars.

Another Railway Construction Battalion.

J. W. Stewart, of Vancouver, B.C., of the contracting firm of Foley, Welch & Stewart, and President of the Pacific Great Eastern Ry., has been authorized by the Minister of Militia to oragnize a battalion of railway men for overseas service, of which he will probably have the command. The construction corps will have the same establishment as an infantry battalion, that is approximately 1,150 men, including base company. It will be organized on similar lines to that of the Canadian Overseas Railway Construction Corps raised under C.N.R. auspices. A recruiting office has been opened in the 400 Block on Homer St., Vancouver. It was reported, June 7, that about 250 men had then enlisted. The battalion will, it is stated, be mobilized at Valcartier, Que.

Grain Inspection at Western Points.

The following figures compiled by the Department of Trade and Commerce, show the number of cars of grain inspected on railways at Winnipeg and other points on the Western Division for May, and for nine months ended May 31, with a comparison of the number of cars inspected for nine months ended May 31, 1915.

	May	Nine months to May 31,1916	Nine months to May 31,1915
C.P.R.	17,104	152,712	56,908
C.P.R. Calgary	465	6,069	6,078
C.N.R.	8,918	80,239	36,308
G.N.R. Duluth.	160	4,845	1,344
G.T.P.R	2,485	35,474	14,180
Totals	29,131	279,339	114,818

The Canadian Northern Ry has provided a special demonstration train for the use of the Saskatchewan Agricultural College. It contains a refrigerator car, live stock car, flat car for live stock demonstrations, boys' and girls' car, field crop production car, lantern lecture car, and household science car, and is to be used by the college to give agricultural instruction to residents along the C.N.R. lines in the province.

Russia's new railway from Petrograd to the White Sea, is nearing completion. Construction of the railway was begun last February, and the work has been executed by 10,000 prisoners, all Slavs from the Austrian army. Five hundred skilled men from Canada have also been engaged upon the fourth section. The line is single track.

Delaware and Hudson Co's Report.

The Delaware and Hudson Co.'s report for the year 1915 covers the operations of the company's collieries and steam and electric railways in the United States and its two lines in Canada—the Napierville Junction Ry. and the Quebec, Montreal and Southern Ry. The statistical statements cover the operations of the whole undertaking, but an incidental reference to the Canadian lines is made in the comments upon the finances. Specific details of the operations of the two Canadian lines, covering the year ended June 30, 1915, were given in our June issue, pg. 218.

The company operates 909.07 miles of railway in the U. S. and 232 miles in Canada. The total operating revenue for 1915 was $23,787,519, against $22,722,-961.55; the operating expenses being $14,823,625.67, against $15,188,850.92; leaving a net operating revenue of $8,-963,893.33, against $7,534,1110.63. The Interstate Commerce Commission's new classification reserve, effective July 1, 1914, consequently the figures for 1914 have been readjusted in order to place them upon a comparable basis with those of 1915. Adding other sources of income, the railway department had a net income for the year of $9,356,838.21, from which was deduced rentals, fixed charges, etc., amounting to $4,840,953.24, bringing a net income of $4,515,884.97, against $3,-171,457.82 for 1914. Adding thereto net income from coal mining department and from all other sources, the net income for the year was $6,071,440.64, against $4,-609,793.85; representing 74.28 per cent., against 10.84 per cent. on the capital stock of $42,503,000. Dividends at the rate of 9 per cent. were declared during the year, absorbing $3,825,270. The general balance sheet shows total liabilities of $133,803,442.88, and total assets of $154,514,595.13, the surplus of assets being $20,711,152.25, against $18,773,318.34 in 1914.

The report contains the following paragraphs relating to the Canadian lines: "The Quebec, Montreal & Southern Ry. shows a decrease in operating revenues of $47,963.04, compared with the previous year. Operating expenses decreased $12,-876.21. Income from hire of equipment decreased $10,189.80. Net income, not allowing for interest due Delaware and Hudson Co., was $96,188.56, a decrease of 35.47 per cent. The Napierville Junction Ry. shows an increase in operating revenues of $9,949.74, compared with the previous year. Freight revenue increased $11,538.07, while passenger revenue decreased $2,129.95. Operating expenses decreased $3,632.31. Net income was $41,923.02, or 6.99 per cent. on capital stock outstanding, an increase of $17,-064.91, compared with the previous year. A dividend of 5 per cent. for the year 1915 was declared."

The table of securities owned by the company includes $1,000,000 of the Quebec, Montreal and Southern Ry. stock and $600,000 of Napierville Junction Ry. stock.

The Canadian Construction Co. has been incorporated under the Quebec Companies Act with authorized capital of $90,000 and office at Montreal, to carry on a general contracting and construction business, and in connection therewith to own and operate quarries, railway sidings, rolling stock, etc. The provisional directors are: J. A. Beaudry, J. E. Valin, E. T. Sayers, U. Beaudry, and G. E. Couillard, Montreal.

Canadian Northern Railway Construction, Betterments, Etc.

Mount Royal Tunnel & Terminal Co.—In order to overcome a difficulty which has been raised in connection with the leasing of the Mount Royal Tunnel & Terminal Co.'s property to the Canadian Northern Ry., the Canadian Northern Ontario Ry. and the Canadian Northern Quebec Ry., an act has been passed by the Dominion Parliament declaring that the provisions of the statutes of 1914, chap. 28, sec. 1, sub. sec. 2, were intended to make and did make the whole of the rents or sums reserved or made payable under the agreement or lease therein referred to a charge upon the whole of the property, assets, rents and revenues of the lessees, parties to the said agreement or lease, the said charge ranking next after penalties heretofore or hereafter imposed for noncompliance with the requirements of the Railway Act, and in priority to all mortgages, changes or encumbrances made or created by such lessees before or after the passing of the said chap. 78, and in priority to all securities thereby secured."

Canadian Northern Ry.—Tenders are under consideration for the extension of the company's freight car shops at the west yard, Winnipeg.

M. H. MacLeod, General Manager and Chief Engineer, promised recently to have an investigation made into the proposal to build a 12 mile extension from Beulah, the present terminus of the Rapid City section, to Birtle, Man.

A contract is reported let to Shannon Bros. for remodelling of the ground floor of the station at Saskatoon, Sask., and the building of a brick extension thereto. The main part of the contract is said to involve the bricking in of the pillars at present supporting the extension of the roof over the platform at the north end of the general offices, thereby converting what is now platform space into a commodious office for the dining and sleeping car department. A wide passage will be left between the north wall of the present general office and the first pillar so that passengers will not require to go out of their way to gain access to the trains. A second platform is also to be built between the first and second tracks. It is expected that the work will be completed early in August.

The Board of Railway Commissioners has ordered the company to complete the fencing of its line east and west of Onoway, Alta.

Canadian Northern Pacific Ry.—M. H. MacLeod, General Manager and Chief Engineer C.N.R., and T. H. White, Chief Engineer C.N.P.R., have completed a trip of inspection over the route of the proposed branch line from Kamloops to Kelowna, B.C. Mr. MacLeod is reported to have told the Kelowna Board of Trade that construction would be started on the line at an early date, probably before the end of July. The branch including branch, sidings and spurs will require 140 miles of track, and will run through Armstrong and Vernon, from which point there will be a branch to Lumley. The line was located in 1913; and about 80% of the right of way is reported to have been acquired, with station sites at Armstrong, Vernon, Kelowna and Lumley.

We are officially advised that the intimation given by Mr. MacLeod, in respect to construction on this branch, was that work would be started on some of the heavy work in the neighborhood of Kamloops in about six or eight weeks from the date of the inspection.

Vancouver Terminals.—The plans for the erection of the station building at False Creek flats, Vancouver, were received in that city June 1, and tenders for its erection were received up to June 20. A description of the building appears on another page of this issue. It is reported that the work to be done in addition to the building of the station, and for which other contracts will be let, will involve the handling of 4,000,000 cubic yards of filling, the laying of 130,000 ft. of tracks; the building of a freight shed 800 x 40 ft. and a locomotive house.

Vancouver Island Lines.—Track is reported to have been laid from Patricia Bay to near Victoria, B.C., and ballasting is being gone on with. A contract is reported let to Robertson & Co., Vancouver, for the erection of a concrete bridge over the Burnside Road, Victoria. Work has been started and is to be rushed to a completion as fast as possible. It is expected that construction will be started upon the car ferry slip at Patricia Bay at an early date. It will be 303 x 27 ft. (May, pg. 178.)

Birthdays of Transportation Men in July.

Many happy returns of the day to:

A. A. Allen, Vice President, The Holden Co., Ltd., Montreal, formerly Master Mechanic, Timiskaming and Northern Ontario Ry., born at Grafton, Ont., July 7, 1870.

J. H. Black, ex-Superintendent, Timiskaming and Northern Ontario Ry., now at Toronto, 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 Tramways Co., born at St. Thomas de Montmagny, Que., July 25, 1877.

H. F. Bradley, Passenger Department, H. & A. Allan, Ltd., Montreal, born at Waterville, Que., July 20, 1876.

D'Alton C. Coleman, Assistant General Manager, Western Lines, C.P.R., Winnipeg, born at Carleton Place, Ont., July 9, 1879.

George Collins, Superintendent, Ottawa Division, Ontario Grand Division, Canadian Northern Ry., Trenton, born at Kingston, Ont., July 20, 1860.

G. C. Conn, Vice President, Pere Marquette Rd., Detroit, Mich., born at Woburn, Mass., July 1, 1867.

D. D'E. Cooper, Canadian Freight Agent, Lehigh Valley Rd., Toronto, born at Buffalo, N.Y., July 8, 1862.

John Corbett, ex-General Foreign Freight Agent, C.P.R.. Montreal, born in Lanarkshire, Scotland, July 19, 1863.

H. Darling, Locomotive Foreman, G.T. Pacific Ry., Smithers, B.C., born in Northumberland, Eng., July 27, 1873.

S. E. Dewey, General Eastern Freight Agent, G.T.R., New York, born at Beckenham, Kent, Eng., July 4, 1879.

A. H. Eager, Assistant Superintendent of Rolling Stock, Western Lines, Canadian Northern Ry., Winnipeg, born at Waterloo, Que., July 15, 1868.

F. C. Foy, Canadian Passenger Agent, New York Central Lines, Toronto, born there, July 5, 1881.

J. F. Gildea, District Master Mechanic, C.P.R., Montreal, born at Strood Park, near Horsham, Sussex, Eng., July 7, 1884.

A. D. Huff, ex-Division Freight Agent, G.T.R., Ottawa, now Traffic Manager, Laurentide Co., Montreal, born at Chatham, Ont., July 17, 1866.

C. W. Johnston, Assistant General Passenger Agent, G.T.R., Montreal, born at Actonvale, Que., July 27, 1879.

M. Kelly, Resident Engineer, District 4, Ontario Division, C.P.R., Toronto, born at Thamesville, Ont. July 6, 1874.

A. E. Lock, Superintendent Car Service, Toronto, Hamilton and Buffalo Ry., Hamilton, Ont., born at Albany, N.Y., July 14, 1879.

G. A. McNicholl, Assistant General Freight and Passenger Agent, Grand Trunk Pacific Ry., Prince Rupert, B.C., born at Montreal, July 31, 1876.

H. D. Mackenzie, District Master Mechanic, Intercolonial Ry., Stellarton, N.S., born at Churchville, N.S.. July 22, 1864.

T. J. Maguire, Accountant, Quebec Central Ry., Sherbrooke, Que., born at Quebec, July 31, 1860.

W. G. Manders, General Freight Agent, Western Lines, Canadian Northern Ry., Winnipeg, born at Owen Sound, Ont., July 24, 1876.

J. E. Morazain, Superintendent, District 1, National Transcontinental Ry., Quebec, Que., born at Wheatland, Que., July 31, 1875.

R. E. Perry, Assistant General Freight Agent, Canadian Government Railways, Moncton, N.B., born at Drayton, Ont., July 5, 1876.

R. Preston, Assistant Superintendent of Motive Power, Western Lines, C.P.R., Winnipeg, born at Toronto, July 28, 1863.

J. E. Quick, General Baggage Agent, G.T.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.

George Stephen, Assistant Freight Traffic Manager, Western Lines, Canadian Northern Ry., Winnipeg, born at Montreal, July 5, 1876.

Sir Thos. Tait, President, Fredericton and Grand Lake Ry. and Coal Co., Montreal, born at Melbourne, Que., July 24, 1864.

G. A. Walton, General Passenger Agent, Western Lines, C.P.R., Winnipeg, born at Montreal, July 17, 1881.

Increased Working Hours in Intercolonial Ry Shops.—Commencing June 1 the working hours in the I.R.C. shops at Moncton, N.B., were fixed as from 7 a.m. to 6 p.m., with one hour for dinner, daily, except Sunday. That is one hour of overtime each day for five days, and two hours on Saturday. It is stated that the extra hours are necessary owing to the general conditions. During the winter traffic was very heavy, and with the difficulty of securing and holding mechanics it has not been possible to keep the rolling stock up to requirements.

The Engineers' Club of Montreal shows a net profit for the financial year ended Mar. 31, of $12,805, which has been applied to writing off portions of the general equipment accounts. The balance sheet shows assets of $281,000 with liabilities of $91,000. There are 515 members, of whom, 19 are on active service overseas. Four members were killed in action during the year. The President of the club is H. Holgate, and R. W. H. Smith is Secretary.

No. 1 Construction Battalion for Overseas Service.

Considerable information about the No. 1 Construction Battalion which is being raised by Lt. Col. Blair Ripley, M.Can. Soc.C.E., heretofore Engineer of Grade Separation, C.P.R., Toronto, was given in Canadian Railway and Marine World for June. In addition to the appointments then mentioned four supernumary lieutenants have been taken on as follows:

F. A. R. McNair, of the City Works Department, Toronto. He has been connected with the roadways branch for some years and has had charge of considerable roadway and paving work.

C. M. Saul, of Montreal, a civil engineer who served his time in Scotland. During the past three years he has been with the California Highway Commission, his special line of work being paving and roadway construction.

Recruiting Car No. 1 Construction Battalion, Canadian Expeditionary Forces.

The car shown above is being used in Toronto for recruiting for No. 1 Construction Battalion, which is being raised by Lt.-Col. Blair Ripley, M.Can.Soc.C.E., until recently Engineer of Grade Superation, C.P.R. Toronto, and full particulars of which were given in Canadian Railway and Marine World for June. The car has been loaned by the Toronto Ry., and was decorated by men of the battalion. Lieut. G. Fleming, son of R. J. Fleming, General Manager, Toronto Ry., is in charge of recruiting for the battalion.

Leslie B. Allen, civil engineer of the City Works Department, Toronto, who has had a number of years experience in paving and roadway work

R. W. H. Palmer, of St. Catharines, Ont., a civil and mining engineer and a retired captain of the Imperial Army.

No appointment of major has been made and this office will probably remain unfilled until the battalion reaches England.

While the enlistment has not proceeded as rapidly as was expected, it is said that the battalion is filling up faster than any of the infantry battalions, the strength being already over 500, with indications that the balance necessary to complete the full force, 1038 officers and men, will be secured quicker than the first half.

It is not intended to give the men much drill, in fact not more than is necessary for the purpose of obtaining discipline and fitting them for moving about from place to place with expedition.

The Late James Jerome Hill.

The death of J. J. Hill, at one time President, and later Chairman, Great Northern Ry., took place at St. Paul, Minn., May 29, too late for an announcement to be made in our June issue. He had been in indifferent health for some little time, but his death was not anticipated until within the last few days of the month.

He was born at Rockwood, near Guelph, Ont., Sept. 16, 1838, and attended school there until he was 14 years old, when his father died, and he worked at the village store. In 1856 he obtain work at St. Paul, Minn., as a shipping clerk, and in 1865 was appointed agent for the Northwestern Packet Co., at St. Paul, and two years later, local agent for the St. Paul & Pacific Ry., running a short line between St. Paul wharf and St. Anthony's Falls. During this period he began a friendship and later entered into partnership with Norman Kitson, who ran an ox wagon and sledge service to Winnipeg, and obtained practical knowledge of the conditions of the northwest on trips to and from Winnipeg. He also built up a business at St. Paul, supplying fuel to steamboats, and this developed into the firm of Hill, Griggs & Co., and later, the Northwest Fuel Co., and in connection with this business, he brought the first boat load of eastern coal to St. Paul from Peoria, Ill., by way of the Illinois & Mississippi Rivers. In 1870, in partnership with N. Kitson, he organized the Red River Transportation Co., and built two vessels, which, in connection with the stage route, established the first through service between St. Paul and Winnipeg. While he was acting as railway agent, it was part of his duty to pilot the scientists Louis and Alexander Agassiz through the Red River and Lake Superior districts, and while with them he gained considerable knowledge of the mineral resources of those regions. In the meantime some extensions had been made to the St. Paul & Pacific Ry., as far as the Red River, but owing to bad management, it deteriorated until in 1873 it became bankrupt. Again in conjunction with N. Kitson, he organized a syndicate to acquire the property, and through Donald A. Smith, then chief representative of the Hudson's Bay Co. at Winnipeg, later Lord Strathcona, enlisted the support of George Stephen, then President, Bank of Montreal, later Lord Mount Stephen, and purchased the property for about 40% of the par value of the outstanding securities. The company was reorganized in 1879 as the St. Paul, Minneapolis & Manitoba Ry. with George Stephen as President, and J. J. Hill as General Manager. In the late seventies the line was extended to the International Boundary at St. Vincent, Minn., where it connected with the line built from the other side of the boundary at Emerson Minn., to St. Boniface, opposite Winnipeg, by the Dominion Government and which was known as the Canadian Pacific Railway, Pembina Branch. In 1881 he became one of the members of the syndicate formed to take over from the Dominion Government the portions of the C.P.R. which were completed and under construction, and he was one of the first directors of the C.P.R. Co. Wm. C. Van Horne, afterwards Sir Wm. C. Van Horne, being selected as the first General Manager on his recommendation at the end of 1881. He only remained on the C.P.R. board for a comparatively short time, devoting his energies to the St. P.M. & M.R., and in 1882 he was elected its Vice President, and in 1883, President, when he relinquished his holdings in the C.P.R., and confined himself exclusively to the upbuilding of the system of railways now known as the Great Northern, and also becoming largely interested in the Northern Pacific, and the Chicago, Burlington & Quincy. This, it is claimed, was accomplished without any Government aid in cash, and with only 3,675,000 acres of land as a grant. He retired as President, G.N.R. in 1907, and was for a short while Chairman of the Board.

Pullman Co.'s Profit Sharing Plan. — The directors have set aside 5,000 shares of stock, which will be sold to employes at $155, which is about $10 below current market price. The employes will make deferred payments, and only those who have been in the company's service over one year will be allowed to purchase. An employe will be allowed to purchase one share for each $500 of his annual pay, or portion thereof, up to 25 shares for those having a salary of $12,000. Payments will be at the rate of $4 a month per share. Interest will also be paid on the deferred payments, at not more than 4%, and the purchaser will receive dividends from the date of his purchase.

Too Forcible Ejection From Train.— The Supreme Court of Canada in giving judgment in the appeal case of Diplock against the Canadian Northern Ry. has decided that the company's servants must not use undue force in ejecting trespassers from its premises or trains. The plaintiff was beating his way from Saskatoon to Regina in company with another man. In the altercation the company's brakeman kicked the second man, knocking him against Diplock, who fell off the train, with the result that he lost a portion of his foot. The jury awarded him $1,000 damages, which award has been affirmed.

St. John and Quebec Railway Construction and Operation.

The Dominion Parliament has passed an Act providing aid for the building of the St. John & Quebec Ry., and to confirm an agreement between the company, and the Governments of Canada and of New Brunswick. The Act, in the first place, repeals the statutes of 1912, chap. 49, and the statutes of 1914, chap. 52, these being the Acts confirming agreements for subsidizing the building of the line up to $6,400 a mile, the building of three bridges across the St. John and Kennebecasis Rivers by the Dominion Government, and for the operation of the line as a branch of the Intercolonial Ry., on the division of the gross receipts in the proportion of 60% for the I.C.R., and 40% for the New Brunswick Government. The Act further authorizes the Minister of Railways to enter into an agreement (set out in a schedule); provides that the Government Railways Act, and the Acts heretofore or hereafter passed amending the same, shall extend to the lines operated under the agreement, and that any expenditure made under the Act and of the agreement shall be paid out of the Consolidated Revenue Fund. The second part of the Act provides for the granting of a subsidy up to $6,400 a mile, for a railway from Andover to Centreville, 26 miles; from Centreville to Gagetown, 120 miles, and from Gagetown to Westfield on the C.P.R., 45 miles, in lieu of the subsidies granted in 1913, and that any sums paid under the Railway Subsidies Act of 1913, shall be considered as having been paid under this Act. It is also provided that any portion of the company's line constructed on lands acquired by purchase or lease from the C.P.R. in or near Fredericton, may be included for the purpose of the subsidy as part of the total length of the company's line.

The schedule to the Act contains the agreement made between the Department, the New Brunswick Government and the company. This agreement cancels the former agreement made Mar. 5, 1912, respecting the leasing of a line from a junction with the National Transcontinental Ry. at Grand Falls to St. John, at a rental of 40% of the gross receipts, and substitutes therefor a new agreement providing for the leasing of the line in sections as built, upon terms to be agreed upon, and for the leasing of the whole line when completed within the time limits mentioned—Aug. 1, 1917, as for the line from Gagetown to the C.P.R. at Westfield, and Dec. 1, 1919, as for the section from Centreville to Andover—at a rental of 40% of the gross proceeds, payable to the New Brunswick Government. This rental is to be used by the New Brunswick Government to pay interest and sinking fund on the bonds issued for the construction of the line, to which the guarantee of the Province has been affixed. The total bond issue is not to exceed $35,000 a mile; and any sum remaining after the bond issue has been provided for is to be paid over to the company. The agreement for the operation of the completed line from Centerville to Gagetown, is to date from April 1, 1915. The Dominion Government is to provide the necessary rolling stock for the operation of the line. The company is authorized to build certain portions of its railway in Fredericton upon Dominion lands, upon terms to be fixed by the Dominion Government. The company undertakes to purchase or lease from the C.P.R. sufficient right of way from near the Victoria Station in Fredericton to the Intercolonial Ry. Y connection with the C.P.R., 133 miles; and to acquire by lease running rights over the C.P.R. and the St. John Bridge & Ry. Extension Co.'s from Westfield into St. John, upon terms and conditions to be approved by the Dominion and New Brunswick Governments. The expenditures by the Dominion Government for additional track, sidings, yards, buildings, alignments and grade revisions and other facilities required for the economic and efficient handling of traffic on the line, shall be repaid by the Dominion out of any part of the gross earnings received by the company, or by debentures secured by mortgage on the railway at 4%, but no such expenditure shall be made without the consent of the company, or an order of the Board of Railway Commissioners. Differences are to be submitted to arbitration, the Dominion Government being one party, and the Province of New Brunswick and the company the second party. In the event of anything arising which is not provided for, the matter shall, on the application of either party, be submitted for decision to the Board of Railway Commissioners.

Appended to the agreement are the specifications for the construction of the line.

The New Brunswick Legislature, on April 29, passed an Act respecting aid to the St. John Valley Ry., the provincial title of the company by which the railway known to the Dominion Parliament as the St. & Quebec Ry. is being built. The measure ratifies the agreement referred to above with the Dominion Government. The Premier informed the Legislature that the cost of the completed section of the line from Centreville to Gagetown, 120.3 miles, had been $37,153 a mile. The Act authorizes the construction of the line from Gagetown to the C.P.R. at Westfield, and from Centreville to Andover, the Province to guarantee the bonds of the company, which is now controlled by the Province, for $35,000 a mile. The question of the building of a line from Andover to Grand Falls to a connection with the National Transcontinental Ry., was held over for further consideration, as also was the proposition to make a connection with the Maine Central Rd.

A contract for building the 40 mile extension from Georgetown to Westfield on the C.P.R., has been let to the Nova Scotia Construction Co., in which T. Cozzolino is interested, and of which H. Lindsay is Managing Director. F. W. Sumner, Chairman of the Board of Directors of the Ry., is reported to have said that the contract figure is considerably lower than the price originally submitted. There was one other tender submitted. The work is to be sufficiently advanced by Feb. 1, 1917, to allow trains to pass over the section with safety, and the contract is to be completed by Aug. 1,1917.

The Premier of New Brunswick, referring to the letting of the contract, June 8, is reported to have said that the delay in reaching a definite decision as regards the route was due to the fact that a final decision had not been reached on some sections on which there were conflicting surveys. There were portions of the route as to which there was no doubt and work on these would be gone on with at once.

Subcontracts are reported as follows: From Gagetown south, 10 miles, Smith & Merrithew; next ten miles, Lynch and Gorman; next ten miles, Poupore Bros.; next 10 miles to Westfield, Kennedy & McDonald. (May, pg. 183.)

Railway Finance Meetings, Etc.

Canada Southern Ry.—At the annual meeting at St. Thomas, Ont., June 7, the following were elected directors for the current year, and also for the Niagara River Bridge Co., and the Niagara Grand Island Bridge Co.: J. E. Brown, C. M. Depew, H. B. Ledyard, W. H. Newman, F. W. Vanderbilt, W. K. Vanderbilt, W. K. Vanderbilt, Jr., and E. A. Wicks.

Central Vermont Ry.—The Massachusetts Legislature has authorized the C.V.R., a G.T.R. subsidiary, to acquire any or all of the Southern New England Ry.'s stock.

Guelph Jct. Ry.—The amount paid over to the city of Guelph, Ont., May 30, as the result of the operations of the Guelph Jct. Ry. for the previous quarter, was $9,775, an increase of about $1,600 over the same quarter in 1915. The amount received represents about 5¾% on the stock the city holds.

Temiscouata Ry.—Net earnings for March, $199. Aggregate from July 1, 1915, to Mar. 31, $24,346.

Toronto Belt Line Ry.—The annual meeting was held at Toronto, June 13. Following are the board for the current year:—E. J. Chamberlin, President; H. G. Kelley, Vice President; Frank Scott, Secretary-Treasurer; and J. E. Dalrymple.

Toronto, Hamilton & Buffalo Ry.—The Dominion Parliament has confirmed an agreement made between the company, the Michigan Central Rd., the Canada Southern Ry., the New York Central Rd., the C.P.R. and the Trust Co., dated Feb. 1, making certain traffic arrangements for 50 years, and providing for the guarantee of consolidated mortgage bonds to be issued by the company.

The Vancouver Transportation Club's members have inaugurated what they call the Social and Educational Ry, under which title its meetings are being conducted. The first of the series was held at the club rooms, 553 Granville St., May 26. The honorary officers of the club are: President, R. Marpole; first vice president, D. E. Brown; second vice president, R. W. Brodie; third vice president, W. A. Powers. The other officers are: President, J. A. McFaulds; vice president, J. K. Burns; second vice president, C. E. Lang; secretary treasurer, H. W. Schofield; directors, J. W. Nutt, A. Whitnall, A. Brostedt, A. L. Clements, J. A. Archer, C. E. Jenney, and C. E. Whitelock. The membership has reached 150, of whom about 100 were present at the inaugural meeting.

Fort William Terminal Development Co.—Superior Terminal Co.—A company with this title has been incorporated under the Ontario Companies Act, with authorized capital of $250,000, and offices at Fort William, to deal in lands, buildings, etc. The provisional directors are A. J. McComber, G. A. McTeigue, and Miss E. E. Allen. These directors, with the addition of Miss L. McComber, are named as directors of the Superior Terminal Co., which was incorporated under the Ontario Companies Act, on the same day, with authorized capital of $250,000 and offices at Fort William, Ont., to carry on grain elevator business in connection with a grain growing, buying and milling enterprise.

Railway Development, Projected Lines, Surveys, Construction Betterments, Etc.

Alberta & Great Waterways Ry.—We are officially advised that track has been laid to mileage 203 on the railway, which starts from a junction with the Edmonton, Dunvegan & British Columbia Ry., at Carbondale, Alta., mileage 14.4 out of Edmonton. (Mar., pg. 106.)

Blomidon Ry.—The Nova Scotia Legislature has extended the time for the construction of this projected railway, which is to be operated by steam. electricity or any other motive power, from Canning, on the Dominion Atlantic Ry. Cornwallis branch, to Cape Blomidon, with branches to Cape Split, and from Canning to Wolfville. (Oct, 1911, pg. 935.)

Dominion Government Ry. to Hudson Bay.—The Dominion Parliament at its recent session appropriated $3,000,000 to carry on construction work on the railway, and on the terminals at Port Nelson, Man.

Construction is reported to have been restarted all along the line for the season, and it is fully expected that track will be laid by the end of the season to the Kettle Rapids, mileage 332 from Pas, Man.

Tenders are under consideration for the supply of hardware supplies for the Port Nelson terminals, and for the supply of hardware supplies for the Port Nelson terminals, and for the supply of provisions for the construction staff there. (June, pg. 219.)

Grand Trunk Ry.—Acting Superintendent McMillan attended a special meeting of the Lindsay, Ont., Town Council, June 8, to confer with that body as to the creation of a new locomotive house and machine shop there. The plans for this work were prepared some considerable time ago, but the outbreak of the war in 1914, caused a delay in taking action. Mr. McMillan is reported to have said that it was expected the work would be started at a very early date. It was proposed to put up a 20 stall locomotive house, built in circular style, so that it could be extended when circumstances warranted it. The biggest type of locomotives in use would be seen on the division before long. Besides the locomotive house a mechanical coal chute would also be constructed as well as a machine shop 50 x 100 ft. It was the intention of the company to erect the locomotive house between Angeline and Adelaide Sts., and between the railway and line fence in order that it might face Adelaide, but owing to the fact that there was only 220 ft. of land, it was decided to put its back to the north. The company as a result of these plans would have to carry four tracks across Adelaide St. at this point, and the consent of the council would have to be obtained before the tracks could be laid. The company would also have to build an extra water tank, which meant that they would get more water from the town. Consideration is being given to the matter by the council.

We have been advised by an officer of the G.T.R. that, so far as he is aware, there is no intention on the company's part to erect a new roundhouse or other buildings at Lindsay, Ont.

Plans are being prepared for the erection of two coal chutes at London, Ont., whic hit is said will cost approximately $40,000.

Edmonton, Dunvegan & British Columbia Ry.—Preparations for construction for the season are reported to be well forward. The new construction will cover a 54 mile extension from the present terminus at Spirit River, to the B. C. Block, passing through the Pouce Coupee Prairie district. A sub-contract was reported let to W. T. Craig, Winnipeg, for the first six miles, June 2; and other sub-contracts were being arranged with G. Webster, J. Timothy, F. V. Riley and A. McGregor.

The finishing up of the line to Spirit River, including station and other buildings, etc., will be completed, and the ballasting and finishing up of the branch from Spirit River to Grande Prairie, will also be done this season.

It is reported that funds for the carrying on of the season's operations were secured by the deposit of $2,420,000 of 4½% bonds, guaranteed by the Province of Alberta, with Chicago and Cincinnati bankers, on terms netting the lenders 5½%. (May, pg. 183.)

Great Northern Ry.—The company's officers have informed the Vancouver City Council that the contract for the building of the station at False Creek flats, let to Grant Smith and McDonnell Co., is on a percentage basis; that all employes are citizens of Vancouver; that they are being paid the current rates of wages, and that as far as possible all materials will be purchased in British Columbia. (June, pg. 222.)

Grand Trunk Pacific Ry.—A press report states that a grading outfit left Moose Jaw, May 27, for Gilroy, the end of track on the Regina-Moose Jaw-Gilroy line, to start grading for the extension of the line to the Saskatchewan River at Riverhurst, Sask.

The G.T.P.R. has deposited with the Minister of Public Works at Ottawa, description of the site and plans of a warehouse at Prince Rupert, B.C., in front of water block G., approval of which is required under the Navigable Waters Protection Act. (May, pg. 182.)

High River, Saskatchewan & Hudson Bay Ry.—The Dominion Parliament has extended the time for building this projected railway from any point in Tps. 25 to 28, range 1, west 4 meridian Alberta, to Saskatoon, Sask., to the Saskatchewan-Manitoba boundary between Tps. 52 and 56, and on to Pas, Man. (Mar., pg. 106.)

Intercolonial Ry.—In connection with the subway improvements completed recently on Main St., Moncton, N.B., the station platforms are being extended easterly to the subway. Tenders are under consideration for the erection of a viaduct, station building and train shed at Levis, Que., to replace the station destroyed by fire about a year ago. The plans for the building have been prepared by Ross & McDonald, Montreal. It is expected that building will be started early in July, and rushed as fast as possible. (July, pg. 231.)

Manitoba & Ontario Ry.—The application to the Dominion Parliament for the incorporation of a company with this title was withdrawn before the bill reached a third reading. (Feb., pg. 51.)

Margaree Coal & Ry. Co.—The Nova Scotia Legislature has extended the time for the construction of the company's projected railway from the Intercolonial Ry. near Orangeville to St. Rose, N.S., 46 miles, and from the Intercolonial, near McIntyre Lake, to Caribou Cove, Port Malcolm, N.S., four miles. (July, 1913, pg. 331.)

Michigan Central Rd.—A press report states that the company is planning to erect a steel bridge across Bear Creek, near Enniskillen, Ont., at an estimated cost of $60,000. There is no station named Enniskillen on the M.C.R. in Ontario, and the only place of the name in the province we know of is a post office near Burketon Jct., on the C.P.R. (June, pg. 223.)

Michigan Central Rd.—L. J. McKee, Superintendent, St. Thomas, Ont., an another official visited Sarnia, Ont., June 15, and was interview by a deputation to urge the transfer of the present terminals at Courtright to Sarnia. The officials went over the whole waterfront, made considerable enquiries, and informed the deputation that the matter would be carefully considered. (June, pg. 222.)

Montreal Central Terminal Co.—C. N. Armstrong, President, addressed the Builders' Exchange members in Montread, June 2, on the company's terminal project. He said it would cost in the neighborhood of $40,000,000, which would be furnished by U. S. financiers. The proposed station site would be from Bleury St. to St. Lawrence Boulevard, and Vitre St. to Lagauchetiere St., the building of which would necessitate the entire re-erection of Vitre and Lagauchetiere streets from Victoria Square to St. Denis St. The proposed station would have 10 lines of railways running into it. There are nine railways coming into Montreal now, but another company is planning to extend its tracks to this city. The station would be larger than the Pennsylvania Rd. station in New York and would be large enough to handle three times as many trains a day as go in and out of the C.P.R. Windsor St. station. On the west side of the building it would be necessary to expropriate the whole of St. Antoine St. Connection would be made with the Harbor Commissioners' tracks, both at the east and west, and a short line would also be built to give a connection at Fulham St. The present stations at Windsor St., Place Viger and Bonaventure would be maintained for freight purposes, and the train level in the station would be the same as the present level of the G.T.R. The main entrance to the station would be on Lagauchetiere and Vitre Sts., but approaches would also be provided from Bleury and St. Lawrence streets. The traffic into and out of the station would be operated by electricity. The tunnel under the St. Lawrence river would run from the Laurier pier in Hochelaga, to the G.T.R. wharf at Longueuil. From there a belt line would run around to the C.P.R. Lachine bridge by which it is proposed to enter the city on the western side to save the present construction of another bridge. The company's plans had been submitted to the Board of Railway Commissioners, and the Montreal Board of Control was preparing a report on them for submission to the council.

It was stated to the meeting that both the C.P.R., and the G.T.R. are opposed to the project. Controller Villeneuve is reported to have said, June 9, that while no railway could enter the city and use its streets would out the consent of the Board of Control and the City Council, the Board of Railway Commissioners was the principal body which should pass upon the proposal. (June, pg. 223.)

National Transcontinental Ry.—Tenders will be received by the Railways Department, Ottawa, up to July 4, for

the construction of reinforced concrete foundations, on wood piles or concrete piles, for a 1,000,00 bush. storage capacity grain elevator, working house and track shed at Transcona, Man.

Pacific Great Eastern Ry.—The British Columbia Legislature has authorized the raising upon treasury bills or notes, or by the issue of British Columbia stock, of $10,000,000, bearing interest at 4½%, and to be redeemable not later than June 30, 1941, out of which the Government is authorized to advance to the P.G.E.R. $6,000,000. In consideration of this loan the company is to transfer to the Government, free of any liability whatever, $2,000,000 of its share capital; it shall pay the cost of placing the loan; shall pay 4½% interest half yearly, and provide for the repayment of the principal before June 30, 1926. The money advanced is to be expended upon the construction of the company's railway, under the Government engineers' supervision. Security for the repayment of the loan is to be given by a mortgage upon the company's entire undertaking and lines, the mortgage to rank next after the securities issued under chaps. 34 and 36 of the statutes of 1912, and chap. 65 of the statutes of 1914, and to assign to the Government $10,250,000 of the company's share capital, in addition to the $2,000,000 provided for to be absolutely transferred. Any bonus granted by the Dominion, the City of Vancouver, or the town of Prince George, is to be paid over to the Government. The P.G.E. Development Co. is to be joined as a party to the transaction by the deposit of 49% of its share capital, and that the Government is to control the price and conditions of sale of the company's lands, and after the cost of subdivision and sale have been paid, one half of the proceeds is to be paid to the Government, on account of the repayment of the loan.

The Premier, in bringing the matter before the Legislature, stated it was clear that it was the Government's duty to assist with its credit in the completion of the railway. Failure to finish the line this year would mean a loss of $2,000,000, being $1,000,000 in road bed depreciation, and another $1,000,000 for interest. If the province did not come to Foley, Welch & Stewart's aid that firm could not raise the money for the early completion of the line. The road would be valuable in bringing out wheat from the Peace River country, and some of the territory lying east in Alberta. The P.G.E. should also be finished as early as possible to give access to the Prince George district. Foley, Welch & Stewart could finish the line more expeditiously and more cheaply than any other firm, and it would be unwise to endeavor to cancel the contract they held, in favor of any one else.

D'Arcy Tate, Vice President, is reported to have said in an interview, June 5, that construction on the line had been resumed. Track laying had been restarted at the present end of track at Clinton, with the steel on hand. It had been found that comparatively little damage had been done during the exceptionally severe winter to the sections graded. It is expected that 40 miles of additional steel will be laid at once from stock. Preparations for building bridges on the section graded from Clinton towards Fort George, and from Fort George towards Clinton, and supplies and plant are being got ready for transport on the 24.5 miles of grading to be completed near the Horse Lake Summit. The total distance from Clinton to Fort George is 263.5 miles. Orders are reported to have been placed for 4,000,000 ft. of lumber for use in trestles and bridges.

In connection with the building of the line from North Vancouver to Squamish, a public meeting was held May 31, to consider the advisability of having the company's tracks removed from the water front to the Esplanade. Property owners are willing to grant additional land for public purposes if the project can be carried out. (May, pg. 183.)

Quebec Bridge.—It is said that an announcement will be made at an early date as to when the connecting span to join the two arms of the central span of the bridge will be floated into position. The pontoons to carry the span are reported to be nearly ready at Sorel. The span itself is well advanced to completion at the shore shops. The north arm of the span is completed, and but little work remains to be done on the north arm. (June, pg. 223.)

The Regal Collieries are reported to have made considerable progress with the development of some coal mines near Taber, Alta. Among the works being carried out is the building of a spur track from the old Eureka mine, north of the town, to the C.P.R. Grading was reported completed June 6, and the men were working for the delivery of the steel to begin track laying. W. A. Aubin and W. E. Bullock, Taber, are interested in the project.

Toronto, Hamilton & Buffalo Ry.—Grading on the extension of the Smithville-Dunnville branch from the latter point to Port Maitland, is reported to be well advanced. Bridge and culvert work is being gone on with and it is expected that track laying will be started at an early date.

The company is making application to the Minister of Public Works, under the provisions of the Navigable Waters Protection Act, for approval of site and plans for a car ferry dock and slip at Port Maitland, in front of lot A of what was formerly the naval reserve lands. (June, pg. 223.)

Toronto Terminals Ry. Co.—Rapid progress is being made with construction on the new union station on Front St., Toronto. The whole of the concrete foundation work is practically completed. This comprises the putting in of about 500 concrete bases down to rock bottom, and necessitated the use of 5000 cubic yards of concrete. The sub-basements are from 25 to 30 ft. below the street level. The steel work for the superstructure is being rapidly erected, and it is expected to have it completed about the end of July. In this frame work there will be about 30,000 pieces of steel having a total weight of 5000 tons. Four large derricks are being used to handle the material. (April, pg. 139.)

Vancouver, B.C.—A press report states that the Vancouver, B.C., Harbor Board is planning a terminal railway system to link up the Kitsilano Indian reserve with the water front area on Burrard Inlet.

Damage Suit Against the C.P.R. — Judgment was given by Justice Clute recently in the action brought by O. E. Fleming against the C.P.R. to recover $30,000, present and future damage to gravel beds on the Attrill estate, near Goderich, Ont., caused by the building of a bridge on the Guelph and Goderich Ry. Judgment was given for the plaintiff, with damages to date of judgment of $600, and in default of either party within 30 days, asking for a reference, all future damages are fixed at $3,500.

Traffic Orders by the Board of Railway Commissioners.

Charges for Heated Refrigerator Cars.

24994. May 22. Re tariffs of the railway companies showing charges for use of heated refrigerator cars; and order of 24680, Jan. 27, 1916, suspending such tariffs in eastern Canada and from eastern to western Canada. The companies having filed tariffs covering similar service in western Canada, and from western to eastern Canada, it is ordered that the following tariffs showing charges for the use of heated refrigerator cars be suspended pending hearing by the Board, viz.: Canadian Pacific, C.R.O. no. W.2155, C.R.C. no. W-2156, C.R.C. no. 326, C.R.C. viz.: Canadian Pacific, C.R.C. no. W.2155, C.R.C. no. 83; Grand Trunk Pacific, C.R.C. no. 157, C.R.C. no. 158; Canadian Northern, C.R.C. no. W-934, C.R.C. no. W-936.

Mining Students' Rates from Montreal to British Columbia.

25066. June 15. Re orders 12829, Jan. 26, 1911, and 21375, Feb. 17, 1914, authorizing the C.P.R. to grant a special rate of $40 per capita to a party of mining students from Montreal to Rossland, Phoenix, and Greenwood, B.C., and return or at a rate of $50 per capita from Montreal to Vancouver and return, including side trips to Rossland, Phoenix, and Greenwood. Upon reading what is filed on behalf of the C.P.R., it is ordered that orders 12829 and 21375 be rescinded.

Interswitching to East End Cattle Market, Montreal.

25074. Re general order 11, July 8, 1908, known as the General Interswitching Order, and the complaint of S. J. Wallace of Beachburg, Ont., that the C.P.R. refused to accept from the Canadian Northern Ry. and switch to the East End Cattle Market in Montreal, a carload of cattle shipped by the complainant via Canadian Northern Ry. from Beachburg to Montreal. Upon hearing the complaint at Ottawa, May 17, 1916, in the presence of counsel for the Canadian Pacific and Canadian Northern Railways, the Montreal Board of Trade and the Canadian Manufacturers' Association being represented at the hearing, and upon reading the written submisison filed on behalf of the Canadian Northern Ry. and the report of the Chief Traffic Officer of the Board, it is ordered that, independently of the said General Interswitching Order, and pending the adjustment of the entire switching question, now before the Board, the toll of the C.P.R. for switching live stock from its connection with the Canadian Northern Ry. at Montreal to the East End Cattle Market in Montreal, be $5 a car. That the C.P.R. be directed to accept such traffic from the Canadian Northern Ry. and perform the necessary switching service over its line to the East End Cattle Market in Montreal, at the toll herein provided.

Master Boiler Makers' Association.—The following officers were elected at the annual convention at Cleveland, Ohio, recently: President, D. B. Lucas, C., B. & Q., Havelock, Neb.; First Vice President, J. B. Tate, Pennsylvania, Altoona, Pa.; Second Vice President, C. P. Patrick, Erie, Cleveland, Ohio; Third Vice President, T. Lewis, Lehigh Valley, Sayre, Pa.; Fourth Vice President, T. P. Madden, Missouri Pacific, St. Louis, Mo.; Fifth Vice President, E. W. Young, C.M. & St. P., Dubuque, Iowa; Secretary, H. D. Vought, New York, and Treasurer, F. Gray, Chicago and Alton, Bloomington, Ill.

Mainly About Railway People Throughout Canada.

S. H. Reynolds, Chairman of the Great Winnipeg Water District Commissioners, died suddenly at Chicago, Ill., June 16.

Lieutenant Wanklyn, who was killed in action in Belgium recently, was a son of F. L. Wanklyn, General Executive Assistant, C.P.R., Montreal.

Thomas Cantley, President, Nova Scotia Steel & Coal Co., has been elected President of the Canadian Manufacturers Association.

A. L. Mohler, President, Union Pacific Rd., will retire from active service on July 1, but will continue to be identified with the system in an advisory capacity.

Baron Shaughnessy left Montreal June 20, with Lady, the Hon. Marguerite, and Mrs. W. J. Shaughnessy, for his summer place, Fort Tipperary, St. Andrews-by-the-Sea, N.B.

T. Duff Smith, Fuel Agent, Grand Trunk Pacific Ry., Winnipeg, has been elected a member of the executive committee of the International Railway Fuel Association, for two years.

F. C. Salter, European Traffic Manager, G.T.R. and Canadian Express Co., London, Eng., has completely recovered from his recent serious illness, and has resumed his full duties.

George Strubbe, City Ticket Agent, Canadian Government Railways, Montreal, committed suicide by shooting, June 1. He is stated to have become mentally unbalanced through business worry.

Howard Brown, a gunner in the Canadian Field Artillery, and son of M. H. Brown, Division Freight Agent, C.P.R., Toronto, who was first reported missing, is a prisoner at Dulmen, Westphalia.

W. M. Godsoe, heretofore Superintendent of Telegraphs, Atlantic Division, C.P.R., St. John, N.B., is on a trip to the Pacific Coast, before entering on his new duties as Commercial Representative, Halifax, N.S.

J. L. Higgins, foreman boiler maker, Prince Edward Island Ry., Charlottetown, who retired recently on the pension fund after 40 years service, was presented with a gold watch, chain and fob by his associates.

Lt. Col. Chas. H. Mitchell, B.A.Sc., M. Can. Soc. C.E., who has been overseas in the Canadian Expeditionary Forces since the early stages of the war, has been made a member of the Distinguished Service Order.

Lieut. T. B. Saunders, of the 74th Battalion, Canadian Expeditionary Forces, who was killed in action early in May, was the eldest son of Dyce W. Saunders, K.C., one of the Michigan Central Rd.'s solicitors at Toronto.

Mrs. G. McL. Brown, wife of the European Manager, C.P.R., presided at a Canadian dinner at the Ladies' Lyceum Club, Piccadilly, London, Eng., recently, at which Canadian officers and others associated with Canada were present.

D. B. Hanna, Third Vice President, Canadian Northern Railway, and Mrs. Hanna, went to New York early in June to see their daughter-in-law off for England, where her husband, Lieut. W. B. Hanna, is with the 92nd Battalion, (Highlanders).

T. J. Kennedy, who is one of the receivers of the Algoma Central and Hudson Bay Ry., of which he was President prior to the receivership, has been confined to his house at Sault Ste. Marie, Ont., for some little time past, his doctor having advised complete rest.

Acton Burrows, Managing Director, Canadian Railway and Marine World, has been unanimously re-elected chairman of the Canadian Press Association's Trade and Class Section, and also a director of the association and a member of its Postal and Parliamentary Committee.

Jas. Bruce Robb, who is a private in the Canadian Expeditionary Forces, and is a son of W. D. Robb, Superintendent Motive Power, G.T.R., Montreal, received gun shot wounds in the ear and leg while in action recently, and was admitted to the war hospital at Dartford, Kent, Eng. His injuries are not serious.

Elisha Lee, General Superintendent, Philadelphia, Baltimore & Washington Rd. (Pennsylvania System), has been promoted to the newly created office of Assistant General Manager, Pennsylvania Lines East of Pittsburg. He was born in Chicago in 1870, and is a brother of Frank Lee, Principal Assistant Engineer, C.P.R., Winnipeg.

Lt.-Col. C. W. P. Ramsey, C.M.G., O. C. Canadian Overseas Railway Construction Corps.

Thomas C. Irving, Jr., A.M.Can. Soc. C.E., Vice President, Robert W. Hunt & Co., Ltd., consulting and inspecting engineers, who went overseas with the 1st contingent, Canadian Expeditionary Forces, as Captain in the Canadian Engineers, and was later promoted to Major, has been made a member of the Distinguished Service Order.

Captain G. A. E. Bury, of the 106th Light Infantry, Winnipeg, son of George Bury, Vice President, C.P.R., who has been at the front for some 8 months, during most of which time he was on the firing line, has been appointed Deputy Adjutant Quartermaster General at the Canadian Training Division Headquarters in England.

Captain Ian M. W. Sinclair, of the 13th Battalion, son of Angus Sinclair, railway contractor, Toronto, who was mentioned as having returned to duty after being slightly wounded in the shoulder while in action, and who had been previously wounded in the knee at the Orchard battle, was reported on June 9 to be suffering from shell shock.

H. P. Leslie, a former Assistant General Baggage Agent, G.T.R., Toronto, died at Detroit, Mich., June 6, aged 77. He was for several years in charge of the Great Western Ry. baggage department at Hamilton, Ont., and on the taking over of that line by the G.T.R. was appointed Assistant General Baggage Agent at Toronto, holding that position until 1896, when the department was reorganized on the present basis. He was retained in the service until his retirement in 1906.

Cesaire Senay, whose appointmnet as Assistant Superintendent, District 3, Eastern Division, C.P.R., Montreal, was announced in our last issue, was born at St. Cesaire, Que., Jan. 31, 1873, and entered C.P.R. service in Oct., 1894, since when he has been, to June, 1902, freight clerk and telegraph operator, Westmount, Que.; Mar., 1903, to Mar., 1904, telegraph operator, Mile End, Que.; Mar., 1904, to July, 1912, agent, Atwater, Que.; July, 1912, to Jan., 1913, agent, St. Henry, Que.; Jan. to Dec., 1913, agent, Mile End, Que.; Dec., 1913, to May, 1916, General Agent, Quebec, Que.

Elroy Theodore Agate, C.E., M. Can. Soc. C. E., who has been appointed Assistant Superintendent, Lake Superior District, Canadian Northern Ry., Capreol, Ont., was born at Pittsford, N.Y., Dec. 7, 1874, and graduated from Cornell University in 1897. He was with the C.P.R. Construction Department from 1897 to 1906, and from 1906 to 1910 was engaged in railway work in British Columbia and Washington State. From July, 1911, to the completion of the line he was engaged as District Engineer, District 1, Port Arthur-Sudbury Line, Canadian Northern Ontario Ry., Sudbury, Ont.

R. W, D. Harris, Trainmaster, C.P.R., who has been transferred from Wilkie, Sask., to Ignace, Ont., and who was born at Victoria, B.C., is the elder son of Dennis R. Harris, M.Can.Soc.C.E., of Victoria, whose wife is the youngest daughter of the late Sir Jas. Douglas, first Lieutenant Governor of British Columbia, who founded and named the city of Victoria. He began work as a clerk in the Bank of British North America at Victoria and in 1905 entered the Mechanical Department, C.P.R., at Revelstoke, B.C. In April 1914 he was appointed Trainmaster at Wilkie, Sask.

Alexander Scott, whose appointment as Resident Engineer, Prince Edward Island Ry., Charlottetown, P.E.I., was announced in our last issue, was born at Kirkcaldy, Scotland, Sept. 6, 1884, and entered railway service May 17, 1911, since when he has been, to Aug. 31, 1911, draughtsman, C.P.R., Montreal; Sept. 1, 1911, to Oct. 15, 1912, draughtsman, C.P.R., Sudbury, Ont.; Oct. 15, 1912, to April 30, 1914, transitman, C.P.R., Sudbury, Ont.; May 1, 1914, to Apr. 1, 1915, chief of survey party, C.P.R., North Bay, Ont.; Apr. 19, 1915, to Apr. 30, 1916, Assistant Engineer, Prince Edward Island Ry., Charlottetown, P.E.I.

Lieutenant Ralph Featherston Lake Osler, who died of wounds received in active service in France early in June, entered C.P.R. service in Jan., 1912, as

a clerk in the President's office, and for a time was secretary to the President. In Nov., 1913, he was transferred to the Kettle Valley Ry., one of the C.P.R. subsidiaries, where he worked under J. J. Warren, President, and the Manager of Construction. In Dec., 1914, he enlisted for overseas service, as a private in the Penticton Company of the 30th Battalion of Victoria, and was promoted to Lieutenant on the field. He was a nephew of Sir Edmund Osler, M.P., director, C.P.R.

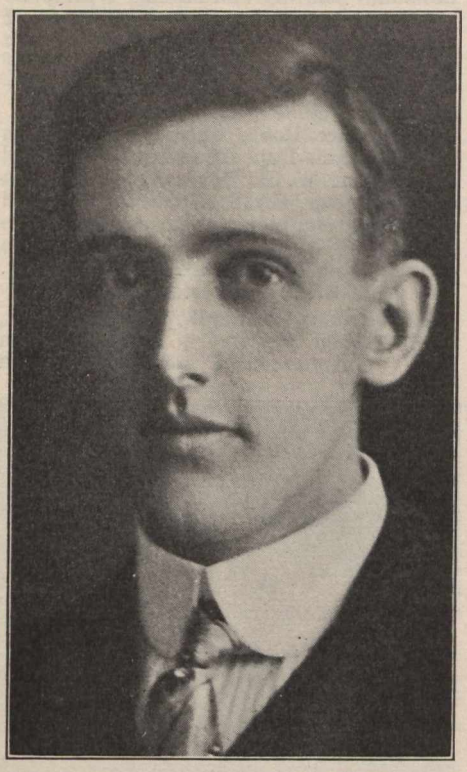
G. G. Grundy, General Manager, Temiscouata Railway, who died at Fraserville, Que., June 9, 1915, without leaving a will, left the following estate: Interest in Montreal real estate, $500; promissory notes, $442; securities for cash, $12,660; furniture, $278; automobile, $1,550; 5 shares Mackinnon-Holmes & Co. stock, $450; Quebec Central Ry. bonds, $387; 8 Canadian Mortgage Investment Co., $704; 74 Dominion Steel Foundry Co., $3,663; 16 Bank of Commerce, $3,248; 1,000 Dome Extension Mines, $80. He held 8,027 shares of stock in other companies which are now valueless. Four brothers, a sister, and two nephews will divide the property.

Ejner L. Landorph, who has been appointed Engineer of Water Service and Tests, Western Lines, C.P.R., Winnipeg, was born at Copenhagen, Denmark, Sept. 9, 1888, and during the summer of 1910 acted as assistant teacher of surveying, etc., at the University of Copenhagen, and in Jan., 1911, graduated from that university as a civil engineer. He entered C.P.R. service June 24, 1912, as draughtsman, Winnipeg, and from Nov. 7, 1912, to Apr. 30, 1913, was transitman, Brandon, Man.; May 1, 1913, to Nov., 1915, Resident Engineer, District 2, Manitoba Division, Brandon; Nov., 1915, to Apr. 1, 1916, Resident Engineer, District 1, Manitoba Division, Kenora, Ont.

Everett Gordon Wickerson, whose appointment as Passenger Agent, Canadian Northern Ry., Prince Albert, Sask., was announced in our last issue, was born at London, Ont., Sept. 27, 1886, and entered railway service Aug. 15, 1906, since when he has been, to Oct., 1906, night operator, C.P.R., Parkbeg, Sask.; Oct. to Nov., 1906, night operator, C.P.R., Pasqua Jct., Sask.; Nov. to Dec., 1906, night operator, C.P.R., West Prince Albert, Sask.; Dec., 1906, to June, 1907, day operator, Canadian Northern Ry., Craik, Sask.; June, 1907, to Apr., 1912, day operator and ticket clerk, C.N.R., Prince Albert, Sask.; Nov., 1912, to Dec., 1915, ticket clerk, C. P.R., Regina, Sask.; Dec., 1915, to May 1, 1916, Passenger Agent, Canadian Northern Ry., Brandon, Man.

Hugh F. Coyle, Superintendent, Districts 5, 6, 7, 8, 9 and 10, comprising the Belleville Division, Ontario Lines, G.T.R., died in his official car, May 31, when returning from Meadville, Pa., to his home at Belleville, Ont. He had been suffering from heart trouble for some time, and during April was granted leave of absence on account of his health. Prior to 1908 he was Assistant Superintendent, District 4 and Montreal Terminals, Eastern Lines, Montreal, and in Jan., 1908, his jurisdiction was extended over District 5. In June, 1912, he was appointed Assistant Superintendent at Belleville, Ont., and in Jan., 1913, was promoted to Superintendent there, which position he retained to the date of his death. The funeral took place at Belleville, June 2.

Jas. Coleman, superintendent, Car Department, G.T.R., who was elected 2nd Vice President, Master Car Builders Association, at the annual convention at Atlantic City recently, was born in Port Huron, Mich., and started work with the G.T.R. as a car department apprentice in 1873. He worked at Port Huron until 1889, when he was appointed foreman at Chicago, remaining in that position until



Alexander Scott,
Resident Engineer, Prince Edward Island Railway.

C. Senay,
Superintendent, District 3, Eastern Division, Canadian Pacific Railway.

1899, when he was appointed Master Car Builder, Central Vermont Ry. at St. Albans, Vt. In 1905 he entered the Canada Car Co.'s service at Montreal, taking charge of the manufacturing department, and in 1906 returned to his former position with the Central Vermont. In Jan. 1908 he was appointed Superintendent, Car Department, G.T.R., at Montreal succeeding W. McWood who retired on pension.

Herbert Gates Reid, who has been appointed Master Mechanic, District 3, National Transcontinental Ry., Transcona, Man., was born at Pembroke, Ont., Oct. 27, 1863, and entered C.P.R. service in Mar., 1884, since when he has been, to Nov. 1884, wiper, North Bay, Ont.; Nov. 1884 to Nov. 1887, fireman, North Bay, Ont; Nov. 1887 to Dec. 1905, locomotive man, North Bay, Ont.; Dec. 1905 to June 1906, relieving Road Foreman of Locomotives, North Bay, Ont.; June 1906 to Feb. 1907, locomotive man, North Bay, Ont.; Feb. to Apr. 1907, Locomotive Foreman, Chapleau, Ont.; Sept. 1907 to Oct. 1908, District Master Mechanic, District 1, Lake Superior Division, North Bay, Ont.; Oct. 1908 to Apr. 1915, Master Mechanic, Lake Superior Division, North Bay, Ont.; Apr. 1915 to May 1916, Master Mechanic, Saskatchewan Division, Moose Jaw.

Moses A. Fullington, A.M.Can.Soc.C.E., who has been appointed Superintendent, District 5, Eastern Division, C.P.R., Smiths Falls, Ont., was born at Johnson, Vt., May 12, 1880, and entered C.P.R. service in Oct. 1904, since when he has been, to Jan. 1905, rodman, Toronto; Jan. to Oct. 1905, transitman, London, Ont.; Oct. 1905 to Apr. 1907, Assistant Engineer of Terminals, Toronto; Apr. 1907 to Jan. 1912, Resident Engineer, Districts 1 and 4, Ontario Division, Toronto; Jan. 1912 to Jan. 1913, Resident Engineer, Dominion Atlantic Ry., Kentville, N.S.; Jan. to July 1913, Assistant Division Engineer, C.P.R., Montreal; July to Sept. 1913, Assistant Engineer, Eastern Lines, Montreal; Sept. 1913 to Feb. 1915, Assistant Superintendent, District 4, Eastern Division, Ottawa, Ont.; Feb. to May 1915, Assistant Superintendent, District 5, Eastern Division, Smiths Falls, Ont.; May 1915 to June 1916, Superintendent, District 3, Eastern Division, Montreal.

F. E. Dewey, who has been appointed General Manager, Wellsville & Buffalo Rd., Buffalo, N.Y., was born Apr. 22, 1858, and entered railway service Feb. 1875, as messenger, Auditor's office, Central Vermont Ry. He subsequently held various positions with different companies, including General Superintendent, New York and New England Ry. In 1898 he was appointed Superintendent, Midland Division, New York, New Haven & Hartford Rd., Boston, Mass., and later served as General Manager, Detroit & Lima Northern Rd.; General Superintendent of Construction, Missouri & Arkansas Rd. and Arkansas & Choctaw Rd.; and as General Superintendent, St. Louis, Memphis and Southeastern Rd.; Oct. 1903 to May 1905, Vice President and General Manager, Mobile, Jackson & Kansas City Ry.; May 1905 to 1906, Vice President, Suffolk and Carolina Rd.; and later he served as Assistant to the President, Wisconsin Central Rd.

Lieutenant-Colonel C. W. P. Ramsey, commanding the Canadian Overseas Railway Construction Corps, has been created a Companion of the Order of St. Michael and St. George, for service in the field. He was born at Bury, Que., Jan. 15, 1883, and entered C.P.R. service as apprentice in the Mechanical Department, in 1898, at the company's Delormier Ave. shops, Montreal. From that date to Sept. 19, 1903, he served the company in various minor capacities, and on the latter date he was appointed a draughtsman in the Construction Department, Montreal, and

then passed through the various grades of transitman, Assistant Engineer and Division Engineer, until Mar. 15, 1912, when he was appointed Engineer of Construction, Eastern Lines, and continued in that position until Feb. 25, 1915, when he was granted extended leave of absence to take command of the Canadian Overseas Railway Construction Corps. During his connection with the company he was closely identified with the construction of the Lindsay, Bobcaygeon & Pontypool Rd., the Toronto-Sudbury Branch, and the double tracking of a large portion of the Eastern Lines, and lastly he had charge of the construction of the Campbellford, Lake Ontario & Western Ry., which constitutes the C.P.R. Lake Shore Line from Glen Tay to Agincourt, Ont. He has been a member of the Canadian Society of Civil Engineers since 1903, when he entered as a student member, becoming an associate member in 1908.

Charles R. Scoles, General Manager, Atlantic Quebec and Western Ry., and Quebec Oriental Ry., New Carlisle, Que., died at Bermuda recently, after having been in ill health for some time. The funeral took place at New Carlisle, June 2, and was attended, in addition to immediate relatives, by a number of the railway companies' employes. He was born at Grantham, England, Aug. 27, 1856, and educated at Bedford College there. He entered railway service in 1890 as General Manager, Salisbury and Harvey Ry., in New Brunswick, and was later appointed General Manager, Atlantic and Lake Superior Ry. From 1885 he was engaged for several years in railway contract work in New Brunswick, and built the Caraquet Ry., and a portion of the Central Ry. of New Brunswick, in addition to carrying out several contracts on various lines in Quebec. He continued as General Manager of the Atlantic and Lake Superior Ry. throughout its final financial troubles, and the acquirement of the property by the Atlantic, Quebec and Western Ry., and on completion of the deal was appointed General Manager of the A.Q. & W.R., and its provincial company, the Quebec Oriental Ry. He was also associated with the New Canadian Co., railway and general contractors, and with the Gaspe Lumber Co., and other concerns, all of which have become inextricably mixed with the affairs of the Charing Cross Bank of London, Eng., which failed a few years ago, the manager being sentenced to a term of imprisonment for fraud.

Jules Edouard Morazain, whose appointment as Superintendent, District 1, National Transcontinental Ry., Quebec, Que., was announced in our last issue, was born at Wheatland, Que., July 31, 1875 and entered C.P.R. service May 3, 1890, since when he has been, to May 21, 1890, freight clerk, Drummondville, Que.; Aug. 1, 1890, to Jan. 8, 1891, night operator, Foster, Que.; Jan. 9 to Aug. 12, 1891, day operator, Richford, Vt.; Sept., 1891, to June, 1892, attended college at Sherbrooke, Que.; Aug. 15, to Sept. 26, 1892, night operator, Sutton, Que.; Sept. 26, 1892, night operator, Sutton, Que.; Sept. 26, 1892, to Feb. 9, 1894, night and day operator, Highlands, Que.; Feb. 9 to July 15, 1894, day operator, Richford, Vt.; July 15 to Oct. 12, 1894, relieving agent and operator at various points; Oct. 12, 1894, to May 27, 1895, day operator, Highlands, Que.; May 27, 1895, to Sept. 24, 1901, agent, Highlands, Que.; Sept. 24, 1901, to Nov. 15, 1908, agent, Mile End, Que.; Nov. 15, 1908, to Feb. 1, 1913, General Agent, Operating Department, Quebec, Que.; Feb. 1 to Dec. 3, 1913, Assistant Superintendent, District 3, Eastern Division, Quebec; Dec. 3, 1913, to Feb. 7, 1914, Assistant Superintendent, District 2, Eastern Division, Montreal; Feb. 7 to Oct. 21, 1914, Assistant Superintendent, District 3, Eastern Division, Montreal; Oct. 22, 1914, to Feb. 10, 1915, Acting Superintendent, District 1, Eastern Division, Farnham, Que.; Feb. 11, 1915, to Apr. 1, 1916, Assistant Superintendent, District 3, Eastern Division, Montreal.

Candian Pacific Railway Construction, Betterments, Etc.

A press dispatch from St. John, N.B., June 17, says the improvements to be carried out during the present season on the Atlantic Division include the construction of a third line from Bay Shore yards to West St. John, construction of storage siding at West St. John, to accommodate 350 adidtional cars and the replacing of all light steel in tracks and switches with heavier rails to permit use of more powerful locomotives. A new 20,000-gallon water tank will be erected to furnish a reserve supply for locomotives and for fire fighting. Additional sidings will be laid between St. John and Montreal to lessen the possibility of congestion, and two of the larger bridges will be strengthened for use of heavier rolling stock.

We have been officially advised that it has been decided to let the old North Toronto station remain where it is for the present, so that none of the tenders received for its removal were accepted. It has been leased to the City of Toronto for use as a market at the nominal rent of $1 a year.

The stations and buildings between Toronto and Windsor, Ont., will be repainted this season.

The line between London and Windsor, Ont., will, it is said, be reballasted this year with dustless ballast.

Tenders are under consideration for filling about 12,500 cubic yards of earth at Gull Lake, on the Transcontinental line, between Swift Current and Medicine Hat, Sask.

It was reported in Moose Jaw, Sask., June 14, that the management had decided to begin construction at once on the section of line, about eight miles, required to convert Vantage, the present terminus of the Moose Jaw-Expanse branch, with the present terminus of the Assiboine branch. Tenders for grading were received June 30.

A press report from Winnipeg, June 15, states that the line now in operation for 75 miles east from Stirling, Alta., will be extended a further 10 miles to Manyberries, this year.

A press report states that the company is preparing to build a concrete dock at Vancouver, B.C., to cost about $1,500,000. When Pier D, the docks used for the coast service, were planned provision was made for two other wharves between D and A, the docks for trans-Pacific steamers. The new dock will probably be built as part B of the general dockage development scheme. F. W. Peters, General Superintendent, is reported to have said that more space is urgently required to handle the large cargoes which are being consigned to the port for transshipment. We are officially advised that the report referred to is somewhat premature. What gave rise to it appears to be the fact that the management had a special study made recently of the dock situation at Vancouver to see if any additional facilities are required. The management has not yet decided what, if any adidtions or improvements will be made in the near future. (June, pg. 222.)

Wages Increase on the Canadian Government Railways.

It was reported in Moncton, N.B., June 14, that an increase of 25c. a day had been granted to trackmen on the Intercolonial and the Prince Edward Island Railways, with corresponding increases in other departments, the new rates of pay to date from June 1. The increases are said to vary from 20 to 40c. a day for men paid by the hour, and at the rate of $5 a month for men paid by the month. The employes affected by the new schedule are said to include freight handlers, station baggage masters, station porters, railway ferry men, locomotive wipers and inspectors, ashpit men, boiler washers, tube cleaners, stationary engine drivers, and firemen and other locomotive house employes, fuel men, store men, watchmen, lamp men, car checkers, janitors, tank men, parlor, sleeping and dining car men, and all classes of employes heretofore covered by the Canadian Brotherhood of Railway Employes' schedule, and several others which are included in the new schedule.

A Winnipeg report of June 16 states that the same increases have been given to employes on the National Transcontinental Ry.

A Moncton despatch of June 14 said:—"Better working conditions and a still further increase of pay are to be discussed within 60 days, and if an agreement is not arrived at, the question is to be submitted to arbitration."

Great Northwestern Ry. of Manitoba Suit.—A settlement, the terms of which were not announced in court, was reached at Winnipeg recently in the action of Delap against the C.P.R. The G.N.W.R. was absorbed by the C.P.R. in 1900, and Mr. Delap, who resides in England, sued the C.P.R., the G.N.W.R., Baron Shaughnessy and R. B. Angus for one-tenth of the G. N.W.R. Co.'s assets. The negotiations for the purchase of the G.N.W.R., in which Mr. Delap owned the controlling interest, were begun in 1898, and a tentative agreement was made, under which he claimed he was to receive $550,000, out of which he was to discharge the company's outstanding indebtedness. Mr. Delap declined to agree unless he was paid in addition one-tenth of the value of the company's assets, but upon negotiations agreed to retain 500 shares of the capital stock, representing one-tenth of the share capital. The agreement of sale was subsequently assigned by the late G. M. Clarke, then general counsel, C.P.R., who concluded the negotiations, to Sir Thomas Shaughnessy and R. B. Angus. The $550,000 was paid, but Mr. Delap claimed that when he applied for the registration of the 500 shares of stock in his name a refusal was given. The action was brought to secure these shares.

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

	Acres.
Calgary & Edmonton Ry.	963.00
Canadian Northern Ry.	481.00
Grand Trunk Pacific Ry.	31.25
Grand Trunk Pacific Branch Lines Co.	7.07
Qu'Appelle, Long Lake & Saskatchewan Rd. and Steamboat Co.	3,444.30
Vancouver Power Co.'s railway right of way.	10.02
Total.	4,936.64

Freight and Passenger Traffic Notes.

The Canadian Northern started operating a daily local train service each way between Vancouver and Hope, B.C., June 11.

C.P.R. train 707, from Toronto to Owen Sound, Ont., Mondays and Wednesdays, returning to Toronto, Tuesdays and Thursdays, carries a parlor car.

The Canadian Northern put a daily train service in operations between Edmonton and Calgary, Alta., June 11, replacing the previous tri-weekly service.

The C.P.R. steamship express trains run from Toronto to Port McNicoll, Ont., to connect with the steamships Keewatin and Assiniboia, on their sailing days three times a week.

The Canadian Northern Ry., owing to lack of rolling stock, will not inaugurate a daily transcontinental train service at present, but will maintain the tri-weekly service to Vancouver.

The Canadian Northern started on June 18, running a special Sunday train from Ottawa to points in the Rideau Lakes district. It will be operated during the summer only.

The Grand Trunk, in connection with a general change of trains time on June 25, start running a new train from Toronto for Detroit and Chicago, leaving the union station at 11.30 p.m.

The Canadian Northern started June 11, operating a regular train service to Victoria Beach, Man. A general accommodation train runs on Tuesdays and Fridays, and on Saturdays, two special trains are run.

The Grand Trunk Pacific has started running an additional train between Winnipeg and Prince Rupert. Trains now leave Winnipeg, Tuesdays, Thursdays and Saturdays. The service to Edmonton remains unaltered.

The Canadian Northern put in operation June 11, a bi-weekly service between Edmonton and Alliance, Alta., via Camrose, the trains eastbound running Tuesdays and Thursdays, and westbound Wednesdays and Fridays.

The Grand Trunk Pacific Ry is now operating parlor observation cars between Winnipeg and Prince Rupert, on through trains, but not on trains 1 and 2, between Winnipeg and Edmonton, when there is no through connection with Prince Rupert.

The C.P.R. trains York and Rideau, running between Ottawa Central Station and North Toronto, via Kempton and the Lake Ontario Shore Line (Campbellford, Lake Ontario and Western Ry.) carry buffet library observation and cafe parlor cars.

The National Transcontinental has added to its service a through sleeping car service between Winnipeg and Quebec, the car being detached from and to the National train to and from Toronto at Cochrane, and being run over the N.T.R. to Quebec.

The Board of Railway Commissioners opened a sitting in Winnipeg, June 12, to hear the application of the Canadian Pacific, Canadian Northern, and Grand Trunk Pacific, to increase general merchandise freight rates from Winnipeg, Portage la Prairie and Brandon to Manitoba points.

Freight and passenger traffic on the National Ry. of Mexico, which has been interrupted for several months, is reported to have been resumed June 9, between Torreon and Aguas Calientes, and it was said that train service between Mexico City and Juarez would be resumed by the end of the month.

The Canadian Government Railways, National Transcontinental section, put in operation its Great Lakes Express service, starting from Winnipeg June 17, at 10.30 p.m., and from Fort William, June 18 at 5.00 p.m. The service is a tri-weekly one, leaving Winnipeg Tuesdays, Thursdays and Saturdays, and Fort William Mondays, Wednesdays and Fridays.

A press report stated recently that as soon as track connection between the Michigan Central Rd. and the London & Port Stanley Ry. was made at St. Thomas, a through sleeping car service would be inaugurated to and from London, via the two lines mentioned. We are advised by officials of both the lines that the question has not even been considered.

In order to avoid congestion at the ticket offices in the union station, Toronto, the baggage checking room on the west side of the Front St. entrance, is to be converted into ticket offices for the C.P.R. and Canadian Northern. The ticket offices on the east side of the main entrance, at present used by the C.P.R. and the G.T.R., will be used entirely by the G.T.R.

The important alterations for the summer on the C.P.R. lines east from Montreal include the starting of the Halifax express at 7 p.m., instead of 7.15 p.m.; the resumption of service of the Twilight Express to Quebec, starting from either end at 5 p.m.; and the resumption of the night express service to Portland, Scarboro Beach, Old Orchard and Kennebunkport, Me., leaving Montreal 9 a.m., and arriving in that city 7.25 a.m.

The most important feature of the C.P.R. summer train service, which went into operation June 4, was the putting on of a new train, no. 635, known as the Michigan Special, leaving Toronto 11.50 p.m., for Detroit and Chicago. It carries the local Detroit sleeping car, heretofore handled on train 20. A new train, the Queen City Special, leaves London, Ont., at 9 a.m., and arrives in Toronto at 12.15 p.m., in connection with which the local service between London, Chatham, Windsor and Detroit has been improved.

The Canadian Government Railways announce that ferry service from Riviere Ouelle Wharf, Que., to Murray Bay points eastbound will hereafter be operated in connection with train no. 4, leaving Montreal 8.15 a.m., arriving Murray Bay via steamboat Champlain at 7 p.m. same day. Westbound there will be no change in the ferry service, steamboat Champlain leaving Murray Bay 7 a.m., connecting with no. 3 Maritime Express due Montreal 6.30 p.m. same day, as previously.

The J. D. McArthur railway lines in Alberta have at present a total operating length of 745.5 miles, the longest being the Edmonton, Dunvegan and British Columbia from Edmonton to Spirit River, 357 miles, with a branch from Spirit River to Grande Prairie 49.8 miles. The Alberta & Great Waterways starts from the E.D.&B.C. at Carbondale, mileage 14.4 from Edmonton, and extends to McMurray, mileage 290.2, the most important midway point being Lac la Biche, mileage 113.2. The Central Canada starts from the E.D.&B.C.R. at McLennan, mileage 262.2.

At Board of Railway Commission's sitting at Saskatoon, Sask., June 16, a letter was read from M. H. MacLeod, General Manager and Chief Engineer, Canadian Northern, giving an undertaking to move the balance of the 1915 grain crop from the Goose Lake territory by July 31. To do this arrangements were made with other railways to secure 300 cars a day, which with the company's own cars would enable 700 cars a day to be moved. Ten train a day would be run, and if these could not be moved over the company's own lines, they would be handed over to other companies.

The Canadian Government Railways, National Transcontinental section, put in operation a new train service between Quebec, Que., and Cochrane, Ont., the the first train leaving Cochrane June 12, and Quebec June 13. The service is tri-weekly, leaving Quebec Tuesdays, Thursdays and Saturdays at 2 p.m., and Cochrane Mondays, Wednesdays and Fridays at 7.15 p.m. Connection is made at Cochrane with the train to and from Winnipeg, known as the National, operated from Toronto to Winnipeg, via the G.T.R., the Timiskaming & Northern Ontario Ry., and the National Transcontinental Ry.

The Canadian Government Railways, National Transcontinental Division, commenced a train service June 11 from Quebec to Cochrane, making connection there for Winnipeg. Westbound trains leave Quebec on Tuesdays, Thursdays and Saturdays at 2 p.m., arriving at Cochrane at 4.10 p.m. on Wednesdays, Fridays and Sundays, and at Winnipeg at 4.30 p.m. Thursdays, Saturdays and Mondays. Eastbound trains leave Winnipeg Tuesdays, Thursdays and Sundays at 5.15 p.m., Cochrane Wednesdays, Fridays and Mondays at 7.15 p.m., and arrive at Quebec Thursdays, Saturdays and Tuesdays at 9.10 p.m. The trains between Quebec and Cochrane will be known as Western and Atlantic respectively when westbound and eastbound, and from Cochrane to Winnipeg they will be known as Western National and National Atlantic respectively.

The C.P.R. Imperial Limited trains handle all classes of traffic between Montreal and Winnipeg, but carry sleeping car passengers only, from Winnipeg to Revelstoke, B.C. When the summer time table was put in operation, June 4, no alteration was made in the time of starting from Montreal—10.15 p.m.—but the train eastward leaves Vancouver at 20.30 K. (8.30 p.m.) half an hour later than the winter schedule, and arrives at Montreal at 8 a.m. instead of 9.20 a.m. The Trans-Canada train leaves Toronto, under the summer schedule, at 6.40 p.m., the same time as during the winter, but arrives in Vancouver 15 minues earlier, viz., at 21.15 K. (9.15 p.m.), while the corresponding train easteward leaves Vancouver at 8.25 K., instead of 9 K., and arrives at Toronto 12.30 p.m., instead of 4.15 p.m. The Montreal-Sudbury trains connecting with the Trans-Canada, resumed running June 5 and 6. These two trains have sleeping cars from Montreal attached, which are carried through on the Trans-Canada to Winnipeg and beyond. The summer trains starting from St. Paul, and Minneapolis, Minn., to Seattle, Wash., and Vancouver, B.C., were also resumed June 4.

The New York Central Rd. has removed its Toronto city office from 80 Yonge St. to Dominion Bank Building, 70 Yonge St. Frank C. Foy, Canadian Passenger Agent, is in charge.

Opening of North Toronto Station, Canadian Pacific Railway.

The new station at North Toronto, which is being built by the C.P.R., although not fully completed, was officially opened for traffic June 14, when train 24 left at 10 p.m. for Montreal via Peterborough, carrying also Ottawa sleeping cars. A. D. MacTier, General Manager, Eastern Lines, who came to Toronto for the opening, was entertained at dinner at the National Club, with a number of other guests, by the Mayor and city council, after which the party proceeded to the new station, every portion of which, including the platforms, was thronged with spectators. Speaking from a dais erected in the main waiting room the Mayor introduced Mr. MacTier, who spoke briefly, and was followed by Sir James Carroll and C. J. Parr, M.P., of New Zealand, and several members of parliament and members of the city council. The Mayor then declared the station open and the party proceeded upstairs to one of the platforms to see train 24 start sharp on time.

At present five trains leave the station each week day and five arrive, the Sunday service being one train out and one in. In addition to the Toronto-Montreal train, leaving at 10 p.m. as above mentioned train 23 from Montreal via Peterborough, carrying also Ottawa sleeping cars, arrives at 8 a.m. The other departing trains are the Rideau, for Ottawa via Belleville and Kempton, at 1.55 p.m.; no. 713 for Teeswater, via Streetsville, at 4.45 p.m.; no. 608 for Lindsay at 5.15 p.m., and no. 707 for Owen Sound, via Bolton, at 5.25 p.m. The other arriving trains are no. 605 from Lindsay at 10.30 a.m.; no. 708 from Owen Sound at 8.10 p.m.; and no. 714 from Teeswater via Streetsville at 8.45 p.m.; and the York, from Ottawa via Kempton and Belleville, at 9.20 p.m.

The new station forms part of the whole general scheme of track elevation across the north end of the city, which is now approaching completion, involving the raising of the tracks for about 4 miles, with the elimination of all grade crossings. The North Toronto line has for a number of years been used by the C.P.R. principally as a freight cut off between Leaside Jct. and West Toronto from which points the main line runs down to the union station in the lower part of the city. Originally the Leaside-West Toronto line was the only entrance into Toronto of the Ontario & Quebec Ry., which was absorbed by the C.P.R. in its early days, and subsequently a connection was built from Leaside Jct. to connect with the union station, and all passenger trains from the east were run over it. For several years a connecting stub line service was operated both ways between Leaside Jct., and West Toronto, and about four years ago the C.P.R. decided to make use of the line from North Toronto to Leaside Jct. for passenger traffic, starting therefrom one of its Toronto-Montreal night trains, and running one of the Montreal-Toronto night trains into it. This proved such a success that a further development of the northern entrance was decided on. The smallness of the existing station made necessary further accommodation, the result of which is the new station, which is now almost complete. This station has been designed on a larger scale than would be required for C.P.R. traffic alone, as the Canadian Northern in planning a permanent entrance into Toronto decided on the northerly entrance, arrangements being made with the C.P.R. to build the station, the C.N.R. to use it jointly as tenants. It is the Canadian Northern's intention to use this station for most, if not all, of its Toronto passenger service, but the C.P.R. will retain its connection with the present union station near the waterfront, only using the North Toronto station for certain trains.

A perspective of the new station is shown in fig. 1; a ground floor plan in fig. 2; and the trackage arrangement in the station vicinity, with its relation to the city transportation conveniences, in fig. 3. The station is located on the east

Fig. 1. North Toronto Station, Canadian Pacific Railway.

This view, made from the architect's drawing, does not show the butterfly roofs over the platforms extending along the north side of the station and over the subway. They will be shown in another view, which will be published in Canadian Railway and Marine World as soon as the tower is completed, and the whole building, etc., can be photographed in a finished condition.

side of Yonge St., at the present end of the Toronto Ry.'s Yonge St. line, which passes down through the centre of the city. With this convenient and through street car line, the new station is very easily reached from the business centre of the city. The rapid growth of the city and stone structure, the central section of which has a high roof, flanked by two lower sections containing the station facilities. On the Yonge St. side there is being built a 140 ft. clock tower, the 30 ft. spire of which will be of terra cotta. The station building is 114 x 76 waiting room on the west are the ticket offices and telegraph offices. Flanking the east side of the waiting room are the women's room, smoking room, lavatory facilities, and telephone booths. Adjoining the waiting room in the northeast corner are the news stand and staff

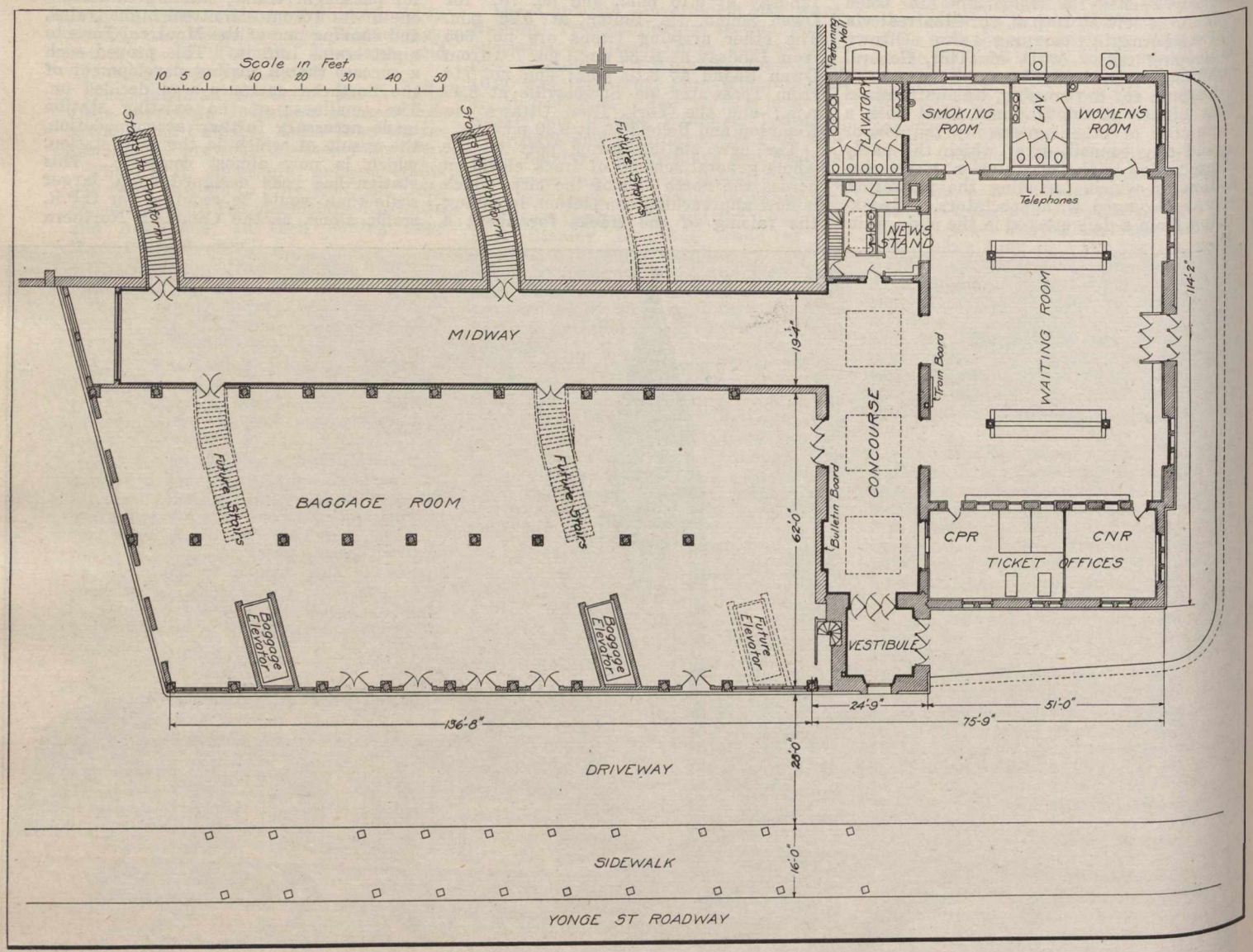


Fig. 2. Ground Plan, North Toronto Station, Canadian Pacific Railway.

The stairs near the south east end of the midway, shown in the above plan as "future stairs," have been built. The two projected stairs on the west side of the midway, also shown as "future stairs," have not been built.

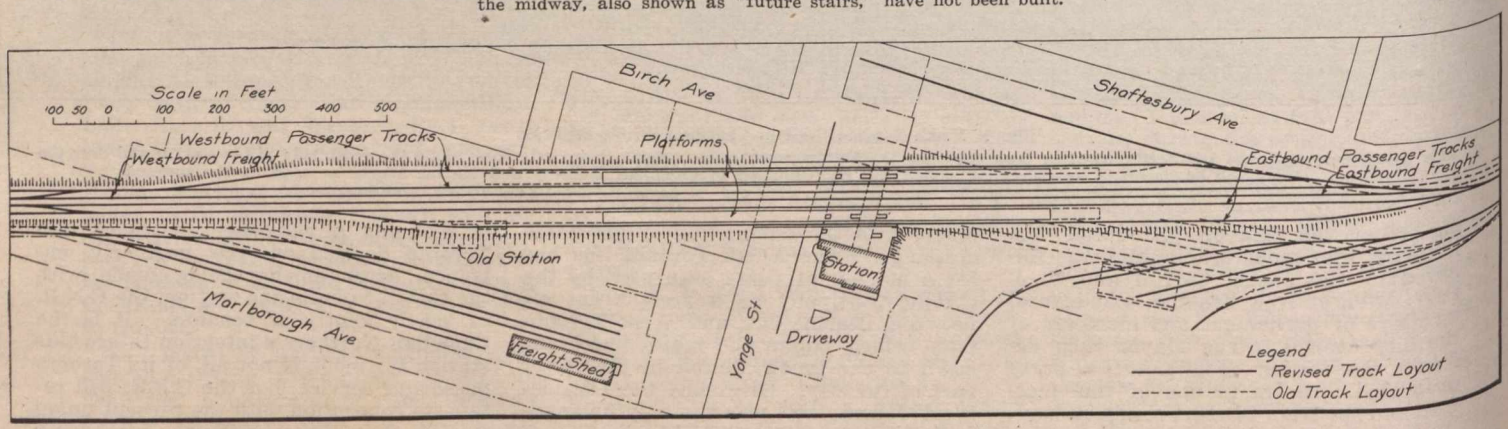


Fig. 3. Track Arrangement, North Toronto Station, Canadian Pacific Railway.

northward makes the North Toronto location particularly available for that section of the city, the new location being more centrally located with regard to the centre of population than the present down town union station.

The new station is a single story brick ft., the broader side facing south, with the tracks on the north side passing it at an angle of about 15 degrees. The central or high section of the station is the main waiting room, 70 x 51 ft., with a centrally located entrance from the driveway on the south side. Flanking this lavatory. Directly opposite the main entrance to the midway under the tracks. The vestibule under the tower leads into the concourse along the north side of the west end of the waiting room, connecting at its east end with the midway. The south and west sides of the station have

sidewalks with metal canopies, so that passengers may either alight at the main entrance centrally on the south side, or at the tower vestibule, the expectation being that the latter entrance will be used by the majority of passengers who have already secured their tickets, and only require to pass directly to the trains, relieving the main waiting room of much of the congestion that might otherwise occur. Along the west side of the station is a 28 ft. driveway, so that vehicles may drive up to either station entrance, and pass through under the tracks through this driveway and out on Yonge St. to the north of the station.

The midway is a passage 20 ft. wide passing from the rear of the station to the far side of the tracks, under the latter. The elevation of the tracks makes a difference in grade between the track platforms and the station level of 15½ ft., giving a headway in the midway of about 14 ft.

Passing over the midway are 6 through tracks, which now connect with two main tracks to the west and a single track to the east, but are so located as to connect in the future with the proposed double track to the east on the revised grade. The northerly two tracks are for westbound trains and the southerly two for eastbound trains, each pair being at 31 ft. centres and tributary to a single platform. The two centre tracks at 13 ft. centres from each other and from the adjoining passenger ones are not tributary to a platform and are reserved for freight or other through train movements, the southerly one for eastbound and the northerly one for westbound. As all passenger trains will originate and terminate at the West Toronto yards and may stand in the North Toronto station for a considerable time, this arrangement gives the greatest possible flexibility in operation, by assigning certain tracks for standing trains and keeping certain others open for through movements at all times.

The platforms are 20 ft. 3½ in. wide and 600 ft. long to accommodate 10-car trains. The portions over the baggage room and subways are of reinforced concrete, and the remaining portions are of wood which will be replaced with concrete when the fill upon which they are built has settled. When traffic requirements warrant, they may be extended to a maximum length of 1,600 ft., thus permitting each platform track to accommodate two trains, or a total of four eastbound and four westbound trains clear of the through tracks.

Butterfly, or inverted umbrella roofs, some 360 ft. long, extend over the concrete portions of the platforms, protecting access to the stairways and elevators. When the fill settles sufficiently to give proper foundation, they will be extended to cover the full length of the platforms. The roof proper is of wood, on a steel frame, which is supported by steel posts in the middle of the platforms. It has a spread of 25 ft. and extends well over cars standing on the platform tracks, thus giving, in many respects, the same protection as the Bush type of train shed when trains occupy the platform tracks. The platforms are reached from the midway by three 6 ft. stairways on the east side. The plans provide for future stairways opposite the present proposed stairways.

The baggage room, 137 x 62 ft., occupies all the section beneath the tracks between the midway and Yonge St. driveway. From the latter the baggage is received through 5 doorways, and is raised on trucks to the platform level by three 15 x 5½ ft. elevators. From the southwest corner of the baggage room a spiral stairway ascends to the track level, where the station master's office is located in the tower above the vestibule. Passenger communication with the baggage room is through the concourse.

The whole exterior of the building, with the exception of the spire, is faced with limestone from Tyndall, Man. The choice of this Canadian stone has been justified by the excellent color effect of the masonry in the mass, an effect equal to any that could have bee obtained by the importation of the better known building stones from the United States. The spire on top of the tower will be faced with terra cotta of a color and texture to tone in with the limestone facing of the remainder of the building. The section under the tracks is of steel and concrete construction.

The main waiting room, tower vestibule and concourse are lined with marble for their entire height, the architectural effect being obtained by the use of different colored marbles, all set in practically the same plane, so as to avoid as far as possible all offsets and other dirt collecting projections. The plaster ceiling of the main waiting room is treated in a broad manner with large panels. The midway is lined with glazed brick for its full height, as are the staircases heading up to the platforms.

A complete system of electric clocks of British manufacture will be installed; of these the large tower clock with four 8 ft. dials will form a part. The clocks throughout the building will be controlled by a master clock which will be synchronized daily from the company's chief time station at Montreal.

All ornamental ironwork such as door frames, stairs, large windows and the marquise on the south and west fronts has been executed by a Toronto firm and all the steel sash throughout the building have been imported from England. The plastering, marble, heating, ventilating, plumbing and electric work has all been carried out by Toronto firms. Wherever possible, and there are but few exceptions, all materials and labor employed in the construction of the building are of Canadian or British origin, and, in accordance with the company's requirements, Canadian timber has been used for all woodwork, whether rough lumber or finished mill work.

The plans were prepared by Darling & Pearson, architects, Toronto, under the J. M. R. Fairbairn, Assistant Chief Engineer, C.P.R., and D. H. Mapes, Engineer of Building, C.P.R. The contractors are P. Lyall & Sons Construction Co. Ltd.

The track elevation work, which included extensive baggage room and roadway construction under the tracks, was carried out under the charge of Blair Ripley, M.Can.Soc.C.E., Engineer of Grade Separation, C.P.R., now Officer Commanding No. 1 Overseas Construction Battalion.

The Board of Railway Commissioners held sittings for hearing complaints as follows: Winnipeg, June 12; Saskatoon, Sask., June 14; Quebec, Que., June 17; Edmonton, Alta., June 15; Vancouver, B.C., June 26; Victoria, B.C., June 28; Montreal, June 28. Sittings will also be held as follows: Nelson, B.C., July 5; Calgary, Alta., July 10; Moose Jaw, Sask., July 12; Regina, Sask., July 13; Winnipeg, July 14; Fort William, Ont., July 17; Sudbury, Ont., July 19.

Canadian Northern Railway Guaranteed Securities.

In the article in Canadian Railway and Marine World for June on "Further Dominion Aid to the Canadian Northern Ry. and the Grand Trunk Pacific Ry.," onpg. 225, in the second paragraph under the heading "Returns to Parliament," line three, reference was made to the "Total amount of stock outstanding," while at the end the word "securities" was used. The word "stock" was used inadvertently instead of securities, which word was used in the return submitted in the House of Commons by the Minister of Finance. As generally understood the word "stock," refers to shares or common stock, and not to bonds, debentures or other securities which are secured by mortgage, guarantee or otherwise, and a correspondent contends that even the word "securities" does not properly express the character of the C.N.R.'s outstanding indebtedness mentioned in the return.,

As mentioned above the word "securities" was used in the return submitted to Parliament, and if our correspondent feels very much excited about it use he should communicate with the Minister of Finance, instead of with us.

The return referred to, which is in the form of a sessional paper, is headed "Statement of Securities Outstanding." The securities listed include bonds of different kinds, 1st mortgage stock, 1st mortgage debenture stock, terminal debenture stock, branch lines stock, second charge stock, perpetual consolidated debenture stock, and perpetual debenture stock.

In the table at the conclusion of the second paragraph referred to the total amount of securities issued was stated as $383,770,798. This was made up by adding the $25,000,000 of income bonds to the $358,770,798 of guaranteed and unguaranteed securities issued. The total guaranteed and unguaranteed securties authoribed amount to $383,438,742.

Canadian Ticket Agents' Association.

The Association's annual outing was held at Port Arthur, Ont., June 12 and 13. The party, numbering about 200 arrived in the city on the Northern Navigation Co.'s steamship Hamonic from Sarnia, and were received by a reception committee of the city council and the board of trade. After the formal reception the members held the annual business meeting, and the ladies were taken for auto trips in the city, and were entertained in the evening by the Women's Canadian Club. The members held their annual smoking concert on June 12, and on June 13, the entire party weer taken on a trip around the bay on the tug Whalen, and in the afternoon went via the Canadian Northern Ry. to Kakabeka Falls. They returned east by the C.P.R. steamship Assiniboia to Port McNicoll.

The following were elected officers at the annual meeting, all being located in Ontario:—President, A. M. Hare, Tillsonburg; 1st Vice President, E. R. Blow, Whitby; 2nd Vice President, H. F. Whittier, Trenton; 3rd Vice President, J. Ransford, Clinton; Secretary-Treasurer, E. de la Hooke, London; Auditor, B. Caswell, Smiths Falls. Executive Committee, J. Jackson, Clinton; W. McIlroy, Toronto; W. J. Moffatt, Toronto; F. W. Churchill, Collingwood; C. B. Janes, Orillia.

Transportation Appointments Throughout Canada.

The information under this head, which is gathered almost entirely 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.

Atlantic Quebec and Western Ry., Quebec Oriental Ry.—J. S. GORDON, Assistant General Manager, is acting as General Manager, consequent on the death of C. R. Scoles, Office, New Carlisle, Que.

Canada Steamship Lines, Limited.—THOMAS HENRY, heretofore Passenger Traffic Manager, has been appointed Superintendent of Hotel Department, Office, Montreal.

Canadian Northern Ry. — In consequence of the sale of the C.N.R. steamships to the Cunard Steamship Co., WILLIAM PHILLIPS, European Railway and Steamship Manager, will return to Toronto in the near future and will be given an important appointment in the Traffic Department.

A. McCOWAN, Supervisor of Car Work, Western Lines, Winnipeg, has had his jurisdiction extended over the Eastern Lines, and advises division officials in regard to staff and general efficiency of operation, and also instructs station officials in respect of maintenance of standards and methods of performing work.

E. H. DREW, heretofore Inspector, Sleeping, Dining, and Parlor Cars, Hotels and News Department, Winnipeg, has been appointed Inspector, same department, Ottawa.

G. C. HEARTS, heretofore Erecting Shop Foreman, Trenton, Ont., has been appointed Locomotive Foreman, Toronto, vice S. L. Tracey, assigned to other duties.

E. T. AGATE, C.E., M.Can.Soc.C.E., formerly District Engineer, District 1, Port Arthur-Sudbury Line, Sudbury, Ont., has been appointed Assistant Superintendent, Lake Superior District. Office, Capreol, Ont.

A. PATRICK, heretofore platform inspector, Sleeping, Dining, and Parlor Cars, Hotels and News Department, Winnipeg, has been appointed Inspector, same department there, vice E. H. Drew, transferred.

W. A. SPEAR has been appointed platform inspector, Sleeping, Dining, and Parlor Cars, Hotels and News Department, Winnipeg, vice A. Patrick, promoted.

H. COLEY has been appointed Sleeping, and Parlor Car Hotel and News Department, Edmonton, Alta., vice G. H. Cullingford, transferred to the linen room, at Winnipeg.

W. A. EAGLESON has been appointed Roadmaster, with juricdiction Lucerne, B. C., to Tollerton, Alta., including Lucerne yard. Office, Lucerne, B.C.

H. A. MACKENZIE has been appointed Roadmaster, with jurisdiction Blue River to Lucerne, including Blue River yard. Office, Blue River, B.C.

J. WARK has been appointed Roadmaster, with jurisdiction Kamloops to Blue River, including Kamloops yard. Office, Kamloops, B.C.

A. ANDERSON, Roadmaster, Boston Bar, has had his office changed to Kamloops, B.C.

A. H. DAVIS, heretofore City Passenger Agent, Winnipeg, has been appointed General Agent, St. Paul, Minn., vice E. P. Wright, who has left the company's service.

Canadian Pacific Ry. — J. R. GILLILAND, heretofore Superintendent, District 5, Eastern Division, Smith's Falls, Ont., has been appointed Superintendent, District 2, Atlantic Division, vice R. McKillop, transferred. Office, Woodstock, N. B.

R. McKILLOP, A.M.Can.Soc.C.E., heretofore Superintendent, District 2, Atlantic Division, Woodstock, N.B., has been appointed Superintendent, District 3, Eastern Division, vice M. A. Fullington, A.M.Can.Soc.C.E., transferred. Office, Montreal.

W. M. NEAL, heretofore Car Service Agent, Montreal, has been appointed Assistant Superintendent, District 2, Eastern Division, vice W. B. Brown, transferred. Office, Montreal.

J. E. RYAN, heretofore Chief Dispatcher, District 1, Ontario Division, Toronto, has been appointed Car Service Agent, Eastern Division, vice W. M. Neal, promoter. Office, Montreal.

E. G. MOORHEAD, heretofore secretary to Superintendent, District 2, Ontario Division, London, has been appointed secretary to General Superintendent, Eastern Division, Montreal.

O. R. BURNS, heretofore Agent, St. Mary's, has been appointed Travelling Freight Agent, Montreal.

W. J. ALLEN, heretofore passenger car painter, has been appointed leading hand painter, West Toronto, vice T. Marshall, transferred to Angus Shops, Montreal.

C. A. WHEELER, heretofore Locomotive Foreman, MacTier, Ont., has been appointed Locomotive Foreman, Ottawa, Ont.

M. A. FULLINGTON, A.M.Can.Soc.C.E., heretofore Superintendent, District 3, Eastern Division, Montreal, has been appointed Superintendent, District 5, Eastern Division, vice J. R. Gilliland, transferred. Office, Smiths Falls, Ont.

K. deS. JOSEPH, Assistant Trainmaster, District 1, Atlantic Division, Brownville Jct., Me., has been appointed acting Trainmaster, District 1, Ontario Division, during the absence on sick leave of A. G. McLeod. Office, Havelock.

T. MULLINS, heretofore City Passenger Agent, Ottawa, has been appointed City Passenger Agent, Toronto, vice W. McIlroy.

W. McILROY, heretofore City Passenger Agent, Toronto, has been appointed Chief Clerk, Passenger Department there, vice H. W. Mathewson, promoted.

D. A. SMITH, heretofore Travelling Freight Agent, Hamilton, Ont., has been appointed Travelling Freight Agent, Toronto, vice J. W. Maguire transferred.

J. TREGASKIS, heretofore Assistant Locomotive Foreman, Lambton, Ont., has been appointed Night Locomotive Foreman there, vice S. Illingsworth, transferred.

J. DODD has been appointed Assistant Locomotive Foreman, Lambton, Ont., vice J. Tregaskis, promoted.

J. W. MAGUIRE, heretofore Travelling Freight Agent, Toronto, has been appointed Travelling Freight Agent, Hamilton, Ont., vice D. A. Smith, transferred.

S. ILLINGSWORTH, heretofore Night Locomotive Foreman, Lambton, Ont., has been appointed Locomotive Foreman, MacTier, Ont., vice C. A. Wheeler, transferred.

R. W. SCOTT, heretofore chief clerk to Lines, Montreal, has been appointed Assistant Superintendent, District 1, Lake Superior Division. Office, Sudbury, Ont.

R. W. D. HARRIS, heretofore Trainmaster, Wilkie, Sask., has been appointed Trainmaster, District 1, Manitoba Division, vice R. McGregor. Office, Ignace, Ont.

M. BLACK has been appointed Resident Engineer, District 1, Manitoba Division, vice E. L. Landorph, promoted. Office, Kenora, Ont.

J. A. PANTHER, heretofore acting Trainmaster, Calgary, Alta., has been appointed Trainmaster, Kenora, Ont.

E. L. LANDORPH, heretofore Resident Engineer, District 1, Manitoba Division, Kenora, Ont., has been appointed Engineer of Water Service and Tests, Western Lines, vice V. J. Melsted, resigned. Office, Winnipeg.

W. BANNON, heretofore Assistant Yardmaster, Winnipeg, has been appointed Night General Yardmaster there, vice H. Hicks, whose appointment as General Yardmaster, Fort William, Ont., was announced in our last issue.

J. N. MURPHY, heretofore Trainmaster, Medicine Hat, Alta., has been appointed Roadmaster, with jurisdiction over Rapid City, Miniota, and Lenors Subdivisions and Brandon yard, vice J. McRae, transferred. Office, Brandon, Man.

J. McRAE, heretofore Roadmaster, Brandon, Man., has been appointed Roadmaster, District 4, Manitoba Division. Office, Souris.

J. A. BERRY, heretofore Car Service Agent, Montreal, has been appointed Car Service Agent, Moose Jaw, Sask., vice G. T. Coleman, whose appointment as Car Service Agent, Toronto, was announced previously.

C. HOOD, heretofore Trainmaster, Nelson, B.C., has been appointed Local Freight Agent, Saskatoon, Sask., vice S. C. Graham, transferred.

S. C. GRAHAM, heretofore Local Freight Agent, Saskatoon, Sask., has been appointed Trainmaster, District 3, Saskatchewan Division, vice R. W. D. Harris, transferred. Office, Wilkie.

D. ENGLAND, heretofore Trainmaster, District 2, Manitoba Division, Winnipeg, has been appointed Trainmaster, District 3, Alberta Division, vice J. M. MacArthur, whose appointment as Superintendent, District 1, Manitoba Division, Kenora, Ont., was announced in a recent issue. Office, Calgary.

A. L. POWELL, heretofore station ticket agent, Moose Jaw, Sask., has been apointed District Passenger Agent, Banff, Alta.

M. D. JORDAN, heretofore in Car Department, Vancouver, B.C., has been appointed Car Foreman, Field, B.C., vice C. J. Crozier, transferred.

For changes in C.P.R. Telegraphs officials see under "Telegraph, Telephone, and Cable Matters," on page 299.

Central Vermont Ry.—G. W. GROOM, heretofore Assistant to Superintendent and Chief Dispatcher, has been appointed Assistant Superintendent, vice J. F. Keefe, resigned. Office, St. Albans, Vt. The position of Assistant to Superintendent has been abolished.

E. T. BUCK has been appointed Chief Dispatcher, St. Albans, Vt., vice G. W. Groom, Assistant to Superintendent and Chief Dispatcher, promoted.

Grand Trunk Ry.—F. J. MILLER has been appointed Assistant Superintendent,

Montreal Terminals. Office, Bonaventure Station, Montreal.

J. C. CARRUTHERS, heretofore in Westinghouse, Church, Kerr Co.'s service at Drummondville, Que., has been appointed ticket agent, G.T.R., Prescott, Ont., vice P. B. Whiteley, enlisted for overseas service.

J. D. McMILLAN, heretofore Trainmaster, Lindsay, Ont., has been appointed Superintendent, Districts 5, 6, 7, 8, 9, and 10, comprising the Belleville Division, vice H. F. Coyle, deceased. Office, Belleville, Ont.

Grand Trunk Pacific Ry. — H. REID, formerly at Edmonton, Alta., has been appointed Car Foreman, Rivers, Man. This is a new position.

F. W. BEHAN, heretofore erecting shop foreman, Transcona, Man., has been appointed Locomotive Foreman, Regina, Sask.

W. SILVERWOOD, heretofore Car Foreman at Edmonton, Alta., has been appointed Car Foreman, Melville, Sask., vice C. A. Munro, transferred.

C. A. MUNRO, heretofore Car Foreman, Melville, Sask., has been appointed Car Foreman, Edmonton, Alta., vice W. Silverwood, transferred.

G. W. WILSON has been appointed Car Foreman, McBride, B.C., vice C. McKinnon, enlisted for overseas service.

D. E. SMITH, heretofore Locomotive Foreman, Regina, Sask., has been appointed Locomotive Foreman, Prince Rupert, B.C.

Michigan Central Rd. — W. HEARD, heretofore Assistant Divisional Storekeeper, London, Ont., is reported to have been appointed Divisional Storekeeper there, vice A. A. Drake, who has retired, after 33 years service.

National Transcontinental Ry.—W. S. STILLWELL, heretofore at Transcona shops, has been appointed Car Foreman, Graham, Ont., vice G. E. Decker, resigned.

J. B. SMITH has been appointed Trainmaster and Chief Dispatcher, District 3, Graham, Ont.

W. A. HILL has been appointed First Trick Dispatcher, Graham, Ont., vice H. M. Bird, assigned to other duties.

J. BIRSE, heretofore District Master Mechanic, District 3, has been appointed Road Foreman of Locomotives, Graham, Ont.

H. G. REID, heretofore Master Mechanic, Saskatchewan Division, C.P.R., Moose Jaw, has been appointed Master Mechanic, District 3, N.T.R., vice J. Birse, transferred. Office, Transcona, Man.

M. F. SCOTT, heretofore charge hand in erecting shop, has been appointed Foreman, Erecting Shop, Transcona, Man.

New York Central Rd. — A. S. INGALLS, heretofore General Superintendent, District 3, Cleveland, Ohio, has been appointed Assistant General Manager, Lines West of Buffalo. Office, Cleveland, Ohio. This is a new position.

R. H. CROLY, heretofore Division Freight Agent, Buffalo, N.Y., has been appointed Assistant General Freight Agent, in charge of freight traffic to and from territory on and adjacent to the Niagara frontier, N.Y.C.Rd. and West Shore Rd. Office, Buffalo, N.Y.

F. F. RIEFEL, heretofore Superintendent Telegraph, Cleveland. Ohio, has been appointed Superintendent, Detroit Division, vice E. R. Bissell, transferred. Office, Detroit, Mich.

F. M. SMITH, heretofore Superintendent, Western Division, Chicago, Ill., has been appointed General Superintendent, District 3, vice A. S. Ingalls, promoted. Office, Cleveland, Ohio.

R. F. FINLEY has been appointed Superintendent of Telegraph, N.Y.C.R., L. E. & W.R., and Western Union Telegraph Co., vice F. F. Riefel, transferred. Office, Cleveland, Ohio.

E. R. BISSELL, heretofore Superintendent, Detroit Division, Detroit, Mich., has been appointed Superintendent, Western Division, vice F. M. Smith, promoted. Office, Chicago, Ill.

Oregon-Washington Rd. and Navigation Co.—J. H. CUNNINGHAM, heretofore Travelling Freight and Passenger Agent, Seattle, Wash., has been appointed in charge of the recently opened office at Vancouver, B.C.

Railway Rolling Stock Notes.

The Eastern Car Co. has shipped 400 gondola cars for the French State Railways.

The Timiskaming and Northern Ontario Ry. Commission has ordered 6 cabooses from Preston Car & Coach Co.

The Canadian Locomotive Co. is quoting on a further supply of locomotives for the Russian Government. The contract for decapod locomotives which the company had has been completed and all shipments made.

The Grand Trunk Pacific Ry., which was intending placing an order for refrigerator cars, in order to cope with the large increase in the transportation of fish from the Pacific coast to Canadian and U. S. points, has decided not to proceed further in the matter at present, pending the result of proposed adverse legislation to the fish trade on the B. C. coast by the U. S. Government, to which reference has already been made.

Referring to the report mentioned in our last issue that Canadian Government Railways had ordered some second hand rolling stock from the Pullman Co., we are officially advised that the purchase was as follows: 19 sleeping cars, 10 tourist cars, 2 parlor cars, 1 dining car, 1 baggage car, and 1 first class car.

Canadian Government Railways, between May 29 and June 10 received the following additions to rolling stock: 1 steel sleeping car from National Steel Car Co.; 3 bagagge cars from Preston Car & Coach Co.; 81 stock cars from Canadian Car & Foundry Co.; 4 consolidation locomotives from Canadian Locomotive Co., and 1 consolidation locomotive from Canadian Allis-Chalmers Ltd.

As mentioned in our last issue, Canadian Government Railways have ordered 500 steel frame box cars, 50 tons capacity, for the Intercolonial Ry., from the Eastern Car Co., and also 500 from the Canadian Car & Foundry Co. The under frames will be built up from structural and pressed shapes, with centre sills of 15 in. channels reinforced top and bottom by angles. The door openings will be 6 ft. wide, and the equipment will include twin spring draft gear, Simplex couplers 5 by 7 ins., inside roof, Simplex truck bolster, McCord journal boxes, and trucks of the arch bar type. The dimensions will be:

Inside length	40 ft. 6 ins.
Inside width	9 ft. 0 ins.
Inside height in clear	9 ft. 0 ins.
Trucks centre to centre	31 ft. 0 ins.
Height over running boards	14 ft. 0½ in.

The French Government has ordered, for the Paris & Orleans Ry., 100 coal cars, 40 tons capacity, from the Eastern Car Co. They will be designed by the builders, and built up entirely of steel with six double vertical swinging doors on each side. The centre sills will be of 10 in. ship channels, reinforced at bottom with angles and truss rods. The buffer and drawbar arrangement will be of the same type as at present used on the railway, and the truck will be of the arch bar type with bathtub bolsters. The hand brake will be arranged to be applied to one truck and operated from either side of the car, and the wheels will be of the open hearth steel kind with special axles and 5 by 9 in. journals, McCord journal boxes and M.C.B. bearings and wedges. The inside length of the car will be 37 ft., inside height 5 ft. 3½ in., trucks centre to centre 25 ft. 3 ins.

Dominion Government Grain Trade Enquiry.

As mentioned in our last issue, the Dominion Government has appointed a commission to investigate the handling and marketing of grain in Canada. The committee of the Privy Council recently had before it the representations of the Minister of Trade and Commerce, that he thinks it expedient that an inquiry should be made into and concerning the whole matter of the handling and marketing of grain in Canada, and in particular (1) the grading and weighing of grain; (2) the shipping of grain from country elevators; (3) grain exchanges; (4) the financing of grain; (5) the handling of grain at terminal points and in respect of the charges for the same; (6) the shipment of grain to Atlantic ports; (7) lake shipments; and recommends that Robert Magill, Chief Grain Commissioner; W. D. Staples, and J. F. Jones, Grain Commisioners, Fort William, Ont., be appointed commissioners pursuant to part 1 of the Inquiries Act, R.S.C., 1906, chap. 104, to conduct such inquiry; and that they be authorized to engage such accountants, engineers, technical advisers, or other experts, clerks, reporters, and assistants as they deem necessary, and also counsel to assist them, and to authorize any such assistants or any other qualified persons to inquire into any matter within the scope of such inquiry as they may direct; also that the commissoners be required to report to the Governor General in Council the result of their investigation, with the evidence taken, and any opinion they may see fit to express thereon. An order in council was passed subsequently authorizing the commission.

Quebec Transportation Club's Annual Meeting.

The annual meeting of the Quebec Transportation Club was held at Kent House, Montmorency Falls, June 6. After passing the report and discussing of several matters affecting the members in their business, officers for the current year were elected as follows: Hon. Presidents, H. G. Matthews, General Manager, Quebec Ry., Light, Heat and Power Co.; E. O. Grundy, General Freight and Passenger Agent, Quebec Central Ry.; W. M. Macpherson, Manager, White Star-Dominion Line; President, J. S. Thom, President, Quebec Forwarding Co.; First Vice President, J. H. Davidson, Superintendent, Canadian Northern Ry.; Second Vice President, A. F. Dion, Traffic Manager, Quebec Harbor Commission. The executive committee was elected as follows: G. J. P. Moore, C.P.R.; F. S. Stocking, Q.C.R.; J. T. Cassels, Q.R.L. & P. Co.; W. J. Thompson, Quebec and Levis Ferry Co.

Orders by Board of Railway Commissioners for Canada.

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

The dates of orders, immediately following the numbers, are those on which they were drawn.

24995. May 23.—Amending order 24965, May 10, re C.P.R. subway at Decary Ave., Montreal.

24996. May 25.—Ordering Canadian Northern Ry. to erect fences along its right of way east and west of Onoway, Alta.

24997. May 23.—Relieving G.T.R. from providing further protection at highway immediately west of Bronte station, Ont.

24998. May 23.—Extending to July 31, time within which C.P.R. shall install bell at highway at west of Welsford station, N.B.

24999. May 23.—Ordering Canadian Northern Ry. to stop train 25 on flag at Indi, Sask., and dismissing application to stop train 6.

25000. May 25.—Extending to July 1 time within which Canadian Northern Ry. shall build crossing at second concession road allowance over its righ of way, Goulbourne Tp., Ont., required by order 24240, Sept. 28, 1915.

25001. May 26.—Authorizing C.P.R. to build spur for Western Canada Flour Co., Calgary, Alta.

25002. May 29.—Authorizing Lake Erie & Northern Ry. to open for traffic its line from Galt to Simcoe, Ont., 43.3 miles.

25003, 25004. May 29.—Authorizing Lake Erie & Northern Ry. to operate across G.T.R. and Toronto, Hamilton & Buffalo Ry. at Brantford, Ont., pending installation of interlocking plant, for three months from date, crossing to be protected by L. E. & N. R.

25005. May 27.—Authorizing G.T.R. to cross Third St., Cobourg, Ont., with three tracks, as shown on plan on file 26998.

25006. May 26.—Authorizing C.P.R. to build switching lead and spur for Canadian Explosives, Ltd., at Nobel, Ont.

25007. May 27.—Authorizing Canadian Northern Ry. to build bridge over Elbow River, Calgary, Alta.

25008. May 26.—Authorizing Canadian Northern Quebec Ry. to build three spurs for Quebec Abattoir Co., Quebec, Que.

25009. May 27.—Ordering C.P.R. within 60 days to install bell at highway first east of Mountain station, Ont., 20 per cent. to be paid out of railway grade crossing fund.

25010. May 27.—Ordering G.T.R. to build station at Rideau at location approved by order 19609 within one year, plans to be filed for Board's approval.

25011. May 29.—Amending order 24754, Feb. 23, re installation of bell by G.T.R. at crossing in Lot 25, Con. 2, Etobicoke Tp., Ont.

25012. May 27.—Ordering G.T.R. to install, by Aug. 31, gates at crossings of Waterloo and Colborne Sts., London, Ont., to be operated day and night; 60 per cent. of cost to be paid by G.T.R., 20 per cent. by City of London, and 20 per cent. out of railway grade crossing fund for each crossing; watchmen to be paid by G.T.R., and balance of maintenance, 70 per cent., by G.T.R., and 30 per cent. by city; protection at Ridout, Richmond, Burwel, William, Maitland, Adelaide, Rectory, Egerton and Clarence Sts., reserved.

25013. May 30.—Authorizing Hydro Electric Power Commisson of Ontario for one year from date to maintain wires across Michigan Central Rd., wires and tracks at Main St., Niagara Falls.

25014. May 29.—Authorizing Canadian Northern Ontario Ry. to build spur for International Contractors, Ltd., mileage 170.5 from Toronto, Parry Sound District.

25015. May 29.—Authorizing C.N.R. to divert road allowance between Secs. 22 and 23-9-21, w. p.m., through n.w. ¼ Sec. 23, Man.

25016. May 29.—Authorizing G.T.R. to build siding for John Marks, Hamilton, Ont.

25017. May 27.—Authorizing C.P.R. to divert road allowance on west boundary Sec. 16-5-32, w.p.m., and build its Griffin Subdivision across same at mileage 48.5.

25018. May 30.—Ordering Canadian Northern Ry. to erect station building on old site at Charlesbourg West, Que., to be completed within 60 days after approval of plans, which are to be filed by C.N.R. within 15 days.

25019. May 27.—Authorizing Ange Gardien Municipality, Que., to make highway crossing over Quebec Ry., Light, Heat & Power Co.'s track at Boischatel, Que.

25020. 25021. May 31, 30.—Extending to Aug. 1 time within which G.T.R. shall install bell at Ontario St., Burlington, Ont., and to Aug. 6 time within which it shall install bell at Talbot Road, just east of Courtland station, Ont.

25022. June 2. — Authorizing Sudbury-Copper Cliff Suburban Electric Ry. Co., pending completion of half-interlocking plant, to operate over C. P.R. at Elm St., Sudbury, cars to be flagged across by watchman, appointed by C.P.R. and paid by S.C.C.S.E.R.

25023. May 30.—Extending to Aug. 1 time within which G.T.R. shall install bell at Chatham Road, Thamesville, Ont.

25024. May 31.—Authorizing New York Central Rd. to rebuild bridge 26-A, near Cambridge, Ont.

25025. May 31.—Approving G.T.R. Form Revised 0-33, being special contract and power of attorney and release to be signed by persons who desire for special reasons to travel on cars which are not intended to carry passengers.

25026. May 31.—Approving C.P.R. revised location from mileage 10.82 to 32.81, Coronation to Chaton, Swift Current Northwesterly Branch.

25027. May 30.—Authorizing C.P.R. to build spur at mileage 119.54, Montreal and Ottawa Subdivision, on Lemieux Island, Ottawa River, Ottawa, Ont.

25028. May 30.—Authorizing British Columbia Public Works Department to make highway over G.T.P.Ry. at Raush Valley, mileage 1120, Winnipeg West.

25029. June 5.—Extending to Aug. 1 time within which G.T.R. shall install bell at highway near Allanburg station, Ont.

25030. June 5.—Authorizing C.P.R. to build spur for Conger Lehigh Coal Co., Toronto.

25031. June 5.—Authorizing British Columbia Public Works Department to make highway over Grand Trunk Pacific Ry. at Carnaby.

25032. June 5.—Authorizing G.T.R. to build extension to siding for Lord & Burnham Co. on part Lot 14, Con. 6, Grantham Tp., Ont.

25033. June 5.—Authorizing Toronto, Hamilton & Buffalo Rd. to build spur for Mercury Mills, Ltd., Hamilton, Ont.

25034. June 5.—Ordering Canadian Northern Ry. to fence right of way, on both sides, mileage 6.29 to 12, west of Tollerton, Alta., and on north side, mileage 12 to 17, to be completed by July 15.

25035. June 5.—Authorizing G.T.R. to operate over Gunns Ltd. siding, north of St. Clair Ave., and west of Gunns Road, Toronto.

25036. June 5.—Extending to Aug. 1 time within which G.T.R. shall install bell at crossing of road between Concessions A and B, Etobicoke Tp., Ont.

25037. June 5.—Authorizing Town of Drummondville, Que., to make highway over C.P.R. at St. Jean St.

25038. June 8.—Authorizing Canadian Northern to rebuild trestle at Snake Creek Crossing, mileage 151.5, Dauphin Subdivision, Man.

25039. June 8.—Authorizing Northern Ontario Ry. to use bridge over Magnetawan River, mileage 188.1 from Toronto, in Wallbridge Tp.

25040. June 8.—Authorizing Canadian Northern Ontario Ry. to divert road between Ha,rcourt and Cardiff Tps.

25041. June 7.—Ordering C.P.R. to remove ridge at crossing at Con. 7, East Flamboro Tp., Ont., to give clear view 75 ft. from track.

25042. June 9.—Approving location of C.P.R. station at mileage 21.1, Brantford, Ont.

25043. June 9.—Relieving C.P.R. from providing further protection at Russel Road crossing, Gloucester Tp., Ont.

25044. June 9.—Ordering Canadian Northern Ry., within two weeks, to rebuild fence on Elgin Babcock's property, in Lot 5, Con. 4, Portland Tp., Ont., according to standard required by Railway Act.

25045. June 9.—Authorizing Three Rivers Traction Co. to operate cars for three months over crossing of C.P.R. loop line at St. Maurice St., Three Rivers, Que., applicant's conductors to flag cars over crossing.

25046. June 9.—Authorizing Canadian Northern Ry. to build bridge across Ochre River, mileage 164.26, Manitoba, and rescinding order 22090, June 27, 1914.

25047. June 9.—Approving location of Canadian Northern Ry. station in Sec. 5-36-9 W. 2 M., Sask., mileage 101.

25048. June 9.—Authorizing Michigan Central Rd. to build spur or Page Hersey Iron Tube & Lead Co., Welland, Ont., and approving overhead clearance under crane runway.

25049. June 12.—Authorizing British Columbia Government to make highway over Esquimalt & Nanaimo Ry. at Malahat, mileage 20.2, from Victoria.

25050. June 10.—Ordering G.T.R. to interswitch cars from London & Port Stanley Ry. to G.T.R. team tracks, under agreement of Apr. 25, 1870, between Great Western Ry. of Canada and London & Port Stanley Ry.; to become effective by July 10th.

25051. June 10.—Relieving G.T.R. from providing further protection at first crossing west of Summertown station, Ont.

25052. June 12.—Ordering G.T.R. to build farm crossing between Cons. 2 and 3, Bertie Tp.

25053. June 13.—Ordering C.P.R. to widen bridge at London St., Windsor, Ont., to 56 ft.; 65 per cent. of cost to be paid by C.P.R. and 35 per cent. by the city, or Sandwich, Windsor & Amherstburg Ry., as may be determined by Board.

25054. June 12.—Ordering C.P.R. to appoint station agent at Torquay, Sask., by June 30.

25055 to 25061. June 12.—Approving Bell Telephone agreements with 7 telephone companies and municipalities.

25062. June 13.—Amending order 24991, May 18, re Canadian Northern Ry. station at Carmel, Sask.

25063. June 13.—Ordering Canadian Northern Ry. to build roads to its station at Menzie, Man., by July 15.

25064. June 14.—Approving plans D. 100-16 and D. 100-17, showing details of Canadian Northern Ry. standard reinforced concrete slabs for structures.

25065. June 14.—Authorizing Great Western Mines Development Co. to build bridge over C.P.R. three miles east of Field, B.C.

25066. June 15. Rescinding orders 12829 and 21375, June 26, 1911, and Feb. 17, 1914, respectively, re transportation of mining students from Montreal to British Columbia.

25067. June 15.—Authorizing C.P.R. to build diversion in lieu of Government trail in n.e.¼ Sec. 1-39-12, w.4.m., Alta.; and to build its Swift Current North Westerly Branch at mileage 18.28 across same at grade.

25068. June 15.—Approving of Brandon, Saskatchewan & Hudson Bay Ry. bylaw 10, June 2.

25069. June 14.—Ordering C.P.R. to lay cinder platform at Mud Lake Crossing, Ont.; trains 37 and 38 to stop there on flag for three months from July 1, record to be kept of travel and report made at end of three months, during this period; flag stops made by trains 37 and 38 at Bolingbroke may be discontinued.

25070. June 15.—Permitting Maine Central Rd. to operate locomotives used in international traffic and merely passing through Canadian territory, equipped with clear vision window in cab of locomotives; permission not to extend to locomotives operated from or entirely within Canadian territory.

25071. June 12.—Authorizing Winnipeg Electric Ry. to operate over C.P.R. crossing on Talbot St.; staying operation of conditions 1, 2, 3 and 4 o forder 18260, Dec. 9, 1912, and authorizing C.P.R. to operate over said crossing, cars to come to stop and be flagged over.

25072. June 15.—Approving C.P.R. plan 51850, July 31, 1914, showing subway at Spadina Road, North Toronto grade separation.

25073. June 16.—Authorizing C.P.R. to build diversion in lieu of Government trail, in s.e.¼ Sec. 10-39-12, w.4.m., Alta., and build its Swift Current Northwesterly Branch across same.

25074. June 9.—Ordering that, independently of general interswitching order, and pending adjustment of entire switching question, now before Board, the C.P.R. toll for switching live stock from its connection with C.N,R. to East End cattle market in Montreal, be $5 a car, and ordering C.P.R. to accept such traffic from C.N.R. and perform necessary switching service over its line to East End cattle market at toll herein provided.

25075. June. Ordering Canadian Northern Ry. to move siding at Lilac, Sask.

25076. June 14.—Ordering Grand Trunk Pacific Branch Lines Co. to build transfer and storage track with C.N.R. at Battleford, Sask., C.N.R. to pay one-fifth of cost of building and half maintenance.

2507. June 17.—Authorizing C.P.R. to build its Gleichen Subdivision across road allowance on east boundary of Sec. 23-22-25, w.4.m. at mileage 12.70.

25078. June 16.—Approving Nelson & Fort Sheppard Ry. bylaw of May 16.

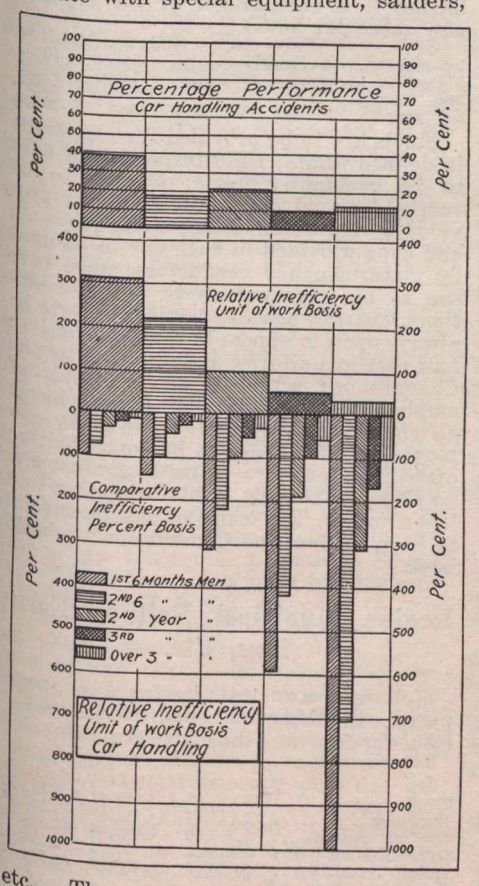
General order 166. May 29.—Extending to July 1, 1917, time within which railway companies, subject to Board's jurisdiction, make changes required under general order 128, July 20, 1914, prescribing rules and regulations respecting safety appliances on trains.

C.P.R. Centre, St. John's Ambulance Association.—The report for last year shows that 1816 persons passed qualifying examinations, out of 2564 who took instruction at the classes. Of wives and daughters of C.P.R. employes 825 have received certificates of qualification. Instruction was given the Borden Battery and Ammunition Column before it left Montreal for overseas. W. T. Davies, C.P.R. ambulance instructor, and Wm. Newcombe, C.P.R. constable, saved three men from drowning at Winnipeg. Particulars were given of administering of first aid in 3,780 cases by members of the C.P.R. Centre, the cases being divided as follows: Atlantic Division 9, Eastern Division 130, Ontario Division 136, Western Lines, 3,440. The report paid a strong tribute to the late Lacey R. Johnson, who was chairman of the C.P.R. Centre and also of the whole Association. While he was chairman nearly 7,000 C.P.R. employes passed qualifying examinations.

Electric Railway Department

Car Operation on Bridge Approaches in Winnipeg.

An interesting situation has developed in connection with an order of the Manitoba Public Utilities Commission that the Winnipeg Electric Ry. should operate cars over the Arlington St. overhead bridge which crosses the C.P.R. tracks, at what is said to be the largest individual railway yards in the world. The company's management always contended that the bridge approaches were too steep to operate over and maintained that the company would not be responsible for accidents if forced to operate over it. The commission at first refused an order when requested by the city to force the company to operate over the bridge, but after considerable pressure had been brought to bear, and after a number of engineers had reported on the bridge, grade, tracks, etc., suggesting changes, an order was issued for the company to operate with special equipment, sanders,

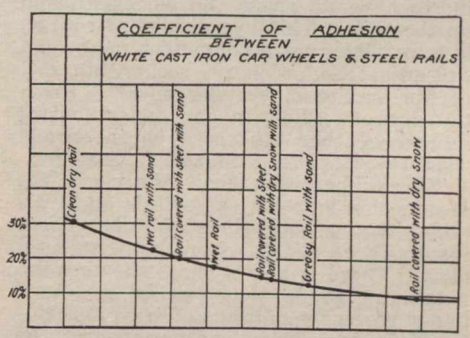


etc. The company proceeded to carry out the order, and the city made changes to the bridge and tracks. The union of motormen and conductors, however, refused to handle the cars over the structure, on the ground that both the company and the city had refused to accept responsibility for accidents. As a result a test trip was made over the bridge by G. L. Guy, the commission's engineer, representatives of the company, union and commission being present. As the result of the report of Mr. Guy, based on this test, the commission ordered that operation over the bridge be suspended to allow further consideration of the conditions.

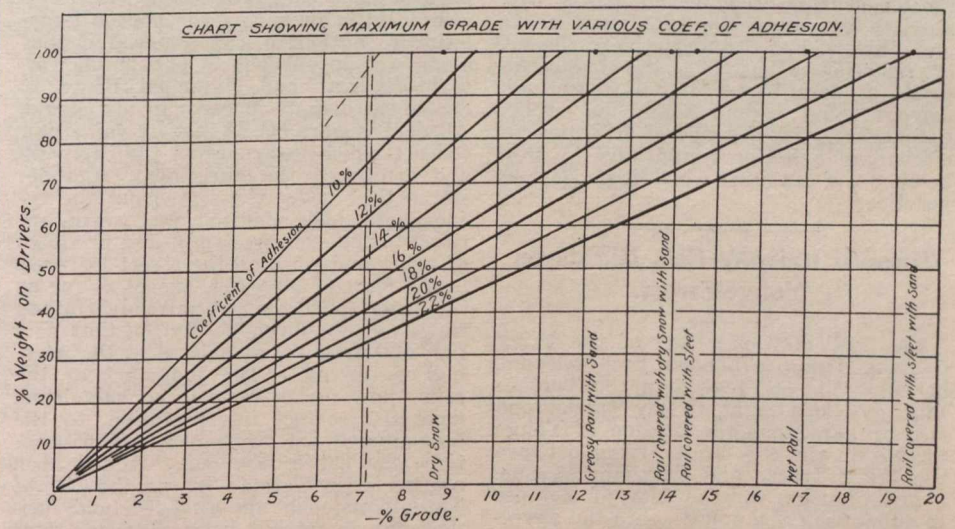
On the day the test was made the temperature was 21.4 deg. F. below zero, while operating conditions were bad on account of dry snow on top of the rails. The car used was of the double truck, double end type, 40 ft. 1 in. long over all, and equipped with four GE-67A motors, with gear ratio of 16:67. The car weighed approximately 41,100 lb. but as loaded for the test, weighed about 50,600 lb. Five one-way trips across the bridge were made, during which different combinations of motor braking, air braking and hand braking were attempted. The car was brought to rest during the ascent on a number of occasions, and started up again without any difficulty. The car was brought to rest and allowed to run backwards till a speed of approximately 2 m.p.h. was attained. It was then stopped with the aid of the motors, and started forward again. On the descent, with a headway of approximately 2½ m.p.h, the air brakes alone could control the car, without sand. At higher speed sand had to be used, and above 4 m.p.h., under the conditions existing, the car could not be stopped readily, even with sand, by means of the air brakes alone. The motors had to be resorted to to bring the car to rest.

As to failure of equipment from freezing up of the air equipment, Mr. Guy estimated that under ordinary conditions the chance of a car going out of service from this cause was about 1 in 13,000, while the chances for freezing on the approaches would be about one-sixth of this ratio or 1 in 78,000. Mr. Guy believed, however, that the efficiency of the motormen in charge of the cars is a more important factor in safe operation than either the grades or the equipment. He accompanied his report with a chart, showing the relative efficiency, as far as car operation is concerned, of car operations of various lengths of service. This chart is made up from actual statistics of accidents during 1914. "It is apparent," the report states, "that accidents are about 10 times more frequent, considering the time worked, with new motormen than with old experienced men. As new men are almost sure to be on this run, there is much more likelihood of accidents from this cause. Another fact which will affect the chance of accidents in the immediate future is that since Aug. 1, 1914, some 270 old operators have left the service for the front." It is Mr. Guy's opinion that some form of brake, such as grips the rail or pavement, might be used on the cars which operate on the bridge, which would prevent a car from running away in case it started to slide. This would prevent, to a very large extent, any serious accident, and make operation over the bridge comparatively as safe as on the level.

"Following is the result of a mathematical analysis of the operation of cars on the grades under very bad rail conditions," says the report, "and under one difficulty which is apt to arise frequently, that is when it will be necessary to stop on the descent to prevent collisions, or



for other reasons. These problems have been worked out for various other conditions which may arise, and the results show that the operation is practicable.



These results, I contend, are borne out under actual tests. The success of it depends on the efficiency of the car operator:

Engineering Computation.

Actual weight of car loaded..50,600 lb.
Weight normal to incline on
7.1% grade—50,600 Cos O..50,446.7 lb.
Force down and parallel to
grade due to weight of
loaded car—50,600 Sin O... 3,592.6 lb.

W—Total weight of car in tons.

p—Coefficient of adhesion (bad rail) 10%.

r—Train resistance in pounds per ton of total weight.

G—Per cent grade (7.1%).

a—Acceleration in miles per hour.

Maximum traction effort that can be

exerted without slipping under bad rail conditions = $20p \times W \sqrt{1 - (G/100)^2}$ = 5034.7 lb.

This also represents the maximum retarding effort of the brakes before the wheels will slip on the incline with bad rail conditions.

Power required to overcome grade is 20 lb. per ton for each per cent grade—3550 lb.

Allowable braking effort to reduce speed—1485 lb.

Pounds per ton of car—59.4 lb.

Maximum negative acceleration—0.91 ft. per sec.

Taking an average condition of requiring to stop the car in 30 ft.—time required to bring car to rest 8.027 sec.

Maximum initial speed allowable to stop car is 30 ft. with bad rail conditions —7,30457 ft. per sec. corresponding to 4.98 m.p.h.

"The calculation takes it as possible to throw the brakes on instantly and set them at the exact pressure, such that any increase would cause the wheels to slip on the rails. This hypothesis, of course, is impossible, but a competent motorman can adjust brakes in 2½ sec. within 25% of the maximum braking effort. From the above, to keep a car under control in bad weather the speed on the grade should not exceed 3 m.p.h.

"Charts herewith show the coefficient of adhesion between car wheels and rails under various conditions of rail. These results are plotted from experimental data. There is also a chart showing the maximum grade that can be ascended under various conditions of track, providing there is sufficient motor capacity. As in the operation of Arlington St. bridge no trailers will be used, there will be 100% of the car's weight on the drivers. Hence where the 100% ordinate is cut by the coefficient of adhesion curve, the abscissa represents the maximum grade mountable. For example, the coefficient of adhesion being 14%, the maximum grade a motor car with all weight on drivers could ascend would be 13.3%. Conversely, with a grade of 7.1% the coefficient of adhesion would have to drop below 8%, a condition which is not met in practice."

Toronto Railway Co's Rights on Yonge Street.

The Judicial Committee of the Privy Council, sitting in London, Eng., May 26, heard arguments regarding the Toronto Railway Co.'s right to lay tracks and operate cars upon the portion of Yonge St. within the city limits, lying between the C.P.R. tracks and Farnham Avenue.

Mr. Clausen, for the City of Toronto in supporting the appeal, said the agreement was made in 1891 between the city and the railway and validated by the Ontario statute to grant to the company the right to operate a surface street railway in the city for 30 years. His contention was that the agreement did not give the right now claimed by the company, because no franchise could be granted for more than 20 years, and no franchise to come into operation in future (in this case more than 24 years after the date of the agreement) could be granted at all.

The Metropolitan Ry., in 1891, had a franchise from the County of York over that part of Yonge St., including a piece running from the present C.P.R. tracks to Farnham Ave., and a short time before the agreement the city had acquired this piece of land. The Toronto & Mimico Electric Ry. had, before the enactment of the validating agreement, obtained a franchise over the portion of Queen St. west of Dufferin St., but the franchise ran out in June, 1915. The Toronto Ry. insisted, however, that it still had a right to run its undertaking over the part of Yonge St. referred to.

The Lord Chancellor said: "The question is whether, on the construction of the agreement by which, by clause 2, the appellants purported to grant the right to respondents to operate tracks along the streets of the city within certain limits, excepting the part of Yonge St. which had been taken over by the Ontario & Quebec Ry., now the C.P.R., and so forth, 'so far as the corporation can legally grant same,' was a grant which passed to respondents, the right to which, in the Canadian courts, they were held to get under the agreement."

Mr. Clausen replied affirmatively, adding that the appellants only granted to the respondents such rights over that portion of Yonge St. in dispute as they had at the date of the agreement power to grant.

Sir John Simon, for the Toronto Ry., submitted that the effect of the agreement was that the city had given the company whatever rights the city had over the street in question; those rights were for a term of 30 years from 1891. His learned friend had shown no ground which entitled the appellants to impose restrictions on the company in the proposed operations on Yonge St. The agreement gave the company the exclusive right to operate such railways for 20 years, and went on to provide that the right should be renewed for a further 10 years in the event of legislation being obtained to enable this to be done. With this object, the appellants' predecessors pleaded that they and their successors would aid in procuring the needed legislation to authorize such renewal if that alone was insufficient to entitle the Ontario Railway and Municipal Board to decide the dispute in favor of his clients. All doubts were set at rest by validating the act which incorporated the company and confirmed the agreement, and declared that under the agreement the respondents had acquired and were entitled to the exclusive right and privilege of using and working the street railways in the city for 30 years, except so far as they overlapped the right already granted to the Metropolitan St. Ry. on that portion of Yonge St. as existed at the passing of the act. The judgment of the court now under appeal, he submitted, gave the correct interpretation to the language of the agreement. The question was not a new one. It had been argued in the Toronto Ry. vs. the City of Toronto as long ago as 1906, and incidentally in other cases decided since then. In these cases the principle decided supported the contention of the respondents in the present case.

The Lord Chancellor said he would consider their opinion, and judgment was reserved.

Judgment was delivered June 23, in favor of the Toronto Ry. with costs. This confirms the original order granting the company permission to extend its tracks on Yonge St., north of the C.P.R. for 1,320 ft. to Farnham Ave.

James Lightbody, who was formerly on the staff of the Daily Province, Vancouver, has been appointed Publicity Agent, British Columbia Electric Ry., vice B. I. Dasent, who has left the company's service.

Brantford Municipal Ry. Wages, Etc.

In consequence of a dispute between the Brantford Municipal Railway Commission and its conductors and motormen, the men having demanded an increase of wages, that motormen be provided with seats on cars, and that there be a written agreement between the Commisison and the men, a board of conciliation and investigation was appointed under the Industrial Disputes Investigation Act, 1907, F. W. Frank, of Brantford, representing the Commission, Jos. Gibbons, of Toronto, representing the employes, and Judge Snider, of Hamilton, being chairman. The Board reported on June 2 that, after repeated efforts a settlement between the parties was arrived at, and that a memorandum embodying the same had been signed by the chairman of the Commission and by the employes' representative before the Board, who is also the President of Division 685, Amalgamated Association of Street & Electric Railway Employes. Under the agreement a new schedule of wages was put into effect to date from June 1, 1916, and to remain in effect until June, 1917. Following is a comparison of the old and new rates per hour:

	Old rate.	New rate.
1st month	15c.	16c.
Following 11 months	17½c.	19½c.
2nd year	19c.	21½c.
3rd year	20c.	22½c.

Stools are to be provided for motormen in defined limits; rigid inspection of cars to be constantly made; change to be carried by conductors is to be amply provided by the Commission; boxes for coats and caps provided in each car to be used by motormen and conductors; open cars are to be improved as to storm conditions; charges against employes are to be always open to appeal to the Commission; half cost of uniforms is to be paid by the Commission; seniority as to duties of employes is to be left to the management; all rights and privileges enjoyed by employes on June 1 are to be continued; no discrimination is to be made against any employe on account of his belonging to a labor union. The terms of settlement are to be placed on the Commission's minute book.

Regina Municipal Railway Earnings, Etc.

Following are statistics for April, compared with those for April, 1915, and the total for four months ended Apr. 30:—

	Apr. 1916	Apri. 1915	Jan. 1 to Apr. 30, 1916
Total revenue	$18,121.67	$12,946.92	$72,384.39
Expenses	15,241.47	14,255.67	70,290.30
Capital charges	8,963.80	9,137.58	35,855.20
Operating surplus	2,880.20	x1,298.75	2,094.09
Deficit	6,083.60	10,436.33	33,761.11
Expenses per car mile without power	15.01c.	13.63c.	18.01c.
Expenses per car mile with power	20.11c.	18.03c.	24.15c.
Platform wages per car hour	72.94c.	73.06c.	73.71c.
Passengers carried.	410,697	277,330	1,609,117
Expenses less capital charges, percentage	84.10		
Expenses with capital charges, percentage	137.57		

Fare Changes on Kingston, Portsmouth and Cataraqui Electric Ry.—On June 1 the company discontinued selling 6 tickets for 25 and instituted a cash fare of 5c. Workmen's tickets, good from 6.30 to 7.59 a.m., and from 5 to 6.30 p.m., are sold at 8 for 25c, and tickets for children between the ages of 5 and 12 are also sold at 8 for 25c.

Electric Railway Projects, Construction, Betterments Etc.

Calgary Municipal Ry.—We are officially advised that an additional half mile of track has been built to the military camp at the Sarcee Indian Reserve, for army freight and supplies, and an additional half mile of sidings to the main track. The main line to the camp, which connects with the city system at Killarney St. was opened for passenger service at the end of May. The extension mentioned above is for freight purposes only, and did not necessitate very much grading. (June, pg. 242.)

Hamilton St. Ry.—The Hamilton, Ont., City Council has been advised by its Street Railway Committee that the company is prepared to lay tracks on Kenilworth Ave., from Barton to Burlington St., and that it was expected to start work by the end of June. (April, 1915, pg. 147.)

Lake Erie & Northern Ry.—The first car over the extension of this line from Brantford to Simcoe, 23.5 miles, was run May 29, and the regular service was started May 30. The cars run right through from Galt to Simcoe, 43 miles, a car running in each direction every two hours. The eight-mile extension from Simcoe to Port Dover is expected to be opened for traffic about the middle of July. The erection of the overhead work on this section is being proceeded with. The station at Simcoe is a commodious building, containing a large waiting room, ticket office, baggage room and their necessary conveniences.

It was stated in our last issue that the Brantford City Council had approved of the plans for the station to be built in Brantford for the Lake Erie & Northern and the Hamilton & Brantford Railways, with the stipulation that the L.E. & N. buy a strip of land opposite the station site in order to widen Water St., and to deed it to the city for highway purposes, the city offering to give in exchange a small piece of land to the west of the triangular portion of Water St., which will also be used by the railways. The L.E. & N.R. objected to this and went to the Board of Railway Commissioners, which decided, June 9, in favor of the city's contention. As the railway clearance under the bridge is 18 ft. and the station clearance 17 ft., and as the line is electrically operated, and it will not be necessary to have men on the top of the cars, the order provides for the clearance required of 17 ft. on the company giving the usual undertaking that men will not be allowed on the top of cars. We are officially advised that the building of the station is being proceeded with. (June, pg. 240.)

London & Port Stanley Ry.—Work on the new station building in London was reported to be well advanced June 14. It is reported that the building is being erected without a permit from the city council, and having been refused on the ground that the building is described as "shed construction," which is not permitted in first class fire limits embracing the site of the station.

Moncton Tramways, Electricity & Gas Co.—We are officially advised that the company will probably remove its track between Weldon St. and High St., on Main St., and between Main and Park St., on High St., and place the same on Weldon St. from Main to Park St., thence on Park St. to High St., about half a mile. It is also proposed to pave about 3,000 ft. of track on Main St. with bitulithic at once. The Sunny Brae, N.B., Town Council has appointed a special committee to meet the company, and discuss the question of the extension of the electric railway from Moncton to Sunny Brae. (Feb., pg. 73.)

Montreal Tramways Co.—A petition has been extensively signed by the residents of the Park Ave. extension district, asking that they may be given a car service by the extension of the Van Horne Ave. line for 350 yards to Atlantic Ave. (June, pg. 242.)

Pictou County Electric Co.—The Nova Scotia Legislature has extended the time within which the company may build the various electric lines which its predecessor in title, the Egerton Tramway Co., was authorized to build in 1902, and which have not been built. (Dec., 1915, pg. 482.)

Quebec Ry., Light & Power Co.—We are officially advised that the management knows nothing of the building of a new piece of railway at a cost of $100,000, which a United States press report stated recently the company had decided on undertaking. The question of the extension of the company's lines in Belvedere Ward is urged by the City Council. The company offered to accept the decision of the Quebec Public Utlities Commission as to the necessity for the extensions asked for, and the city will make the necessary application. (Dec., 1915, pg. 482.)

Regina Municipal Ry.—An extension of track to the Imperial Oil Co.'s headquarters, Winnipeg St., Regina, Sask., has been completed. (July, 1915, pg. 277.)

Sandwich, Windsor & Amherstburg Ry.—Negotiations are in progress between the city and the company for the construction of a second track on London St. West, before the new pavement is laid. There is some difference of opinion between the city and the company as to terms, but it is expected that these will be adjusted so that the work may be proceeded with this season.

We are officially advised that the present single track line between the Michigan Central Rd. bridge and Bridge Ave., on London St., Windsor, Ont., approximately 0.416 of a mile, will be double tracked at an early date. (Nov., 1915, pg. 441.)

Toronto Suburban Ry.—In reference to the proposal to change the gauge of a portion of the line, we are officially advised that the gauge of the lines being operated is 4 ft. 10¾ in., while that of the extension from Lambton to Guelph, is 4 ft. 8½ in. The lines now operative are the ones to Lambton, along Keele St., to Weston and Woodbridge, and the Davenport road line. As it is intended to handle freight over the Lambton-Guelph line, it was necessary that it should be built standing gauge, and as the passenger cars on that line have to operate over both interurban and city lines, the gauge of all should be the same. The gauge of the Toronto Ry. and of the Toronto Civic Ry. is 4 ft. 11⅞ in. (May, pg. 195 and 196.)

Toronto Civic Ry.—We are officially advised that construction is almost completed, upon the Lansdowne Ave. extension, from St. Clair Ave. to the C.P.R., 0.615 of a mile of double track. We are advised by the Commissioner of Works for Toronto, relative to the new eastern entrance to the Exhibition Park, and the electric railway track there, that it is a continuation from the Toronto Ry. tracks from the corner of Bathurst and Front Sts. to the terminal in the exhibition grounds, just east of the Midway. The total length of the line is approximately 10,900 ft. of single track, and it is for the most part double track construction, with 60 lb A.S.C.E. rails on cedar ties and gravel ballast. The overhead construction is span work, and 2/0 round trolley wire will be used. The line is being built by the city, and will be operated by the Toronto Ry. Orders have been placed for material for track and overhead work. It is expected that this new eastern entrance will be completed by the end of August. (June, p. 242.)

Windsor, Essex & Lake Shore Rapid Ry.—In connection with the City of Windsor's proposal to pave Howard Ave. from the cemetery to Tecumseh Road, the question of the location of the company's tracks came up at the council meeting June 9. The company's tracks are on the boulevard, south of the cemetery, where they were located at the city's request, the city paying $1,800 to move them there. The matter was referred back to the committee in charge with a request to confer with the company as to moving the tracks to the middle of the road.

The company has been granted permission by the city to pave the road on the west side of its car barn in Windsor. (Mar., pg. 115.)

Winnipeg Electric Ry.—We were officially advised May 26 that negotiations were under way for building a second track on the Winnipeg, Selkirk & Lake Winnipeg Ry., from the north city limits of Winnipeg to Kildonan Park, about a mile. These negotiations were not then completed, and the management was not in a position to state whether the work would be gone on with this year or not. The discussions about this matter, show that the undertaking of the work depends largely upon whether the city of Winnipeg will persist in its application to the company to lay a new line on Talbot Ave. (June, pg. 242.)

The Quebec Ry., Light & Power Co.'s lines after the transfer to the Dominion Government of the line from Quebec to St. Joachim, will consist of the City Division, 19.77 miles, and the Quebec County Division 4.82 miles. The latter line runs from Maple Ave. to Sillery, on the road to the Quebec Bridge. What is known as the Beaufort line is owned by the Beaufort Insane Asylum authorities, and it is and will continue to be operated by them. Whether the company will continue to operate the upper level line to Montmorency Falls has not been decided. (June, pg. 227.)

Safety First at Winnipeg.—For three or four days prior to the closing of the public schools in Winnipeg, R. R. Knox, Traffic Superintendent; H. Long, Electrical Superintendent, and L. Palk, Assistant to the Manager, Winnipeg Electric Ry., attended at the various schools in the district, and gave addresses to the scholars on safety first in relation to traffic on the streets. A quantity of literature was also distributed, in which hints are given to the children, all couched in such language as will be readily understood even by the smaller ones.

J. W. Lyon, President, Ontario Hydro Electric Radial Railway Association, was slightly injured by being struck by a street car in Toronto, June 8.

Safety Provisions on Niagara Falls Park and River Railway.

Following on the serious accident which occurred near Queenston Heights, on the N.F.P. & R. Ry. on July 7, 1915, the Ontario Railway and Municipal Board had its engineers, H. W. Middlemist and J. C. Royce, of Toronto, make a very thorough examination of the whole line, in which they were aided by the company's officials. As a result of the engineers' report, and of conferences between the Board and the company's management, the Board passed an order May 26 requiring the company to do as follows: follows:

That the tracks from the upper arch bridge to the Grand Trunk bridge be ballasted with stone or gravel ballast in a good and sufficient manner under and between the ties and to the tops of the same, to be approved by the Board's engineer; and that all clay and mud be removed from the ballast to the satisfaction of the Board's engineer. That where necessary in the judgment of the Board's engineer suitable drains or ditches be placed in the tracks from the upper arch bridge to the Grand Trunk bridge, with cross drains adequate to carry the water to the edge of the cliff at the lowest points; such work to be done to the satisfaction of the Board's engineer. That immediate temporary or partial repairs be made as in the two preceding sentences mentioned ready for inspection by the Board's engineer not later than June 15, 1916, and that the matter of further permanent repair be reserved for consideration by the Board on said date. That adequate provision be made for the proper drainage of the tracks at all places where the track is low, from the Grand Trunk bridge northerly to the river dock at Queenston; this work to be done ready for inspection by the Board's engineer during 1916. That all ties in the tracks which are defective or unfit for use owing to decay shall be removed at once, and sound, serviceable ties substituted therefor; and so from time to time hereafter. That suitable stone or gravel ballast be put in at all low spots along the line where water is likely to accumulate, and that where low joints are found in the tracks these should be raised and ballasted and the ballast tamped under the ties. That where any spikes are missing in the ties they shall be replaced. That all outer rails which are in a worn condition and which are situated on a curve, be renewed. That all guard rails be carefully inspected and where necessary securely spiked to the ties, and that existing guard rails be added to and extended as required from time to time by the Board's engineer.

That the safety switch near Brock's monument be reconstructed according to the plan approved by the Board.

That all weeds and vegetable growths be forthwith removed from between the rails and for a distance of 18 in. outside the tracks and also (except upon the section of the railway within the Queen Victoria Niagara Falls Park) from the devil strip between the tracks: and that the said areas, except as above excepted, be hereafter maintained free from weeds and vegetable growths. That those portions of the cliff at which the track approaches close to the edge, and which under instructions from the Board were examined by officials of the company and reported upon, be hereafter, not later than the first week in May in each year, carefully examined by officials of the company, and reported upon in writing to the Board as to the condition and safety of the same. That all culverts under the tracks be rebuilt of concrete or cast iron pipe of suitable diameter in a good and substantial manner during 1916.

That the railway from Queen St., Queenston, to the river dock be reconstructed with a safety switch and with altered grades and curves, in accordance with the plan approved by the Board.

Where the trolley wire is carried on span wires, the trolley poles supporting the span wires shall be erected and maintained at a minimum distance of 7 ft. from the centre line of the nearest track, such distance to be measured to the face of the trolley pole nearest the track; provided that where this is impracticable, owing to the proximity of the railway to the cliff, the Board may permit a trolley pole or poles to be erected nearer the centre line of the nearest track.

That in operating the cars rule 18 of the rules for the government of conductors and motormen shall be strictly observed. That hereafter all cars operated to Queenston dock shall have double motor equipment. That the brake rods and brake equipment of the cars operated shall be strengthened as specified in drawing filed with the Board. That all cars operated on this line shall be equipped with suitable fenders of a type approved by the Board. That sanders of ample capacity, as approved by the Board, shall be fitted to the cars and adjusted to deposit the sand as close to the wheel as possible, and that the sanding adjustment be frequently inspected so as to ensure that it is in good working order. When operating up or down the Queenston grade and if loaded to the full extent of its seating capacity, the number of permissible standing passengers, in excess of such loading, shall be limited as follows,—an open car shall not be loaded beyond 10% of its seating capacity, and a closed car shall not be loaded beyond 30% of its seating capacity.

That the company's rule 133, limiting the speed of cars over switches and curves and square crossings, be strictly observed. That this order shall take effect forthwith and all its requirements shall be satisfied in a manner to be approved by the Board's engineer.

The International Ry. Co.'s management has favored Canadian Railway and Marine World with plans showing the change in track leading to Queenston dock, and the installation of the so-called safety switch on the same piece of track, in connection with which it may be mentioned that the gradient has also been reduced approximately 1% incident to these changes. In regard to the various paragraphs of the Board's order, it is stated that the ballasting of the tracks from the upper arch bridge to the G.T.R. bridge has been completed, and that the necessary drains are being installed. New ties are being put in wherever defective ones appear. This is done regularly each year in carrying on ordinary maintenance work, there being about 10% of renewals yearly. Stone or gravel ballast has been put in all low spots, and where there are low joints they have been raised and ballasted and the ballast tamped under the ties. Where any spikes are missing in the ties they are being replaced. Naturally this work is done as part of the ordinary maintenance. The same remark applies to the inspection of guard rails and the spiking of them to the ties. Other points where guard rails are desired have been indicated by the Board's engineers, and they will be installed. The desired changes have been made in the safety switch near Brock's monument. The new switch provides an easier approach to the derail.

Mainly About Electric Railway People.

F. W. Brooks, heretofore General Manager Detroit United Ry., has also been elected President, in succession to J. C. Hutchins, elected Chairman of the Board.

Mrs. W. C. Hawkins, wife of the Vice President and Managing Director, Dominion Power & Transmission Co., has been elected President of the Hamilton, Ont., Associated Field Comforts Committee.

Percy Lewis has been appointed Purchasing Agent, British Columbia Electric Railway, vice **C. A. Lee,** appointed Assistant Engineer in the Electric Engineering Department.

E. Kidd, General Manager British Columbia Electric Ry., left Vancouver, June 9, for London, Eng., for his annual conference with the directors. He expects to return early in August.

Lieut. Col. G. C. Royce, Secretary-Treasurer and General Manager, Toronto Suburban Ry., who for some time has been in command at the alien internment camp at Kapuskasing, Ont., is to raise an overseas battalion in Toronto in connection with Queen's Own Rifles.

R. M. Dunlop, heretofore chief clerk, Freight Office, G.T.R., Chatham, Ont., has been appointed agent, Chatham, Wallaceburg & Lake Erie Ry., there. The position of General Freight Agent, heretofore held by D. L. Welch, who has gone to the London & Port Stanley Ry., has been abolished.

D. L. Welch, heretofore General Freight Agent, Chatham, Wallaceburg & Lake Erie Ry., Chatham, Ont., has been appointed accountant, London & Port Stanley Ry., London, Ont. The report mentioned in our last issue stated that his title would be travelling auditor. Some biographical particulars were given in our June issue.

London, Eng., cablegram May 2:—"The news that **Major Norman C. Pilcher** of the Canadian Mounted Rifles was killed in action was received with special regret in Liverpool, where his family was well known, his father being a captain. Edward Pilcher, his grandfather, twice refused the Mayoralty of Liverpool. Major Pilcher was several times personally congratulated by General Seely for courage and resource under heavy fire. He served in the Boer war."

Major N. C. Pilcher, General Manager, Sherbrooke Railway & Power Co., was killed in action in France recently, as mentioned in our last issue. **J. H. Trimingham,** Superintendent of Power, who acted as General Superintendent during Major Pilcher's absence, has been appointed Sub Lieutenant in the Royal Naval Motor Boat Patrol Service, and has left for England. **Capt. Thos. Irving,** Assistant Accountant, is now with the 117th Eastern Townships Battalion at St. John's, Que., preparatory to going overseas. **Chas. Johnstone,** heretofore Accountant, has been appointed Acting Manager, and **J. T. Kemp,** heretofore with the Aetna Chemical Co., Drummondville, Que., has been appointed General Superintendent.

Contracts for Toronto Civic Railway Cars.

As announced in our last issue, the Toronto City Council has awarded contracts for materials for the assembling and construction of 13 double truck, double end operation, cars for the civic railway, as follows:

Bodies, Preston Car & Coach Co., each..	$4,907.00
Trucks, Dawson & Co., Montreal, per set	828.50
Electrical equipment, Canadian Westinghouse Co., per set	1,866.00
Wire and cable, Eugene F. Phillips Co., Montreal, per car	123.17
Fare boxes, Coleman Farebox Co., each..	51.10

Tenders were invited originally for the cars complete and delivered in Toronto ready for operation, and also for the bodies, trucks and equipment separately. Two tenders were received for the complete cars, no. 1 for $8,867 each, and no. 2 for $9,075 each. Tender no. 1 offered to deduct $158 if the step and door operating mechanism were supplied by the city. This mechanism would cost $190 delivered, and the cost of unloading each car at Toronto was estimated at $25, therefore, based on this bid, the price for each completed car would be $8,925, or $116,012 for the lot of 13.

Taking the tenders as submitted for the various parts the Works Commissioner reported that if the parts were purchased and assembled at the civic car barns, the price for each completed car would work out as follows:

Bodies, Preston Car & Coach Co........	$4,907.00
Trucks, Dawson & Co.	828.50
Electrical Equipment, Canadian Westinghouse Co.	1,866.00
Air brakes, estimated	350.00
Fareboxes, Coleman Farebox Co.	102.20
Wire and cable, Eugene F. Phillips Co.	123.17
Gears and pinions, Allen General Supplies	108.98
Step and door operating mechanism, National Pneumatic Co.	190.00
Unloading and assembling	144.65
	$8,620.50
or for the 13 cars	$112,066.50

a total saving of $3,945.50.

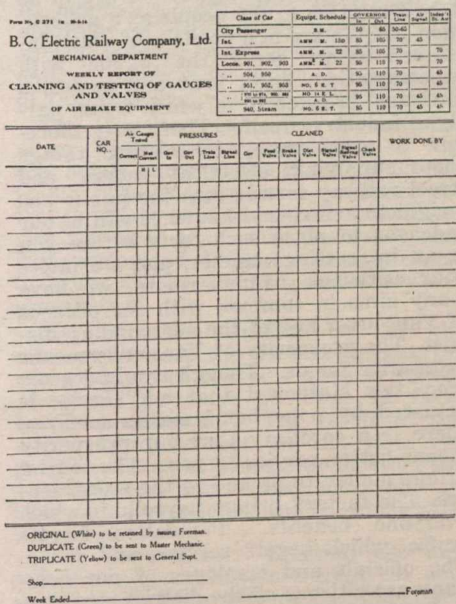
The St. Louis Car Co. originally bid $3,300 for the bodies, and later amended its offer to deliver them in Toronto, with freight, duty and war tax prepaid, for $4,643.50 each, to deduct $30 a car if the city supplied the step and door operating mechanism, and also to allow a deduction of $74 a car if the work of installing trucks, motor equipment, air brakes, wire cable and fare boxes were done in Toronto. These deductions brought the price of the car bodies to $4,539.50 each, which was the lowest tender, but as it was not submitted on the form supplied by the city, it was declared informal. Had this tender been accepted, the total cost of each car complete would have been $8,200, showing a total saving of $5,466.50 on the order for 13.

Testing Air Brakes on British Columbia Electric Railway.

In the B.C.E.R. shops at Vancouver, air brake equipment is thoroughly tested at regular intervals. According to requirement of a provincial act gauges are tested once a month, and in accordance with M.C.B. rules brake cylinders are cleaned every six months. Pumps are generally overhauled once every two years. They are torn down, cleaned and scraped out.

To keep a record of the testing of brake cylinders, gauges, compressors and governors it has been found convenient to make use of a wall cabinet by means of which it is possible to indicate the work laid out for this department for six month periods. Opposite the car numbers, which are arranged numerically, is a row of six ½-in. eye-hooks. If a car or a certain part of its air brake equipment is to be tested during this period a round white cardboard tag, metal bound, is hung on on, the tag representing the month this work is scheduled to be performed. As soon as the work is accomplished the tags are removed. A drawer at the bottom of the cabinet is used for the tags not in use. The tags are stamped with a single letter for the part requiring attention, thus G stands for gauge, P for pump and C for brake cylinder. The board is divided into sections for Vancouver city-cars, interurban cars, locomotives and miscellaneous equipment.

The air brake department foreman makes out a weekly report of cleaning and testing in triplicate, one copy going


B. C. Electric Railway Company, Ltd.
MECHANICAL DEPARTMENT
WEEKLY REPORT OF
CLEANING AND TESTING OF GAUGES AND VALVES
OF AIR BRAKE EQUIPMENT

DATE	CAR NO.	Air Gauges Tested: Correct	Not Correct	PRESSURES: Gov. In	Gov. Out	Train Line	Signal Line	CLEANED: Gov.	Feed Valve	Brake Valve	Dist. Valve	Signal Valve	Signal Reducing Valve	Check Valve	WORK DONE BY

ORIGINAL (White) to be retained by issuing Foreman.
DUPLICATE (Green) to be sent to Master Mechanic.
TRIPLICATE (Yellow) to be sent to General Supt.

Shop ——————

Week Ended —————— —————— Foreman

Weekly Report of Cleaning and Testing Gauges and Valves of Air Brake Equipment.

to the Master Mechanic, one to the General Superintendent and one being retained by himself. The standard M.C.B. report form for brake cylinders and triple valves is used.

International Traction Co.'s Back Dividends. — Buffalo, N.Y., press dispatch June 9:—"The International Traction Co., of which the International Ry. Co. is the operating company, will pay 42% accumulated dividend on the outstanding 4% preferred stock on June 30, it was announced here today. For the first time since the organization of the company in 1899, it was also announced, the directors have declared a 1¾% dividend on the common stock. The total dividend distributions on June 30 will be about $600,000. The International Ry. system embraces all the electric lines in Buffalo and along the Niagara frontier including Niagara Falls, N.Y., and the Niagara Falls Park & River Ry. in Canada.

Terminal Grain Elevator Construction is the title of an illustrated lecture given by C. D. Howe, A.M.Am.Soc.C.E., Chief Engineer, Dominion Grain Commisison, before the Canadian Society of Civil Engineers' Regina Branch, and the Regina Engineering Society, at a joint meeting, June 22.

The beautifying and planting of the grounds of the Intercolonial Ry. station at Moncton, N.B., were completed June 8, the work having been carried out under the supervision of Mrs. Gutelius, wife of the General Manager, Canadian Government Railways.

Electric Railway Finance, Meetings, Etc.

British Columbia Electric Ry., and allied companies.—

	Apr. 1916	Apr.1915	July1,1915to Apr.30,1916	July1,1914to Apr.30,1915
Gross....	$549,046	$540,861	$5,531,193	$6,295,902
Expenses	471,179	485,553	4,796,640	5,011,043
Net......	77,867	55,308	734,553	1,284,859

Cape Breton Electric Co.—

	Apr.1916	Apr.1915	Jan. 1 to Apr.30,1916	Jan. 1 to Apr.30,1915
Gross	$28,234.65	$25,164.46	$118,559.68	$101,163.46
Expenses .	18,295.86	15,336.62	76,004.32	63,844.35
Net	9,938.79	9,827.84	42,555.46	38,309.11

Morrisburg & Ottawa Ry.—A meeting of shareholders was called to be held at Ottawa, May 30, to pass resolutions forfeiting, under the provisions of the Ontario Railways Act, sec. 93, all stock upon which any areraráges for calls or interest were due. R. A. Bishop is Secretary-Treasurer.

Port Arthur Electric Ry.—Statistics of operation for April:

	1916	1915
Revenue	$7,423.71	$7,117.32
Operating expenses	5,880.84	6,223.29
Net earnings	$1,542.87	$894.03
Car mileage	44,260	45,826
Passengers carried	166,471	154,934
Transfers	13,726	18,833

Sherbrooke Ry. & Power Co.—

	Apr.1916	Apr.1915	July 1,1915 Apr.30,1916	July 1,1914 Apr.301915
Gross	$10,925.27	$9,361.04	$112,598.53	$100,555.09
Expenses .	5,900.08	4,421.17	57,744.37	55,143.41
Net	5,025.19	4,939.87	54,854.16	45,411.68

Toronto Ry.—

	1916	City percentage	1915	City percentage
Jan.	$473,784	$68,847	$471,226	$70,486
Feb.	470,764	70,614	440,313	66,047
Mar.	518,555	97,237	488,468	93,141
Apr.	496,172	99,234	467,701	93,540
May	500,314	100,063	468,953	93,790
	$2,459,590	$435,995	$2,336,661	$417,004

Toronto Ry., Toronto & York Radial Ry., and allied companies.—

	Apr.1916	Apr.1915	July1,1915to Apr.30,1916	July1,1914to Apr.30,1915
Gross....	$873,209	$895,816	$3,546,784	$3,227,243
Expenses	444,212	422,757	1,853,075	1,731,845
Net......	438,997	373,059	1,793,709	1,495,398

Winnipeg Electric Ry.—

	Apr.1916	Apr.1915,	Jan. 1 to Apr.30,1916	Jan. 1 to Apr.30,1915
Gross.......	$282,498	$264,856	$1169,808	$1,233,405
Expenses...	171,463	177,336	730,148	783'156
Net.........	111,900	111,035	87,520	450,249

Owing to the regulations in England respecting precautions to be taken in case of Zeppelin raids, the hours during which electric street cars can be operated has been curtailed in some towns. This has caused a loss in wages to those employed, amounting to about $2 a week. In Northampton, where the cars are municipally operated, the wages are being paid as for a full number of hours. The employes declined to accept half rates.

Spitting on Cars. — The International Ry. has requested the Buffalo police to enforce the city ordinances prohibiting spitting and smoking on the street cars, and as a result a number of fines, ranging from $5 to $50, have been inflicted recently. So far as the enforcement of the regulations in Canada against spitting is concerned the bylaws are more or less of a dead letter.

The International Ry. is operating for the summer a new fast through service between the Buffalo, N.Y., terminal and Queenstown, Ont., via Niagara Falls, and the Upper Bridge across the Niagara Gorge, returning via the Gorge route. No stops are made between Buffalo and Niagara Falls, and the round trip is made in two hours.

British Columbia Electric Railway Bulletin.

The British Columbia Electric Ry. has commenced the issue of a bulletin for its patrons, from the first number of which the following is reproduced:

"Every Friday morning we expect to publish one of these little bulletins for our patrons' information and edification, and we hope that you will take one from the box, read it, and enjoy it.

"Our purpose is not hard to explain. We aim to give service, whether it is by way of a safe, speedy street car service or a reliable, efficient electric light service. But giving service is not so simple as it may seem, especially when Tom, Dick or Harry each wants a special brand of service different from the others. For instance, Tom, who lives at the end of one of the car lines, wants the car he is on to speed right through and wait for no one. Dick, who lives half way to town, waves at the motorman when he is half a block away from the track and wants to be waited on. Harry, who lives fairly close in, generally walks to work, but occasionally, when it is wet and disagreeable, he rides, and complains because the car is crowded with other persons situated similarly to himself. Now, it is impossible, in a system that is for all, for everyone to obtain exactly what he wants at all times, and so we try to strike a happy medium of service, intended to meet the wishes of as many persons as possible. If we did not run our cars by rule—or on schedule, as it might be put—we would not be giving service. You could not tell when you would get a car, or whether, having found one, it would take you to your destination.

"It is, then, one of the objects of this bulletin to acquaint you with your street car system and incidentally to help you to take the most benefit out of it. You are all anxious to get to your destinations as quickly and as comfortably as possible, and we, who are at your service, are anxious to comply with your wishes. There is just one thing lacking, namely, co-operation between company and patron.

"'But why,' you may ask, 'do you request co-operation, when your company owns and operates the street cars? We ride and pay the bill. What more do you want?'

"The answer lies in our desire to work for the benefit of the public. There are certain things—trivial in themselves, but of great importance in the aggregate—that can be done only by the public. Fast schedules, accurate timing, up to date equipment can do their part in getting the tired business man to his home quickly, but the final element, the assistance of the man himself, has been lacking.

"'But how can I assist in making the cars run faster?'

"'By having the right fare ready, by handing the conductor your transfer unfolded, by getting on board the car quickly, and in many other ways you can assist the service. Many minutes each trip can be saved by such means. We dare say that many persons never think how they are delaying the system, and incidentally themselves, by not having their transfers unfolded when boarding a car. We want to teach you how to save the seconds on the back platform and how best to use a transportation system that is for you.

"This will be our method of talking to our patrons, and if you have any suggestions to make as to running our car system we want you to make them. Your wishes are what guide us in giving service. All we ask is that you be reasonable. Sometimes we are in a better position than you are to choose when there are several opposing wishes which cannot all be satisfied. You may ask why we did not begin this before. Frankly, we were too busy extending our lines into new territory and doubling and trebling our equipment to meet growing conditions. What person during the boom years was not fully occupied with the industrial expansion?

"We believe we can say truthfully that we have been a prominent factor in building up Vancouver and the surrounding part of British Columbia. In our position as a public utility company we are in as close a relation to the people as a government is. We are in a position of trust, inasmuch as we serve the public with transportation, light, heat and power, a continued breakdown of which would paralyze industry itself. There are, therefore a great many interesting things about supplying electrical energy and street railway service that the public has a right to and should know. It will be our endeavor to place such facts before you in an interesting manner, and we invite your criticism. Furthermore, we have many aims in common with the citizens of Vancouver and of the surrounding district. The prosperity of Vancouver means prosperity for us. Though it might seem from this statement that our service is actuated by none but business motives, there is a corollary that our prosperity means better service to you. The tourist brings money to us and to the storekeepers. The factory brings payrolls in which everyone benefits. Population begets traffic, which begets service, and so on. The officials and employes of our company are citizens of the district we serve. A large percentage of them own their homes. All but a small percentage of our earnings remains in this district. We want to convince you that we are just as much interested in the prosperity of Vancouver as you are, and hope to enlist your assistance in making it the city that it should be."

The company offered prizes for the three best suggestions for a name for the bulletin, $15 for first, $10 for second, $5 for third, to be submitted by June 30. For the guidance of competitors it gives the names of bulletins issued by other companies, as follows: Seattle, "The Electrogram"; Tacoma, "Public Service Forum"; Portland, "Watts Watt"; San Francisco, "Transit Tidings"; Denver, "Tramway Bulletin"; Baltimore, "Trolley News"; Olympia, "Public Service"; Sioux Falls, "On the Cars."

The Great Lakes Power Co., which, as announced in our last issue, has purchased the International Transit Co., operating a street railway and ferry service at Sault Ste. Marie, Ont., has also acquired the water power rights owned by the Algoma Steel Corporation, Ltd. It is the intention to increase the plant to 30,000 h.p., under plans and specifications prepared by J. O. Heyworth, M.Am. Soc.C.E., Chicago, Ill., and to have the extended plant ready for operation by Jan. 1, 1918. The company's chief officers are: President, S. Insull, Chicago; First Vice President, M. J. Insull, Chicago; Second Vice President, J. A. McPhail, Sault Ste. Marie, Ont.; Secretary, P. L. James, Chicago; Treasurer, R. W. Waite, Chicago.

Montreal Tramways Co's Wages, Etc.

The Montreal Tramways Co. voluntarily increased its conductors and motormen's wages on June 1. Following is a comparison of the old and new rates per hour:

	Old rate.	New rate.
1st and 2nd year men	22c.	23c.
3rd, 4th and 5th year men.....	23c.	25c.
After 5 years	25c.	27c.

The arrangement regarding uniforms remains the same as before. For the first two years the men pay half the cost, after which the company furnishes uniforms free. There is no extra allowance for Sundays or overtime, but schedules are made out to allow for about time and a half for all extras and trippers. About 70% of the men have been over 5 years in the service.

A. Gaboury, Superintendent, issued a bulletin to conductors and motormen on June 1, containing the following letter from J. E. Hutcheson, General Manager: "The management has had under consideration for some time the question of increased wages for conductors and motormen, and it is with pleasure that I am able to announce that commencing July 1 the wages per hour will be 23, 24 and 27c. respectively, instead of the rate of 22, 23 and 25c. which is in effect at present. There will be no change in the arrangement regarding clothing. The management appreciates very much the loyal services of the staff in the past, and feels confident of faithful co-operation for safe and efficient service in the future. I trust that the end of the war will mean the return of prosperity. In the meantime, assure all the employes of your department that their welfare is ever considered."

Edmonton Radial Railway Earnings, Etc.

	April 1916.	March 1916.
Revenue	$48,458.19	$52,631.96
Expenses	54,196.90	56,380.76
Passengers carried ...	982,674	1,081,451

Results of operation from Jan. 1 to April 30:

Expenditure.

	1915	1916
Depreciation	$10,979.16	$8,617.76
Maintenance	17,420.23	15,226.78
Operation (including bank interest)	85,431.36	84,483.70
Power charges	34,547.66	36,677.10
	$137,399.25	$136,387.58

Revenue.

	1915	1916
Cash fares	$143,942.30	$170.657.15
Ticket sales	39,313.00	21,862.40
Advertising	1,040.95	1,290.29
Special cars	72.90	167.95
Miscellaneous	1,519.78	2,660.25
	$185,888.93	$196,638.04

Capital Charges and Depreciation.

	1915	1916
Debenture int.	$47,853.64	$47,331.92
Debenture redemption..	28,428.60	29,119.80
	$87,261.40	$85,068.76

In their report the Commissioners say: "Considering the city has decreased in population and that the citizens have received an improved service as compared with last year, the street railway is holding its own under trying conditions; that is, the street railway earned during the first four months of 1916, over and above its operating expenses, sufficient monies to pay all interest charges, as well as depreciation charges and leaving some $4,500 on hand to apply on debenture sinking fund account."

Jitney Traffic Notes.

A number of jitneys are operating in London, Ont., the number having been increased owing to the suspension of Sunday operation by the London St. Ry.

The Esquimalt, B.C., Town Council has approved a bylaw respecting the operation of jitneys. A provision requiring a bond of $5,000 for each car was held over for further consideration, as jitney men claim its enforcement will put a number of them out of business, for the summer traffic. Their interests are being looked after by the Victoria Jitney Association.

The jitney licenses in Vancouver, for the half year, expired May 31, and since then very few of the owners of cars have had them renewed owing to the bonds put up not being acceptable to the City Council. The license inspector has been instructed not to accept any bonds under the bylaw unless they are issued by a company doing business with the Dominion Government's approval. Most of the jitney bonds hitherto accepted were issued by a company which is unable to comply with the requirements in this respect. The jitney men were given a short time to obtain new bonds, and instructions were given to prosecute under the bylaw any jitney men who were operating cars without licenses. The bond issuing company in question is interested in an action taken to quash the council's resolution as to the bonds.

The New York Public Service Commission, second district, has issued a regulation, prohibiting jitneys operating on routes parallel to existing car lines in Rochester. In the course of the investigation some interesting figures were given to show how the presence of jitneys would congest traffic on street. C. R. Barnes, electric railway inspector, made checks to show that 450 vehicles ordinarily passed through Main St. in the evening rush hour. If jitneys were used to take off the passengers who now stand in the trolleys, 304 machines would have to be operated, increasing the traffic 70%. If jitneys were substituted entirely for street cars, Mr. Barnes showed that some 2,000 jitneys would have to be in operation from 5.4 to 37.8 seconds apart. Through Main St. more than 6,500 jitney movements an hour would be necessary. The summing up of the commission was that the existing electric railway of Rochester, viewed as a public agency rather than as a money-making machine, was distinctly worth saving, in the interest of the people of Rochester. It had performed very valuable service in the upbuilding of the city. As a result licenses were refused to 60 jitney operators.

Electric Railway Notes.

Saskatoon, Sask., Municipal Ry. employes are applying to the city council for an increase of wages.

The Saskatoon Municipal Ry. inaugurated a Sunday car service between Saskatoon and Sutherland, Sask., May 28.

Moncton Tramways, Electricity & Gas Co., Moncton, N.B., will change to one-man-car operation in the near future, as soon as the cars are equipped with the Coleman Fare Box Co.'s no. 4 stationary fare box.

A complaint against the Quebec Ry., Light & Power Co., before the Quebec Public Utilities Commission, relative to a cash fare charged for transfers on the sillery line within the city limits, was heard on May 30, and was adjourned to June 15.

The Oshawa Ry. has ordered one 25-ton electric locomotive from Ottawa Car Manufacturing Co. It will be about 23 ft. long, mounted on trucks and equipped with 4 Westinghouse 101-B-2 motors, L-4 controller, and Westinghouse ET 6 air brake equipment.

Brantford, Ont., Municipal Ry., employes were, on June 2, granted an increase of 2½c. an hour. Stools are to be provided for motor men and conductors, and the conductors are to be supplied with change by the Commission. The union is not to be recognized.

The City Commissioners operating the Edmonton, Alta., Radial Ry. have reported against a proposition to discontinue operation of the cars on Sundays. The surplus revenue from the operation of the cars on Sundays from Jan. 1 to April 30 of this year was reported to be $4,462.25.

The Hamilton, Ont., City Council has under consideration a revision of the city bylaw affecting the Hamilton St. Ry. traffic. The matter has been under the Street Railway Committee's consideration for some time, with the result that it is recommended that the present clause in bylaw 679 be dropped, and a new one substituted.

The litigation arising out of the attempt to pass the Hebert project for the granting of a new franchise to the Montreal Tramways Co. June 22, 1915, has been called off. The result of the whole matter is that the city is in the position it was before the application for an injunction, and is once more able to take up the question of the franchise with the company.

The Three Rivers Traction Co. has ordered one combination freight car and snow plough from Ottawa Car Manufacturing Co. It will be about 29 ft. long over end sills, equipped with a heavy nose, or wedge plough at the front end and a heavy wing plough at one side. The body, etc., will be mounted on 76-E trucks and equipped with 4 Westinghouse 101-B-2 motors and Westinghouse S-M-E air brake equipment.

Sunday Car Service in London.

The arrangement for the operation of cars on the London St. Ry. on Sundays expired June 6, and the service was discontinued. For some time prior to that date, negotiations were carried on between the company and the city regarding a renewal of the privilege. In return for the renewal, the city demanded the immediate construction of some extensions, some double tracking, the provision of additional cars and a general improvement of the service. The company advised the council that it was prepared to purchase certain second hand cars, of which the City Engineer declined to approve, and also pointed out the difficulty of obtaining steel for new lines. The Board of Control, on June 9, decided to recommend the city council to remain firm in the position it had taken. Negotiations were however continued, and on June 16 a special meeting of the council was called for the following day to complete arrangements for a continuation of the Sunday service. Further negotiations and considerable discussion took place at the meeting on June 17, but without any satisfactory arrangement being arrived at, and the service on Sunday remains suspended.

Cost of Track Weeding on Interurban Railways.

The cost of track weeding on 16 electric interurban railways is given in the American Electric Railway Association's official journal, from a compilation made by E. Karow, Assistant to Vice President, Twin City Rapid Transit Co., Minneapolis, which appeared in reply to a question as to the best method of weeding. The figures of annual cost per mile of single track are as follows:

Company no.	Manual Labor	Chemicals	Weed Burner
1	$37.50	....	$6.25
2	50.00	$23.90	....
3	....	....	7.50
4	....	6.00	....
5	20.00	....	15.00
6	27.04	....	....
7	52.50	....	....
8	....	....	4.66
9	....	36.54	....
10	18.30	....	....
11	58.00	12.00	12.00
12	55.00	25.06	....
13	50.00	43.55	....
14	75.00	25.00	....
15	50.00	33.00	....
16	70.00	28.80	....
Average ..	$47.00	$26.00	$9.00

Some companies clean their track to the end of the ties and others for a considerable distance beyond. Where manual labor is relied on, the track has to be weeded from one to three times per year; but the track is left in the cleanest condition. Burning is the cheapest scheme; but the track is left unsightly, and the work has to be repeated as often as hand weeding. Chemical treatment is the most effective; the cost is high in the first year, but lower in the second and third years.

Toronto Suburban Ry. Wins Case.—The Ontario Railway and Municipal Board decided June 22 that the Toronto Suburban Ry. has the right to connect its existing line at Lambton, Ont., with its extension to Guelph. The City of Toronto opposed the company's application. If the Toronto Suburban changes its existing guage of 4 ft. 10¾ in. to the standard, 4 ft. 8½ in., which is the guage of the Lambton-Guelph extension it will be enabled to run through cars from Guelph to Lambton, thence along Dundas St., Keele St. and Davenport road to Bathurst St. and down that street for some distance in Toronto.

Telegraph, Telephone and Cable Matters.

The Great North Western Telegraph Co. has opened offices at Valcartier Camp, Que.; Camp Borden, Ont.; Richlea, Sask., and Stanmore, Alta., and has closed its office at Chandler, Sask.

The following changes have taken place in the C.P.R. Telegraph Department: W. M. Godsoe, heretofore Superintendent, Atlantic Division, St. John, N.B., has been appointed Commercial Representative in Nova Scotia, Halifax; A. C. Fraser, heretofore Superintendent, Eastern Division, Montreal, has been appointed Superintendent, Atlantic Division, St. John, N.B., vice W. M. Godsoe; W. D. Neil, heretofore Superintendent of Traffic, Eastern Lines, Montreal, has been appointed Superintendent, Eastern Division, Montreal, vice A. C. Fraser; W. M. Thompson, heretofore chief operator, Montreal, has been appointed Superintendent of Traffic, Eastern Lines, Montreal, vice W. D. Neil; J. G. Davies has been appointed chief operator, Montreal, vice W. M. Thompson; E. W. Clayton, heretofore Agent, Nelson, B.C., has been appointed Agent, Victoria, B.C.

Marine Department

Freight Steamships Being Built at Port Arthur.

As previously stated in Canadian Railway and Marine World, two steel freight steamships are being built at Port Arthur, Ont., one for the Great Lakes Transportation Co., of which Jas. Playfair, Midland, Ont., is President and General Manager; and the other for the British Sulphite Fibre Co., of Vancouver, B.C., in which Jas. Whalen, of Port Arthur, Ont., is interested. They are sister ships, with the following general dimensions:

Length over all	251 ft.
" between perp.	251 ft.
Breadth moulded	43½ ft.
Depth moulded	28 ft. 2 in.
Carrying capacity about	3,000 gross tons

They will be of the single deck type, with poop, bridge and forecastle, steel deckhouse on bridge deck and chart room on top of deckhouse, with navigating bridge, and will be built on the transverse system of construction. There will be two cargo holds with two hatches in each hold, no. 1 hold to extend from collision bulkhead to boiler room bulkhead, and no. 2 hold to extend from engine room bulkhead to after peak bulkhead. The propelling machinery is located amidships. The double bottom will be 3 ft. deep and extend from collision bulkhead to after peak bulkhead, divided by transverse water or oil tight floors into a suitable number of compartments. Part of the double bottom will be utilized to carry fuel oil, the remainder of the fuel to be carried in wing tanks, which can also be used for coal. The officers and crew will be berthed amidships on bridge deck, where the mess rooms, galley, pantry, water closets, etc., will be situated. The firemen and sailors will have their quarters aft on main deck.

The main boilers will be of the Scotch marine type, single ended, arranged abreast. They will be 14½ diam. by 11 ft. long and have a combined grate area of 126 sq. ft. Each boiler will have three corrugated furnaces, of the suspension type, 42 ins. inside diam. The boilers will be fitted for natural draught.

The propelling machinery will consist of triple expansion engine, with surface condensers, built-in type, 3-cylinders each, working each on a separate crank placed at an angle of 120 degrees. Slide motion to be of Stephenson link type. Cylinders 20, 33 and 54 in., with a stroke of 40 in. The average working horse power to be 1200, maximum 1300. The high pressure cylinder will have piston valve, and the low and intermediate double ported slide valves, with relief frames, and the low pressure cylinder will have a Lovekin assistant cylinder. The high pressure cylinder will be supplied with a loose bushing of hard cast iron. All cylinders will have relief valves, top and bottom, discharging into the atmosphere. The turning gear will consist of a single cylinder engine, driving through worm gearing a shaft mounted on sliding cast steel worm.

The propeller will be of cast iron, solid section, with four blades. The air pump will be of the Edwards type, bolted to the back column of the engine. The steam steering gear will be placed on the main deck in engine room. There will also be a hand steering gear aft, and an 8x2 in. steam windlass fitted with hand attachment and friction brakes. All anchors will be of the stockless type, of size in accordance with Lloyd's requirements. To facilitate the handling of the cargo there will be six 7x12 in. reversible steam winches, and 6 derrick booms to lift 4 tons each.

The vessels will be fitted throughout with electric light. One 7½ k.w. generator will be fitted in engine room. All wires, with the exception of those in cabins, will be enclosed in conduit, with outlets terminating in watertight fixtures. In the cabins the wire will be run in wood mouldings.

The vessels are being built by the Western Drydock & Shipbuilding Co. to take the highest class in Lloyd's Registry and under their special survey.

Steel Shipbuilding in Nova Scotia.

As stated in Canadian Railway and Marine World for April, the Nova Scotia Steel and Coal Co. is commencing building a steel steamship for its coal trade along the coast. She will be of about 2,000 tons dead weight capacity, 220 ft. long, 35 ft. beam and 20 ft. moulded depth. She will be built to Lloyd's classification, with all scantlings 10% in excess of classification requirements. It was expected that the keel would be laid during June, and the launching, depending on labor conditions and the delivery of material, will probably take place late in the autumn. The stem, stern post and rudder forgings, all propelling shafting, propeller and all fittings, all the frame angles, floor plates, etc., are to be made by the Nova Scotia Steel and Coal Co., at its New Glasgow works.

The propelling machinery will consist of a 1,000 shaft h.p. De Laval geared turbine, geared to the propeller shaft through two sets of gears. This will, it is said, be the first vessel built in Canada with a geared turbine, and it will also be the first vessel to be equipped with a De Laval geared turbine for driving the propellers. The equipment will also be unique in regard to the auxiliaries, having a rotary pump and centrifugal circulating pump, driven by a single engine.

Work is in progress on the building yard, which is located on the East River, near the Eastern Car Co.'s plant, which is also subsidiary to the Nova Scotia Steel and Coal Co. Thomas Cantley, President and General Manager, in writings us, says: "This is the initial venture, which may lead to far reaching results in the development of a naval and commercial steel shipbuilding industry."

Investigation into Stranding of s.s. Ennisbrook.

An investigation into the cause of the stranding of the Brook Steamship Co.'s s.s. Ennisbrook, off Glace Bay, N.S., May 15, was held recently before Capt. L. A. Demers, Dominion Wreck Commissioner, assisted by Capts. R. MacDonald and A. J. Morrison as nautical assessors. After weighing the evidence, which was short while covering the facts, the court found that the master, H. J. Vickers, showed lack of judgment in navigating his vessel from Cape North to the place of grounding. He had clear weather, with light northerly winds, from the time of passing Cape North, with clear water on his port side, and on his starboard side ice was bordering the Cape Breton coast, and the current, if the trouble had been taken to ascertain it, would have been found running southwesterly, and both current and wind were influencing the ice. His intention at first was to make Sydney for bunkering, but on the way from Cape North, when he found so much ice in shore, he changed his mind and decided to go to Louisburg, as there was a clear passage there, but when in the neighborhood of Flint Island, when the ice was all on his starboard in masses, with clear water in shore, he thought he could make Sydney, and retraced his way to reach it. The court considered that in view of the fact that the master and mate were strangers to the locality, and owing to the masses of ice on the weather side and closing down gradually, it was most unwise and careless navigation to bring the vessel so near land, even after observations were made to ascertain the position of the vessel, which were not, however, plotted on the chart produced. After the grounding, every method possible was adopted to release the vessel, and there was no criticism on that point. Not wishing to cause delay to the dispatch of the vessel, which was only very slightly damaged, the court did not deal with the master's certificate, but severely censured him and reprimanded him for his lack of judgment, both in entering the ice and for careless navigation in approaching so near to land which was unknown to him, especially under the difficulties which would have been apparent even to those not accustomed to the sea.

Vessel Casualties on the Great Lakes.

The Canadian Lake Protective Association has issued its second casualty report for the season.

In view of the risk of damage and delay from fire, exemplified by one of the casualties reported, it has been resolved by the Association's committee that smoking be prohibited in sleeping quarters on all steamships. Instructions have been given accordingly to all members, and all masters are asked to see that the rule is strictly observed.

It has also been resolved to adopt a recommendation of the Great Lakes Protective Association that no vessel should attempt to pass another in the shallow and narrow channels between the lower end of Port Huron middle ground and Corsica Shoals lightship, and between the upper end of Russell Island and the lower end of St. Clair Flats Canal.

The committee will hereafter withhold from publication all reported casualties which in its opinion are not sufficiently serious or culpable to be of general interest. Masters will understand that they should report all casualties and it will be for the committee to determine which of these will be mentioned in the bulletin. Under this rule the present bulletin omits several reported casualties.

Danger of vessel collisions during darkness and fog will, according to a press dispatch from London, Eng., be practically eliminated very shortly, owing to a new device invented by W. Marconi, of wireless telegraph fame. It is said that the device is easily installed on vessels, and is operated from the bridge.

Proposed Further Diversion of Water from the Great Lakes.

The State of Illinois is proposing to divert water from the Great Lakes for a traffic canal from Chicago to the Illinois and Mississippi Rivers, and the Governor of the State and a number of congressmen recently waited on the Secretary for War asking for the approval of plans for the construction of the canal at an expenditure of about $5,000,000. The Dominion Marine Association has filed a protest and asked for an opportunity to present the views of the Canadian navigation interests, and has been advised by the Secretary for War that the matter is being held for further consideration, and that if further hearings take place the Association will be given an opportunity to express its opinion.

A bill is at present passing through Congress to sanction the Illinois Legislature's action in authorizing this expenditure. The Senate has added an amendment to the bill limiting the amount of water to be withdrawn to 250,000 cub. ft. a minute, being the limitation in force in 1912, when an application was made unsuccessfully to increase the amount of water which may be withdrawn. This amendment is being discussed in the lower house, and the matter has become the subject of representations from the Dominion Government with reference to Canadian interests in the waters of the Great Lakes. At a conference with the Dominion Government on the subject, at which F. King, Counsel, Dominion Marine Association; A. A. Allan, President, and T. Robb, Secretary, Shipping Federation of Canada; W. G. Ross, Chairman, Sir John Kennedy, Consulting Engineer, F. W. Cowie, Chief Engineer, and D. Seath, Secretary, Montreal Harbor Commissioners; J. G. Sing, C.E., representing the Toronto Harbor Commission; C. A. McGrath, of the International Joint Waterways Commission; the Deputy Minister, and Assistant Deputy Minister of Public Works, the Deputy Minister of Marine, and W. J. Stewart, Chief Hydrographer, were present, it was strongly urged that the conservation of the waters of the Great Lakes and St. Lawrence River is essential to the trade and commerce of the Dominion. The conclusion arrived at was to reaffirm the position previously taken by the Dominion Government against any further diversion of water from Lake Michigan.

The Davidson & Smith Elevator Co. Ltd., is reported to have purchased the s.s. Panther from the Massey Steamship Co., Duluth, Minn., for operation in the Canadian lake trade. She is a wooden vessel with diagonal strapping on frames, steel arches, bow sheathed for ice, steel boiler house, steam pump wells. She was built at West Bay City, Mich., in 1890, and was practically rebuilt there in 1912. She is equipped with fore and aft compound engines with cylinders 24 and 4 6ins. diar. by 42 ins. stroke, 600 i.h.p. at 86 r.p.m., supplied with steam by one Scotch boiler 12 by 13 ft. at 120 lbs. Her dimensions are, length 236 ft., breadth 36 ft., depth 24 ft.; tonnage, 1634 gross, 1140 register.

Canadian Pacific Ocean Service Flag.—Since the C.P.R. first entered the steamship business its red and white checkered flag has become well known on both the Atlantic and Pacific oceans, and in most ports of importance on both sides of both oceans. A slight alteration has been made in flag, owing to the transfer of the steamships to Canadian Pacific Ocean Services, Ltd. It consists of the addition of the monogram letters C.P.O.S. placed in the centre.

The Chatham Steamship Co., Ltd., has been incorporated under the Quebec Companies Act, with $10,000 authorized capital and office at Quebec, to own and operate steam and other vessels, and to carry on a general trading and navigation business. W. Q. Stobo, H. C. Thorn, C. J. Griffis, J. Graham and L. H. Cote, Quebec, are the incorporators.

The use of magnetic chucks in machining steel and iron parts is now fairly common in up to date plants, especially for thin parts where the use of clamps is apt to spring them out of shape.

Shipbuilding in British Columbia.

The passing of the British Columbia Shipping Act, providing for aid to the shipbuilding industry in the province, has given considerable impetus to a number of schemes to increase the coast shipping trade, as well as to relieve the general congestion, chiefly in the lumber trade, resulting from the shortage of tonnage due to war conditions. A company is in process of organization, in which Jas. Carruthers, J. W. Norcross, Sir Trevor Dawson, and M. J. Haney, all connected with Canada Steamship Lines; Jas. Whalen, Port Arthur, Ont.; R. M. Wolvin, Winnipeg, and H. W. Brown, formerly associated with the Pittsburgh Steamship Co., a subsidiary of the U.S. Steel Corporation, are interested, and orders have been placed with the Wallace Shipyards Ltd., Vancouver, for three steel vessels of about 2,500 tons capacity each, of the five masted type with auxiliary power. Other vessels will be ordered, and it is expected to have ten such ships completed by the end of the year. H. W. Brown, who is to be General Manager of the new company, was formerly located at Duluth, Minn., but has removed to Vancouver, where he will remain in his new capacity.

St. John Dry Dock & Shipbuilding Co. Ltd. has been incorporated under the Dominion Companies Act, with an authorized capital of $1,000,000, and office at St. John, N.B., to carry on a general building and contracting business, and to build, own and operate all kinds of transportation equipment, including railways, railway material, rolling stock, steam and other vessels, wharves, docks, etc., and to carry on a general transportation and navigation business.

Sorel Shipbuilding and Coal Co., Ltd., has been incorporated under the Dominion Companies Act, with $100,000 authorized capital and office at Montreal, to carry on the businesses of shipbuilders and repairers, to own and operate steam and other vessels, docks, and wharves, and to deal in fuel, coal and general merchandise, etc.

List of Steam Vessels Registered in Canada During May, 1916.

No.	Name	Port of Registry	Where and When Built		Length	Breadth	Depth	Gross Tons	Reg. Tons	Engines, Etc.	Owner or Managing Owner
133954	Becancour	Sorel, Que.	1914	Sorel, Que	93 0	22 55	9 0	214	84	48 sc..	The Minister of Marine and Fisheries, Ottawa.
133514	Calgary.....	Midland, Ont.	1912	Newcastle-on-Tyne,	248 0	42 5	17 3	1639	1306	105 sc..	Great Lakes Transportation Co., Midland, Ont.
138096	Collinge	Montreal	1881	Cleveland, Ohio	261 8	38 4	19 6	1707	971	79 sc..	C. Webster, Montreal.
133953	Deschaillons ..	Sorel, Que.	1614	Sorel, Que.	93 0	22 55	9 1	214	76	48 sc..	Minister of Marine and Fisheries, Ottawa.
106022	Freshfielda (a)	Montreal	1896	Glasgow, Eng.....	345 0	44 1	24 6	3445	2166	500 sc..	R. L. Smith, Ltd., Montreal.
135238	Impoco	Sarnia, Ont.....	1913	Grangemouth, Eng..	249 5	43 1	19 7	2257	1384	157 sc..	Imperial Oil Co., Sarnia, Ont.
134616	J. H.Wade.....	SaultSte.MarieOnt.	1890	Cleveland, Ohio.....	265 6	38 1	13 1	2301	1389	111 sc..	J. Hawson, Sault Ste. Marie, Ont.
133955	Vercheres	Sorel, Que.	1906	Sorel, Que.	92 83	17 0	6 50	147	53	24 sc..	Minister of Marine and Fisheries, Ottawa.
138107	Wm. J. Averell	Montreal	1884	Detroit Mich.....	260 0	36 8	14 3	1854	1063	89 sc..	Lake & River Transportation Co., Montreal.

(1) Formerly "Clement', and "La Plata."

List of Sailing Vessels and Barges Registered in Canada During May, 1916.

No.	Name	Port of Registry	Rig	Where and When Built		Length	Breadth	Depth	Reg. Tons	Owner or Managing Owner
134180	Carrie & Nellie	Shelburne, N.S.....	Schr	Shelburne, N.S.....	1916	103 0	24 7	10 7	85	J. B. Patten & W. Forsay, GrandBank,Nfld.
134179	Emily H. Patten...	" "	Schr	"	1916	108 4	26 0	10 8	152	" " "
137942	Griff (b).....	Vancouver, B.C.....	.....	Seattle, Wash.....	1911	133 0	40 0	12 6	641	Coastwise Steamship & Barge Co.Vancouver
138099	H. C. M. Derrick 1.	Montreal.....	Scow.....	Montreal.....	1915	75 5	27 2	6 4	198	Harbor Commissioners, Montreal, Que.
138100	" " " 3.	"	"	"	1915	77 0	27 2	6 4	197	" "
138101	" " " 4.	"	"	"	1913	80 5	27 0	5 9	196	" "
138102	" " " 5.	"	"	"	1914	80 1	27 1	5 8	197	" "
138103	" " " 6.	"	"	"	1913	80 1	27 0	5 9	195	" "
138104	" " " 7.	"	"	"	1914	87 1	31 1	7 2	289	" "
138097	H. C. M. Dredge 6.	"	Dredge	Sorel,Que.....	1911	104 2	39 2	8 9	556	" "
138098	H.C.M. Drill Boat 1	"	Scow.....	Montreal.....	1910	80 3	57 3	4 0	198	

(b) Foreign name, Pioneer Sand and Gravel Co.

Atlantic and Pacific Ocean Marine.

A movement is on foot in Vancouver to make that port the headquarters for the chartering and management of British vessels engaged in the Pacific Ocean trade.

The Robert Dollar Steamship Co. has leased the Great Northern dock at Vancouver, B.C., for handling its trans-Pacific vessels. It has been using the dock for some time.

The Norwegian s.s. Lyngfjord, which ran ashore at Holyrood, St. Mary's Bay, Nfld., June 1, during a dense fog, was towed off by the s.s. Portia on the following day, and taken to St. Vincent's Harbor. She is owned by O. M. Milterg & Co., Christiania, and was formerly the Evangelos, owned by a Greek firm, and built at Sunderland, Eng., in 1890.

The steamships Korea and Siberia, formerly a part of the Pacific Mail Steamship Co.'s fleet, which was sold on that company ceasing business last year, to the Atlantic Transport Line, New York, are now reported to have been sold to the Toyo Kisen Kaisha of Japan. They were built at Newport News, Va., in 1902 and cost $3,975,114. The price paid for them both, by the Atlantic Transport Line, which is a constituent of the International Mercantile Marine Co., was $2,000,000. It is stated that the Japanese company first offered $3,000,000 for them, but eventually purchased them for $4,000,000. Since their first purchase they have been running between New York and London.

Maritime Provinces and Newfoundland.

The name of the s.s. Elizabeth, registered at St. John, N.B., and owned by the Marine Department, has been changed to Thos. Mason.

Annapolis Shipping Co., Ltd., has been incorporated under the Nova Scotia Companies Act, with $50,000 authorized capital and office at Annapolis Royal, to own and operate steam and other vessels, etc. D. Owen, F. W. Pickels and H. Edwards are interested.

Hillcrest Shipping Co., Ltd., has been incorporated under the Nova Scotia Companies Act, with $24,000 authorized capital and office at Lunenburg, to purchase the schooner Hillcrest, and to carry on a general carrying business. The incorporators are A. H. and E. F. Zwicker and W. E. Knock, Lunenburg.

Press reports from Halifax, N.S., state that the Board of Trade has received three enquiries as to available sites and possible bonuses for shipbuilding plants in the neighborhood. It is stated that all of the enquiries are from Great Britain, and are the outcome of an advertising campaign carried out by the board.

Tug Atlantic Ltd., Tug Anticosti, Ltd., Tug Mouton, Ltd., Tug Anita, Ltd., Tug Nora J., Ltd., Tug Ralph E. S., Ltd., and Tug Rosemary, Ltd., have been incorporated under the Nova Scotia Companies Act, each with $10,000 authorized capital. These tugs are all registered as owned by interests associated with Neville Canneries, Ltd., Halifax.

The Reid Newfoundland Co.'s s.s. Kyle was taken off her route on the Cabot Strait for her annual overhaul early in June. She was relieved by the s.s. Sagona, from the Battle Harbor route, which, in turn, was relieved by the s.s. Ethie from Cabot Strait. On the return of the s.s. Kyle to service, June 12, the s.s. Sagona was placed on the mail route to Labrador.

The s.s. Empress, which the C.P.R. acquired recently from the Charlottetown Steam Navigation Co. for operation in its Bay of Fundy service, was placed on the route between St. John, N.B., and Digby, N.S., May 30. Her captain and chief engineer are A. MacDonald and J. A. Ledingham respectively. The s.s. Yarmouth, on the same route, is in charge of A. G. Potter, captain, and J. M. Pendrigh, chief engineer.

Province of Quebec Marine.

The Quebec and St. Laurent Salvage and Wrecking Co. is being organized in Quebec for general salvage business. E. Tremblay, who is the chief person interested, was engaged in the examination of the wrecked s.s. Empress of Ireland in 1914. The schooner Tousignant is reported to have been purchased and to have been equipped with two gasoline engines.

Considerable progress is being made on the construction of the dry dock at Lauzon, where a large staff is working day and night. The power house is practically completed, as is also the foundation for the pumphouse. Most of the power house machinery was installed during June. About 300 ft. of excavation on the river side has been completed, together with the entrance.

The traffic through the Lachine Canal during May showed a slight decrease from May, 1915. The chief decrease was in grain, being 7,412,025 bush., and all other commodities showed decreases with the exception of coal, in which there was an increase of 100,890 tons. The total tonnage handled was 523,999 tons, against 616,505 tons in May, 1915. The number of vessel passages was 968, against 1,070 in May, 1915.

Work was started at the end of May on the landing shed along the new dock near the Harbor Commissioners' elevator at Quebec. The building is to be 600 x 102 ft., of structural steel, with concrete walls. Galleries are to be placed on the roof. The contract calls for completion by Sept. 15. The work is being carried out by J. Gosselin, under the supervision of St. George Boswell, Chief Engineer, Quebec Harbor Commision.

Ontario and the Great Lakes.

Wrecking operations were undertaken during June on the s.s. Charles S. Price, which was overturned in the Nov., 1913, storm on the Great Lakes. The vessel was located in Lake Huron near the Fort Gratiot light.

The Dominion Government has decided, on the representations of interests at Chatham, to do some dredging in the Thames River, and has sent a dredge to dredge a 14 ft. channel from Chatham to Lake Ontario.

A verdict of $2,000 damages was awarded to J. C. Freeman, a bridge keeper at Bolsover, against the Lake Simcoe Navigation Co., for injuries sustained by him when the company's s.s. Otonabee struck the bridge he was tending.

The Northern Navigation Co.'s s.s. City of Midland, which was burnt, and sank at her moorings, alongside the wharf at Collingwood, in March, was raised June 10, and placed in the dry dock there. It is reported that she will be converted into a tow barge or a scow.

The Montreal Coal & Dock Co. Ltd. has been incorporated under the Ontario Companies Act, with $40,000 capital and office at Toronto, to own and operate steam and other vessels, deal in coal and other merchandise and to carry on a general shipping business.

The Grain Growers' Grain Co. is reported to have arranged for the erection of a grain elevator on the north water front at Port Arthur, with capacity for 300,000 bush. This, it is stated, will be a hospital elevator, to replace the one burned there a few months ago.

The Hamilton Ship Building & Ferry Co. Ltd., which was incorporated recently with $100,000 authorized capital and office at Hamilton, is said to be a subsidiary of Canada Steamship Lines Ltd., and will operate the ferry service at Hamilton. J. G. Gauld is President.

The Toronto Harbor Commissioners have deposited with the Public Works Department at Ottawa a description of the site and plans of the harbor head walls

Saulte Ste. Marie Canals Traffic.

The fallowing commerce passed through the Saulte Ste. Marie Canals during May.

ARTICLES			CANADIAN CANAL	U. S. CANAL	TOTAL
Copper	Eastbound	Short tons		13,423	13,423
Grain	..	Bushels	6,923,875	8,913,239	15,837,114
Building stone	..	Short tons			
Flour	..	Barrels	415,760	461,170	876,930
Iron ore	..	Short tons	1,348,581	6,795,974	8,144,555
Pig iron	..	..		8,292	8,292
Lumber	..	M. ft. b.m.	1,652	33,641	35,293
Wheat	..	Bushels	14,821,592	22,511,811	37,333,403
General merchandise	..	Short tons	15,394	8,924	24,318
Passengers	..	Number	1,061	32	1,093
Coal, hard	..	Short tons	9,800	241,581	251,381
Coal, soft	..	..	99,000	1,976,552	2,075,552
Flour	..	Barrels		205	205
Grain	..	Bushels		100	100
Manufactured iron	..	Short tons	834	29,334	30,168
Iron ore	..	Short tons			
Salt	..	Barrels	4,487	129,396	133,883
General merchandise	..	Short tons	37,512	125,301	163,813
Passengers	..	Number	630	33	663
SUMMARY					
Vessel passages		Number	776	2,439	3,215
Registered tonnage		Net	1,764,616	7,653,838	9,418,454
Freight—Eastbound		Short tons	1,981,127	7,771,361	9,752,488
—Westbound		..	147,787	2,393,201	2,540,988
Total freight		..	2,128,914	10,164,562	12,293,476

to be built in Toronto Bay, from the eastern extremity of the old western channel to a point about 450 ft. east of Spadina Ave.

The Toronto Ferry Co. has equipped its ferry vessels with life saving floats, each 15 ft. long by 2 ft. wide by 15 ins. high, with accomodation for 16 persons. The casing of the float contains three air tight compartments. These are additional to the full equipment of lifebelts with which all vessels are equipped.

The Detroit and Windsor Ferry Co. has submitted to the Dominion Government plans for the construction of docks at the foot of Ouellette and Ferry Aves., Windsor, at an estimated cost of between $125,000 and $150,000. It is stated that work will be commenced about the beginning of July if the plans are passed.

The Toronto Harbor Commissioners, in conjunction with the city council, are considering the establishment of coal handling facilities in the harbor. During June, J. Laxton, one of the commissioners, and E. L. Cousins, Harbor Engineer, accompanied by the Mayor and Works Commissioner, visited a number of ports in the U.S. equipped with coal handling plants.

The Toronto, Hamilton & Buffalo Ry. has purchased a ferry steamship from the Great Lakes Engineering Works, Detroit, Mich., for operation between Port Maitland, Ont., and Ashtabula, Ohio. A ferry slip and dock is to be built on the Grand River at Port Maitland. It is expected that the service will be commenced in August.

The United States Lake Survey reports the levels of the Great Lakes in feet above tidewater for May as follows: Superior, 603; Michigan and Huron, 580.49; Erie, 572.87; and Ontario, 247.13. Compared with the average May levels for the past ten years, Superior was 1.14 ft. above; Michigan and Huron 0.08 ft. below; Erie, 0.14 ft. above, and Ontario 0.33 ft. above.

It is reported that the whole of the stock of the St. Lawrence and Chicago Steam Navigation Co. has been handed in under the agreement by which Canada Steamship Lines, Ltd., acquires it at 185, with the exception of three shares held in Dublin, Ireland. The final clearing up of the whole stock is therefore a little delayed, owing to the disturbances there, during which the post office was held by some of the rebels.

Manitoba, Saskatchewan and Alberta.

The Peace River Tramway & Navigation Co.'s s.s. D. A. Thomas, which, it was expected, would be launched about the end of May, as mentioned in our last issue, was launched at Peace River Crossing, Alta, June 6. She will ply on the Peace River from Hudson's Hope to Fort Vermilion, about 600 miles. The hull is of British Columbia fir, cedar and pine, and she is equipped with engine of 800 h.p. Oil tanks have been installed, so that liquid fuel may be used.

British Columbia and Pacific Coast.

The Alberta Pacific Elevator Co. is stated to be arranging for the reconstruction of its elevator at Vancouver, which was burned at the end of May.

Side Streams Navigation Co., which operates the s.s. Vidette, from Dawson, Yukon, has appointed W. Bailey, captain, and G. W. Watenbaugh, chief engineer, for this season.

Navigation on the Yukon River opened early in June, the first steamboats from White Horse for through trips sailing on June 5, the Yukon for Fairbanks, Alaska and the Casca for Dawson.

The Union Steamship Co. is reported to have purchased the s.s. British Columbia from the Coast Steamship Co., for operation in the coast freight trade. Her dimensions are, length 170.7 ft., breadth 21.7 ft., depth 10.5 ft.

The Imperial Oil Co. has built a wharf in Victoria harbor, extending 150 ft. from the shore. It is L shaped, 50 ft. long by 40 ft. wide, and there is a depth of 20 ft. of water at the end. The chief object is the supply of fuel oil to vessels.

Western Shipping Co., Ltd., has been incorporated under the B.C. Companies Act, with $40,000 authorized capital and office at Victoria, to build, own and operate steam and other vessels and to carry on a general navigation and trading business.

D'Alton C. Coleman, Assistant General Manager, Western Lines, C.P.R., is credited with the statement that the company has under consideration the building of a new dock of the same type as pier A, at Vancouver, and that a decision will be made shortly so that construction may proceed.

The Marine Department received tenders recently for the construction of a lighthouse tower, fog alarm building and dwelling combined, at Triple Island, Brown Passage, the main entrance to Prince Rupert harbor from the the open sea, to replace the old gas beacon at that point.

The C.P.R. s.s. Princess Charlotte has been equipped with a supply of buoyant rafts. each capable of carrying 26 persons. They are so arranged on the vessel that they will float off in case the vessel became submerged. By adopting this additional life saving equipment the vessel will be able to carry 1,000 passengers.

A press report from Victoria states that a syndicate headed by M. P. Cotton of Vancouver is negotiating for the lease of the G.T.P.R. dry dock completed recently at Prince Rupert for building of freight steamships. It is stated that possibly steel vessels will be built there, and that the syndicate is applying to the Government for assistance in building four such vessels of about 5,000 tons each.

The Grand Trunk Pacific Coast Steamship Co.'s s.s. Prince John was taken from the Alaska route June 13 and placed on the run from Vancouver and way ports to Prince Rupert and Queen Charlotte Islands, replacing the s.s. Prince Albert, which has been utilized for miscellaneous freighting purposes. The s.s. Prince Rupert was taken off her route between Seattle, Prince Rupert and Alaska June 5 for general overhaul at Victoria, the s.s. Prince George taking her place. The Prince Rupert was replaced in service June 13.

The Cameron & Genoa Mills Shipbuilders Ltd. is the name of a company which, it is reported, is commencing the construction of two shipways on the west side of the inner harbor at Victoria, south of the Point Ellice bridge. The interests comprising the company are associated with the Cameron Lumber Co. and the Genia Bay Lumber Co., and it is stated that they have secured a lease of land formerly a part of the Songhees Indian Reserve. Wooden ships with capacity for about 1,500,000 ft. of lumber are to be built.

An application has been made in B.C. courts for a winding up order against the Dominion Shipbuilding, Engineering & Drydock Co., on the ground that it is insolvent and unable to meet its accounts, and an order is also asked for an enquiry into the condition of the company's affairs, the actions of its directors and the disposal of its assets. The company was incorporated in 1914 with an authorized capital of $5,000,000. Among those interested in the company are Capt. H. Mowat, formerly Marine Superintendent, C.P.R., and F. F. Busteed, formerly Engineer in charge of second tracking, Kamloops, B.C.

Water Pollution on the Great Lakes.—At a meeting of the International Joint Waterways Commission at Detroit, Mich., June 26, a report was made by the commissions' engineers on the pollution of the Great Lakes, with special reference to navigation, and a general discussion of the subject took place. Before any definite conclusion as to methods of dealing with it are reached the fullest consideration of the whole subject will be given and tests of proposed appliances made, more particularly as the larger problem requiring immediate solution is one with relation to land drainage from the various municipalities bordering on the lakes. Representatives of the Dominion Marine Association were present and took part in the discussion.

Claims re s.s. Empress of Ireland Disaster.—The Registrar of the Admiralty Court made his final award, at Montreal, June 2, re claims arising out of the sinking of the C.P.R. s.s. Empress of Ireland by the s.s. Storstad in the St. Lawrence River about two years ago. The claims totalled $3,069,482, and the amount available to meet them was $182,242, which was received from the sale of the s.s. Storstad. The costs were $28,140, leaving $154,202 for distribution amongst claimants, as follows: C.P.R., $43,974; relatives of victims, $110,128, in individual amounts from $8,000 to $3,000. All claims for personal loss were dismissed.

Discrepancies in Outturns of Grain Cargoes.—The Board of Grain Commissioners has again adopted for the current year the rules and regulations which were passed last year under the authority of the Dominion Parliament for the purpose of disposing of discrepancies and disputes in the outturn weights of grain cargoes. This renewal is in accordance with the Dominion Marine Association's recommendation, agreed to by the elevators, and discussed at a conference with the Commission at Montreal recently.

A combine of certain shipping and colliery interests, with a nominal capital of £100,000,000, is reported to have been completed in England, chiefly with the view of arranging mutual service and facilities, in order to make use of the maximum power of shipping and coal for the benefit of international customers at the close of the war.

The permitted draught of water through the Welland Canal has been increased from 14 ft. to 14 ft. 4 ins., in view of the present high levels. A similar increase has been asked for by the Dominion Marine Association for the St. Lawrence Canals, and the Marine Department has the matter under consideration.

The Great Lakes Transit Corporation, which was incorporated in the United States recent, to take over and operate a number of the lake steamships formerly owned by railway companies, which had been ordered to relinquish their interest in them, has filed its schedules of freight rates.

Progress of Toronto Harbor Work.

An official inspection of the Toronto harbor work was made June 13 by the acting Minister of Public Works, Hon. J. D. Reid, who was accompanied by the commissioners, members of the city council and a number of representative guests, who were much impressed with the satisfactory progress of the work. Leaving Yonge St. Wharf on one of the Toronto Ferry Co.'s steamboats the party went out through the new western entrance to the western end of the work, viewed the dredging on which three huge dredges, two of them rotary suction ones, were engaged; the land making work, the construction of crib work to provide a sheltered waterway from Humber Bay to the western entrance, and the preparations for boulevard and driveway construction. Returning through the same entrance they went east through the harbor to Ashbridge's Bay, where they disembarked and walked over a portion of the land which is being made for industrial sites, and on which several industries have been established already, viewed the 1400 ft. channel which is being made 400 ft. wide and 30 ft. deep, and the large turning basin at its eastern end, and on re-embarking went to the Royal Canadian Yacht Club on Centre Island, where they were entertained at luncheon.

Lionel H. Clarke, Chairman of the Commission, spoke enthusiastically of the successful way in which the work is being proceeded with and gave great credit to the Dominion Government for the liberal way in which it is assisting, it having given land worth over $1,500,000 and only requiring in return the construction of a dock costing some $75,000. He said that while the Commission's portion of the harbor work had been estimated to cost about $5,000,000, it would be done for less than $4,000,000, great savings having been found possible in the reclamation work. Over 230 acres of land have already been made. The commisison have secured some 130 acres of water lots along the Bay front from Bathurst St. to Yonge St., without giving anything to the railway companies except undertaking to fill in their water lots to a common depth with those owned by the Commission and suitable for deep water vessels. He said that the work will undoubtedly be completed in three years. He warmly eulogized the Commission's Chief Engineer, E. L. Cousins, A.M. Can. Soc. C.E., and announced that following the resignation of the Secretary, A. C. Lewis, on undertaking military service, Mr. Cousins had also been appointed General Manager.

Government Aid to Shipbuilding in British Columbia.—In a recent discussion in the B.C. Legislature recently on the bill to aid shipbuilding in the province, it was decided that the number of vessels to be subsidized under the act be increased from 20 to 25. The matter of whether the bonus of $5 a ton is to be figured on the registered tonnage or on the dead weight tonnage capacity was also discussed.

Asiatic Labor on Canadian Vessels.—The clause in the bill passed by the British Columbia Legislature recently to aid shipbuilding, which provided restrictions against the employment of any but white labor on any vessels coming under the act has been removed. It is stated that the Dominion Government intimated that the bill might be disallowed if a clause restricting Japanese labor were included.

Dominion Marine Association Appreciates Canadian Railway and Marine World.

Canadian Railway and Marine World has, in recognition of its service to the shipping interests, been appointed the Dominion Marine Association's official organ, as stated in the following letter, which is much appreciated by the publishers:

DOMINION MARINE ASSOCIATION.
Executive Committee :

G. E. Fair, Toronto .....President.
A. E. Mathews, Toronto..1st Vice President.
W. E. Burke, Montreal...2nd Vice President.
H. W. Cowan, Toronto W. J. McCormack, Sault
L. Henderson, Montreal. Ste. Marie
D. Murphy, Ottawa. J. Playfair, Midland
W. L. Reed, Toronto. J. F. M. Stewart, Toronto
C. B. Harris, Toronto A. A. Wright, Toronto
Counsel.....Francis King, Kingston

Kingston, Ont., May 29, 1916.

Acton Burrows, Esq., Managing Director,
Canadian Railway and Marine World.

Dear Sir,—I have much pleasure in informing you that at a meeting of the Dominion Marine Association's Executive Committee in Toronto on the 26th inst., it was unanimously resolved:

"That in view of the thorough manner in which Canadian Railway and Marine World covers the marine field throughout Canada, the care which it exercises to secure accuracy, and the way in which its columns are freely at the Dominion Marine Association's disposal, it is hereby appointed the Association's official organ."

Yours truly,
FRANCIS KING,
Counsel, Dominion Marine Association.

Beeson's Marine Directory, for 1916 maintains the reputation attained by previous issues in the collection and notation of matter which is interesting as well as necessary to those whose business is concerned with navigation on the Great Lakes. In addition to the general information relating to vessels on the Canadian and U.S. registers, dry docks, shipbuilding and wrecking plants, etc., the resume of the details of lake traffic for the past year, is of exceptional interest, owing to the abnormal conditions existing on account of the war. This is the 30th year of publication, and the publisher announces that the next edition will be produced under the supervision of a committee of prominent vessel men who will choose, supply or approve its entire contents. The book consists of 288 pages, 10 by 7 ins., bound in cloth boards, and is published by Harvey C. Beeson, Chicago, Ill., at $5.

Canada Steamship Lines' Dividends.—The directors announced, June 1, that a further payment of 1¾% will be made on Aug. 1 to shareholders of record on July 1, on account of deferred preference dividends. The announcement was made earlier that customary, as there are still a few remaining Richelieu and Ontario Navigation Co. shareholders who have not exchanged their holdings for C.S.L. scrip, and are therefore deprived of these payments. An opportunity is thus afforded them of making the transfer in time to participate in the payment to be made.

Longshoremen's Strike on Pacific Coast.—A strike of longshoremen at U.S. Pacific coast ports commenced June 1, the men demanding 55c an hour and $1 an hour for overtime. The strike did not extend to British Columbia ports, the consequence being that a number of trans-Pacific vessels used B.C. ports considerably instead of U.S. ports.

Investigation Into the Grounding of the s.s. Rock Ferry.

In investigation into the grounding of the s.s. Rock Ferry on Main Duck Island, Lake Ontario, May 17, was held at Montreal, June 6 and 9, by Capt. L. A. Demers, Dominion Wreck Commissioner, assisted by Capts. F. Nash and J. O. Grey, as nautical assessors. The court came to the conclusion that the master and mate both disregarded the most simple precautions in navigating the vessel. The master admitted that he kept full speed in a dense fog, and that no lookout was kept at any time. The fact that the vessel was floated off the rocks after two days, practically uninjured, does not palliate the offence. She is a wooden vessel, and had she been of iron, it is probable she would have been a total loss. In view of the good seamanship exercised by the master, A. Robineau, in getting the vessel off, the court evercised leniency, and suspended his certificate for two months from the time of the receipt of the certificate by the court, as it was not delivered at the time of the investigation. Regarding the mate, J. P. Dufour, the court found that he was left in full charge of the deck while the master had gone to rest, and it was his duty to reduce speed and place a lookout, and on feeling that he was near Main Duck Island, to have consulted the log which was apparently trailing, stop his vessel and take soundings if necessary, according to the rules, therefore the court found him equally to blame and suspended his certificate for two months from June 9.

Shipping employment offices have been opened at a number of lake ports recently, and the sailors' institutes at Kingston and Port Arthur have opened registers where both employers and employes may each make known their wants. These offices are under the Dominion Marine Association's auspices, and, in addition to these, Verity's Employment and Shipping Agency has been appointed to act in Toronto, and similar arrangements are being concluded at other lake ports. The facilities thus afforded should be of considerable benefit.

Grain Elevator for St. John, N.B.—In connection with the proposal to erect a Government grain elevator at St. John, F. P. Gutelius, General Manager, Canadian Government Railways, inspected three sites alongside the Government wharves there May 31. The site most favored is said to be on land now occupied by Harding's lumber yard, as from the location it is considered the conveyors could be fed better. If it is decided to proceed with the work, the cost will approximate $1,000,000, and it will be urged that it be completed by Jan. 1.

The Plunkett Navigation Co., Ltd., has been incorporated under the Dominion Companies Act, with $20,000 authorized capital and office at Cobourg, Ont., to own and operate steam and other vessels, and to carry on a general trading and navigation business. It is reported that the schooners, Charlie Marshall, owned by D. Plunkett and D. Rooney, Jr., Cobourg; the Ford River, owned by J. Richardson & Sons, Ltd., Kingston, and the Keewatin, owned by Jas. Doherty, Belleville, have been acquired, and that these will be used for Atlantic coasting service. We have been unable to get any confirmation of this, and are advised that the Ford City is still being operated by J. Richardson & Sons Ltd.

Mainly About Marine People.

T. M. Nairn, formerly Superintendent, Donaldson Line, Montreal, died at Notre Dame de Grace, Que., June 6.

L. A. W. Doherty, Freight Traffic Manager, Canada Steamship Lines Ltd., made a business trip to the Pacific coast in June.

F. S. Isard, Comptroller, and **H. W. Cowan,** Operating Manager, Canada Steamship Lines, Ltd., are both going to build houses in Montreal.

Thos. Henry, heretofore Passenger Traffic Manager, Canada Steamship Lines, Ltd., has been appointed Superintendent of the Hotel Department. Office, Montreal.

E. L. Cousins, A.M.Can.Soc.C.E., hereto fore Chief Engineer, Toronto Harbor Commission, has been appointed Chief Engineer and General Manager of the whole works.

F. H. Walker, of Walkerville, Ont., who died at Detroit, Mich., June 17, was associated with a number of local business concerns, among which is the Walkerville and Detroit Ferry Co.

Lieutenant T. L. Harling, who has died in Belgium from wounds received in action, was son of **R. D. Harling,** Toronto, Canadian representative of the Manchester Ship Canal Co. of England.

Capt. W. D. Shepherd, who was in command of the s.s. Empress of Fort William, which was sunk near Dover, Eng., early in the year, when going to the rescue of passengers and crew of the s.s. Maloja after she had been torpedoed, has been presented with a gold watch by her owners, the Peninsular and Oriental Steam Navigation Co.

Sir William Price, Chairman, Quebec Harbor Commissioners, has resigned, in order to devote more time to military duties. It is stated that the resignation of Commissioners Gravel and Lettellier will be announced shortly. The names of D. O. l'Esperance, as Chairman, and J. G. Scott, formerly General Manager, Quebec and Lake St. John Ry., are mentioned in connection with the new commission.

James H. Mancor, who retired recently from the position of Principal Surveyor of Lloyd's Register of Shipping for the United States and Canada, was entertained to dinner at New York, at the end of May, by a number of friends connected with shipping and shipbuilding. He was presented with a silver tea and coffee service. Among those present was G. T. Davie, of G. T. Davie & Sons, Ltd., shipbuilders, Levis, Que.

E. T. Stebbing, whose appointment as General Agent, Passenger Department, Trans-Pacific and Trans-Atlantic Lines, Canadian Pacific Ocean Services, Ltd., New York, was mentioned in our last issue, has been connected with the steamship and tourist business during his whole business life, having been, for about 20 years, with Thos. Cook & Sons, during the last seven of which he was Superintendent of their New York offices.

Capt. John Simpson, who died at Owen Sound, Ont., June 3, aged 91, was born near Belleville, Ont., and went to sea at 12 years old. He was for some time a master of sailing vessels on the Great Lakes, and learned shipbuilding at Oakville. He went to Owen Sound in 1874 to build the s.s. City of Owen Sound for A. M. Smith & Co. This vessel was equipped with the machinery from the s.s. City of London, which had been burned. In conjunction with some local people, he built at Owen Sound the first dry dock and shipbuilding plant above the Welland Canal, and built many of the wooden vessels which navigated the Upper Lakes in the early days.

Navigation in the White Sea and Arctic Ocean.—The Russian Government, in consequence of the dangers in navigation due to the laying of mines in the White Sea and Arctic Ocean, announces that trading and merchant vessels, and all other types of vessel under any flag, except those which have received special permission, are prohibited from navigating in the White Sea and approaches thereto southward of a line joining Cape Kanin and Kharlov lighthouse, as well as in all waters of the Russian coasts of the Arctic Ocean within 12 miles of the coast line, rocks awash or off-lying islands. Vessels passing without permission into the prohibited areas are exposed to the danger of destruction by mines and are liable to be stopped by guardships for search and necessary orders. Vessels which have obtained permisison to pass through the prohibited areas must observe all regulations. Permission for such navigation is arranged by the Director General of Arkhangel and the Jurisdiction of the White Sea.

Shipbuilding in Canada. At the Merchants Bank annual meeting in Montreal recently, General Manager Hebden, in the course of his remarks, said that shipbuilding, particularly steamship building, was a matter that required looking into. He compared facilities for building steel ships in Canada with those of the United States, much to the Dominion's benefit, saying that British Columbia had already begun the work and that such an industry would enable Canadians to make use of the wonderful resources of their country.

The American Society for Testing Materials held its annual meeting at Atlantic City, N.J., June 27 to 30, when various committee reports were dealt with.

Canada Steamship Lines Notes.

The s.s. Toronto arrived in Toronto at the end of May, after having been in the dry dock at Kingston, for a thorough overhaul. The interior furnishings have been completely transformed, and the decorations done in the various colors of the allies. She commenced her service on the Toronto-Charlotte-Prescott route, June 3.

The company is installing moving picture apparatus on its tourist vessels, for the amusement and instruction of passengers, and certain of the vessels will also be supplied with latest news of the war, etc., by wireless telegraphy. The pictures will chiefly be of scenes with which the company's steamships come in touch, and they will be shown on the upper deck in the evenings. The steamships Toronto and Kingston, running between Toronto, Charlotte and Prescott were equipped during June.

The s.s. William C. Moreland, the recovered wreck, which was purchased by the company a short while ago, was towed into Duluth recently. As mentioned in our last issue, the wreck was in such a condition that it was not possible to salve the whole of her, she having broken in three pieces. The greater portion, the stern end, is in good condition, and it is stated that a new forward end is to be built on and the whole vessel overhauled and re-equipped. The recovered vessel was in charge of two tugs and, after being floated and bulkheaded, commenced her trip from Detroit, May 10, arriving at Duluth, May 21, after experiencing very rough weather.

Duluth, South Shore and Atlantic Ry. operators and agents have been granted increases in pay averaging a little over 10%, dating from June 1.

Grain in Store at Terminal Elevators, Interior Terminal Elevators and at Public Elevators in the East.

Week ending June 9, 1916.	Wheat. bushels.	Oats. bushels.	Barley. bushels.	Flax bushels.	Totals. bushels.
Fort William—					
C.P.R.	1,916,250	501,214	90,648	.....	2,508,112
Consolidated Elevator Co.	847,310	166,153	38,842	154,597	1,206,902
Empire Elevator Co.	1,145,793	304,186	46,276	191,627	1,687,882
Ogilvie Flour Mills Co.	1,179,476	101,877	33,752	.....	1,315,105
Western Terminal Elevator Co.	947,844	186,612	14,849	226,220	1,375,525
G. T. Pacific	1,714,541	439,158	48,973	133,769	2,336,441
Grain Growers' Grain Co.	1,545,192	369,941	40,989	.....	1,956,122
Fort William Elevator Co.	407,665	272,412	52,626	26,212	758,915
Eastern Terminal Elevator Co.	583,425	195,545	30,318	.....	809,288
Port Arthur—					
Port Arthur Elevator Co.	1,832,817	500,161	166,815	153,382	2,653,175
D. Horn & Co.	160,462	41,989	23,610	203,169	429,230
Dominion Government elevator	1,550,411	451,599	57,790	92,017	2,151,817
Grain afloat	.....	.....	.....	.....	.....
Total terminal elevators	13,831,186	3,530,847	645,488	1,180,993	19,188,514
Calgary Dom. Govt. Elev.	263,242	116,831	3,861	.....	383,934
Saskatoon Dom. Govt. Elev.	1,289,222	383,647	23,794	86,471	1,783,134
Moose Jaw Dom. Govt. Elev.	1,152,048	199,976	19,953	44,449	1,416,426
Total interior terminal elevators	2,704,512	700,454	47,608	130,920	3,583,494
Depot Harbor	366,125	.....	.....	.....	366,125
Midland—					
Aberdeen Elevator Co.	556,493	108,920	.....	.....	665,413
Midland Elevator Co.	289,035	10,820	.....	.....	299,855
Tiffin, G.T.P.	1,063,614	787,838	229,494	.....	2,080,946
Port McNicoll	541,019	1,592,099	81,670	14,267	2,229,055
Collingwood	.....	.....	.....	.....	.....
Goderich Elevator & Transit Co.	743,345	165,791	.....	15,400	924,536
Goderich, W.C., Flour Mills, Ltd	152,150	.....	.....	.....	152,150
Kingston—					
Montreal Transportation Co.	.....	.....	.....	.....	.....
Commercial Elevator Co.	.....	.....	.....	.....	.....
Port Colborne	579,587	1,131,891	6,325	8,000	1,725,803
Prescott	.....	.....	.....	.....	.....
Montreal—					
Harbor Commissioners no. 1	635,853	1,036,895	178,997	44,408	1,896,153
Harbor Commissioners no. 2	740,607	941,428	34,089	.....	1,716,124
Montreal Warehousing Co.	598,467	824,524	308,210	4,735	1,635,936
Quebec Harbor Commissioners	706,633	130,836	12,519	.....	849,988
West St. John, N.B.	383,446	1,680	3,341	.....	388,467
Halifax, N.S.	.....	.....	.....	.....	.....
Total public elevators	7,356,374	6,732,722	754,645	86,810	14,930,551
Total quantity in store	23,892,072	10,964,023	1,447,741	1,398,723	37,702,559

Among the Express Companies.

F. Pearce, heretofore cashier, Canadian Northern Ex. Co., Saskatoon, Sask., has been appointed agent at Elrose, Sask.

The Canadian Ex. Co. has opened an office at Camp Borden, the military camp near Angus, Ont., with A. E. Stone as agent.

A. E. Stone has been appointed agent, Canadian Ex. Co. at Camp Borden, the Dominion Government military camp established recently near Angus, Ont.

The Dominion Ex. Co. has opened offices at Blumenhof, Cantaur, Estuary, Kirriemuir, Loyalist, Regina Beach and Supurb, Sask.

The Canadian Northern Ex. Co. has opened offices at St. Norbert, Que.; Gogoma, Kashbaw, Longuelac and Ruel, Ont.; Ericksdale, Man.; Birdview, Mervin and Richlea, Sask., and Excel, Lavoy and Stanmore, Alta.

The Association of Express Accountants, at its annual convention at Chattanooga, Tenn., recently, elected H. A. Kropp, General Auditor, Southern Ex. Co., President for the curernt year, and R. Mundle, Comptroller, American Ex. Co., Vice President. It was decided to hold the next annual convention at Toronto. Among the Canadian members of the association, are, W. W. Williamson, General Auditor, and W. H. Bryce, Superintendent Money Orders, Canadian Ex. Co., Montreal; W. H. Plant, General Auditor; D. Barron, Auditor of Transportation; C. E. Foote, Auditor of Receipts, and H. H. Wheeler, Auditor Money Orders, Dominion Ex. Co., Toronto.

The United States Ex. Co., in liquidation, has made a further payment of $15 a share, thus totalling payments of about 40% since the commencement of the liquidations. The first payment was $25 a share, and it is expected that a third payment will be made before the end of this year. D. E. Roberts, formerly General Manager, Quebec, Montreal & Southern Ry. and Napierville Jct. Ry., Montreal, is the liquidator. He stated recently that none of the company's assets would be sold at a loss, and though some of those connected with the proceedings are anxious for a speedy closing of the accounts, it has been decided to adhere to that policy, and not to hurry things unduly.

Transportation Conventions in 1916.

Aug. 15-17.—International Railroad Blacksmiths' Association, Chicago, Ill.

Aug. 16 to 18.—American Association of Railroad Superintendents, Memphis, Tenn.

Aug. 24-26.—American Railway Tool Foremen's Association, Chicago, Ill.

August 29.—International Railway General Foremen's Association, Chicago, Ill.

Sept. 5 to 8.—Traveling Engineers' Association, Chicago, Ill.

Sept. 12-14.—Master Car and Locomotive Painters' Association of United States and Canada, Atlantic City, N.Y.

Sept. 12-14.—Railway Signal Association, Mackinac Island, Mich.

Sept. 19-22.—Roadmasters and Maintenance of Way Association, New York.

October 3-5.—Railway Fire Protection Association, New York.

Oct. 9-13.—American Electric Railway Association, Atlantic City, N.J.

October 10.—Association of Manufacturers of Chilled Car Wheels, New York.

Oct. 17, 18.—American Association of Passenger Traffic Officers, Washington, D.C.

October 17-19.—American Railway Bridge and Building Association, New Orleans, La.

October 17-19.—Maintenance of Way and Master Painters' Association of the United States and Canada, Philadelphia, Pa.

Oct. 18-20.—Society of Railway Financial Officers, Washington, D.C.

Oct. 19-21.—American Association of Dining Car Superintendents, New Orleans, La.

Trade and Supply Notes.

The matter which appears under this heading is compiled, in most cases, from information supplied by the manufacturers of, or dealers in, the articles referred to, and in publishing the same we accept no responsibility. At the same time we wish our readers distinctly to understand that we are not paid for the publication of any of this matter, and that we will not consider any proposition to insert reading matter in our columns for pay or its equivalent. Advertising contracts will not be taken with any condition that accepting them will oblige us to publish reading notices. In other words, our reading columns are not for sale, either to advertisers or others.

The Standard Underground Cable Co. of Canada, Ltd., has removed its Montreal branch office to the McGill Building, from the New Birks Building.

B. J. Arnold, of the Arnold Co., Chicago, Ill., has been engaged by the Rochester, N.Y., Chamber of Commerce to survey and report on the needs of the city regarding local transportation facilities.

M. Beatty & Sons Ltd., Welland, Ont., have received an order from the St. Maurice Construction Co. for an 8 x 12 triple drum hoisting engine with boom swinger, and for a 37 h.p. double firm electric hoist, for use on construction of the St. Maurice River dam near Sanmaur, Que.

Roberts & Schaefer Co., engineers and contractors, Chicago, have issued bulletin 31, 8 pages, 9 x 11½ in. describing and illustrating Rands measuring coal loader for locomotives, patent for which has been applied for.

M. Beatty & Sons, Ltd., Welland, Ont., have received an order from the Dominion Bridge Co. for two 9 x 12 link motion hoisting engines, with cut steel gears, and two 60 x 156 in. vertical boilers, to be built under Ontario inspection, for use on the Canadian Government Railways car ferry terminals at Carleton Point, P.E.I., and Cape Tormentine, N.B.

The Du Pont Fabrikoid Co., Wilmington Del., and Toronto, has issued a booklet, Du Pont Fabrikoid Book Finish, dealing with its artificial leather, which has proved especially satisfactory for railway car, automobile and furniture upholstery, and is being extensively used for book binding. The company claims that "some of its advantages and features are, that it has the leather effect in any grain or color, and costs less, comes in rolls and thus eliminates waste in cutting, no unused corners or edges. It has just the needed degree of pliability, not too soft to work well in a case-making machine, nor too hard to stand the bending of the joints. It is waterproof and washable. This is a strong point, for books naturally get dirty, but if bound in Fabrikoid the covers can be washed. Besides it is vermin proof, and cannot be destroyed in that manner."

Transportation Associations, Clubs, Etc.

The names of persons given below are those of the secretaries unless otherwise stated:

Canadian Car Service Bureau—J. Reilly, Manager, 401 St. Nicholas Building, Montreal.

Canadian Electric Railway Association—Acton Burrows, 70 Bond Street, Toronto.

Canadian Freight Association (Eastern lines)—G. C. Ransom, Canadian Express Building, Montreal.

Canadian Freight Association (Western lines)—W. E. Campbell, 805 Boyd Block, Winnipeg.

Canadian Railway Club—J. Powell, St. Lambert, Que. Meetings at Montreal 2nd Tuesday each month, 8.30 p.m., except June, July and August.

Canadian Society of Civil Engineers—C. H. McLeod, 176 Mansfield St., Montreal.

Canadian Ticket Agents' Associations—E. de la Hooke, London, Ont.

Dominion Marine Association—F. King, Counsel, Kingston, Ont.

Eastern Canadian Passenger Association—G. H. Webster, 54 Beaver Hall Hill, Montreal.

Engineers' Club of Montreal—R. W. H. Smith, 9 Beaver Hall Square, Montreal.

Engineers' Club of Toronto—R. B. Wolsey, 94 King Street West, Toronto.

Express Traffic Association of Canada—W. H. Burr, Chairman, Toronto.

Great Lakes and St. Lawrence River Rate Committee—James Morrison, Montreal.

Hydro-Electric Railway Association of Ontario—T. J. Hannigan, Guelph, Ont.

International Water Lines Passenger Association—M. R. Nelson, New York.

Niagara Frontier Summer Rate Committee—James Morrison, Montreal.

Nova Scotia Society of Engineers—A. R. McCleave, Halifax, N.S.

Quebec Transportation Club—A. F. Dion, Quebec.

Shipping Federation of Canada.—Thos. Robb, Manager, 42 St. Sacrament Street, Montreal.

Ship Masters' Association of Canada—Capt. E. Wells, 45 St. John Street, Halifax, N.S.

Toronto Transportation Club—W. A. Gray, 143 Yonge Street, Toronto.

Transportation Club of Vancouver.—H. A. Schofield, 589 Granville St., Vancouver, B.C.

Twin Cities Local Freight Agents' Association—E. J. Travers, Fort William, Ont.

Western Canada Railway Club—Louis Kon, Box 1707 Winnipeg. Meetings at Winnipeg 2nd Monday each month, except June, July and August.

Winnipeg Traffic Club—James Gehrey, Bannatyne Avenue, Winnipeg, Man.

CANADIAN GOVERNMENT RAILWAYS.

TENDERS.

SEALED TENDERS, addressed to J. W. Pugsley, Secretary, Department of Railways and Canals, Ottawa, Ont., and marked on the outside "Tender for Elevator Foundations, Transcona," will be received up to and including Twelve O'Clock Noon, Tuesday, July the 4th, 1916, for the construction of reinforced concrete foundations on wood piles or concrete piles, for 1,000,000 bushel storage capacity Grain Elevator, Working House and Track Shed at Transcona, Manitoba; separate tenders to be submitted for the foundations with concrete piles and foundations with wooden piles, and tenders may be submitted on either or both designs.

Plans, Specifications and blank form of contract may be seen at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa, at the Office of the Chief Engineer, Moncton, N. B.; at the Office of the General Superintendent, Winnipeg, Manitoba; at the Office of the Resident Engineer, Fort William, Ont.; and at the Office of the J. S. Metcalf Co., Ltd., Engineers, Montreal, P. Q.

All the conditions of the Specifications and Contract form must be complied with.

Tenders must be put in on the blank form of tender, which may be obtained from any of the offices at which plans are on exhibition. Each tender must be accompanied by a certified bank cheque, payable to the Honourable the Minister of Railways and Canals, for the sum of $15,000.00.

The lowest or any tender not necessarily accepted.

F. P. GUTELIUS,
General Manager,
Canadian Government Railways.

Dated at Moncton, N.B.,
June 17th, 1916.