

Canadian Railway and Marine World

July, 1920

The June Mechanical Conventions at Atlantic City.

The two great annual railway mechanical conventions of the American Railway Master Mechanics' Association and the Master Car Builders' Association, held principally at Atlantic City, N.J., for many years, were suspended after 1916, in consequence of the United States having entered the war, but meetings of the executive committees were held in Chicago in 1917 and 1918, at which reports of various committees were presented.

In 1919, the Director General of the U.S. Railroads decided to provide, during the period of federal control, a responsible channel through which he might obtain recommendations for the advancement of railway practice. The American Railway Association revised its organization, changed its name to the American Railroad Association, and enlarged its scope by covering the former activities

of a number of other railway associations, etc., including among others, the American Railway Master Mechanics' Association, and the Master Car Builders' Association. The American Railroad Association was divided into five sections, viz.: operating, engineering, mechanical, traffic and transportation, respectively. The mechanical section took over the former activities of the American Railway Master Mechanics' Association, and the Master Car Builders' Association, the committee consisting of three representatives of the U.S. Railroad Administration, two representatives of each of the operating regions into which the U.S. was divided and two representatives of Canadian railways. Under the mechanical section's management a convention was held at Atlantic City in June, 1919.

The re-organized American Railroad

Association has been continued as outlined above and the mechanical section held its annual convention at Atlantic City this year, June 9-16, the chairman of the general committee being W. J. Tollerton, General Mechanical Superintendent, Chicago, Rock Island & Pacific Rd., the vice chairman being J. Coleman, Assistant to General Superintendent Motive Power and Car Departments, G. T.R., Montreal. W. H. Winterrowd, Chief Mechanical Engineer, C.P.R., Montreal, was also a member of the committee. Locomotive matters were dealt with on June 9-11, the election of officers was held on June 14, and car matters were dealt with on June 14 to 16. The most important features of the convention were, as usual, reports of the standing and special committees, and individual papers presented. The principal ones are given on this and following pages, either in full or in abstract.

Scheduling and Routing Systems for Locomotive Repair Shops.

The committee, of which Henry Gardner, Supervisor of Apprentices and Shop Schedule Systems, Baltimore & Ohio Rd., was chairman, reported as follows:—Scheduling and routing in railway shops is not new. The first schedules recorded were used in the Chicago & Northwestern shops in 1904. These consisted simply of working sheets, and assigned dates made out and followed up by the shop supervision. Since that time more than 15 railways have adopted some form of schedule system for repairing locomotives, all of which are more or less alike in basic principles. Briefly, the locomotive is brought to the shop on a predetermined date or order, tank disconnected and engine forwarded to the stripping pit. Stripping is handled by a special gang in charge of a leader, and all parts are delivered to each department of the shop. Predetermined dates are then assigned for completing all parts in time to assemble the engine in best practical and logical sequence. These dates are obtained from master schedules which are compiled for each class of repair and for varying numbers of days required to complete the engine. All delays of material or operations are checked daily, and foremen are notified of the delays in their department. No definite time is given in which operations shall be performed and it is only necessary that the work shall be finished on a certain day or date. The result of scheduling the complete capacity of the shop will automatically develop for each operation a stated number of hours which will very closely approximate the minimum number of hours in which that operation can be performed.

The following items cover the necessary steps to be taken for installing an up-to-date and adequate scheduling and routing system as now in operation on some railways: 1—Supervisor of shop schedules and assistant. 2—Schedule office for supervisor. 3—Schedule and planning boards. 4—Shop or job black-

boards. 5—Printed forms, master sheets, etc. 6—Calendar slide rules. This list may be modified for smaller shops, but as the general methods and principles are the same, the above installation will be described. It is the committee's opinion that it is not advisable to introduce this shop system where less than 10 locomotives a month are given classified repairs. It is also found inadvisable to employ these methods in locomotive houses and shops making heavy running repairs exclusively. Details covering the above listed subject are given in order below:

1. Supervisor of shop schedules should be a man with practical experience, capable of handling men, and with sufficient technical education to make clear reports and records; preferably a man who has served an apprenticeship and is familiar with all trades. He should report to the superintendent or assistant superintendent of shops. At large shops an assistant may be required.

2. The schedule office should be located conveniently with respect to the machine and erecting shops, preferably in the general foreman's office, or leading from it. A room 10 x 12 ft. will be sufficient, but should be larger if possible. It is important to have this office so located that the supervision can frequently consult with the schedule supervisor and have ready access to and examine the records on the schedule boards.

3. Schedule boards are made to suit local conditions in shops and should be about 36 x 58 in. in size, or smaller. Two boards are necessary, one for current month and one for following months, continuing in succession from month to month. The planning board is used for assigning engines to the shop, with reference to adjusting the class of work to be done to the existing organization, and particularly to avoid overloading any department. This board simplifies the work of the schedule supervisor.

4. Small blackboards are used for con-

veying dates work is due finished, directly to the man on the job. These blackboard may be employed to the extent of 15 or 20, as may be found desirable. Foremen of gangs, or departments, are expected to keep up these blackboards, crossing out engines and dates when work is completed and delivered.

5. About 20 forms are used for operating this system to best advantage. These forms cover constant or master schedules, delay sheets, check sheets and shop sheets used for conveying dates directly to the department interested. All forms, excepting master schedules, should be printed.

6. The calendar slide rule is indispensable for transferring the constant intervals of time on the master schedules into actual dates on the shop sheets. By the use of this simple device a large number of dates can be assigned quickly and one setting of the rule is sufficient for one schedule on an engine. Items 3, 4, 5 and 6 are covered by figs. 1 to 9 appended to this report.

The above discussion contemplates only the handling of the locomotive and its parts after arriving at the shop and is not directly concerned with the assignment of engines to the shop and their selection for repairs. But this feature is important and has a decided bearing upon the success of the system. Overloading departments with too much boiler work, or too many broken cylinders or frames, will result in delays, and prevent schedules based upon evenly apportioned work from operating effectively. The shop superintendent should have absolute control over engines to be repaired, as he is in best position to adjust the incoming work to his organization and with relation to the work being performed in the shop.

It is not perhaps pertinent to this discussion to treat at length the subject of proper inspection of incoming engines, although this matter has considerable bearing upon successful operation. One

LINKS.— Inside surfaces for link blocks. Grind when variations in any two dimensions exceed 0.015 in., or when out of radius more than 0.062 in.

LINK AND SADDLE.—To be assembled complete in valve motion department in assembling fixture and properly lined to work freely in the same. The distance, collar to collar, of bushings when link is assembled must be such as to allow between 0.025 in. and 0.035 in. lateral motion in link bracket. This distance to be adjusted by use of liners or varying thickness of bushing collars.

Department to Make Repairs—Lift, Shaft, Bracket and Supports.

All repairs to be made by valve motion department. Pins and bushings to be fitted as specified above. Bearings on lift shaft to be trued up when more than 0000 in. out of round. Bearing in

- L—Reline.
- G—Grind.
- P—Patch.
- W—Weld.
- R—Ream.
- F—Refinish.
- S—Straighten.
- H. T.—Heat Treatment.
- O—Not to be removed.
- O. K.—Correct, no work required.
- D—Dress to standard dimensions.
- R. S.—Reset to standard dimensions.

Feed Water Heaters for Locomotives.

The committee, of which F. M. Waring, Engineer of Tests, Pennsylvania Rd., was chairman and of which W. H. Sample, General Superintendent Motive Power and

before them the very valuable individual paper by J. Snowden Bell, Associate Member. (See 1917-1918 proceedings.) The author's conclusion, stated in par. 95 of his paper, as "beyond question," is, that a feed-water heater "can and will be developed and adopted with the most substantial benefit in locomotive operation" and this, after giving the history and description of most or all of the important devices of this character, as applied to locomotives, during the preceding 116 years.

Paragraph 4 of the paper classifies feed-water heaters as of two different types which may be termed respectively, (a) surface or closed heaters, and (b) injection or open heaters. At the same time mentioning the fact that the type (a), in which the heat transfer, to the feed-water, is effected through walls of comparatively thin metal, has been the more frequently experimented with, and, for several reasons, has heretofore seemed to be the more practical and desirable of the two types. Your committee wishes to draw careful attention to this latter statement, because, while this opinion has no doubt been more or less generally held, the latest developments suggest that the open heater, which operates under practically atmospheric pressure, has no small tubes as heating surface, and delivers the heated feed water and condensed exhaust under suction to the boiler feed pump, using an oil separator, has fully as good, if not a better chance of final success, considering the conditions which should obtain in an efficient heater.

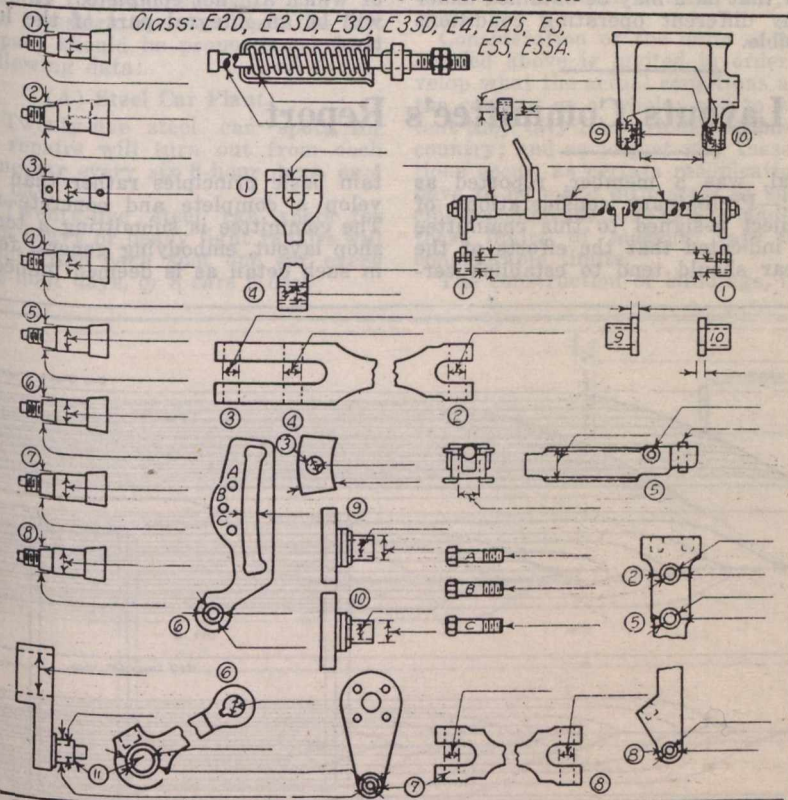
Your committee, for the present at least, is not considering heaters using waste gases from the flues, but only the exhaust steam as the heating medium; because these two sources of heat are independent of each other and require separate heaters, and where both of them are employed in conjunction, the exhaust steam must or should be used first, although usually in tandem with the other and the exhaust steam carries much larger portion of the waste heat, (approximately six times that in the waste gases) and this heat is more readily available, and with the open heater especially, it is believed has been much more successfully employed than that of the waste gases, without interference with the working of the locomotive.

Your committee began its work by endeavoring to accumulate information by means of a circular addressed to the members, and replies were received from 86 railways. Seven roads report that they now have, or very recently have had, feed-water heaters in service and give full replies to the circular. Four roads that they they contemplate the use of heaters. The remainder of the replies are to the effect that 76 roads have had no recent experience in the use of feed-water heating appliances. A tabulation of the replies, which were made in full, describing feed-water heating systems in use at present, or but recently removed from service, is given in appendix 1 to the report. Appendix 2 gives data on open and closed heaters tested by the Pennsylvania Rd. Appendix 3 gives comments by the Baltimore & Ohio Rd. on its experience. Appendix 4 gives some comments by Boston & Albany Rd. Appendix 5 gives comments by the Canadian Pacific Ry.

It appears from this survey, that at the present, there are in use in this country but two general types of feed-water heaters, the closed heater, having a number of small tubes; and the open heater, in which the exhaust steam is condensed by a jet of cold feed-water.

VALVE GEAR

SIDE: RIGHT...LEFT...



For Classified Repairs Only

| | | |
|-----------------|-------------------|-----------------------|
| TRACK NO. _____ | INSPECTOR _____ | DATE _____ |
| LOCO. NO. _____ | PRELIMINARY _____ | DATE _____ |
| CLASS _____ | FINAL _____ | DATE _____ |
| S.O. _____ | FORM NO. _____ | TO BE COMPLETED _____ |

Fig. 10. Valve Gear Inspection Sheet.

brackets for same to be rebabbitted when 0000 in. larger than shaft bearing.

Eccentric Crank.

FIT ON CRANK PIN.—Valve motion department to be responsible for fit of eccentric crank and bolts and nuts for the same and must properly fit the same to crank pin.

Valve Stem Cross-head.

FIT, VALVE STEM IN SAME.—Valve motion gauge to be responsible for fit of valve stem in valve stem cross-head and also the key for same, and shall see that these parts fit properly.

Link Saddle and Link Hanger Casting.

FITTING.—Valve motion department to apply bushing in hanger and be responsible for proper fitting.

Letters to Be Used to Designate Finish, Etc.

- X—Renew.
- B—Rebore.

Car Departments, G.T.R., was a member, reported as follows:—The conditions now appear to your committee to be favorable for a renewal of interest in feed water heaters for locomotives, and while the trials of them have been somewhat retarded by the unusual conditions of the past few years, we appear to be upon the eve of an extensive application of heaters, under more favorable conditions than at any previous time, on account of the high cost of fuel and the greater need for its conservation. After consideration of the development and present state of feed water heaters for locomotives, your committee believes that the early phases of the subject have been very fully covered in reports and individual papers, and they will, therefore, confine their discussion to heaters of recent production, either in use or immediately available for application.

The members of the association have

From some of the replies to our circular, it appears that attempts at heating the feed-water while in the tender tank have been made by using the air compressor exhaust for this purpose. The arrangements were not entirely successful or satisfactory on account of the difficulty in pumping the heated water to the boiler. When the temperature of the water was low enough to be handled by an injector the saving was very small.

It has been suggested that water having a high percentage of incrusting solids would make feed heating impossible, on account of the scale deposited on the tubes of the heater. Such water would, no doubt, be troublesome if used in a closed type heater. The open type heater, however, could be expected to handle such water with no more difficulty than when injectors are used.

The location of the heater apparatus on the locomotive is of considerable importance. The exhaust steam should have short and direct passages into the heater; and heater, pumps and piping should be placed so as to be easily drain-

ed. The attachment of the heater and pumps to the side of the boiler has been found of advantage in the prevention of freezing. It has been found that the superheat of the steam is reduced when the feed heater is used, and a new basis should be established for determining the necessary superheating surface for feed heater locomotives. It is thought, however, that an enlargement of the superheater should be considered for new construction only, the reduction in superheat not being sufficient to require a revision of existing superheaters when feed-water heaters are applied to old locomotives. It appears from present indications, that feed-water heating for locomotives, is about to be given a thorough trial on a few roads, and, with the improved heaters now available, we believe that a satisfactory arrangement of heater can be developed and that the association members should assist by installing heaters on their various roads in order that data may be obtained under as many different operating conditions as possible.

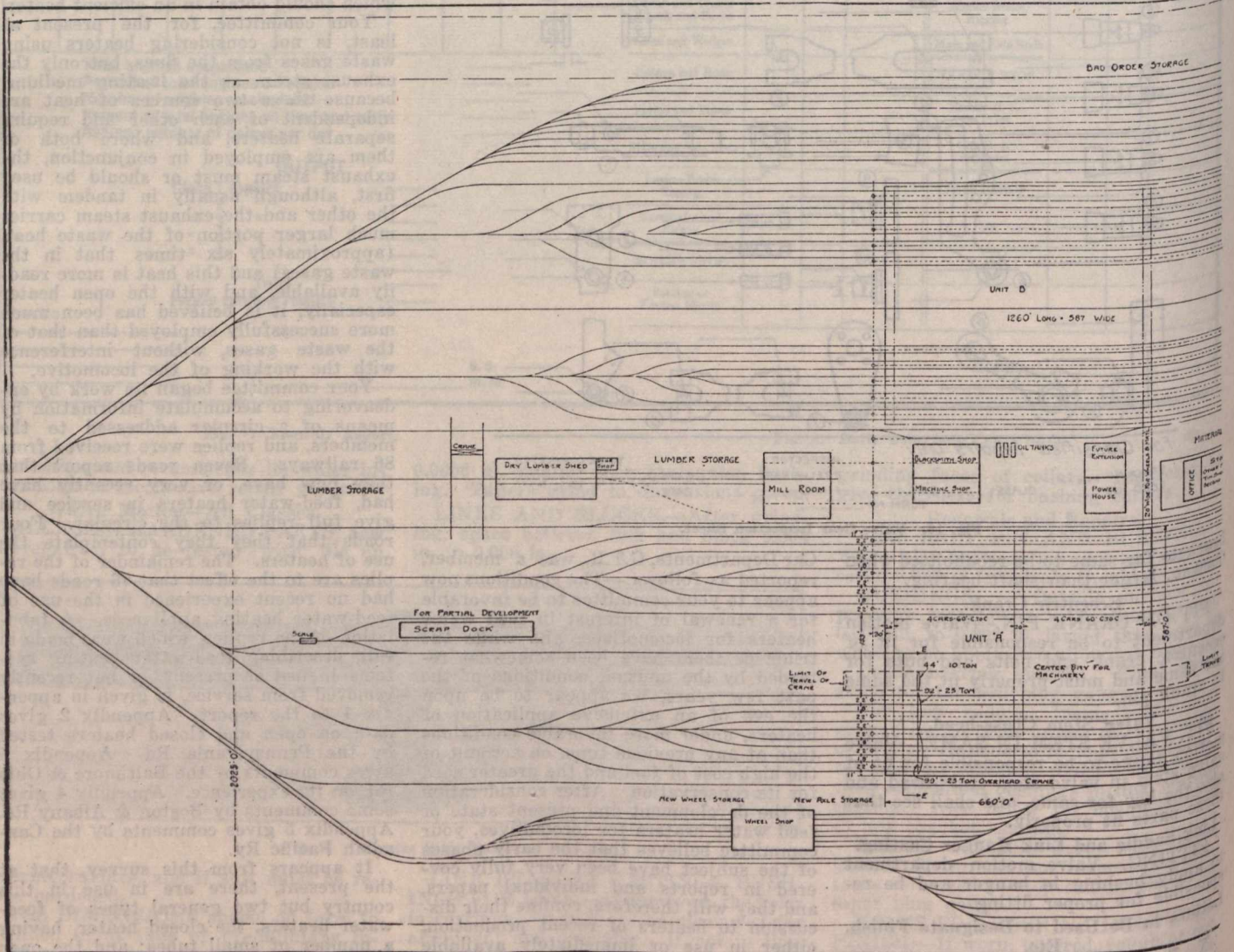
Appendix 5. Canadian Pacific Ry. officials state that they have experimented for the past 15 years with various types of waste gas and exhaust steam feed water heaters. A great deal of information has been obtained, although practically the majority of arrangements throughout the past have proved unsuitable for one reason or another. They are now designing a feed water heater which they propose to try thoroughly in competition with other feed water heaters on the market. They feel there is a considerable amount of experimental work to be done yet, before any satisfactory heater is discovered for their own climatic conditions, but they feel that the future will bring forth a heater which can readily be applied to any type of locomotive. In their past experiments the heater was placed crosswise over the door of the smokebox, and in front of the stack. They are also experimenting with an entirely new design, the details of which are not complete. This heater will be an integral part of the locomotive.

Repair Shop Layouts Committee's Report.

The committee, of which I. S. Downing, General Master Car Builder, Cleveland, Cincinnati & St. Louis Rd., was chairman, and of which W. J. Robider, General Master Car Builder, C.P.R.,

Montreal, was a member, reported as follows:—Preliminary considerations of the subject assigned to this committee clearly indicated that the efforts of the first year should tend to establish cer-

tain basic principles rather than to develop a complete and concrete report. The committee is submitting a tentative shop layout, embodying general features in such detail as is deemed immediately



Proposed A.R.A. Freight Car Repair Shop. Plan of buildings and tracks.

essential, together with their general observations on the subject. Criticism is invited, which should tend toward the development of complete and specific recommendation some time in the future. From the progress so far to be reported, and discussions it is anticipated will follow, it is felt there will be currently available considerable information which it is hoped the members of the association will take advantage of in consideration of their immediate needs and work contemplated. The work of the committee thus being progressively constructive.

It was decided in the preliminary layout of a repair shop to submit the general characteristics of a shop with an ultimate 100 car a day output, such units providing for 25 cars a day, and recommendations being submitted in the expansion programme so mapped out that the layout would be expanded in units of 20 cars a day until the ultimate capacity of 100 was reached.

Some investigations developed the fact that space should be proportioned from the following data:

(A) Steel Car Plant.

- (1) Twenty-five steel car spots for heavy repairs will turn out from each spot one car every six 8-hour days, or 4 cars a day.
- (2) Twenty-five steel car spots for medium heavy or heavy light repairs will turn out from each spot one car every three 8-hour days, or 8 cars a day.

(B) Wood Car Plant.

- (1) Twenty-five wood car spots for heavy repairs will turn out from each spot one car every six 8-hour days, or 4 cars a day.
- (2) Twenty-five wood car spots for medium heavy or light repairs will turn out from each spot one car every three 8-hour days, or 8 cars a day.
- (3) Fifty wood car spots for light repairs will turn out one car from each spot every 8-hour day, or 50 cars a day.

While the committee provides, in the general plan of the 100-car shop, space for wood cars, and while it is recognized that for a great many years there will be wood cars to consider, and for a considerable time longer, steel cars with a certain amount of wood work to be performed, the major part of the committee's considerations are devoted to steel cars.

Consideration of the units of measure decided above is invited in order to develop what the actual conditions are over the country as a whole; and to what extent they vary for various sections of the country; and as to just why these variations occur, as certain modifications will have to be made ultimately of such specific recommendations as are made should these limits of measure vary between considerable limits.

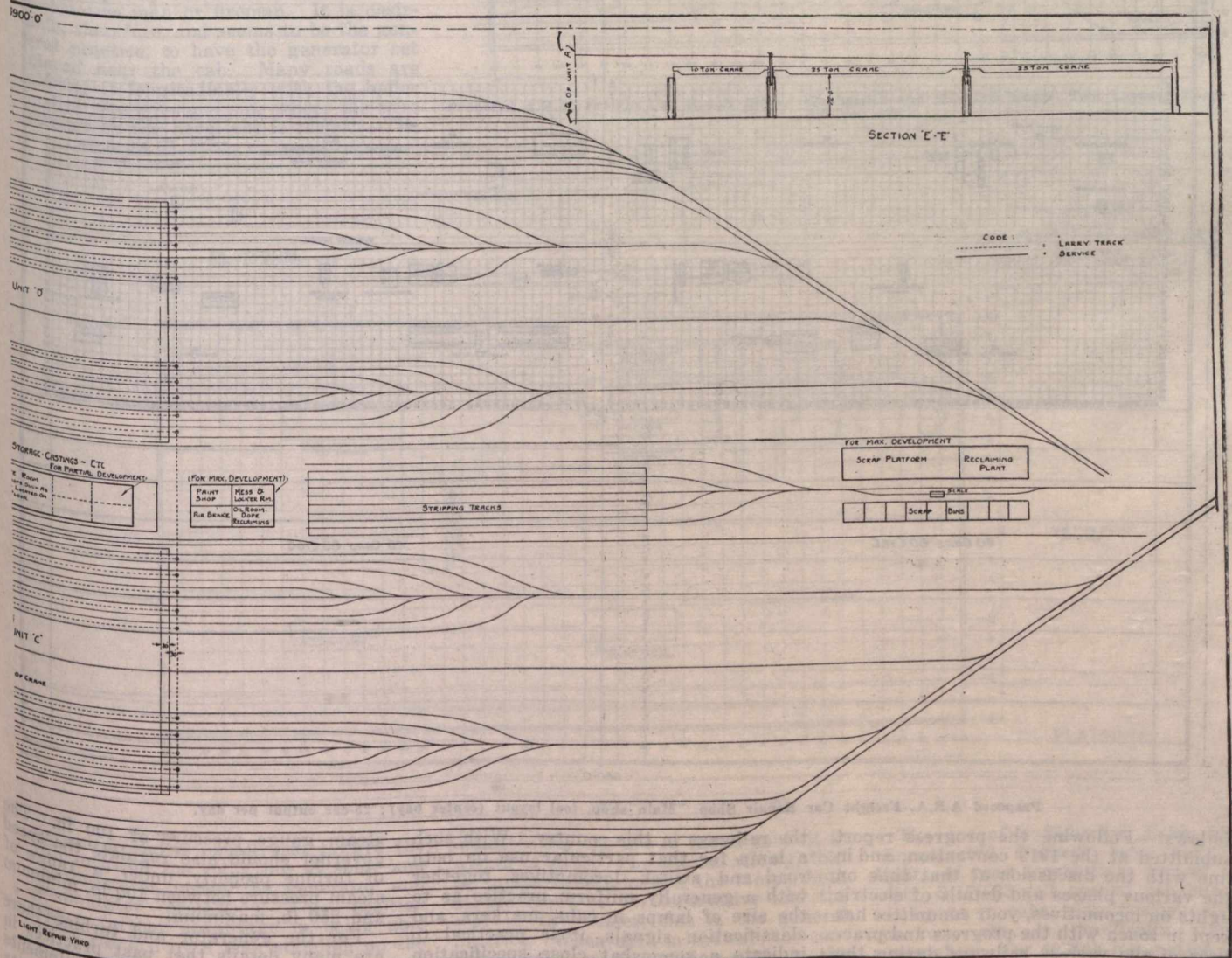
The construction of buildings, it is be-

lieved by the committee, when ultimately developed, should be the joint work of the engineering and car shop committee. For the present, it is thought sufficient to conform to buildings which are in plan practically square. Roof construction involves the geographical location of the buildings and their layout relative to the points of the compass. Several materials are largely construction matters, not essential to the general subject other than in final consideration of the cost. Briefly, the development of the plant and facilities as to capacity, efficiency and economy of operation should first be completed, and construction as reflected in first cost worked out as secondary considerations.

It is believed that track spacings such as shown for larry and service tracks are representative. Height of buildings will be largely governed by operations taking place therein and the extent to which cranes are installed. Where cranes are used, a clearance from rail to bottom of crane girder of 22 ft. is suggested. All larry track should be of standard gauge, and plan between rails for tractor service.

Gas and electric cutting stations should be considered in general, but specific advantages should be more clearly established before final recommendations are made.

The distribution of compressed air is largely one of local preference and conditions, but the ultimate capacity of



Proposed A.R.A. Freight Car Repair Shop. Plan of buildings and tracks.

the plant considered, it is deemed advisable to provide several electrically driven air compressors, located near points of consumption, in preference to two or more large units located at a central point, both on account of economy of distribution and continuity of service.

The question of machine tools, as reflected by the plans accompanying this report, is a matter for considerable discussion. The committee report contain-

ing such layout of tools and their number is more as a suggestion than as a concrete recommendation. In this connection it should be recognized that, up to the present, the steel car repair work is carried on largely by machine tools primarily designed for locomotive work, and that, no doubt, great economies can be perfected by the design of machine tools specifically adapted to car repair work.

The location of cranes and their installation, as shown by the committee's plans, are recognized as facilities the installation of which need not be carried on to the maximum point at the time of initial construction of shop, but should be provided and installed as conditions indicate their economy.

Other illustrations relating to this article appear below, and on pages 345 and 346.

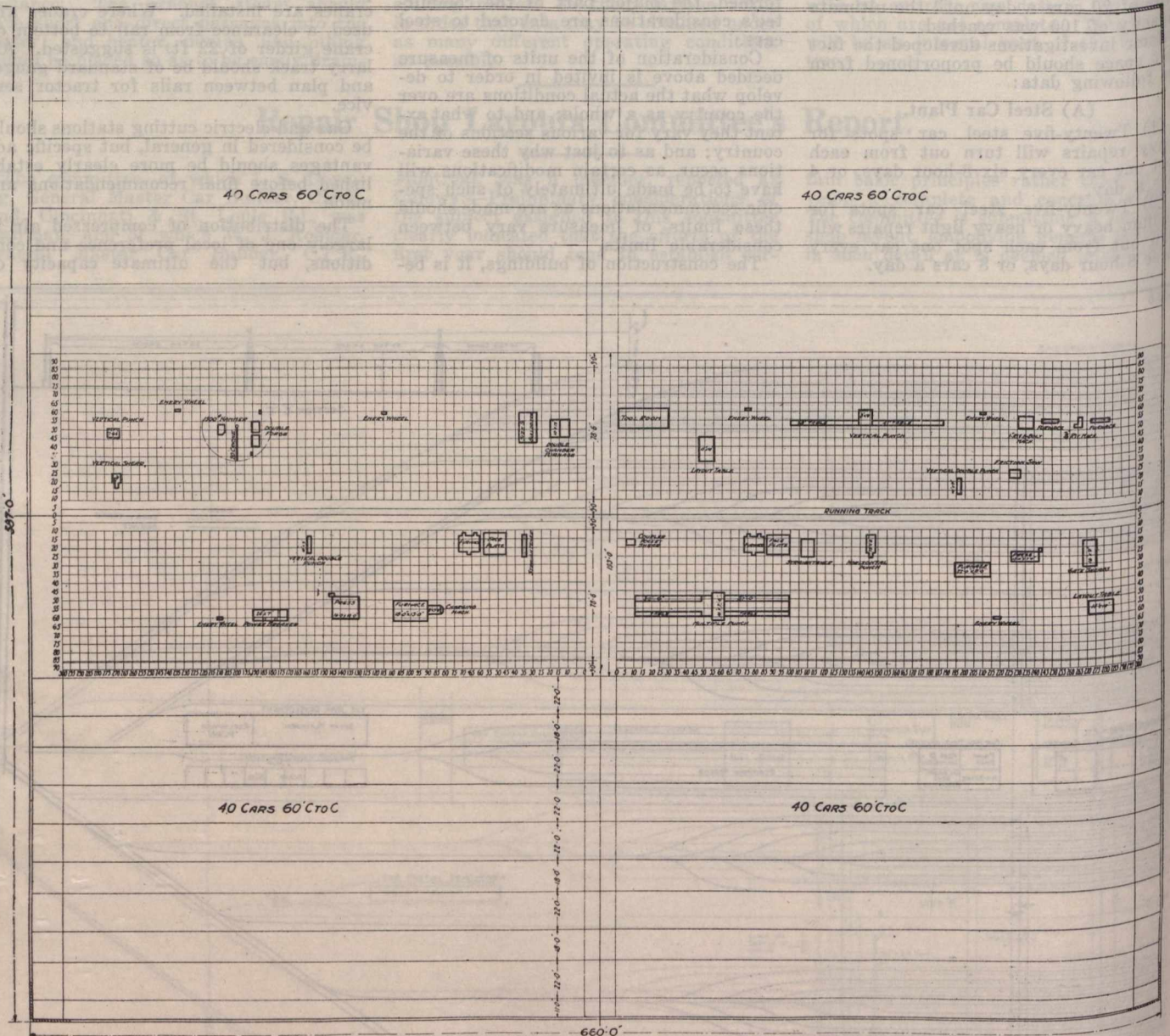
Locomotive Headlights and Classification Lamps.

The committee, of which H. T. Bentley, Superintendent Motive Power and Machinery, Chicago & Northwestern Rd., was chairman, and of which W. H. Flynn, Superintendent Motive Power, Michigan Central Rd., was a member, reported as

regarding capacity of generator, type of steam driving unit, details of connections and wearing parts of both generator and steam unit, sizes of lamp, reflector, etc.

The incandescent headlight lamp has now been practically made standard on

ing able to transfer on short notice the equipment from one locomotive to any other, it is believed that such an equipment should be of 500-watt capacity, of the turbine driven type, and capable of developing 32 volts and full load at a



Proposed A.R.A. Freight Car Repair Shop. Main shop, tool layout (center bay); 25-car output per day.

follows:—Following the progress report submitted at the 1919 convention, and in line with the discussion at that time on the various phases and details of electric lights on locomotives, your committee has kept in touch with the progress and practices of the various railways during the past year. There appears to be a desirability for uniformity in practices as re-

the railways in this country. With such a lamp for that particular use on both road and switch locomotives, together with a generally uniform practice as to the size of lamps in cabs, markers, and classification signals, it is practical to indicate a somewhat close specification for the generator and steam driving unit. Taking into account the necessity of be-

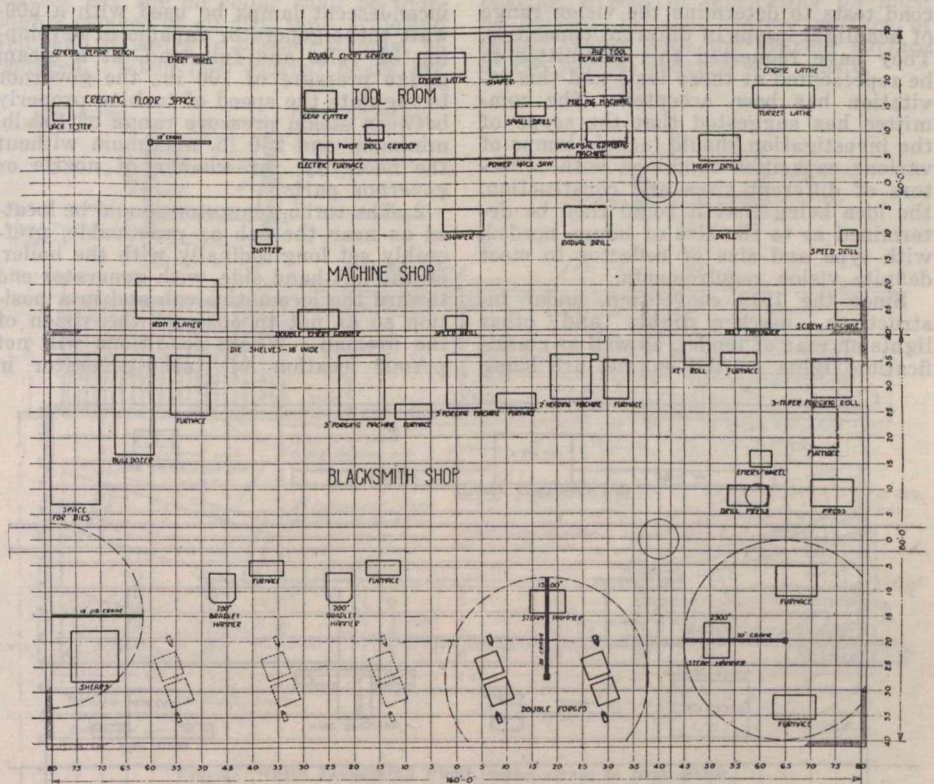
steam gauge pressure of 100 lb. The governor should also regulate the speed of turbine properly, under a range of steam pressure between 100 lb. minimum and 250 lb. maximum.

For the generator and turbine there are many details that past practices in handling somewhat similar equipments indicate uniformity in certain dimensions

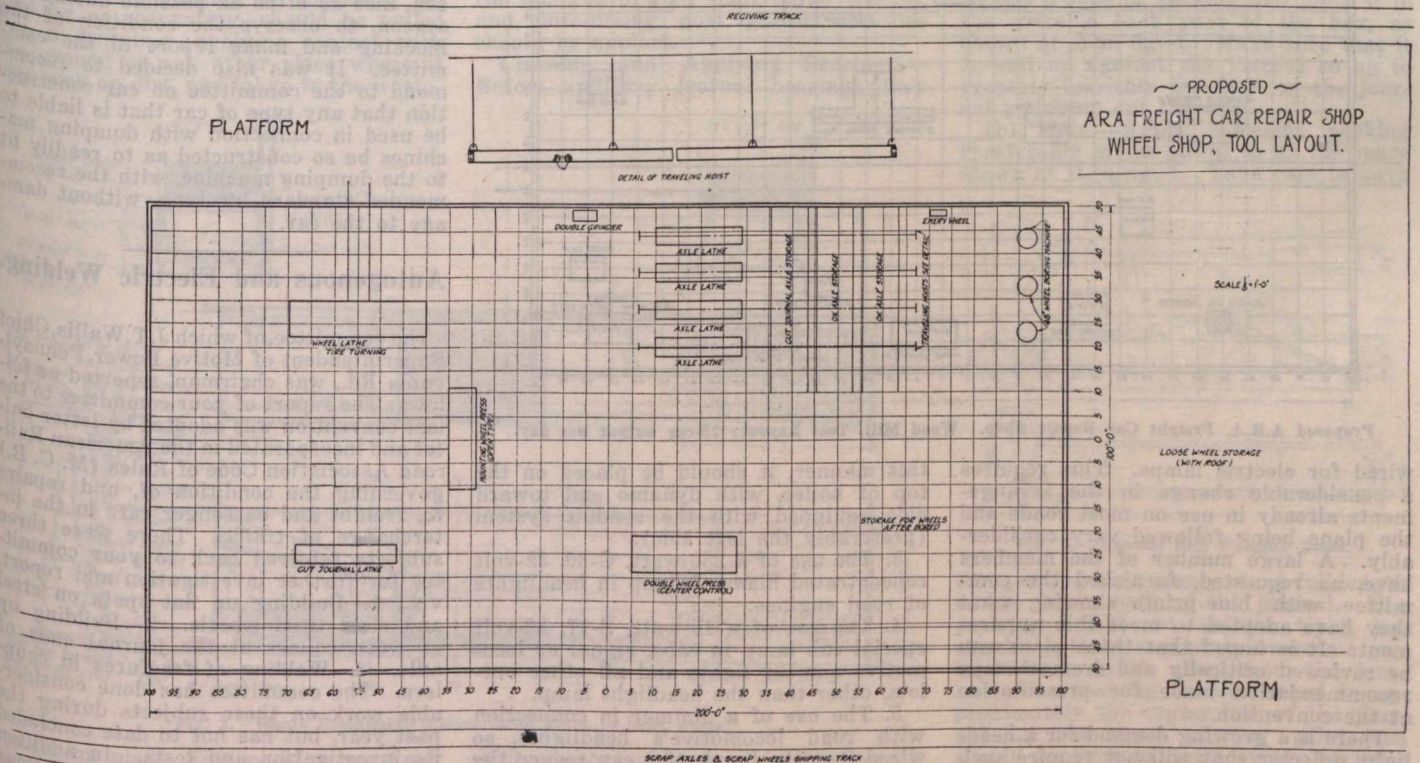
and arrangement on equipments, as furnished by the several manufacturers, that should be maintained. This is, of course, for the express purpose of obtaining prompt interchangeability in service, and reduction in the stock of renewal parts where different makes of machines are used and locomotives are interchanged. It will be apparent that the bolt spacing of the base should be the same on all equipment, also that the size of steam pipe required should be the same. In this same connection, it would be advantageous if the location of the steam exhaust and drain connections were identical on all makes of headlight turbo-generators. As to the renewal parts, the ball bearings can be made similar, brushes can all be the same size and all bolt and screw threads should be standard.

In locating the turbo-generator on the locomotive four details must be considered, all of approximately equal importance. In the first place, short steam pipes are necessary. Long pipes are difficult to maintain and they do increase radiation losses. The location must be one that is accessible for inspection, and also not interfere with the inspection and care of other parts of the boiler or machinery that require both inspection and renewal. It must not in any way interfere with the vision ahead of the locomotive crew, and the exhaust steam cannot be permitted to cloud up the front cab windows, condense over the cab roof, or in any way become a nuisance to the locomotive man or fireman. It is desirable, therefore, and seems to be the general practice, to have the generator set placed near the cab. Many roads are placing it longitudinally with the boiler and on the left-hand side where the wire conduit to the headlight is placed. The

collects in and around the unit from the With either open or metal conduit wiring and safety valve discharge and in the cabs, all drops should be made leaks of steam therefrom, particularly through suitable fittings, so that in order when it is placed on top of the boiler just nary maintenance or the overcoming of trouble on the road no joints in the wires ahead of the cab. There is a rather strong preference will have to be disconnected.



Proposed A.R.A. Freight Car Repair Shop. Blacksmith and Machines Shops, Tool Layout; 25-car output per day.



generator end is usually set toward the cab to avoid the collecting of snow and ice or water inside the generator and commutator protection. This position has a further advantage in being able to be reached by a man standing on the running board, as well as being away from the condensation and moisture that

indicated for the use of metal conduit in wiring of cabs. For outside wiring, that is, to the headlight and the lamps, both at the front of the locomotive and the rear of the tender, this is the general practice. When used in the cab, the conduit placed on the ceiling and on the sides should not be rigidly connected.

The use of a 250-watt, G-30, 32-volt concentrated filament lamp for headlights of road locomotives and of a 15-watt, S-17, 33-volt special cab lamp for all lights in cabs, classification signals, markers, etc., is practically standard everywhere. For switch locomotive headlights there is still considerable and very

strong difference of opinion as to what size lamp can be used, and meet both the requirements as to the 300-ft. vision and the frequent objections of yard crews to a light that is too dazzling. In this connection, the National Lamp Association has under consideration a series of road tests to determine the vision range of headlight lamps of different capacities. They have requested this committee to be represented at these tests and this invitation has been accepted. The committee has suggested that the scope of the investigation should include lamps of various capacities combined with reflectors of different sizes and construction, the idea being that it could then be determined as to the size of lamps needed, with type and size of reflector to meet definite vision requirements.

Since the 1919 convention, under instructions, marker lights and other lights on rear of tender, as well as classification lights on the engine, are being

lamp tests mentioned above are made some definite information will be available for the members.

Your committee would recommend the following for submitting to letter ballot as recommended practice:

1. For electric headlight equipment, incandescent lamps be used with a 500-watt turbo-generator capable of developing 32 volts and full load, at a steam gauge pressure of 100 lb., the governor to regulate the speed of turbine properly between steam pressure range of 100 lb. minimum and 250 lb. maximum without the necessity for change of nozzle or governor parts.

2. The turbo-generator should be located as near the cab as practicable, preferably set longitudinally with the boiler, on the left-hand side, with generator end toward the locomotive cab and in a position so as not to obstruct the vision of the fireman. Where conditions will not permit location of turbo-generator in

cab where possible, in back of and not directly over the boiler so that they are readily accessible.

Your committee would also request approval of the plan to work jointly with the manufacturers of headlight turbo-generators, and the Association of Railway Electrical Engineers in developing standard practices as to: bolt spacing of the base; size of steam, exhaust and drain pipes; location of steam, exhaust and drain pipe connections; size of ball bearing; size of commutator brushes; bolt and screw threads.

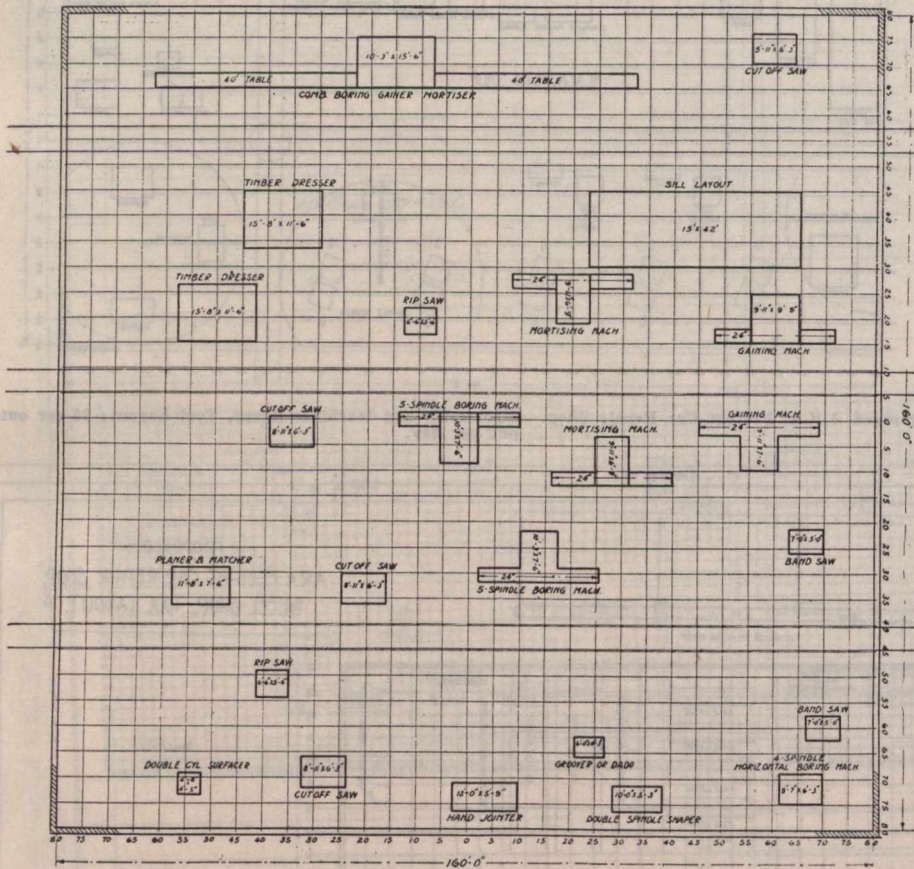
Standard Blocking for Cradles of Car Dumping Machines.

The committee, of which J. McMullen, Superintendent, Car Department, Erie Rd., was chairman, reported as follows: The committee appointed to make recommendations covering standard blocking for cradles of car dumping machines have made investigation and find that two machines have been equipped with the recommended practice for blocking for cradles of car dumping machines. As the recommended practice was adopted after the close of navigation, there has been very little opportunity to observe the working of the machines so equipped. It is felt, however, that the cars will be better supported, and less damage will result to them if the recommended blocking is applied.

The committee would like to receive reports from any of the members who may observe car dumping machines which are equipped with the recommended blocking. Members of the committee will make inspection of the blocking on car dumping machines within their territory prior to the opening of the lake boat season, also as often as possible during the season, to observe the condition of the blocking and make report to the committee. It was also decided to recommend to the committee on car construction that any type of car that is liable to be used in connection with dumping machines be so constructed as to readily fit to the dumping machine, with the recommended standard blocking, without damage to the car.

Autogenous and Electric Welding.

The committee, of which J. T. Wallis, Chief Superintendent of Motive Power, Pennsylvania Rd., was chairman, reported as follows: The report of your committee to the last convention was adopted by letter ballot and incorporated in the American Railroad Association Code of Rules (M. C. B.) governing the condition of, and repairs to, freight and passenger cars in the interchange of traffic. There were three subjects referred back to your committee for further investigation and report, viz.: 1—Building up flat spots on steel and steel tired wheels. 2—Building up of worn collars at the journal ends of axle. 3—Welding of fractures in couplers. The committee has done considerable work on these subjects during the past year, but has not to date concluded its investigation and tests. In addition to the subjects left over last year, your committee is making a thorough study of the relative merits of autogenous, gas and electric welding on the various parts of car and locomotive equipment. Your committee, therefore, desires to submit this as a progress report, pending the conclusion of the investigations and tests which they now have under way.



Proposed A.R.A. Freight Car Repair Shop. Wood Mill, Tool Layout; 25-car output per day.

wired for electric lamps. This requires a considerable change in the arrangements already in use on most roads and the plans being followed vary considerably. A large number of the members have, as requested, furnished the committee with blue-prints showing what they have adopted to meet this requirement. It is hoped that these plans can be reviewed critically and from them a recommendation made for presentation at the convention.

There is a growing demand for a headlight reflector that will not require such constant attention to keep clean as it is necessary to give the usual silvered copper reflector, so that it will function properly. This is particularly the case in connection with yard locomotives which often are kept away from the locomotive-house for days at a time. Several types of reflectors are being developed along this line and it is expected that after the

this manner, it should be placed on the top of boiler, with dynamo end toward side equipped with the conduit system (preferably the left side).

3. The use of a 250-watt, G-30, 32-volt concentrated filament lamp in headlights of road engines.

4. The use of a 15-watt, S-17, 33-volt special cab lamp in cabs, signal or locomotive number lights and all other outlets, other than the headlight lamp.

5. The use of a dimmer in connection with road locomotive's headlights, so wired that the locomotive can reduce the intensity of the light as desired and in accord with the rules.

6. That all wiring in cabs be in metal conduits so applied that it may be removed intact, a loose connection being arranged between the conduit placed on the ceiling and on the sides of the cab.

7. All drops should be made through suitable fittings placed on the ceiling of

Standard Method of Packing Journal Boxes.

The committee, of which C. J. Bodermer, Assistant Superintendent of Machinery, Louisville & Nashville Rd., was chairman, reported as follows:—Your committee respectfully submits the following report covering a standard method of packing, cleaning and assembling of journal boxes on locomotive tenders and cars, and recommends that it be submitted to letter ballot for adoption as recommended practice:

Preparation of New Packing.—The waste must be loosened, placed in a saturating vat and kept completely submerged in car oil, at a temperature of not less than 70 degrees Fahrenheit, for at least 48 hours to ensure thorough saturation. It shall then be drained for the

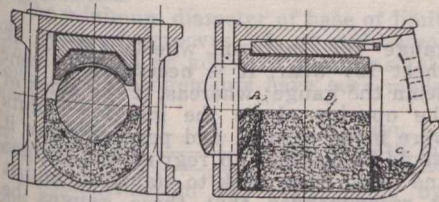


Figure 1.

purpose of removing the excess oil, until the packing is in a resilient or elastic condition.

Prepared packing in storage should be turned over at least once each 24 hours, or the oil which has accumulated in the bottom of the container shall be drawn off and poured over the top of the prepared packing.

Preparation of Renovated Packing.—All packing, when removed from journal boxes for the purpose of periodical repacking or renovating, should be pulled into a container, avoiding contact with the ground or any other place where it may pick up dirt, and taken to the waste-

oil, then drained for the purpose of removing the excess oil.

Cleaning Boxes.—Before packing a journal box the oil cellar shall be thoroughly cleaned of all dirt, sand, scale and grit, and if water is present it must be removed. When new journal boxes are

The surface of the journal should be smooth and thoroughly clean before bearing is applied. When applying a journal bearing, a coat of lubricating oil must be applied to the bearing surface of same. Never wipe the bearing surface of the journal bearing with waste.

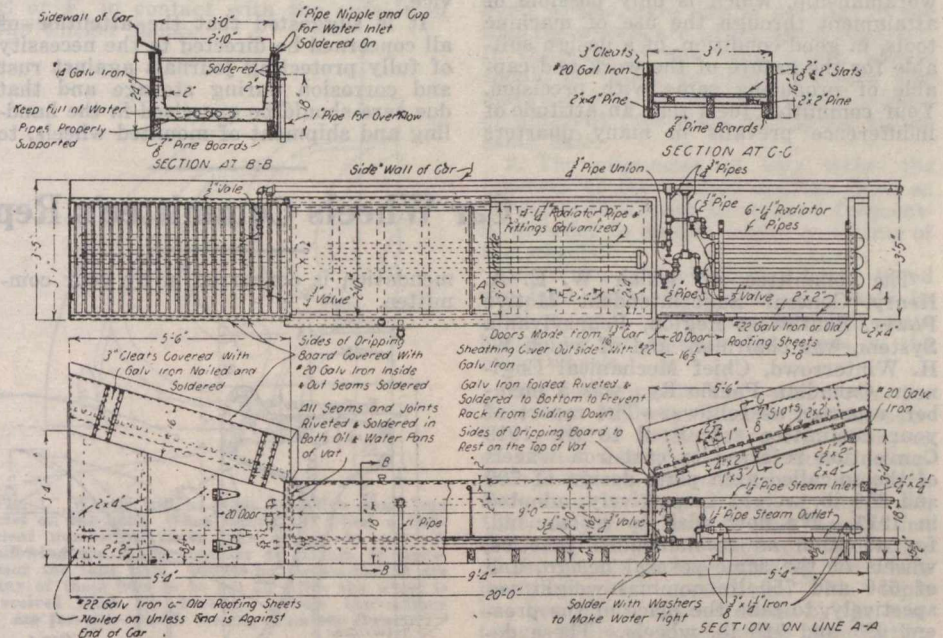


Fig. 3. Waste Reclaiming Plant, using steam to heat water.

applied, or when reapplying journal boxes, the interior of the box, including the dustguard well, shall be so treated, and close-fitting dust guards and lids should be applied.

Cleaning and Applying Bearings.—Before applying journal bearings they

Application of Packing.—(a) Inner.—In packing a journal box, twist somewhat tightly a rope of packing and place it in the extreme back part of the box, as shown at A in fig. 1. Make sure that it is well up against the journal so as to properly lubricate the fillet on the journal and keep out the dust.

(b) Main.—Apply sufficient packing (preferably in one piece) to fill the space shown at B in fig. 1. Take care to have

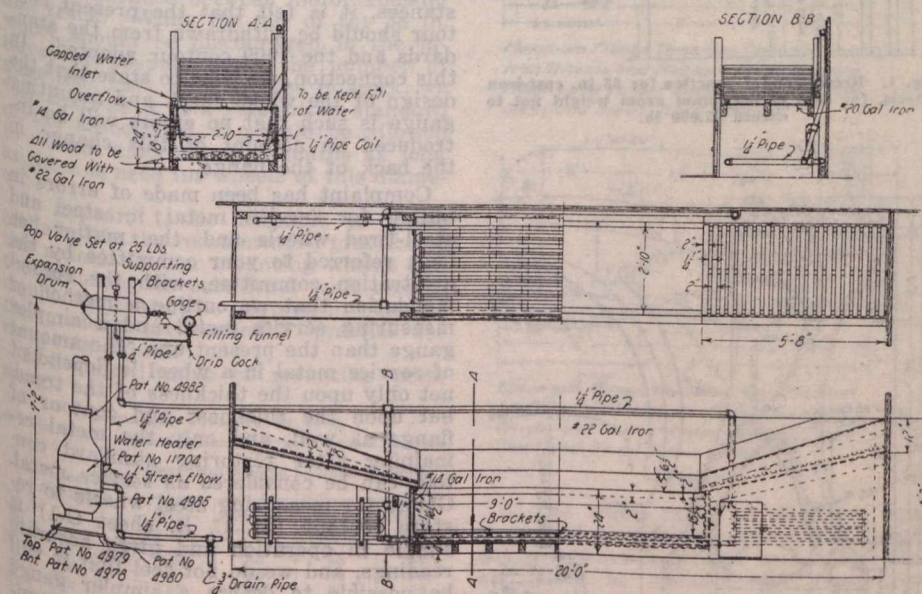


Fig. 2. Waste Reclaiming Plant, using stove to heat water.

reclaiming plant. This packing must not be reused until renovated.

In reclaiming packing it should be first picked over carefully, and dirt, metal, etc., shaken out, the knotted strands of waste pulled apart, and then placed in hot oil in renovating tank for a short time, working it with a fork for the purpose of thoroughly washing and loosening it. It should then be rinsed in clean

shall be thoroughly clean, have a smooth bearing surface, free from irregularities, and shall have a proper bearing. Under no circumstances is it permissible to use sand paper, emery paper or emery cloth for the purpose of removing irregularities from the bearing surface. A half-round file or scraper should be used. Care must be taken that the wedge has a good contact on the crown of journal bearing.

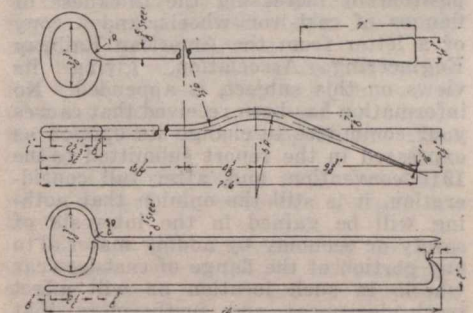


Fig. 4. Journal Box Packing Tools.

this packing bear evenly along full length of the lower half of the journal. The packing should not be too tight, but should be tight enough to overcome any tendency to settle away from the journal. The packing should extend to approximately the center line of the journal but not above at any point, and should be pressed down evenly at sides that no loose ends may work up under the journal bearings.

(c) Outer.—Apply a third piece of firmly twisted packing as shown at C in fig. 1, and pack tightly, in order to prevent displacement of the main packing. There should be no loose ends hanging out of the box as they would tend to draw out the oil.

General Remarks.—In addition to the above recommended practice the committee desires to emphasize the importance of causing the observance of several other factors, as follows, with the view of reducing hot boxes to the minimum:

It is very essential that journals, after being turned, should be cylindrical, free from taper, tool marks, ridges, corrugations and other defects. In other words, a turned journal should reflect first-class workmanship, which is only possible of attainment through the use of machine tools, in good condition, of a design suitable for the nature of the work and capable of producing same with precision. Your committee feels that an attitude of indifference prevails in many quarters

with respect to the necessity of providing suitable heavy-duty lathes for the machining of axles, especially the larger sizes, and, as a result, many obsolete and worn-out axle lathes, that have outlived their usefulness, are being continued in service, whereas a close examination would disclose defects in the machining of the axles that would prove such lathes incapable of meeting the requirements, and warrant their retirement from service.

It is suggested that the attention of all concerned be directed to the necessity of fully protecting journals against rust and corrosion during storage and that due care should be exercised in the handling and shipment of mounted wheels, to

guard against the damage which journals are subjected to through coming in contact with flanges of wheels as a result of improper loading or careless handling around shop yards.

It is also highly desirable that rigid instructions be issued to effect a more careful practice in the handling of journal bearings, especially for shipment, to prevent the indiscriminate tossing of journal bearings against each other, thus nicking and needlessly damaging the smooth bearing surface of the babbitt metal lining.

Drawings showing two representative waste-reclaiming plants and a representative set of journal box packing tools are shown in figs. 2, 3 and 4.

Car Wheels Committee's Report.

The committee, of which W. E. A. Henry, General Superintendent Motive Power, Southwest Region, Pennsylvania System, was chairman, and of which W. H. Winterrowd, Chief Mechanical Engineer, Canadian Pacific Ry., was a member, reported as follows:—The report of your committee submitted to the 1919 Convention referred to cast-iron wheels of the so-called arch plate design of 700 and 850 lb. weight respectively, adopted in 1917. We now wish to recommend, for adoption as recommended practice, wheels of the same several design, and of 650 and 750 lb. nominal weight respectively, to take the place of the present 625 and 725 lb. wheels. These designs are in accordance with recommendations of the Association of Manufacturers of Chilled Car Wheels and we are recommending them for adoption on account of the universally favorable reports on the performance of the 700 lb. arch plate wheel in comparison with the 650 lb. wheel of the former design. Figs. 1 and 2 show proposed designs for the 650 and 750 lb. wheels. If adopted, these wheels would be marked "A. R. A. 1920," and specifications changed accordingly.

There has again been referred to your committee for recommendation the proposition of increasing the thickness of flanges of cast-iron wheels, and a copy of a letter from the American Railway Engineering Association, giving its views on this subject, is appended. No information has been received that causes your committee to change its opinion as expressed in the report submitted to the 1916 convention, and, after full consideration, it is still the opinion that nothing will be gained in the interests of safety or economy by adding material to any portion of the flange of cast-iron car wheels in such location as will affect track clearances, and, furthermore, that such change is unwarranted and inadvisable.

It has been recommended that the present method of stenciling tape size of cast-iron wheels be discontinued and instead a permanent record of this information be provided as follows: Five small lugs $\frac{3}{8}$ in. in diameter by $\frac{3}{8}$ in. high, to be cast on inner plate near hub as shown on sketch, fig. 3. As each wheel is taped the necessary number of lugs to be broken or cut off, those remaining to indicate the tape size. For example, for a normal wheel tape size 3, two lugs to be broken or cut off, the three remaining indicating a tape 3 wheel. This practice is now being followed by some roads and the information is found to be of value when grinding second-hand wheels. This recom-

mendation is concurred in by your committee.

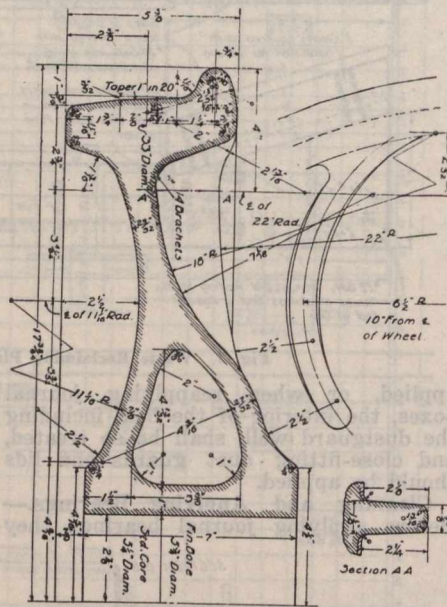


Fig. 1. Recommended practice for 33 in. cast-iron wheels, for cars of maximum gross weight not to exceed 95,000 lb.

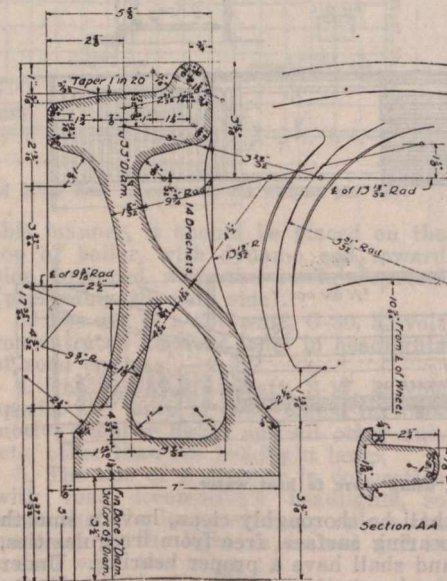


Fig. 2. Recommended practice for 33 in. cast-iron wheels, for cars of maximum gross weight not to exceed 161,000 lb.

Attention has been called to the fact that when the gauging points of maximum and minimum flange thickness

gauge for cast-iron wheels (M. C. B. sheet 16) wear, it is necessary to condemn the gauge; whereas, if the sides of the opening above the gauging points were made parallel and perpendicular it would be possible to regrind the gauges and bring them back to standard; and it is recommended that these gauges be changed accordingly, as shown in fig. 4.

In 1912 the contour of the back of flange of steel and steel-tired wheels was changed so as to be identical with the flange contour of cast-iron wheels between the base line and top of flange, the total width of rim being increased from $5\frac{1}{2}$ to $5\frac{19}{32}$ in., which is the same as the corresponding portion of the cast-iron wheel. The process of manufacture of wrought-steel wheels is such that the present contour is very difficult to produce, and as far as your committee is able to learn, it is not being furnished by any of the manufacturers, but instead all wrought-steel and steel-tired wheels are being manufactured with flange in accordance with design adopted in 1909. Under the circumstances, it is felt that the present contour should be withdrawn from the standards and the 1909 contour adopted. In this connection, we wish to state that the design of the wheel check and mounting gauge is such that no errors will be introduced on account of this change in the back of the flange.

Complaint has been made of errors in billing for service metal in steel and steel-tired wheels and the matter has been referred to your committee by the arbitration committee, with the recommendation that we outline a method of measuring service metal and a simpler gauge than the present one. The amount of service metal in a wheel is dependent not only upon the thickness of the tread, but upon the thickness and contour of flange as well, and only the metal remaining after restoring standard contour can be considered as service metal. Gauge for measuring steel wheels to restore contour (M. C. B. sheet C-1) is simple in operation and gives accurate readings, and we do not feel that it will be possible to design a simpler gauge that will take into account all the dimensions necessary to determine the service metal remaining in wheels. The errors in billing complained of are very evidently due to lack of care in taking measurements and it is also apparent that the gauge above referred to is not being generally used.

In order to correct the conditions complained of, we would recommend that the second paragraph, rule 98, 1919 Rules of Interchange, be modified as follows,

the modification being shown in bold face type.

"The price for new wrought-steel wheels shall be based on the scrap value of \$8 for metal inside the condemning limit (which is 1/4 in. above the limit groove) plus \$1.75 for each 1/16 in. of service metal (on radius of tread) in connection with standard full flange contour, as determined by gauge for measuring steel wheels to restore contour, M. C. B. sheet C-1, also base of limit groove must not be less than 29 1/2 in. in diameter; in no case shall a charge or credit for service metal be made in excess of 1 1/2 in."

It is also recommended that the present recommended practice gauge for measuring steel wheels to restore contour, as shown on M. C. B. sheet C-1, be advanced from recommended to standard practice.

The minimum diameter of base of limit of wear of grooves of wrought-steel wheels should be added to sheets as follows, and arrangements have been made accordingly:

| | |
|--------------------|--------------------------|
| M. C. B. sheet 25 | Not less than 29 1/2 in. |
| M. C. B. sheet 25A | Not less than 32 1/2 in. |
| M. C. B. sheet 25B | Not less than 34 1/2 in. |

Recommendation has been made by one of the companies manufacturing steel wheels that our specifications require wheels to be machined exact to diameter. Your committee can see no justification for this added expense, together with the loss of service metal, which is, from the standpoint of wear, the most useful in the wheel. The recommendation, therefore, is not concurred in.

Recommendation has been made by certain of the manufacturers of wrought-steel wheels that the 38 in. wheel be dropped from our standards. Replies to circular of enquiry indicate that the number of such wheels used is small and that their use is being discontinued as a general practice. It is, however, necessary to use wheels of this diameter in certain cases under motor cars in order to afford proper clearance between motor housing and track. While the use of the 38 in. wheel should be discouraged in the interest of keeping down the number of sizes that have to be carried in stock, we feel that, as it is a recognized standard of the association, it should be allowed to remain among our standards as long as there is need for wheels of this diameter.

It appears to be desirable to revise and amplify the recommended practice of this association for mounting wheels and the following is submitted with recommendation that it be adopted in place of the present recommended practice for mounting wheels:

1. Standard table of mounting pressure:

Mounting Pressure in tons.

| Axle. | Wheel seat diameter. | Cast iron wheels. | | Steel Wheels. | |
|-------|----------------------|-------------------|---------|---------------|---------|
| | | Minimum | Maximum | Minimum | Maximum |
| A | 5 1/8 in. | 30 | 45 | 45 | 60 |
| B | 5 3/8 in. | 35 | 50 | 50 | 70 |
| C | 6 1/8 in. | 40 | 60 | 60 | 80 |
| D | 7 in. | 45 | 65 | 65 | 85 |
| E | 7 5/8 in. | 50 | 70 | 70 | 95 |

2. Wheels having flanges worn so as to take limit gauges for remounting cast-iron wheels shown on M. C. B. Sheet 16-A shall not be remounted.

3. The thickness of flanges of wheels fitted on the same axle should be equal and should never vary more than 1/16 in.

4. In mounting of wheels, new or second-hand, the standard wheel mounting

and check gauge should be used in the following manner:

After one wheel is pressed into position, place the stop A or B of the check gauge against the inside of the flange of the wheel, with the thinner flange with the corresponding tread stop C or D against the tread of the wheel. Press the other wheel on the axle, until opposite tread stop comes in contact with the tread of the corresponding gauge point E or F, in contact with the outside of the thicker flange.

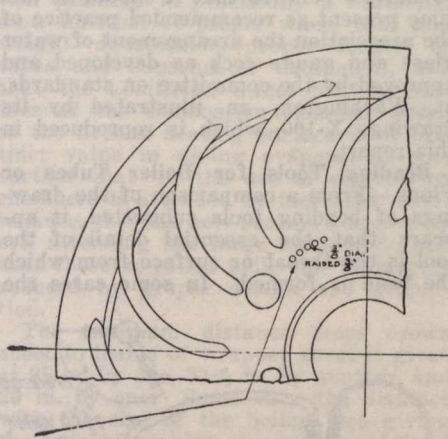
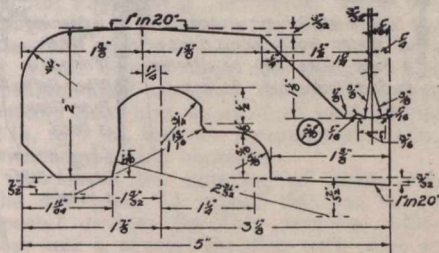
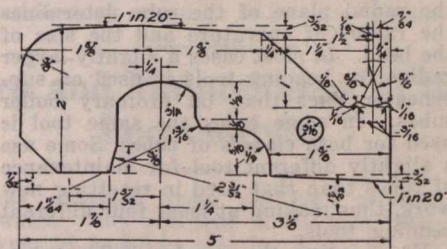


Fig. 3. Wheels will be made with five small lugs cast on the hub. When taping the wheel a sufficient number of these lugs are to be cut off, allowing the proper number to remain to represent the tape size. Under no circumstances are any of these lugs to be cut off after the wheel is received from the foundry. These instructions are for new wheels coming from the foundry.



Maximum Flange Thickness Gauge For Cast Iron Wheels and Maximum Flange Thickness, Height and Throat Radius Gauge For Solid Steel and Steel Tired Wheels.



Minimum Flange Thickness Gauge For Cast Iron Wheels and Minimum Flange Thickness, Height and Throat Radius Gauge For Solid Steel and Steel Tired Wheels.

Figure 4.

5. The wheel seats on all axles must be turned to uniform diameter throughout the entire length of each wheel seat and must be smooth and free from ridges, so as to provide even bearing for the wheel fit throughout. The mounting of wheels on axles having the wheel fit tapered is not permissible. The wheels must also have a straight bore, with the exception of the chamfering, for not more than 3/8 in. at the back hub face which may be allowed to facilitate application to axles.

6. Wheels should be mounted centrally on the axle. All axles should be center punched and some form of gauge be used to measure the location of the wheel

from this center punch mark. The central mounting of wheels is necessary, in order to secure proper running of the wheels and to prevent hot boxes.

7. Wheels should ordinarily be fitted to (word "used" eliminated) axles and not axles fitted to the wheels. It is usually unnecessary to turn the wheel seat of second-hand axles unless they are found a tapered fit.

8. In mounting, either new or second-hand wheels, care should be used to see that the wheels are of the same diameter. In the case of new wheels, the wheels should be taped, to check the tape size marking, and, in no case, should wheels of different tape sizes be applied to the same axle.

9. The alignment of axle lathe, the trueness of the centers and the jaws on boring mills should be checked frequently in order to ensure proper mounting of the wheels.

10. While the wheels are being bored the high spots on the flange should be marked, and, in mating, the high spots should be put opposite low spots on the mate wheels.

The following is the letter from the American Railway Engineering Association referred to in the report:—Contour of chilled car-wheels and throat clearance for frogs, guard rails and crossings. Referring to your letter of April 20, 1917, referring back to this association the question of widening of the flange of the wheels as suggested by the wheel manufacturers' committee. This topic has been under consideration by the American Railway Engineering Association Track Committee, and the following report is made thereon by this committee, and is transmitted to you for your information: "The track committee is willing to agree that the flanges can be increased, as recommended by the chilled car wheel people, without any serious detriment from a track standpoint, provided:

"1. That the wheels are in all cases accurately mounted to 3/16 in. additional spread gauge.

"2. That the allowable flange wear before wheels are removed be changed so that wheels will be removed when the flange is worn to within 3/16 in. of the present limit of removal.

"3. That more care be used in matching wheels on any given axle, on account of the reduction in play and the corresponding reduction in compensation from coning.

"4. That this flange width be confined to flanges of four-wheel freight car trucks.

"5. That this conclusion on the part of the track committee be not construed as an invitation to increase the axle load.

"With the above provisions, it is believed that it will be unnecessary to make any difference in the width of flangeway of frogs and crossings, or change the present method of track construction."

Locomotive Repair Costs.—C. A. Gauvreau, M.P. for Temiscouata, Que., asked in the House of Commons recently, "Is the government, or the Minister of Railways, aware that the amount for repairing a locomotive at the Canadian National Rys. shops at St. Malo, Quebec, is five times higher than it was at the Riviere-du-Loup shops, before the machines of the latter were transferred to St. Malo?" The Minister of Railways replied: "Neither the Government or the Minister of Railways has any such information."

Design and Maintenance of Locomotive Boilers.

The committee, of which C. E. Fuller, Superintendent Motive Power and Machinery, Union Pacific Rd., was chairman, reported as follows:—The association adopted the following resolution in connection with last year's report: "That the report of the committee on design and maintenance of locomotive boilers be accepted and the committee continued and that the subject of combustion chambers be referred to the same committee." Forty-five roads have replied to questions contained in this year's circular, from which the committee presents the following report:

Water Glass Fittings and Mountings. Out of 45 roads making replies, 27 use tubular water glass, 14 the reflex, and 4 report using both. Four roads report having made comparative tests of the tubular and reflex glasses with the following results: One states that the reflex water glass, after test, was found no better than tubular; another, that the tubular with a protector was found more satisfactory; another, that the tubular has less visibility but lower maintenance cost, and another that after trial the reflex glass was regarded as unsatisfactory. These tests in a general way appear to favor the tubular glass, although it is conceded that both types of glass have their adherents, and it is likely that local conditions have a great deal to do with this question. The committee thinks that no valid objection can be taken to either type of glass, where properly installed and maintained.

Regrinding of reflex glasses was reported as successful by 4 roads, with fair results by 2, and without success by 3. The cost of regrinding was reported as varying from 7½c. to 45c. a glass. The principal thought to be extracted from the replies is that regrinding reflex glass is of questionable value.

Specifications for use in the purchase of gauge glasses were reported as not used by 30 roads and in use by 6; 4 of which use specification prepared by the New York Central Rd. The Pennsylvania Rd. also has a specification which has been adopted by the Union Pacific. A test of the various bullseye tubular and reflex glass by the digester and dipping methods will readily convince the observer of the necessity for such a specification, and the committee recommends that the committee on specifications for materials be requested to prepare a specification for gauge and water glasses for this association.

No trouble was reported from packing washers expanding, and clogging the passages. The precautions taken include care in packing, the use of a proper design of connections and repacking at regular intervals, if necessary.

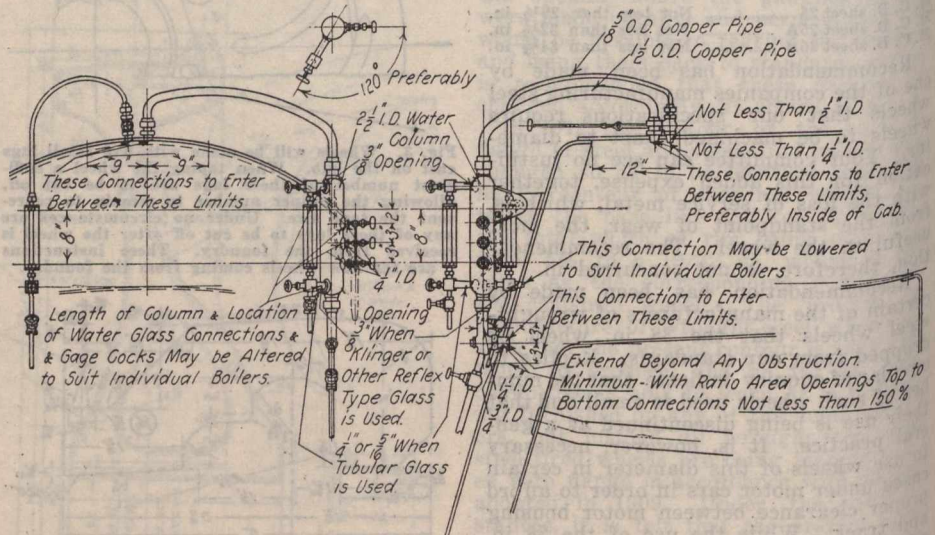
Results of experience with water columns were reported as follows: One road regards the water column as superior to all other arrangements; 11 state that it furnishes true readings 6 state that it is satisfactory; 5 regard it with disfavor, while 5 state that it is not satisfactory; one member stating that he believes it does not give true readings, and another states that there is a siphon action when gauge cocks are open, which causes the readings to vary as much as 5 or 6 in. from the true water level in the boiler. In commenting on the latter statement, it is the belief of the committee that some other unusual and undesirable condition existed, such as insufficient opening or proximity to a water tube.

With the usual types of modern wide firebox boilers, having sloping back head, and generally provided with arch tubes admitting large volumes of steam into the back water space, it is the belief of your committee that, in order to obtain more accurate readings, the application of gauge cock and water glass fixtures deserves careful consideration, and your committee believes that it should at this time present as recommended practice of the association the arrangement of water glass and gauge cock as developed and approved by the committee on standards, at Washington, as illustrated by its drawings X-100, which is reproduced in this report.

Beading Tools for Boiler Tubes or Flues.—From a comparison of the drawings of beading tools submitted, it appears that the essential detail of the tool is the throat or surface from which the bead is formed. In some cases the

The reports indicate a wide variation of practice without any apparent necessity for such variation, and your committee appeals to the association for its views as to the advisability of preparing and submitting a set of tools and operations for setting, beading and maintaining tubes and flues, the same to be presented next year to the association as recommended practice.

Proper Location of Blow-Off Cocks in Locomotive Boilers, and Reasons Therefor.—The number of blow-off cocks in use per locomotive varies from one to four. Some report blow-off cocks located on the belly of the cylindrical part of the boiler, but most of them are located on the water legs about the firebox. Some have one cock on each side of firebox with one on the throat sheet at the center. Some have only two blow-off cocks, one on each side of firebox, sometimes located near the center of the side,



Arrangement of water glass and gauge cock, developed by committee on standards, Washington, D.C.

tool is shown straight in the circumferential direction of the flue. The curve in the radial plane of the tube determines the radius of curvature and the size of the bead. In most cases a slightly larger radius for beading tools is used on superheater flues than on ordinary boiler tubes. In some cases the same tool is used for both classes of tubes. Some use a slightly different tool for maintenance of tubes than that used in resetting new work, thus making at least four different beading tools.

For beading the regular boiler tubes, the radius of curvature reported for beads varies from 1/8 to 11/64 in. The radius of curvature of the throat of the tool in the other direction is usually made the same for boiler tubes and superheater flues, and varies from 5/8 to 2 in., although, as stated above, some were made straight. The committee thinks that there is no essential reason for all of this variation, except the variation in the size of the bead, which is a function of the thickness of the flue. Reports indicate that practically all beading tools are maintained to size by regular periodical checking with standard gauges.

In regard to the method of expanding flues, there is considerable variation in the details of operations. Most roads use both the flue roller and the prosser expander, and follow closely in details of tools and in practice the recommendations of the Locomotive Superheater Co.

and possibly more frequently near the front corners. Two roads reported the use of a single blow-off, located on one side at the back corner of firebox, and connected to a perforated pipe lying along the mud ring in the back water leg under the fire door. Quite a number report the use of one blow-off cock located over the mud ring at the center of the throat sheet. The number and location of blow-off cocks is determined to a considerable extent by the kind and quality of water used for boiler feed. Very few failures, or troubles, with any of the blow-off valves in use were reported. Some failures occasionally occur from pieces of staybolts lodging in the valve. Trouble from leaking has been ascribed to lack of care in maintenance.

To reduce the danger of obstruction from scale and sludge, a great many blow-off valves are provided with some form of strainer. One road places the valve about 12 in. above the mud ring, with the idea of leaving the scale in the water leg below the valve when blowing off.

The practice of blowing off on the road is employed only by roads where water conditions make such practice necessary. Of 42 roads reporting, 22 do not open the blow-off cock on the road, and 8 only occasionally, or in emergency. The recommended essentials in construction to permit blowing off and closing on the road are; a valve rigging designed to be

operated from the cab, or from a safe position on the running board, the valve should be located so as to be in view of the operator when blowing off, the valve should be designed so that the boiler pressure will assist in closing and hold it to its seat. An auxiliary valve should be provided that can be closed in case the main valve fails. There should be a strainer to prevent scale and other obstructions from lodging in the valve. The valve should open full, have straight full passage, and be rigid in construction and positive in action.

Combustion Chambers.—The number of engines reported with combustion chambers was 2,152, with chambers varying in length from 5 to 88 in. Of these about 300 are reported with back flue sheet welded in place while the others are riveted. Out of 23 roads reporting combustion chambers, 18 use a transverse weld across the crown sheet at the rear, but 6 of these express a preference for continuous crown sheets, and the intention to apply continuous crowns on renewals.

One road with about 200 combustion chambers, is of the opinion that the cost of their maintenance overbalances any fuel economy obtained from their use. One road states that the combustion chamber permits of construction of longer boilers than otherwise would be practical. Another, without definite tests, can see no advantage in the combustion chamber over those of other designs. Three believe that flue troubles are reduced from the application of combustion chambers, and 11 believe that fuel economy is obtained from their use.

Troubles reported from combustion chambers include: the collection of cinders in the chamber resulting in the warping of sheets. Six have reported trouble from cracks in the throat sheets, one reports trouble from broken stays on long combustion chambers, which was corrected by the application of flexible stays, another reported trouble in keeping the water space under the chamber free from mud, one is of the opinion that the trouble from combustion chamber increases the cost of maintenance, ten report no troubles in maintenance, and one reports some trouble due to faulty design, and one says the flue sheets are easier to

apply with combustion chambers. Six roads reported experience with bridge walls, three of which were of the opinion that they are desirable and three were not. One thinks a bridge wall should be used only when necessary.

One road is of the opinion that the combustion chamber is essential in aiding the distribution of weight on large engines, one that it has little effect, and 14 consider that it is not essential for that purpose. It is the committee's view that on large modern engines a combustion chamber is practically a necessity, as a function of proper wheel base and weight distribution, proper length of tubes and superheater equipment, and that the additional direct heating surface of the combustion chamber added to the firebox heating surface is of distinct value in aiding evaporation, and further that if the use of combustion chambers is attended by increased maintenance, this has now become a necessary evil attending the large locomotive, and that these so-called evils can be largely reduced by proper design and proportion.

The minimum distance from crown sheet to inside of wrapper sheet is given at 25 in. by one, 23½ in. by another, and 20 in. by one. Some vary the distance with the size of the boiler, two giving the rule of making it equal to 15% of the diameter of the largest course; four endorse the standards followed by the locomotive builders, and eight have no standard practice.

In regard to lowering the crown sheet at the expense of the heating surface, 14 do not consider it justifiable, while two roads do, if necessary to maintain the standard minimum, and four state that it would depend upon the design. The recommended minimum distance between bottom flues and waist sheet varies from 2 in. to 7 in., and one recommends 10 in., with combustion chamber.

To lessen the entering of water into the dry pipe, 14 report the use of no special devices for this purpose, while four use a special throttle with inlet at the top of dome.

Three roads report on the test of special devices for promoting water circulation in boilers, two of which gave unsatisfactory results, while one claims

economy by the use of the Harter circulator plate for promoting water circulation in boilers. The latter consists of a horizontal baffle plate, extending from side to side of boiler, and extending to approximately 2 ft. from the front flue sheet to within 6 in. of the back flue sheet. It also has a series of 2 in. tubes at intervals along each side to conduct steam formed beneath the baffle plate to the space above same. The Nicholson thermic syphon is also referred to as a water circulating device.

Conclusions and Recommendations.—A review of the replies received to this circular fails to reveal much that is new. Apparently little out of the ordinary is being planned at the present time to develop locomotive boiler design. Briefly, the results of the evidence obtained on the different subjects of this circular are as follows:

Tubular water glasses suitably protected against accidents appear to be more popular than the reflex. Regrinding of reflex water glasses appears to be of doubtful value.

Beading tools in use are quite similar, and could probably be easily standardized if such a result is considered desirable. The same is true of the prosser expanders. The only variations apparently necessary are those required to care for the different thicknesses of tube sheet and the different thicknesses and diameter of tubes.

The number and location of blow-off cocks required per locomotive boiler depends on the conditions of service, and the quality of feed water used.

Combustion chambers, in general, improve combustion, and promote fuel economy, also tend to lessen tube troubles, but are subject to troubles in maintenance unless care is taken in their design.

In regard to water and steam space above the crown sheet, no evidence was submitted that would warrant the drawing of any definite conclusions thereon.

Your committee recommends the presentation of a specification covering tubular and reflex water glasses, and bulls-eye glasses for lubricators.

The committee endorses water glasses and gauge cocks applied to modern boilers in accordance with method approved by committee on standards.

Installation, Operation, Care and Maintenance of Superheater Equipment for Locomotives.

The committee, of which H. R. Warrick, General Superintendent Motive Power, Chicago, Milwaukee & St. Paul Ry., was chairman, reported as follows: Before outlining the recommended practice on this subject, we will present an item that received some consideration at one of the committee meetings, and about which it was not considered that, on account of the contradictory results obtained, it should be included in the recommended practice. It is the matter of providing swabbing on piston rods. Very little concrete data were furnished the committee relative to the value of maintaining swabbing on piston rods, only one road reporting at length on this subject.

This road has been making a study of the value of swabbing on different types of piston-rod packings, the identity of which packings is withheld. The information that has been reported is shown in the accompanying table. On the 5 in. diameter rods considerably better service

was obtained from packings without swabs. This was true in the first three types of packings mentioned, but on the D packing there was a slight difference favorable to the swabbing. On the 3¼ in. diameter rods the results are in support of the use of swabbing when we consider the results as a whole, but it will be noticed that exceptionally good service has been obtained from some of the packings without the use of swabbing. The results do not strongly support the opinion that piston-rod swabbing is essential to good service and, on account of the limited information that has been furnished along this line, your committee hesitates to make recommendation either for or against the use of swabbing.

Proposed recommended practice for installation, operation, care and maintenance of superheater equipment for locomotives.

Installation.—When parts are received from manufacturers they should be coat-

ed with some protective coating and stored under shelter until used. Care should be taken to see that the wooden protection blocks over ends of units and joints in headers are in place and used.

In the installation of the header the perfection of the joints should be thoroughly established, and care exercised to see that the header is placed in a level position before it is finally secured to the boiler. The same care with reference to the condition of the ball joints on the units and their seat in the header should be exercised. It is recommended that all ground joints should be bolted in place, metal to metal, without any medium other than a coating of oil to bring the joints to set without causing any undue friction.

Bolts, either heat treated or of special steel, should be employed in securing the units to the header.

Care should be exercised to see that the operating cylinder is properly located on the damper shaft so as to give the

piston sufficient movement to provide the proper opening for the dampers.

In closing the opening around the steam pipe, where it passes through the smoke box, a fibrous packing or cement should not be used. A metal covering should be used in such a manner that it can be fastened both to the smoke box and to the steam pipe. See exhibit A for suggestion of two methods that have been successfully used for this purpose. After the superheater and steam pipes are completely placed and hydrostatic test is applied, if any ball joints are found leaking they should be taken out and reground, as tightening a bolt will not repair an imperfect joint.

After superheater header and units, piston and valves have been applied, the throttle valve should be blocked down and steam test blown back through steam chest and superheater units. When these parts become heated, tighten all joints.

When superheaters are installed some provision should be made for supplying

Superheater locomotives should be handled only when the air brakes are in operative condition.

It is essential that the oil supply for the lubrication of the valves and cylinders on a superheater locomotive should be constant, as the high temperature will cause serious damage to these parts if there is an interruption of their lubrication. When locomotives are not equipped with drifting valves the throttle should be slightly open when drifting, in order to avoid the suction of hot gases into the steam chests and cylinders. The position of the superheater damper can be determined by observing the position of the counterweight attached to the damper shaft, and the engineman should know that the damper is wide open when steam is being used.

Care and Maintenance. — At regular periods, and preferably when the monthly Federal inspections are made, there should be a thorough inspection of all parts which come in contact with the fire

against its seat.

The special tools recommended by the Locomotive Superheater Co. for installing and maintaining superheaters should be employed.

When, for any reason, superheater units are removed from boiler they should be tested before being returned, with a cold water pressure of at least 20% in excess of nominal boiler pressure.

Unit bands and supports should be inspected whenever units are removed, and renewed if necessary, to ensure units always being properly supported and in correct relation to the flues.

When replacing superheater units, bolts should be renewed when there is any evidence of deterioration either in the condition of the thread or worn or pitted condition of the bolt. In all cases, a new nut should be applied and used as the pulling nut in setting the unit in place. An old nut can then be applied as a locking feature after the unit has been properly seated.

In regrinding the ball joint of the unit and the socket joint of the header, the original contour of these surfaces should be maintained.

After removal of the units, seats should be protected with a protecting coating and covered to prevent injury to seats, and entrance of foreign substances into unit pipes.

All dirt should be removed from the top of the header or T bolt slots before the superheater is reassembled.

Comparative merits of hydrostatic and force-feed lubrication for locomotive cylinders and steam chests and best method of application.—The committee gave this matter considerable study, and for the reason that there is no definite information available on which to base conclusions, is unable to make any recommendations at this time. The committee proposes, if continued, to further study the subject and outline a programme of tests to be followed on several different railways, the data obtained from these tests to furnish a basis for drawing some definite conclusions as to the relative value of hydrostatic and force-feed lubrication.

Economical diameter of piston valves of superheater locomotives, with recom-

Comparison of service of piston-rod packings as influenced by the use of swabbing on piston rods on superheater locomotives.

| Kind of packing | ITEMS | Passenger service. 5-in. diam. rods. | | Mallet locomotive h.p. engine 3 3/4-in. diam. rods. | |
|-----------------|-------------------------------|--------------------------------------|---------|---|---------|
| | | Swabbing. | | Swabbing. | |
| | | With | Without | With | Without |
| A | Number of rods equipped | 4 | 2 | 3 | 3 |
| | Number of sets renewed | 16 | 4 | 3 | 1 |
| | Average mileage | 7 240 | 20 247 | 9 002 | 18 850 |
| B | Number of rods equipped | 3 | 3 | 3 | 3 |
| | Number sets renewed | 13 | 8 | 3 | 2 |
| | Average mileage | 6 663 | 8 944 | 14 004 | 12 028 |
| C | Number of rods equipped | 3 | 3 | 3 | 3 |
| | Number sets renewed | 6 | 5 | 7 | 22 |
| | Average mileage | 14 359 | 18 648 | 2 384 | 2 007 |
| D | Number of rods equipped | 2 | 2 | 2 | 2 |
| | Number sets renewed | 5 | 4 | 9 | 6 |
| | Average mileage | 9 810 | 8 679 | 3 503 | 2 390 |
| Total | Number rods equipped | 12 | 10 | 11 | 11 |
| | Number sets renewed | 40 | 21 | 22 | 31 |
| | Average mileage | 8 379 | 13 357 | 5 329 | 3 271 |

a limited amount of steam for use when drifting.

A limited number of pyrometers should be applied to superheater locomotives on each division for the educational value they would possess.

When superheaters are applied to existing equipment the front end door should be made sufficiently large to permit working to advantage in removing or applying units. It is recommended that the clear opening be 42 in. in diameter. This dimension can easily be arranged on new locomotives.

Operation.—Locomotives equipped with superheaters should, in general, be operated in the same manner as locomotives using saturated steam. The cylinder cocks should normally be open when the locomotive is standing under steam, and when the locomotive is started they should remain open until dry steam appears. In starting a superheater locomotive, the reverse lever should initially be placed for full travel of the valves, and at all times the water level in the boiler should be such that there will be no possibility of water being carried into the superheater. Water carried into the superheater will be evaporated into saturated steam or steam with a low degree of superheat, seriously affecting the economies available through proper operation; also water carried into the superheater may flash into steam after the throttle has been closed, placing the locomotive to that extent beyond the control of the locomotive man. Water carried into the superheater in quantities sufficient to reach the valves and cylinders will remove the lubrication from these parts and may result in knocking out cylinder heads or other damage.

or with the products of combustion. There should be a careful inspection for steam leaks, and the entire front end arrangement should be carefully examined.

When the locomotive receives this periodical inspection, each flue in the boiler must be thoroughly cleaned by blowing out with compressed air supplied through

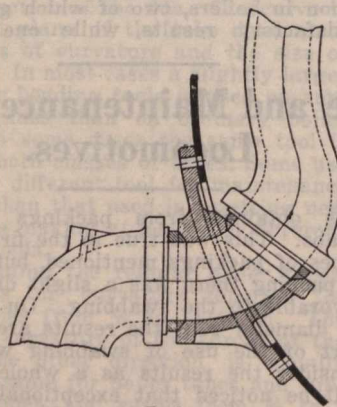


Fig 1

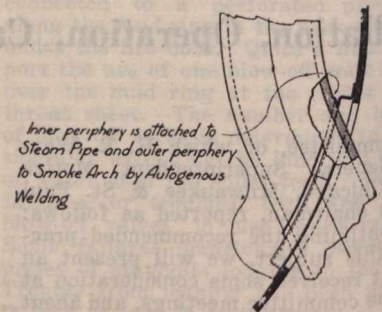


Exhibit "A"

Fig 2

a pipe of sufficient length to extend entirely through the flues; the flues also should be cleaned whenever necessary between the periods when the periodical inspections are made.

At the time of the periodical inspection, the superheater damper should be connected to the shop steam or air line, in order that the damper may be operated and the rigging checked for lost motion and the damper opening also checked; it should also be known that the damper piston travels through the full stroke and makes a steam-tight joint

mentation for standard practice in connection with various cylinder diameters. This question has been studied at quite some length, and a number of roads reported to the committee relative to the dimensions of their leading locomotives for passenger, freight and switching services. Among the items reported were the valve diameter, the cylinder diameter, the stroke of the piston, diameter of drivers, area of steam ports, maximum cut-off, port opening at said maximum cut-off, and several other items tending to work out a relation between the valve

diameter and steam demand of the cylinders.

Among the variables encountered are the travel of the valve, the port openings, the cross sectional area of the various elements of the entire steam passageway

between the boiler and the cylinder. By giving this subject a little thought it will be appreciated that no one item can be fixed as long as there are any variables to take into consideration. If such items as port area and valve travel are

fixed, then the diameter of a valve can be ascertained that will supply the proper amount of steam for a certain piston displacement.

For the above reasons, we are unable to make recommendations at present.

Car Construction Committee Report.

The committee on car construction, of which W. F. Kiesel, Jr., Mechanical Engineer, Pennsylvania System, was chairman, and of which J. Coleman, Assistant to General Superintendent Motive Power and Car Departments, G.T.R., and W. J. Robider, General Master Car Builder, C.P.R., were members, reported on questions referred to the committee, suggesting changes to existing standards and practice, with reasons therefor, as follows:—

Pressed Steel Journal Boxes.—An opinion was requested whether the application of pressed steel journal boxes in repairs constituted wrong repairs.

Sheets 8 and 8-A, standard journal box for journal 5 by 9 in.; sheet 11, standard journal 6 x 11 in., contain notes per sheet 12-B, standard journal box for journal 6 by 11 in., contain notes permitting the use of cast iron, malleable iron, pressed steel, or cast steel, provided all the essential dimensions are adhered to. In the opinion of your com-

mittee is opposed to any consideration of the rebuilding of existing cars providing them with wide side doors, as the framing will be inadequate, unless entirely rebuilt, and does not recommend that all box cars should be built with wide doors to facilitate the loading of automobiles, for the reason that the cost of cooping such cars will be approximately twice the cost of cooping a car with 6-ft. doors. The failures of double doors in service will result in a very considerable increase in the number of cars out of service for defective doors. The first as well as the maintenance cost will be increased. For the reasons given above, the cars with wide side doors should be considered as special cars; only to be provided in such numbers as traffic conditions warrant. It is recommended that the association's executive committee endeavor to bring about very close co-operation between railways and manufacturers who ship raw materials or parts to automobile manufacturers, to

tom door guides from 1 to 1 3/4 in., increasing the depth of bottom Z-bar to correspond.

It is the observation of the committee that car doors equipped with door fastenings, bottom Z-bar and door guides in accordance with, or equivalent to, the designs shown on sheet 30, are very seldom found defective as to these parts. There are, however, many thousands of cars in service which have no metal protection on the bottom edge of door, so that the corners of the door decay, and may readily be forced over the guides and opened at the back edge without breaking the seals. There are thousands of cars in service with hasp cored so that the metal is barely 1/8 in. thick, and with the door lock, consisting of a small malleable casting, fastened on the face of the wooden door stop with only two bolts and the door hasp fastener or staple, consisting of a small hook, fastened with only one bolt. It is the usual condition of cars equipped with this small staple

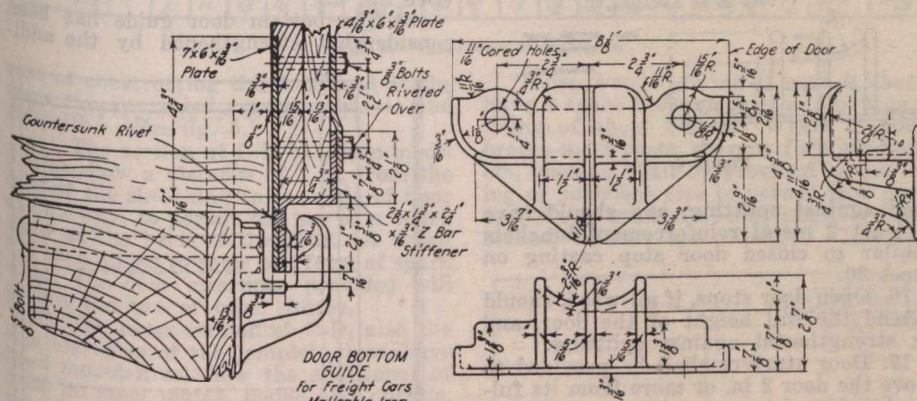


Figure 1.

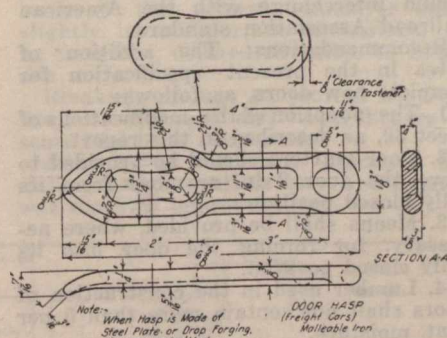


Figure 2.

mittee the bottom lugs on these boxes are an essential part of the box, both in strength and location, for all trucks which depend for their integrity on the proper holding power of the bottom tie bars, but that these bottom lugs are not an essential part of the box for trucks with cast steel or other sides frames which do not require the bottom tie bar.

Recommendations.—1. Add the following note to each sheet showing standard freight car journal boxes: When used with side frames of such design that the bottom tie bar is omitted or is not an essential strength member for carrying the load, the bottom box lugs may be omitted. When used in connection with other side frames, the bottom box lugs must be equivalent, both in location and strength, to those shown..”

2. Add the completed notes to all other freight car journal box drawings.

Automobile Side Doors.—The committee's 1919 report made reference to a request of the General Motors Corporation that 10 ft. double side doors with movable post should be used on all box cars. This request has been renewed, and your committee has adopted the following resolution, and recommended sending it to the American Railroad Association's executive committee: "That the

end that orders for cars for such shipments shall specify that automobile cars are to be furnished to as great an extent as available. This arrangement will automatically return to the automobile manufacturers many automobile cars which are now being sent elsewhere."

Car Doors and Fixtures.—The subject of box car doors has been brought very prominently to the committee's attention, in many different phases, and demands immediate, decisive and constructive action by this association. A number of communications relating to defective door fastenings have been received, the causes for complaint being broken door fastenings, door guides fastened with lag screws, or fastened with bolts in such a way that guides could easily be removed.

Standard sheet 30, revised in 1914, made several changes from previous practice, as follows:

1. Increased the number of bolts holding door locks from 2 to 3, the third bolt being placed on the side of the car where it would support the lock against tipping.

2. Provided a wrought iron strap extension to the door hasp fastener, making it 24 in. over all.

3. Increased the height of lip of bot-

either to have the staple torn off or the front edge of the door broken off.

In 1914 the committee revised several of the important details on sheet 30, standard box car, outside hung side door, and submitted specification for reinforcing doors on existing box cars, which specification, however, was not adopted and when again submitted in 1916 was again rejected. Your committee believes that the complaints previously referred to in this report are legitimate, and that it is our duty to remove the causes for them, and, if this is to be done, it is necessary that this association should adopt some form of specification governing the reinforcement of doors on existing cars. Your committee submits, for the third time, specification for this purpose, which has been amplified to include, among other things, a Z-bar at the bottom of the door. It is believed that most of Mr. Crawford's complaint in regard to opening of doors without breaking seals comes from cars having doors without bottom Z-bar protection, so that the doors decay at the corners and can readily be lifted over the bottom guides.

That portion of the loss which is made possible by the removal of bottom guides would be eliminated by the use of guides which cannot be removed when door is

in closed position, as called for by the specification submitted in 1914. Your committee is this year recommending one such design for addition to sheet 30. (See fig. 1.)

In submitting the new design of hasp a note is added that when the hasp is drop forged, or of steel plate, the ribs may be omitted. All-steel doors should have locks, hasp and fastenings considerably stronger than are being recom-

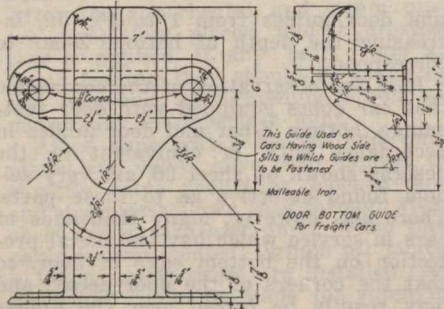


Figure 3.

mended on sheet 30, in view of the greater weight and inertia of such doors; but, as the all-steel doors are comparatively few in number, the committee feels that it is preferable to have the present standard designs of the association cover wooden doors only, including steel framed wooden doors, and let the all-steel doors be covered by special designs. The hasp provided for the all-steel doors should interchange with the American Railroad Association standard.

Recommendations: The addition of notes in the present specification for complete new doors, as follows:

1. The adoption of the modifications of sheet 30, as described in this report.
2. Door starters should be provided to move the door 2 in. or more from its fully closed position.
3. Means shall be provided, where necessary, for forcing the door into its fully closed position.
4. Lumber used in the construction of doors shall not contain more than 5 per cent. moisture.
5. Door rollers must be carried on turned or cold rolled steel pins. Pins must be a driving fit in bracket or housing. Rollers must be drilled not more than 0.01 in. larger than pin, and outside of roller must be turned or ground so that it will be round and concentric with the bore.
6. If bottom supported door is used, the lap of the Z-bars, both top and bottom, shall be equivalent to bottom Z-bar, as shown on sheet 30. Rollers must conform to the above specification, and there shall be sufficient rollers provided so that door is always carried on at least two rollers.
7. That the specification for new car doors, adopted in 1915, and revised as above, should be extended to cover the application of complete new doors and door fixtures to existing cars.
8. The adoption of the following specifications for reinforcing existing car doors:
 8. Top of door shall be reinforced by a 1 1/2 x 1 1/2 x 3/16 in. angle, or its equivalent, extending horizontally the full width of the door and not more than 12 in. from the top.
 9. Bottom of door must be reinforced by 2 1/2 x 1 3/4 x 3/16 in. Z-bar, or its equivalent, applied as shown in sheet 30.
 10. Depending leg of Z-bar, or other construction which engages bottom guides, must not be less than 1 3/4 in.
 11. There shall be not less than 4 bot-

tom door guides on each side of car, located as shown on sheet 30, and of the same or equivalent design.

12. If the design of door is such that the removal of the door guide next to the back door post would permit the door to be pulled away from the car, then this door guide shall be of the same design as shown on sheet 30, or its equivalent, for this particular location.

13. Door hasp fastener shall be at least 24 in. long, the same as, or equivalent to, the design on sheet 30, fastened with not less than five 3/8 in. carriage bolts, with nuts on inside of door, and bolts riveted over. Fastener shall be of such design that hasp cannot be removed without removing bolts from fastener.

14. Door locks shall be secured by not less than two 1/2 in. carriage bolts through the closed door stop, and one additional 1/2 in. bolt through the side of car, with all nuts on inside and bolts riveted over nuts.

15. Closed door stop shall have 2 or more lips extending at least 1 1/2 in. over the door, to support it against bulging outward. Where all-wood closed door stops are used, they should be strength-

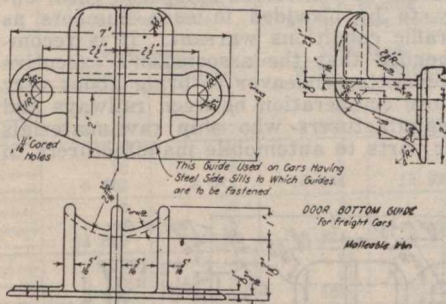


Figure 4.

ened against splitting, and should have at least 2 metal reinforcement brackets similar to closed door stop casting on sheet 30.

16. Open door stops, if all-wood, should extend the full height of the door, and be strengthened against splitting.

17. Door starters shall be provided to move the door 2 in. or more from its fully closed position.

18. Means shall be provided, if necessary, for forcing the door into its fully closed position.

19. Lumber used in the construction of doors shall not contain more than 5% moisture.

20. Lap of door over door post shall not be less than 2 1/2 in.

21. The proper clearance must be provided, so that 3/8 in. bulging of side of car will not interfere with the free movement of the door.

22. Door rollers must be carried on turned or cold rolled steel pins. Pins must be a driving fit in bracket or housing. Rollers must be drilled not more than 0.01 in. larger than pin, and outside of roller must be turned or ground so that it will be round and concentric with the bore.

23. Door must be designed and vertical clearance provided, so that under any service conditions there will be no binding of the door on account of vertical interference of door guides or track.

24. If the bottom supported door is used, the lap of the Z-bars, both top and bottom, shall be equivalent to bottom Z-bars, as shown on sheet 30. Rollers must conform to the above specification, and there shall be sufficient rollers provided so that door is always carried on at least 2 rollers.

Fastening of End Doors.—Resolution adopted by the Association of Railroad Chiefs of Police, communicated by R. S. Mitchell, Chief of the Secret Service and Police Section, recommending the fastening of small end doors on the inside before loading, and removal of seal fastening from doors that are so fastened. In 1913, the Master Car Builders' Association adopted as recommended practice, that end doors must be constructed that, when closed, they lock automatically from the inside of the car, thus avoiding the necessity of taking seal records. Sheet 30 shows a design of inside fastening which is not automatic, and your committee recommends that recommended practice adopted in 1913 should be advanced to standard, and that the design of inside latch shown on sheet F should be removed, and a note substituted that the fastening should lock the door automatically from the inside of the car. Your committee has made this recommendation to the executive committee, and has advised Mr. Trenholm accordingly.

Revision of Manual.—Your committee has modified certain details on sheet 30, and has added others for your consideration, as follows:

(a) Door hasp has been strengthened by the addition of ribs, and certain unimportant dimensions have been modified, which will greatly increase its strength. The new design is entirely interchangeable with the former design. (See fig. 2.)

(b) The bottom door guide has been considerably strengthened by the addi-

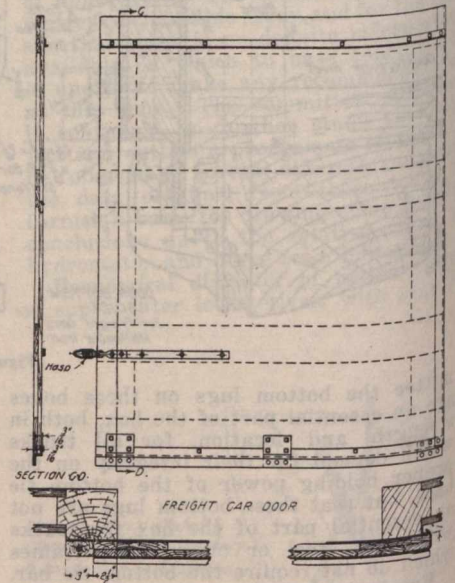


Figure 5.

tion of ribs, and two designs have been shown, one for use where the guide is riveted directly to steel side sills, and the other, which is extended downward to provide more bearing surface for use when bolted against wooden sheathing. (See figs. 3 and 4). A note has been added that door guide bolts should be applied with nuts on the inside of the sill, and bolts thoroughly riveted over the nuts.

(c) A design of burglar proof bottom door guide has been added, in which the guide is fastened with carriage bolts, with the heads inside, and the nuts applied with a socket wrench. When the door is in place the bottom Z-bar covers up the nuts so that the guide cannot be removed. This design has another advantage in having the fastening bolts directly behind the point where the strain

comes on the guide so that the tendency to pull guides downward and away from the side of the car will be much less than with designs where the bolts are lower down. (See fig. 1.)

(d) The construction of the door itself has been changed to eliminate four diagonal braces and add one more horizontal batten, the object being to reduce the

sill as construction will permit. After the sheathing has been thus thoroughly secured the space between the ends of floor boards and sheathing shall be carefully filled with a plastic compound which does not become brittle in cold weather. It should then be further protected with triangular grain strips, not less than 3 in. by 3 in.

Association, at Milwaukee, Sept., 1918.
Brine Dripping on Rail, Etc.—Reports presented to the American Railway Engineering Association, on injury to signal equipment, bridges and tracks, due to brine drippings from refrigerator cars, indicate a necessity for definite action. The following rules, which are now recommended practice, should be advanced to standard:

1. All salt water drippings should be retained in the ice tanks and drained off at icing stations.

2. The total capacity of drain openings should not exceed the capacity of traps, and the capacity of both drains and traps should be sufficient to release all drippings within the time limit of icing the train.

3. The mechanism adopted for handling drain valves should be simple and positive, and so designed as to ensure closing the valves before hatch plugs can be returned to their places.

4. Salt drippings should be conducted from ice tanks through the regular traps and drain pipes.

5. Paragraph F, of Interchange Rule 3, has been extended from time to time. It is recommended that no further extension be made, and that this rule be enforced beginning October 1, 1920.

After affirmative action on the above, refrigerator car owners should be advised.

Minor Adjustments of Standards.—On account of additions to standards at intervals of time by different committees, some of the present standards differ slightly in unimportant dimensions. It is, therefore, deemed advisable to establish uniformity.

Breakage of lugs on journal bearings has been reported, and strengthening of same has been suggested.

Journal box lids now standard are claimed to be unsatisfactory, and request was made to improve same.

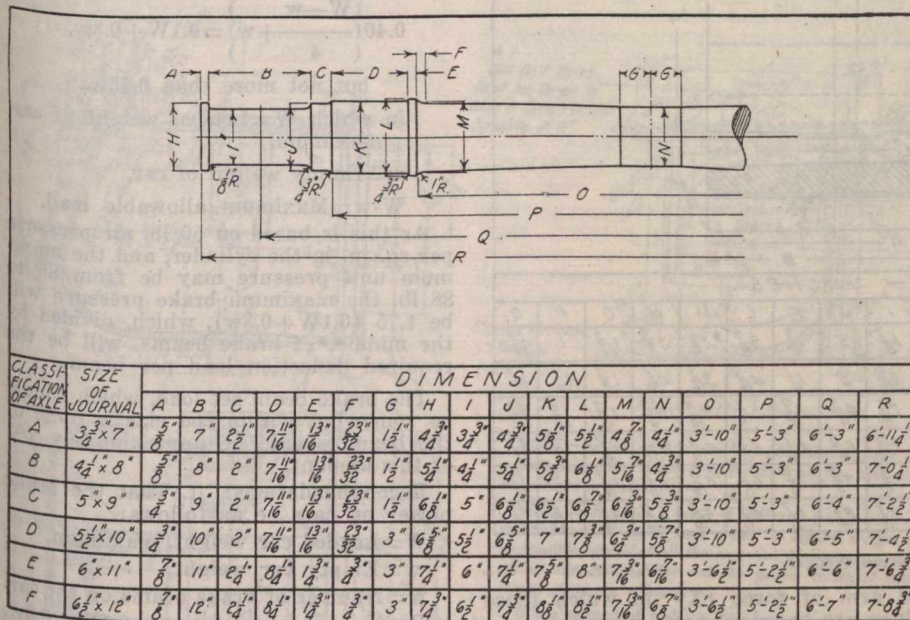


Fig. 6. Tabulation of Axles.

cost of constructing the door, and at the same time provided greater stiffness and strength. (See fig. 5.)

(e) The section at C-D has been modified to show a distance of 1 in. from the face of the sheathing to the edge of floor at doorway, to permit the use of a spark strip at the back of the door. A detail has been added to show one form of spark strip; the door clearance provided will permit the use of other forms.

(f) The cross section at C-D, also the side elevation of the complete door, have been modified to show the additional of 5/32 in. steel plates, inside and outside, for the purpose of supporting the bottom Z-bar.

(g) The cross section through closed door post has been modified to reduce the width of the wooden door stop to 3 in. and increase the lap of the door over the door post to 2 1/2 in. to provide better waterproofing.

Prevention of Grain Leaks and Retention of Grain in Pockets Behind Lining of Box Car.—A number of communications were submitted, including statistics showing considerable loss, both on account of grain leaks between side sills and loose siding boards, and on account of pockets back of lining, which cannot be emptied without cutting the lining.

Recommendation: Section 10, of circular 8, issued by the Assistant Director, Division of Operation, U.S. Railroad Administration, modified as indicated in the text below, should be made standard:—

"Where sheathing is nailed to the outside of sills it should be further held in place by angle iron, channel iron, or strap, securely bolted in place to ensure sheathing being held tight against side sill, to prevent grain leaks, bolts to have single nuts and be riveted over. The spacing of bolts shall not exceed 12 in. The preferable construction is to use dropper bar D-24, Jones & Laughlin catalogue, 0.84 lb. per ft. These reinforcing bars shall be located as near top of side

"When wooden lining is used it should have a space between floor and bottom of lining of about 2 1/2 in. Where diagonal braces meet posts, thereby forming pockets, opening shall be provided in the lining of sufficient size to permit free passage of any grain that may possibly lodge behind wooden side linings. The ver-

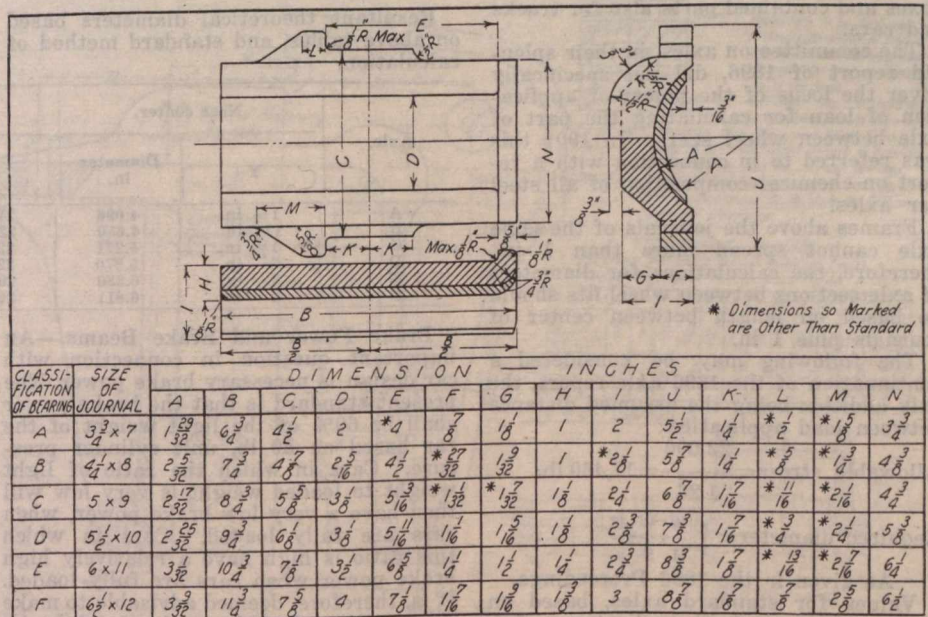


Fig. 7. Tabulation of Journal Bearings.

tical dimension of the opening for this free passageway above the point of pocket, formed by the intersection between post and brace, shall be about 2 in."

Note.—These recommendations are based on resolutions adopted by a joint conference of terminal grain weighmasters and committee on uniform grain weighing, of the National Scale Men's

Present axle capacities increase by steps, which can be made more uniform by increasing the capacity of the axle with 5 1/2 x 10 in. journals from 38,000 to 40,000 lb., the present dimensions being such that the allowable stresses will not be exceeded. It was suggested to add another axle with 6 1/2 x 12 in. journals, capacity 60,000 lb. and bearing, wedge and box to suit.

This committee intends that no existing cars should be marked up in capacity on account of this increased rating of axle D with 5½ x 10 in. journals, until they have received permission to do

Values for ratio (R) of $\frac{M}{w}$ at edge of cylindrical center portion, at inside of collar and at wheel fit 24 in. from center

allowable load, and to base this on 50 lb. unit cylinder pressure. This will serve to more nearly equalize the brake power on freight cars with average loads. The possible maximum per cent. of brake power for the lightest cars would be 75% of the light weight of car, based on 50 lb. unit cylinder pressure. The formulae for brake power will then be as follows:

$$0.40 \left(\frac{W-w}{4} + w \right) = 0.1W + 0.3w.$$

but not more than 0.75w.

in which W=Loaded weight of car, maximum,

w=Empty weight of car,

W-w=Maximum allowable load.

As this is based on 50 lb. air pressure per sq. in. in the cylinder, and the maximum unit pressure may be from 85 to 88 lb. the maximum brake pressure will be 1.75 (0.1W+0.3w), which, divided by the number of brake beams, will be the required deflection load per beam.

The brake beam set load, which should be somewhat within the elastic limit of the beam, should be approximately 1½% of this amount.

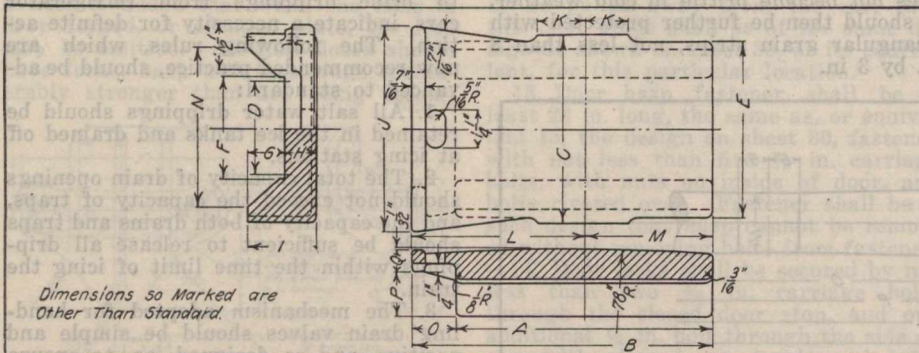
Recommendations: 1. That the brake power on cars be as follows:

W=Loaded car weight, maximum,

w=Empty car weight,

N=Number of brake beams on the car.

Required brake power = 0.1W+0.3w,



Dimensions so Marked are Other Than Standard.

| CLASSIFICATION OF WEDGE | SIZE OF JOURNAL | DIMENSION - INCHES | | | | | | | | | | | | | | | | |
|-------------------------|-----------------|--------------------|----------|-------|---------|-------|-------|-------|-------|---------|-------|-------|--------|---------|--------|---------|--------|--------|
| | | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q |
| A | 3½ x 7 | *5 3/8 | *6 9/16 | 4 1/2 | 2 1/8 | 3 3/4 | 2 1/4 | 1 | 3/4 | 1 3/4 | 5 | 1 1/4 | 3 7/8 | *2 1/16 | 3 3/8 | *1 1/16 | 1 | 2 3/32 |
| B | 4½ x 8 | 6 3/8 | 7 3/4 | 4 7/8 | 2 11/32 | 4 1/2 | 2 1/8 | 1 1/8 | 7/8 | 1 15/16 | 5 | 1 1/4 | 4 1/8 | 3 1/16 | 4 1/16 | 1 3/8 | 1 1/16 | 2 7/32 |
| C | 5 x 9 | 7 3/8 | 8 3/4 | 5 5/8 | 3 1/8 | 5 1/4 | 3 3/8 | 1 1/8 | 1 | 2 1/16 | 6 3/4 | 1 1/8 | 5 1/16 | 3 1/16 | 4 3/4 | 1 3/8 | 1 1/16 | 2 3/32 |
| D | 5½ x 10 | 8 3/8 | 9 13/16 | 6 1/8 | 3 1/8 | 5 3/4 | 3 3/8 | 1 1/8 | 1 | 2 1/16 | 6 3/4 | 1 1/8 | 5 5/8 | 4 1/16 | 5 3/4 | 1 1/8 | 1 1/16 | 2 3/32 |
| E | 6 x 11 | 9 3/8 | 10 13/16 | 7 1/8 | 3 9/16 | 6 7/8 | 3 3/8 | 1 3/8 | 1 1/8 | 2 1/2 | 7 3/4 | 1 1/8 | 6 1/8 | 4 1/16 | 6 1/8 | 1 1/8 | 1 1/16 | 2 5/32 |
| F | 6½ x 12 | 10 3/8 | 11 13/16 | 7 5/8 | 4 1/16 | 7 3/8 | 4 1/4 | 1 1/2 | 1 1/8 | 2 5/8 | 8 1/4 | 1 1/8 | 6 5/8 | 5 1/16 | 6 7/16 | 1 1/8 | 1 3/32 | 2 7/8 |

Fig. 8. Tabulation of Journal Wedges.

so from the American Railroad Association. When asking permission for this increased marking they shall present evidence that the trucks and cars are of a strength commensurate with the proposed increase in the load of the axle. In no case shall cars be changed by other than the owner.

To avoid the usual confusion in nomenclature of axles, boxes, trucks and cars, it is thought advisable to classify the axles according to their letter, and to use this as a classification basis for boxes and contained parts also for trucks and cars.

The committee on axles, in their splendid report of 1896, did not specifically cover the locus of the points of application of load for calculating the part of axle between wheel seats. In 1901 this was referred to in connection with a report on chemical composition of all steel car axles.

Frames above the journals of the same axle cannot spread more than 1 in., therefore, the calculations for diameters of axle sections between wheel fits should be based on length between center of journals plus 1 in.

The following may be considered a continuation of the 1896 axle report, the only addition being the assumed distance between load application:

$$\text{Allowable stress} = \frac{22,000}{1.26} = 17,460 \text{ lb.}$$

$$\text{Required diameter} = \sqrt[3]{\frac{W \cdot W \cdot 32}{M \cdot S \cdot X}}$$

As given in the 1896 Proceedings. Values for standard axles, based on distance between load applications of L (distance between centers of journals) plus 1 in.

| Axle. | Capacity lb. | L+1 in. | $\frac{M}{W}$ | $\frac{W \cdot 32}{X \cdot S}$ |
|-------|--------------|---------|----------------|--------------------------------|
| A | 15,000 | 76 in. | 15.00414—196X | 8.751 |
| B | 22,000 | 76 in. | 15.00414—196X | 12.835 |
| C | 31,000 | 77 in. | 15.49821—200X | 18.085 |
| D | 40,000 | 78 in. | 15.99228—2035X | 23.335 |
| E | 50,000 | 79 in. | 16.48635—2071X | 29.170 |
| F | 60,000 | 80 in. | 16.98042—2106X | 35.003 |

and arm of force (X) on which these values are based.

| Axle. | Near center. | | Inside of collar. | | At wheel fit. | |
|-------|--------------|---------|-------------------|----------|---------------|----------|
| | X | R | X | R | X | R |
| A | 36 1/2 in. | 7.85014 | 15 3/4 in. | 11.91714 | 14 in. | 12.23214 |
| B | 36 1/2 in. | 7.85014 | 15 3/4 in. | 11.91714 | 14 in. | 12.23214 |
| C | 37 in. | 8.09821 | 16 1/4 in. | 12.24821 | 14 1/2 in. | 12.59821 |
| D | 36 in. | 8.66628 | 16 3/4 in. | 12.58365 | 15 in. | 12.93978 |
| E | 36 1/2 in. | 8.92720 | 19 in. | 12.55145 | 15 1/2 in. | 13.27630 |
| F | 37 in. | 9.02622 | 19 1/2 in. | 12.77112 | 16 in. | 13.55682 |

Resultant theoretical diameters based on above tables, and standard method of calculation.

(Y=distance from center of axle.)

| Axle. | Near center. | | Inside of collar. | | At wheel fit. | |
|-------|--------------|--------------|-------------------|--------------|---------------|--------------|
| | Y | Diameter in. | Y | Diameter in. | Y | Diameter in. |
| A | 1 1/2 in. | 4.096 | 24 1/4 in. | 4.707 | 24 in. | 4.748 |
| B | 1 1/2 in. | 4.650 | 22 1/4 in. | 5.348 | 24 in. | 5.395 |
| C | 1 1/2 in. | 5.271 | 22 1/4 in. | 6.050 | 24 in. | 6.108 |
| D | 3 in. | 5.870 | 22 1/4 in. | 6.647 | 24 in. | 6.709 |
| E | 3 in. | 6.386 | 20 1/2 in. | 7.154 | 24 in. | 7.289 |
| F | 3 in. | 6.811 | 20 1/2 in. | 7.646 | 24 in. | 7.800 |

Brake Power and Brake Beams.—An important question in connection with car design is necessary brake power. The present standard is that the brake power shall be 60% of the light weight of the car based on 50 lb. unit cylinder pressure. Cars in which the ratio of light weight to loaded weight is very low will then have a very low brake power, when cars are fully loaded. Cars in which this ratio is high have a relatively high brake power when cars are fully loaded. It is, therefore, deemed advisable to make a change, and to base the total brake power of the car on 40% of the sum of the light weight plus ¼ of the maximum

which, for cars having four and six wheel trucks, will be:

| Axle. | BRAKE POWER | |
|-------|-------------------|------------------|
| | Four-wheel trucks | Six-wheel trucks |
| C | 13 200+ .3w | 19 800+ .3w |
| D | 16 900+ .3w | 25 350+ .3w |
| E | 21 000+ .3w | 31 500+ .3w |
| F | 25 000+ .3w | 37 500+ .3w |

2. That the brake beam deflection load be $\frac{1.75}{N} (0.1W + 0.3w)$.

3. That the brake beam set load be $\frac{3}{N} (0.1W + 0.3w)$.

If the above is adopted the 12,000 lb. beam will be required as follows:

| Car class | Car weight |
|-----------|----------------------|
| 4 B | All cars, |
| 4 C | Less than 50,000 lb. |
| 4 D | Less than 40,000 lb. |

The 15,000 lb. beam will be required as follows:

| Car class | Car weight |
|-----------|--------------------------|
| 4 C | 50,000 lb. and over, |
| 4 D | 40,000 lb. to 60,000 lb. |
| 4 E | Less than 45,000 lb. |

4. That the 6,500 lb. capacity beam be dropped from the standards and that the 12,000 lb. capacity beam be denominated as the no. 1 beam, and that the interchange rules should be amended to conform to the foregoing.

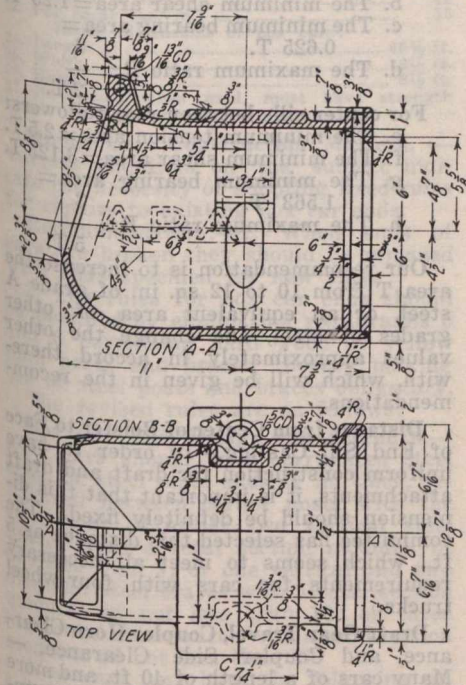
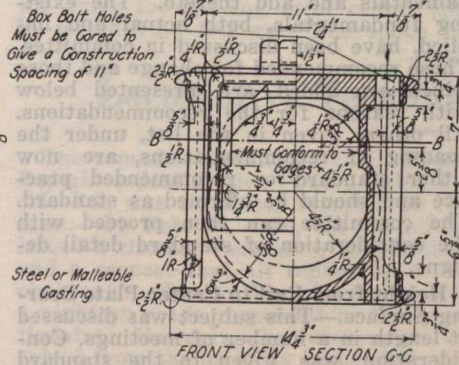


Figure 9.

opening to hold wedge to be so provided. Increase width of dust guard cavity in the 3 3/4 in. by 7 in. box to 6 3/4 in., and in the 4 1/4 in. by 8 in. box to 8 in.

11. The committee's attention was called to the fact that the standard passenger car pedestals have shown weakness and a large number of them break, indicating a necessity for redesign.



NOTE—Section of Box may be made either circular or square below the center line, provided all the essential dimensions are adhered to.

When Journal Box is made of Malleable Iron, reduction in thickness of metal and coring to lighten weight is permissible, provided all the essential dimensions, which affect interchangeability and the proper fitting of contained parts are adhered to.

If the method of molding does not permit of placing the letters A. R. A. on the side of the Journal Box, they may be placed on the top between hinge lug and the arch bar seat.

3. Functions.—(a) Lid must protect the journal by preventing the entrance into the journal box of dust, sand, fine coal, or other foreign matter.

(b) Lid should prevent oil from working out of the end of the journal box.

4. Construction.—(a) Lid to be attached to the journal box by a fastening so arranged that it can be easily opened and closed, but it must retain itself in a fully open position without danger of closing.

(b) When closed, the tension between the lid and fastening must be sufficient to prevent vibration of lid or any parts thereof.

(c) Lids of the hinged type to have the hinge located at the top of the journal box, so arranged that the lid will open outward and upward to an angle of 90 deg. with the lid face of the journal box. Lids of other types should provide an equivalent opening.

(d) A tight contact between the lid and the face of the journal box must be maintained in order to meet the requirements as stated under item 3. For journal boxes used on passenger train equipment a machined fit is recommended.

(e) A ledge, flange, or other suitable arrangement, should be provided on the inside of the lid, particularly along the lower part, so that oil thrown against the inside face will drain back into the box.

(f) Springs should be of the coiled type when possible.

(g) The eyes of the lid must be integrally closed.

13. For calculating the diameters of axles between wheel seats, assume that the loads take effect 1/2 in. from center of journal at each end of axle, making the distance between assumed points of load application 1 in. more than the distance between centers of journals.

Recommendations:—1. Make radii of fillets for all axles 1/8 in. on journals at collar, and 3/4 in. on journals at dust guard seat, on dust guard seat at wheel seat, and on wheel seat at collar. (See tabulation of axles, fig. 6.)

2. Increase all lugs on journal bearings, as shown in columns 12 and 13 in tabulation of bearings. (See tabulation of journal bearings, fig. 7.)

3. Make slight changes in dimensions, as shown by asterisks in tabulation of bearings.

Note.—Recommendations 1, 2 and 3 do not interfere with interchangeability.

4. Adopt classification of axles by letters A, B, C, etc., as indicated in tables.

5. Adopt same classification for boxes and contained parts. (See tabulation of journal wedges, fig. 8.)

6. Adopt classification 2A, 2B, 2C, etc., for 2-axle trucks, and 3A, 3B, 3C, etc., for 3-axle trucks, the letter designating the axle used.

7. Adopt classification 4A, 4B, 4C, etc., and 6A, 6B, 6C, etc., for cars, the letters designating the axle used, and the figures designating the number of axles under the car.

8. Raise the capacity of the D axle to 40,000 lb. without changing dimensions. No existing cars shall be marked up in capacity on account of this increase in allowable axle load until it has been determined that the body and trucks are safe under such a load.

9. Add axle F, journal box F, journal bearing F, wedge F and dust guard F, as given in tabulations. (See figs. 6, 7, 8 and 9.)

10. Make distance from center of dust guard to top such that when in place with box, bearing, and wedge of full standard dimensions, the top of dust guard is 1 1/2 in. below the top of dust guard cavity in box; the boxes not now provided with an offset at dust guard

Recommendations:—1. That sheets 21 and 22 of the book of standard drawings showing standard passenger car pedestals for 3 3/4 in. x 7 in., 4 1/4 x 8 in. and 5 x 9 in. journals be eliminated.

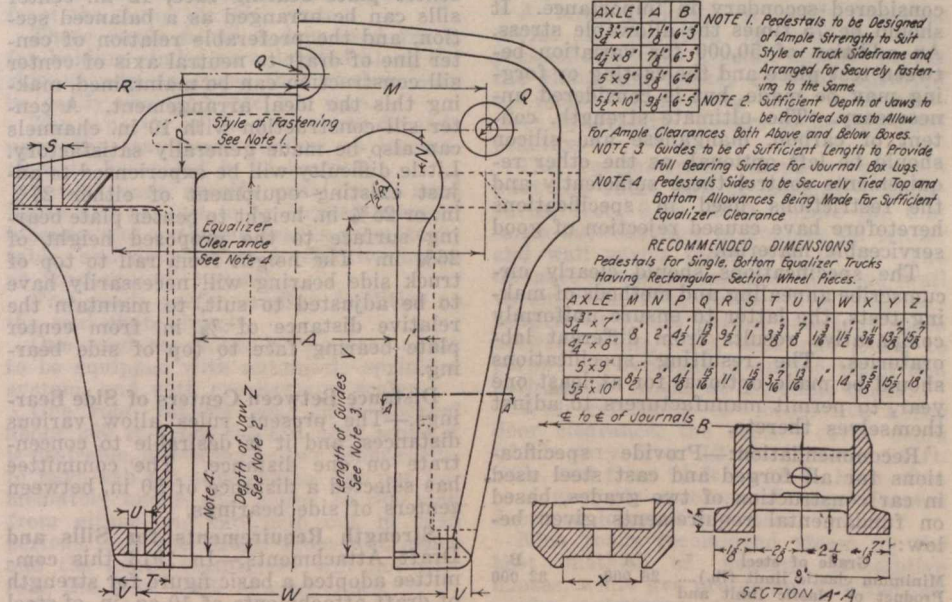


Figure 10.

2. That pedestals shown in fig. 10 be substituted for these pedestals for use on trucks with single bottom equalizers.

12. The present standard journal box lids and bolts should be withdrawn and the following specification for lids substituted:

1. Scope.—This specification covers all lids for use on A. R. A. standard journal boxes.

2. Material.—Lids may be made of malleable iron or pressed steel. Ma-

14. For calculating the diameters of axles outside of wheel seats, assume a lever arm from the section under consideration to the center of journal, plus one-fourth of the standard journal diameter, and allow a unit stress of 10,500 lb. per sq. in. to determine the diameter for minimum road limit.

15. The committee on standard and recommended practice suggested revision of center plate drawings to show contour only, and recommend definitely spe-

cifying the material of which the center plates may be made.

Recommendations:—1. Eliminate sheet 20, which is not used in present standard constructions, and advance sheet F, which represents present practice, to standard.

Note.—If body center plate on sheet F is used in conjunction with truck center plate on sheet 20, a 3/16 in. liner should be applied to prevent body center from riding on outer rim of truck center plate.

2. Center plates shall be made either of drop forged or cast steel.

Quality of Steel.—Specifications for materials used in car construction are varied from time to time. It has been found that the tendency to lower the requirements for elastic limit and elongation for steel have endangered details which have been based on certain stresses, also the close adherence to requirements for ultimate strength and chemistry has caused rejection of material which was superior to material acceptable under the specifications. It is suggested that the basic requirements which will ensure meeting unit stresses allowed in the past be fixed by this committee, that unnecessary restrictions be eliminated, and that the committee on specifications and tests embody these basic requirements in a specification.

Unit stresses commonly allowed for detail parts of cars made of steel, and which are subject to variable loads and occasional light shock, are 12,500 and 16,000 lb. per sq. in. The minimum elastic limit should be double this amount, and the product of elastic limit and elongation should not be less than 50 times the allowable stress. As the test piece usually shows better physical properties than the casting or forging, the requirement for product of elastic limit and elongation should be increased by 50,000, making it 50 times the allowable stress plus 50,000. The reduction of area is considered secondary in importance. It should be 75 times the allowable stress. An addition of 50,000 for variation between test piece and the casting or forging may be made, but is considered unnecessary. The ultimate strength, content of carbon, manganese and silicon should be left optional, as the other requirements control these sufficiently and the restrictions used in specifications heretofore have caused rejection of good serviceable material.

The specifications should clearly circumscribe annealing and methods of making tests, the latter to ensure uniformly comparative results from different laboratories. The resulting specifications should be made optional for at least one year, to permit manufacturers to adjust themselves thereto.

Recommendation:—Provide specifications for all forged and cast steel used in car construction of two grades, based on fundamental requirements given below:

| Grade of steel | A | B |
|--|---------|-----------|
| Minimum elastic limit (lb.) | 26 000 | 32 000 |
| Product of elastic limit and elongation | 700 000 | 850 000 |
| Product of elastic limit and reduction of area | 975 000 | 1 200 000 |

The ultimate strength, carbon, manganese and silicon shall be optional. Sulphur shall not exceed 0.05%. Phosphorus shall not exceed 0.05%. The elastic limit shall be determined by extensometer. The elongation shall be measured in a length of 2 in.

Grade A steel shall be annealed if the carbon content exceeds 0.30%, or if the manganese content exceeds 0.75%. Grade B steel shall be annealed if the carbon

content exceeds 0.22%, or if the manganese exceeds 0.05%.

Pieces of irregular section, and of less carbon or manganese content, where shrinkage or other internal strains may be suspected, should also be annealed. Unimportant details may be accepted on surface inspection only.

Fundamentals of Design.—In order to prepare the way for the design and adoption of additional standards, it is advisable to confirm or change existing fundamentals and add thereto. The existing fundamentals, both actual and implied, have been discussed in committee. Those recommended for change and those which are added are presented below with reasons for the recommendations. All others given in the list, under the heading of recommendations, are now either standard or recommended practice and should be affirmed as standard. The committee can then proceed with the consideration of standard detail designs.

Height from Rail to Center Plate Bearing Surface.—This subject was discussed at length in a number of meetings. Consideration was given to the standard height of 27 3/4 in. and to the U. S. R. A. height of 25 3/4 in. The former height would result in a distance from bottom of sills to center line of draft gear of about 4 in., an ideal condition for sills 10 in. deep, and generally satisfactory for sills 12 in. deep. The latter height is ideal for sills 14 or 15 in. deep, and moderately satisfactory for sills 12 in. deep. The reason for its use was apparently to eliminate bottom angles in the center sill construction, and to somewhat speed up production. However, the elimination of the bottom angles, in connection with the 12 in. channel sills, results in an unbalanced section. A balanced section of the same area will have about 20% greater resisting moment.

With a height of 26 3/4 in. from rail to center plate bearing face, 12 in. center sills can be arranged as a balanced section, and the preferable relation of center line of draft to neutral axis of center sill construction can be maintained, making this the ideal arrangement. A center sill construction with 10 in. channels can also be made generally satisfactory. Little difficulty will be experienced to adjust existing equipment of either 27 3/4 in. or 25 3/4 in. height to center plate bearing surface to the proposed height of 26 3/4 in. The height from rail to top of truck side bearing will necessarily have to be adjusted to suit, to maintain the relative distance of 7/8 in. from center plate bearing face to top of side bearing.

Distance Between Centers of Side Bearings.—The present rules allow various distances, and it is desirable to concentrate on one distance. The committee has selected a distance of 50 in. between centers of side bearings.

Strength Requirements for Sills and Draft Attachments.—In 1913 this committee adopted a basic figure for strength of draft attachments of 10 sq. in. of steel equivalent to grade A material for tension. This strength requirement was somewhat in excess of the strength of the coupler used at that time. A stronger coupler, type D, has now been adopted, and the strength value of which is equivalent to at least 12 sq. in. of steel of the same material. In order to meet the increased requirements, and compare closely with the increased strength of the coupler, it is desirable to increase the strength requirements for draft gear attachments and center sills by about

20%. The formulae on which the former requirements were based as follows:

$$R = \text{Ratio} = \frac{\text{Unit stress}}{\text{End load}} = \frac{1}{A} + \frac{X}{SM}$$

A=Area of section in square inches.
X=Eccentricity of load in inches.
SM=Section modulus.

For draft gear and draft attachments:

- a. The minimum tension area = T.
- b. The minimum shear area = 1.25 T.
- c. The minimum bearing area = 0.625 T.
- d. The maximum ratio R = 2 T.

For center sills between rear followers:

- e. The minimum tension area = 2.5 T.
- f. The minimum shear area = 3.125 T.
- g. The minimum bearing area = 1.563 T.
- h. The maximum ratio R = 5 T.

Our recommendation is to increase the area T from 10 to 12 sq. in. of grade A steel, or an equivalent area of other grades of steel, and change the other values approximately in accord therewith, which will be given in the recommendations.

Distance from Center of Bolster to Face of End Sill Casting.—In order to have uniform construction for draft and draft attachments, it is important that this dimension should be definitely fixed. The committee has selected this distance as 5 ft., which seems to meet all necessary requirements for cars with four-wheel trucks.

Draft Gear Travel, Coupler Horn Clearance, and Coupler Side Clearance.—Many cars of a length of 40 ft. and more are deficient in side clearance for couplers, and we believe it imperative that the side clearance be increased. Experience with cars with the draft gear located between center sills indicates that it is undesirable to permit the horn of the coupler to strike the end sill, and that all of the strain should be carried through the rear follower into the center sills at a distance of about 1 in. below the neutral axis of the center sill construction. Until the committee on couplers and draft gear has had an opportunity to demonstrate by test that some other travel is preferable, we recommend adopting a draft gear travel with draft gear in place on the car of 2 3/4 in. The coupler horn clearance should be 1/4 in. more, or 3 in. The total coupler side clearance should be increased from 2 1/2 in. to 3 in. In this connection the minimum draft gear capacity of 150,000 lb. is recommended.

Recommendations:—The values given in the tabulation below should be approved as standard fundamentals for future design:

| | |
|---|-------------|
| 1. Height from rail to center of brake shoe face | 13 in. |
| 2. Height from rail to brake beam hanger fulcrum | 24 3/4 in. |
| 3. Height from rail to bottom of truck springs | 10 1/2 in. |
| 4. Height from rail to top of springs (empty car) | 18 3/4 in. |
| 5. Height from rail to center plate bearing surface | 26 3/4 in. |
| 6. Height from rail to top of truck side bearing | 27 3/4 in. |
| 7. Distance from center to center of side bearing | 50 in. |
| 8. Average clearance per side bearing per truck: | |
| Minimum | 1 1/4 in. |
| Maximum | 5 1/16 in. |
| 9. Height from rail to floor of box car (minimum) | 42 in. |
| 10. Height from rail to floor of refrigerator car (minimum) | 48 in. |
| 11. Distance between center sills | 12 3/4 in. |
| 12. Area of center sill construction between rear followers (minimum) | 30 sq. in. |
| 13. Distance from center of truck to end sill face for cars with 4-wheel trucks | 5 ft. 0 in. |

| | |
|---|------------|
| 14. Draft gear travel (on car) | 2 3/4 in. |
| 15. Coupler horn clearance | 3 in. |
| 16. Minimum draft gear capacity | 15,000 lb. |
| 17. Coupler shank side clearance, total | 3 in. |
| 18. Draft gear follower thickness | 2 1/4 in. |
| 19. Ratio of unit stress to end load (maximum) for center sills | .05 |
| 20. Ratio of unit stress to end load (maximum) for draft attachments | .125 |
| 21. For draft attachments the area of steel in square inches equivalent to the minimum required strength values is: | |
| 21. Tension or compression (square inches, grade A steel) | 12 |
| 22. For shear (sq. in.) | 15 |
| Inside dimensions of box cars: | |
| 24. Length | 40 1/2 ft. |
| 25. Width | 8 1/2 ft. |
| 26. Height | 8 1/2 ft. |
| 27. Hardwood, when used, must have strength values for times those given for steel. | |

Minor Car Construction Matters.—Various enquiries on the subject indicate the necessity of adopting fixed rules for repairs to existing box car ends.

Recommendation:—1. When ends of cars are broken they should be replaced with ends specified for new cars.

2. The rules for box car ends should be modified by eliminating paragraphs 5 and 6 permitting hard wood or yellow pine posts and braces, thereby making use of steel posts and braces obligatory.

The revised rules are as follows:

Box Car End, Design and Strength.—New cars should have corrugated steel ends, or steel plate ends 1/4 in. thick, reinforced between corner posts with the equivalent of either two vertical steel braces with a total section modulus of not less than 9; or one vertical and two diagonal steel braces with a total section modulus of not less than 10; or three horizontal steel braces with a total section modulus of not less than 10.

New cars may have the following alternative arrangement: Three or more steel braces, two of which run diagonally, with a total section modulus of not less than 12 1/2, and wood lining 1 3/4 in. thick.

To concentrate strength at a point near floor line on vertical center line of car, diagonal braces should extend from the center sills to the side plates, and not from the bottom corner to the ridge.

The attachments for the braces and the members to which they are attached must be sufficiently strong to realize the full strength of the braces.

Lining at car ends should be supported at intervals not greater than 30 times the thickness.

Two 4 by 3 in. Z-bars, 12.4 lb. per ft. have a total section modulus of 9.34.

Two 5 in. I-beams, 9.75 lb. per ft. have a total section modulus of 9.6.

Three 4 in. I-beams, 9.5 lb. per ft. have a total section modulus of 10.2.

Three 3 in. Z-bars, 14.2 lb. per ft. have a total section modulus of 10.3.

The corrugated ends referred to may be made of one or more pieces. If made of one piece it should not be less than 1/4 in. thick. If made of more than one piece the lower third must be not less than 1/4 in. thick, and the remainder should be not less than 3/16 in. thick.

Hopper and Gondola Car Cross Ties.—Request was made for specification of the proper number of cross ties to be used in hopper gondola coal cars.

Recommendations:—The distance between cross ties or braces in hopper or high side gondola cars shall be less than 20 times the width of the top chord of car side. Consideration should be given to providing necessary space for use of clam shell buckets in loading or unloading. If the dimensions for distance between cross ties is less than the space required for operating clam shell buckets, the ties shall be alternated with braces extending from the center ridge or floor

to a location corresponding with the tie anchorage.

Thickness of Splice Plates for Center Sills When Webs or Sills are More than One-half Inch Thick.—Attention was directed to the use of center sills on some tank cars with webs 3/8 in. thick, and that the rules for splicing of steel center sills would require butt plates of the same thickness, which is inconsistent, and would interfere with proper riveting. Recommendation: That paragraph 2, of the rules for splicing steel center sills be modified as follows: "The splice for

center sills, except as otherwise herein stated, to be located not less than 7 in. from either side of the body bolster, consisting of butt joints. The butt joints to be reinforced by plates on both sides to be not less than twice the length of the protruding end, but not exceeding 24 in. and not less than same thickness of web plate, but not more than 1/2 in. thick, with the one on the flange side of channel to include flanges, while the outside plate should only cover the web. The rivets to be spaced as shown on figs. A and B, sheet 28.

Locomotive Terminal Design and Operation.

The committee, of which C. E. Fuller, Superintendent Motive Power, Union Pacific Rd., was chairman, reported as follows:—On Feb. 20, 1920, the committee issued a circular containing 20 questions and a request that all replies be in the chairman's office by Mar. 15. Up to May 1 eighteen roads responded to the questionnaire. However, the information received from the majority responding was of such a nature that the committee feels that no general conclusions or recommendations can be presented and, therefore, begs to offer the following as a progress report:

The length and capacity of ash pits is determined by the maximum number of engines handled in 24 hours.

One road recommends an ash pit of suitable size to take care of 50% more power than is being handled, so that if the pit conveyor is put out of commission temporarily, the ash pit will be of sufficient capacity to hold cinders until repairs are made.

Two roads recommend two large water cinder pits emptied by locomotive cranes, with grab buckets operated from a separate track, with pits so arranged that cinders can be flushed into cinder pit from the dump pit with water.

Three roads favor a depressed track, for holding cinder cars, located along the side of pits, in order that cinders may be easily shoveled into the cars.

The capacity of the coal chute depends upon the maximum number of locomotives to be coaled in 24 hours.

Seven roads specify coal chute, sand house and ash pit to be located between inbound and outbound tracks from turntable, and as close to locomotive house as trackage will permit.

Five roads prefer sanding facilities at the coal chute direct.

One road recommends the coal chute to be equipped with automatic sprinkler system, and with crusher and scales.

One road reports coal chute located about 200 ft. from the ash pits; while it is desirable, according to two other roads, to have ash pit adjacent to, but not immediately under, coal chute, so that men from either one can help out in rush periods, and the fumes from wet ashes and the ashes themselves will not corrode the steel work of coal chute.

One road recommends, for a cold country, locomotive house, turntable, ash pit, etc., all under one roof, with coal chute close by, and incoming locomotive to be left by crew before coming to the coal chute.

The problem of coal chute and ash pit organization depends materially on the amount of power handled, as well as the question of locomotive house organization and the character of repairs to be made; in other words, it is based on the size of the terminal and the business handled.

Five roads report a foreman in charge of coal chute and ash pit, whose duties are to see that all locomotives are properly sanded, coal and water furnished, and fires cleaned.

Four roads recommend locomotive house foreman's supervision of ash pit and coal chute gang leaders, fire cleaners, ash shovelers, helpers, etc.

There is not sufficient data available upon which to base a recommendation for a definite system of organization. Regarding locomotive house operation as a whole, while only four roads replied on this subject, three agree that there has been a great deal of neglect in the proper design of locomotive houses.

Adequate equipment with as many labor-saving devices as possible will repay the expense of installation in a short time.

Locomotive houses should be equipped with proper ventilation to force out smoke and gases.

Eleven roads recommend coal stoves as the best method of drying sand, while six prefer steam coils. It is pointed out that drying by stove burns off organic matters and renders the sand more gritty.

A large majority of roads replying prefer the elevation of sand by compressed air, while a small number prefer the chain and bucket elevator operated by motor. Conveying sand to locomotives by gravity appears to be universal practice.

The recommended distance between pilot and outer wall of locomotive house varies from 8 to 15 ft., while the distance between face of coupler on tender and wall varies from 5 to 10 ft. The distance from locomotive to side wall varies from 5 to 10 ft. The ideal arrangement would permit sufficient space between walls, with tank cut loose, to permit the removal of engine truck and both tender trucks at the same time.

With reference to locomotive house door clearance, the replies cover doors which vary from 12 ft. 8 in. to 14 ft. wide, and from 14 ft. to 18 ft. high. One road strongly recommends steel framed doors on locomotive houses.

Nine roads recommend steam as the best method of heating locomotive houses, while five prefer hot air, and two prefer coal stoves. Others specify steam heat for small locomotive houses and hot air for large ones.

The preference in location for steam heat is to place the coils in the pits, properly protected from damage from heavy parts falling from above. It is essential for the coils to set in from the side and be protected so that water drippings from thawing ice and snow on engine will not run on to the pipes. Eight out of nine roads recommending steam heat favor steam coils on outer wall, while five roads report additional coils on in-

ner wall to whatever extent is permissible. The vacuum return system of steam heat is preferred by the majority of roads, while some use exhaust steam from air compressor and stationary engine.

Several of the roads recommending hot air for heating locomotive houses do not heat the pits, but have outlets 4 ft. from the floor with drop at alternate spaces between pits.

The problem of locomotive house heating depends materially upon climatic conditions first, and upon such matters as the availability of waste or exhaust steam; and, while the desirability for well heated locomotive houses is apparent to all, it is somewhat a local problem.

There is a great deal of difference on the question of machine tools for locomotive house work, and this subject depends very largely upon the amount of work to be taken care of. A number of roads recommend the installation of machine tools separate from the locomotive house, but attached to same, as nearly centrally as possible.

The majority of roads recommend drop pits to take care of engine truck and trailer wheels, in addition to the main drop pit. Several roads report desirability of separate drop pits, to handle tender truck wheels, while one road advises that a single pit is ample. A second road recommends a driving wheel pit for every 6 stalls and an engine trailer pit for every 10 stalls. The Whiting hoist is mentioned by several roads for driving-wheel pits in large locomotive houses.

The hydraulic jack appears to be favored by the majority, although a small number of roads prefer air jacks, on account of the telescopic feature requiring less depth of pit. One road reports an electric crane for lifting wheels, and one specifies Watson and Stillman's hydraulic compressed air telescope jack.

Regarding material for locomotive

house flooring, opinion is divided between concrete, creosoted block, brick, and mastic or asphalt composition. The majority, however, recommend creosote blocks, with concrete running second.

The use of packing blocks the full length of pit is universally recommended.

Smoke jacks are reported as made of fireproof wood, sheet metal, asbestos and cast iron, opinions being about equally divided. The views as to the hood opening at bottom range from 8 to 15 ft. in length. Several roads recommend the use of dampers on smoke jack.

Recommendations regarding handling material in locomotive houses, cover a trolley track, swing crane, overhead travelling crane, electric truck and collapsible horses.

The majority of roads recommend that all stalls be equipped with hot water wash-out facilities, while several prefer only one-half of the stalls equipped. The general view appears to be that the washing of locomotives with hot water is at all times desirable from the standpoint of saving in time, fuel, water, and, most important, a reduction in fire box repairs. The majority of roads blow off boilers through a blow-off pipe leading from engine to atmosphere or tanks, which in some cases are connected with the sewer. Three roads recommend a pipe line from end to end of engine house above locomotive domes, with connection at each pit, and outlet on both ends of house. This system is used by one road to connect with cold water system to cool down boilers. The entire subject is of the most importance in connection with engine terminals.

As to locomotive house lighting, there seems to be about an evenly divided preference for reflector lights on the walls, and lights placed between pits. All, however, appear in favor of sufficient extension plugs on post for working in pits and fire boxes. In lighting outside grounds, all roads appear to favor flood

lighting of sufficient power and proper height to afford a good light on points where needed.

Analysis of the replies indicates the widest divergence of opinion on nearly all subjects connected with locomotive house and locomotive terminals; this refers to design, equipment, maintenance and operation. It is entirely natural that varying local conditions should develop different systems at locomotive terminals, and your committee feels, after reviewing this subject, that there is little opportunity for standardizing on the general layout for the reason that, as a rule, there is no choice of location, and the ground available is usually limited both in area and in relation to its surroundings. It is, therefore, apparent that the layout of each locomotive terminal is properly a separate problem—again, the entire problem is largely a function of the size of terminal, the power handled, the estimated expansion of future business, and similar questions. The replies, however, do indicate a decided trend in the last few years toward improvement in facilities in modern terminals, especially in the art of heating, lighting, ventilating, tool equipment, boiler washing, cleaning fires, coaling and sanding.

It is the committee's opinion that while the standardization of locomotive terminals as to general layout is impossible it might be desirable to standardize locomotive house design as to general dimensions and structural features, that some progress may be made in the future toward the standardization of such equipment as locomotive house cranes, drop pits and washout systems; also in lighting, heating and ventilation.

The time available has been entirely too short to prepare a comprehensive report on such a large, important subject, and your committee desires to offer the above as a progress report with a continuation of the committee if the association feels that this is desirable.

Mechanical Stokers Committee Report.

The committee, of which M. A. Kinney, Superintendent Motive Power, Hocking Valley Ry., was chairman, reported as follows:—The mechanical stoker as adapted for locomotive firing has, from the evidence of its application, become a necessity, there being over 5,000 in use on locomotives in the United States. The necessity for a mechanical application to the locomotive for stoking purposes became apparent, as the rapid strides in increased tractive effort of the locomotive to reduce the transportation costs were not meeting the expectations of those directly connected with operation, as the full power of the locomotive could not be sustained over a period of time, on account of the human agency behind the scoop shovel not being able to deliver fuel enough, and with efficiency, to maintain a reasonable speed with a tonnage that the locomotive had been designed for, and could haul over a division. The mechanical stoker, therefore, found a field on railways where the heavy tonnage train of commodity freight carried at low rates was the major part of their revenue, and it might be said that the stoker was first commercially a fact in 1910. Several types of stokers had been receiving experimental attention for several years prior to that date, but 1910 marked the beginning of the time that railways, as mentioned above, started the

application on new power of extraordinary weight of tractive effort, realizing that to get the most out of the locomotive of high capacity some mechanical means must be provided. In 1912 demand was made by firemen in the eastern wage application for two firemen on locomotives weighing over 200,000 lb. on the drivers; this naturally stimulated the inventive genius of the stoker manufacturers, and improvements and different types of stokers came out that made it a successful machine compared with past efforts, and has well supplied the necessity for its development.

The determination of the points as to the size of locomotive when the stoker shall be applied, the economy of fuel that may be expected, the cost of repairs, and not the least point to be considered, the kind and preparation of fuel, have been the subjects that your committee, and also the members of this association, have presented and discussed more than any other features during the past seven years which it has been before you, therefore it was deemed advisable to obtain material for your consideration in this paper, by putting out a questionnaire, endeavoring to arrive at some definite understanding as to the general feeling on the subjects, especially those enumerated, and to comply with resolution passed by the 1919 convention. While

the responses were not as numerous as it was hoped, 30 railways answering are representative lines which have had experience with the mechanical stoker and are qualified to make answer from actual knowledge. We will state the question, and comment on each in its turn.

State the number and kind of stokers you have and type of locomotive and tractive power on which they are used. Replies were received from several roads using over 100 and one road reports 563 in use. The mikado, Santa Fe and Mallet type predominate, with tractive effort from 54,000 to 135,000 lb. There were a limited number of consolidations as low as 51,000 lb. It is, therefore, apparent that to date the locomotive of less than 55,000 tractive effort has not received much consideration as to equipping with the mechanical stoker.

What is the tonnage rating on type of locomotives in territory where operated? Is there any difference in the tonnage rating on hand-fired and stoker-fired locomotives of the same type in the same territory? Do you load the stoker-fired locomotives heavier than the hand-fired? If not, why? With the increased tonnage, do they make better or poorer time over the division? These questions are practically the same but were asked separately in an effort to bring out such views as would be possible by different

forms of interrogation. The tonnage rating is controlled locally by gradients and type of commodities hauled. The difference in rating between hand-fired and stoker-fired locomotives, in the majority of cases, is hard to determine, few railways having both types of firing, as the stoker came with the inception of heavier power, and prevents comparisons being made. However, some of the larger users of the stoker report increasing loading 150 tons on a 2,400 ton train, and 400 tons on a 4,600 ton train, with the stoker-fired locomotive, over the hand-fired on the same division. Where the stoker and hand fired are used on the same type of locomotive, with one exception, replies indicate as good performance can be procured with the stoker, with increased tonnage, as the hand-fired with reduced rating.

How does the condition of fire of the hand-fired locomotives compare with the stoker-fired locomotives when arriving at terminals? The general answer to this question, "Better condition on stoker-fired, demonstrates that the firemen soon realize the advantages of the stoker and will endeavor to carry a light, even fire, which can easily be accomplished by ordinary attention. It lightens the labors of the locomotive crew and also shortens labor of cleaning or knocking fires at the ash pit.

Do your records indicate any decrease in boiler maintenance with the stoker-fired locomotives as compared with the hand-fired locomotives, in parallel cases? One road notes changes in locomotive boiler construction, largely in welding flues and other parts of the fire box, have made comparisons difficult. The committee wishes to call attention to the advantages of maintaining a fire box temperature while trains are on sidings waiting for orders, or any stop of the locomotive, especially in single track operation, that will minimize the detrimental results of rapid contraction in large fire boxes. This can be very satisfactorily overcome by keeping a light, even fire easily controlled with the stoker.

Do you use two firemen, or a relief fireman, or give the fireman any assistance on your hand-fired locomotives? Majority of roads report "No."

State what prompted you to apply stokers to particular classes of locomotives. With one exception all answers report "Increased tonnage and size of locomotives." One representative reply which appealed to the committee was "A better class of men can be recruited and held as firemen," another, "The fireman can devote more time to improving himself in the necessary knowledge he requires to become a locomotive man." One large road states "The stoker is considered a positive necessity where coal consumption averages more than 5,000 lb. an hour." All replies, with one exception, call attention to the operation of large type locomotives under maximum conditions, stating that the mechanical stoker is essential.

With the experience you have had with stoker-fired locomotives generally, and from actual tests, please express your views on economy as to amount of fuel consumed, and efficiency of the locomotive as to speed and tonnage compared with hand firing, either with run-of-mine or prepared coal. Naturally in the consideration of applying any new device to a locomotive the thought of economy, by the shortest route, appears, and in the case of the mechanical stoker, the coal which it delivers to the fire box, and in fact its chief function, being the largest item of expense connected with the loco-

motive, immediately falls heir to the query, "How much coal will it save over hand firing?" The replies, with one exception, to this question above stated are in line with all reports that have been made by previous reports by the stoker committee, viz., that there is, undoubtedly, some more coal burned by the stoker-fired locomotives than by the hand-fired, but from the replies on this subject, there are no doubts in the minds of your committee that the increased efficiency as to tonnage, speed, and in fact the various thoughts before enumerated, offset any loss that may develop in amount of coal consumed for a given service performed. Your committee, however, desires to make the point that the users of stokers realize that fine coal to the extent it is handled by the stoker increases stack losses; the education of the fireman is just as essential as in hand firing, and not to be lost sight of is the fact that stoker firing is mechanical rather than a human operation, and it is for the manufacturers to improve and so refine the machine that it can be kept in a closer range of operation, and the stoker on the locomotive today, however successful, does not free the manufacturers from improving the mechanical condition to remove human inefficiency.

What percentage of the run-of-mine coal which you receive for locomotive use is slack? If this same coal is prepared at a crusher, how much is the slack increased? Local conditions govern the answer to this question. From 20 to 50% of so-called slack reported. The term slack, as recorded by several roads, is the amount of fine material passing through a 4-mesh per sq. in. screen. One road reports increasing from 35 to 50% crusher, and another from 15 to 75%. All others report "No coal prepared by crusher."

What do you estimate the additional cost of maintenance where stokers are equipped with crushers? All roads report "No data."

Are you in favor of coal crushers with stoker equipment on locomotives? Please state reasons. This question is one of the most discussed, and possibly the most serious subject, in connection with the mechanical stoker, owing to the fact that it resolves itself into a local condition, on account of the great diversity of fuel coal, as to amount of slack, fitness to be handled by a crusher on account of hardness, and the possibilities of procuring the proper supply at all times. It will be recognized that the opinions of the officers will be influenced by the conditions and best methods applicable to their own road. The answers received to this question were practically unanimous that the locomotive equipped with the mechanical stoker should, to make it a complete machine, capable of operating over a wide territorial range, have the crusher on the locomotive. Your committee concurs in this as applied to a limited number of stokers being used on a railway, but as locomotives equipped with the stoker are centralized it becomes possible to prepare the fuel before delivery to the tenders. The manufacturers are confronted with conditions in the application of the crusher to the locomotive that have been met with fairly good success, but will require their best talent to meet the widely varying conditions as the stoker is placed on more roads. The hardness of the coal causes an extremely wide range of conditions the country over. The strengthening of the crusher parts, and the possibility of the crusher mechanism being detachable, in a way that prepared coal can be used, and dis-

continue operation of the crusher parts while using the stoker, are recommended by this committee.

It has been proposed that coal should be prepared at the mines. Where railways own their own mines and when the entire output of some coal mine is controlled, this suggestion has its merits, but with the unsettled conditions that have confronted us the past few years, in the mining industry, the changing of contracts and unreliability at all times of being assured 100% of fuel for their stokers, this suggestion cannot be recommended. The coal, if prepared before being delivered to the tenders, should be crushed at the railway coal tipple or a centralized crushing plant on the railway.

Do you prepare coal for stokers before loading it on the locomotives? If so, by what methods and what does it cost by each of these methods? The resolution of this convention in 1919 asking for the information embodied in this question cannot be answered by your committee, as no figures were made available in the answers. Where coal is prepared before being placed on the locomotive it is bought in that state or screened at the railway coal tipple. One road reports crushing at fuel station, but the cost is practically negligible, as the coal is dropped from the car into the crusher and prepared before it is elevated. The capital expenditure necessary to install this method will, where electric power is available, be from \$6,000 to \$12,000 at each coaling station.

The question of using so-called lignite fuel has been referred to this committee. There is some question as to the proper definition of lignite. We find the term semi-lignite and sub-bituminous used; it being a fuel used by the north-western railways having a b.t.u. value from 11,250 to 12,500. Reports indicate no difficulties are being experienced in firing with this fuel, if handled properly. Stack losses and fires along right of way not developing. One road reports less liability of fire, on account of the fire, and character and regularity of the fire, and doing away with the necessity of opening the fire door, which creates sparks with this class of fuel. The only change in fire box or draft appliance noted, to burn lignite, was one road reports applying one more row of fire brick.

On the question as to what recent changes have been made in coal space of locomotive tenders to permit the coal to flow within easy reach of the fireman, replies state that several roads have resorted to a mechanical device for pushing the coal forward, which was reported successful in various sections. Existing power has been largely cared for by local arrangements of changes in slope sheets, raising and moving coal boards.

Your committee recognizes that the mechanical stoker, coming to the railways as it has in the past three years, under trying times, with inexperienced firemen, shop forces not up to the standard, and the burden of an overloaded organization trying to move every ton of freight possible, has received many a hard knock and will continue to receive them, but the manufacturers will be on the ground; and, as we have tried to bring out plainly in this report, local conditions must be studied and the preparation of fuel, the cost of maintenance and the benefits of having a locomotive that will prove 100% good, up hill and down, will be your problem and result in improvements to the benefit of all.

Enquiry was made of the stoker manu-

facturers as to the number of stokers in service Mar. 1, 1920, with following result:

| Kind of stoker | Mal-let | Mi-kado | Santa Fe | Centi-pede | 12-Wheel | Deca-pod | Con-solidation | Moun-tain and Mo-hawk | Pacific | Total |
|--------------------|---------|---------|----------|------------|----------|----------|----------------|-----------------------|---------|-------|
| Street | 424 | 638 | 357 | 4 | 14 | | 21 | 3 | 36 | 1,497 |
| Duplex | 422 | 1,139 | 441 | | | 123 | 22 | 28 | 20 | 2,195 |
| Standard | 120 | 338 | 36 | | 33 | | 21 | 162 | 21 | 731 |
| Hanna | 70 | 6 | 73 | | 16 | | | 4 | | 169 |
| Elvin | | | 19 | | | | | | | 19 |
| Crawford | | 50 | 35 | | | | 337 | | 93 | 515 |
| Total | 1,036 | 2,171 | 961 | 4 | 63 | 123 | 401 | 197 | 170 | 5,126 |

Couplers and Draft Gears Committee Report.

The committee, of which R. L. Kleine, Assistant Chief of Motive Power-Car Matters, Pennsylvania Rd., was chairman, reported as follows:—Since the adoption of the D coupler as a standard of the association, and rules governing the application of the standard coupler to both new and existing cars, your committee has followed closely the performance of the couplers and kept in touch with the manufacture and gauging of the product.

Slight changes in detail of construction, as well as minor modifications in gauges, that tend to improve the manufacture and gauging of the couplers, have been brought to the attention of the

committee from time to time by the manufacturers. All such suggestions have been carefully investigated, and, if

found desirable, and in no way affecting the strength or interchangeability of the parts, are approved without submitting to action by the association.

At the request of the Secretary, your committee furnished information covering couplers for the manual of standards.

The United States Railroad Administration, under the direction of C. B. Young, Manager of Inspection and Test Section, has been conducting very valuable tests on draft gears and attachments. The members of your committee have witnessed some of these tests and have had a representative working with the administration on these tests. Your committee has been advised that a complete report covering all draft gear investigation work done by the administration will be turned over to them as soon as it is possible to finish tabulation

of the data. From the study of this data your committee will be able to prepare a programme of such further tests and investigations that are essential, which will be submitted to the general committee for approval, to the end that final recommendations may be made to the association on this subject.

Snow Fighting Equipment.

W. H. Winterrowd, Chief Mechanical Engineer, Canadian Pacific Ry., read at the Atlantic City convention an individual paper on snow fighting equipment, in which he traced very fully the history of snow ploughs, etc., and described their various types. The paper, as printed for the convention, and which contains 74 illustrations, occupies 87 pages 6 x 9 in., so that it is impossible to reproduce it in this issue, on account of the large amount of space required for other matter relating to the convention, but we hope to utilize it in future issues. It deals with locomotive, pilot, push, wing, spreader and machine ploughs; the C.P.R., the Fuller, and the Russell steel ploughs; the C.P.R., Grand Trunk Pacific and Union Pacific rotary ploughs; also with flangers, ice cutters, sweepers; the operation of equipment, and preventive measures. The whole subject is most exhaustively treated, and the paper will undoubtedly become a standard reference work.

Other Atlantic City Convention Reports.

In addition to the reports reproduced on earlier pages of this issue, the following were presented:—

Arbitration.—T. H. Goodnow, Superintendent, Car Department, Chicago & North Western Rd., chairman, J. Coleman, Assistant to General Superintendent Motive Power and Car Departments Grand Trunk Ry., being a member. This reports decisions on cases 1156 to 1170.

Auxiliary or Safety Connections Between Locomotives and Tenders.—M. H. Haig, Mechanical Engineer, Atchison, Topeka & Santa Fe Rd., chairman. This deals with designs of draw bars; safety bars for new and for large locomotives; safety bars and safety chains; substitution of safety bars for safety chains; bolting must be substantial; welding not favored; approximate cost of changing to central safety bars on locomotives in service; offset draw bars; draw and safety bar pins; maintenance and inspection of drawbars; drawbar and safety bar pockets; U.S. law on safety bars.

Boiler Plant Modernization.—A. C. Trumbull, Mechanical Engineer, Erie Rd., chairman. This deals with boiler room equipment, stokers, piping, pipe covering, power plants for locomotive terminals, and repair shops, special methods of combustion, and pulverized fuel.

Brake Shoe and Brake Beam Equipment.—B. B. Milner, Engineer Motive Power and Rolling Stock, New York Central Rd., chairman.

Depreciation For Freight Cars.—C. E. Chambers, Superintendent Motive Power and Equipment, Central Rd. of New Jersey, chairman, W. J. Robider, General Master Car Builder, Canadian Pacific Ry., being a member. This contains recommendations for changes in interchange rules.

Electric Rolling Stock Design, Maintenance and Operation.—C. H. Quereau,

Superintendent Electric Equipment, New York Central Rd., chairman. This consists of individual papers written by the various members of the committee, showing the development of several of the important electrification projects on American steam railways, as follows:—Baltimore tunnels electrification, Baltimore & Ohio Rd. New York Central Rd. electrification, New York to Harlem. Brief history of New York, New Haven & Hartford Electric Rolling Stock. Great Northern Rd. electrification Cascade tunnel. Boston & Maine Rd., Hoosac tunnel electrification. Butte, Anaconda & Pacific Ry., electric operation. Norfolk & Western Rd., electrified line historical sketch. Chicago, Milwaukee & St. Paul Ry., synopsis of electrification. Long Island Rd. electrification. Southern Pacific Co.'s electrification of Oakland, Alameda and Berkeley suburban lines.

Fuel Economy and Smoke Prevention. Wm. Schlafge, Mechanical Manager, Erie Rd., chairman. This consists of revision of the text of "Fuel Economy on Locomotives," comprising complete instructions to bring about the economical use of fuel, to promote good practice in the operation of locomotives and to improve the methods of firing.

Interchange Rules for Passenger Cars. H. H. Harvey, General Car Foreman, Chicago, Burlington & Quincy Rd., chairman, I. N. Clark, Master Car Builder, Grand Trunk Ry., being a member. This recommends several changes in the rules.

Labor and Material Prices.—G. E. Carson, District Master Car Builder, New York Central Rd., chairman. This recommends the complete revision of rules existing heretofore.

Loading Rules.—R. L. Kline, Assistant Chief of Motive Power, Pennsylvania Rd., being a member of the committee. This

recommends a number of changes in the rules.

Research Bureau.—C. B. Young, Manager, Inspection and Tests Section, U.S. Railroad Administration. This favors the establishment of a research bureau, the cost to be assessed, in the usual manner, on railways which are members of the association.

Specifications and Tests for Materials. F. M. Waring, Engineer of Tests, Pennsylvania Rd., chairman. This recommends specifications for steel cars; boiler and fire box steel for locomotive equipment; line journal bearings; annealed and unannealed carbon steel axles, shafts and other forgings; solid wrought carbon steel wheels; bronze bearings for locomotives; carbon steel axles for cars, locomotive tenders and locomotive trucks; solid and hollow staybolt iron, and tender tank hose.

Standard and Recommended Practice. W. E. Dunham, Assistant to General Superintendent, Motive Power and Car Department, Chicago & Northwestern Rd., chairman. W. J. Robider, General Master Car Builder, Canadian Pacific Ry., being a member. This deals with the combining of the standards and recommended practice, as recorded for the Master Car Builders Association and the American Railway Master Mechanics Association, and in preparing the manual in the form in which it has been furnished recently.

Tank Cars.—A. W. Gibbs, Chief Mechanical Engineer, Pennsylvania System, chairman. The committee's work has been large devoted to details for construction calling for improvement, and, as the details have not been settled, the report is principally one of progress.

Train Brake and Signal Equipment.—T. L. Burton, Air Brake Engineer, New York Central Rd., chairman. This recommends a number of subjects to be sub-

mitted to letter ballot, for adoption as standard.

Train Lighting and Equipment.—J. R. Sloane, Chief Electrician, Central Re-

gion, Pennsylvania Rd., chairman. This deals principally with specifications for axle generators.

Train Resistance and Tonnage Rating.

O. P. Rees, Superintendent Motive Power, Pennsylvania Lines, chairman. This is a progress report, dealing briefly with equated tonnage rating.

Railway Supply Exhibits at the Atlantic City Convention.

The railway supply exhibits at the Atlantic City convention were, as usual, arranged for by the Railway Supply Manufacturers' Association, the officers of which were: President, Geo. R. Carr; Vice President Dearborn Chemical Co., Chicago; Vice President, J. F. Church, Vice President, T. H. Symington Co., Chicago; Secretary Treasurer, J. O. Conway, Pittsburg, Pa. Mr. Carr was also chairman of the joint committee of arrangements, comprised of representatives of both the railway and manufacturers associations. There was a considerable increase in the number of exhibits and the space occupied was 100,000 sq. ft., against 93,000 in 1919. Among the principal exhibitors were the following:—

American Brake Shoe & Foundry Co., New York.—Standard patterns railway brake shoes; steel back driver shoes; steel back engine truck shoes; steel back passenger and tender shoes; steel back freight car shoes; malleable iron locomotive driver brake head and keys.

American Locomotive Co., New York.—Alco reverse gear; flexible staybolts; intercepting valves.

American Steel Foundries, Chicago.—Economy cast steel draft arm; Davis steel wheel; Ajax and Hercules brake beams; Simplex coupler; cast steel bolster; Simplex clasp brake; Simplex coupler pocket; Vulcan truck.

Association of Manufacturers of Chilled Car Wheels, Chicago.—One 33 in. no. 625 M. C. B. car wheel for 30-ton cars; one 33 in. no. 700 M.C.B. car wheel for 40-ton cars; one 33 in. no. 725 M. C. B. car wheel for 50-ton cars; one 33 in. no. 850 M. C. B. car wheel for 70-ton cars. Also a moving picture showing various processes of manufacturing the chilled iron car wheel, including moulding, pouring, pitting and drop testing of the wheel. In addition thereto, a series of pictures showing measurement of temperature stresses to which the wheels are subjected, indicated by test gauges.

Barrett Co., New York.—Carbosota, coaltar, pitch and felt products; roofing; waterproofing; wood preservatives; metal protective paints.

Boss Nut Co., Chicago.—Boss lock nut; bolts and rivets.

Bowser & Co., S. F., Fort Wayne, Ind.—Tanks and self-measuring pumps for receipt, storage, distribution and checking of oils and similar liquids; paint handling and mixing equipment.

Crane Co., Chicago.—Locomotive brass valves, railroad unions and railroad union fittings; locomotive blow-off valves; locomotive pop valves, brass railing fittings.

Davis Boring Tool Co., St. Louis, Mo.—Full line of Davis expansion car wheel and shop boring tools; Davis micrometer adjustable reamers.

Davis-Bournonville Co., Jersey City, N.J.—General line of oxy-acetylene cutting and welding apparatus.

Dearborn Chemical Co., Chicago.—Dearborn water treating preparations for prevention of scale formation, corrosion and foaming in locomotive boilers; No-ox-id rust preventive.

Electric Service Supplies Co., Philadelphia.—Golden Glow locomotive headlights, sheet metal and cast iron types; keystone turbo generators; golden glow

and crystal mirror glass reflectors; locomotive headlight switches; marker lights; classification lights; lamp guards; flood lights and searchlights.

Fairbanks, Morse & Co., Chicago.—Oil engine, direct connected to electrical generator in operation; motor-driven centrifugal pump, direct-connected in operation; locomotive water crane; motor cars.

Flannery Bolt Co., Pittsburg, Pa.—F. B. C. welded flexible staybolts, flexible crown staybolts and boiler section under test; Tate flexible staybolts; crown adjustable staybolts and marine flexible staybolts. Tools for proper application of F. B. C. and Tate products.

Franklin Railway Supply Co., New York.—Ragonnet type B reverse gear; automatic adjustable driving box wedge; driving box lubricator; no. 8 fire door, Franklin steam grate shaker; McLaughlin flexible conduit; Franklin ball joint; two-wheel engine truck; radial buffer; unit safety bar; no. 9 fire door; universal valve chest; Booster engine on exhibition track.

Galena-Signal Oil Company, Franklin, Pa.—Reception booth.

Garlock Packing Co., Palmyra, N.Y.—Air pump and throttle, slip and ball joint, and power reverse gear packing; compressor and accumulator, steam hammer and power plant packing; gaskets and pump valves; flexible metal packing.

Gold Car Heating & Lighting Co., New York.—Vapor, combination pressure and vapor, pressure, hot water and electric car heating systems; thermostatic control for all types of car heating systems and buildings; ventilators for railway cars; pressure regulators.

Griffin Wheel Company, Chicago, Ill.—Chilled iron car wheels.

Grip Nut Co., Chicago.—Grip nut products; grip lock nut; holding nut; unit nut; pump piston rod nut.

Hunt-Spiller Manufacturing Corporation, South Boston, Mass.—Locomotive parts made of Hunt-Spiller gun iron; cylinder bushings; cylinder packing; solid pistons; bull rings; piston valve bushings; tee rings; piston valve packing; crosshead shoes; side rod and knuckle pin bushings for freight service; air pump bushings and packing; driving boxes; pedestal shoes; pedestal wedges; eccentrics and eccentric straps.

Independent Pneumatic Tool Co., Chicago.—Thor pneumatic drills, reamers, grinders, hammers, hoists, rammers and electric drills and grinders.

Ingersoll-Rand Co., New York.—Little David pneumatic tools and appliances.

Johns-Manville Co., H. W., New York.—The 85% magnesia pipe covering and boiler lagging; J-M sponge felted pipe covering and blocks; miscellaneous J-M pipe coverings and transite and ebony asbestos wood; asbestos shingles; high temperature and insulating cement; Mastic flooring; J-M built-up and ready roofing; Salamander insulation; Keystone hair felt and standard hair felt; spiral locomotive pipe covering; power reverse gear packing; Mallet locomotive packing; J-M expander rings and packing cups; friction tape and splicing compounds; Transite asbestos wood smoke jacks; miscellaneous packing materials; Vulcabeston gaskets and washers; J-M fire extinguishers; Transite ventilators.

Joliet Railway Supply Co., Chicago.—Brake beams; truck bolsters; side bearings; journal boxes.

KeYoke Railway Equipment Co., Chicago.—Murray cast steel friction draft gear and cast steel coupler yokes.

Locomotive Feed Water Heater Co., New York.—Boiler feed pump; model of feed water heater; samples of various parts from service.

Locomotive Stoker Co., Pittsburg, Pa.—Full size type D duplex stoker with locomotive backhead; 1/3 size type D duplex stoker with locomotive backhead; full size type D slope sheet coal pusher.

Locomotive Superheater Co., New York.—Steam superheaters for locomotives; fire tube superheater for Scotch marine boilers; Elesco superheater for stationary boilers; pipe coils; steam pyrometers.

McCord & Co., Chicago.—Journal boxes.

Metal & Thermit Corporation, New York.—Thermit and appliances, sample of square single track crossing, constructed by Thermit welding. Sample of carbon-free metals and alloys produced by the Thermit process. Sample weld on 9 in. crank shaft. Materials for demonstrating pipe welding for the purpose of welding locomotive superheater units. Sample of superheater unit so welded.

Miner, W. H., Chicago.—Friction draft gears; side bearings; safety hand brakes; refrigerator car door fasteners; draw-bar yokes.

Mudge & Co., Chicago.—Solvit compound; Mudge motor cars; Mudge-Peerless ventilators.

National Carbon Co., Cleveland, Ohio.—Columbia dry cells; Columbia hot shot and multiple batteries; Columbia high voltage caustic soda cells; carbon and metal brushes for motors; generators and headlight equipment; lighting and welding carbons; welding paste; carbon plates; carbon packing rings; special forms in carbon and carbon telephone specialties; American flashlights and batteries.

National Lock Washer Co., Newark, N.J.—Models of car curtains; curtain fixtures, sash locks; sash balances; window packing; national lock washers and Hipower nut locks.

Norton, A. O., Incorporated, Boston, Mass., and Coaticook, Que.—Different types of Norton self-lowering speed-controlled jacks—100 ton; 50 ton; 50 ton inverted type—new this year. 35 ton; 25 ton; 25 ton and 35 ton ball bearing journal jacks.

Pyle-National Co., Chicago.—Model of Young valve gear. A complete line of turbo generators; electric headlight sets; suburban train lighting; headlight cases of all sizes; sheet steel and cast; locomotive cab lamps; back-up lamps; switches; connectors; focusing devices for lamps.

Q & C Packing & Lubricator Co., New York.—Piston rod packing and lubricators.

Safety Car Heating & Lighting Co., New York.—Electric and gas car lighting equipment; car lighting fixtures and reflectors; electric fans; oxy-Pintsch metal cutting equipment.

Standard Car Truck Co., Chicago.—Complete models showing different types and capacity of lateral motion trucks and working parts; roller center plates; roll-

er side bearings and four-point bearing truck.

Stucki Co., A., Pittsburg, Pa.—Side bearings.

Symington Co., The T. H., New York. Full size models Farlow draft gear attachments; Symington journal boxes; Symington journal box lid with locking attachment.

Tuco Products Corporation, New York. Tucolith plastic composition flooring material; flexolith composition flooring material; steel preservative as applied to chanarch; Imperial and Universal car window screens; National and Universal steel trap doors; trap door locks; resisto quilt hairfelt insulation; Tucork mineral insulation.

Union Draft Gear Co., Chicago.—Cardwell friction draft gear, type G, class 11-A; Cardwell friction draft gear, type G, class 11-A; duplex.

Union Railway Equipment Co., Chicago.—Ureco reclaim coupler release rigging; improved brine valve; tank hand-hole; drop brake shaft; pipe clamp; tank support; bevel hatchway; metal box-car ladder.

Universal Draft Gear Attachment Co., Chicago.—Cast steel coupler yokes; cast steel reinforcing draft arms; miscellaneous draft lugs in cast steel and malleable iron.

Vapor Car Heating Co., Chicago. — Vapor system of car heating—short-circuit cut-out method; new type steam hose couplers, with take-up lock; automatic car temperature control and automatic control for reducing yard temperatures; pressure reducing valves; steam traps; train pipe valves.

Westinghouse Air Brake Co., Pittsburg, Pa.—Universal passenger equipment demonstration rack of three cars and locomotive. Illuminated electric chart showing performance of UC passenger equipment with and without the electro pneumatic feature. Empty and load brake equipment demonstration rack. Westinghouse NA-1 friction draft gear complete.

Westinghouse Electric & Manufacturing Co., East Pittsburg, Pa.—Type 815 switch; type 809 reversing switch; type C controller, class C-7440; types 815 and 816 switch; type A auto starter; type 816 switch; 500 watt 32 volt turbine generator; type F. B. controller; type S duplex controller; type HK crane motor; 175 arc welding outfit.

Wheel Truing Brake Shoe Co., Detroit, Mich.—Samples of abrasive brake shoes.

Whiting Foundry Equipment Co., Harvey, Ill.—Working model of Whiting screw-jack locomotive hoist for wheeling and unwheeling locomotives; folios of drawings, photographs and literature covering complete line of cranes, foundry equipment and railway specialties, locomotive and coach hoists, turntable tractors and transfer tables.

Officers Section 3, Mechanical, American Railroad Association.

The term of office of the Vice Chairman and seven members of the general committee, Section 3, Mechanical, American Railroad Association, having expired in June, the committee on nominations, nominated the following, to serve until June, 1922:—

For Vice Chairman:—J. Coleman, Assistant to General Superintendent Motive Power and Car Department, Grand Trunk Ry.

For members of General Committee:—J. S. Lentz, Master Car Builder, Lehigh Valley Rd.; H. R. Warnock, General Sup-

erintendent Motive Power, Chicago, Milwaukee & St. Paul Ry.; C. E. Fuller, Superintendent Motive Power and Machinery, Union Pacific Rd.; W. Kells, General Superintendent Motive Power, Atlantic Coast Line Rd.; John Purcell, Assistant to Vice President, Atchison, Topeka & Santa Fe Rd.; H. L. Ingersoll, Assistant to President, New York Central Lines; J. J. Tatum, Superintendent Car Department, Baltimore & Ohio Rd.

The report was unanimously adopted on June 14. It was also resolved that the officers should be elected annually, instead of every two years, so that a greater number of members may enjoy the honor of being officers of the section.

Interchange Rules Modified.

Section 3, Mechanical, American Railroad Association, issued the following circular May 28:—

Effective June 1, 1920, the following

Birthdays of Transportation Men in July.

Many happy returns of the day to:

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

J. H. Black, ex-Superintendent, Timiskaming & Northern Ontario Ry., now at Toronto, born near Smiths Falls, Ont., July 8, 1874.

D. E. Blair, Superintendent of Rolling Stock, Montreal Tramways Co., born at St. Thomas de Montmagny, Que., July 25, 1877.

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

G. C. Conn, ex-Freight Traffic Manager, Pere Marquette Ry., Detroit, Mich., now General Traffic Manager, Buick Motor Co., Flint, Mich., born at Woburn, Mass., July 1, 1867.

A. R. Curran, Paymaster, Eastern Lines, Canadian Northern Ry., Toronto, born there, July 3, 1877.

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

A. H. Eager, Mechanical Superintendent, Western Lines, Canadian National Rys., Winnipeg, born at Waterloo, Que., July 15, 1868.

F. E. Hartshorn, Assistant Superintendent, Montreal Division, Quebec District, Canadian National Rys., Montreal, born at West Stewartstown, N.H., July 21, 1877.

S. J. Hungerford, Assistant Vice President, Canadian National Rys., Toronto, born at Bedford, Que., July 16, 1872.

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

H. J. Lambkin, District Commissary Agent, Sleeping, Dining and Parlor Cars and News Service, Canadian National Rys., Winnipeg, born at Quebec, Que., July 25, 1881.

M. Kelly, Resident Engineer, Farnham Division, Quebec District, C.P.R., Farnham, born at Thamesville, Ont., July 6, 1878.

T. King, Superintendent, Detroit Division, Western Lines, G.T.R., Detroit, Mich., born at Dunbarton, Ont., July 18, 1869.

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

G. A. McNicholl, Assistant General

modifications are made in sections (k) and (o) in rule 3 of the 1919 Rules of Interchange: Rule 3, Sec (k) modified to read as follows: "After Mar. 1, 1910, no car will be accepted in interchange unless properly equipped with United States Safety Appliances or U.S. Safety Appliances, Standard, except cars moving home on car service orders for equipping with safety appliances. Cars will not be accepted from owner at any time unless equipped with U.S. Safety Appliances or U.S. Safety Appliances, Standard."

Rule 3, section (o), modified to read as follows: "Cars built after Nov. 1, 1920, will not be accepted in interchange unless equipped with 6 x 8 in. shank A. R. A. Standard Type D Couplers."

This circular should be considered as a supplement to the Rules of Interchange and necessary instructions issued to all concerned. These modifications to the Rules of Interchange will be incorporated in the next supplement to these rules.

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

H. D. Mackenzie, Master Mechanic, Canadian National Rys., Edmundston, N.B., born at Churchville, N.S., July 22, 1864.

M. H. MacLeod, Vice President, Operation, Maintenance and Construction, Canadian National Rys., Toronto, born in Skye, Inverness-shire, Scotland, July 13, 1857.

J. M. Macrae, Assistant General Freight Agent, Canadian National Rys., Winnipeg, born at Stornoway, Scotland, July 31, 1884.

W. G. Manders, Assistant Freight Traffic Manager, Canadian National Rys., Winnipeg, born at Owen Sound, Ont., July 24, 1876.

Neil Marple, General Foreman, Michigan Central Rd., St. Thomas, Ont., born in McKillop Tp., Ont., July 1, 1860.

J. E. Morazain, General Superintendent, Quebec District, Canadian National Rys., Quebec, born at Wheatland, Que., July 31, 1875.

P. C. Perry, Assistant Resident Engineer, Grand Trunk Pacific Ry., Regina, Sask., born at Fort William, Ont., July 27, 1889.

R. E. Perry, Assistant General Freight Agent, Canadian National Rys., Montreal, born at Drayton, Ont., July 5, 1876.

G. G. Ruel, General Counsel, Canadian National Rys., Toronto, born at St. John, N.B., July 5, 1866.

George Stephen, Freight Traffic Manager, Canadian National Rys., Toronto, born at Montreal, July 5, 1876.

H. G. Studd, Auditor for Europe, C.P.R., London, Eng., born at Tottenham, Eng., July 10, 1883.

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

M. M. Todd, Vice President and Treasurer, Grand River Ry. and Lake Erie & Northern Ry., Galt, Ont., born there, July 22, 1891.

H. B. Walkem, Assistant Engineer, C.P.R., Vancouver, B.C., born at Montreal, July 31, 1858.

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

R. H. Webster, Commercial Agent, G.T.R., Moncton, N.B., born at Pictou, N.S., July 2, 1885.

Canadian Northern Railway Co's Annual Report.

The Canadian Northern Ry. Co.'s directors' report, addressed to the shareholders, has been issued over the signature of D. B. Hanna, President, as follows:—

Attention is particularly directed to the fact that this report covers only the operations of the Canadian Northern Railway lines, forming a part of the Canadian National Rys.

The directors submit herewith the fifth annual report covering the working of the Canadian Northern Ry. System for the year ended Dec. 31, 1919.

| | |
|---|-----------------|
| Gross earnings— | |
| Passenger traffic | \$10,775,708.46 |
| Freight traffic | 39,175,552.09 |
| Express, mail and telegraphs | 1,588,902.18 |
| Miscellaneous earnings | 2,022,014.84 |
| Interest and profits from elevator and other subsidiary companies, investments, etc. | 1,791,752.61 |
| | \$55,353,930.18 |
| Working expenses | \$60,034,023.92 |
| Hire of equipment, taxes, rentals and miscellaneous charges | 1,020,553.96 |
| | \$61,054,577.88 |
| Deficit | \$ 5,700,647.70 |
| Interest charges | 19,969,710.36 |
| | \$25,670,358.06 |

The total mileage operated at the end of the year was 9,685.7 compared with 9,566.5 at the end of 1918, an increase of 119.2 miles. The average mileage in operation throughout the year was 9,636.9.

Operating Revenues for 1919 increased by \$6,252,165.66 over 1918, or 13.22%. The increases were derived from

| | | |
|-------------------------|----------------|--------|
| Passenger traffic | \$2,951,264.02 | 37.72% |
| Freight traffic | 2,439,682.63 | 6.64% |
| Other | 861,219.01 | 31.32% |

Traffic Movement.—The increase in passenger earnings in 1919 as compared with 1918 is due in part to the removal of restrictions on travel applicable to war time traffic, augmented by the movement of troops for demobilization. As a result of the cessation of activities dependent on the war, and the consequent cancellation of government orders for munitions, foodstuffs, etc., a decline in business took place in the first half of the year. This was inevitable in a period of transition from war to peace. The loss in freight tonnage from Jan. 1 to July 31 was 1,500,000 tons, after which the tonnage showed an increase over 1918, to the extent that by the end of the year the net loss in tonnage was cut down to 850,327 tons. A gratifying feature of the situation is the additional long haul business, which is indicated by the instance of 23 miles in the average distance each ton of freight was hauled. While movements of live stock, lumber and building material show gains over last year, the declines in grain, coal and miscellaneous traffic more than offset these gains, resulting in loss of tonnage already mentioned as compared with 1918. The decline in coal traffic is due to the loss of shipments from Drumheller, Cardiff and Wayne during June, July and August, caused by the strike of the miners in the Alberta coal fields.

Operating Expenses.—The increase of \$15,971,073.98 in operating expenses is nearly all due to higher wages. The general large increases in rates of pay granted during 1918 under the McAdoo series of advances which were reflected only in part in the operating expenses for the year ended Dec. 31, 1918, show their full effect in this year's figures, and the total is increased by the effect of additional supplements issued during 1919 by the United States Railroad Administration

and which, under arrangement between the Canadian Railway War Board and the Dominion Government, have been applied to the wages of railway employes in Canada. The total increase in expenses due to wages for the year was \$12,350,226.60, or 77.31% of the total increase in operating expenses.

The deficit of \$5,700,647.70 is after crediting miscellaneous earnings and charging deductions from income. The actual operating deficit for the year is \$6,471,846.35, against net earnings of \$3,247,061.97 for 1918, and net earnings of \$7,443,369.41 for 1917. This loss between 1917 and 1919 of nearly \$14,000,000 in net earnings is a direct reflection of the improper relation existing between earnings and operating expenses. During these two years the abnormally large wage increases more than represent the loss in net earnings, as the following comparison of pay-roll totals shows:

| | | | | | |
|--|--------------|--------------|--------|--------------|-------|
| | 1917 | 1918 | Inc. % | 1919 | In. % |
| | \$20,871,397 | \$29,269,906 | 40.24 | \$41,620,133 | 42.19 |

For every dollar earned in the last year the railway had to pay out over 75c. in wages.

As all elements of the railway's expenses enter into the production of transportation in the shape of train miles, the increase in the cost of running a train one mile tells better than any other unit the story of the railway's inability to make ends meet, under conditions such as have existed in the past two years. When the large increases in the cost of materials and supplies are also considered, the difficulties of the situation will be more fully appreciated. The cost of running a train one mile increased from \$1.98 in 1917 to \$2.65 in 1918 and to \$3.36 in 1919, the latter figure being an increase of 27% over 1918 and 70% over the cost in 1917. Gross earnings per mile of line increased, from \$4,396 in 1917, to \$5,005 in 1918, and to \$5,558 in 1919, the 1919 gross per mile being only 10% over 1918 and 25% over 1917. Under these conditions, and with less than 1% increase in train service, the net result for the last two years has been to convert net earnings of \$789.08 a mile of line in 1917, and \$343.53 in 1918, to a deficit of \$671.63 a mile for 1919. This change in the net earnings situation is entirely due to the conditions referred to in the preceding paragraphs.

In comparing the train mile expenses for the last three years, the higher percentage of expenses devoted to maintenance, particularly in 1919, is worth noting, as indicating that a large percentage of the expenses is going towards the improvement of the roadway, structures and rolling stock. The cessation of hostilities having appreciably relieved the labor situation, your company was enabled during 1919 to commence overtaking considerable maintenance of roadway, structures and equipment work which (as referred to in previous reports) had been unavoidably deferred by war conditions. The amount of money spent on deferred maintenance through the year is estimated at over \$4,500,000, which is included in operating expenses.

The increase in revenue, which higher rates were expected to bring, has been greatly cut down by the falling off in tonnage of certain commodities, as compared with 1917, which, in common with other railways in Canada, has affected your line and has been most noticeable in respect to grain traffic. This loss of tonnage, and the extra expenditures, due to taking up in part the deferred main-

tenance, with the conditions already referred to in respect to wages, etc., precluded the possibility of making any net earnings without a readjustment of transportation rates.

Freight Rates.—The existing improper relationship between earnings and operating expenses is a condition which fortunately may be regarded as transitory. It is recognized in the United States and Great Britain, as well as in Canada, that the railways cannot continue to provide transportation at practically pre-war rates. Canadian and U.S. freight rates being generally on an equality, the general percentage of increase in the U.S. will, in the opinion of your directors, largely determine what the increase in Canada should be. From the statistics embodied in the report, it is clear that existing rates do not provide an adequate return. With the U.S. railways now handed back to the private owners, with legislation passed providing that they are to receive "a fair return upon the aggregate value of the railway property" and this fair return for two years fixed at 5½% a year and provision for an additional half of 1% for equipment, betterments, etc., there is every reason to believe that freight rates will be fairly adjusted in the near future.

Land Sales for the year were 79,053 acres for \$1,535,608.44, an average of \$19.42 an acre, compared with an average of \$19.45 for 1918. During the same period sales previously entered into, aggregating 32,403 acres, were, by mutual agreement, cancelled, so that the acreage of land available for sale has been decreased by 46,650 acres, leaving a total of 772,309 acres unsold.

Additional car trust obligations were created during last year to the extent of \$22,500,000 for the purchase of equipment of different kinds, and \$4,705,000 was repaid in respect of previous obligations, thus making the net increase \$17,795,000, and leaving the total amount of car trust obligations outstanding at Dec. 31, 1919, \$32,936,000.

New Equipment.—Motive power and other rolling stock ordered in 1919 were as follows:—

- 25 Pacific type locomotives.
- 25 Six-wheel switch locomotives.
- 750 Box cars.
- 800 Wooden stock cars.
- 550 Dump cars.
- 500 Flat cars.
- 250 Hart ballast cars.
- 150 Refrigerator cars.
- 30 Steel baggage cars.
- 6 Flangers.
- 130 Colonist cars.
- 20 Tourist cars.
- 18 Standard sleepers.
- 13 Compartment observation cars.
- 20 First class cars.
- 20 Mail cars.
- 9 Dining cars.
- 6 Snow ploughs.
- 5 Caboose.

Construction and Betterments.—As referred to in your directors' previous report, the construction programme for 1919 contemplated the completion of certain branch lines in Western Canada which were under construction at the outbreak of the war. Work was done on the following lines:—Acadia Valley extension, Jackfish Lake extension, Onoway extension, Alask southeasterly, Luck Lake extension, Peebles-Lampman extension, Amaranth northerly, Melfort-Humbolt extension, Gravelbourg extension, Eston southeasterly, Melfort northeasterly, Thunderhill extension, Hanna southeasterly, Oliver northeasterly, Kamloops-Kelowna-Lumby branch. While conditions governing labor and materials

prevented as great progress being made on these lines last year as was hoped for, the major portion of the work on these branches is expected to be completed this year.

Work on the improvement and betterment programme was carried on throughout the year; 550 miles of track had existing rails changed to heavier section; 101 temporary structures were replaced with permanent work; 11 timber trestles were partly filled and diversions at Falding and Grenville and on Sudbury Subdivision were completed. The work of replacing the line along the St. Lawrence River, west of Quebec, washed out by the tidal wave of 1918, was nearly completed. Much additional trackage for operating purposes was built, viz.: 45 passing tracks, 19 siding extensions, 32 transfer, storage and other tracks. Among the buildings erected were 27 stations, 6 freight sheds, 39 section houses, 36 bunk houses, 3 express buildings. Additions and improvements were made to various roundhouses, machine and car shops. Good progress was made on reballasting. Important structures completed during the year were the Vancouver passenger terminal and the St. Charles River bridge at Quebec. The value of these improvements and betterments has been already demonstrated in improved operating conditions. Your directors are pleased to report that upon their recommendations amounts for expenditure on capital account have been included in the government's estimates for the year, which will enable the improvement and betterment programme to be continued, thus equipping your system to better perform the transportation service of the country and particularly to handle economically those increases in traffic which, it is your directors' firm belief, will result coincident with the progress of the Dominion and which may largely be expected to take place in the areas served by your lines.

Canadian Government Merchant Marine Ltd.—Reference was made in last year's annual report to the ocean steamship service established through the Canadian Government Merchant Marine, Ltd. This service has continued with success, and as new ships are delivered the service will be enlarged and extended. To date 63 vessels have been ordered by the Marine Department, with a total d.w. tonnage of 380,615 tons. Of this number 19 were in service at Dec. 31, 1919, and since that date several additional ships have been delivered by the builders and put in operation. While the builders have been delayed in the construction of these ships, due to various causes, so that it is difficult to estimate deliveries definitely, yet it is hoped that by the end of the year there will be nearly 60 ships in service. The operation of the services established has, up to date, shown a substantial return. The Canadian National Rys. also benefit from the earnings on goods moving to and from ocean ports in connection with the services operated by these ships.

Outlook for the Future.—Your directors view the future with the confidence based on knowledge of the particularly favorable location of the system's lines and the general good character of the country served. The railway property of your system has invested in it not less than \$550,000,000. It is not held by your directors that because the year's operations resulted in a deficit, the value of this great investment is impaired. The conditions which have resulted in the present improper relation between earnings and expenses have been stated. Un-

der existing rates U.S. railways are acknowledged to be going behind their pre-war record at about the rate of \$1,000,000 a day. The increase in the value of the services performed by your railway may be illustrated by the rise in wholesale prices, and when this is contrasted with the almost stationary ton mile and passenger mile receipts, the inadequacy of the present rates needs no further comment.

The prospect in the near future of having the Grand Trunk System lines co-ordinated with those of the Canadian Northern and other government owned railways presents favorable opportunities of increased traffic for your system; and the benefits which will result from the inclusion of the Grand Trunk lines in the national system, while difficult to definitely estimate, are certain to prove substantial. As noted in previous reports, the Canadian Northern Ry. operates under a great disadvantage in not having a Niagara frontier line and connection in Ontario with U.S. lines. These the Grand Trunk will provide. The consolidation will also remove restrictions on traffic interchange to territory served by the Grand Trunk, which will certainly prove to be of great benefit to the national system.

Traffic returns since Jan. 1 indicate that tonnage on your lines is running about 8½% over the movement in the same period last year. This is a particularly good showing, in view of the much colder weather experienced this winter. There is no doubt that housing facilities are much behind the demand in practically all communities, and a large movement in building materials may be expected. There are large road building programmes under way, which should also produce increased tonnage in certain commodities. Immigration, which on the outbreak of the war fell away rapidly is, according to late reports, reviving. The return to pre-war immigration figures would have a most beneficial effect in restoring those conditions of expansion which before the war were so general along much of your western mileage. The live stock industry in western Canada continues to thrive, and is developing most remarkably. The Province of Saskatchewan now ranks first in the production of horses in Canada.

The importance of the Drumheller coal field development to western Canada, and particularly to the areas served by your line, was well demonstrated when the supply of coal from U.S. mines was interrupted through the general strike which occurred in Oct., 1919. The situation showed how generally dependent many other sections of this country are on the U.S. for supplies of coal. The double tracking of the line between Drumheller and Munson Jct. has been completed, and the output of the 23

mines in the district is being distributed to a constantly widening field of consumers, with increasing gross revenue to your company.

It is a matter of congratulation that the Prince of Wales has chosen the purchase of a ranch in Western Canada as one means of practically identifying himself with Canadian development, and as a permanent reminder of his first visit to Canada. Your directors cannot let this opportunity pass of expressing the hope that the royal example will be followed by many from Great Britain, not only in the matter of making a tour of Canada, but in acquiring property here. Your directors feel this can only result in good for the Imperial cause. The visit of the Prince of Wales to various points on the lines of your system was successfully accomplished, and the entire Canadian tour was one unbroken success.

It is with the greatest regret that your directors have to record the death on Jan. 24, 1920, of Z. A. Lash, K.C., L.L.D., Senior Counsel of your company. Mr. Lash, as chief legal adviser of the company for nearly 20 years, gave invaluable advice and counsel to the executive, during the construction and development period of the railway, and extended this service to your directors up to the time of his death.

Organization and Staff.—Your directors are glad to report that the rearrangement of official personnel, and general amalgamation of staff with that of the Canadian Government Rys. has proved to be most satisfactory. The two systems have worked together as one, and there has been the fullest co-operation between employes and management, and the board desires to express its thanks for the loyal and efficient services rendered during the year.

| Income Statement for year ended Dec. 31, 1919. | |
|---|-----------------|
| Revenue | \$53,562,177.57 |
| Subsidiary miscellaneous earnings | 1,791,752.61 |
| | \$55,353,930.18 |
| Working expenses | \$60,034,023.92 |
| Taxes, rentals, joint facilities, etc. | 1,020,553.96 |
| | 61,054,577.88 |
| | \$ 5,700,647.70 |
| Loss on operating | |
| Fixed charges— | |
| Canadian Northern Ry. | 8,012,969.65 |
| Affiliated Companies. | 4,895,112.71 |
| Interest on demand and short term notes & loans— | |
| Government | 6,939,373.68 |
| Other (net balance). | 122,254.32 |
| | 19,969,710.36 |
| Deficit carried to profit and loss statement | \$25,670,358.06 |
| Profit and Loss Statement, Dec. 31, 1919. | |
| Deficit on income account for the year | \$25,670,358.06 |
| Discount, etc., on funded debt | 472,682.09 |
| Delayed income, debits and credits, debit balance | 1,324,711.98 |
| | \$27,467,752.13 |
| Deduct surplus brought forward Dec. | |

| Operating Revenues. | | Operating Expenses. | |
|--|-----------------|--|-----------------|
| Class | 1918 | Class | 1918 |
| Passenger | \$ 7,824,444.44 | Maintenance of way and structures.. | \$ 9,060,264.79 |
| Freight | 36,785,869.46 | Maintenance of equipment | 8,498,673.11 |
| Mails | 245,187.12 | Traffic expenses | 797,181.68 |
| Express | 964,617.55 | Transportation expenses | 23,907,348.28 |
| Miscellaneous | 1,539,893.34 | Miscellaneous operations | 576,071.12 |
| Total | \$47,310,011.91 | General expenses | 1,223,410.96 |
| | | Total | \$44,062,949.94 |
| Summary of Revenues and Expenses. | | Summary of Revenues and Expenses. | |
| Class | 1918 | Class | 1918 |
| Operating revenues | \$47,310,011.91 | Operating revenues | \$47,310,011.91 |
| Operating expenses | 44,062,949.94 | Operating expenses | 44,062,949.94 |
| Net earnings | 3,247,061.97 | Net earnings | 3,247,061.97 |

Parcel Post Rates on Mail Order Business.

| | |
|--|-----------------------|
| 31, 1918 | 17,982,224.61 |
| Total deficit at Dec. 31, 1919, carried to balance sheet | \$9,535,527.52 |
| Description of Freight Carried. | |
| Flour, sacks (100 lb.) | 1919 1918 |
| Grain, bush | 8,978,640 8,904,498 |
| Live stock, head | 91,373,574 93,985,078 |
| Logs and lumber, ft. (m.f.) | 834,991 654,583 |
| Firewood, cords | 1,928,698 1,614,829 |
| Coal, tons | 329,138 362,118 |
| Immigrants' effects, cars | 2,174,207 2,378,985 |
| Building material (lime, stone, brick, sand, etc.) | 4,728 5,279 |
| Miscellaneous, tons | 34,076 29,794 |
| Earnings, Expenses and Net operated | 3,142,961 4,048,065 |
| per mile | |
| Average miles Operated | 1919 1918 |
| 1917 | 9,433 |
| 1918 | 9,452 |
| 1919 | 9,636 |
| Earnings | \$4,396.27 |
| Expenses | \$3,607.19 |
| Net Earnings | +\$789.08 |
| Earnings | 5,005.29 |
| Expenses | 4,661.76 |
| Net Earnings | + 343.53 |
| Earnings | 5,558.55 |
| Expenses | 6,230.18 |
| Net Earnings | - 671.63 |

The amount required per mile of road to pay fixed charges (including leased lines), was as follows:—1919, \$2,072.41; 1918, \$1,093.60; 1917, \$1,695.24.

| | | | |
|---|--|-----------------|-----------------|
| Passenger, Freight and Miscellaneous Statistics. | | 1919 | 1918 |
| Passenger traffic— | | | |
| Passengers carried (earning revenue) | | 4,925,547 | 4,114,965 |
| Passengers carried one mile | | 344,773,029 | 288,067,800 |
| Average distance carried | | 36,256 | 30,477 |
| Total passenger revenue \$ | | 9,629,460.01 | 7,128,141.55 |
| Average amount received per passenger | | 1.95.500 | 1.73.225 |
| Average amount received per passenger train | | 2.793 | 2.474 |
| Freight train earnings per train mile | | \$11,811,612.85 | 8,783,084.63 |
| Freight train earnings per train mile | | 1.53.575 | 1.28.903 |
| Freight traffic— | | | |
| Revenue tons carried | | 12,439,314 | 13,289,641 |
| Revenue tons carried one mile | | 4,046,023,363 | 4,021,275,963 |
| Average distance haul of one ton | | 425,472 | 425,442 |
| Total freight revenue \$ | | 38,276,419.06 | 35,674,816.63 |
| Average amount received for each ton of freight | | 3.07.705 | 2.68.441 |
| Average revenue per ton per mile | | .946 | .887 |
| Total freight train earnings | | \$39,010,667.80 | \$36,719,136.76 |
| Freight train earnings per train mile | | 3.34.877 | 3.24.220 |
| Mileage of passenger trains | | | |
| Mileage of freight trains | | 5,864,271 | 5,044,607 |
| Mileage of mixed trains | | 9,822,281 | 9,556,238 |
| Expenses per freight train mile | | 1,826,898 | 1,769,124 |
| Maintenance of way and structures | | | |
| Maintenance of equipment | | 89.45 | 54.67 |
| Traffic expenses | | 65.05 | 51.12 |
| Transportation expenses, rail | | 5.82 | 4.79 |
| Transportation expenses, water | | 1.61.96 | 1.43.69 |
| Miscellaneous operations | | 0.11 | — |
| General expenses | | 5.34 | 3.52 |
| Total | | 8.51 | 7.10 |
| Total | | 3.36.24 | 2.64.89 |

| | |
|--|----------------------------|
| Operations of Electric Lines not included in above Statement. | |
| Electric line statistics— | |
| Passengers carried (earning revenue) | 11,281,694 6,036,625 |
| Revenue | 909,985.72 504,319.84 |
| Revenue tons carried | 383,130 409,704 |
| Total freight revenue | \$ 280,489.07 \$252,756.20 |

The total mileage operated in 1919 was 9,685.7, viz.: owned by C.N.R. Co., 9,183.1; joint running rights, 155.3; Northern Pacific lines in Manitoba, leased, 347.3.

Cornwall Bridge Assessment.—The Ontario Legislature has confirmed a Cornwall Tp. bylaw validating an agreement between the township and the Ottawa & New York Ry., fixing the amount of the assessment of the portion of the company's bridge across the St. Lawrence River at Cornwall, at \$150,000 for ten years.

The following motion by Senator W. Proudfoot, was passed by the Senate April 28:—"That an order do issue for a return of the evidence and other proceedings submitted before the Board of Railway Commissioners at the sessions at Ottawa on Oct. 3, 1911, Nov. 7, 1911, and Mar. 18, 1919, relating to freight rates and all matters before said board on said dates. 2. A copy of the report made by said board to the Government as the result of said investigations. 3. A copy of the postal rate agreement or agreements existing between the government and the railway companies for parcel post service, including a statement or copy of the rates charged by the government railways. 4. A copy of the report made by the Board of Railway Commissioners to the government on the contracts between the government and the railway companies as to the rates charged for the postal services. 5. Does the said report show (or is the government aware) that the rates fixed and paid are less than it cost the railway companies to perform the services? 6. What quantity of mail is carried annually by parcel post?"

In moving the resolution, Senator Proudfoot said:—"The object of the investigations above referred to, as I understand, was to ascertain whether or not certain commodities were being carried at certain rates. I understand that a report was made by the Board of Railway Commissioners to the government, but it has not yet been made public, and it is for the purpose of having it brought down that I make this motion. Another object of the motion is to enable me to deal with the question of postal rates, in so far as they affect mail order houses. The mail order business is one of great importance to the people. When in the Ontario legislature, I advocated the imposition of a tax on mail order houses in each municipality; that is to say, if they sold by mail order in certain townships, or in certain towns or villages, they should pay a tax based on the business they did in each municipality. It is not fair that they should do business in a municipality and pay nothing in the way of taxes to the municipality, while the merchants there are obliged to pay taxes and other rates toward the upkeep of the municipality. The mail order business is carried on very extensively throughout the Dominion, and, according to my information, the mail order houses have been securing a great advantage over the merchants in the country districts. The question then arises, how far is the government responsible for enabling the mail order houses to carry on business? We find that on Mar. 15, 1918, freight rates were advanced 15%, and that on Aug. 12, 1918, they were again increased 25%. There was also an increase in the rates on various commodities on all the railways. The salaries of those engaged in the mail service were also increased, and in that way the cost of transportation was increased. My information is to the effect that, although those increases were made, nevertheless the postal rates were not increased, and that therefore the mail order houses were able to carry on business at practically what it cost them to do so prior to the increase in freight rates. If that is so, it is unfair discrimination in favor of the mail order house, and it is a kind of discrimination which should be put an end to. We must consider the

effect it has on business in the rural municipalities and in the towns and villages. We find throughout the length and breadth of the land that the country stores are gradually being driven out of business by unjust competition. I say it is unjust competition when mail order houses are enabled to ship goods into these municipalities at less than it costs the country to provide the carrying of these goods. They are discriminated against, first, in so far as the railways are concerned, and, secondly, in so far as the government is concerned. The railways are carrying the mail order business at less than cost, and the government is providing the means for carrying it at less than cost. The result is, as an examination will show, the government of this country is handing over every year millions of dollars to the mail order houses. It would not be so bad if the general public were getting the benefit, but the public as a whole are not getting the benefit of the millions that are handed out in this way.

"The Minister of Labor, at a meeting in, I think, Ottawa last year, made the statement that the government was bonusing the newspapers of Canada to the extent of about \$6,000,000 a year by carrying them at less than the cost of transportation. I am not making any complaint in that respect. There may be some justification for newspapers being carried in that way. Newspapers are supposed to be a means of educating the people and of disseminating the news from one end of the country to the other. That being so, there is an excuse for the government spending money in that way. But there is no excuse in permitting one section of the people to secure an advantage over others. If the country stores had been allowed to go on as they did in years past, many of the young people in the country would have found it to their advantage to remain at home. The money would be kept in circulation in their immediate neighborhood. Besides, those localities would not be entirely rural districts, as they are being made by the change which has been gradually brought about in the mode of business by the mail order houses. No one objects to fair competition, but what people do object to, and I think they have a right to it, is unfair competition; and the competition is unfair when one class secures an advantage over another, at the expense of the whole public.

"The object in desiring to distinguish between the provinces is to ascertain what amount of mail order business is being done by the various houses, say in Ontario. We can in that way ascertain whether the mail order business is being carried on more extensively in Ontario than in any of the other provinces; and if that is the case, and I am correct in my surmise that this service is being carried on at a loss to the country, then Ontario is securing an advantage over the rest of the Dominion. If the service is being performed at a loss, the sooner the government makes a change in that respect the better. Otherwise the same unfair conditions will continue in the future as in the past."

British Railway Rates.—The Minister for Transportation is reported to have stated in the British House of Commons June 14 that a further increase in railway rates cannot be avoided.

Demurrage not Chargeable Where Delays Caused by Customs Officials.

Commissioner A. S. Goodeve, of the Board of Railway Commissioners, gave the following opinion April 28 on applications for an informal opinion of the board in the matter of the right of railway companies to collect demurrage, or storage, under circumstances where cars are delayed by Customs and the testing or inspection of the goods in the car.

There are two applications upon this file, in both of which the same principle is involved. The first is from W. J. Collins, Manager, Canadian Car Demurrage Bureau, in connection with a carload of lima beans, apparently Asiatic, consigned to Montreal from 60th St., New York, ex s.s. Port Albany from London, and which arrived in Montreal Feb. 9, 1920, and was released by the appraiser on Feb. 19. The application is for an informal ruling of this board, in the matter of the right of the railway company to collect demurrage, or storage, under the circumstances where cars are delayed by customs authorities and the testing or inspection of the goods in the car. Ten dollars demurrage was assessed on this car, which the consignee, the Universal Importing Co., refused to pay, on the ground that the Customs Department would not allow it to take delivery of the car until the beans were tested by the Chief Analyst at Ottawa. The Superintendent of the Car Service Bureau, F. Price, wrote Mr. Costigan, Customs Department, Inland Revenue, Montreal, April 5, as follows: "We respectfully refer you to the enclosed papers covering delay to car 43909 at Montreal between Feb. 9 and 16, 1920. This car arrived Montreal Feb. 9, and it is claimed by the consignee that the Customs Department would not allow it to take delivery of the car until the shipment, which consisted of beans, had been tested by the Chief Analyst at Ottawa. Note letter from appraiser, O'Shea, and kindly advise exact date this shipment was released by Customs Department." To which Mr. Costigan replied, April 6: "Car 43909 was released on report of analysis under date of Feb. 19, 1920." This inspection was in compliance with a circular issued by the Customs Department, Jan. 28, 1920, instructing all collectors of customs to withhold delivery of East India, or Oriental beans, or beans of Asiatic or East India origin, pending a receipt of a report from the authorities of the Health Department.

The second application is the complaint of the Canada Seed Co., Toronto, per Agriculture Department, Canada (Seed Commissioner) in connection with a carload of clover seed consigned to the Canada Seed Co., Brantford, Ont., and held for inspection under the seed importation regulations of the Agriculture Department. These regulations were contained in a circular issued to collectors of customs throughout Canada, Oct. 26, 1918. This car, 11840, was held in bond from Sept. 17 to 29, 1919, at Brantford, and \$30 demurrage charges assessed against it. The following letter from the Customs Collector at Brantford to the G.T.R. agent makes the situation clear: "The papers for this car arrived in Brantford from Toronto Sept. 19, 1919, being sworn to at Toronto Sept. 18, 1919. Samples drawn according to then Customs regulations sent to Agriculture Department to test as to purity. Instructions received from Agriculture Department, dated Sept. 27, 1919, received here Sept.

29, to release shipment, and papers sent same date to G.T.R. to release car."

It is quite clear from the written statements of J. T. Costigan, General Inspector, and J. W. Spence, Collector, that in both these cases the delay was due to government regulations. These regulations are general in their application; and the delay to the two cars under consideration was not due to any inherent cause in these two particular consignments. I am, therefore, of the opinion that under Canadian Car Demurrage Rule 8, which is as follows: "Customs or inspection delays.—Demurrage shall not be collected from the consignee for any delays for which government . . . officials may be responsible," the railway company is not entitled to collect demurrage.

Assistant Chief Commissioner McLean concurred as follows:—Rule 8 of the Demurrage Rules, which is headed "Customs or Inspection Delays," as it stands, is ambiguous. It is open to two constructions: (1) that the exemption from demurrage "for which government . . . officials may be responsible" is an exemption arising out of neglect on the part of said officials; (2) that the exemption may arise where there is a delay from general governmental regulations, under which the government officials are working. The position taken by the Canadian Car Demurrage Bureau is that the exemption applies only where the delay is attributable to an act or neglect of Customs officials. It may be that the rule is not clear in wording in regard to its intent. It is, however, an established rule of construction in regard to tariffs, classifications, etc., that where the rule or item is ambiguous, the rule or item is to be construed strictly against the railway. Looking at the matter from this standpoint, I agree in Commissioner Goodeve's finding.

Dismissal and Reinstatement of Intercolonial Railway Conductor.

The following questions were asked in the House of Commons recently by J. B. Bourassa, M.P. for Levis, Que., and answered by the Minister of Railways, Hon. J. D. Reid.

"Has Philippe Boucher, of Charny, railway conductor, Intercolonial Ry., who was arrested for theft of merchandise from the G.T.R. in Montreal last autumn, and found guilty, been reinstated in his former position?" Answer: "He was not arrested for stealing from the G.T.R., but he was arrested by a G.T.R. policeman for having in his possession blankets belonging to Canadian Government Railways. He has since been reinstated."

"If so, how long after his offence was he reinstated?" Answer: "Twenty-six days."

"At whose request was he reinstated?" Answer: "At the request of the General Superintendent, after he had thoroughly investigated the matter and found that Boucher was not attempting to steal."

Nepigon Terminals Ltd. has been incorporated under the Ontario Companies Act with authorized capital of \$40,000, and office at Port Arthur, to deal in lands and buildings for various purposes. A. J. McComber is one of the provisional directors.

The West Indies Cable.

When an item of \$38,933.33, for West Indies cable, in the estimates for this fiscal year, was under discussion in the House of Commons recently, W. Duff, M.P. for Lunenburg, N.S., asked if the government pays that amount towards cable service with the West Indies.

Sir GEORGE FOSTER replied: Yes. I think about eight years ago an arrangement was made between the British Government, the United States Government and the West India Islands Government, which had two things in view, an extension of the cable service, and a cheapening of the costs of that service. The subsidy that was given was shared in equal proportions by Great Britain and Canada. I think it was \$8,000 for each, and the West India administration contributed \$10,000 a year. That subsidy has yet three years, I think, to run. A cheapening in the cost was brought about at once, and has continued up to this time. That cheapening runs from Halifax and other Canadian points, all the way through down to Bermuda, and through the other lines down as far as Demerara and connecting all that outer rim of the islands. That service has within the last two years been a good deal troubled and interrupted, and I have had the fullest explanations and information with reference to it. The service has been intermittent, and the condition has been extremely annoying to business men, but on the other hand it has been up against the hardest luck that I have known in connection with the service. Owing to the war, and other circumstances, it was absolutely impossible to get repair ships, and that was where the trouble arose. I got into communication with the British Post Office authorities, who manage the service so far as Great Britain is concerned, and a thorough examination is being made into the matter. That also will be one of the questions which will come up for discussion when our conference meets in Ottawa.

Mr. DUFF said:—I am very glad to hear that the cable service will be resumed, because for the last year or so it has been very unsatisfactory. Sometimes it takes as much as a week for a cable to go from Canada to the West Indies and the reply to come back, and that seriously interferes with business. It is absolutely necessary for business men that their cables shall arrive at their destinations quickly, so that they can get replies as soon as possible. Competition is keen, and it is necessary to catch the steamships that are sailing between Canada and the West Indies, and sometimes the cables are only sent 24 hours before the steamer sails from Halifax or St. John.

Grain Inspected at Western Points.

The following figures, compiled by the Dominion Bureau of Statistics' Internal Trade Division, show the number of cars of grain inspected at Winnipeg and other points on the Western Division during May, and during 9 months ended May 31, 1920 and 1919:—

| | May 1920 | 9 mons. to May 1919 | 9 mons. to May 1919 |
|---------------------------------|----------|---------------------|---------------------|
| Canadian National Ry. | 3,854 | 48,835 | 45,634 |
| Canadian Pacific Ry. | 2,757 | 65,789 | 61,761 |
| Grand Trunk Pacific Ry. | 654 | 19,021 | 14,839 |
| Great Northern Ry. | 39 | 534 | 850 |
| Totals | 7,304 | 134,179 | 122,884 |

Railway Operation and Maintenance Under a Divisional Organization.

By Alfred Price, General Manager, Eastern Lines, Canadian Pacific Railway.

In the very early days of railroading on this continent there was no necessity for an elaborate official organization. One can imagine that the rules and methods of operation first adopted were somewhat similar to those now in effect on rural electric lines. The trains were then few in number; they cannot now be satisfactorily handled on single track lines. The locomotives weighed from 4 to 6 tons; the latest achievement weighs 427 tons. The passenger cars were simply stage coaches coupled together; they are now elegant palaces on wheels. The rails were short wooden beams, covered with strap iron, and after a short use failed mechanically under 6 ton locomotives; they are now from 30 to 41 ft. long, and

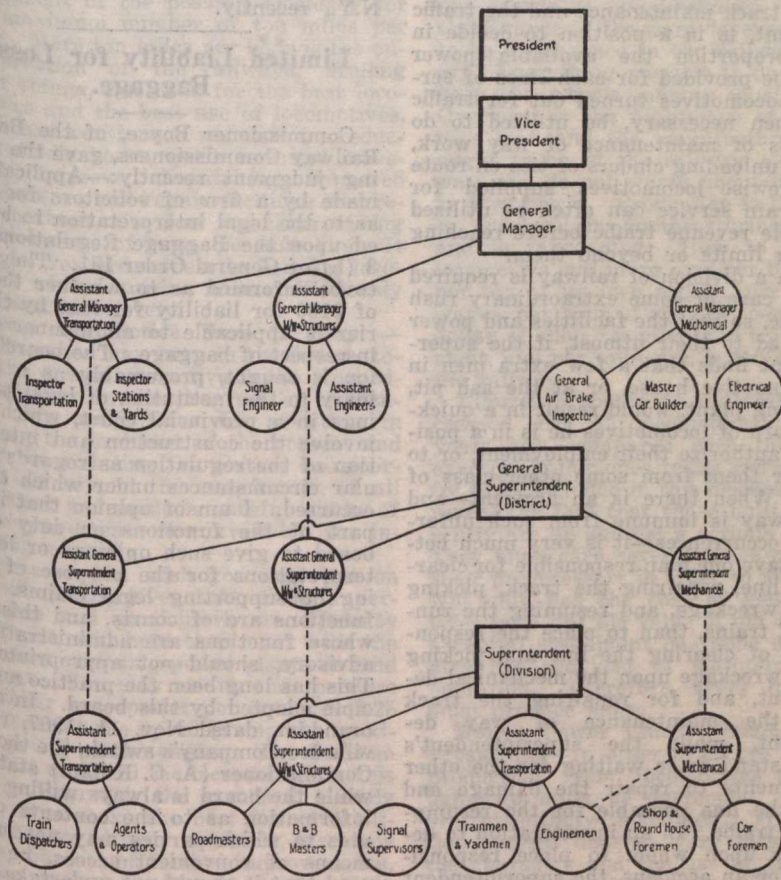
the number of miles of railway under operation, the extent of the territory served, and the prodigious sums of money invested in property, material and equipment, it is almost impossible to realize that the first railroad in the United States was built only about 90 years ago. Since then, not only have the achievements in railway building been stupendous, and the improvement in equipment and facilities marvelous, but the organization which has been developed to handle the immense traffic over an interlaced system of rails, with its complicated movements, has been amazing. In this development each railway company was at first a law unto itself and worked independently. All roads were not built

its object being the discussion and recommendation of methods for the management of American railways. Probably the oldest organization of the kind is the Master Car Builders' Association, formed in 1867. Its objects are the advancement of knowledge concerning the construction, repair and service of railway cars, to bring about uniformity and interchangeability in their parts, and to adjust the mutual interests growing out of their interchange and repair. There are also important associations, representing all branches of railway work, including maintenance of way, car service, railway telegraph, railway signal, passenger traffic, freight traffic, accounting, baggage, stores and claims agents, which discuss and legislate upon the various matters over which they respectively have jurisdiction. Through the recommendations and decisions of these associations, agreements have been reached on almost every known railway subject and almost every article used in connection with railway construction, maintenance and operation.

Upon one subject, however, no agreement has ever been arrived at. Both the divisional and the departmental organizations are in effect upon railways that are known to be efficiently and economically managed and neither system is without its champions. It is believed by some successful railway executives that the maintenance of way department should be under the direct supervision and sole control of men who are technically trained engineers, and that the track and bridge maintenance should be something entirely separate from the operation of the railway. Similarly it is their opinion that the mechanical department should be managed exclusively by men having had a thorough mechanical training and that there should be a well defined line of demarcation between it and the operating department. The theory is that, in this day of specialization, the right principle is to have experts in sole charge of the three important departments, operating, maintenance of way and mechanical, and that they should be handled as separate entities.

Organization has been defined as "The systematic union of individuals in a body whose officers, agents and members work together for a common end." Those who favor the divisional organization believe that better results are obtainable by a fusion, under one head, of the three important departments referred to above, and that by such an organization "the officers, agents and members" are much more likely to "work together for a common end" than if the departments are kept separate.

The departmental idea is carried a great deal higher up on some roads than on others. In some cases the general superintendent, besides being in charge of operation, controls all maintenance and mechanical work on his district, the officers of these departments reporting direct to him. In other cases the departments are kept entirely separate on districts, as well as on divisions, and the departmental officers report direct to the general manager. Again on other roads a great gulf is fixed between the working forces in the different departments, the general manager having no control of maintenance of way and mechanical matters. Instead the departmental officers



Railway Operation and Maintenance under a Divisional Organization.

are made of steel by the Bessemer, open hearth or other processes. In those good old days the trains were known as accommodation trains. The passengers were accommodating, for it is recorded that they habitually alighted from trains on steep ascending grades and climbed to the summits on foot; the modern passengers object to climb even into upper berths. But as traffic increased, trains multiplied, locomotives and cars were enlarged, and all railway facilities, equipment and appurtenances, which at the beginning were exceedingly crude, by a continuous series of improvements reached their present degree of excellence. Coincident with this great physical change there was naturally and necessarily a development in methods of operation, varying from time to time as traffic increased and conditions altered.

As one surveys today, the whole railway field on this continent, and considers

to the same gauge, and the interchange of cars was thereby rendered impossible. The necessity of standardizing the gauge was therefore recognized. Every railway ran its trains according to the local time of the city in which its head offices were located, or on some other arbitrary time. The various railways had their own system of operating rules; and in giving signals by hand or lamp, what was a "stop" signal on some roads was a "proceed" or "back-up" signal on others.

The need for reaching agreements on many matters and the desirability of standardizing methods, brought railway officials together, for an exchange of ideas and railway associations were the outgrowth of these meetings. Of the many railway associations in existence today the most important, although not the oldest, is the American Railroad Association, which was organized in 1872,

have supreme authority over their respective departments and report direct to the vice president in charge of operation and maintenance.

The absolute necessity of having highly trained experts supervise these two technical departments is fully appreciated, but this is quite possible, under a system that will co-relate under the divisional superintendent all the forces of the operating, maintenance of way and mechanical departments, so as to make them complementary to one another. The plan recommended is clearly shown on the accompanying diagram. The solid lines indicate direct jurisdiction and control, whereas the dotted lines indicate a medium of communication between men engaged in the same department, so that the benefit of the technical knowledge and expert training of those at the top may be transmitted to those who are directly in charge of the work.

Instead of designating the departmental officers as "assistants," some would prefer to use the old familiar titles, such as superintendent of transportation, district master mechanic, division engineer, trainmaster, chief dispatcher, etc., but this is not material. By a reference to the diagram, it will be seen that the general manager, general superintendent, and superintendent each has assisting him men who may be regarded as specialists in maintenance of way, transportation and mechanical work, respectively. The assistant general manager (maintenance of way) prescribes standards in connection with track, bridges and buildings; allocates new rails supplied for replacement; passes upon all plans submitted to the general manager by general superintendents for approval; criticizes maintenance of way expenditures, etc., etc. The assistant general manager (transportation) is responsible for the distribution of cars as between districts; the preparation of timetables, fixing the time of through trains at inter-district points; the issuance of instructions about preference and special passenger train movements; notices of embargoes; criticizes transportation expenses, etc., etc. The assistant general manager (mechanical) is responsible for the distribution of power as between districts; he prescribes locomotive shop, car shop and roundhouse practices; controls the movement of air brake inspection cars; supplies dynamometer car and attendants for the making of tonnage rating tests; criticizes mechanical department expenses, etc., etc. All three officers report to the general manager and all instructions to district officers are addressed to the general superintendents over the signature of the general manager.

The three assistant general superintendents bear pretty much the same relation to their general superintendent as the three assistant general managers bear to the general manager, communications and instructions being sent out over the signature of the general superintendent. They confer with officers of higher rank on work in which they are especially concerned, and guide those of lower rank so as to ensure the work being prosecuted in accordance with the prescribed standards and practices. The assistant superintendents report direct to their superintendent. They bear pretty much the same relation to him as corresponding officers of higher grades bear to the general manager and to the general superintendents. They are held directly responsible to him for the work of the men under them and have the advantage of the assistance and advice of

the district officers in the same departments.

The above gives, in brief outline, a general idea of a divisional organization, but does not show in any definite way the advantages to be derived from it. Time will not permit of more than a mention of a few of these. Such a system absolutely removes any departmental friction, and tends to promote harmony throughout all branches of the service. If passenger trains fail to maintain their schedules, the superintendent is not in a position to blame the engineering department for not keeping the track in proper condition for high speed trains, nor the mechanical department for not maintaining locomotives in condition to make time. He is responsible for the condition of both the track and the power.

When there is an abnormal demand for locomotives for work train service, as well as for traffic, the superintendent, being in full control, and responsible alike for the track maintenance and the traffic movement, is in a position to decide in what proportion the available power should be provided for each class of service. Locomotives turned out for traffic can, when necessary, be utilized to do odd jobs of maintenance of way work, such as unloading cinders or ties en route and likewise locomotives supplied for work train service can often be utilized to handle revenue traffic before reaching working limits or beyond them.

When a division of railway is required to take care of some extraordinary rush of traffic, so that the facilities and power are taxed to their utmost, if the superintendent finds that a few extra men in the locomotive house, or at the ash pit, or coaling plant, would result in a quicker outturn of locomotives he is in a position to authorize their employment, or to transfer them from some other class of work. When there is an accident—and no railway is immune from such unfortunate occurrences—it is very much better to have one man responsible for clearing the line, repairing the track, picking up the wreckage, and resuming the running of trains, than to place the responsibility of clearing the line and picking up the wreckage upon the mechanical department, and for repairing the track upon the maintenance of way department, while the superintendent's forces stand aside waiting for the other departments to repair the damage and make the line passable for the resumption of traffic. In an investigation to determine upon whom to place responsibility for an accident, the superintendent can have no object in attempting to fix the blame, except where it belongs. Under a departmental organization, all departments interested are represented and every representative naturally desires to escape the necessity of admitting responsibility. This is unfortunate, but as human nature is constituted, it is inevitable.

A superintendent has a greater number of officers available for special emergencies. If it is suspected that men engaged in train service are becoming lax in the observance of any of the important general rules, or if it is considered advisable to check up any feature of track work, he is in a position to use all his assistants for checking or efficiency testing. There is an added advantage in that so many assistants obtain a general all around knowledge of and experience in the operation and maintenance of a division fitting them for greater responsibilities. Not the least important benefit to be derived from a divisional organi-

zation is the broader training which officers in the lower positions receive. A man occupying the position of general manager, or general superintendent, should not only know something theoretically, but a great deal practically, about the maintenance of track, buildings, bridges, signals, cars and locomotives, besides being a competent transportation officer, and the best way to acquire this general knowledge is to be placed in a position to gain the practical experience. A superintendent given such an opportunity will naturally make a more capable general officer than one whose training is confined to one department.

It has already been stated that some railways are being efficiently and economically managed under a departmental organization. The question naturally arises "Would still better results be produced under a divisional organization?"

The foregoing paper was read before the Central Railway Club, at Buffalo, N.Y., recently.

Limited Liability for Loss of Baggage.

Commissioner Boyce, of the Board of Railway Commissioners, gave the following judgment recently:—Application is made by a firm of solicitors for advice as to the legal interpretation to be placed upon the Baggage Regulations—rule 3 (b) of General Order 151. They desire to be informed as to whether the limit of \$100 for liability for loss by the carrier is applicable to all manner of loss in respect of baggage. The board's opinion is sought, presumably as a preliminary to the institution of legal proceedings in a provincial court, which would involve the construction and interpretation of the regulation as regards particular circumstances under which the loss occurred. I am of opinion that it is no part of the functions or duty of this board to give such opinions or legal interpretations for the purpose of founding or supporting legal claims. Those functions are of courts, and this board, whose functions are administrative, not advisory, should not appropriate them. This has long been the practice and principle adopted by this board. In a memorandum, dated Nov. 11, 1907, re Dunville Ice Company's switch, the then Chief Commissioner (A. C. Killam) stated that while the board is always willing to give information as to the contents of statutes to which parties may not have the means of convenient access, he considered that it should not undertake to give legal opinions as to parties' rights under circumstances stated to it, except where it became necessary for it to do so in dealing with applications and complaints coming before it in due course for adjudication; that in the particular case submitted, rights and obligations of the parties might be affected by circumstances not known to the board; and that the board could not properly undertake to advise in the matter.

The Commissioner then cited a number of similar rulings by the board, and concluded as follows:—The applicants should be advised that, for the reasons given, the board is unable to comply with their request.

The Union Pacific System has now three offices in Canada, for both freight and passenger purposes, as follows:—Toronto, G. W. Vaux, General Agent; Calgary, Alta., L. J. Canfield, General Agent; Vancouver, B.C., F. S. Elliott, General Agent.

The Locomotive as an Investment.

By G. M. Basford, President, Locomotive Feed Water Heater Company.

The following individual paper was read at the Sec. 3, Mechanical, Convention, American Railroad Association:—

More Ton Miles per Hour.—The locomotive is a big investment, and it must be so considered and so treated. In no other branch of engineering development has so much progress and improvement been made in efficiency as has been made in the steam locomotive during the present official generation, and the improvement has just begun. If all new and all existing locomotives are made as efficient as the best, and it is possible to make them nearly so, private ownership and operation of railways will be put in the way of success. But, no matter how efficient the power unit may be as a unit, its operation must be such as to obtain the benefit of the possible efficiency for the maximum number of ton miles per hour. More ton miles per hour is the only salvation of the railways. Among other things, this calls for the best locomotives and the best use of locomotives, quick and continuous movements, reduction of idle hours, quick terminal movements, improved dispatching, improved maintenance and repair facilities and repair methods, also fuel and labor saving improvements of every possible kind. It calls for resourcefulness in keeping locomotive wheels turning most continuously and most effectively.

Steam Locomotive Here to Stay.—Whatever we may have in the future, today the steam locomotive is the most vital influence in the progress of civilization. Its possibilities for assisting in meeting the problems of the present and future by reducing the cost of transportation lie beyond the imagination of all who have not made a careful study of the improvements now available for increasing capacity.

Whenever you wish you may put on the rails locomotives that, from a performance and particularly an efficiency standpoint, will hold their own with the best non-condensing power plants on land or afloat. You may at any time produce a drawbar horsepower per hour for 2.25 lb. of coal at the speed giving the maximum power of the engine. The problem is how to make all the locomotives in this country approach the standard already set, how to make the best use of facilities that are already available, also how to keep abreast of further improvements.

Your speaker innocently suggested as a subject for this convention: Modernization of existing locomotives, a study of locomotive operation from the point of view of a large investment, believing this to be the greatest problem before you. Your general committee honored me with the request, which is as effective as an order, to do it myself. I appreciate the responsibility. The only difficulty is to make the facts clear and to state the case strongly enough.

Importance of Overhead.—I have said that a locomotive must be considered as a big investment and must be used accordingly. It has been stated that the value of locomotives used on our railways is 60% of the total value of all the machinery, implements and tools used in all of the other industries in the country. Is this equipment used as efficiently and as effectively, when it is used, as is that of our manufacturers? A manufacturer is mighty careful about his \$25,000 and \$100,000 machines to keep them busy. If he does not, he goes

"broke." He puts cranes over them. He keeps raw material coming and clears away the finished product. He keeps them in repair. He works them night and day by watching operation and methods. He treats them as a big investment and keeps them going. He thinks of his machinery as being worth so many dollars per hour and he knows just how many dollars in each case. That is why he makes money.

In increased production an important lesson is learned from the electric locomotive. It costs more than the steam locomotive, and its friends have seen to it that it is given every opportunity for greater continuity of service. Expensive machinery ties up lots of capital. That machinery must produce or the carrying charge is overwhelming. The true significance of the word "overhead" needs to be emblazoned in the railway dictionary. Everything possible to do what will keep the wheels moving must be done. Overhead is the nightmare of the business man and the manufacturer, and it ought to be of the railway man. Railway men do not worry about it as much as they ought. Production is the answer to overhead in manufacturing business and in railroading. How to make the locomotive pull more tons per ton of coal, per ton of its own weight, per dollar of wages, per hour of the day, per year, per dollar of shop, terminal and track investment, and per mile run, is the answer on the railway.

Figures prepared to illustrate the increased cost of locomotives built two years ago, compared with the cost of exactly similar ones today were too painful to be included in this discussion. They reveal the fact that those built most recently are up against a serious handicap. They must earn several times more than their predecessors in order to make good. Not only has the cost of new locomotives gone up; the value of old ones from a capital standpoint has gone up and so also has the cost of maintenance and operation. Therefore, every locomotive must produce more.

Motive Power Chiefs Should be Vice Presidents.—In order to secure increased production from locomotives a serious handicap must be overcome. Railways are essentially machines. Transportation success depends very largely upon the character and the use of the power plants that move the tons. Not all the operating officers have come to their high places with sufficient knowledge and intimate contact with the locomotive to understand and thoroughly know what a locomotive should be and what it should be expected to do. It is not their fault, but it has been unfortunate for the railways. Many of the members of this organization know that for many years the speaker has implored the mechanical officers of American railways to compel the locomotive problem to take its proper place in railway organizations and therefore in railway operation. For years the speaker has urged a more commanding position for the mechanical officer and the mechanical department. In the present crisis this means more than it ever did. As a matter of course, traffic, accounting, legal and sometimes purchasing responsibilities are given recognition and high standing by being administered by officers of the rank of vice president. This is as it should be. In my opinion, the pulling power of the railways can

never be what it ought to be, and what it may be, until motive power problems are solved and motive power policies are presided over by officials acknowledged and supported by the standing that the officer in charge of locomotive design, construction, operation and maintenance requires, not to mention the other question of cars. This suggests that the mechanical policies of the railways, using 26½% of the fuel of the country, involving technical responsibility for upwards of six billion dollars worth of property, for more than four hundred million dollars spent per year in locomotive repairs, and presenting possibilities to effect savings upon the expenditure of over a billion dollars a year for fuel, might with profit be presided over and decided by officers of the standing of vice presidents. This ought to happen, but it should be done in such a way as to accomplish three things: First, safeguard mechanical policies; second, provide for maintenance and operation of mechanical matters through the operating department; and, third, provide prospects and official standing which will constitute adequate reward for lifelong effort in a line of endeavor that requires this incentive.

On the other hand, if our railways do not take care of their mechanical officials, they will continue to lose men whose knowledge, experience and ability are needed in order to prevent public ownership and operation. They must be given the opportunity to increase production of transportation, and, fortunately, they know how to help to do it. In many cases they are obliged to plead and argue for improvements, with higher officials who do not always appreciate the importance of these mechanical questions. Sometimes the decision concerning equipment is in the hands of persons or departments whose responsibility does not extend to the operating results. Too often prices only determine their decisions. Such a selection of equipment is not only detrimental to the operating results, but most discouraging to the motive power officials who must keep the locomotives going and going at the minimum cost of fuel and repairs.

Profit, Not Fuel Cost, Important.—The vital thing is to make a profit on transportation. Profit is not determined so much by the first cost of the piece of machinery as by the economy of its performance. Under certain conditions a costly machine may be far more profitable to its owner than a cheap one, which is wasteful in its workings. Railway executives have realized this point in electric locomotive installations. Such installations have not been hampered by traditions such as exist with the steam locomotive, and the engineers are allowed a free hand to produce the best possible economic results. It would be worth while for any railway to give an order for steam locomotives to do certain work at minimum cost per unit of work done without restriction as to the cost of the machine. The writer knows of no record of this having been done. He predicts surprising economies when it is done.

This constitutes the strongest argument for basing locomotive recommendations upon facts that cannot be questioned and for pushing plans to conclusions. High officials will yield to the insistence of arguments the strength of which is made clear to them. Show the

president the meaning of the locomotive as a big investment, and, in justice to himself and the road, he cannot cut money-making improvements out of his appropriations. The president always defers to some authority in mechanical matters. It is most fortunate for every one concerned when this authority is his own mechanical organization. Unhappily it is not always so.

Bigger Boilers Possible.—An example of subjects which open the way to revolutionary improvements in the locomotive is dynamic augment, which opens up great possibilities in increased capacity of locomotives. About six years ago, a systematic movement to reduce reciprocating weights and decrease dynamic augment was started. It was carried on successfully up to the beginning of the war and then stopped. This work must be resumed. Railway men were beginning to realize that it was not the static or dead weight of the locomotive alone that was important, but the dead weight plus the additional weight put on the rails by the unbalanced weights at speeds. When the dynamic increase from the unbalanced weights is reduced by lighter weights of reciprocating parts more weight may be put into the boiler. This development lies right at hand. It is well worked out and is ready for immediate application.

Let us see what this means. Consider what are known as the 2-10-2 A and B classes of United States Railroad Administration locomotives. They have not enough counterweight in their main wheels to balance the rotating weights at the main pins. With ordinary open hearth steel parts, as these locomotives are built, there is a lack of rotating balance at the main pins of 390 lb. This produces a dynamic augment at 54.2 miles an hour equal to 50% of the static weight at the main wheel. By the use of high quality steel forgings for reciprocating and rotating parts it is possible to reduce this unbalanced weight in the main wheel to very nearly zero. This would also help the overbalance in the other wheels. Of course, it must be made clear that there was insufficient time to consider this in the U.S.R.A. locomotives.

Furthermore, if the U.S.R.A. heavy mikado is given specially designed reciprocating and revolving parts of high quality steel, its destructive action upon the track at a speed between 40 and 45 miles an hour will be less than that of the U.S.R.A. light mikado that is fitted with the present corresponding parts of open hearth steel. The advantage thus gained is cheap, when it costs only a change in material and refinement of design. At all speeds, at which these locomotives are at all likely to damage the track, the heavy mikado, if built with light reciprocating parts, will be actually a safer locomotive than the light mikado is now. The heavy mikado has 10% more tractive power, 14% more heating surface and its total weight is 9½% greater than the light mikado.

The excellent report to this association in 1915 on this subject should be followed by another study of this promising development, which means so much to the track and to bridges, as well as to the locomotive itself. Maintenance of way officers are now studying stresses in track. They take dynamic augment into consideration, but they seem to accept it as being necessarily high, instead of considering it is a series of forces which may by refinement be reduced. They may be greatly reduced. Their re-

duction will relieve the track immensely, and relieve boiler restrictions.

Boiler Design Improved.—About eight years ago methods of laying out sizes, capacities and proportions of locomotive boilers changed from the empirical to the exact. New rules were established. These were based upon the power of the cylinders, and the boiler was designed to produce the necessary steam. This is not as simple as it sounds. The result of the change in methods was to put locomotive designing into a higher plane, equal to that of marine and stationary engine design. What this has meant to our railways and what it means now, with increasing weight, size and power of locomotives, is difficult to estimate, but it is safe to say that we could not build the big engines of today on the basis of the rules of design recommended by this association in 1897. The locomotive builders have introduced these radical improvements in elementary design. Others have insistently and consistently developed improvements of factors making for better use of fuel and of steam. The use of steam in the cylinders, production of superheated steam, the subjects of combustion, stokers, steam conservation and boiler circulation are now studied in locomotive practice as they have been studied for years in the stationary and the marine fields. Locomotive combustion is being studied as it never was before. This has revealed the relative value of firebox, combustion chamber and tube heating surface and has thrown new light on the subject of air supply to the fire, baffling and mixing the gases and the form and volume of fire boxes. In fact, the fire box has been transformed into a proper furnace. If stationary and marine engineers were limited as to size and weight as locomotive designers are limited, the progress that the locomotive has made during the past few years would be appreciated.

Fix Up Old Locomotives.—There is scarcely an item that goes to make up an efficient and safe locomotive that has not been improved to make more power and more mileage. They not only make for better use of fuel, but they keep the locomotive from going to the shop as early and as often, and they protect the crews. These improvements need not be mentioned in detail. They are well known, are past the experimental stage, and are available to transform the fuel, wage, time and tonnage wasters into money makers, because the improvements are applicable to old locomotives as well as to new ones.

Locomotive men and firemen know these things. They know how modernizing transforms a locomotive. They understand what these factors mean to the big new power and they cannot be expected to exert themselves to the utmost and give most efficient service when so many of them must work with locomotives that they know to be capable of so great improvement. Not the least of the advantages of modernizing is its effect upon the men. They naturally do better work when provided with good tools.

New locomotives are usually well equipped for good performance. They are usually provided with most of the factors that make for increased capacity and improved economy. Their application to old locomotives offers a wonderful opportunity for a big money saving improvement. This application to old locomotives is a gold mine ready for immediate operation. These old locomotives may be made, weight for weight, as good and as efficient as new ones. How many men in this meeting realize

the task before them if they were asked to explain to a successful manufacturer the reason why this has not been done. How often a 12 or 15 car locomotive is seen on a 4 or 5 car train. This happens on roads having hundreds of locomotives that if modernized would handle light trains economically while the big ones do not. This is somewhat like turning piston rings in a wheel lathe. This is difficult for a manufacturer to understand, especially when it is so easy to bring small, old engines up to date.

What Has Happened to Some Locomotives.—Turn to page 55 of the proceedings of this association for 1917 to see how a single modernizing factor changed the maximum power of a locomotive. By applying this improvement to a consolidation locomotive on the Big Four Railroad, the power of the locomotive at 27 miles an hour was increased one-third. The speed at which the locomotive produced its maximum power was stepped up 42%. This is typical of the possibilities on other locomotives with correspondingly greater improvement when all the modernizing factors are applied.

Not long ago, one of the largest Pacific type passenger locomotives in the country gave up its train because of a loose tire. A 20-year-old 8-wheeler took the train of 8 steel cars 40 miles into the terminal in time to save refunding the excess fares. The little 8-wheeler had been modernized. The locomotive man said: "The bosses don't know what these modernized little locomotives will do. They do not know what we have to work with, and they do not use the old locomotives as they should after they are modernized. The tendency is to overlook their possibilities." Due in part to this experience, thirty more of these small locomotives on this road are now being modernized as they go through the shops.

When one of our big railways was considering the application of a fuel saving and capacity increasing factor for modernizing existing locomotives and improving old ones, the problem of keeping one of its important passenger trains on time was pressing. The regular train had six passenger and one parlor car and was hauled on a very fast schedule by a Pacific type saturated locomotive which usually was unable to make the schedule with nine cars. One of the locomotives was modernized in the hope that it would handle 10 cars. In the first test the train had seven cars. On each of the following test runs one additional car was put on until the locomotive handled 15 cars on schedule time. Let me here make record of the fact that one of our great railways declined to even try this particular improvement until its owner agreed not only to furnish it without obligation on the part of the railway, but to remove it at his own expense if it did not satisfy the representations made for it.

In another case modernizing saved 300 old 8-wheel locomotives which were too ineffective to be maintained as they were. They were good to haul wooden cars, but were outclassed by steel equipment. Approximately 30% in fuel was saved by modernizing and they were made sufficiently powerful for steel car trains.

Modernizing received its first good start by the improvement of a lot of Mallets. Another road has rebuilt prairie type locomotives into mikados with 21% increase in tractive effort. Another road changed over 300 consolidations into mikados. At speeds of 35 miles an hour the last mentioned rebuilt locomotives have a drawbar pull of 22,300 lb., whereas the consolidations gave only 8,500 lb.

at that speed. These were comprehensive changes which have proved successful. Modernizing usually need not be carried as far as to change the type or wheel arrangement. Its greatest field lies in adding improvements without this change. Every railway man knows that he has this opportunity before him. It is unnecessary to cite further notable examples, although this paper could be filled with them. The thing to do is to get into action, survey all existing locomotives, plan the modernizing and rejuvenate a certain number per month on a real time card as they go through the shops.

In 1915 a comparison was made between two locomotives. One was a consolidation, which represented best practice before the time modernizing of design and introducing of fuel saving factors began, the other was a mikado built in 1915. The mikado delivered 82% more work for the same amount of coal, which in each case was as much coal as the fireman could handle. The locomotives were designed for the same road and the same service and represented the advance of 10 years in modernizing on that road, including design and the use of fuel saving, capacity increasing factors.

The locomotive of 10 years ago, and unmodernized, is very little more efficient than one of 70 years ago. Modernizing three of them, however, is usually equivalent to an additional locomotive of the same size. The rest of the problem is to get the utmost service out of the improved locomotive and to obtain on the road the increased capacity known to be available. The available improvements should be capitalized and made to earn money. Not only should the locomotive itself be considered as an investment, but the improvements should also be so considered.

Electric Locomotive Fallacy.—Electric locomotive partisans are propagandists in arguments for electricity versus steam. They argue, however, on the basis of the steam locomotive as they knew it in the past rather than as it is today. They further weaken their case by absurd claims to the effect that electric locomotives can save two-thirds of the coal burned by all the steam locomotives in the country, and they base their claims on the steam locomotive of 10 years ago. The truth is that in five years of this period the economy and the capacity of the steam locomotive has more than doubled. The object is not merely to win against the electric, but to pit the steam locomotive against the high cost of everything. Constructive, systematic policy of locomotive engineering and operation is the way to do this and it will do it.

We are told that electricians are replacing steam locomotives. We do not hear enough about the 38 steam mikados that replaced 12 moguls and 38 consolidations on the Missouri, Kansas and Texas several years ago, and of the 41.8% increase of train load, also of the reduction of 23% in the number of trains. The Norfolk and Western replaced 57 locomotives with 40, with a reduction of 26% in the number of trains for the same traffic. The Delaware and Hudson showed a saving of 43.8% in coal by substituting Mallets for consolidations. Each Mallet replaced two consolidations. A year later each of these Mallets showed 7.6% better fuel records and each of them continued to do the work of two consolidations, while burning less coal than one of the consolidations. On the Chesapeake and Ohio 25 Mallets replaced 44 con-

solidations, saving 37% in the cost of handling freight traffic. This has been going on the country over, in cases too numerous to mention, but too little is said about these improvements and too little is said about future possibilities. When every existing locomotive is thoroughly modernized and when all are operated with the study, care and supervision called for, and when coal and fuel oil are used as if they were expensive—then this association and the men who make it will be recognized for saving the railways. In this scheme of things the obsolete locomotive lacking labor saving, capacity increasing, fuel conserving and safety factors has no place.

For further development we have the tractive effort booster, also the fixing of cut-off to give maximum power at every speed of the locomotive to which B. B. Milner referred at this convention last year.

Scrap the Old Shops.—Shops for quick and economical repairs to big locomotives present possibilities for revolutionary modernizing improvement. If the "average" railway shop should be made the subject of investigation and report with a view of equipping it to put locomotives back on the road repaired as quickly and as cheaply as possible, it is the writer's opinion that the honest recommendation of the investigator would be to salvage the old and build a new shop, from foundations up. Shops as well as locomotives need modernizing from the standpoint of being considered as a big investment. Only a short time ago the writer watched the wheeling of a heavy locomotive by air jacks at one of the shops of a big railway where he once had the honor of employment. This would be impossible if the locomotive, or the shops, were considered by that road as a big investment. Let us hope that an able, quick crane has replaced the dangerous, sluggish jacks, and time and man-killing wooden blocking. Fortunately, shops as well as locomotives may be modernized if there is a will to do it, and if the policy of doing it is established on a stable basis. Bear in mind the fact that increasing the number of new big locomotives without increasing shop and locomotive house facilities is fatal as a business policy.

Maintenance of way officers are now engaged upon the establishment of units for comparison of track repair costs, and great improvements in track maintenance costs are expected. If costs of various locomotive repair shop jobs were compared upon a fair and really comparable basis, many shops with high costs could be put on the basis of the best shops. Improved machines, rearrangement of machines and improvement of methods, with reduction of distance traveled by material and parts, would certainly result. Many shop operations are subject to comparisons that would be intelligent and fair, but only items which are subject to fair comparison should be selected. There are many of these, and if the facts that comparisons would reveal are put up to the managements strongly, machinery 50 or more years old would disappear from our shops and locomotive houses because it cannot be modernized.

In the matter of shop production methods this association would do well to discuss the paper upon graphic production control read by E. T. Spidy, Production Engineer, Canadian Pacific Ry., before the Canadian Railway Club (see Canadian Railway and Marine World, Feb., 1920, pg. 55). Officers who desire to make a good record should study it. If

Mr. Spidy's "up-to-the-minute" shop information were also applied to locomotives and their operation, railway stockholders and the public would be happy indeed. Careful attention to the excellent report by the committee on shop scheduling systems, to be presented at this convention is earnestly recommended in connection with the reduction of overhead.

Stitch in Time Terminals.—Locomotive terminals are not all equipped to handle expensive locomotives promptly and economically. Has anyone charted or scheduled locomotive terminal movements with a view of short cuts in delays? Are big locomotives ever held in yards and sent in herds to the locomotive house for fire cleaning, coaling, sanding and locomotive house jobs, when they could as easily be sent singly to keep the locomotive house load curve more uniform? Because the "stitch in time" at the locomotive house may keep a big locomotive going strong, the best of mechanics and the best of tool equipment should be at the locomotive houses. Is this so today? Unquestionably the locomotive house foreman should be a man of greater authority. It would seem to be a money making scheme to give him much better standing, also to give him a yard foreman to handle the firing up of locomotive and all the out-of-door work, to speed up ash pit and other work that delays expensive locomotives from the road. An inspector who has been a locomotive man should meet all incoming locomotives and discuss with the crews the condition of the locomotive and the defects found. These men would save their annual pay every month. It would be very profitable to have travelling engineers spend a day or so every month at the locomotive house.

Adequate locomotive terminals laid out, organized and equipped for quick, thorough work will speed up the entire railway. Inadequate terminals do more than anything else to slow down the entire railway. Furthermore, locomotives themselves may be designed and equipped for quick terminal work, particularly at the ash pit. Who knows how many new locomotives might be saved by quickening terminal operations?

Better Use of Power.—In locomotive operation lies a fruitful field for study and improvement. Mileage of passenger and freight runs is an item of importance. Water and coal stations that were established years ago upon the basis of locomotives which did not have the advantage of modernizing factors may in many cases be relocated with profit. Why should not passenger divisions be extended to 300 miles and freight divisions to 200 miles? There are difficulties, but are we sure they cannot be overcome? It is much better to change crews and much cheaper than to let the locomotive go to a terminal so often. Is it possible to double the mileage between locomotive housings or to cut in halves the time waiting for the ash pit?

As to terminal delays, have conditions improved greatly since N. D. Ballantine recorded, before the Western Railway Club five years ago, the results of an investigation of locomotive service which showed that the mechanical department had the locomotives 58.5% of the time, and of the balance of the time 65% was occupied between terminals and 36% in actual running? Mr. Ballantine revealed an opportunity for remarkable saving by lengthening locomotive divisions that this association can profitably discuss.

Coal Will Never Again be Cheap.—Individual fuel records have been advocated for a quarter of a century and some success has come to those patient enough to persist in this direction. Coal costs are already high enough to justify this, and many other improved methods, the importance of which increases with coal costs and with the amount of fuel a big locomotive burns. For example, one reason for the delay in adopting feed water heating is that coal has been considered cheap. Coal must now be considered as a big investment. Fuel is no longer cheap, and in the quantities required to haul the big tonnage that is coming it never again can be cheap. Natural gas was once considered cheap. Think of the result of such opinion.

Government experts have performed wonderful work in the use of fuel. This work will be continued by individual roads, and when it is coupled with systematic application of modernizing factors to old locomotives the results will appear to their full value. However, fuel saving on an obsolete locomotive is like trying to save water that has gone over the dam. Put flash boards of modernizing on top of the dam and save that water for the wheel that turns the mill.

"Follow Up" Policies.—A very wise policy has been followed for years by a motive power official who is well known among you. He believes in following up the items of maintenance upon his locomotives. For every item, for example, injectors and rod packing, and the fuel and labor saving factors, staybolts, springs, tubes, annual expenditures for which reach or exceed \$100,000, he assigns an expert service man, reporting to him, whose duty is to ensure the proper application, maintenance and use of the items in question. If every road would follow up its \$100,000 investments in this way wonderful savings would be effected and many a locomotive would go out on its run instead of being held by government inspections. You know and I know what the railways owe today to the service organizations the supply companies find it necessary to employ to ensure the most efficient use of their devices. This service rendered by these companies has made the big modern, efficient, economical locomotive possible. The time has come for the railways to render these service organizations less necessary than they are today. Some years ago the writer saw the mechanical superintendent of an English railway "hit the ceiling" when a freight locomotive went past his office window with its piston rod packing blowing. We have much to learn concerning the value of keeping worth while improvements up to their best work. We do not worry enough about things that leak and things that may grow into engine failures.

Another fertile field for modernizing is the railway power plant, shop plant and pumping station. These use enormous amounts of fuel in the aggregate and are proverbially wasteful. Records may be made and very easily by rounding these up and by modernizing power plants. In one case, by merely charging up the coal a plant burned, a 25% saving was made. It was saved by showing that fuel is an investment.

Men who make great business successes are said to be brainy—they are brainy, but they are more than that. The number of men who know how to do things and who recognize opportunities is greater than the number that actually do them. Success comes from persistent pushing to conclusions the plans that brains conceive. Those who have won

great success in modernizing locomotives are the ones who not only recognize the opportunities for applying to old locomotives modernizing factors that make for more ton miles per ton of metal and per ton of coal, but those who persist in definite plans for doing it. They are the ones who will take high standing in economy of locomotive operation, because they schedule and programme their improvements that make for higher capacity and economy.

Safeguard Money Already Spent.—By spending a few thousands in modernizing, millions of dollars already invested in locomotives that are 10 or more years old will return more service. These old locomotives stand as a big non-paying investment. Spend the little that modernizing costs and change them into a big paying investment. A manufacturer must scrap his obsolete machinery. How much more fortunate are the railways. They may at little cost reclaim their locomotives by methods that make them often 50% better than when they were built. We should not consider a 10 year old locomotive in the light of its depreciated value. Many of them will sell today for their original cost. On this basis they are all the more worth modernizing.

Suicide.—Without question the greatest locomotive investment, and one which cannot be expressed in dollars, is the organization for locomotive design, operation and maintenance. Organization constitutes the greatest opportunity of all. Constructive, consistent and persistent personnel plans are imperative. The problem is simple, but the solution must be comprehensive. Every railway should see to it that employes are selected wisely, trained properly, promoted by merit from intimate knowledge of performance, promoted from the inside to fill all important prize positions. To this end apprenticeship must be revived, and applied to all departments, in a form adapted to the great need of the time, and the graduates from apprenticeship must be kept on the road by intelligent systematic personnel plans. The plans referred to will supply every position, including those requiring special technical education. Railways will not be forgiven for neglect of apprenticeship. They are having their punishment now for neglect of it. Have you been making your quota of skilled mechanics all these years? Is one apprentice for every 18.58 mechanics, the country over, safe? Have you studied your labor turnover and made plans to reduce it? Labor is a big investment, and labor turnover is a big loss.

Vision.—As to conditions, possibilities and the future development is the great need now. Who is to have the vision to correct the tendency which is already acquiring momentum full of danger to the railways, the tendency for the mechanical departments to drift down to merely practical maintenance organizations? That this association has the power and the opportunity to bring about a proper recognition of the locomotive problem is one of the hopeful factors for the future. But this organization must get above the smaller questions and into the business questions of the pulling power of railways and must do it quickly.

No group of men ever had a more glorious outlook before them. No group ever had a better and stronger incentive; and no problem could possibly be accompanied as this one is, with the means ready at hand for its solution. The task is to study conditions, use factors and facilities that are all ready at hand and assist the development of new ones. The outlook is most promising, hopeful and

encouraging; but quick, hard work is necessary, because the situation as it stands today demands the best we have.

What are you going to do about these new things? Eight hour day. Time and a half for overtime. 100 to 200% increase in wages. 100 to 200% increase in fuel cost. What are you, the individual, going to do? You know the conditions and the remedies. Put them before your superior officer in a convincing way—with a foundation and structure of facts. Give them the arguments that will get the money necessary to economical operation. Nothing that lies ahead is as difficult as the pioneering that gave the country its wonderful railways.

Tree Windbreaks on C.P.R. Western Lines.

In response to a request for information in regard to the prices of tree windbreaks on the C.P.R. Western Lines, we are advised that the last two summers were exceedingly trying on trees on the prairie, particularly from Moose Jaw west, where the greater part of the company's windbreaks were planted. The hot winds, that swept the prairie during the dry spell, played havoc even with stock that had been well established and had survived many hard winters. In some cases entire plantations were killed back and what trees survived were severely checked in their growth and had to be cut back in order to give them a fresh start. Another feature in the destruction of trees is the panel and slab fence, which has to be maintained until the trees are sufficiently thick to hold the snow. This causes the snow to pile up, and in some cases to completely cover the trees, with the result that the young stock are badly shaken up, when the snow thaws, and settles in heavy masses in the spring.

Of course tree windbreaks are most necessary on knolls and hills, where the track is in a cut. Trees so situated get less than the average amount of moisture, due to quick run off. For this reason trees along the right of way are at a greater disadvantage than they would be around a farm or on low lying ground.

It is generally conceded by all who have tried tree planting on the prairie, that the windbreak must be of at least eight rows of trees, and that it must carry a percentage of dense shade giving, or close foliage, trees. The object of this is to reduce the amount of evaporation from the soil, bank the snow in the center of the plantation and conserve needed moisture. It also reduces evaporation from the leaves in the hot dry spells.

When the C.P.R. started this tree planting there had been no experiments carried on west of Moose Jaw, by either government or private individuals, consequently the company adopted the accepted planting practice of eastern Saskatchewan and Manitoba, and did not plant trees in sufficiently thick strips for territory farther west. When windbreaks have been planted east of Moose Jaw they have been decidedly satisfactory.

Prairie farmers are beginning to realize how beneficial windbreaks are around their dwellings, and more so around the farms, where by repeated cultivation and ploughing, the soil is pulverized, and drifts from the heavy winds. This phase of tree windbreaks is receiving attention from the various farmers' organizations, which are advocating it very strongly in their meetings and through their press.

Practical Shop Hints; Grinding.

Speed is one of the most important factors in grinding. Don't forget that the cutting speed decreases as the wheel wears down.

Every grinding wheel used at all regularly should have an exhaust hood and should be connected to an exhaust system supplied with a suitable fan.

Some work can be ground from the rough more cheaply than with preliminary turning. Makers of grinding machines should be consulted if there is any doubt in the matter.

"Glazing" of the abrasive wheel, is when the cutting point becomes dull. This sometimes occurs when the wheel is being run at too low speed. Glazing and loading are sometimes confused.

"Loading," is when the material being ground fills into the spaces between the cutting points of the abrasive. The soft materials such as aluminum and babbitts, tend to load an abrasive wheel much more than the harder metal.

The grinding wheel is in reality a milling cutter which presents millions of cutting teeth to the work every minute. Don't forget that these teeth cut chips, although they are naturally much smaller than those produced by the milling cutter.

The great field for grinding is in the economical finishing of work, either from the rough or in connection with other machines. In too many cases it has failed because of lack of co-operation between the turning and grinding departments.

An abrasive wheel is a disc built up from an immense number of small cutting particles held together by a bond of some kind. Excessive pressure of the work against the wheel tears these cutting particles out of the bond and wastes the wheel.

Automobile cylinders are usually ground dry and the wheel connected with an exhaust system to remove the dust. If water is used, it is usually circulated in the water jackets surrounding the cylinder, and in this way keeps the cylinder casting cool.

It is good practice to change wheels from one machine to another as they wear down, having the speed of the machines varied according to the diameter of the wheel. Some shops provide different size pulleys so that the speed of the machine may be increased to compensate for the wear of the wheels.

A hard wheel with a narrow face will grind work with less care and thought on the part of the operator, but it is the most expensive grinding that can be done. A wide-face soft wheel with the proper care does much more work per dollar of expense and is the proper combination for economical manufacturing.

Fine grinding can be done with a coarse-grain wheel under the proper conditions; in the same way a fine wheel may produce rough work. Many of the scratches which appear on ground work are made by small particles of metal between the wheel and the work. Good grinding demands conditions which allow these particles to escape.

When work is to be finished by grinding, the lathe hand must realize that conditions have entirely changed and that his work is not to finish, but to prepare for the grinder. This means about the roughest kind of turning he can do, simply reducing the stock to the point where the grinder can handle it more economically than the lathe.

A heavy grinding machine with a stiff spindle can run a soft wheel much more successfully than a lighter machine. This is because it holds the wheel firmly while cutting, and the mass of the machine absorbs much of the vibration. A light machine requires a harder wheel because it does not have the qualities referred to. Don't forget to consider all these points in trying to find out exactly where the trouble lies.

Grinding machines are run at high speed and the question of lubrication should be carefully considered. Don't overlook the directions or suggestions sent out by the makers of the machines. It is to their interest to have them run properly, and the directions should be followed.

Lubrication of grinding machines requires the proper kind of lubricant; this varies according to the kind of work being done and the speed at which the wheel spindle runs.

When grinding has to be done in addition to the lathe finish, it is an added expense. The proper way is to rough-turn with a coarse speed to within, say 1/32 of finished size, then send the piece to the grinding room. No grinding wheel should be used without a substantial safety guard for protection of the operator and surrounding machinery against damage should the wheel break. The operator's eyes should also be protected from the chips either by a glass shield, a spark brush or goggles.

Manufacturers of grinding machinery and wheels claim that a good grinding wheel run at proper speed wears less during its passage over the work than a milling cutter under similar conditions.

The wheel contact helps to determine the proper grade of wheel to be used on any kind of work. On work of small diameter there is more contact and consequently a harder grade of wheel can be used. In surface or in internal grinding the contact is very much greater so that a softer wheel gives better results.

Where water is used in automobile cylinders in the type of grinders where the wheel travels around the surface of the cylinder, trouble is often experienced by the collection of mud in the bottom of the cylinder through which the wheel must pass during every revolution.

The old fear of emery or other abrasive working into the metal being ground has been proved without foundation. Where oil and emery are used between metal surfaces rubbed together, the abrasives will lodge in the pores of the metal. This, however, does not happen in grinding automobile cylinders and similar work.

It is important that a grinding wheel fit the spindle or arbor closely to avoid play which throws it out of balance. Don't make the mistake, however, of forcing a wheel on its spindle, as even a slight strain may result in breaking the wheel. An allowance of 0.005 in. will usually be found about right.

A grinding wheel should always have flanges from 1/2 to 2/3 the diameter of the wheel itself. These should be relieved in the centre so as to bear perhaps for 1/2 in. at the outer edge. Never tighten the flanges directly against the wheel, but put in washers of blotting paper or some soft or thick substance between the flange and wheel.

Grinding allowances vary entirely with the work being done and the machine in which it is ground. In heavy, powerful

machines which remove stock rapidly, the grinding allowance may be anything from 1/64 to 1/32 in.

For fine finish of grinding where the work is not out of true, 0.003 in. is usually sufficient to true it up nicely if the turned surface is not too rough.

In wet grinding the stream of water should be applied at the right spot, which is the grinding point. It should have sufficient force to keep the face of the wheel clean while in contact with the work. It is especially important on internal work.

Grinding wheels appear softer at slow speed because the metal being ground tears the grinding particles away from the bond which holds them together. Don't condemn a wheel as being too soft until you are sure that its cutting speed is correct.

A soft wheel at the proper speed will give more satisfactory results than a harder wheel at slower speed. Don't forget that the wheel maker has had a wide experience and is always willing to give you the benefit of it. If you are having trouble of any kind submit it to the wheel maker.

Grinding problems cannot always be solved by asking the other man what he is doing. A wheel that is perfectly satisfactory on one machine may not give good results on another. Don't think from this that there is anything mysterious about it, because there is always a good reason for everything that happens.

The old notion about keeping oil away from grinding wheels has been largely exploded. This does not mean that oil spots are good for a grinding wheel as they undoubtedly help it to accumulate dirt and dust. Grinding wheels can be lubricated with oil, water, or almost any compound, as long as it is supplied freely and evenly over the wheel. While soda-water is best for general use, there are places where oil is being used successfully.

Grinding wheels should never be trued with the toothed sharpener if accurate work is to be done. While these cost less money than the diamond, they cannot produce nearly as accurate results. Wheel dressers are good for grinding wheels used on rough work or to true up wheels before applying the diamond. Both wheel dressers and diamonds should be supplied as freely as necessary if economical grinding is to be done.

The most important point in lapping is that the laps shall always fill the hole. If this is not done the hole will not be round as the lap will follow the original surface. The lap should be a little longer than the work, so as to lap the whole length of the hole at once, and so tend to correct any curvature which may exist.

To avoid bell-mouthed holes, which come from being lapped large at the ends, put the emery in a slot near the center of the lap and after the lap is in the hole squirt in oil to float the emery against the surface. Don't sprinkle the emery on the ends of the lap and work the piece over it while it is running as this grinds the ends large.

Ring gauges are lapped with a lead lap. They are first ground straight and smooth to within 0.0005 in. of size. After being lapped they are cooled and cleaned before trying the plug. This is done by placing them in a pail of benzine long enough to bring them down to the temperature of the room.—American Machinist.

Merging the Grand Trunk into the Canadian National Railways System.

Canadian Railway and Marine World for June gave full particulars of the appointment of a managing committee, to ensure the operation of the G.T.R. in harmony with the Canadian National Rys., the two systems to be treated in the public interest as nearly as possible as one. This committee, as stated previously, consists of H. G. Kelley, President G.T.R. and G.T. Pacific Ry., as chairman; C. A. Hayes, Traffic Manager, Canadian National Rys.; and S. J. Hungerford, Assistant Vice President, Canadian National Rys., representing the Dominion Government; and Frank Scott, Vice President and Treasurer G.T.R., and W. D. Robb, Vice President, Transportation and Maintenance G.T.R., representing that company. The committee, which will continue until after the arbitration award has been made and the G.T.R. preference and common stocks are vested in the government, held a series of conferences during June, careful and expert consideration being given to the work of co-ordination. The managing committee has named a number of subcommittees, composed of C.N.R. and G.T.R. officials, to make reports and recommendations regarding their respective departments, with a view to ensuring the maximum of efficiency and economy under the co-ordination plan, and action has already been taken in regard to joint operation of certain lines of both systems, and as to the amalgamation of a number of ticket offices.

Train Changes.—The Canadian National Rys. announced the following as the most important changes, effective June 27:—Train leaving Toronto for Port Arthur, Fort William and Winnipeg, Sunday, Monday, Wednesday and Friday, 9.15 p.m., cancelled. New train 11, leaves Toronto 9.30 p.m. daily for Sudbury and Capreol, connecting at Sudbury with Algoma Eastern Ry. for Little Current. Train 11, leaving Toronto Tuesday, Thursday and Saturday, connects at Capreol Wednesday, Friday and Sunday with new Canadian National-Grand Trunk Train 1, tri-weekly Montreal to Winnipeg via Port Arthur.

Train 2 from Winnipeg, arriving Toronto 4.30 p.m., Tuesday, Wednesday, Friday and Sunday 4.50 p.m., cancelled.

New train 12 leaves Capreol and Sudbury daily, arriving Toronto 8.50 a.m. Train arriving Toronto, Monday, Wednesday and Friday connects at Capreol the preceding day with new train 2, Winnipeg to Montreal.

The National leaves Toronto 11 p.m. daily for Winnipeg via Grand Trunk to North Bay, T. & N.O. to Cochrane, thence Canadian National. The National will arrive Toronto from Winnipeg, 3.00 p.m. daily.

West of Winnipeg the National runs over the Grand Trunk Pacific Ry. to Edmonton, 799 miles, thence over the Canadian National Ry. to Vancouver, 775 miles, making a total run of 1,574 miles, against 1,602 by the Canadian Northern through route, and 1,474 over Canadian Pacific. The train leaves Winnipeg daily at 10.25 a.m., arriving at Saskatoon at 12.10 p.m.; Edmonton 11.15 p.m., and Vancouver 9 a.m. Eastbound it leaves Vancouver at 9 a.m., Edmonton 8 a.m., Saskatoon 7.10 a.m., arriving Winnipeg at 11 a.m.

A new fast train, the Capital City, leaves Toronto 12.00 noon, daily except Sunday, for Ottawa, via Grand Trunk Toronto to Napanee, thence Canadian Na-

tional, arriving Ottawa 7.15 p.m., with close connection for Montreal and Quebec. Westbound, The Queen City leaves Ottawa 1.15 p.m., daily except Sunday, over same route, arriving Toronto 8.30 p.m. Stops on these trains between Toronto and Napanee will be limited to Whitby, Oshawa, Bowmanville, Port Hope, Cobourg, Trenton and Belleville. Connection is made at Harrowsmith for and from Kingston. Trains leaving Toronto 9.30 p.m. and Ottawa 12.30 p.m. cancelled.

Night train leaves Toronto 10.40 p.m. daily, arriving Ottawa 7.30 a.m.; returning, leave Ottawa 10.00 p.m. daily, arriving Toronto 7.00 a.m. These trains operate over the Canadian National throughout.

Train formerly leaving Toronto 4.45 p.m. daily, except Sunday, for Yarker, leaves at the same time and operates over Canadian National to Cobourg (G.T.R. station) only; returning, leaves Cobourg 7 a.m., daily except Sunday, arriving Toronto 10.15 a.m.

Grand Trunk train formerly leaving Toronto 6 p.m. daily except Sunday, for Belleville, leaves at same time and operates to Kingston via Grand Trunk to Brighton, Canadian National to Napanee, thence Grand Trunk to Kingston. Westbound this train leaves Kingston 6 a.m., daily except Sunday, for Toronto, via same route.

Grand Trunk train leave Toronto 7 a.m. daily for Montreal, running via Canadian National between Brighton and Napanee.

Ticket Office Amalgamations.—As part of the unifying process of the traffic agencies and other interests of the C.N.R. and the G.T.R., the following changes will take place about July 1, the amalgamated offices being known as Canadian National-Grand Trunk ticket offices:—

Boston, Mass.—The C.N.R. and G.T.R. offices have both been in the Old South Building, 294 Washington St. The C.N.R. office will be closed, and the business amalgamated in the G.T.R. office, W. R. Eastman, heretofore General Agent, Passenger Department, G.T.R., being appointed General Agent, and C. K. Howard, heretofore General Agent, C.N.R., being promoted to another position.

New York, N.Y.—The C.N.R. office at 1520 Woolworth Building will be closed, and the business amalgamated at the G.T.R. office, 1270 Broadway, A. B. Chown, heretofore General Agent, Passenger Department G.T.R., being appointed General Agent, and F. A. Young, heretofore General Agent, C.N.R., being transferred to another position.

Quebec, Que.—The C.N.R. office at 7 Du Fort St. will be closed, and the business amalgamated at the G.T.R. office at Ste. Anne and Du Fort Streets, S. J. Nestor, heretofore City Ticket Agent, C.N.R., being appointed City Passenger Agent; G. H. Scott, heretofore City Passenger and Ticket Agent, G.T.R., being appointed Special Passenger Agent, and P. H. Proulx, heretofore Ticket Agent, C.N.R., being appointed City Ticket Agent.

Montreal.—The G.T.R. office, at 22 St. James Street, will be closed, and the business amalgamated at the C.N.R. office, 230 St. James Street, M. O. Dafoe, heretofore City Passenger and Ticket Agent, G.T.R., being appointed City Passenger Agent, and A. J. Roy, heretofore City Passenger Agent, C.N.R., being appointed City Ticket Agent.

Ottawa.—The G.T.R. office at Sparks and Elgin Sts. will be closed, and the business amalgamated at the C.N.R. office at Sparks and Metcalf Sts., P. M. Butler, heretofore General Agent, Passenger Department, G.T.R., being appointed General Agent; I. G. Reece, heretofore City Passenger Agent C.N.R., being appointed City Ticket Agent, and C. A. Belford, heretofore City Ticket Agent, G.T.R., being appointed City Ticket Agent.

Toronto.—The C.N.R. office, at 52 King St. East, will be closed, and the business amalgamated at the G.T.R. office, King and Yonge Sts., W. J. Moffatt, heretofore City Passenger Agent, G.T.R., being appointed City Passenger Agent; C. E. Tewny, heretofore City Ticket Agent, G.T.R., being appointed City Ticket Agent; and R. E. Richmond, heretofore City Ticket Agent, C.N.R., being appointed Assistant City Ticket Agent.

Hamilton, Ont.—The G.T.R. office at 11 James St. North will be closed, the business being amalgamated at the C.N.R. office at 7 James St., Jas. Anderson, heretofore City Passenger and Ticket Agent, G.T.R., being appointed City Ticket Agent.

Western Amalgamations.—Winnipeg press dispatch, June 20.—Complete amalgamation of stations and staffs on the Canadian National and Grand Trunk Pacific Railways will take place within the next 30 days at all western points. Local committees are working on the matter in connection with the Winnipeg staffs.

Rehabilitation of Belgian Railways.

The following is stated to be the condition of the Belgian railways on Jan. 1, the latest date to which information has been received:—Freight cars available average about 14,000 daily, while in 1914 the daily average furnished Belgian shippers was in the neighborhood of 20,000. The number of freight trains running is about 84% of the number before the war. The average daily tonnage hauled is 171,000 tons, compared with a daily average of 190,000 tons in 1914. The passenger trains in daily operation number 1,536.

On Jan. 1, 1919, there were but 578 locomotives in good running condition; this number is now said to be increased to 2,776. Railway receipts have greatly increased in recent months, although there will probably be some deficit for the year because of the heavy monthly deficits during the period following the armistice. For the 11 months ended Nov. 30, 1919, the total receipts amounted to \$57,128,000, at normal exchange, while the total for 1913 was \$59,444,000.

During Nov., 1919, passenger and passengers' baggage receipts were \$2,516,720, and freight receipts were \$4,130,200. The corresponding figures for November, 1913, were \$1,497,101 and \$3,762,149 respectively. This increase of current receipts is of course, partly occasioned by an increase in rates.

The need for additional rolling stock is acute. Locomotives and cars reclaimed from Germany are usually found to be in need of extensive repairs, and it has been impossible to obtain prompt delivery of new orders. At present it is stated that it would take more than 4,000 additional freight cars daily to meet the demands of commerce and industry.

Industrial, Logging and Mining Railways in British Columbia.

The B. C. Railways Departments report for the calendar year 1919 contains considerable information relative to industrial railways in the province, and says: "During the year a large amount of new work has been added in connection with the above owing to the amendments to the Railway Act having brought railways not subject to the Dominion jurisdiction under this department's jurisdiction. This new work includes, besides the inspection of locomotive boilers, previously under the Boiler Inspector's department, the examination of locomotive engineers." An amendment to the Railway Act passed in 1917, provided that "no company shall operate a railway

within the province except with the Minister of Railways' written consent, subject to such conditions as the Lieutenant-Governor-in-council may impose, and a further amendment passed in 1918, brought under the Minister's control the inspection of rolling stock used on such railways. Under these provisions the department has drawn up a new set of locomotive rules, and from April to Dec. 31, 1919, 53 locomotive boilers were given a hydrostatic test, 150 preliminary examinations have been made, 70 locomotive men have been examined and granted certificates, and there are 50 more applicants for certificates awaiting examination. The inspector is giving

careful inspection of the rolling stock employed, and giving instruction to the employes as to rules, etc.

There are over 70 industrial common carrier railways under the department's jurisdiction operating approximately 1,000 miles of line, equipped with 170 steam locomotives, 32 electric locomotives, 4,000 cars and miscellaneous equipment. The accompanying table shows the railways under the department's jurisdiction, with mileage and particulars of rolling stock. The table includes three railways which report to the Dominion Government, viz.: Eastern British Columbia Ry., Morrissey, Fernie & Michel Ry., and Pacific Great Eastern Ry.

| Company. | Head Office. | Operating. | Miles track. | Locos., steam. | Locos., elec. | Equipment. | Total. |
|--|-------------------------|--------------------------------|--------------|----------------|---------------|---|--------|
| Abbotsford Timber & Trading Co. | Abbotsford | Abbotsford Mill | 8 | 1 | 1 | 17 logging-trucks, 1 flat car, 1 oil-car | 19 |
| Alberni Pacific Lumber Co. | Port Alberni | Alberni Mill | 7 | 2 | 2 | 20 logging-cars, 7 logging-trucks, 1 workmen's passenger-car | 28 |
| Amtek, J. H., Logging Co. | Sooke | Sooke | 8 | 1 | 1 | 40 logging-trucks | 40 |
| Anderson, P. B. | Vancouver | Knox Bay | 4 | 1 | 1 | 10 logging-cars, 8 logging-trucks, 1 flat car | 19 |
| Beaver River Lumber Co. | New Westminster | Beaver River | 4 | 2 | 2 | 11 logging-cars | 11 |
| Beaver Cove Lumber & Pulp Co. | Vancouver | Beaver Cove | 6 | 1 | 1 | 4 cars | 4 |
| Bloedel, Stewart & Welch Lumber Co. | Vancouver | Myrtle Point | 20 | 3 | 3 | 51 cars | 51 |
| Britannia Mining & Smelting Co. Britannia Beach | Britannia Beach | Britannia Beach | 35 | 25 | 25 | 267 cars | 267 |
| B.C. Mills Timber & Trading Co. | Vancouver | Rock Bay | 27 | 6 | 6 | 70 logging-trucks | 70 |
| Brooks, Scanlon & O'Brien (Eagle River and Northern Ry.) | Vancouver | Stillwater | 18 | 3 | 3 | 42 logging-trucks | 42 |
| Campbell River Lumber Co. | White Rock | Hernando Is. | 2 | 4 | 4 | 4 logging | 4 |
| " | " | Otter | 1 | 4 | 4 | 6 cars | 6 |
| Canadian Panama Timber & Logging Co. | Victoria | Sooke | 7 | 1 | 1 | 14 logging-cars, 2 workmen's passenger-cars | 16 |
| Canadian Collieries, Ltd. | Victoria | Ladysmith | 21 | 10 | 10 | 8 box, 25 flat, 333 coal-cars, 25 rock-dumps, 2 passenger-cars, 8 workmen's passenger-cars, 1 steam-shovel, 1 pile-driver, 1 snow-plough | 455 |
| " | " | " | 35 | " | " | " | 72 |
| Canadian Puget Sound Co. | Victoria | Jordan River | 3 | 3 | 3 | 72 logging-trucks | 72 |
| Canadian Robert Dollar Co. | Vancouver | Union Bay | 7 | 1 | 1 | 1 boarding-car, 6 logging-cars, 16 sets logging-trucks | 23 |
| Canadian Western Fuel Co. | Nanaimo | Nanaimo | 20 | 6 | 6 | 42 flat, 564 coal-cars, 21 work-cars, 2 workmen's passenger-cars, 1 crane | 630 |
| Capilano Timber Co. | North Vancouver | North Vancouver | 8 | 2 | 2 | 1 flat, 12 logging-cars, 27 logging-trucks, 1 steam-shovel, 1 snow-plough | 42 |
| Clayburn Co. | Clayburn | Clayburn | 8 | 2 | 2 | 3 flat, 11 ore-cars, 4 coal-cars | 18 |
| Columbia River Lumber Co. | Vancouver | Golden | 28 | 3 | 3 | 2 box, 2 flat, 82 logging-cars, 3 log-ladders | 89 |
| Comox Logging Co. | " | Comox | 50 | 6 | 6 | 200 logging-cars, 30 logging-trucks, 10 boarding-cars, 12-tank-cars, 2 flat, 1 box, 4 gons | 259 |
| Corbin Coal & Coke Co. | Spokane, Wash. | Corbin | 12 | 2 | 2 | 96 coal-cars, 8 work-cars, 2 steam-shovels, 1 rotary plough | 107 |
| Craig-Taylor Lumber Co. | Vancouver | Otter | 5 | 2 | 2 | 8 logging-cars | 8 |
| Crow's Nest Pass Lumber Co. | Wardner | Waso | 9 | 2 | 2 | 3 flat, 7 boarding-cars, 2 log-loaders | 12 |
| Clayton Lumber Co. | Cloverdale | Cloverdale | 4 | 1 | 1 | 4 trucks | 4 |
| Dolly Varden Mines Ry. | Vancouver | Alice Arm | 18 | 3 | 3 | 1 box, 15 flat, 2 cabooses | 18 |
| Eagle Timber Co. | Vancouver | Grassy Bay | 3 | 1 | 1 | 1 box, 1 flat, 7 logging-trucks, 1 pile-driver, 1 log-loader | 11 |
| East Kootenay Lumber Co. | Jafray | Jafray | 10 | 1 | 1 | 24 logging-cars, 2 log-loaders | 26 |
| Eastern B.C. Ry. (Corbin Coal & Coke Co.) | Spokane, Wash. | Corbin | 16 | 2 | 2 | 8 box, 19 flat, 1 baggage, 1 passenger-car, 1 pile-driver, 1 snow-plough | 31 |
| Eastern Lumber Co. | Ladysmith | Ladysmith | 3 | 1 | 1 | 5 logging-trucks | 5 |
| Ellis, H. M. | Vancouver | Lombard | 3 | 1 | 1 | 10 logging-trucks | 10 |
| Galbraith Logging Co. | New Westminster | Langley Mill | 4 | 1 | 1 | 4 logging-trucks, 1 log-loader | 5 |
| Gordon Development Co. | Vancouver | Half Moon Bay | 4 | 1 | 1 | 1 flat, 10 logging-trucks | 11 |
| Granby Consolidated Mining & Smelting Co. | Vancouver | Anyox | 6 | 3 | 3 | 2 box, 12 flat, 50 ore-cars, 3 coal-cars, 20 ballast, 1 steam-shovel | 88 |
| Gwilt Lumber Co. | Courtenay | Courtenay | 4 | 1 | 1 | 2 sets logging-trucks | 4 |
| Griffin, Contractors | Vancouver | C. N. Ry. | 2 | 2 | 2 | " | 4 |
| Hedley Gold Mining Co. | Hedley | Hedley | 3 | 2 | 2 | 40 ore-cars | 40 |
| Heaps, E. H. | Ft. Victoria, Vancouver | Ruskin | 12 | 1 | 1 | 4 flat, 15 logging-trucks, 3 oil-cars, 2 tank-cars | 24 |
| Hoard & Flaherty | Bainbridge | Bainbridge | 3 | 1 | 1 | 4 sets logging-trucks | 8 |
| International Timber Co. | Vancouver | Campbell River | 20 | 3 | 3 | 2 flat, 50 logging-cars, 10 work-cars, 1 box, 1 workmen's passenger-car, 1 pile-driver | 65 |
| Keystone Logging Co. | Vancouver | Silverdale | 8 | 2 | 2 | 1 flat, 11 logging-trucks, 1 pile-driver, 1 log-loader | 14 |
| King, M. B., Lumber Co. | Newton | Kings | 3 | 1 | 1 | 2 box, 1 logging-car | 3 |
| Khaless International Timber & Trading Co. | Mission | Mission | 2 | 1 | 1 | 1 logging-car | 1 |
| Lamb Lumber Co. | Vancouver | Lang Bay | 4 | 1 | 1 | 1 flat, 10 logging-cars, 4 logging-trucks | 15 |
| Mayo Lumber Co. | Duncan | Duncan | 3 | 1 | 1 | 2 logging-cars, 1 log-loader | 3 |
| McDonald-Murphy Logging Co. | Campbell River | Campbell River | 3 | 1 | 1 | 3 logging-trucks | 8 |
| Merrill-Ring-Moore Co. | Vancouver | Johnstone Strait | 3 | 2 | 2 | 19 logging-cars | 19 |
| Morrissey, Fernie & Michel (Crow's Nest Pass Coal Co.) | Fernie | Fernie | 12 | 5 | 5 | 6 box, 49 coal-cars, 1 passenger-car, 5 workmen's passenger-cars, 1 caboose, 1 snow-plough, 1 crane | 64 |
| Magoffin, Contractors | Prince George | G.T.P. Ry. | 4 | 4 | 4 | " | 34 |
| Nimkish Timber Co. | Vancouver | Alert Bay | 9 | 3 | 3 | 21 logging-cars, 12 logging-trucks, 1 pile-driver | 34 |
| New Ladysmith Lumber Co. | Nanaimo | Nanaimo | 9 | 2 | 2 | 11 cars | 11 |
| Otis-Staples Lumber Co. (St. Mary's & Cherry Ry.) | Wycliffe | Wycliffe | 34 | 3 | 3 | 91 cars | 91 |
| Pacific Great Eastern Ry. | Vancouver | North Vancouver to Whytecliffe | 13 | 10 | 10 | 49 box, 138 flat, 35 stock, 3 refrigerators, 10 gons, 10 oil-cars, 4 cabooses | 352 |
| " | Vancouver | Squamish to Tatton | 231 | " | " | 45 ballast, 27 outfit-cars, 8 coaches, 1 comb. P. & B., 2 mail and baggage, 3 P. gas-motors, 3 steam-shovels, 1 ditcher, 1 pile driver, 1 crane | 352 |
| Pacific Coast Coal Mines | Victoria | Wellington | 20 | 3 | 3 | 3 flat, 48 coal-cars | 51 |
| Pacific Mills | Ocean Falls | Kimsquit | 8 | 2 | 2 | 25 logging-cars, 4 work-cars, 2 pile-drivers, 2 log-loaders | 33 |
| Powell River Co. | Vancouver | Kingcome Inlet | 24 | 2 | 2 | 3 flat, 82 logging-trucks | 35 |
| Port Moody-Cooquitlam Ry. (Robt. McNair Lumber Co.) | Vancouver | Port Moody | 15 | 1 | 1 | 6 flat cars, 12 logging-cars | 18 |
| Peterson, Contractors | Vancouver | Kootenay River | 12 | 2 | 2 | " | 27 |
| Ross Saskatoon Lumber Co. | Waldo | Sperling | 5 | 1 | 1 | 1 set logging-trucks | 2 |
| Seaford River Lumber Co. | Sperling | Powell River | 3 | 1 | 1 | 19 cars | 19 |
| Shawford Logging Co. | Victoria | Shawnigan Lake | 6 | 2 | 2 | 20 logging-trucks | 20 |
| Shawnigan Lake Lumber Co. | Seattle, Wash. | Bute Inlet | 7 | 2 | 2 | 1 flat car, 11 logging-cars, 2 logging-trucks, 1 pile-driver | 15 |
| Southgate Logging Co. | Seattle, Wash. | Fraser Valley (B. C.E. Ry.) | 2 | 1 | 1 | 2 sets logging-trucks | 4 |
| Smith-Hutchinson Lumber Co. | Vancouver | " | " | " | " | " | " |

| | | | | | | |
|---|------------------|-------------------------|-----|-----|---|-------|
| Straits Lumber Co..... | Vancouver | Lang Bay..... | 9 | 1 | 18 logging-trucks, 1 pile-driver..... | 19 |
| Timberland Lumber Co..... | New Westminster | Ladysmith..... | 6 | 1 | 8 logging-cars..... | 8 |
| Vancouver Lumber Co. (Mainland Cedar Co.) | Connaught Bridge | Port Neville..... | 4 | 1 | 10 logging-cars, 1 box car, 4 logging-trucks, 1 work-car, 1 pile-driver, 2 log-loaders..... | 19 |
| Victoria Lumber Co..... | Chemainus | Chemainus and Ladysmith | 21 | 4 | 73 logging-cars..... | 73 |
| Wilson Brady, Ltd..... | Vancouver | Valdes Is..... | 7 | 2 | 1 flat car, 16 logging-trucks..... | 17 |
| Wilson Logging & Timber Co..... | Vancouver | Heriot Bay..... | 6 | 1 | 8 logging-trucks..... | 8 |
| Wilson, J.C., Lumber Co..... | Qualicum Beach | Qualicum Beach..... | 4 | 1 | 8 logging-trucks..... | 8 |
| Totals..... | | | 956 | 162 | 32 | 3,638 |

Aerial Transportation Notes.

The Vancouver Island Aerial Service Co. is reported to have been inaugurated with headquarters at Victoria, B.C. A site for an aeroplane and hydroplane landing station is said to have been secured at Comox.

An Ottawa press report states that the Dominion Government will shortly undertake survey and forest protection service by aeroplane in the Rocky Mountain areas from stations at Vancouver, B.C., and Morley, Alta.

Lieut.-Colonel A. K. Tyler, O.B.E., who has been appointed officer commanding the Canadian Air Force, has gone to Camp Borden, Ont., to take up his duties. Applications for positions on the force have been received, and the work of selection and organization is reported to be in progress.

The Dominion Express Co. has, according to a London, Eng., cable, arranged for the transportation of passengers between London and Paris by aircraft. There will be a daily service in each direction, the time of the trip being scheduled at 2 hours 15 minutes. The single trip fare is approximately \$75.

Airship R-80, built at Barrow-in-Furness, Eng., for the British Admiralty, was expected to be launched by the end of June. Her dimensions, etc., are:—length, 535 ft.; breadth, 70 ft.; lifting power, 38 tons; number of engines, four; power, 240 h.p. each; estimated maximum speed, 65 miles an hour.

The Clifton Aero Club Ltd. has been incorporated under the Ontario Companies Act with authorized capital of \$40,000 and office at Niagara Falls, Ont., to provide aviation fields and aerodrome sites; to deal in aircraft and aeronautical supplies of all kinds; to carry passengers, merchandise and mail and give exhibition flights for hire. The provisional directors are J. B. Robinson, J. P. O'Reilly and H. R. Hillick, Niagara Falls, Ont.

Plans for Grouping British Railways.

London, Eng., cablegram: — Sir Eric Geddes' scheme for the economical administration of the British railways, which is being considered by the cabinet, disposes of the widespread expectation that the systems were to be nationalized. The scheme, however, contains some revolutionary proposals. The 135 railway undertakings in England and Wales are to be distributed into four geographical groups, comprising the northeastern and central system, the northwestern and midland, the southwestern and south coast, and the western and Wales system, each administered by one board of management. The proposal is that the state will buy out the smaller companies, and lease their lines to the larger undertakings in the various groups, thus leaving the entire management to be continued by private enterprise. It is claimed that this scheme of co-operation will effect enormous economies in directors' fees and administra-

tion charges, while the pooling of locomotives and cars and the prevention of overlapping will make for greater efficiency.

The proposals will not, however, pass into law without a storm of protest from the working railwaymen, who have placed absolute dependence on the statement by Mr. Winston Churchill during the general elections to the effect that the government intended to nationalize the lines. Nationalization makes the same appeal to railwaymen as to the miners, and the tabling of Sir Eric Geddes' scheme is certain to usher in another big struggle on this issue.—Copyright by Toronto Star.

It may be explained that of the 135 railway undertakings in England and Wales apparently independent, only a comparatively few are trunk lines or of more than local importance, although a number of the smaller lines carry a very considerable traffic, and up to 1915, at any rate, paid dividends to their shareholders. The Cambrian Ry. is perhaps the largest of the independent companies but it has never been a prosperous concern owing to the fact that there is little traffic originating in the territory through which it runs. It has close affiliation with the London & North Western Ry., the Great Western Ry. and the Midland Ry. There are a number of other lines having considerable mileage and carrying a lot of traffic operated as separate lines, but owned jointly by two or more of the large trunk lines. The Shrewsbury & Hereford Ry., owned by the L. & N. W. Ry. and the G. W. Ry. and the lines operated by the Cheshire Lines Committee, owned by the Midland Ry. and the Great Central Ry.; and the Somerset & Dorset Ry., owned by the Midland Ry. and the London & South Western Ry. Of the other lines which are of little more than local importance, notwithstanding the amount of traffic carried, are the Taff Vale Ry., the Rhondda Valley Ry., the Barry Docks & Ry. Co., and other coal carrying lines in South Wales, and the Maryport & Carlisle Ry. in Cumberland.

Qu'Appelle, Long Lake & Saskatchewan Railway Land Suit.

An action brought by David Russell, Montreal, broker and promoter, to recover \$8,175,000 from Sir Edmund Osler, Hon. W. Pugsley, the National Trust Co. as executor of the estate of the late H. C. Hammond, and C. S. McInnes, as executor of the estate of the late Hon. D. McInnes, came before the Ontario High Court April 27. The plaintiff alleged that in May, 1916, he bought from the then directors of the Qu'Appelle, Long Lake & Saskatchewan Ry. 493,000 acres of its land grants for \$500,000 and stock in the Canada Saskatchewan Land Co.; that the directors sought to evade carrying out the contract; that he lost \$5,000,000 through the railway and its lands being subsequently sold to Mackenzie, Mann & Co. and the Canadian Northern Ry.; and the claim further included \$200,000 alleged to have been expended in attempting to recover the property from

Mackenzie, Mann & Co. The statement of claim contained allegations of fraud, espionage, bribery and attempts on his liberty and life. The statement of defence claimed that Russell had made default in his agreement to pay for the land, and that in return for shares in the Canada Saskatchewan Land Co. he gave up all claim to the land. Russell was not in court when the case came up, and it was dismissed.

Canadian National Railways Earnings.

| | | |
|----------------|--------------|--------------|
| | 1920 | 1919 |
| January | \$ 7,726,562 | \$ 6,787,517 |
| February | 6,516,059 | 6,265,562 |
| March | 7,761,326 | 7,160,036 |
| April | 8,207,478 | 6,936,635 |
| May | 8,305,860 | 7,884,287 |
| | \$88,058,285 | \$85,034,037 |

Approximate earnings for three weeks ended June 21, \$5,305,120, against \$4,621,197 for the same period 1919.

Canadian Northern Railway System.

| | | |
|----------------|--------------|--------------|
| | 1920 | 1919 |
| January | \$4,200,700 | \$4,026,000 |
| February | 3,862,300 | 3,363,800 |
| March | 4,587,700 | 3,554,350 |
| April | 4,732,623 | 3,878,149 |
| | \$17,383,323 | \$14,822,299 |

Canadian Pacific Railway Earnings, Expenses, Etc.

Gross earnings, working expenses, net earnings, and increases or decreases, from Jan. 1, 1920, compared with those of 1919:

| | | | | |
|---------|--------------|--------------|-------------|----------------------|
| | Gross | Expenses | Net | Increase or decrease |
| Jan.... | \$13,914,569 | \$13,323,628 | \$585,941 | *\$967,571 |
| Feb.... | 13,557,104 | 12,843,231 | 713,873 | *267,242 |
| Mar.... | 15,715,937 | 13,758,171 | 1,957,766 | 418,721 |
| Apr.... | 15,929,416 | 13,587,570 | 2,341,846 | 253,222 |
| | \$59,117,026 | \$53,517,600 | \$5,599,426 | *\$562,870 |
| Incr. | \$9,541,444 | \$10,104,314 | | |
| Decr. | | | \$562,870 | |

Approximate earnings for May \$16,161,000, and for three weeks ended June 21, \$10,857,000, against \$13,277,000 for May, and \$9,073,000 for three weeks ended June 21, 1919.

Grand Trunk Railway Earnings, Expenses, Etc.

Gross earnings, working expenses, net earnings, and increases or decreases, from Jan. 1, 1920, compared with those of 1919:

| | | | | |
|---------|--------------|--------------|-------------|-------------|
| | Gross | Expenses | Deficit | Increase |
| Jan. \$ | 5,054,034 | 5,867,445 | \$813,411 | \$ 97,406 |
| Feb. | 4,660,831 | 5,159,742 | 498,911 | 185,987 |
| Mar. | 5,756,372 | 5,491,293 | 265,079 | 576,215 |
| Apr. | 5,477,816 | 5,187,340 | 290,476 | 465,592 |
| | \$20,949,553 | \$21,705,320 | \$ 756,767 | \$1,327,200 |
| Incr. | \$1,587,993 | \$2,915,193 | | |
| Decr. | | | \$1,327,200 | |

Approximate earnings for May, \$7,269,680, and for three weeks ended June 21, \$5,905,666, against \$6,846,886 for May, and \$5,059,517 for three weeks ended June 21, 1919.

Sir William Mackenzie's Private Car. P. F. Casgrain, M.P. for Charlevoix-Montmorency, Que., asked in the House of Commons recently, "How many times has Sir William Mackenzie's private car travelled on the Canadian National Rys. within the last two years." The Minister of Railway replied: "The Government has no information as to the details of operation of each individual car, on the Canadian National Rys."

Mainly About Railway People Throughout Canada.

J. Antonisen, who was appointed City Engineer, Port Arthur, Ont., recently, was born in Christiania, Norway, in 1869, and after spending a year in shipbuilding at Bergen, Norway, went to the United States in 1888, where he acquired some practical experience in civil engineering, and returned to Norway in 1894. After graduating in civil engineering at the Dresden University, he was engaged for about two years as Assistant Engineer on the Saxony Government Railways, and spent another four years in the Saxony Government department for improvement and regulation of rivers. He came to Canada in 1904 and entered C.P.R. service as Terminal Engineer, Winnipeg, and in 1905 was appointed City Engineer, Port Arthur, Ont., and subsequently also Manager, Public Utilities Commission there, resigning in 1911, when he was appointed City Engineer, Moose Jaw, Sasks., in 1912. He resigned the last mentioned position in 1913 and was appointed Superintendent, Brandon Municipal Ry., Brandon, Man., in 1913, which position he resigned in 1914, and returned to Port Arthur, Ont., where he conducted a private practice until his present appointment.

W. B. Bamford, who has been appointed District Freight Agent, C.P.R., Nelson, B.C., was born at Belleville, Ont., Sept. 10, 1863, and has been, prior to June, 1910, District Freight Agent, C.P.R., London, Ont.; June, 1910, to Apr., 1911, General Freight Agent, Atlantic Division, C.P.R., St. John, N.B.; Apr., 1911, to May, 1916, Division Freight Agent, Atlantic Division, C.P.R., St. John, N.B.; May, 1916, to June 1, 1920, District Freight Agent, C.P.R., Toronto.

Kennet William Blackwell, Vice President, Canadian Steel Foundries Ltd., Montreal, died there, June 11, after a short illness. He was born at Devizes, Eng., July 16, 1850, and was the son of T. E. B. Blackwell, Vice President and General Manager of the G.T.R. from 1857 to 1863. He was educated at Bishops College, Lennoxville, Que., and in England, and took up the study of mechanical engineering at the age of 17, spending five years in the drawing office of the G.T.R. shops at Montreal, after which he was, from 1872 to 1875, Shop Foreman, G.T.R., Montreal; 1875 to 1879, Assistant Mechanical Superintendent, G.T.R., Montreal; 1879 to Sept., 1881, Mechanical Superintendent, Chicago and Grand Trunk Rd.; 1881 to 1883, Superintendent, Locomotive and Car Department, C.P.R., Montreal. In 1883 he resigned to enter business in connection with the manufacture of railway supplies in Montreal, and eventually became President and Managing Director of the Canada Switch & Spring Co., which later became the Montreal Steel Works Ltd., of which he was President, and when the business was taken over by Canadian Steel Foundries Ltd., he became Vice President of the last mentioned company. He was President of the Canadian Society of Civil Engineers, now the Engineering Institute of Canada, in 1903, and was subsequently an honorary councillor of that institute. He was also a director, at various times, of the Locomotive & Machine Co., Montreal; Vice President, Suburban Tramway & Power Co., Montreal Park & Island Ry., Montreal Street Ry., Nova Scotia Steel & Coal Co., and several financial and industrial companies. The funeral took place at Mount Royal Cemetery, Montreal, June 14, when

a large number of transportation men attended.

George Bonham, who died suddenly, from apoplexy, at Montreal, June 1, aged 83, was at one time accountant on the Quebec & Lake St. John Ry., and remained for a time with the Canadian Northern Quebec Ry., when the control of the former line passed to the latter.

W. A. Booth, chief draftsman, G.T.R., Montreal, and Secretary Canadian Railway Club, was elected Vice Chairman of the Society of Railway Club Secretaries, at Atlantic City, recently.

J. M. Copeland, who has been appointed Travelling Agent, Great Northern Ry., Toronto, was presented with a silver mounted and engraved umbrella recently, by R. W. Long, Divisional Freight Agent, G.T.R., Toronto, and staff, on leaving the G.T.R. service.



T. M. Hyman,
Master Car Builder, London, Ont., Shops, Grand
Trunk Railway.

J. J. Crowley, Assistant Superintendent, Canada Southern Division, Michigan Central Rd., St. Thomas, Ont., died at St. Bernard Hospital, Chicago, Ill., June 14.

J. H. Cunningham, who has resigned as General Agent, Union Pacific Rd., Vancouver, B.C., is now President of Rock-Cunningham Inc., Seattle, Wash., shippers and steamship agents.

Mrs. Dennis, wife of Col. J. S. Dennis, C.M.G., Chief Commissioner of Colonization and Development, C.P.R., died at Calgary, Alta., June 8, after a long illness.

Richard Doyle has been appointed Assistant General Manager, Mississippi River & Bonne Terre, Ry., Bonne Terre, Mo., operating 46.2 miles of line from Riverside to Doe Run, and 8.11 miles of branches. He was born at Dudley, Ill., Nov. 12, 1862, and entered transportation service June 16, 1862, since when he has been, to Jan. 1, 1883, telegraph operator, Big Four Rd., at various points;

Jan. 1, 1883, to Aug. 1, 1892, dispatcher; Aug. 1 to Nov. 15, 1892, chief dispatcher; Nov. 15, 1892, to Mar. 1, 1893, Assistant Trainmaster; Mar. 1, 1893, to Dec. 1, 1899, Trainmaster same road, Mattoon, Ill.; Dec. 1, 1899, to Jan. 1, 1904, Trainmaster, Wabash Rd., St. Thomas, Ont.; Jan. 1, 1904, to Nov. 1, 1906, Superintendent, same road, Moberly, Mo.; Nov. 1, 1906, to Dec. 1, 1909, Trainmaster, G.T.R., Battle Creek, Mich.; Dec. 1, 1909, to Dec. 15, 1910, Master of Transportation, same road, Durand, Mich.; Dec. 15, 1910, to Nov., 1912, Trainmaster and Assistant Superintendent, Chicago & Alton Rd., Springfield, Ill.; Nov., 1912, to Mar. 16, 1916, Trainmaster; Mar. 16, 1916, to June 1, 1920, Superintendent, Mississippi River & Bonne Terre Ry., Bonne Terre, Mo.

James Dunsmuir, at one time chief owner of the Esquimalt & Nanaimo Ry., and later a director of the C.P.R., which company acquired the control of the E. & N.R., died at Cowichan Lake, B.C., June 6, as the result of a stroke, after being in poor health for some time. He was born at Fort Vancouver July 8, 1851. He entered business life with his father, who discovered and developed the first coal measures of any importance in British Columbia, and eventually succeeded him as President and chief owner of the Union and Wellington collieries, and the Esquimalt & Nanaimo Ry. These properties have since passed into the hands of Canadian Collieries (Dunsmuir) Ltd., and the C.P.R. respectively. He was a director of the C.P.R. for some years after 1908, was a member of the B.C. Legislature from 1898 to 1902, President of the Council 1900 to 1902, and Lieutenant-Governor of the province from 1906 to 1909. He entertained the present King and Queen when they visited British Columbia in 1901, and was present at the coronation of the late King Edward and Queen Alexandra in 1902.

L. C. Fritch, at one time General Manager, Eastern Lines, Canadian Northern Ry., Toronto, and latterly Vice President and Chief Engineer, Chicago, Rock Island & Pacific Ry., under corporate control, has been elected Vice President of the latter company, in charge of construction, maintenance and capital expenditures, with office at Chicago.

John Macneil Grieve, who has been appointed General Superintendent, Sleeping, Dining and Parlor Cars and News Service, Canadian National Rys., Toronto, was born in Scotland, Aug. 25, 1870, and entered railway service in July, 1900, since when he has been, to Sept., 1900, waiter, Intercolonial Ry., Halifax, N.S.; Sept., 1900, to Apr., 1907, waiter and steward, C.P.R., Montreal; May, 1907, to Apr., 1908, waiter, Apr., 1908, to Mar., 1910, dining car steward, Mar., 1910, to Mar. 1912, Inspector, Mar., 1912, to Apr., 1915, Chief Inspector, Apr., 1915, to Oct., 1917, Assistant Superintendent, Sleeping, Dining and Parlor Cars and News Service, Canadian Northern Ry., Winnipeg; Oct., 1917, to May 1, 1920, Superintendent, same department, Canadian Northern Ry., latterly Canadian National Rys., Winnipeg.

John Halstead, whose appointment as Division Freight Agent, C.P.R., Winnipeg, was announced in our last issue, entered C.P.R. service Jan. 7, 1892, since when he has been, to May, 1894, messenger and clerk, Freight Department,

London, Ont.; May, 1894, to July, 1897, billing clerk, Toronto; July, 1897, to July, 1901, stenographer, General Freight Department, Toronto; July, 1901, to May, 1902, chief clerk, General Freight Department, Toronto; May to Nov., 1902, Travelling Freight Agent, Winnipeg; Nov., 1902, to Feb., 1906, chief clerk, General Freight Department, Vancouver, B.C.; Feb. to Oct., 1906, Freight and Passenger Agent, Tacoma, Wash.; Oct., 1906, to Jan. 1, 1909, Assistant General Freight Agent, Calgary, Alta.; Jan. 1, 1909, to May 15, 1920, Division Freight Agent, Calgary, Alta.

R. A. C. Henry, B.A., B.Sc., Assistant Engineer, Railways and Canals Department, Ottawa, has been appointed Engineer in Charge, for the Dominion Government, in connection with the arbitration as to the acquisition of the G.T.R. System, and is located in the Drummond Building, Montreal. **F. P. Moffatt** of Winnipeg, formerly Senior Division Engineer, Hudson Bay Ry., has been appointed Assistant Engineer in connection with the work.

C. R. Hosmer, one of the C.P.R. directors, and **Mrs. Hosmer**, are spending the summer at Dorval, Que.

T. M. Hyman, whose appointment as Master Car Builder, G.T.R., London, Ont., was announced in our last issue, was born near Bristol, Eng., June 12, 1885, and after serving an apprenticeship in car construction in England, came to Canada and entered G.T.R. service at Point St. Charles shops, Montreal, and in 1914 was Car Inspector. On the outbreak of war in 1914, he enlisted for active service and went overseas with the Second Brigade of the first contingent, and served throughout the war, receiving the Distinguished Conduct Medal. On his return to civil life in 1919, he was appointed Assistant General Foreman, Car Department, Point St. Charles shops, G.T.R., Montreal, and was appointed to his present position May 1.

Walter E. Joyce, who has been engineer in charge of the Montreal tunnel, Canadian National Rys., since the late **S. P. Brown** resigned the position of Chief Engineer, has resigned, and is reported to have been appointed in charge of the Ridout suspension bridge at Kingston, N.Y.

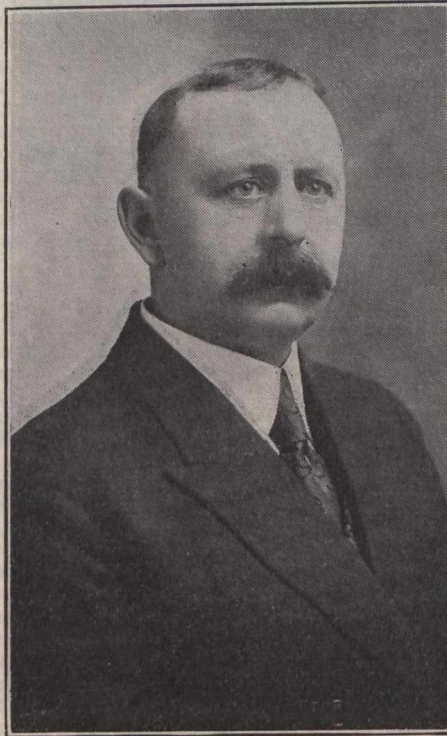
H. G. Kelley, President G.T.R. and G.T. Pacific Ry., is a member of the committee on freight stations, organization, simplification of switching, and mechanical appliances, of the International Railway Congress, which will meet in Rome, Italy, in April and May, 1922.

Jas. A. C. Kelman, whose appointment as Telegraph Traffic Supervisor, Central & Western Divisions, Grand Trunk Pacific Ry., Winnipeg, was announced in our last issue, was born at Bowmanville, Ont., Nov. 1, 1886, and entered telegraph service Feb. 1, 1902, since when he has been, to Mar. 30, 1903, messenger, Great North Western Telegraph Co., Bowmanville, Ont.; Feb. 1, to Sept. 10, 1903, telegraph operator, same company, Brighton, Ont.; Oct. 1, 1903, to Nov. 1, 1905, telegraph operator, G.N.W.T. Co. and C.P.R. Telegraph, Toronto; Nov., 1905, to July, 1908, telegraph operator, C.P.R. and Canadian Northern Ry., Winnipeg; July 13, 1908, to Nov. 1, 1910, telegraph operator, G.T.P. Ry., Winnipeg; Nov. 1, 1910, to June 1, 1917, chief telegraph operator, same company, Winnipeg; June 1, 1917, to May 17, 1920, telegraph circuit manager, same company, Winnipeg.

Ernest Roy Logie, whose appointment as Division Engineer, Superior Division,

Canadian National Rys., Hornepayne, Ont., was announced in a recent issue, was born at Chatham, N.B., Aug. 16, 1886, and entered railway service in Mar. 1907, since when he has been, to Sept., 1908, draftsman and rodman, Grand Trunk Pacific Ry., Winnipeg, and Edmonton, Alta.; June, 1909, to Dec., 1910, draftsman, leveller and Resident Engineer, successively, Bangor & Aroostook Rd., Bangor, Me.; Jan., 1911, to Jan., 1912, topographer on location, and instrument man on construction, Franz to Hearst, Ont., Algoma Central & Hudson Bay Ry.; Jan., 1912, to Sept., 1917, Resident Engineer on construction, Sudbury-Port Arthur line, Canadian Northern Ry., and Lambton-Guelph line, Toronto Suburban Ry.; Sept., 1917, to Dec., 1918, Resident Engineer, Toronto, Hamilton & Buffalo Ry., Bridgeburg and Hamilton, Ont.; Jan., 1919, to Feb., 1920, Resident Engineer on Maintenance, Canadian National Rys., Rosedale, Ont.

J. K. Macdonald, who has been appointed Chief Engineer, Northern Light Railways Co., Elk Lake, Ont., in charge



J. M. Grieve,
General Superintendent, Sleeping, Dining and Parlor Cars and News Service, Canadian National Railways.

of surveys and construction of the projected light railways in Northern Ontario, was born in 1869, and graduated in civil engineering from Ottawa University in 1892, and held various minor engineering positions in Canada and the U.S. from 1892 to 1900. In 1900 he was contractors' engineer on the harbor works at Port Colborne, Ont.; 1901, Chief Engineer and General Superintendent, Marietta, Columbus & Cleveland Ry., and rebuilt and operated 67 miles of coal railway, which was subsequently sold to the Wabash Rd.; 1902, Division Engineer, Missouri Pacific Ry. on construction work in Arkansas; 1903, Division Engineer on location; 1904, Locating Engineer on the southern end of the Toronto-Sudbury line, C.P.R.; 1905, Division Engineer, New Liskeard to McDougalls Chutes, Timiskaming & Northern Ontario Ry.; 1906 to 1907, prospecting mining claims, and contractors' engineer,

Canadian Northern Ry.; 1908, on location work, Ontario Northern & Timagami Ry. from Sturgeon Falls north, and also engaged on the construction of the Northern Ontario Smelter at Sturgeon Falls, Ont.; 1909, Inspection Engineer, Atlantic, Quebec & Western Ry., Gaspe, Que.; 1910, Engineer for the Foundation Co. engaged on the reconstruction of the C.P.R. Windsor St. station, Montreal; 1911, Engineer in charge of the Mond Nickel Co.'s connecting railway; 1912, Contractors' Engineer, C.P.R., double tracking on the Lake Superior Division; 1913, engaged in mine surveying, prospecting and municipal work, Sudbury, Ont.; 1914, Contractors' Engineer, Trent Canal, Washago, Ont. From 1915 to 1919, he was in military service overseas, two years being spent in France on light railway location and construction, and subsequent to his discharge in Apr., 1919, he has acted as a vocational officer for the Disabled Soldiers Civil Re-establishment Commission at Toronto.

W. McIlroy, whose appointment as General Agent, Passenger Department, C.P.R., Detroit, Mich., was announced in our last issue, entered C.P.R. service in May, 1891, in the telegraph department, and has been, from June, 1892, to July, 1893, clerk, Galt, Ont.; July 1893, to Feb., 1899, telegraph operator, Toronto; Feb., 1899, to June 1900, agent, Brantford, Ont.; June, 1900, to Mar., 1905, agent, Galt, Ont.; Mar., 1905, to Oct., 1912, agent, Peterborough, Ont.; Oct., 1912, to May, 1915, City Passenger and Ticket Agent, Hamilton, Ont.; May, 1915, to June, 1916, City Passenger Agent Toronto; June, 1916, to June 1, 1920, chief clerk to District Passenger Agent, Toronto.

Miss Evelyn MacInnes, second daughter of **W. R. MacInnes**, Vice President Traffic, C.P.R., was married at Montreal June 15, to **Capt. R. B. S. Reford, M.C.**, of the Irish Guards, formerly A.D.C. to the Lord Lieutenant of Ireland, and elder son of **R. Wilson Reford**, of the Robert Reford Co., Montreal.

Arthur Tilley McKean, whose appointment as Division Freight Agent, C.P.R., Calgary, Alta., was announced in our last issue, was born at St. John, N.B., Dec. 18, 1886, and entered C.P.R. service Apr. 1, 1903, since when he has been, to Mar., 1906, clerk and stenographer, General Freight Department, St. John, N.B.; Mar., 1906, to Jan., 1908, clerk, assistant chief clerk and chief clerk to Assistant Freight Traffic Manager, Winnipeg; Jan., 1908, to June, 1911, Soliciting Freight Agent, Winnipeg; June, 1911, to Jan., 1916, City Freight Agent, Winnipeg; Jan., 1916, to May 15, 1920, Division Freight Agent, Winnipeg.

R. M. MacMillan, whose appointment as Divisional Superintendent of Telegraphs, and Superintendent of Time Service, Central Division, Grand Trunk Pacific Ry., Winnipeg, was announced in our last issue, entered telegraph service in 1904 as messenger with the Western Union Telegraph Co., Sydney, N.S., and worked through the various positions of clerk, operator and local manager there, and was later transferred to Halifax, N. S. In 1911 he went west and entered C.P.R. Telegraphs service, transferred to the Grand Trunk Pacific Telegraph service at Winnipeg in the same year, and was subsequently city manager in that service at Regina, Sask., and Calgary, and Edmonton, Alta., successively, and during the absence on active military service of **F. T. Caldwell**, was appointed acting Divisional Superintendent of Telegraphs.

Mrs. A. D. MacTier, wife of the Vice President, Eastern Lines, C.P.R., and Miss Adeline MacTier, are spending the summer in England.

Richard Marpole, General Executive Assistant, C.P.R., Vancouver, B.C., died there June 8. He was born in Wales in 1850, and served for nearly eight years in the construction and traffic departments of British railways before coming to Canada. He entered C.P.R. service in 1881, serving successively as contractor, Assistant Manager of Construction, Nipissing Division; Superintendent, Lake Superior Division; Superintendent, Pacific Division, and General Superintendent, Pacific Division to 1907, when he was appointed Executive Agent for the Pacific Coast, and later, General Executive Assistant for British Columbia.

Charles Sedgewick Morse, who has been appointed District Freight Agent, C.P.R., Toronto, was born at Ottawa, Ont., Aug. 31, 1889, and entered C.P.R. service Mar. 1, 1906, since when he has been, to Jan. 1, 1909, stenographer, tracing clerk and export clerk, Winnipeg; Jan. 1, 1909, to Apr. 1, 1912, Travelling Freight Agent, Calgary, Alta.; Apr. 1, 1912, to July 15, 1914, District Freight Agent Fort William, Ont.; July 15, 1914, to June 1, 1920, District Freight Agent, London, Ont.

Lord Mount Stephen, first President of the C.P.R., celebrated his 91st birthday in England, June 5.

Jas. Murdoch, of Toronto, who has resigned his position as a member of the Dominion Board of Commerce, has announced that he will return to his office in Cleveland, Ohio, as Vice President of the Brotherhood of Railway Trainmen of America.

John Murphy, Chief Electrical Engineer, Railway and Canals Department, and Board of Railway Commissioners, addressed the Engineering Institute of Canada, Ottawa Branch, recently, on ice problems and their solution, illustrated with moving pictures and lantern slides.

Charles F. Needham, whose appointment as Assistant to General Superintendent, Motive Power and Car Departments, G.T.R., Montreal, was announced in our last issue, was born at London, Ont., Dec. 9, 1877, and entered G.T.R. service July 2, 1898, since when he has been, with the exception of short periods in the road and transportation department and the motive power department, successively as follows,—clerk, head time keeper, accountant, chief clerk, and special assistant, to 1905, at Toronto, and to May 17, 1920, at Montreal.

David Pottinger, I.S.O., at one time General Manager, Intercolonial & Prince Edward Island Railways, at Moncton, N. B., and Mrs. Pottinger, who spent most of the winter in Montreal, are at Scheldiac, N.B., for the summer.

C. Price-Green, Industrial Commissioner Canadian National Rys., Toronto, spoke on forests and forest preservation in Canada, before the National Editorial Association at Boston, Mass., June 4.

John Gunion Rutherford, C.M.G., one of the members of the Board of Railway Commissioners, Ottawa, has been given the degree of doctor of veterinary science, honoris causa, by Toronto University.

S. Osborne Scott, General Passenger Agent Canadian National Rys., Winnipeg, was married there, June 2, to Miss Audrey Heath.

Lady Shaughnessy and Hon. Marguerite Shaughnessy have returned to Mont-

real from England.

Mrs. Spencer, widow of C. W. Spencer, at one time in the C.P.R. service, and afterwards with the Canadian Northern Ry., and Miss Beatrice Spencer, who spent the winter in California, have returned to Montreal.

Frederick William Sterling, who has been appointed District Freight Agent, C.P.R., Edmonton, Alta., was born at Thornbury, Ont., Sept. 13, 1879, and entered C.P.R. service in 1894, since when he has been, to 1903, messenger, local freight office, Vancouver, B.C.; 1903 to 1904, claims clerk, General Freight Department, Vancouver, B.C.; 1904 to 1906, chief clerk, General Freight Department, Vancouver, B.C.; 1906 to 1910, Contracting Freight Agent, Seattle, Wash.; 1910 to 1913, Travelling Freight Agent, Vancouver, B.C.; 1913 to May, 1920, District Freight Agent, Nelson, B.C.

William Tansley, who has been appointed Car Service Agent, C.P.R., Toronto, was born at Shelburne, Ont., Dec. 27, 1872, and entered C.P.R. service in Sept., 1889, since when he has been, to 1900, operator and agent at various points on the Ontario Division; 1901 to 1907, dispatcher, Toronto; 1907 to 1912, Chief Dispatcher, Toronto; 1907 to 1912, Assistant Superintendent, Havelock, Ont.; 1914 to 1915, Assistant Superintendent, Toronto; May 18 to July, 1915, Assistant Superintendent, Smiths Falls, Ont.; July to Dec., 1915, acting Superintendent of Car Service, Eastern Lines, Montreal; Dec., 1915, to Feb., 1916, Assistant Superintendent, Montreal Terminals; Feb., 1916, to Jan., 1917, Assistant Superintendent, London, Ont.; Jan. to Apr., 1917, acting Superintendent, London, Ont.; Apr., 1917, to Apr., 1918, Superintendent, Laurentian Division, Quebec District, Montreal; Apr., 1918, to May 31, 1920, Car Service Agent, C.P.R., St. John, N.B.

Lady Van Horne, and Miss Van Horne, are spending the summer at Covenhoven, St. Andrews, N.B.

Mrs. Vaughan, wife of H. H. Vaughan, formerly Assistant to Vice President, C.P.R., and their family, are spending the summer at Lake Placid, N.Y.

W. G. Vernon, Yardmaster, G.T.R., Windsor, Ont., dropped dead in the yards there, June 24, aged 54.

F. L. Wanklyn, General Executive Agent, C.P.R., Montreal, and Mrs. Wanklyn, are spending the summer at their country house, at Senneville, Que.

Howard Williams, C.B.E., heretofore Assistant General Manager, London & North Western Ry. of England, has been appointed General Manager, Central Argentine Ry.

John H. Wilson, whose appointment as Locomotive Foreman, C.P.R., John St., Toronto, was announced in our last issue, was born at Aberdeen, Scotland, Aug. 31, 1878, and entered C.P.R. service May 1, 1899, since when he has been, to May, 1900, machinist, Winnipeg; May to Dec., 1900, charge hand, Calgary, Alta.; Jan., 1901, to Nov., 1906 assistant foreman, Brandon, Man.; Nov., 1906, to Aug. 1909, Locomotive Foreman, Brandon, Man.; Aug. to Dec. 1909, Locomotive Foreman, Moose Jaw, Sask.; Jan., 1910, to Nov., 1914, Locomotive Foreman, Kenora, Ont.; Nov., 1914, to Apr., 1916, Locomotive Foreman, Canadian Northern Ry., Hornepayne, Ont.; Apr. 1916, to Apr. 1919, General Foreman, Canadian Northern Ry., Trenton, Ont.; Apr. to Nov., 1919, Locomotive Foreman, C.P.R., Smiths Falls, Ont.; Nov., 1919, to Apr., 1920, Locomotive Foreman, C.P.R., Brownville Jct., Me.

Delaware & Hudson Co.'s Canadian Properties.

The Delaware & Hudson Co.'s annual report, for the year ended Dec. 31, 1919, contains the following:—Your railroad properties in Canada, operated by their owners, obtained the following results, which are compared with the previous year:

The Quebec, Montreal & Southern operating revenues decreased \$208,238.47, or 26.49%, and operating expenses increased \$49,874.32, or 6.34%. Income from hire of freight cars increased \$49,480.83, or 22.04%, and net operating income, not deducting interest due your company, was \$7,712.47, a decrease of \$199,264.27. Freight movement decreased 23,355,427 ton miles, or 51.97%, mainly on account of the reaction following the war. Freight revenue decreased \$211,476.70, or 33.97%. Passenger movement decreased by 491,408 passenger miles, or 10.69%. Operating expenses were increased by charges in anticipation of wages adjustments which may be necessary and will probably be retroactive to Jan. 1, 1919. Decreases occurred in maintenance of way and structures and transportation expenses, but were more than offset by an increase in the outlay for maintenance of equipment resulting from heavy repairs to locomotives during the year.

The Napierville Junction operating revenues increased \$73,474.20, or 17.27%; operating expenses increased \$83,831.25, or 27.71%, and net operating income decreased \$10,118.92, or 13.64%. Operating expenses were increased by necessary wages adjustments and this company's proportion of the increased cost of operating through passenger train service due to increased wages paid by the U.S. Railroad Administration. Passenger revenue increased \$124,443.64, or 97.01%, on account of the increase in passenger traffic which followed the termination of the war and the operation of through passenger train service to the station at Windsor St., Montreal. However, this increase was more than offset by a decrease in freight revenue of 23.76%, and the increase in expenses.

Toronto Union Station Progress.

W. F. Maclean, M.P. for South York, Ont., asked the following questions in the House of Commons June 8:—"Is the Minister of Railways aware that the new Union Station at Toronto, which is being built largely at the expense, either directly or indirectly, of the people of this country, has been completed, and is practically ready for occupation, but that for some reason or another the use of it is delayed? Is he also aware that the people of Toronto and of Ontario generally would like to see the splendid accommodation provided in that station for postal, express and passenger business, put at their disposal at the earliest possible date? If some legal difficulty stands in the way, I should like to know whether the government is prepared to remove that and to give the public the use of the building?"

The Minister of Railways, Hon. J. D. Reid, replied:—"The work in connection with the new station at Toronto is not and will not be completed for some little time. It has been delayed on account of strikes and shortage of material. The Toronto Terminals Railway Co., which is constructing this station, tells me that every effort is being made to complete it at the earliest possible moment.

Railway Association of Canada's Officers, Committees, Etc.

Following is a revised, up-to-date list of Railway Association of Canada's officers, committees, etc.

Honorary Chairman, Lord Shaughnessy, Chairman, C.P.R. Co., Montreal.

President, H. G. Kelley, President, G. T.R., Montreal.

General Secretary, C. P. Riddell, Montreal.

Executive Committee—Lord Shaughnessy, Chairman, C.P.R., Montreal; H. G. Kelley, President, G.T.R., Montreal; E. W. Beatty, President, C.P.R., Montreal; D. B. Hanna, President, Canadian National Rys., Toronto; J. N. Beckley, President, T. H. & B. Ry., Rochester, N.Y.; A. H. Smith, President, New York Central Rd., New York.

Operating Committee—Grant Hall, Vice President, C.P.R., Montreal; W. D. Robb, Vice President, G.T.R., Montreal; M. H. MacLeod, Vice President, C.N.R., Toronto; F. F. Backus, General Manager, T. H. & B. R., Hamilton; J. H. Walsh, General Manager, Quebec Central Ry., Sherbrooke.

Traffic Committee—C. A. Hayes, Vice President, C.N.R., Toronto; J. E. Dalrymple, Vice President, G.T.R., Montreal; W. R. MacInnes, Vice President, C.P.R., Montreal; G. C. Martin, General Traffic Manager, T. H. & B. R., Hamilton; Carl Howe, Traffic Manager, Michigan Central Rd., Chicago.

Financial Committee—I. G. Ogden, Vice President, C.P.R., Montreal; Frank Scott, Vice President, G.T.R., Montreal; A. J. Mitchell, Vice President, C.N.R., Toronto; W. H. Maund, Sec.-Treas., T. & N. O. R., Toronto; E. B. Barber, Comptroller, Algoma Central & Hudson Bay Ry., Sault Ste. Marie.

Legal Committee—W. C. Chisholm, General Solicitor, G.T.R., Montreal; W. H. Curle, General Solicitor, C.P.R., Montreal; Gerard Ruel, General Counsel, C. N.R., Toronto; F. E. Robson, General Solicitor, Michigan Central Rd., Detroit; E. D. Cahill, General Solicitor, T. H. & B. Ry., Hamilton.

Sub-Committee on Transportation—H. T. Malcolmson, Superintendent, T. H. & B. R., Hamilton; H. Shearer, General Superintendent, M.C.R., Detroit; C. G. Bowker, General Superintendent, G.T.R., Toronto; F. P. Brady, General Manager, C.N.R., Montreal; A. Price, General Manager, C.P.R., Montreal; W. H. Farrell, General Manager, Algoma Eastern Ry., Sudbury; W. A. Griffin, Sup't of Traffic, T. & N. O. Ry., North Bay.

Sub-Committee on Car Service—F. Price, Sup't Car Service, G.T.R., Montreal; A. Hatton, Gen'l Sup't Car Service, C.P.R., Montreal; A. E. Lock, Sup't Car Service, T. H. & B. R., Hamilton; J. P. Driscoll, Gen'l Sup't Car Service, C.N.R., Toronto; W. S. Moy, Car Accountant, Quebec Cent. Ry., Sherbrooke; W. M. Hugill, Sup't Car Service, A. C. & H. B. R., Sault Ste. Marie; J. S. Gordon, General Manager, Quebec Oriental Ry., New Carlisle; C. A. Stewart, Manager, Temiscouata Ry., Riviere du Loup.

Sub-Committee on Rolling Stock—W. H. Sample, Gen'l Sup't Motive Power, G. T.R., Montreal; W. H. Winterrowd, Chief Mech. Engineer, C.P.R., Montreal; W. U. Appleton, Mechanical Engineer, C.N.R., Moncton; H. L. Rodgers, Mech. Engineer, T. & N. O. R., North Bay; W. T. Kuhn, Sup't Motive Power, T. H. & B. R., Hamilton; G. M. Robins, Master Mechanic, Quebec Central Ry., Sherbrooke; G. E. Parks, Mechanical Engineer, Mich. Cent. Rd., Detroit; T. C. Hudson, Gen'l

Master Mechanic, C.N.R., Montreal.

Sub-Committee on Engineering—F. L. C. Bond, Chief Engineer, G.T.R., Montreal; A. F. Stewart, Chief Engineer, C. N.R., Toronto; J. M. R. Fairbairn, Chief Engineer, C.P.R., Montreal; R. S. McCormick, Gen. Supt. and Chief Engineer, A. C. & H. B. R., Sault Ste. Marie; R. L. Latham, Chief Engineer, T. H. & B. R., Hamilton.

Sub-Committee on Wages and Working Conditions—E. R. Battley, Sup't Motive Power, G.T.R., Montreal; Geo. Hodge, Asst. to Vice President, C.P.R., Montreal; A. J. Hills, Asst. to President, C.N.R., Toronto.

Sub-Committee on Claims—J. M. Eedson, Freight Claim Agent, T. H. & B. R., Hamilton; E. Arnold, Freight Claim Agent, G.T.R., Montreal; G. C. Jackson, Auditor of Claims, C.P.R., Montreal; H. McDonald, Freight Claim Agent, C.N.R., Toronto.

The Railway Association of Canada Western Lines.

Secretary—E. J. Stone, Winnipeg.

Western Operating Committee—W. P. Hinton, Vice President, G. T. Pacific Ry.; A. E. Warren, General Manager, C.N.R.; C. Murphy, General Manager, C.P.R.; D. C. Coleman, Vice President, C.P.R.; C. E. Dafoe, Gen'l Superintendent, Midland Ry. of Manitoba.

Sub-Committee on Traffic and Transportation—H. H. Brewer, General Superintendent, G.T.R.; C. E. Dafoe, General Superintendent, Midland Ry. of Manitoba; A. E. Stevens, General Superintendent, C.P.R.; A. Wilcox, General Superintendent, C.N.R.; W. J. Manders, Asst. Frt. Trf. Manager, C.N.R.; W. M. Kirkpatrick, Asst. Frt. Trf. Manager, C.P.R.; W. C. Bowles, General Freight Agent, C.P.R.; A. E. Rosevear, General Freight Agent, G. T. Pacific Ry.; E. D. Cotterell, Sup't of Car Service, C.P.R.; T. P. White, Sup't of Car Service, G. T. Pacific Ry.; E. Crawford, Sup't of Car Service, C.N.R.; A. G. Sutherland, Sup't of Car Service, E. D. & B. C. Ry.

Grant Hall Honored in Winnipeg.

Grant Hall, Vice President C.P.R., was entertained at dinner at the Royal Alexandra Hotel, Winnipeg, on June 4, the event being somewhat belated, owing to the fact that when he was appointed to his present position he had to leave Winnipeg suddenly for Montreal to assume it. Nearly 300 leading citizens from throughout the west were present, Sir Jas. Aikins, Lieutenant Governor of Manitoba, presiding. Mr. Hall, in replying to the toast of his health, is reported as saying that it was a really great encouragement to a man to find that after years spent among them they would go to extremes of trouble to show him such marks of approval and appreciation. It was not all of his own volition that he went to Montreal, for both on account of his own many warm friendships and associations in Winnipeg and the west, and the fact that his family has grown up here and formed close ties in Winnipeg, it was a great loss to him and them to leave. He had watched with constant faith the development of Winnipeg and of the west for 20 years, from the time when at the invitation of Sir William Whyte he had first gone west. He continued:—"I have seen the C.P.R. extend its main line passenger service from one train a day to three, including the Trans-Canada Limited. I have seen 100 miles of the track doubled; the Winnipeg yards grow to 150 miles of track, including Transcona; the shops from 500 men to

over 2,000, and the Ogden shops established with 1,200 men. Thirty years ago I was only an apprentice in the Grand Trunk shops. I cannot speak to my western friends on an occasion like this without referring to the problems that face us as a result of the war. The western men gave a good account of themselves in France and Flanders and may be relied upon to do the same now at home. I am not a pessimist, but I would suggest that we all get together and consider our problems, present and future, with a minimum of provocative argument. We want to serve you; we cannot get along without you. I claim that we should be allowed, and should get, the remuneration necessary to make that service adequate to your needs. Though I live in the east, my heart is with you, for I appreciate the west. I hope you will always believe I am trying to give you the service to which you are entitled. Sometimes I hear western men say that the eastern men do not know enough about the west. I know that western men do not know enough about the east. We are one country, and the west is an important part of it, but I would suggest that you learn the east, and learn to appreciate it."

Premier Norris of Manitoba, who spoke for all the other western premiers as well as himself, voiced the sentiments of the west in regretting the departure of such a sterling public spirited person as Mr. Hall. The Mayor of Winnipeg, in the name of its citizens at large, paid a tribute of appreciation to the services rendered the city by Mr. Hall, during his executive residence there. Among the other speakers were the Mayor of Toronto, and Peter Heenan, M.L.A., for Kenora, Ont., a C.P.R. employe, who is often called upon to represent the men in conference with the management, and who testified to the confidence they have in Mr. Hall.

Alaskan Railway Work for 1920.

Construction and preparatory work for 1920 on the southern and northern sections of the Alaska Government Ry., as outlined by Col. Frederic Mears, Chairman and Chief Engineer, Alaskan Engineering Commission, includes heavy bridges and rock-cut work, as well as new grading and repair of old grades. The contract has been let for the 504 ft. truss span over the Susitna River, 265 miles north of Seward. Examinations are being made for the foundations of the Hurricane Gulch steel arch bridge, 284 miles north of Seward, which will be the northern limit of operation for the southern division this year. It was necessary to start excavation at this point early in the season, owing to the heavy yardage in the approach cut. Several miles of sidehill grading work will be carried out by steam shovel along the Susitna River. North of this work, in the same locality, about 24 miles of re-grading are required, to repair the old grade, which has deteriorated badly at several points owing to its abandonment in 1917-18. Distribution of supplies and materials, from the present end of track, 237 miles north of Seward, for 38 miles northward was carried out during the winter by sledding over frozen roads. On the northern division construction will be confined to Nenana Canyon, over a distance of about 10 miles, 120 miles south of Fairbanks, from the present end of track. Here engineers have been assigned to construction sections and six station gangs have made contracts for heavy rock cut work.

Canadian Railway AND Marine World

ESTABLISHED 1898.

Devoted to Steam and Electric Railway, Marine, Shipbuilding and Railway, Harbor and Canal Contractors' Interests.

Official Organ of various Canadian Transportation Associations.

Published on the first of each month at 70 Bond Street, Toronto, Canada.

ACTON BURROWS, Proprietor and Editor.

AUBREY ACTON BURROWS, Business Manager.

Assistant Editors, JOHN KEIR and DONALD F. KEIR

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

Member of Associated Business Papers, Audit Bureau of Circulations, Canadian National Newspapers and Periodicals Association, Canadian Press Association.

Authorized by the Postmaster General for Canada, for transmission as second class matter.

SUBSCRIPTION PRICE, including postage anywhere, \$2 a year in advance.

SINGLE COPIES, 25 cents each, including postage.

The best method of remitting is by express or post office money order. If remittance is made by cheque, 15 cents should be added to cover cost of collection unless cheque is payable at par in Toronto or Montreal.

NOTICE TO ADVERTISERS.

ADVERTISING RATES furnished on application. ADVERTISING COPY must reach the publishers by the 10th of the month preceding the date of the issue in which it is to appear.

TORONTO, CANADA, JULY, 1920.

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Electrification of Railways in Great Britain.

Reports of recent annual meetings of British railway companies give information as to proposals for electrifying sections of the lines as follows:—The London & North Western Ry. appropriated £150,000 for widening its line between Chalk Farm and Willesden for electric service, and work on completing the electrification of suburban lines, postponed during the war, is in progress. The London & South Western Ry. has decided to supersede the present electrical equipment of the Waterloo and city underground line with modern equipment and to extend the length of the trains, at a cost, including additional cars, of £750,000. The Great Eastern Ry. has authorized its General Manager to prepare a scheme for the electrification of its lines. The London, Brighton & South Coast Ry., which has been operating its minor suburban trains electrically for some years, is encouraged to hope that at an early date the company may be able to electrify its lines throughout the whole of its suburban area. The Lancashire & Yorkshire Ry. directors have recommended that the line between Manchester and Oldham, and on to Shaw and Royton, be electrified. The Great Western Ry. is electrifying the Ealing & Shepherd's Bush Ry. The North Eastern Ry. has under consideration proposals for the electrification of the main line between York and Newcastle, 80 miles.

A North and South American Railway.

The often discussed proposal for a north and south American railway extending from Hudson Bay, to Patagonia is again being revived. This line would be approximately 10,000 miles long, and it is estimated the trip could be made in 10 or 12 days. The projected railway, while it has been advocated to some extent for the past 50 years, obtained the official endorsement of the International American Conference in 1902, and has again been considered by the Pan-American financial conference held in Washington most of the South American republics have been linked up by railways, and the Peruvian Government is building additional lines so that a north and south railway on the southern half of the continent is within measurable realization. The same may be said of the railway situation in Canada, the United States and Mexico, where something like a through route will be available on the completion of the Hudson Bay Ry. by the Dominion Government. The greatest difficulty to be overcome is in Central America, where the population apparently is not deeply interested and the geological conditions to be met with are discouraging.

Quebec & Saguenay Ry. Ownership and Operation.—The Minister of Railways stated in the House of Commons, recently, that the government took possession of this line Mar. 4, 1919, that it is still in the contractors' hands and is being operated by them under an arrangement made Sept. 24, 1919.

Sir William Van Horne's Estate.

The Supreme Court at Ottawa recently heard the case of the British Columbia Finance Minister vs. Royal Trust Co., an appeal from the judgment of the British Columbia Court of Appeals affirming the judgment of the trial judge, which declared that the Finance Minister's statement determining the amount of succession duty in respect to the estate of the late Sir Wm. Van Horne payable to the Province of British Columbia proceeded upon an erroneous basis, and that the succession duty payable in respect of such estate to British Columbia is \$8,523.16 and no more. The appellant's grounds of appeal were that the property of the deceased, wherever situated, should be taken into account in determining the rate of succession duty to which the property of deceased situate within British Columbia is liable and that the part of deceased's property within the province is liable to the proportionate duty that would have been payable by that portion if all the property of deceased, wherever situate, had been within the province. Judgment was reserved.

Air Required to Operate Thermit Welding Preheaters.

The following data is the result of tests made recently by Metal & Thermit Corporation, New York, N.Y., to determine the proper amount of air required for special thermit welding gasoline and compressed air preheaters: 25 lb. per sq. in. seems to be a practical minimum for operating preheaters. At this pressure, a single burner preheater will require approximately 25 cu. ft. of free air a minute and a double burner preheater approximately 50 cu. ft. of free air a minute. For very large welds, where the walls of the molds are thick, and the preheater gates longer than usual, a pressure of 40 lb. a sq. in. would be advisable, which would require approximately 35 cu. ft. of free air a minute for a single burner preheater and 70 cu. ft. of free air a minute for a double burner preheater. In the case of a large plant, with a central air compressor plant, upon which demands are being made by many departments, the pressure mentioned above should be maintained at the outlet to which the preheaters are attached.

Railway Employes' Voting Act, Ontario.—The Act passed in 1918 providing for the taking of the votes of railway men, who expected to be absent from their homes on the regular election day was amended at the Ontario Legislature's recent session. The provisions of the act are made to apply to voting on bylaws, elections for boards of education, or for public school trustees where the election is held by ballot, and the act is to apply in any place where at least 25 railway employes petition the council to pass a bylaw to that effect.

The Federated Order of Railroad Employes has been incorporated under the Dominion Companies Act part 1, without share capital, and with office in Toronto, to promote the moral and social welfare of its members, and to further their interests in every legitimate manner; also to provide for the maintenance of permanently disabled members or their dependents by furnishing shelter or other relief. The incorporators are:—F. Morrison, Brockville, Ont.; M. Morrison, H. A. Nightingale, A. J. Stark, Toronto, and H. S. Rand, Chicago, Ill.

Caraquet & Gulf Shore Railway Acquired by Dominion Government.

The following report of a committee of the Privy Council was approved by the Governor General on June 10:—The committee of the Privy Council have had before them a report, dated June 8, 1920, from the Minister of Railways and Canals, submitting, with reference to the order in Council of May 22, 1918, no. 1260, whereby authority was given for the purchase of various branch lines of railway in New Brunswick, upon the terms and conditions therein mentioned and for the reasons therein set out, that, in the Appropriation Act, No. 2, Statutes of Canada, 1918, chap. 52, provision was also made for the purchase of the Caraquet & Gulf Shore Ry., but that such purchase was not completed, on account of the parties not being able to agree as to the terms. That the owners of the said railway have now agreed to accept the offer made by the Minister of Railways and Canals of \$200,000, and the cancellation of the amount owed by the company to the Canadian Government Rys. of \$87,705.39, for the said railway, its equipment and other property, free from all liens, encumbrances and debts whatsoever. The Minister, therefore, recommends that, under the provisions of An Act to amend the Government Railway Act, and to authorize the purchase of certain railways, 5 George V, chap. 16, authority be given for the purchase of the said railway accordingly, and that provision therefor be made in the supplementary estimates, the said railway to be taken over as of June 1, 1920, and interest to be paid on the amount aforesaid, from the said date to the date of payment, upon transfer of title satisfactory to the Department of Justice. The committee concur in the foregoing recommendation and submit the same for approval.

The Caraquet Ry. Co. was incorporated by the New Brunswick Legislature in 1882, and the railway was put in operation from Gloucester Jct., on the Intercolonial Ry., to Shippegan Harbor, N.B., 68 miles, by the contractors in Dec., 1887. It was taken over by the company for operation Jan 1, 1889. The Gulf Shore Ry. Co. was incorporated by the N.B. Legislature in 1885. Its line extends from Pokemouche Jct., on the Caraquet Ry., to Tracadie, 16.78 miles. This line was subsequently amalgamated with the Caraquet Ry., and the combined lines have been operated as the Caraquet & Gulf Shore Ry. The operations for the year ended June 30, 1918, the last figures available, were as follows:—

| | |
|-------------------------------|---------------------|
| Earnings: | |
| Passenger traffic | \$21,958.35 |
| Freight traffic | 83,866.93 |
| Total | \$105,825.28 |
| Expenses: | |
| Maintenance of way | \$33,793.15 |
| Maintenance of equipment..... | 15,581.77 |
| Traffic expenses | 415.01 |
| Transportation | 43,623.40 |
| General expenses | 11,631.35 |
| Total | 105,044.68 |
| Net earnings | \$780.60 |

The Caraquet Ry. received subsidies of \$224,000 from the Dominion, and \$180,000 from New Brunswick, and the Gulf Shore Ry. received subsidies of \$53,699.20 from the Dominion and \$41,950 from New Brunswick. The capital at June 30, 1918, was reported to be \$1,250,000 of stocks and \$500,000 of bonds.

The Caraquet & Gulf Shore Ry. officials, as last reported to Canadian Rail-

way and Marine World, were as follows: President, Geo. Collins, Special Representative, Canadian National Rys., Trenton, Ont.; Secretary, C. S. Hamilton, Toronto; Treasurer, K. W. Mullins; Superintendent, F. V. Burton; and Mechanical Superintendent, N. Thibideau, Bathurst, N.B.

Port Arthur and Fort William Government Grain Elevators.

The following questions were asked in the House of Commons recently by J. P. Molloy, M.P. for Provencher, Man.:—"Is the Government aware of the general dissatisfaction of shippers of grain from the West, with the government terminal weights at Port Arthur? If so, what measures, if any, have been taken to investigate and remedy same? If any investigations have been held by the Board of Grain Commissioners or other commission, has their report been received, and what has been, if any, their recommendation?"

Sir Geo. Foster replied as follows:—"The government is not aware of any general dissatisfaction with regard to

the weights given by the terminal elevators at Fort William and Port Arthur. Individual complaints are received from time to time, which is every case are investigated. As a protection in the case of errors in weighing, the depth of grain in each car on arrival at the elevator is recorded, and the cubical contents estimated accordingly, which furnishes a basis against which the actual weight can be checked. The Board of Grain Commissioners has on file a statement from one of the largest shippers of grain from Western Canada to the head of the Lakes, that the outturns of their cars at terminal elevators at Fort William and Port Arthur are 100% satisfactory. The only thing in the nature of a general complain received by the Board of Grain Commissioners is that raised by the Order of Grain Buyers, which was fully investigated by the board in January last, and their full report on which is now in the hands of the government. While is complaint touched to some extent on the matter of weights at the head of the Lakes, it was mainly a question of shortage bonds as applied to country buyers that furnished the chief grounds for complaint."

Grain in Store at Terminal Elevators, Interior Terminal Elevators and Public Elevators in the East.

| Prepared by the Dominion Bureau of Statistics, Internal Trade Branch. | | | | | | |
|---|-------------------|------------------|------------------|----------------|----------------|-------------------|
| Week ending June 4th, 1920. | Wheat. Bush. | Oats. Bush. | Barley. Bush. | Flax. Bush. | Rye. Bush. | Totals. Bush. |
| Fort William | | | | | | |
| C.P.R. | 42,168 | 20,375 | 19,653 | ..... | 7,444 | 89,640 |
| Empire Elevator Co. | 39,999 | 15,077 | 46,694 | 8,976 | 15,402 | 126,149 |
| Consolidated Elevator Co. | 55,154 | 29,769 | 52,237 | 36,194 | 1,361 | 174,715 |
| Ogilvie Flour Mills Co. | 529,089 | 28,116 | 13,815 | ..... | 1,529 | 573,549 |
| Western Terminal Elevator Co. | 60,597 | 15,096 | 12,118 | 14,522 | 99 | 102,412 |
| G. T. Pacific | 65,863 | 41,341 | 28,751 | 20,354 | 1,572 | 157,881 |
| Grain Growers' Grain Co. | 99,622 | 38,302 | 53,718 | ..... | 1,339 | 192,981 |
| Fort William Elevator Co. | 28,366 | 163,850 | 6,449 | 6,697 | 461 | 205,823 |
| Northwestern Elevator Co. | 143,141 | 161,173 | 33,615 | 43 | 69 | 338,041 |
| Port Arthur — | | | | | | |
| Port Arthur Elevator Co. | 473,504 | 108,759 | 106,354 | 1,946 | 7,479 | 698,042 |
| Sask. Co-op. Elevator Co. | 177,440 | 26,671 | 66,845 | 59,979 | 3,224 | 325,159 |
| Canadian Government Elevator | 73,340 | 132,540 | 41,720 | 72,181 | 4,656 | 324,437 |
| Thunder Bay | 142,762 | 202,983 | 20,437 | 14,495 | 1,292 | 381,969 |
| Davidson and Smith | 48,702 | 10,003 | 3,166 | ..... | 4,734 | 71,605 |
| Eastern-Richardson | 177,048 | 61,998 | 33,475 | 9,087 | 5,985 | 287,533 |
| Total Public Terminal Elevators .. | 2,156,775 | 1,057,053 | 544,047 | 235,474 | 56,646 | 4,049,995 |
| Total Private Terminal Elevators .. | 529,020 | 78,371 | 122,931 | 145 | ..... | 730,467 |
| Saskatoon Can. Gov't. Elevator..... | 1,988,908 | 56,628 | 1,829 | 1,118 | ..... | 2,048,551 |
| Moose Jaw Can. Gov't. Elevator | 1,512,984 | 38,135 | 1,962 | 5,491 | 223 | 1,558,796 |
| Calgary Can. Gov't. Elevator | 1,242,779 | 448,187 | 21,025 | 58 | 9,934 | 1,721,983 |
| Vancouver, B.C. .... | ..... | ..... | 5,616 | ..... | ..... | 5,616 |
| *Total Interior Terminal Elevators .. | 4,744,671 | 542,950 | 30,432 | 6,735 | 10,158 | 5,344,946 |
| Midland — | | | | | | |
| Aberdeen Elevator Co. | 386,481 | 151,175 | 53,174 | ..... | ..... | 590,830 |
| Midland Elevator Co. | 986,868 | 14,301 | 123,706 | ..... | 39,437 | 1,164,312 |
| Tiffin, G.T.P. | 81,299 | 30,770 | ..... | ..... | ..... | 112,069 |
| Port McNicoll | 997,305 | 6,232 | 173,670 | ..... | ..... | 1,177,207 |
| Goderich — | | | | | | |
| Elevator and Transit Co. | 484,883 | 290,362 | 81,509 | ..... | ..... | 856,754 |
| West Can. Flour Mills Co., Ltd. | 245,171 | ..... | ..... | ..... | ..... | 245,171 |
| Toronto Campbell Flour Mills Co..... | 108,533 | 7,647 | 4,393 | ..... | ..... | 120,573 |
| Kingston — | | | | | | |
| Commercial Elevator Co. .... | ..... | 1,714 | ..... | ..... | ..... | 1,714 |
| *Maple Leaf Milling Co., Ltd..... | 739,613 | ..... | ..... | ..... | ..... | 739,613 |
| Montreal — | | | | | | |
| Harbor Commissioners No. 1 and 2 .. | 2,018,303 | 348,753 | 723,401 | ..... | 20,329 | 3,110,786 |
| Montreal Warehousing Co. | 1,250,903 | 6,786 | 38,638 | ..... | ..... | 1,296,327 |
| Ogilvie Flour Mills Co. | 77,295 | 231 | 35 | ..... | ..... | 77,561 |
| Quebec Harbor Commissioners ..... | ..... | 28,684 | ..... | ..... | ..... | 28,684 |
| West St. John, N.B., C.P.R. | 59,143 | ..... | 26,806 | ..... | ..... | 85,949 |
| St. John, N.B., Can. Nat. Rys. | 9,191 | ..... | 34,940 | ..... | ..... | 44,131 |
| Halifax, N.S., Can. Nat. Rys. .... | ..... | ..... | ..... | ..... | ..... | ..... |
| Baltimore, U.S.A. .... | ..... | ..... | ..... | ..... | ..... | ..... |
| Total Public Elevators | 7,444,993 | 886,655 | 1,259,772 | ..... | 59,766 | 9,651,186 |
| *Total Country Elevators | 4,574,375 | 2,617,847 | 948,745 | 278,040 | ..... | 8,419,007 |
| U.S. Atlantic Seaboard ports — | | | | | | |
| *Portland, Me. | 10,330 | 7,209 | 19,788 | ..... | 128,836 | 166,163 |
| Baltimore, Md. .... | ..... | ..... | ..... | ..... | 4,317 | 4,317 |
| Total U.S. Atlantic Seaboard Ports | 10,330 | 7,209 | 19,788 | ..... | 133,153 | 179,480 |
| Total Quantity in Store | 19,460,164 | 5,190,085 | 2,925,715 | 520,394 | 259,723 | 28,356,081 |

*Quantity for each individual interior terminal elevator not received.
*Week ending May 27th, 1920.

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.

Important traffic orders made by the Board are given in full on another page of this issue.

General order 296. May 15.—Approving regulations for transportation by express of acids, inflammables, oxidizing substances, etc.

General order 297. May 21.—Authorizing Great North Western Telegraph Co., C.P.R., Grand Trunk Pacific Telegraph Co. and Western Union Telegraph Co. to file with Board, for consideration, tentative schedules in accordance with direction contained in judgment of Assistant Chief Commissioner May 6.

General order 298. June 2.—Approving forms of Live Stock Contract and Special Contract with Attendants in charge of Stock, marked Schedule A and Schedule B respectively; and that form of Special Contract with Attendants in Charge of Stock (Schedule B), be printed on back of Live Stock Contract form (Schedule A); that on and after July 1, the forms herein approved shall be the only contracts for carriage of live stock to be used by all railway companies.

General order 299. June 5.—Approving schedules submitted by Great North Western Telegraph Co., C.P.R. Telegraph Co., Grand Trunk Pacific Telegraph Co., and Western Union Telegraph Co., and amended as a result of the checking and scaling by Board's Traffic Department.

29,639. May 15.—Apportioning cost of diverting Bowen Road, across Toronto, Hamilton & Buffalo Ry., between Lots 8 and 9, Concessions 3, 4 and 5, from Niagara River, in Welland County, Ont.

29,640. May 15.—Approving location of proposed express building by G.T.R. at Stuart St. station, Hamilton, Ont.

29,641. May 14.—Authorizing Saskatchewan Government to make highway crossing over Grand Trunk Pacific Ry. Moose Jaw Northwesterly Branch, in n.w. $\frac{1}{4}$ Sec. 1, Tp. 20, Range 2, west 3rd meridian.

29,642. May 18.—Rescinding order 29,478, Mar. 18, which authorized London & Port Stanley Ry. to erect station at east end of base line road, Westminster Psychopathic Hospital, London, Ont.

29,643. May 14.—Authorizing C.P.R. to rebuild bridge 112.6, Chalk River Subdivision, Ont.

29,644. May 18.—Approving location of C.P.R. crossing on line between Secs. 4 and 9, Tp. 15, Range 19, west 4th meridian, Alta.

29,645. May 17.—Authorizing Canadian National Ry. to rebuild bridge over St. Esprit River, Montcalm County, Que.

29,646. May 17.—Authorizing Canadian National Ry. to make highway diversion and overhead crossing at mile 31.3, Vernon-Kelowna Branch, B.C.

29,647. May 17.—Authorizing Canadian National Ry. to rebuild bridge over Jordan River, Terrebonne County, Que.

29,648. May 14.—Authorizing C.P.R. to rebuild bridge 30.8, Shaunavon Subdivision, Sask.

29,649. May 12.—Authorizing Canadian National Ry. to erect a platform and an open shelter, and stop its suburban trains at intersection of Monkland Boulevard, about half a mile south of Lizard, Que.

29,650. May 19.—Dismissing application of Ford City, Ont., for order directing G.T.R. to provide suitable highway crossing over its track at Albert Road.

29,651. May 20.—Amending order 29,582, Apr. 27, re overhead bridges at Hastings, Pender and Keefer Sts., Vancouver, B.C., over Vancouver, Victoria & Eastern Ry.

29,652. May 18.—Authorizing C.P.R. to build spur for Imperial Oil Ltd., Estevan, Sask.

29,653. May 19.—Authorizing town of Capreol, Ont., to make highway crossing over Canadian National Ry. at Yonge St.

29,654. May 18.—Authorizing Ste. Agathe des Monts Municipality to construct a highway crossing over C.P.R. at mile 43.80, Laurentian Subdivision.

29,655. May 18.—Authorizing Sherbrooke Ry. & Power Co. to build tracks across C.P.R. at Alexander St., Sherbrooke, Que.

29,656. May 18.—Authorizing G.T.R. to build spur for F. Rogers & Co., Toronto.

29,657. May 20.—Rescinding order 5,646, Nov. 3, 1908, authorizing G.T.R. to build spurs in Tay Tp., Ont.

29,658. May 21.—Dismissing Winnipeg Board of Trade's complaint against alleged discriminations in cost of cable tolls as between Manitoba points and Great Britain, as compared with rates prevailing between western boundary of Ontario and Canso, N.S.

29,659. May 21.—Approving Canadian National Ry. application for approval of its Standard Mileage Freight Tariff C.R.C. no. E-115 to apply between stations on railway south of the St. Lawrence River, including also Montreal and Quebec.

29,660. May 21.—Amending order 28,202, Mar. 31, 1919, approving C.P.R. plan, showing proposed location of new station at Metiskow, Alta.,

with detail plans of building to be built in lieu of the class A-2, by changing class A-2 to class A-3.

29,661. May 21.—Authorizing Canadian National Ry. to enter upon lands of J. B. Mercier, Quebec, Que., to remove trees which obstruct view of Quinn's crossing, St. Malo, Que.

29,662. May 21.—Authorizing Canadian National Ry. to rebuild bridge over L'Assomption River, St. Charles Borromeo Parish, Joliette County, Que.

29,663. May 21.—Authorizing G.T.R. to rebuild overhead bridge at mile 281.03, District 2, Montreal Division, 0.94 mile east of St. Bruno station, Que.

29,664. May 21.—Approving London & Port Stanley Ry. plan of signal protection for gauntlet tracks on Mill Creek bridge, St. Thomas, Ont.

29,665. May 20.—Authorizing C.P.R. to build spur for Imperial Oil Ltd., Shaunavon, Sask.

29,666. May 21.—Relieving C.P.R. from providing further protection at crossing of Carleton Ave., $1\frac{1}{2}$ miles west of Ottawa, Ont.

29,667. May 21.—Extending to July 1, time within which Canadian National Ry. may install automatic bell at crossing of main road leading to Red River, St. Jean Baptiste, Que. See also order 29,684.

29,668. May 20.—Authorizing Saskatchewan Government, on behalf of Swift Current rural municipality 137, to make highway crossing over C.P.R., between Secs. 23 and 26, Tp. 15, Range 15, west 3rd meridian, and to divert highway in s.e. $\frac{1}{4}$ Sec. 26.

29,669. May 22.—Approving C.P.R. relocation of station building at Cassils, Alta.

29,670. May 21.—Authorizing Canadian National Ry. to build spur for Imperial Oil Ltd., Drumheller, Alta., to be completed within three months from date.

29,671. May 15.—Dismissing application of City of Montreal for order directing G.T.R. to operate six passenger trains and one freight train between Cote St. Paul and Bonaventure station.

29,672. May 26.—Ordering G.T.R. to erect station at Bechar, Sask.

29,673. May 26.—Ordering Canadian National Ry. to build two one-car stock pens at Ste. Rose du Lac, Man.

29,674. May 27.—Authorizing C.P.R. to rebuild bridge 26.6, Timiskaming Subdivision, Algoma District, Ont.

29,675. May 27.—Approving G.T.R. plan of express building to be built for Canadian Express Co. at Chatham, Ont.

29,676. May 27.—Authorizing Kettle Valley Ry. to build spur on Lot 340, Yale Division, B.C.

29,677. May 27.—Authorizing C.P.R. to build two spurs for Jenckes Canadian Co., Grantham Tp., Que.

29,678. May 27.—Ordering Canadian National Ry. to build 2-carload stock yard and platform at Steep Rock, Man.

29,679. May 28.—Authorizing C.P.R. to build spur for Dominion Metal Exporting Co., Winnipeg.

29,680. May 28.—Authorizing C.P.R. Co., as lessee of St. Lawrence & Ottawa Ry., to build spur for W. Freedman, Ottawa, Ont.

29,681. May 27.—Authorizing C.P.R. to build passing track extension across road allowance north of north boundary of n.e. $\frac{1}{4}$ Sec. 32, Tp. 24, Range 10, Canmore, Alta.

29,682. May 26.—Authorizing C.P.R. to rebuild bridge 1.17, over west branch of Winnipeg river, on Keewatin Subdivision.

29,683. May 29.—Apportioning cost of building and maintaining interchange track between C.P.R. and G.T.R. in Guelph, Ont., 70% to be paid by G.T.R. and 30% by C.P.R.

29,684. May 29.—Amending order 29,667, May 21, by substituting Manitoba for Quebec, after St. Jean Baptiste.

29,685. June 2.—Authorizing Canadian Northern Ontario Ry. to connect with G.T.R. at Pembroke, Ont., and to cross Park Lane, concession road between Lot 13 and block P and the River Road.

29,686. June 2.—Ordering that G.T.R. crossing of Cherry St., Toronto, be protected in so far as southbound movement is concerned, by watchmen between 6 a.m. and 10 p.m., the cost to be paid 65% by G.T.R. and 35% by the city.

29,687, 29,688. June 2.—Approving C.P.R. plans showing details of alterations to abutments and replacement of existing 20 ft. girder span by 22 ft. 4 in. reinforced concrete span, bridge 73.6 over Gould's Creek, Chalk River Subdivision, Que., and of 29 ft. girder by 28 ft. 4 in. concrete span of bridge 6.88, on its North Bay Subdivision, Algoma District, Ont.

29,689. June 2.—Authorizing C.P.R. to build spur for Dominion Brass & Iron Bedstead Co., Outremont, Que.

29,690. June 1.—Ordering C.P.R. to have postal car 40, in use on Dominion Atlantic Ry., rebuilt in accordance with Board's Mail Car Specifications, or, in the alternative, withdrawn from service and replaced by suitable car.

29,691. June 2.—Approving C.P.R. plans B-2-305, May 3, and B-1-1604-2, Mar. 19, showing details of alterations to abutments and replacement of 24 ft. girder by 22 ft. 4 in. reinforced concrete span, at mile 37.98 Thessalon Subdivision, Algoma District, Ont.

29,692. June 1.—Authorizing G.T.R. to build

spur for Canadian Steel Foundries, Point St. Charles, Montreal.

29,693. June 1.—Relieving G.T.R. from providing further protection at Stamford crossing, west of Clifton Jct., Ont.

29,694. May 31.—Approving Pere Marquette Rd. plans showing track circuit locking to be installed and detector bars to be eliminated at interlocking plant at Blenheim, Ont.

29,695. June 2.—Authorizing C.P.R. Co. to build three spurs for Cowan Co., Toronto.

29,696. June 1.—Authorizing Elk Valley Lumber Co. to connect with Crows Nest Southern Ry. at Fernie, B.C.

29,697. June 2.—Approving agreement, May 6, between Bell Telephone Co. and Mississippi Telephone Co., Lanark County, Ont.

29,698. June 4.—Authorizing C.P.R. to rebuild bridge 111. over Black River, Heron Bay Subdivision, Algoma District, Ont.

29,699. June 2.—Authorizing British Columbia Government to make highway crossing over Esquimalt & Nanaimo Ry. at mile 63.15, Vancouver Island, B.C.

29,700, 29,701. June 2.—Approving Bell Telephone Co. agreements, May 12, with Fraser Telephone Co., Oxford County, Ont., and May 14, with South Diagonal Telephone Co., Grey County, Ont., and rescinding order 25,941, Mar. 16, 1917, approving previous agreement with latter company.

29,702. June 2.—Relieving C.P.R. from providing further protection at crossing of highway 3 miles east of Yamachiche, Que.

29,703. June 4.—Authorizing C.P.R. to build spur for Hodge Coal Co., Moose Jaw, Sask.

29,704. June 4.—Authorizing Vancouver, Victoria & Eastern Ry. & Navigation Co. (G.N.R.) to build bridge over Grand View cut at Clarke Drive and Eighth Ave., Vancouver, B.C.

29,705. June 4.—Authorizing Canadian National Ry. to cross and divert highway in n.e. $\frac{1}{4}$ Sec. 22, Tp. 53, Range 22, west 3rd meridian, Sask.

29,706. June 4.—Authorizing C.P.R. to divert road allowance on south boundary of s.e. $\frac{1}{4}$ Sec. 23, Tp. 19, Range 1, west 2nd meridian, and to carry same at grade across its tracks at mile 79.84 Neudorf Subdivision, and to close diverted portion.

29,707. June 7.—Authorizing C.P.R. to build connection with West Canadian Collieries spur in s.e. $\frac{1}{4}$ Sec. 3, Tp. 8, Range 4, west 5th meridian.

29,708. June 2.—Approving agreement, May 14, between Bell Telephone Co. and Falkirk Telephone Co., Middlesex County, Ont., and rescinding orders 6,138 and 25,826 approving agreements between same companies, Aug. 22, 1907, and Jan. 9, 1917, respectively.

29,709. June 7.—Authorizing C.P.R. to divert road allowance on south boundary of s.w. $\frac{1}{4}$ Sec. 20, Tp. 12, Range 21, west 1st meridian, and to carry same across tracks at mile 20.4, Lenore Subdivision.

29,710. Ordering G.T.R. to remove trees on northwest corner of crossing of Kingston Road near West Hill, Ont.

29,711. June 8.—Authorizing G.T.R. to extend spur for Dominion Cannery, St. Catharines, Ont.

29,712. June 8.—Authorizing G.T.R. to build two extensions to spurs for Goodyear Tire & Rubber Co. of Canada, New Toronto, Ont.

29,713. June 8.—Authorizing City of Montreal to alter subway on St. Denis St., under C.P.R.

29,714 to 29,716. June 8.—Authorizing Canadian Northern Quebec Ry. plans, profiles and books of reference of proposed revisions of line at East Yamachiche, mile 94.82 to 96.43 from Quebec, St. Boniface parish; at St. Paulin, St. Lawrence Subdivision, mile 100.60, St. Paulin, St. Severe and St. Barnabe parishes, and near Ste. Ursule, mile 110.15 to 114.89, through St. Justin and Ste. Ursule parishes, Maskinonge county, Que.

29,717. June 9.—Authorizing British Columbia Electric Ry. to cross Vancouver & Lulu Island Ry. at Twelfth Ave., Vancouver.

29,718. June 8.—Authorizing G.T.R. to take up one of the sidings authorized for Expanded Metal & Roofing Co., Toronto by order 5,682, Nov. 17, 1908.

29,719 to 29,722. June 8.—Approving Bell Telephone Co. agreements, Mar. 29, with St. Paul de Chester Telephone Co., for interchange of messages, and rescinding order 22,864, Nov. 12, 1914; May 13, with Riverside Telephone Co.; May 18, with Brant Telephone Co., and May 13, with Admaston Rural Telephone Association, and rescinding order 26,120, May 11.

29,723. June 8.—Approving Canadian Northern Quebec Ry. plan of proposed revision of line near St. Boniface, mile 87.6 to 91.60 from Quebec through St. Boniface and St. Flore parishes, Que.

29,724. June 8.—Approving plans and specifications of Maidstone Tp., Ont., showing work to be done on Pike Creek drain crossing.

29,725. June 8.—Authorizing G.T.R. to build spur at Cainsville, Ont.

29,726. June 8.—Approving G.T.R. plan of new station at Clandeboye, Ont.

29,727. June 8.—Authorizing C.P.R. to cross Place d'Armes St., Kingston, Ont., at grade.

29,728. June 9.—Authorizing C.P.R. to build spur for Hydro Electric Power Commission of Ontario, at Peterborough, Ont.

29,729. May 29.—Approving C.P.R. route map, showing revised general location of its Langdon

North Branch from Sec. 36, Tp. 24, Range 15, mile 10, to Sec. 5, Tp. 24, Range 2, west 4th meridian, mile 215, Alta.

29,730. June 10.—Authorizing C.P.R. to build its Neebing ballast pit spur, at grade, across road allowance between Lots 20 and 21, Con. 3, Neebing Tp., Ont., at mile 5.83 Kaministikwia Subdivision.

29,731. June 10.—Authorizing Canadian National Rys. to build bridge over Rosebud River at mile 319.2, Calgary Subdivision in Sec. 28, Tp. 28, Range 19, west 4th meridian, Alta.

29,732. June 9.—Approving change in location of C.P.R. station at Bowell, Alta.

29,733, 29,734.—June 10.—Approving Bell Telephone Co. agreements, May 31, with Port Hope Telephone Co., Durham County, Ont.; and May 28, Dunsford Telephone, Light & Power Co-operative Association, Victoria County, Ont., and rescinding order 25,055, June 12, 1916.

29,735. June 10.—Authorizing Quebec, Montreal & Southern Ry. to build two additional sidings in Sorel, Que.

29,736. June 10.—Approving Canadian Northern Saskatchewan Ry. revised location in the west half of Sec. 36, Tp. 12, Range 8, west 2nd meridian.

29,737. June 10.—Ordering C.P.R. to stop on flag, trains 23 and 24, and on Sundays in lieu of these trains to stop trains 33 and 34, at Norwood, Ont.

29,738. June 12.—Approving agreement, May 28, between Bell Telephone Co. and Point Mara Telephone Co., Ontario County, Ont.

29,739. June 12.—Authorizing Essex Terminal Ry. to build siding across MacDougall St., Windsor, Ont.

29,740. June 11.—Approving C.P.R. plans, Mar. 1, showing details of superstructure and three reinforced concrete girders to be erected at bridge 61.48 over Amound Creek, North Bay Subdivision, Algoma District, Ont.

29,741. June 11.—Relieving C.P.R. from providing further protection at highway crossing near Yamachiche station, Que.

29,742. June 11.—Authorizing C.P.R. to divert road allowance on north boundary of Sec. 10, Tp. 2, Range 25, west 3rd meridian, across its tracks at mile 19, Moose Jaw Southwesterly Branch (Assiniboia to Consul) and to close diverted portion within its right of way.

29,743. June 12.—Authorizing Essex Terminal Ry. Co. to build siding for Piggott Lumber Co., Windsor, Ont.

29,744. June 9.—Authorizing C.P.R. to build sidings and alterations to sidings for Quaker Oats Co., Peterborough, Ont.

29,745. June 11.—Approving agreement, May 29, between Bell Telephone Co. and Uptergrove Telephone Co., Ontario County, Ont.

29,746. June 11.—Ordering G.T.R. to install wigwag signal at crossing of Parkdale Ave., Ottawa.

29,747. June 11.—Approving Canadian National Rys. standard plan showing clearances at overhead unloading apparatus for tank cars, suction pipe to be swung around clear of the track when not in use, and employes to be kept off tops and sides of cars when passing under structure.

29,748. June 15.—Approving G.T.R. bylaw, May 21, authorizing Vice President, Passenger Traffic Manager or General Passenger Agent to prepare and issue tariffs of passenger tolls, and rescinding orders 13,449 and 21,718, Apr. 18, 1911, and Apr. 30, 1914, respectively.

29,749. June 15.—Approving agreement, June 2, between Bell Telephone Co. and Dingwall Telephone Co., Oxford County, Ont.

29,750. June 15.—Approving C.P.R. route map showing revision of Cutknife to Whitford Lake Branch from Sec. 35, Tp. 44, Range 25, west 3rd meridian, mile 24, to Sec. 11, Tp. 56, Range 15, west 4th meridian, mile 180.5.

29,751. June 15.—Authorizing Michigan Central Rd. to connect with the Essex County track on Lot 23, Con. 4, Gosfield Tp., Ont.

29,752. June 15.—Amending order 29,052, Nov. 20, 1919, re Pere Marquette Rd., crossing bell at Middlemarch, Ont., by rescinding paragraph 2.

29,753. June 11.—Authorizing Ottawa Electric Ry. to build power distribution line over C.P.R. on Clifton Road, Westboro, Ont.

29,754. June 15.—Approving proposed extension to Grand Trunk Pacific Ry. station at Stony Plain, Alta.

29,755. June 15.—Authorizing Canadian Northern Quebec Ry. to build spur for Jos. Dufresne at mile 175.40, Montreal.

29,756. June 15.—Authorizing Esquimaux & Nanaimo Ry. to build bridge 3.75 over Stamp River, on its Great Central Lake Branch, B.C.

29,757. June 15.—Authorizing C.P.R. to build spur for Ford Motor Co. of Canada, Ltd., Calgary, Alta.

29,758. June 16.—Approving C.P.R. plan of revised location of portion of its Lanigan North-easterly Branch from Sec. 23, Tp. 33, Range 22, at mile 0 to Sec. 11, Tp. 40, Range 18, west 2nd meridian, at mile 50.55, and rescinding order 29,158, Dec. 12, 1919.

29,759. June 16.—Ordering Ottawa & New York Ry. (N.Y.C.R.) to build station at Northfield, Ont., including waiting room and freight shed combined; and to appoint caretaker to see that station is kept clean, heated, ventilated and lighted for accommodation of passengers.

29,760. June 15.—Ordering Toronto, Hamilton & Buffalo Ry. to provide protection at crossing of

Wellington St. South, Hamilton, Ont., between 7.3 a.m. and 11.30 p.m. daily.

29,761. June 16.—Ordering Dominion Atlantic Ry. to have postal car 40 rebuilt in accordance with Board's mail car specifications, or withdrawn from service and replaced by suitable car; D.A.R. to be liable to penalty of \$25 a day for every day it is in default in complying with this order; and rescinding order 29,690, June 1.

29,762. June 16.—Authorizing Canadian National Rys. to build spur for Sanitary Buildings, Ltd., Regina, Sask.

29,763. June 17.—Extending to July 31, 1921, time within which Canadian Northern Ontario Ry. may install interlocking plant at junction

with C.P.R. at mile 18.4, Kingston Subdivision, near Harrowsmith station, Ont.

29,764. June 18.—Relieving C.P.R. from providing further protection at highway crossing at Putnam, Ont.

29,765. June 18.—Authorizing Canadian Northern Ry. to build across highway at mile 45, Kamloops-Vernon line, Okanagan Branch, B.C.

29,766. June 18.—Authorizing Canadian National Rys. to connect Canadian Northern Ry. with National Transcontinental Ry. near St. Prosper, Que.

29,767. June 18.—Ordering Canadian National Rys. to appoint station agent at Valparaiso, Sask., by July 15, and to build suitable station there.

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

Canadian Niagara Bridge Co.—A meeting of shareholders to effect organization, elect directors, etc., was held at Hamilton, Ont., on June 7, and the following officers were elected subsequently:—President, E. W. Beatty, K.C., President C.P.R., Montreal; Vice President, A. H. Smith, President New York Central Rd., New York; Secretary, E. F. Stephenson, Secretary New York Central Rd., New York; Assistant Secretary and General Solicitor, E. D. Cahill, General Solicitor, Toronto, Hamilton & Buffalo Ry., Hamilton, Ont.; General Treasurer, M. S. Barger, New York; Assistant General Treasurers, H. G. Snelling and Edgar Freeman, New York; Treasurer, Ernest Alexander, Secretary, C.P.R., Montreal; Auditor, John Leslie, Comptroller C.P.R., Montreal; Chief Engineer, R. L. Latham, Chief Engineer, Toronto, Hamilton & Buffalo Ry., Hamilton, Ont.

The company was incorporated by the Dominion Parliament in 1918, with Lord Shaughnessy, J. N. Beckley, E. D. Cahill and W. P. Torrance as provisional directors, to build a bridge across the Niagara River, the Canadian end to be located between Chippawa and Fort Erie, Ont., and six miles of lines to connect the bridge with existing railways. In 1919 the act was amended to enable the company to build 12 miles of line, instead of six, to connect with existing lines from Welland to Bridgeburg.

Great Northern Ry.—We are officially advised that there is no truth in a recent press report that the company has filed plans for dock and wharfage improvements on Semiahmoo Bay, White Rock, B.C., in connection with its B.C. lines. (June, pg. 297.)

Hudson Bay Railway.—A special committee of the Senate, appointed to take evidence, and report, upon the navigability and fishery resources of Hudson Bay and Strait, and of the character of the ports on the bay, with regard to their fitness as a railway terminus, has reported that sufficient care was not taken in the selection of Nelson as the railway terminus and that the government should not make further important expenditures upon that port without first making a new and thorough examination into the relative merits of Churchill and Nelson as a terminus. To utilize Churchill would necessitate the building of 80 miles of railway, across a country about the character of which there is considerable divergence of opinion. The committee's report is given very fully in the Marine Department of this issue, under "Senate committee report on the Hudson Bay route and ports."

Kettle Valley Ry.—A press report states that it is expected to have about 13 miles of the branch from Princeton to the Copper Mountain district opened for traffic at an early date.

Mount McKay & Kakabeka Falls Ry. Co.—The Ontario Legislature has passed an act providing that this railway may be operated by steam for a further period of two years, except on Neebing Ave., north of Montreal St., Fort William, Ont., and extending the time for the completion of the unconstructed sections of the line to Squaw Bay until 1922. (April, pg. 176.)

Northern Light Ry.—A press report states that the first car load of steel rails for the construction of the 36 in. gauge light railway from Elk Lake to Gowganda, Ont., has been delivered at Elk Lake. The report also states that surveys on the projected line are being proceeded with.

A meeting of shareholders of this newly incorporated company has been called to be held in Toronto, July 5, to receive and adopt the provisional directors' report and accounts; to elect directors; to let contracts for the construction of a light railway, and to authorize the directors to issue bonds for \$10,000 a mile on the whole undertaking, or on any branch or part contracted to be built. A press report of June 12 stated that \$300,000 of 7% first mortgage bonds were being offered by the company as part of the financing necessary for the construction of the projected light railway from Elk Lake to the Gowganda mining camp, about 30 miles.

Pacific Great Eastern Ry.—The Premier of British Columbia on his return from a trip of inspection over the line recently is reported to have said that the foundation work for the viaduct at Deep Creek was completed, that the steel work was expected to be completed in July, that track laying would then be resumed, and that it was expected to have rails laid into Quesnel some time in September. The site for the station building and terminal yards in Quesnel was selected during the Premier's visit. (June, pg. 297.)

Springfield Ry. Co.—The Nova Scotia Legislature has passed an act amending the company's charter. The Davison Tramway Co. was incorporated by the Nova Scotia Legislature at its 1903-4 session to build a railway to be operated by electricity, steam or any other motive power, near Alpena, and from near Cherrifield, on the Halifax & Southwestern Ry., and from any point on the Caledonia branch of that railway to points on the Davison Lumber Co.'s lands. The name of the company was changed in the following year to the Springfield Ry. Co. Construction of a line from Hastings Jct., one mile from Springfield, on the Halifax & Southwestern Ry., was begun in 1905, and about 9 miles of line were reported in operation in Nov., 1906. Subsequent additions were made, and it is reported that the company is operating 30

miles of standard gauge track, carrying mail to Crossburn, N.S., 10 miles, and lumber and general freight traffic over all its lines. The company's head office is at Crossburn.

Timiskaming & Northern Ontario Ry.

The Ontario Legislature has authorized the construction of an extension of this railway from its present terminus at Cochrane, Ont., to James Bay, with 20 mile branches and spurs as may be necessary. The location of the extension

and branches is to be subject to the government's approval, and the cost of construction is to be paid out of such sums as may be appropriated therefor by the legislature from time to time. (June, pg. 298.)

Canadian National Railways Construction, Betterments, Etc.

Halifax Ocean Terminals.—A recent Halifax, N.S., press report states that the only permanent work in progress at the new ocean terminals there is the train shed, which is nearing completion.

Fairview Locomotive Terminal.—Tenders are under consideration for grading at the locomotive terminal at Fairview, near Halifax, N.S.

Sydney Mines Freight Shed.—Tenders are under consideration for the erection of a freight shed at Sydney Mines, N.S. We are officially advised that it will be 180 x 40 ft. and be of wooden construction. It will replace a similar structure destroyed by fire recently.

New Glasgow Station.—We are officially advised that the work in hand at New Glasgow, N.S., consists of the erection of an extension 79 ft. 8 in. long and the remodelling of the existing building to give modern facilities for handling passenger and baggage business.

St. John Train Shed Damaged.—A large section of the roof of the train shed at St. John, N.B., collapsed on June 15, and it is said that 15,000 square ft. of the roof fell on the platforms and tracks. The roof was condemned some time ago, and work has been in progress taking down the entire station. A start had been made June 14, on taking down the trusses supporting the roof, and it is believed that the jar from the operation of trains out of the station, brought about the collapse. The St. John City Council was reported to have been advised in May that appropriations had been made for \$1,000,000 towards the erection of a new station, and additions to the yards.

McGivney Jct.-Fredericton Division.—We are officially advised that R. B. Stewart's tender for improvements on the line between McGivney Jct. and Fredericton, N.B., for about \$186,000 is to be accepted.

Moncton Yards.—Tenders are under consideration for grading for a yard for Moncton, N.B.

St. Lawrence Subdivision Revisions.—Tenders were invited recently for clearing, fencing, grading, and building trestles, culverts, and bridge substructures on the following deviations of main line on the St. Lawrence Subdivision, Canadian Northern Quebec Ry.: Burrel deviation, between mile 87 and 92, between Glenada and St. Boniface; East Yamachiche deviation, between mile 94.5 and 96.5, between St. Boniface and Charette; St. Paulin deviation, between mile 100 and 106, between Charette and St. Paulin; St. Ursule deviation, between mile 109 and 116, between Fremont and St. Justin.

The St. Lawrence Subdivision extends from Joliette to Quebec, and is made up in part of the Great Northern Ry. of Canada, a line acquired by Canadian Northern Ry. interests, and in part by the Quebec, New Brunswick & Nova Scotia Ry., which was built by the same interests, and leaves the former line at Garneau Jct., just east of the St. Maurice River and 80 miles from Quebec. The Great Northern was built under rather stringent financial conditions, and in days when 1% grades were considered quite

good enough, especially as its connections at either end were built to that standard and worse, but for some 30 miles out of Joliette it runs over the Montreal plain, and it was difficult to get 1% grades even if one tried. The Quebec, New Brunswick & Nova Scotia, on the other hand, was built to the same standard as the National Transcontinental Ry., which it parallels for some distance, so that on the whole subdivision of some 140 miles there are only about 30 miles on which the 6/10% standard was seriously exceeded, where the old line brushed up against the foothills of the Laurentides, and about one half of this was compatible with modern standards.

The location staff had made more or less of a study of this section for many years back, but capital was scarce and traffic none too heavy, and until recently it did not seem worth while to call attention to it, but the recent boom in paper and pulp products, and the growth of Northern Quebec generally has caused quite a change of conditions. Heavier locomotives and cars became the rule, and it happened, as it very often does, that the worst sections in point of grades and curvature were also those which required considerable bridges and viaducts. The bridges were built about 1900, and were not equal to the heavier loading of the present day, rebuilding became necessary, and it turned out that the bridges could be built on the revised locations just as cheaply, and in one instance much more cheaply than on the existing location. The intervening grading was a comparatively unimportant matter. The result is a reduction of the grades over the subdivision from 1% to 6/10%, and a corresponding increase in train load of 80%, at a cost (excluding bridges) of some \$250,000, while the capitalized value of the increased trainload is estimated at from \$4,000,000 to \$6,000,000 with present traffic, and the traffic shows every sign of increasing even faster in the future than in the past.

From the west the diversions are: 1, the St. Ursule, 4.75 miles, which entails a viaduct 700 ft. long and 150 ft. high; 2, the St. Paulin, or Riviere-du-Loup, 3 miles, and including a viaduct over the Riviere-du-Loup 1,000 ft. long and 140 ft. high; 3, the East Yamachiche, only 1½ miles long, but involving a viaduct 550 ft. long and 100 ft. high; 4, the Burrel, some 4 miles long. This extends over two ravines, one of which is to be filled in solid, and the other is crossed by a steel trestle 450 ft. long and 80 ft. high. The intervening grading is comparatively unimportant, although there is some rock on both the first and last sections. Aside from the reduction of grades, the distance has been shortened somewhat, and the curvature flattened from 8° to 5°, and much reduced in total amount. These revisions when completed will furnish the C.N.R. with a first class line from Montreal to the St. Maurice, and from Garneau to Quebec, the only break in the standard being across the valley of the St. Maurice River, some 7 or 8 miles.

Levis Station.—The repairs and improvements at Levis, Que., station, upon which the Minister of Railways advised the House of Commons in Oct., 1919, the government proposed to expend \$125,000, have been completed and the renovated building was expected to be opened for public use June 27. A party of C.N.R. officials made an inspection of the building June 5. The renovated station is provided with three entrances, viz., from Laurier Ave., from Commercial St., and the third facing the platform. The ground floor contains a general waiting room, 75 x 40 ft.; a ladies' waiting room, 28 ft. square; smoking room, 30 x 40 ft.; Canadian Express Co.'s office; ticket office, lavatories, etc., for passengers, and conductors' rest room. The upper floors will contain division officials offices.

Charney to Quebec Bridge.—Tenders were received to June 25 for grading and track laying for direct connection between Charney, 8 miles west of Levis, Que., and the Quebec bridge.

Western Lines Betterments.—Tenders are under consideration for the following betterments, etc., on Western lines:—For excavation and laying of cast iron pipe lines at Maymont, Humboldt, Dana, Alsask, and Margo, Sask.; for fencing (labor only) on 24 track miles on the Swan River subdivision; for construction of stream diversions at miles 333.1 and 335.6, Calgary Subdivision, Alta., and for grading and culverts, on line diversion between miles 333.2 and 335.1 Calgary Subdivision, Alta.

Western Line Extensions.—The House of Commons on June 10 passed an act authorizing the Canadian Northern Ry. Co. to build and operate the following lines of railway:—From Prince Albert, Sask., to Tp. 57, Range 25, west 2nd meridian; from the company's main line between the crossing of the North Saskatchewan River and Radisson, generally northerly and westerly to Meeting Lake; and from the Maryfield branch in Ranges 23 to 26, west of the 2nd Meridian, generally southerly and westerly to Tps. 2 or 3, on the 3rd Meridian.

We are officially advised that the invitation for tenders for the construction of a 16 mile extension of the Maryfield branch, in the direction of Bengough, Sask., was withdrawn, on account of a deputation requesting another route to be investigated. The management acceded to the request and the route suggested is being investigated.

Lampman Mines Branch.—We are officially advised that the work to be done on the Peebles-Lampman, Sask., Branch for this current year will include the completion of the 20 miles south from Peebles which was started in 1919.

Turtleford Extension.—We are officially advised that it is proposed to complete the grading on the Turtleford extension, Sask., to mile 83 this year, but it is not expected that any rails will be laid on the extension this year. We are also advised that a contract for grading on this extension has been let to the Western Construction Co., North Battleford, Sask.

Railway Rolling Stock Orders and Deliveries.

Imperial Oil Ltd. has ordered 300 tank cars from Canadian Car & Foundry Co.

The G.T.R. is reported to be in the market for 12 eight-wheel switching locomotives.

The C.P.R. has ordered 15 vans from its Angus shops, Montreal, and between May 19 and June 13, received 2 Santa Fe locomotives from its Angus shops, and 2 vans from its Winnipeg shops.

U.S. Bureau of Foreign and Domestic Commerce figures shows that 5 locomotives valued at \$41,900, 91 freight and miscellaneous cars valued at \$91,531, and car parts valued at \$41,512 were exported to Canada during April.

Canadian National Rys. have received 20 mail cars and 7 first class passenger cars, ordered in 1919, from Canadian Car & Foundry Co., and 6 medium Pacific locomotives from Montreal Locomotive Works, ordered this year.

The Interstate Commerce Commission has announced the immediate appropriation of \$125,000,000, out of the \$300,000,000 revolving fund provided in the Transportation Act, for the purchase of rolling stock for U.S. railways.

Canadian Car & Foundry Co., between May 15 and June 12, delivered 15 first class passenger cars to Canadian National Rys., 336 repaired box cars to Grand Trunk Pacific Ry., 63 tank cars to Imperial Oil Ltd., and 85 dryer cars to Citadel Brick & Paving Block Co. The G.T.P.R. cars were delivered from the Fort William shops and the others from Montreal.

Canadian Railway and Marine World for June gave particulars of the amounts voted by the Ontario Legislature in the supplementary estimates for the year ending Oct. 31, 1920, for the Timiskaming & Northern Ontario Ry., including \$225,000 for additional locomotives. The main estimates for the year ending Oct. 31, 1921, passed subsequently, contained \$450,000 for new locomotives and equipment, as capital expenditure.

The Kipawa Co., Ltd., has ordered a 4-wheel switching locomotive from Montreal Locomotive Works. Following are the chief details:—

| | |
|-------------------------------|---------------------|
| Weight in working order | 79,000 lb. |
| Wheel base | 7 ft. |
| Cylinders, diar. and stroke | 14 x 22 in. |
| Cylinder spread | 30 in. |
| Driving wheels, diar. | 40 in. |
| Driving wheels, material | Cast iron |
| Driving journals | 7 x 8 in. |
| Boiler, type | Straight top |
| Boiler inside diar first ring | 45 in. |
| Boiler pressure | 190 lb. |
| Firebox, length and width | 46 3/4 x 50 1/4 in. |
| Tubes, no. and diar. | 111 2 in. |
| Tubes, length | 11 ft. 8 in. |
| Heating surface, tubes | 674 sq. ft. |
| Heating surface, firebox | 60 sq. ft. |
| Heating surface, total | 734 sq. ft. |
| Grate area | 16.2 sq. ft. |
| Tractive power | 17,400 |
| Factor of adhesion | 4.5 |
| Reverse gear | Hand type |
| Cab | Steel plate |
| Tank, type | Saddle |
| Capacity, water | 1,700 U.S. gal. |
| Capacity, coal | 1,600 lb. |

The Timiskaming & Northern Ontario Ry. has ordered 2 eight-wheel switching locomotives from Montreal Locomotive Works. Following are the chief details:

| | |
|---------------------------------|--|
| Weight in working order | 202,000 lb. |
| Wheel base | 14 ft. 6 in. |
| Cylinder, diar. and stroke | 23 x 28 in. |
| Cylinder spread | 38 in. |
| Driving wheels, diar. | 53 in. |
| Driving wheels, material | Cast steel |
| Driving journals | Main 9 1/2 x 12 in., others 9 x 12 in. |
| Frames, width | 4 1/2 in. |
| Boiler, type | Extended wagon top radial stayed |
| Boiler, inside diar, first ring | 69 3/4 in. |
| Boiler pressure | 180 lb. |

| | |
|------------------------------|----------------------------|
| Firebox, length and width | 89 1/2 x 75 1/4 in. |
| Tubes, no. and diar. | 202 2 in.; 32 5/8 in. |
| Tubes, length | 14 ft. 6 in. |
| Heating surface, tubes | 1,533 sq. ft. |
| Heating surface, flues | 653 sq. ft. |
| Heating surface, firebox | 153 sq. ft. |
| Heating surface, f. b. tubes | 25 sq. ft. |
| Heating surface, total | 2,364 sq. ft. |
| Superheating surface | 570 sq. ft. |
| Grate area | 46.26 sq. ft. |
| Tractive power | 42,760 |
| Factor of adhesion | 4.72 |
| Superheater | Schmidt |
| Reverse gear | Ragonnet |
| Cab | Steel plate vestibule type |
| Tender frame | Commonwealth cast steel |
| Tender wheels, diar. | 33 in. |
| Tender truck, type | Cast steel side frame |
| Tender journals | 5 1/2 x 10 in. |
| Tank, type | Water bottom |
| Capacity, water | 5,700 imp. gal. |
| Capacity, coal | 10 tons |

The Roumanian Government has ordered 25 consolidation (2-8-0) locomotives from Montreal Locomotive Works. Following are the chief details:—

| | |
|---------------------------------|-------------------------|
| Weight on drivers | 158,000 lb. |
| Weight on truck | 16,000 lb. |
| Weight, total | 174,000 lb. |
| Wheel base, driving | 15 ft. 6 in. |
| Wheel base, engine | 23 ft. 8 in. |
| Wheel base, engine and tender | 57 ft. 4 1/2 in. |
| Cylinders, diar. and stroke | 21 x 28 in. |
| Cylinder spread | 78 1/2 in. |
| Driving wheels, diar. | 56 in. |
| Driving wheels, material | Cast steel |
| Driving journals | 9 1/2 x 10 in. |
| Frames, width | 4 in. |
| Engine truck wheels | 33 in. |
| Engine truck journals | 5 x 10 in. |
| Boiler, type | Straight top |
| Boiler, inside diar. first ring | 70 in. |
| Boiler pressure | 13 1/2 kg. per sq. c/m. |
| Firebox, length and width | 122 3/4 x 37 1/2 in. |
| Tubes, no. and diar. | 165 2 in.; 26 5/8 in. |
| Tubes, length | 13 ft. 9 in. |
| Heating surface, tubes | 1,181 sq. ft. |
| Heating surface, flues | 500 sq. ft. |
| Heating surface, firebox | 181 sq. ft. |
| Heating surface, total | 1,862 sq. ft. |
| Superheating surface | 420 sq. ft. |
| Grate area | 32.3 sq. ft. |
| Tractive power | 35,600 |
| Factor of adhesion | 4.15 |
| Superheater | Schmidt |
| Reverse gear | Screw type |
| Cab | Steel plate |
| Tender frame | Steel channels |
| Tender wheels, diar. | 33 in. |
| Tender truck, type | Arch bar |
| Tender journals | 5 1/2 x 10 in. |
| Tank, type | Water bottom |
| Capacity, water | 4,630 imp. gal. |
| Capacity, fuel | 4 metric tons |
| Capacity, oil | 1,320 imp. gal. |

C.P.R. Special Farming Train. — The C.P.R., in connection with the Saskatchewan Agriculture and Education Departments, and Saskatchewan University College, provided a special train of 13 lecture and demonstration cars to travel over the Saskatchewan lines and give instruction on the raising of live stock, field husbandry, poultry raising, farm mechanics, household science and instruction for boys and girls. The first stopping place was Macklin, on May 31, and the trip was timed to end at Yorkton, June 19. The schedule provided that two centers were to be visited each day, the period of instruction being four hours— from 9 a.m. to 1 p.m., and from 2.30 to 6.30 p.m.

C.P.R. Boys Club, Montreal.—Alfred Price, General Manager, Eastern Lines, C.P.R., and President of the club, occupied the chair at the annual meeting in Montreal, May 31. The report showed the various branches of work carried on and the prize list showed the standing obtained by the boys in their studies in railway accounting, railway auditing, elementary shorthand, and advanced shorthand. Physical exercise is not neglected, the C.P.R. providing tickets for members for physical instruction at the Y. M. C. A. The prizes were presented by A. D. MacTier, Vice President, Eastern Lines, C.P.R.

Grand Trunk Railway Construction, Betterments, Etc.

Arthabaska, Que. — Senator Lavergne called the attention of the Senate recently to the necessity of building a G.T.R. branch line from Victoriaville to Arthabaska, Que., 3 miles, and asked whether it was the government's intention, now that the G.T.R. is being taken over by the Dominion, to build such a line. He stated that Victoriaville is on the G.T.R. main line, and that Arthabaska is the chief town of a district with a population of 100,000. Arthabaska is the seat of all government and other public buildings, and is also an industrial center, and its only present outlet is at Victoriaville. Sir James Loughheed in reply stated that the G.T.R. had not come absolutely under government control; it was being administered by representatives of the company and the government. He had no doubt that in due course every consideration would be given to the suggestion.

Ottawa Cross Town Tracks.—A petition is being signed asking the Dominion Government to take steps to discontinue all through traffic across Ottawa and to remove all cross town tracks with the exception of a switching track for serving existing industries, such track to be used only at certain hours, and to be removed at some future date.

London Grade Separation Proposals.—Several meetings are reported to have taken place between a special committee of the London, Ont., City Council and G.T.R. representatives to discuss the elimination of level crossings in the city. The Board of Railway Commissioners has had officials in London investigating the situation and a report has been received on the necessity of increased protection at the crossings. The city council is in favor of eliminating the crossings altogether and of so saving the cost of keeping watchmen, and G.T.R. officials are reported to have expressed a willingness to meet the city on the matter. A press report states that the company's Chief Engineer will visit London shortly to prepare plans for subways at Waterloo and Rectory streets as the beginning of the work. It is estimated that these subways will cost about \$200,000 each. (June, pg. 292.)

Reported Sale of Edmonton, Dunvegan & British Columbia Railway.

A recent press report stated that control of the E., D. & B. C. Ry. and of its subsidiary, the Central Canada Ry., had been secured by eastern persons closely associated with the C.P.R., and that pending a definite settlement of the matter, a report on the condition of the two railways was being prepared by W. A. James, Assistant Chief Engineer, C.P.R., Winnipeg. An Edmonton, Alta., press report of June 3 stated that J. D. McArthur, President E., D. & B. C. Ry., had said it would be about three weeks or so thereafter before any announcement as to the contemplated change in the ownership of the line and its subsidiaries could be made.

The Premier and the Attorney General of Alberta, together with J. D. McArthur, and the solicitor for the Union Bank, which is interested in the transaction, were reported to be in Montreal, June 12, in connection with the proposed sale of the line.

Freight and Passenger Traffic Notes.

The Canadian National Rys. and the C.P.R. put into effect summer tourist rates to Pacific coast points on June 1.

The number of cars which passed over the Quebec Bridge for the seven days ended June 8 was as follows:—

| | | |
|---------------------------------------|-----------|-----------|
| Bridge Station to Chaudiere Jet..... | 1920. 441 | 1919. 326 |
| Chaudiere Jet. to Bridge Station..... | 358 | 172 |
| Total | 799 | 498 |

The U.S. Interstate Commerce Commission was reported on June 8 to have approved of the C.P.R.'s application for permission to file a schedule containing reduced rates on shipments of paper and paper articles from points in Canada to New York City.

The Grand Trunk Pacific Ry. has announced a second summer tour over its lines. The party is limited to 200 persons, and will start from Grand Forks, North Dakota, July 6, and will travel from Winnipeg in a special excursion train to Prince Rupert, B.C., which will be reached in nine days, stopovers being made at several points. From Prince Rupert the party will travel by G.T.P.R. steamship via the inner channel to Seattle, Wash., with stopovers at Vancouver and Victoria, B.C. Members of the party have the option of returning to the starting point by a number of routes, and may complete the trip any time up to Oct. 31.

The Canadian National Rys. is reported to have put in operation on June 1 a gasoline motor car on the line between Winnipeg and Transcona, Man. The car accommodates 75 passengers, and makes the 6-mile trip in 10 minutes. It makes seven trips from Winnipeg to Transcona, and eight trips from Transcona to Winnipeg every week day, and two trips each way on Sundays. On week days additional trips are run to accommodate the employes of the Canadian National Rys. Transcona shops. More than 1,000 persons are reported to have used the car on the first day it was operated. It has sufficient power to haul a trailer, which will be provided as soon as traffic warrants.

The Quebec & Saguenay Ry. continues to be operated by the contractors, Hugh Doheny & Co., for the Canadian National Rys. On June 1 the contractors put in operation the following train service:—A train daily except Sundays, leaving Quebec (Quebec Ry., Light & Power station) at 2.45 p.m., reaching Murray Bay at 6.45 p.m., and a train leaving Murray Bay at 7.45 a.m., reaching Quebec at 11.45 a.m. On June 26 and on each succeeding Saturday to Sept. 11, a train will leave Quebec at 7.30 a.m., reaching Murray Bay at 11.30 a.m. The return train will leave Murray Bay at 5.15 p.m. on Sunday, June 27, and each succeeding Sunday to Sept. 12, reaching Quebec at 9.15 p.m.

Justice Lafontaine gave judgment in the Superior Court at Montreal June 8 in an action brought by Hodgson, Sumner & Co. against the C.P.R. for \$931.55 for loss of merchandise. The goods were delivered to a carter driving a wagon bearing the C.P.R. sign, and were signed for on one of the company's bills of lading, but never reached their destination. The judge held that according to the custom established by the C.P.R. Co. for receiving goods and signing a bill of lading for their transportation to places indicated, the person accredited to receive them was not any particular individual,

but whatever person might be in charge of the vehicle on which appeared the printed initials "C.P.R." In view of article 1730 of the Civil Code to the effect that the mandator is liable to third parties who, in good faith, contract with a person not his mandatory, under the belief that he is so, when the mandator has given reasonable cause for such belief, the court ordered the C.P.R. to pay the full amount claimed by plaintiffs, with interest from the date the action was taken, and costs.

Canadian Pacific Railway Construction, Betterments, Etc.

St. John, N.B., Bridge.—A press report states that excavation for the main piers for the new bridge at the reversible falls of the St. John River has been started, that the caissons to be used for the foundation work are being built in Montreal, that different sections will be put together at St. John and that it is expected the work for the supports of the western approach to the bridge will be started during the summer.

St. John-Montreal Gradients.—A press report states that the company has an engineer in the field studying the gradients on the line between St. John, N.B., and Montreal, to determine the possibility of reducing them.

Timiskaming to Lac La Quinze.—Hon. L. A. Taschereau, Attorney General for Quebec, is reported to have said recently that arrangements had been completed regarding the construction by the C.P.R. of the projected line from Timiskaming to the Quinze River Falls, Que., and that he had been given to understand by the C.P.R. officials, whom he had seen at Montreal, that construction work would be carried out promptly.

Ottawa Suburban Station.—A press report states that the company proposes to build a station near Parkdale Ave., Ottawa.

Saskatchewan Beach Station.—A station building is reported to have been built at Saskatchewan Beach, Sask. Hitherto passengers for this summer resort have had to use Silton station.

Western Branch Lines.—The Senate railway committee on June 2 approved without amendment the company's bill authorizing construction of certain branch lines in the prairie provinces, details of which were given in Canadian Railway and Marine World for June, pg. 292. The bill was read a third time, and was assented to June 16. (June, pg. 291.)

A St. Malo Shops Mare's Nest.—As a sample of how time is wasted in the House of Commons, the ridiculous questions asked, and the difficulties of carrying on the management of a government railway under such circumstances, the following may be quoted: C. A. Gauvreau, M.P. for Temiscouata, Que., asked recently, "Is it true that two first class machines, which were in good working order at the Riviere-du-Loup shops, were scrapped after their transfer to the St. Malo shops?" The Minister of Railways answered "No." The answering of this question probably involved, first a letter from a House of Commons officer to the Railways Department transmitting it, then a letter from the Railways Department to the Canadian National Rys. management, enquiry by the management of the St. Malo shops Superintendent, a reply from him, and its transmission from the management to the Railways Department.

Traffic Orders by Board of Railway Commissioners.

Contracts for Live Stock Transportation.

General order 298. June 2.—Re consideration of special form of contract for transportation of live stock, to be used by railway companies: Upon hearing the matter at Ottawa, Feb. 10, 1920, the Canadian Manufacturers' Association, Western Live Stock Shippers' Association, Winnipeg Live Stock Exchange, Calgary Live Stock Exchange, Cattle-men's Protective Association of Western Canada, Express Traffic Association, Toronto Humane Society, Western Canada Live Stock Union, Canadian Council of Agriculture, United Farmers of Ontario, United Farmers' Co-operative Company, Eastern Canada Live Stock Union, Brotherhood of Locomotive Engineers, Brotherhood of Locomotive Firemen, Swift Canadian Co., Grand Trunk and Canadian Pacific and Canadian National Railways, and Michigan Central Rd. being represented, it is ordered as follows:—

1. That the forms of Live Stock Contract and the Special Contract with Attendants in Charge of Stock, attached hereto marked Schedule A and Schedule B respectively, be approved.

2. That the form of Special Contract with Attendants in Charge of Stock (Schedule B) be printed on the back of the Live Stock Contract form (Schedule A).

3. That on and after July 1, 1920, the forms herein approved shall be the only contracts for the carriage of live stock to be used by all the railway companies subject to the legislative authority of the Parliament of Canada.

We are unable to give sufficient space to publish the schedules A and B.

Railway Finance, Meetings, Etc.

The Canada & Gulf Terminal Ry.—The company received tenders recently for the purchase of \$1,400,000 of 5% twenty-year first mortgage gold debentures secured by a trust deed in favor of the Royal Trust Co., and dated Mar. 31, 1920.

New Brunswick Ry.—At a special meeting of shareholders at St. John, N. B., June 1, a resolution is reported to have been passed authorizing the directors to sell or dispose of all or any part of the company's extensive landed properties in the Upper St. John River district. The company's railway forms part of the C.P.R. system, and the company for years past has been dealing with its land grants only.

Thousand Islands Ry.—There has been deposited with the Secretary of State at Ottawa two instruments dated Aug. 2, 1905, and April 21, 1920, appointing J. P. Ashworth, and F. Scott, respectively, as trustees under a mortgage dated Feb. 28, 1894, from the Thousand Islands Ry. Co. to John Bell, to secure payment of \$50,000 of 6% first mortgage bonds.

Toronto, Hamilton & Buffalo Ry.—At the annual meeting at Hamilton, Ont., June 2, the following were elected directors:—Lord Shaughnessy, E. W. Beatty, K.C., Grant Hall, A. H. Smith, A. H. Harris, W. E. Scott, H. B. Ledyard, W. P. Torrance, W. K. Vanderbilt, Jr., D. W. Saunders and J. N. Beckley.

Fighting Grasshoppers.—The C.P.R. has had poison spread along its right of way in the prairie provinces to kill grasshoppers in the infected areas.

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.

Canadian Government Merchant Marine, Ltd.—G. E. BUNTING, heretofore Ontario Freight Agent, who has been in Australasia for several months, in C.G. M.M. interests, has been appointed representative for Australia and New Zealand. Office, Auckland, New Zealand.

Capt. L. M. HATFIELD, formerly master of various steamships owned and managed by William Thomson & Co., St. John, N.B., and latterly master of various steamships owned by the British Government, has been appointed Assistant Marine Superintendent. Office, Montreal.

H. M. MILBURNE, heretofore Marine Superintendent, Montreal, has been appointed Assistant to Manager. Office, Montreal.

Capt. E. E. TEDFORD, formerly master and Marine Superintendent, Strath Steamship Co., Cardiff, Wales, and latterly superintending the building of steamships for the British Government, to be managed by that company, has been appointed Marine Superintendent, C. G. M. M., vice H. M. Milburne, appointed Assistant to Manager. Office, Montreal.

Canadian National Rys.—L. BROUSSEAU has been appointed District Engineer, Levis, Edmundston & St. Maurice Divisions, Quebec District, vice J. C. Beckwith, transferred. Office, Quebec, Que.

J. G. HOLMAN has been appointed agent for the summer, at Lake Joseph, Ont.

J. KIRKPATRICK has been appointed agent for the summer, at Bala Park, Ont.

O. I. VIRTUE has been appointed Inspector, Sleeping, Dining and Parlor Cars, Toronto, vice E. L. Clarke, resigned on account of ill health.

Canadian Pacific Ry.—W. B. BAMFORD, heretofore District Freight Agent, Toronto, has been appointed District Freight Agent, Nelson, B.C., vice F. W. Sterling, transferred.

H. G. BUCHANAN, heretofore District Freight Agent, Edmonton, Alta., has been appointed District Freight Agent, London, Ont., vice C. S. Morse, transferred.

R. V. CARLETON, heretofore Locomotive Foreman, Toronto, has been appointed Locomotive Foreman, Trenton, Ont., vice D. L. Jones, transferred.

W. R. JEFFREY, heretofore tax and assessment clerk, has been appointed Assistant Tax Agent, Montreal.

D. L. JONES, heretofore Locomotive Foreman, Trenton, Ont., has been appointed Locomotive Foreman, Windsor, Ont., vice T. Milne, retired on pension.

C. P. MCGHEE has been appointed District Freight Agent, Los Angeles, Cal.

C. S. MORSE, heretofore District Freight Agent, London, Ont., has been appointed District Freight Agent, Toronto, vice W. B. Bamford, transferred.

F. W. STERLING, heretofore District Freight Agent, Nelson, B.C., has been appointed District Freight Agent, Edmonton, Alta., vice H. G. Buchanan, transferred.

W. TANSLEY, heretofore Car Service Agent, St. John, N.B., has been appointed Car Service Agent, Toronto, vice H. C. Taylor, promoted.

H. C. TAYLOR, heretofore Car Service Agent, Toronto, has been appointed Superintendent of Car Service, Eastern Lines, vice R. A. Sewell, transferred. Office, Montreal.

J. H. WILSON, heretofore Night Locomotive Foreman, Brownville Jet., Me., has been appointed Locomotive Foreman, Toronto, vice R. V. Carleton, transferred.

Central Vermont Ry.—E. F. SMITH has been appointed Assistant to President. Office, St. Albans, Vt.

Grand Trunk Ry.—The position of Assistant to Vice President in Charge of Transportation, held by C. R. MOORE, with office at the company's general offices, whose appointment as General Superintendent of Car Service was announced in our last issue, has been taken by C. MANNING, heretofore Assistant to Vice President, with office at Point St. Charles shops, and the last mentioned position has been abolished.

R. S. MOORE, recently in Canadian National Rys. service, has been appointed chief clerk to General Agent, G.T.R., Toronto.

Grand Trunk Pacific Ry.—A. D. CAREY, heretofore Assistant Superintendent, Smithers, B.C., has been appointed Superintendent, Edson, Alta., vice R. M. Halpenny, resigned to enter private business.

Great Northern Ry.—J. M. COPELAND, recently in G.T.R. service, has been appointed Travelling Agent G.N.R., Toronto.

H. E. WATKINS has been appointed General Agent, in charge of Canadian territory east of Port Arthur and Fort William, Ont., including the Maritime Provinces, but no Windsor, Walkerville and Ford, Ont. Office, 53 Yonge St., Toronto.

Union Pacific Rd.—F. S. ELLIOTT has been appointed General Agent, Vancouver, B.C., vice J. H. Cunningham, resigned to enter private business.

C.P.R. Taxation.—T. W. Caldwell, M.P. for Victoria and Carleton, N.B., asked in the House of Commons recently:—"What amount was paid by the C.P.R. Co. in Business Profits Tax in 1916, 1917, 1918 and 1919?" The Finance Minister replied: "Accounting period ended June 30, 1915, none; accounting period ended June 30, 1916, none, this was due to tax paid to United Kingdom; accounting period ended Dec. 31, 1916, \$588,600.20; accounting period ended Dec. 31, 1917, none; income tax paid for 1917 period, \$1,765,475.13; accounting period ended Dec. 31, 1918, none; amount paid for 1918 period under Income War Tax Act, 1917, and order in council Mar. 14, 1918, \$1,463,097.24; accounting period ended Dec. 31, 1919, returns for 1919 period not filed. The Business Profits War Tax Act, 1916, provides the returns may be filed on or before July 1, 1920. Total tax paid by C.P.R. for accounting periods 1915 to 1918, inclusive, \$3,817,172.57."

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

| | Acres. |
|--|--------|
| Canadian Northern Ry. | 240.00 |
| Canadian Pacific Ry. grants | 27.64 |
| Canadian Pacific Ry. roadbed and station grounds | 9.91 |
| Grand Trunk Pacific Ry. | 428.33 |
| Grand Trunk Pacific Ry. Branch Lines Co. | 29.41 |
| | <hr/> |
| | 785.29 |

Telegraph, Telephone and Cable Matters.

B. A. Boate, heretofore local manager, Great North Western Telegraph Co., Brandon, Man., has been appointed local manager at Regina, Sask., vice R. F. Errington, transferred.

L. Black, for several years in Western Union Telegraph Co.'s service at Sydney, N.S., has been appointed local manager there, vice J. B. Colbourne, resigned to enter C.P.R. telegraph service at Calgary, Alta.

The C.P.R. Telegraphs have nominated F. H. Phippen, K.C., as their representative on a board of conciliation to consider operator's wages. J. T. Gunn, Secretary Electrical Workers Union, represents the men.

J. B. Colbourne, who has resigned as local manager, Western Union Telegraph Co., Sydney, N.S., to enter C.P.R. telegraph service at Calgary, Alta., was presented with a gold chain and an address by the Sydney staff on leaving for the west recently.

H. Wittmaak, who died at Kitchener, Ont., June 3, aged 60, was formerly in C.P.R. Telegraphs service, and was said to have been the first of that company's telegraph operators in Hespeler, Ont. He was agent there when he retired from active service about two years ago.

The Great North Western Telegraph Co. has opened offices at Authier and Kiskisink Club House, Que., Moonbeam, Ragged Rapids, Port MacDiarmid and Sparrow Lake, Ont., and has closed its offices at Oscalanea, Que., Battersea and Thamesford, Ont., and Kylemore, Sask.

A London, Eng., press dispatch states that the Pacific cable connecting Canada with Australasia is to be duplicated between Bamfield, B.C., and Norfolk Island at a cost of approximately £4,000,000. The Pacific cable was completed in 1902, and the distance between Bamfield and Norfolk Island is approximately 6,000 miles, and there are two intermediate stations, one at Fanning Island and the other at Fiji. The cable between Bamfield and Fanning Island is said to be the longest laid in one piece.

The British Postmaster General has sent notices to the various chambers of commerce and boards of trade in Great Britain calling attention to the fact that a state owned cable is in operation between Great Britain and Canada, and to the government's desire that this cable, which is known as the Imperial cable, should be used mainly, if not exclusively, for traffic between Great Britain and the British Dominions. It is operated direct from the Central Telegraph Office in London, to Halifax, N.S., where connection is made with the Canadian land lines, as well as with the British cable to the West Indies. Traffic for Australasian points is sent by a special line direct from Halifax to Bamfield, B.C., and thence by the state owned Pacific cable to Australia and New Zealand, there being only one retransmission, viz., at Halifax.

Among the Express Companies.

The Canadian National Ex. Co. has closed its office at Prince Albert, Sask.

M. Cunningham, formerly with the Canadian National Ex. Co., is reported to have been appointed agent Canadian Ex. Co., at Stewart, B.C.

J. I. M. Grant, heretofore cashier, Canadian Ex. Co., St. Catharines, Ont., has been appointed agent at Brantford, Ont., vice G. A. Oliver, resigned.

Electric Railway Department

Oshawa Railway Fifty-ton Electric Locomotive.

The Oshawa Ry., Oshawa, Ont., has added a 50-ton 400 horse power, steel, electric locomotive, which it has had built by Ottawa Car Manufacturing Co. The following are the principal dimensions:—

| | |
|---|---------|
| Length over end sills | 32 ft. |
| Length of cab | 16 ft. |
| Distance between bolter centers | 18 ft. |
| Width over cab | 10 ft. |
| Height, top of rail to top of roof | 12 ft. |
| Height top of rail to center of draw bar..... | 34½ ft. |

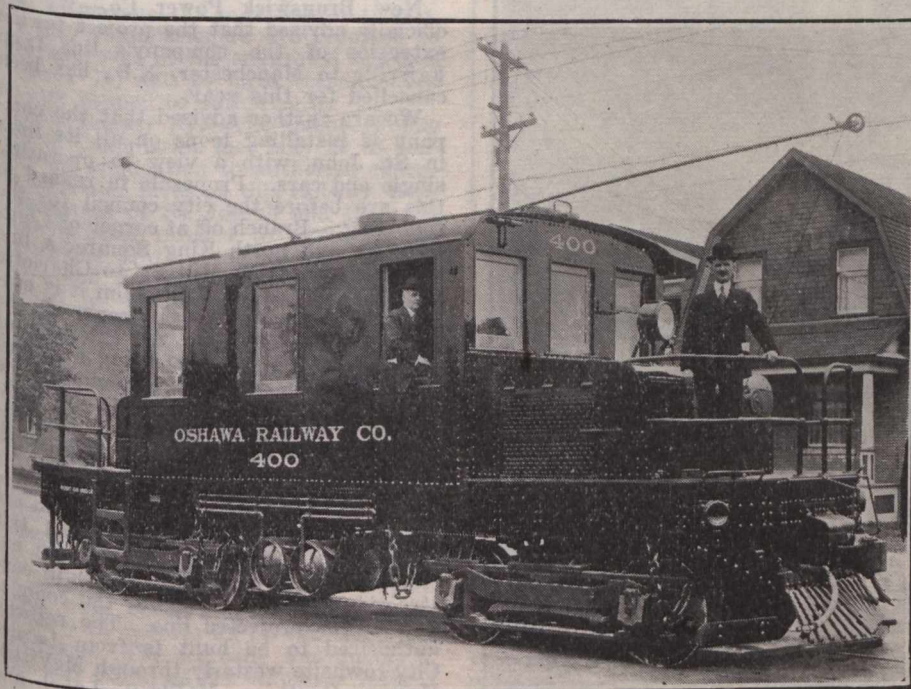
The underframe is of steel construction, built as one unit. There are 6 longitudinal sills consisting of four 12 in. I beams and two 12 in. channels, with cross sill of 9 in. I beams and corner angle 6 x 6 x ½ in. Bumpers, or end sills, are built up with a 12 in. channel, fastened to ends of longitudinal sills by 6 x 6 x ½ in. angles, with another 12 in. channel shaped to meet the requirements of the M.C.B. coupler height, after which a ¾

is placed on the end window opposite the locomotive man. An 18 in. globe ventilator is placed at the center of roof, to take away any heat generated by the resistors. All sash and doors are of white ash, with ⅞ in. white ash t. and g. sheeting on the interior. A frame is built of angle iron, surrounded with movable expanded metal screens, for the purpose of mounting the control equipment, which is located in the center of the cab. The resistors, which are installed in the top half, near the roof, are surrounded by 4 sheet metal doors, with ends of permanent sheet steel panels rivetted to frame. The floors are of wood, with air space of 1½ in. between the 1½ steel plate and bottom side of floor boards, which are 1½ in. thick, t. and g., covered over with steel checker plate. The hoods or sloping ends are of 3/16 in.

ing is 3 ft. high with center rail, one end secured to hoods, and the opposite end forms a grab handle on the side, where angle iron steps are provided, with another grab handle fastened to cab corner post, providing access to inside of cab. A hand brake is provided with a 15 in. drop handle. Marker lamps and sockets of standard railway type are provided with flags. Sand boxes are located in each hood and designed to carry a quarter ton of sand, with 2 O.B. type air sanders in each box. The corner wheels have an independent discharge pipe of 1¼ in., which is attached to the truck connected with rubber hose to each air sander. A standard air operated locomotive bell is provided at one end, mounted on hoods. This bell is also hand operated by a cable running through a ½ in. pipe and pulleys, which makes a very easy hand ringing apparatus. The headlights, which are located on each hood, are of the Golden Glow type 12 in., 94 watts, 115 volts, plain resistance, with mirror reflector. Trolley retrievers are of the O. B. type on each end, mounted on hoods. The couplers have been designed specially to meet the requirements of the underframe and trucks. A very heavy bumper pocket casting, rivetted to center I beams, contains the Westinghouse friction draft gear. This arrangement eliminates any buffing shocks, which the locomotive would get if provided with the solid coupler head, therefore, is an important factor when one takes into consideration the Westinghouse h.l. control, which is installed inside the cab, giving longer life and better service, also eliminating unnecessary adjustments, which would occur without the use of the Westinghouse friction draft gear. Coupler heads are the M.C.B. standard. Poling sockets are provided at each corner, complying with the M.C.B. standard design. Air signal is installed, to meet future requirements for passenger service.

The trucks are the Baldwin-Westinghouse standard electric locomotive truck, with rigid bolster, equalized type, designed especially for locomotive service, and built with rolled steel side frames located outside of wheels. The cast steel transom and rolled steel end frames are fitted together with reamed taper bolts. This construction is especially adapted to heavy traction and buffing strains met in locomotive service. Wheels are rolled steel, 36 in. diameter with 4 in. tread, 1½ in. flange. Axles are forged steel, to meet requirements of A.E.R.A. standard in diameter and bearing area; 6½ in. diameter at bearing and 7 in. at gear. Journal boxes are of semi-steel of the Symington type journals, 5 x 9 in. The brake rigging is actuated through a radial brake beam, and through a brake beam located adjacent to truck transom. This permits the locomotive to negotiate short radius curves.

The electrical equipment comprises the Westinghouse type h.l. unit switch control, double end, arranged for field control of motors, including forced ventilation to motors and train line receptacles. The type of motor is 562-D-5 of 100 h.p., 600 volts, making a total of 400 h.p. per locomotive. The gears are Nuttall helical. A smooth drive, which is free from



Oshawa Railway, Fifty-Ton, All Steel Electric Locomotive.

in. steel plate is sheared to meet the required shape, and securely rivetted together. Bolsters are of box girder type constructed with two 12 in. channels and 1½ x 15 in. steel plate on the bottom side, rivetted to flanges of the 12 in. channels. A ½ in. rolled steel floor plate extends the full length of the locomotive and the full width of cab. This construction forms a strong girder of the box type.

The cab, or body, is of steel construction, consisting of angle irons for ends and Z bars intermediates, 6 in all, bent to form the sides and roof in one continuous piece, to which 3/16 in. sheet steel plates are rivetted, forming window and door openings. The roof is of steeple type, having 3 windows in each side and 2 on ends, with door at each diagonal corner. Two windows on each side are drop, and the third, which is at the control corner of the cab, is of a sliding type, with hinged arm rest, to enable the locomotive men to look out with ease when shunting. A storm sash

steel plates rivetted to angle irons. Doors are placed on end to permit installing new carbons and oiling air compressors. Also on side of hoods there is a double door, to permit installation of equipment, and the same are constructed to prevent undue heating of the electrical apparatus, which they contain, including the fan motor. There is also a door into the cab, so as to give the locomotive man easy access from inside of cab without going outside. These side doors are arranged to keep out water and give abundance of ventilation. An upholstered seat, with arm rest, is provided at each operator's position.

Pilot and switchman's steps are provided at each end. The pilot is constructed of angle iron base, with 1½ in. iron pipe for uprights, conforming to shape to meet the requirements of the locomotive end and coupler. A 1¼ in. pipe rail is located on each end, to ensure safety, with an 18 in. opening at center, to give access to switchmen and train men, also train line jumpers. This rail-

vibration, exists on helical gear equipped locomotives.

Air brakes are the Westinghouse Traction Brake Co.'s make, 14-E.L., arranged for double end operation, including two compressors, type D-3-E.G., also governor synchronizing system, which ensures uniform compressor labor. Without this, the life of a compressor overloaded is considerably shortened, and the running and maintenance expense must be correspondingly high. Through the operation of this system, the two compressors must start and stop simultaneously. A

city and mechanical design should be suitable for the service requirements; (2) the motive power apparatus; (3) the apparatus on the locomotive should be mounted in such a way that each part would be permitted to operate to the best advantage, with the chance of trouble reduced to a minimum; (4) all apparatus should be accessible for inspection, maintenance and overhauling; (5) there should be no danger of the operator being thrown in contact with the live parts. Centralization of control equipment is very important and one arrangement of

Electric Railway Projects, Construction, Betterments, Etc.

Calgary Municipal Ry.—R. A. Brown, Superintendent, has reported that extensive reconstruction of double track lines will have to be done at the rate of from five to seven blocks a year, at a cost of about \$11,000 a block, or \$12,500 a block if heavier rail is used; and reconstruction of line on unpaved streets at the rate of six blocks a year at a cost of \$6,000 a block. The estimated total cost of this reconstruction is about \$91,000 a year for the next five years. He proposes that \$60,000 a year be taken from depreciation fund and that the balance be made up from revenue. June, pg. 316.)

Hydro Electric Ry. (Essex Division). We are officially advised that a second track is being built on London St., Windsor, Ont., from Ouelette St. to Wellington St.; and that the car shop on London St. is being rebuilt. The new work will provide a new repair pit, an armature room, a blacksmith shop and a machine shop. (See Sandwich, Windsor & Amherstburg Ry., June, pg. 316.)

New Brunswick Power Co.—We are officially advised that the project for the extension of the company's line from Fairville to Manchester, N.B., has been cancelled for this year.

We are further advised that the company is installing loops on all its lines in St. John, with a view to operating single end cars. Proposals in regard to this are before the city council for the following:—Branch off at corner of Charlotte St. and north King Square; a line up Union St. from Mill St. to Charlotte St., 1,500 ft. At West St. John it is proposed to connect through tracks at the head of Rodney wharf. An extension of 3,000 ft. of track is also being arranged for in East St. John to accommodate the Symons Parish, the new harbor dry dock, etc., and the county hospital. The materials for these extensions are on hand. T. H. McCauley is General Manager.

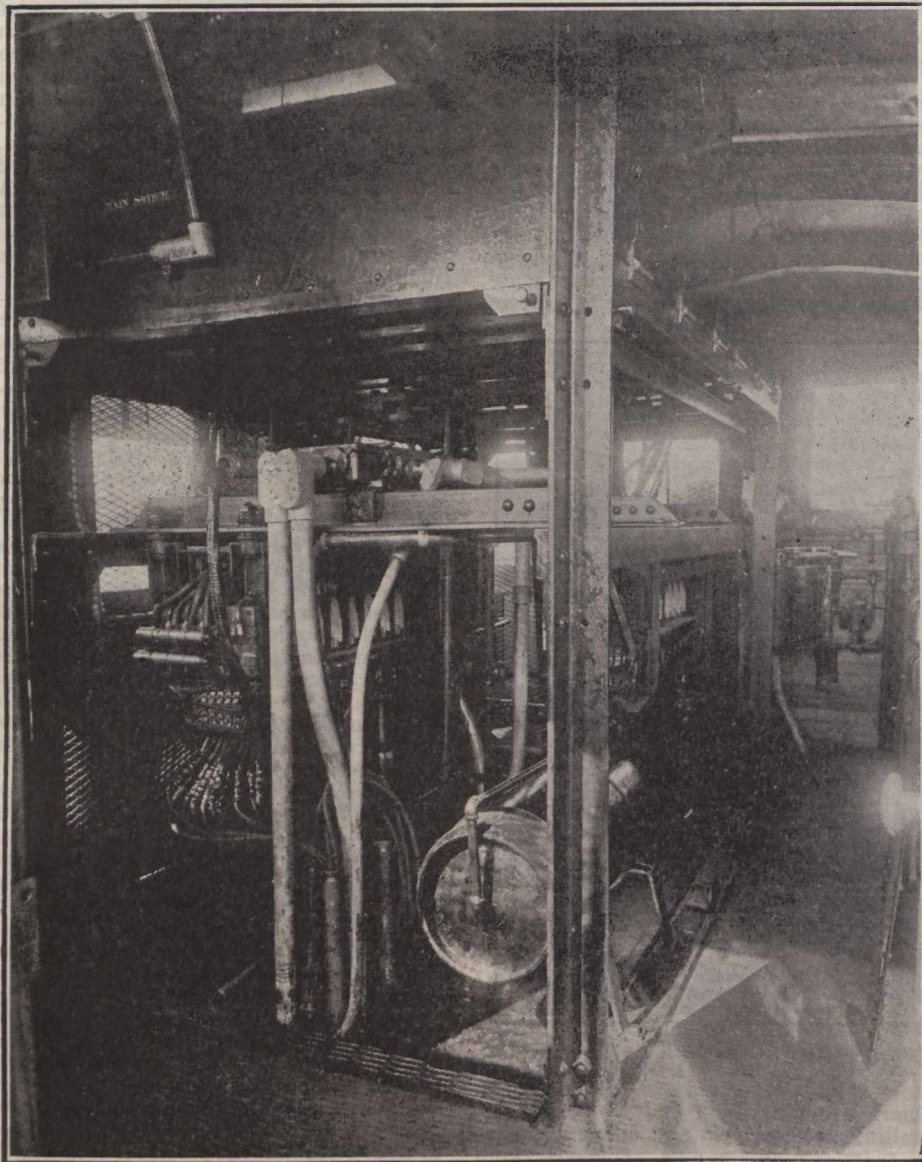
Porcupine Rand Belt Electric Ry. Co.—The Ontario Legislature has revived the charter of incorporation granted this company in 1912, together with an extension of time until 1922 to begin construction and until 1923 for the completion of the projected line. The railway authorized to be built is from Larder City townsite westerly through McVittie, Hearst, Gauthier, McElroy, Label and Boston Tps., to Dane townsite. (Nov., 1916, pg. 460.)

Quebec Ry., Light & Power Co.—The extension of the electric railway tracks in Belvedere Ward is under consideration by Quebec City Council. A delegation waited on the council requesting that the company be asked to extend its service on St. Cyrille St., by St. Marguerite Bourgeois to Bells Road, so as to reach the St. Malo section of the line, and suggested the consideration of another extension along the cliff, by Boulevard de l'Entente and the city limits. Another extension asked for is a line to Belmont cemetery. (June, pg. 346.)

Winnipeg Electric Ry. is, according to report, planning an extension of its Academy Road line to Lindsay St., at an estimated cost of \$20,000.

We are officially advised that the company is building a substation to house two motor generator sets.

The **Guelph Radial Ry.**, owned by the city, will be taken over for operation by the Hydro Electric Power Commission of Ontario July 1.



Oshawa Railway Electric Locomotive Cab Interior, showing installation of equipment, with screens removed.

clarion type of whistle is installed over end corner window, operated by air.

Marker lamp brackets are installed on each corner for holding signal flags. The locomotive is equipped with 2 marker lamps, and 2 classification lamps, including 4 green and 2 red flags.

The heater equipment consists of 2 sets of 4 heaters per set, Consolidated Heater Co. make, including 2-knife switch and fuse.

The painting is a dead black, varnished, with lettering in gold leaf, which is a very suitable color for this type of locomotive.

Reliability was the most important factor considered in designing this locomotive, also five essential features were considered: (1) The weight, type, capa-

city and mechanical design should be suitable for the service requirements; (2) the motive power apparatus; (3) the apparatus on the locomotive should be mounted in such a way that each part would be permitted to operate to the best advantage, with the chance of trouble reduced to a minimum; (4) all apparatus should be accessible for inspection, maintenance and overhauling; (5) there should be no danger of the operator being thrown in contact with the live parts. Centralization of control equipment is very important and one arrangement of

this is shown. This has a number of advantages: (1) All control apparatus is assembled compactly in one part of the locomotive and the switch groups are located in such a manner that they are readily accessible from all sides; (2) location of grid resistors above switch groups, which are placed under the roof, reducing the length of connection between these two pieces of apparatus to a minimum. All the heat from resistors passes directly through the roof ventilators. The distributing valve is located inside the cab, as a protection against freezing. Fan motor and blower are located inside hoods, also one compressor installed in each hood, which eliminates considerable objectionable noises, which are caused when these two pieces are in motion.

Increases in Electric Railway Passenger Fares.

Brandon Municipal Ry.—A Brandon, Man., press report of June 11 stated that the Manitoba Public Utilities Commission had approved an increased schedule of fares for Brandon Municipal Ry., effective June 21., as follows:—Cash, 7c.; ordinary tickets, 6 for 35c.; workmen's tickets, 5 for 25c.; children's tickets, 8 for 25c.

Brantford Municipal Ry.—A new schedule of fares is reported to have been put in operation June 10 in order to meet the increase of wages granted to the employes. The sale of tickets at 6 for 25c. has been abandoned and the fare is now a straight 5c. one.

Calgary Municipal Ry.—R. A. Brown, Superintendent, is reported to have recommended that an increased schedule of fares be put in operation. Following is a comparison of the present and suggested rates:—

| | Present. | Suggested. |
|---------------------------|----------|------------|
| Cash | 5c. | 10c. |
| Tickets for \$1 | 22 | 18 |
| Tickets for 25c. | 5 | 4 |

The reason for suggesting the 10c. fare is to encourage the purchase of tickets. The city commissioners are reported to have approved of the suggested schedule on June 11, and to have recommended the city council to authorize it.

Levis County Ry.—The Quebec Public Service Commission met May 25 to consider an application to authorize charging increased fares on this railway. Representatives of St. Joseph and Romuald municipalities refused to agree to the application or to abide by any decision made, and asked that the company be ordered to operate a service according to its franchise terms. The service through the two municipalities named, to Lauzon, had been suspended from May 20, the company's employes having refused to operate the cars over the boundary line, on account of the action of the St. Joseph and Romuald municipalities in refusing to join in the application for increased fares. The Commission, after investigating the company's finances and operations, together with the cause of the strike, reserved judgment, so far as the City of Levis and Bienville municipality were concerned, but ordered the company to operate its cars in the Town of Lauzon. The company was unable to obey this order, as the employes refused to operate cars in Lauzon, and they further intimated that if attempts were made to operate the cars in that town by other men, there would be a general strike, thus tying up the remainder of the system. The Town of Lauzon applied to the Commission, June 1, asking it to force the company to find money to operate the cars in Lauzon, or that the Commission take over the line and operate it. Judgment was given June 9, the Commission refusing to entertain the motion, or to force the company to operate its cars by borrowing money, as the company had proved in the investigation that it was unable to do so, and decided that no further motions of the Town of Lauzon to force the company to operate its cars under the existing conditions would be entertained, and also that no further motions or applications in regard to the matter would be accepted until the four municipalities interested got together and agreed to revise the franchise, or to submit the whole question to the Commission for its decision. On June 10, all the company's employes, including the car barn men, etc., went on strike. The Mayor of Levis, on behalf

of Levis and Bienville, guaranteed to re-adjust the fare schedule, so as to permit wages to be increased, and the service was resumed in those two municipalities June 11, the council subsequently agreeing to the granting of the following tari:—Cash fare, 10c.; tickets, 4 for 30c., 50 for \$3.50; children's tickets, 10 for 25c.; scholars tickets, 50 for \$2. The situation in St. Joseph and Romuald is reported as unchanged.

A press report of June 21 stated that the company's cars were again running in St. Romuald, the municipal council having on June 19 accepted the new fare schedule asked for by the company. St. Joseph municipality and the Town of Lauzon were still without a car service.

and between 1 and 4.30 p.m. of every regular school day.

Section 3 of the act provides that the new fares shall only be in effect for two years from the coming into operation of the act, viz., from May 23, and that on or before Dec. 31, the government shall appoint a commission under the Public Inquiries Act consisting of three members—one appointed by the Chief Justice of the Supreme Court of Nova Scotia, one by Halifax City Council, and one by the company—who shall make investigations and report to the government and to the Halifax City Council by Feb. 1, 1922, as to whether the increased fares granted by the act shall be continued further.

We are advised that very little difficulty was experienced in the legislature over the granting of the right to charge increased fares, but that there was considerable discussion over the matter of regulating the rates for the future. Under the company's charter the matter of the regulation of fares, etc., in the tramway department does not come under the Nova Scotia Public Utilities Commission, but is subject to legislative enactment. The company desires that the Public Utilities Commission should have jurisdiction over its electric railway, but the Halifax City Council objected to this being done and the legislature finally approved of the appointment of a special commission.

Sarnia St. Ry.—The Point Edward, Ont., Town Council is reported to have refused to permit the Sarnia St. Ry. to charge increased fares within its limits, unless provision is made for selling tickets for working women as well as for working men. The rates of fare are before the Sarnia City Council, and it is reported that the putting in operation of a straight 5c. fare may be the only solution to the difficulty.

Winnipeg Electric Ry.—The hearing of evidence by the Manitoba Public Utilities Commission on the Winnipeg Electric Ry.'s application to permanently increase the fares charged on its lines, is reported to have been concluded June 16, when the sittings were adjourned to June 24, to hear arguments. A press report states that the Commissioners' decision is expected to be given about the end of July.

One-Man Cars for St. John, N.B.—The New Brunswick Power Co. is arranging to operate on its electric railway in St. John, N.B., one-man cars of the McCauley type, similar to those on the Calgary, Alta., Municipal Ry., and the Moose Jaw, Sask., Electric Ry., on the street railway in St. John, N.B. The proposal is being opposed by the employes on the ground that they do not consider the cars to be safe. The company is arranging to fit up some cars and to submit the question of their safety and that of their operation to the civic authorities and the citizens. The company claims that it is impossible to give a service with two men on a car at the present 6c. It is proposed to put on a third more cars of the one-man type, than are now in service, and to give a night service.

Montreal Tramways Co. has declared a dividend of \$2.50 a share for the quarter ended Dec., 1918. A press report states that with this payment the company will have paid up half of the amount of dividends in arrear.

Canadian Electric Railway Association.

Honorary President, Lieut.-Col. J. E. Hutcheson, General Manager, Montreal Tramways Co.

Honorary Vice President, Acton Burrows, Proprietor and Editor, Canadian Railway and Marine World.

President, A. Gaboury, Superintendent, Montreal Tramways Co.

Vice President, G. Gordon Gale, Vice President and General Manager, Hull Electric Co.

Honorary Secretary-Treasurer, pro tem, A. Eastman, Vice President and General Manager, Windsor, Essex & Lake Shore Rapid Railway Co.

Executive Committee, The President, Vice President, and F. D. Burpee, Superintendent, Ottawa Electric Railway Co.; C. C. Curtis, Manager, Cape Breton Electric Co.; A. Eastman, Vice President and General Manager, Windsor, Essex & Lake Shore Rapid Railway Co.; Geo. Kidd, General Manager, British Columbia Electric Railway Co.; M. W. Kirkwood, General Manager, Grand River Railway Co. and Lake Erie & Northern Railway Co.; A. W. McLimont, Vice President and General Manager, Winnipeg Electric Railway Co.; R. M. Reade, Superintendent, Quebec Railway Light & Power Co.; Lt.-Col. G. C. Royce, General Manager, Toronto Suburban Railway Co.; C. L. Wilson, Assistant Manager, Toronto & York Radial Railway Co.

Official Organ—Canadian Railway and Marine World, Toronto.

London & Port Stanley Ry.—In order to meet increased wages, the week end rates between London and Port Stanley were cancelled June 17, and the regular tariff rates were put in force, viz., London to St. Thomas and return 80c, and London to Port Stanley and return \$1.25. The previous week end rate from London to Port Stanley and return was 95c.

Nova Scotia Tramways & Power Co.—The Nova Scotia Legislature has passed an act amending chap. 180, of the act of 1914, subsections c and f of sec. 22, which fixed the fares to be charged by the company and sec. 1 of the new act declares that notwithstanding anything contained in those subsections and any amendments thereof increased fares may be charged. Following is a comparison of the old rate of fares and those now authorized:—

| | Old. | New. |
|---|------|--|
| Cash | 5c. | 7c. |
| 6 tickets for | 25c. | 4 tickets for 25c. |
| 25 tickets for \$1 | | 17 tickets for \$1 |
| 10 workingmen's tickets for 25c. | | 20 workingmen's tickets for \$1 |
| 10 school children's tickets for 25c. | | 8 school children's tickets for 25c. |

The workmen's tickets are good only up to 8 a.m., and the school children's tickets are for pupils under 16 years of age actually attending any public school, available for use between 8 and 9.30 a.m.

Jurisdiction over British Columbia Electric Railway.

An article in Canadian Railway and Marine World for June, referring to a bill introduced by the Minister of Railways, to amend the Railway Act, 1919, was headed "British Columbia Electric Ry. Restored to Provincial Jurisdiction." This was somewhat premature. The bill, being a government measure, and having been read a first time, it was taken for granted that it would pass without amendment, but it was amended by the Commons Railway Committee. The bill, as introduced by the Minister of Railways, was as follows:—

"1. Section 6 of the Railway Act, 1919, chapter 68 of the statutes of 1919, is amended by adding thereto the following subsection:—

"(2) The provisions of paragraph (c) of this section shall be deemed not to include or apply to any street railway, electric suburban railway or tramway constructed under the authority of a provincial legislature, and which has not been declared to be a work for the general advantage of Canada otherwise than by the provisions of the said paragraph."

During its consideration by the Railway Committee, W. A. Boys, M.P. for South Simcoe, Ont., moved, seconded by J. R. Wilson, M.P. for Saskatoon, Sask., that the following be added to subsection 2:—

"Provided that this subsection shall not affect, or come into force with respect to any street railway, electric suburban railway, or tramway in the Province of British Columbia, until the expiration of one year from the passing of this act."

This amendment was carried by 35 to 6, the Minister of Railways, Hon. J. D. Reid, being among those who voted for it. The House of Commons went into committee of the whole on the bill, June 16, when the chairman read the Railway Committee's amendment. Following is the official report of the discussion:—

Hon. J. D. Reid: The necessity for this bill arises from the fact that last year in amending the Railway Act a clause was inserted, at the request of the railway brotherhoods, bringing under the Board of Railway Commissioners' jurisdiction any provincial railway leased or operated by a railway company holding a Dominion charter. The question arose over the Quebec Central Ry., which, although operated by the C.P.R. Co., was subject to the jurisdiction of the Quebec Public Utilities Commission. But the clause as drafted goes further than we intended and covers any provincial electric railway or tramway leased to a railway company subject to the Board of Railway Commissioners. It was brought to our attention by the British Columbia Electric Ry. Co., which applied to the B.C. Public Utilities Commission for approval of a higher rate schedule, and was referred to the Dominion commission, the provincial commission pointing out that, under the amendment in question, the B. C. E. R. Co. was no longer under its jurisdiction.

D. D. McKenzie: What is the clause of the Railway Act which is amended by this bill?

Hon. J. D. Reid: Sec. 6, subsec. (c) as follows:

"Every railway or portion thereof, whether constructed under the authority of the Parliament of Canada or not, now or hereafter owned, controlled, leased, or operated by a company wholly or partly within the legislative authority of the Parliament of Canada, or by a company operating a railway wholly or partly within the legislative authority of the Parliament of Canada, whether such ownership, control, or first mentioned operation is acquired or exercised by purchase, lease, agreement or other means whatsoever, and whether acquired or exercised under authority of the Parliament of Canada, or of the legislature of any province, or otherwise howsoever; and every railway or portion thereof, now or hereafter so owned, controlled, leased or oper-

ated shall be deemed and is hereby declared to be a work for the general advantage of Canada."

What has happened in British Columbia has happened in several of the other provinces. When the Railway Act amendment of last session was put through there was no intention of bringing all our street railways under the control of the Board of Railway Commissioners. This bill is simply to provide that these electric railways and tramways shall remain under provincial jurisdiction as they were prior to the revision of the Railway Act last year. The bill was thoroughly threshed out before the railway committee. The only question was with regard to this amendment; the committee were unanimous so far as the principle of the bill was concerned.

D. D. McKenzie: When the Railway Act was amended last year it was not discovered that the law as then passed was so far reaching as it turned out to be?

Hon. J. D. Reid: That is it.

D. D. McKenzie: Is there any judicial decision to the effect that the bill does mean more than the house intended it to mean?

Hon. J. D. Reid: The British Columbia authorities, as I understand it, contended that the amending legislation of last year took away certain of their rights so far as their electric railway system was concerned. The B.C. Electric Ry. applied to the railway commission to have the rates fixed, and action was taken by the Dominion Board of Railway Commissioners. The decision was therefore arrived at that we should take this step to provide that these electric railways and tramways shall remain under the provincial jurisdiction.

The section was agreed to, and the bill reported, read the third time and passed.

The Minister of Railways' remarks would give the impression that the B. C. E. Ry. was to be restored to provincial jurisdiction forthwith, but, as shown above, the amendment to the bill provides that this shall not take place until a year from the passing of the act. The effect of this is that the company will continue to charge 6c. fares in Vancouver for at least another year.

Hydro-Electric Power Commission of Ontario's Radial Railway Projects.

W. S. Murray, consulting engineer, New York, N.Y., who was employed recently by the Hydro Electric Power Commission of Ontario, to report on the proposed construction of the Toronto and Bowmanville, the Toronto, Hamilton and Niagara Falls, and the Hamilton and Elmira radial railways, has made a report which he has summarized as follows:—

I consider the construction and operating estimates made by your engineering staff conservative.

I find the lines admirably located with reference to the passenger and goods traffic they are designed to reach, the density of which is not in unfavorable comparison to existing roads which have thrived in the United States.

I do not consider the act of their construction as one against which a charge of duplication can be made.

I am in full accord with the Commission's conclusion that it is inadvisable to proceed at this time with the full construction of these radials on account of

the greatly inflated costs applying both to line and equipment.

I consider it most important, however, that the Commission proceed with the development of its full plans, applying to financing as well as construction, in order that it may be in a position to acquire such existing radials and property as may be economically purchased, and which will later form parts of the completed systems.

Mr. Murray is of the firm of McHenry & Murray, who practice in general railway electrification, the senior partner being E. H. McHenry, at one time Chief Engineer, C.P.R., Montreal. Mr. Murray was Chief Electrical Engineer, New York, New Haven & Hartford Rd., in full charge of electrical engineering and construction details of its electrification, which cost about \$25,000,000.

Sunday Operation of Electric Cars in Ontario.

The Ontario Railway Act, R.S.O., 1914, chap. 185, provides as follows:—

"235. (1) Subject to subsections 2 and 3 and notwithstanding anything in this act or any other act, street railways may be operated on Sunday within a city having a population of over 50,000 after a majority of those voting of the electors qualified to vote at municipal elections have voted in the affirmative in answer to the question: "Are you in favor of operating street railways on Sunday?" but no person shall be entitled to vote more than once on such question.

"(2) The question shall not be submitted until the Lieutenant Governor in council has declared that the population of the city is over 50,000, and the Lieutenant Governor in council may require a census to be taken and may prescribe the nature of the census and the time and manner of taking the same.

"(3) When the Lieutenant Governor in council has declared that the population of the city is over 50,000 the question may be submitted at the annual municipal election, if the municipal council shall have decided on or before the 1st of December preceding the date of such election to submit the question, and shall not later than the 15th of December have given notice of such decision by public advertisement, for at least one week in each issue of some daily newspaper published in the municipality.

"(4) The provisions of The Municipal Act as to the submission of questions to the electors and the voting thereon and the imposition of penalties and the prevention of corrupt practices in connection with elections shall apply to a vote taken under the provisions of this section, but no person shall be entitled to vote more than once on the question.

"(5) Nothing in this section shall entitle a street railway company, which has entered into an agreement with a municipal corporation not to run cars on Sunday, to run any of their cars on any Sunday unless and until the company has received permission from the council of such corporation by bylaw to run their cars on Sunday, and then only under and subject to such terms and conditions as may be contained in such bylaw, and unless and until the company has also entered into an agreement with the corporation to observe the terms and conditions of the bylaw."

The Ontario Legislature at its last session passed an act striking out the figures 50,000, wherever they occur in the the above section and substituting the figures 15,000.

Bill to Amend the Ontario Railway Act.

C. McCrea, M.L.A., introduced a bill in the Ontario Legislature May 13 to change the Ontario Railway and Municipal Board's powers as follows:—

1. The Ontario Railway Act is amended by inserting as part of section 210 the following as sub-section 4 thereof:

(4) In the event of the board being of opinion that the fares taken by any company are insufficient to meet the ordinary and necessary expenditures of the company and to provide for the maintenance and upkeep of the tracks, equipment and rolling stock in a manner consistent with the safety and comfort of the public, the board may authorize and permit an increase in the fares to be taken by any such company to such an extent as will ensure the provisions of this subsection being carried into effect notwithstanding the provisions of subsection 3 or the provisions of any agreement between the company and a municipality in regard to the amount of the fares to be charged by such company, to the contrary.

2. Section 260 of the said act is amended by adding thereto the following as subsection 9:

(9) The provisions of this section shall not apply nor shall the board be authorized to exercise the powers given it under the terms of the preceding subsections if it appears that the alleged violation is the result of a difference or dispute arising between any company and its employees until after such time as a board of conciliation has been appointed under The Industrial Disputes Act and has considered and delivered their award upon the matters in dispute nor shall the board exercise such powers provided any company shall within four days after the receipt of the said award express its intention of accepting and complying with the same.

When the bill came before the Legislature's Legal Committee on May 25 it was decided to replace it by one said to have been prepared by the Ontario Railway & Municipal Board as follows:—

"Where the council of any municipality has by resolution expressed the opinion that the wages paid to the workmen upon an electric railway or street railway operating in the municipality, under a bylaw or agreement of the municipal corporation are insufficient or unfair, and that such wages should be increased, the council may apply to the Ontario Railway and Municipal Board to hold an inquiry and report as to the practicability of increasing the wages paid to such workmen, having regard to revenue derived by the company in the operation of the railway, and the board shall not, where a question of wages is involved, take possession of the railway or any part of the same as authorized by subsec. 2 of sec. 260 of The Ontario Railway Act until the council has passed such resolution.

"Where upon such inquiry by the Ontario Railway and Municipal Board it is found that the revenue derived by the company in the operation of the railway, after providing for other working expenditures, and without making any allowance for dividends payable on preferred or common stock, is not sufficient to admit of an increase in the wages paid to such workmen without operating the railway at a loss, the council may by bylaw, and with or without submitting the same to the electors, authorize the company to charge such different or increas-

ed rates of fares as the council may deem necessary, and may enter into an agreement or contract with the company for that purpose."

"The powers conferred by sections 2 and 3 may be exercised notwithstanding the terms and limitations of any general or special act of this legislature or of any municipal bylaw, agreement, license, contract or other instrument heretofore passed or entered into."

When the house went into committee of the whole on the new bill, Lt. Col. Price, M.P. for Parkdale, Toronto, took exception to it, on the ground that it was, as reported from the legal committee, an entirely different bill to that referred by the house to the committee, and requested that the committee rise and that the Speaker give a ruling upon the point raised. The Speaker decided that, while it was apparently a new bill, recommended to the house by the legal committee, he did not feel that he could rule it out of order, but he advised adherence to the British practice and that the bill be withdrawn and be reintroduced as a new bill. Mr. McCrea accepted the Speaker's ruling, and introduced the bill as a new one. It was read a second time, but the motion for its second reading was defeated.

Lt. Col. Price then introduced a bill to amend the Municipal Franchises Act, which was in part as follows:—

2. (1) Subsection 3 of section 3 of The Municipal Franchises Act is repealed and the following substituted therefor:

(3) No renewal or extension of any franchise heretofore or hereafter granted, and no alteration or modification of the terms or conditions of any such franchise nor in any agreement between any individual, firm or company constructing or operating upon, or using any highway for the purpose of a railway, street railway or public utility, shall be lawful until the same has been sanctioned by a by-law of the council of the municipality which has been submitted to and has received the assent of the municipal electors in the manner provided by The Municipal Act with respect to bylaws requiring the assent of the electors.

(2) The amendment made by subsection 1 shall take effect as if the same had been enacted at the time of the passing of The Municipal Franchises Act, chap. 42, of the casts passed in the second year of His Majesty's reign.

This bill was ruled out of order and the whole matter then dropped.

Proposed Sale of Moncton Tramways, Electricity & Gas Co.'s Property.

The New Brunswick Legislature has passed an act on the application of Moncton City Council authorizing it to run ton City Council authorizing it to buy all the Moncton Tramways & Gas Co.'s rights, title and interest in the electric lighting plant in the city, and all its rights and property belonging to or forming part of its tramway system upon such terms as may be agreed upon between the city council and the company. No agreement for the purchase of the lighting plant or tramways, or either of them, shall take effect until it has been approved by the ratepayers.

The Moncton Tramways, Electricity &

Gas Co. acquired from the City of Moncton by lease dated May 11, 1910, the gas lighting and electric lighting plants belonging to the city and subsequently built the tramway lines. It has 2.5 miles of line, 4 motor passenger cars and 1 other car. The company is controlled by people in Pittsburg, Pa.

The ratepayers will vote on July 3, on a by-law to improve an agreement made between the city council and the company for the purchase of the latter's electric light plant and electric railway in the city, also certain lands, from May 31, 1920, for \$165,000, to be paid before May 31, 1921, with interest, and subject to certain adjustments to be settled by the city auditor.

Additional Cars for Toronto Railway.

The Ontario Railway and Municipal Board, on the application of the City of Toronto, has issued an order directing the Toronto Ry. to provide 200 additional double truck cars for operation by June 1, 1921, and in case of default, to pay the city a penalty not to exceed \$1,000 for each day it continues in default from that date.

The history of this matter dates back for several years, the board having ordered the company to provide and have in operation 100 additional cars by Jan. 1, 1918, and a further additional 100 by Jan. 1, 1919. Prior to this order, the City of Toronto promoted a bill in the Ontario Legislature, which provided among other things, that the company place in operation 100 new cars during 1917 and a further 100 during 1918, and in default to pay to the city \$100 a day for each car less than the numbers called for. While in committee this section of the bill was struck out, on the ground that it was a matter entirely within the Ontario Railway and Municipal Board's jurisdiction. At the same time as this matter was before the legislature, the city had an application before the Ontario Railway and Municipal Board to enforce the company's compliance with the board's previous order. Early in 1918 further legislation was sought by the city to compel the company to comply with the board's order and to penalize it for default, and an amendment to the Ontario Railway Act was passed Mar. 26, 1918, providing that the board, for the purpose of enforcing compliance with any order theretofore or thereafter made upon a railway company under its jurisdiction, to furnish additional cars for its service, might order such company to pay to the municipality in which it operates, a penalty not exceeding \$1,000 a day for noncompliance. On Apr. 19, on the city's application, the company was fined \$24,000 by the board, being at the rate of \$1,000 a day from Mar. 26, for noncompliance with the board's order. This judgment was appealed by the company through various courts and eventually to the Imperial Privy Council, which decided that the board could not inflict a penalty for noncompliance with a previous order, unless it was mentioned and made a part of the order. Since this judgment was delivered early this year, the city again applied to the board for an order to enforce its original judgment, with the penalty attached, and the board, as stated above, ordered the company to provide an additional 200 double truck cars by June 1, 1921, with \$1,000 penalty for each day in default.

London Street Railway Fares and Wages.

As stated in Canadian Railway and Marine World for June, the Ontario Railway and Municipal Board, after having taken over the London St. Ry. on May 5 upon the city council's application, owing to its having ceased to be operated in consequence of the employes strike for higher wages, presented a report upon the condition of the line on May 18. The board stated that a consideration of the report it had received from its special auditors clearly established the following conclusions:—"That the present fares will not produce sufficient revenue to operate the railway and pay an increase in wages to employes, even if no provision is made for dividends or depreciation. That of the \$637,480.00 capital stock outstanding, \$578,640.00 was paid for in cash and \$58,840.00 was paid as stock dividends properly declared out of earnings. The average yearly dividends of the shareholders for the 25 year period was 4.82%, which was paid 4.54% in cash and 0.28% paid in stock dividends. Since Dec. 31, 1915, the total amount of cash dividends declared was \$17,180.40. No dividends were declared in 1918 and 1919. As will be seen from the comparative statement of working capital, the company's financial position as of Dec. 31, 1918, shows a deficit of \$48,268.30, and as of Dec. 31, 1919, a deficit of \$33,179.38." The board has no power to increase fares, but the recent decision of the Appellate Division of the Supreme Court of Ontario indicates that the city council has such power, but under the Ontario Railway Act such increase is limited to an increase not exceeding 5c. a passenger. The board added:—"If railway operation is to be carried on, it is absolutely necessary to procure additional revenue. The board cannot operate at a loss, as there is no fund available to which it can resort to meet losses in operation. In the board's view there is only one possible source of additional revenue and that is by way of an increase in fares. It seems to the board that the question of a new wage scale and the question of increased fares are so interdependent that the duty of determining by negotiation with the company's employes the minimum demands of the latter, as well as of making such alterations in the agreement in respect of fares as may be necessary to provide additional revenue and ensure the continued operation of the railway, properly falls upon the London City Council as one of the original parties to that agreement."

Following the receipt of this report several propositions were made to the council in order to permit the charging of an increased fare so that an increase of wages might be given to the men. The first proposition was for the fixing of the fare at 5c. and abolishing all tickets, with the exception of the limited hour tickets, which it was proposed to sell at 6 for 25c.; this being defeated, an attempt was made to increase the number of limited tickets to be sold to 7 for 25c., but this also was defeated on June 9, and the men again went on strike. The Ontario Railway and Municipal Board presented another report to the Council on June 10, in which it expressed its willingness to operate the line on a basis of a 5c. cash fare, with unlimited tickets at 6 for 25c. and limited tickets at 8 for 25c. and to pay over to the city any surplus remaining after paying the men an advance of 8c. an hour. After several

days negotiations the men returned to work June 16, having, it is reported, agreed to accept an increase of 4c. an hour, with a rearranged service which will have the effect of reducing the number of cars on certain routes. The fare schedule remains unchanged, the railway still being under the Ontario Railway and Municipal Board's charge.

The London Free Press of June 17 said:—"The Ontario Railway and Municipal Board has effected an agreement with the street railway employes that may be said to represent a victory for all concerned. The employes are to receive an increase of 4c. an hour, and more if the earnings will warrant it. The company is to have its bonds retired at the rate of \$36,000 yearly, which is equivalent to about 6% upon the money invested in the railway. The patrons of the railway are to retain the dates of fare named in the agreement made between the city and the company 25 years ago."

The London Trades and Labor Council on June 16 asked that the council arrange for taking a vote as early as possible on the question whether the existing fares are to be continued, or whether the price of tickets is to be amended by selling 6 for 25c., unlimited, and 8 for 25c., limited.

Electric Railway Finance, Meetings, Etc.

British Columbia Electric Ry. and allied companies:—

| | Apr. 1920 | Apr. 1919 | 10 mos. to Apr. 30, 1920 | 10 mos. to Apr. 30, 1919 |
|----------|-----------|-----------|--------------------------|--------------------------|
| Gross | \$749,081 | \$631,988 | \$7,306,918 | \$6,022,107 |
| Expenses | 544,276 | 458,674 | 5,146,419 | 4,449,003 |
| Net | 204,805 | 173,314 | 2,160,499 | 1,573,104 |

Calgary Municipal Ry.—R. A. Brown, Superintendent, is reported to have submitted a statement to the city commissioners showing that there will be a total deficit of \$82,221.72 in street railway funds this year, of which \$38,688 is required to be placed in depreciation account. The total deficit to May 31 was \$10,629.29 without counting two carloads of wheels the city has bought, making the actual deficit \$18,139.04. The gross earnings of the railway this year are estimated at \$900,000.

Cape Breton Electric Co. and allied companies:—

| | Apr. 1920 | Apr. 1920 | 4 mos. to Apr. 30, 1920 | 4 mos. to Apr. 30, 1920 |
|----------|-----------|-----------|-------------------------|-------------------------|
| Gross | \$47,111 | \$46,456 | \$186,058 | \$184,554 |
| Expenses | 41,116 | 33,317 | 168,816 | 136,732 |
| Net | 5,995 | 13,137 | 17,242 | 47,802 |

Sudbury-Copper Cliff Suburban Electric Ry.—We are officially advised that the Sudbury-Copper Cliff Suburban Electric Ry. Co. has offered to sell its system to the town of Sudbury, Ont., for \$222,921. This amount is said to represent \$208,680, the actual cost of the system and \$14,251 representing three years' dividend on preferred stock. The company offered to accept payment in 10, 15 and 20 year municipal debentures.

The company's railway was opened for traffic in the Town of Sudbury, and from Sudbury to Copper Cliff, a distance of 6.27 miles, Nov. 11, 1915, and subsequent extensions brought the total mileage up to 9 miles. It owned at June 30, 1918, 3 closed passenger cars, and has its own power plant, a description of which was given in Canadian Railway and Marine World, Sept., 1916, pg. 377. Its capital consists of \$173,100 of stock,

and \$94,000 of bonds, a total of \$267,100.

Toronto Civic Railway.—

| | May 1920 | May 1919 |
|----------------------|-----------|-----------|
| Receipts | \$45,803 | \$36,004 |
| Passengers | 2,678,059 | 2,120,776 |

Toronto Railway.—

| | 1920 | | 1919 | |
|------|-------------|-----------------|-------------|-----------------|
| | Receipts | City percentage | Receipts | City percentage |
| Jan. | \$ 652,350 | \$110,950 | \$ 588,923 | \$ 88,339 |
| Feb. | 595,861 | 119,172 | 545,771 | 96,563 |
| Mar. | 745,706 | 149,141 | 615,526 | 123,105 |
| Apr. | 653,340 | 130,668 | 600,231 | 120,046 |
| May | 644,458 | 132,892 | 620,068 | 124,014 |
| | \$3,311,715 | \$642,823 | \$2,970,519 | \$552,067 |

Toronto Ry., Toronto & York Radial Ry. and allied companies:—

| | Apr. 1920 | | Apr. 1919 | |
|----------|-------------|-------------|-------------|-------------|
| | Apr. 1920 | Apr. 1919 | Apr. 1920 | Apr. 1919 |
| Gross | \$1,211,708 | \$1,051,960 | \$4,711,579 | \$4,257,882 |
| Expenses | 799,048 | 573,597 | 3,098,732 | 2,476,148 |
| Net | 412,660 | 478,363 | 1,612,847 | 1,781,739 |

Winnipeg Electric Ry. and allied companies:—

| | Apr. 1920 | | Apr. 1919 | |
|----------|-----------|-----------|-------------|-------------|
| | Apr. 1920 | Apr. 1919 | Apr. 1920 | Apr. 1919 |
| Gross | \$431,685 | \$367,196 | \$1,832,310 | \$1,513,834 |
| Expenses | 338,964 | 272,626 | 1,385,434 | 1,112,590 |
| Net | 92,721 | 94,570 | 446,876 | 401,244 |

Electric Railway Notes.

The Hydro Electric Power Commission of Ontario has ordered 6 motor cars and 6 trailer cars for the Hydro Electric Ry. (Essex Division), formerly Sandwich, Windsor & Amherstburg Ry.

R. A. Brown, Superintendent, Calgary, Alta., Municipal Ry., is reported to have advised the city council against adopting the pay-as-you-leave system on the city cars, and in favor of continuing the present system of pay-as-you-enter cars.

The Montreal Tramways Commission, the Montreal Administrative Commission and the Montreal Tramways Co. are reported to have agreed to have snow removed from the streets next winter by flat cars operated by the Montreal Tramways Co.

The St. Thomas, Ont., Municipal Ry. is reported to be operating two of its one-man cars, but pending the installation of the protective devices ordered by the Board of Railway Commissioners at the steam railway crossings the cars are in charge of a motorman and conductor.

A Hamilton Accident Suit.—Judgment was given by Mr. Justice Kelly recently, in an action brought by Mrs. Jeannie Ellis, against the Hamilton St. Ry. and H. K. Stiles, which was heard at the Hamilton, Ont., assize court in January. The plaintiff alighted from a Hamilton St. Ry. car on its stopping at a place other than a regular stopping place. Stiles was driving an automobile behind the car, and not expecting it to stop ran alongside it, knocking down and injuring Mrs. Ellis. In his judgment Justice Kelly said:—"While I do not lay it down that the stopping of a street car between the regular stopping places is in itself an act of negligence, there is a duty on those operating a street car to take reasonable means to safeguard one who, by their act, may be exposed to such danger. It is likewise incumbent on persons in the position in which plaintiff placed herself, or was placed, to take reasonable means to avoid such danger. But the jury have exonerated her from negligence in that respect." Judgment was given against the company for the damages assessed and costs and the action as against Stiles was dismissed with costs. A 15 days stay was granted.

Nova Scotia Tramways and Power Co's Annual Report.

Following are extracts from the annual report for the year ended Dec. 31, 1919. Early in the year your newly elected directors deemed it advisable to secure the services of Stone & Webster, Boston, Mass., to manage and operate the company. This was accomplished in June. In accepting the management Stone & Webster stated that in view of the conditions which have arisen during the past two or three years it was impossible for the company to fulfil its obligations either to the community or to the stockholders, if it were compelled to continue to attempt to meet its increased charges with its present rate of income. The results of the past year show that this statement was accurate. Many adverse causes had tended to bring about certain undesirable operating conditions, but certainly the prime causes were the war conditions in Halifax, its sudden increase in population, but lack of available labor, the disastrous explosion and the impossibility of financing in competition with Victory Loans and other war activities. As a result of these conditions, the tramway service was not satisfactory to anyone and the need of large sums for construction and reconstruction was perfectly evident. Additional cars were needed, as the equipment was entirely unable to handle the traffic properly. A portion of the distribution lines of the light and power department were in very bad shape. Due to the quality of coal available, the quality of the gas was entirely unsatisfactory.

Financing.—While the outlook was not encouraging for the immediate future, it was, nevertheless, determined to use every effort to better the service, in the confident belief that the imperative need of additional revenue would be recognized by all and granted by the authorities. Negotiations were entered into with well-known bankers in order to finance the necessary reconstruction and essential improvements and finally \$1,000,000 of 3 year 7% notes were sold. About three-quarters of the proceeds was immediately appropriated to definite items of construction, and reconstruction as follows: Tramway department, \$480,000; light and power department, \$188,000; gas department, \$58,000; and to miscellaneous items about \$12,000. Owing to unavoidable delays much of the work remains to be completed in 1920. Present plans call for the expenditure of the remaining quarter in about the following proportions: Tramway department, \$133,000; light and power department, \$60,000; gas department, \$30,000. While the business in sight will call for the expenditure of large sums in addition to the above, such expenditures cannot be made until the company is in a position to finance them.

Tramway Construction and Reconstruction: twenty-four steel safety cars were ordered, at a cost, including duty, of 42½%, of approximately \$10,000 each, or \$240,000 for the lot, and delivery was promised Nov. 1, 1919. In spite of the utmost efforts by your company, the manufacturers have from time to time postponed this date because of shortage of labor and materials. There now seems good reason to believe that actual delivery will begin in Feb., 1920, and that the cars, or at least a substantial number of them, will be in operation in March. For city work the safety car is rapidly displacing all others. The general public satisfaction with its performance is graphically demonstrated by the fact that

during 1919 three of every four cars ordered for city lines in the United States were safety cars. As traffic conditions in Halifax are not as difficult as in many cities on the continent, the fact that the safety car meets adequately the requirements of the more exacting conditions in many other cities assures its success in Halifax. During the year 21 of the more modern old cars were rebuilt and painted in the company's shops. One new snow sweeper was purchased and a new snow plow constructed.

Much of the tramway overhead construction was rebuilt during the last half of the year, and reasonable progress made in carrying out the programme of double tracking all of the belt line.

The track reconstruction was very expensive, one of the heaviest portions of this expense being the paving of the street itself, which under the law falls upon the company. This is particularly heavy, as the best grade of paving obtainable is required, even though the balance of the street, paved by the city, is covered with a less permanent surface. The work in connection with the rehabilitation of the track system was accomplished under very adverse conditions. Labor was scarce, and wages high, and the weather was particularly bad, hampering the progress of all outside work in the city. In addition to the completion of the paving programme already started and financed out of the proceeds of the notes authorized, the city's street paving programme for 1920 will call for an expenditure by the company of about \$400,000, along tracks which need not be reconstructed at present.

Tramway Earnings and Expenses.—The gross earnings of the tramway department have increased substantially over those of the previous year, but the increase has been more than offset by the growth in operating expenses and taxes. During the year, the labor cost of this department, already high, has increased over 15%; materials even to a greater degree. Shareholders familiar with the financial difficulties which have recently overtaken tramway lines in the U.S. will understand the greater difficulties which have confronted this company, when it is realized that materials in Halifax cost from 30% to 60% more than they do in the U.S. This is mostly because of high customs tariffs, which affect Canadian prices as well as goods purchased in the U.S. The average tramway fare in Halifax is 4.3c a passenger. In the United States such a fare has been found inadequate and ruinous and has been increased very generally. The street car fare in Boston is 10c, in St. Louis, 8c., in Cincinnati 7c., in Montreal and in Quebec 7c. There are 460 cities in the U.S. serving a population of over 31,000,000 in which fares have been increased.

Following the determination to better the service, the car mileage in 1919 was increased 432,227 miles, or 40% above that of 1918. The earnings per car mile in 1918 were 39.3c and fell to 33.2c. in 1919, because of the increased number of car miles operated. As there is still overcrowding in rush hours, further increases in car mileage will be made during 1920 and from 40 to 50 cars will be operated against the usual 31 during 1919.

Fares.—The Nova Scotia Legislature will be asked to authorize an increased tramway fare. The thinking public real-

ize fully that no street car company can carry passengers at 4.3c. each, and, if they can be assured of good service, should not oppose the legislation necessary to compensate the company for the cost of that service. It certainly is absolutely essential that the requested legislation be prompt and adequate, if the company is to be put into a position to borrow the additional funds which it is imperative that it should have if it is to give the service that the city needs.

Other sections of the report deal with the company's gas, electric light and power departments. The gas department has been self sustaining for a number of years and should be on a paying basis before the end of this year. The light and power department's growth of gross earnings has been satisfactory, and it should show even better earnings than it did last year.

Tramway Difficulties.—The difficulties which the company is endeavoring to meet are in the tramway department, which is not receiving income sufficient to cover the cost of service. It is in the interest of both shareholders and public that this situation be corrected. The City of Halifax is forging ahead rapidly. Its public utilities must keep pace with it or both they and it will suffer. Your company will need to make arrangements for additional funds during the coming year if it is to fill its place in the community. Unfortunately, with the present and prospective price of wages and materials, the net earnings from all departments are not sufficient to warrant a further increase in the company's liabilities. It seems hopeless to expect that operating expenses as a whole will be reduced; in fact, the tendency will be rather upward. The only way to increase the net earnings is to increase the operating revenue. This will be accomplished to some extent by the better service which the company will be able to give, as better service always brings increased use of that service. The increase from this source, however, will be but a fraction of what is necessary. The balance must be obtained by increased charges to the public. Experience in other cities has shown that the public is willing to make use of good facilities at an increased price. They do wish, however, to feel assured that they are not paying too much and giving the owners of a public utility an undue profit. In this connection the cry of "watered stock" is often raised. By "watered stock" is meant capitalization in excess of the value of the property. Most people now realize that under the law such excess capitalization has no effect on rates. The company is not entitled to earn a fair return on the par value of its securities, but upon the value of its property.

In authorizing the issue of securities the Board of Commissioners of Public Utilities valued the plant at about \$3,700,000, which was a much smaller amount than that determined by the company's appraisal. Since that time large additions have been made, so that the present book value is about \$4,700,000. Owing to the increased cost of construction, the real value of this property today is materially in excess of this latter amount. To encourage new capital it is evident that a fair return must be earned on the present capital. The constant need of new capital is emphasized when it is realized that in a growing city it is necessary to nearly double the facilities every seven to ten years. There-

fore rates must be based on the cost of acquiring new capital and the cost of installing new facilities.

The trouble with the general public utility situation today is that it is trying to function by meeting a post-war outgo with a pre-war income. It cannot be done. The currency has been inflated. The dollar today, measured by its purchasing power of five years ago, is less than 50c. Many years must elapse before this condition can be fully corrected. It can only be met by permitting the industry to charge rates which will give it an income commensurate with its outgo. This report has gone into considerable detail because your directors feel that the shareholders are entitled to full information. They are, however, by no means discouraged, as they feel confident that the citizens and the governing bodies in Halifax have a clear realization of the situation, and realize the wisdom from their own standpoint of supporting the company in its endeavor to give them a public utility of which they can be legitimately proud.

Results of operation for year ended Dec. 31, 1919.

| | Gross Earnings | Operating Expenses | Balance |
|---|-----------------------|---------------------|---------------------|
| Railway dept. | \$532,368.11 | \$462,349.16 | \$ 70,018.95 |
| Light and power dept. | 538,780.12 | 324,330.05 | 214,450.07 |
| Gas dept. | 121,539.72 | 133,524.87 | *11,985.15 |
| Steam heat dept. | 46,861.98 | 28,484.68 | 18,377.30 |
| Misc. earnings (rents) | 2,559.00 | | 2,559.00 |
| Revenue interest | 16,392.99 | | 16,392.99 |
| Total | \$1,258,501.92 | \$948,688.76 | \$309,813.16 |
| Taxes | | | 98,303.13 |
| Net earnings | | | \$211,510.03 |
| Int. and Amort. charges | | | 144,618.89 |
| Dividends paid on preferred stock | | | \$ 66,891.14 |
| | | | 62,364.00 |
| Prior surplus (Jan. 1, 1919) | | | \$ 4,527.14 |
| | | | 16,630.52 |
| Deferred dividends restored to surplus acct. | | | \$ 21,157.66 |
| | | | 62,280.00 |
| Net direct charges to reserve and surplus (applying to prior year's operations) | | | \$ 83,437.66 |
| | | | 34,311.49 |
| Appropriation for replacements | | | \$ 49,126.17 |
| | | | 47,557.75 |
| Current surplus | | | \$ 1,568.42 |

†3% June 1st. *Deficit.

The foregoing report was prepared before the N.S. Legislature had authorized the increase of fares.

At the annual meeting all the directors were re-elected, except F. B. Adams, who was succeeded by W. E. S. Griswold, New York, N.Y. The directors are as follows: A. Stuart Pratt, President; W. H. Covert, K.C., Vice President; W. L. Weston, Manager; F. P. Royce, A. J. McAllister, W. E. S. Griswold, M. L. Sperry, R. Ernst and H. H. Hunt. Stone & Webster are General Managers; H. A. Lemmon, Secretary, and J. R. Blackett, Treasurer.

The Canadian National Rys. Toronto Association held its annual picnic at Orillia, Ont., June 26, travelling by special train from Toronto and back. Several hundred people attended, including President D. B. Hanna, and a number of other prominent officials.

Montreal Incline Ry.—A press report states that the tracks, etc., have been taken up and the plant dismantled. The property was sold to be removed, the price received for the material being reported as \$2,000.

Steel Rail Order.—The Canadian National Rys. have ordered 7,500 tons of steel rails, 85 lb. C.P.R. standard section, from Dominion Iron & Steel Co., Sydney, N.S., for immediate delivery.

Nova Scotia Public Utility Commissioners Show Necessity for Higher Rates.

The Board of Commissioners of Public Utilities for Nova Scotia's last annual report states that of the 276 public utilities in the province required to report to the board, five are tramways. Referring to these, the commissioners say: "It is being generally recognized that the present are strenuous times for public utilities of every class. The difficulty of obtaining new capital and the higher interest rate demanded, the increased cost of labor, fuel and materials all contribute to make more severe the struggle, and a movement for an increase of rates is observable all over the continent. It was not to be expected that the utilities of this province should prove an exception to the rule, or escape the general stress. A number of them, including several incorporated towns, notwithstanding the advantage which a lower interest rate and exemption from taxation gives them, have found it difficult to continue service on the old schedules.

"The general movement towards higher rates is nowhere more noticeable than in the case of tramways. Notwithstanding that it is said that 53% of the urban population of the United States is paying higher fares on tramways than a year ago, it appears that 10% of the companies are under receivership. Similar figures are not available for Canadian centers, but it may be observed that increases have been granted in a large number of Canadian cities. What makes the problem more difficult is that indisputable fact that any increase over what has apparently come to be considered the standard 5c fare, does not bring a proportionate increase of revenue. It might be supposed that the trifling difference between 5c and 6c would deter few from using tram service. Experience, however, teaches that whether it be higher cost, inconvenience of making change, or resentment at a departure from long established standards, a falling off in traffic, not inconsiderable, follows any advance in rates. Some attempts at a solution of the problem thus presented have been suggested, amongst others, state or municipal aid to the utility, while the 5c fare is continued.

"Recently in New Brunswick a commission of experts called in to investigate the N.B. Power Co.'s affairs filed its recommendations. Among others, besides joint control, may be noted a proposal to relieve the company from any special taxes; from street repairs, excepting those made necessary by own way or structure; from removal of snow from any street or road; from cost of new pavement, and from rental of any street or bridge beyond the expense of maintenance of tracks. While on the one hand it may be said that it is illogical and unfair to impose any part of maintaining tram service upon others than those who use and directly benefit, it may with considerable force be argued that inasmuch as facility in transportation and the maintenance of a low-priced and efficient service benefits the whole community, giving in most instances an added value to real estate, no injustice is done in placing at least a portion of the burden upon those who may be non-users, but still derive a benefit, substantial if indirect.

"Under existing conditions the board

deems its duty clear. Public utilities, in common with other companies and ordinary citizens, must be expected to bear their fair share of the burden which war conditions have imposed, but they are entitled to such a revenue as will meet operating cost and yield a fair, if somewhat modified return on the value of the property used. To withhold revenue sufficient to operate must result in decreased efficiency of service and ultimate bankruptcy or a receivership. To withhold return on investment will discourage capital and retard development of necessary enterprise. The board realizes the responsibility of exercising the wide powers which have been entrusted to it in dealing with matters of great importance to the public and often vital to the utility."

The companies operating electric railways under the board's jurisdiction are: Cape Breton Electric Co.; Nova Scotia Tramways and Power Co.; Pictou County Electric Co.; Sydney and Glace Bay Ry., and Yarmouth Light and Power Co. The Sydney and Glace Bay Ry. is operated by the Cape Breton Electric Co., thus making four companies, all of which operate electric light and power plants in their respective areas. The Cape Breton Electric Co. also operates a ferry service and the Nova Scotia Tramways and Power Co. also operates a gas plant. The Inverness Ry. and Coal Co., also comes under the board's control in respect of its electric light plant.

The commission's receipts for the year ended June 30, 1918, including a balance brought forward of \$772.10, were \$13,191.47. This amount was made up of fees of \$25 each, collected from 25 companies, including the Cape Breton Electric Co. and the Nova Scotia Tramways and Power Co., and of assessments amounting to \$11,794.37, of which companies operating electric railways paid the following amounts. Nova Scotia Tramways and Power Co., \$2,868.49; Cape Breton Electric Co., \$1,913.20; Pictou County Electric Co., \$996.87, and Yarmouth Light and Power Co., \$208.14. The expenditures including: Salaries of the commissioners, \$9,620; expenses of the commissioners, \$728.59; salary and expenses of counsel, \$916.67; salary and expenses of the secretary, \$565.60; and sundry other items were \$12,480.59, leaving a balance of \$710.88.

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

| | |
|--|---------------|
| Calgary and Edmonton Ry. | Acres. 816.50 |
| Canadian Northern Ry. | 191.52 |
| Canadian Pacific Ry. grants | 27.10 |
| Canadian Pacific Ry. roadbed and station grounds | 114.76 |
| Central Canada Ry. | 10.97 |
| Edmonton, Dunvegan & British Columbia Ry. | 85.32 |
| Grand Trunk Pacific Branch Lines Co. | 14.57 |
| Nicola, Kamloops & Similkameen Ry. | 19.95 |
| Total | 780.69 |

The G.T.R. motive power team from the Stratford, Ont., shops won the Chamberlin trophy in the fifth annual competition in first aid work at Montreal recently. Two teams each from Montreal and Stratford shops, and one each from Bonaventure station, Montreal, Turcot, Que., and Belleville, Ont., entered the competition.

Electric Railway Employes' Wages, Working Conditions, Etc.

Brantford Municipal Ry.—A press report states that a new wage scale has been agreed upon between the commissioners and the employes, the increase granted being equal to about 15% and the new rates per hour being worked out as follows:—First year, 46c.; second year 48c.; third year, 50c.

Hamilton St. Ry.—The board of conciliation appointed to deal with questions of wages, etc., as between the company and its motormen and conductors being members of Division 107, Amalgamated Association of Street and Electric Railway Employes of America, was composed of Judge C. D. Snider, chairman; G. S. Kerr, K.C., representing the company, and F. Bancroft, representing the men. The board met April 29, when the parties not being ready, the sittings were adjourned to May 10, from which date they were continued to May 18, when a majority report was signed by Judge Snider and G. S. Kerr. During the sittings the various sections of the proposed agreement were discussed and finally adopted by both parties with the exception of those relating to wages and overtime. Following are the rates of wages per hour in force under the old agreement, in comparison with the rates recommended in the majority and minority reports respectively:—

| | Old rate. | Majority report. | Minority report. |
|------------------------|-----------|------------------|------------------|
| First six months | 38c. | ..... | ..... |
| Second six months .. | 40c. | ..... | ..... |
| First year | 34c. | 50c. | ..... |
| Second year | 38c. | 45c. | 55c. |
| Third year | 41c. | 52c. | 65c. |

The majority report recommending time and a half for all overtime, also for legal holidays, and 7c. an hour extra for work on Sundays, which is not overtime. The minority report recommended that time and a half be paid for all overtime, legal holidays and Sunday work. The board was unanimous in fixing the date of the coming into operation of the new wage schedule as April 1.

After some negotiation between the parties, the men agreed to accept the wages recommended in the majority report, and an agreement was signed accordingly.

Hull Electric Co.—We were officially advised recently that the wages agreement between the company and its employes would expire July 1. The rate per hour under that agreement for motormen and conductors has been:—First six months, 34c.; second six months, 36c.; second year, 39c.; third year, 41c. The men asked for a new agreement with a uniform rate of 65c. Several conferences were held between G. Gordon Gale, Vice President and General Manager, and the men's representatives between June 3, when the demand was made, and June 9, but without result. At a meeting held June 12, the men decided to apply for a board of conciliation.

Hydro Electric Ry., Essex Division, formerly Sandwich, Windsor & Amherstburg Ry. W. R. Robertson, General Superintendent Hydro Electric Power Commission of Ontario's Electric Railways, is reported to have had a conference with the employes in Windsor June 19, and to have stated that wages will be increased on July 1.

Levis County Ry.—We were officially advised June 17 that the wages for employes operating safety cars are 32c. an hour for first year men, increasing 2c. an hour yearly until in the fifth year the rate is 40c.

London & Port Stanley Ry.—In our last issue it was stated that the employes had returned to work, at the rates of wages fixed by the conciliation board, but that if the management found it possible to pay higher wages in the future it would do so. The increased wages recommended by the conciliation board were made effective from Feb. 1, and some slight further advances have now been made to freight conductors and motormen, and to brakemen, also effective from Feb. 1. Following is a comparison of the rates per hour, prior to the conciliation proceedings, the conciliation board's award and the new rates.

| | Old | Conciliation | New |
|------------------------------------|-------|--------------|------|
| Passenger conductors and motormen— | | | |
| 1st year | 44c. | 46c. | 46c. |
| 2nd " | 46c. | 48c. | 48c. |
| 3rd " | 47c. | 50c. | 50c. |
| 4th " | 48c. | 52c. | 52c. |
| Freight conductors and motormen— | | | |
| 1st year | 44c. | 46c. | 48c. |
| 2nd " | 46c. | 48c. | 50c. |
| 3rd " | 47c. | 50c. | 52c. |
| 4th " | 48c. | 52c. | 54c. |
| Brakemen— | | | |
| 1st year | 4c. | 41c. | 43c. |
| 2nd " | 42c. | 43c. | 44c. |
| 3rd " ..... | ..... | ..... | 45c. |
| Baggageman | 37½c. | 40c. | 43c. |
| Linemen | 55c. | 60c. | 60c. |

Conductors, motormen and brakemen are paid time and a half after 10 hours. Line men are paid time and a half after 9 hours work, previous to 10.30 p.m., and after that double time. Some advances have also been given to other classes of employes.

Montreal Tramways Co.—Following the failure of efforts to secure a new agreement with the company at greatly advanced wages, as detailed in Canadian Railway and Marine World for June, pg. 318, the employes applied to the Minister of Labor for a board of conciliation, which was appointed June 10 as follows: Justice Archambault, Chairman; E. W. Villeneuve, representing the company, and J. A. Woodward, representing the men.

The Montreal Tramways Commission, which, under Quebec provincial legislation, has control of the company's expenditures, fares, etc., has been carrying large advertisements in Montreal papers to show that the wages asked are unreasonable and could not be paid without another increase in fares.

Nova Scotia Tramways & Power Co.—Under the provisions of an act passed by the Nova Scotia Legislature at its recent session granting the company power to increase fares, the company was directed forthwith to extend to the employes of its various departments the increased wages schedules agreed upon.

The maximum rate agreed upon for conductors and motormen is 52c. an hour, with 5c. an hour extra for operators of one-man cars. The rate of pay is to be graduated up to the maximum according to length of service. It is estimated that the increase of pay granted will add about \$100,000 a year to the company's pay roll.

Ottawa Electric Ry.—Justice F. S. MacLennan, chairman; G. D. Kelley, representing the company, and A. E. Fripp, K.C., M.P., representing the employes, members of Division 279 Amalgamated Association of Street and Electric Railway Employes of America, met as a board of conciliation in Ottawa, May 25, and presented a unanimous report May 28. The report deals with three matters, viz., a closed shop, an 8-hour day, and

wages. After hearing all that was urged by both parties the board concluded that it was not desirable that the request for a closed shop should be granted. The company has no objection to its men joining the union, but desires to leave them free to join or to remain out; it has not in the past and will not in the future discriminate against any employe who does not desire to join the union. The men have been working a nine hour day, and are being paid overtime rates for all work done in excess of that time. The service rendered to the public is between 6 a.m. and midnight, covering a period of 18 hours, and the board did not think it practicable to introduce the 8-hour day under these circumstances. Following are the rates of pay per hour for motormen and conductors, as agreed upon, compared with those in force formerly:—

| | Old. | New. |
|----------------------------|------|------|
| First year | 39c. | 49c. |
| Second year | 41c. | 51c. |
| Third year | 43c. | 53c. |
| Fourth year and over | 45c. | 55c. |

The men asked for a minimum rate of 65c. an hour. In regard to the other employes the board granted an increase of 20%. Time and a quarter is to be paid for work on Sundays and legal holidays and time and a half for all overtime.

The agreement is dated from May 1, and is to be operative until May 1, 1921, and from year to year thereafter, unless either party shall give 30 days notice to the other of a desire for a change.

Quebec Ry., Light & Power Co.—We are officially advised that an agreement has been made between the company and the Fraternal National des Employes de Tramways de Quebec (Union of conductors and motormen of the city street railways division, Q. R. L. & P. Co.). It is dated May 15, and is to be continued unless cancelled by either party giving the other two months notice. It provides for the recognition of the union; that the company is to engage only conductors and motormen who are members of the same; the appointment of a committee to deal with engagements, suspensions or dismissals and working conditions, consisting of two employes and two representatives of the company with a president elected by the four, who, however, has no vote; for respecting the present agreement, which does not expire until Mar. 1, 1921, and fixes a new scale of wages effective May 16. Following is the new scale of wages per hour as compared with that in operation formerly:—

| | Old. | New. |
|--------------------------------|------|------|
| On appointment | 31c. | 34c. |
| After one year service | 36c. | 40c. |
| After two years service | 36c. | 42c. |
| After five years service | 38c. | 45c. |

The company has also entered into an agreement with the shopmen on its city division, effective June 1, and to continue in force from year to year thereafter unless 30 days written notice is given by one or other of the parties prior to each recurring May 31.

Sarnia St. Ry.—A press report states that there is little likelihood of a strike taking place in Sarnia, Ont., in connection with the employes' application for an increase of wages. It is stated that many of the older employes are shareholders in the company, and that they are likely to discourage a strike.

The St. Thomas, Ont., City Council's street railway committee has recommended the submission to the ratepayers of a bylaw providing for the operation of cars on the municipal railway on Sundays.

Another Toronto Railway Strike.

The agreement as to wages and working conditions between the Toronto Ry. Co. and its employes expired June 15, prior to which the employes union made a demand for amended working conditions in several details, and for the payment of a flat rate of 85c. an hour for motormen and conductors in place of the rates fixed in the award of the 1919 board of conciliation, viz.: First three months, 50c.; next nine months, 52½c.; thereafter, 55c. an hour. The company applied for the appointment of a board of conciliation, which was granted, and the board was constituted as follows:—Justice MacLennan, Montreal, chairman; W. H. Moore, General Manager, Toronto & York Radial Ry., representing the company, and J. T. Vick, business agent Bricklayers Union, Toronto, representing the men.

The board held its first sitting June 9, and made its report June 11. The report was signed by the three members of the board. The working conditions in force were recommended by the board of conciliation of 1919, and the modifications thereof asked had reference to a number of matters, the most important being the demand for a closed shop, and the payment of overtime after 8 hours work instead of 8½. The board, after taking into consideration everything that was said by the parties, came unanimously to the conclusion that no change should be made in the working conditions.

After reviewing the conditions as to wages, particularly in cases where rates have been fixed by boards of conciliation, and conditions as to cost of living, the report said:—"Briefly stated, the result of the evidence on wages and the cost of living shows: The wages now paid are equal to or exceed those paid by any other street railway in eastern Canada. The wage increases during the past few years, going back to the commencement of the war, are fully equal to all increases in the cost of living. The amounts actually paid to motormen and conductors are wages during the last six months of 1919, and during May, 1920, show that, on an average, motormen and conductors were paid amounts equal to or averaging more than the skilled trades of the city, without taking into account uniforms and free tickets, or other advantages which the employes enjoy in the company's service. The company's franchise expires on Aug. 31, 1921, and the board was informed by the mayor that the city will take possession of the road on that date. The board, having considered all evidence and representations made to it, recommend unanimously as follows: That the working conditions and rates of pay in force since July 4, 1919, should be continued until Aug. 31, 1921, and trust that this recommendation will be accepted by all parties concerned."

On June 12, J. T. Vick, the men's representative, who had signed the award along with the other two members of the board, forwarded to the Minister of Labor a letter in which he said:—"I have been reading the award carefully and I find that I signed it under a misapprehension. I am agreeable to recommend most of the conditions as they prevailed and which have been recommended. I certainly had no idea that my signature placed me in the position of agreeing with the other two of the board on the rates of wages. I contended for an increase and am going to recommend the

same. While the figures and evidence presented show that at the present time wages paid equal and exceed in some cases that paid on other roads in Eastern Canada per hour, but not per day, yet it was shown by the evidence that the wages in border cities of a like size exceed that paid in Toronto both in hourly and daily rates, Cleveland paying 75c. an hour, Detroit 75c, Chicago 65c, and the corporation of the city of Toronto paying their street railway employes from 60 to 65c. with holidays added. The amounts actually paid some motormen and conductors show that these men wrok a great deal of overtime in order to make the amounts submitted by the company, and without working overtime the men would not earn the rates paid skilled trades. That for the sake of harmony and everybody concerned I recommend that the present working conditions be continued until Aug. 31, 1921, which is the expiration of the franchise, and also recommend that in my opinion the men working for the Toronto Ry. should receive at least the same wages as paid by the City of Toronto, where there was an exhaustive investigation by the heads of the departments and the Board of Control before striking the rates named, namely: 60c. an hour for the first three months; 63c. for the next nine months; 66c. thereafter."

The employes at a meeting held after receipt of the conciliation board's report refused to accept it, and passed the following resolution, which set out:—"That we agree to accept a scale of wages 20% in advance of existing scale for all men included in the draft agreement presented to the company, which equals the rate paid by the City of Toronto, for like service; all other conditions to remain as provided in existing arrangements between the Toronto Ry. employes represented by the union and the Toronto Ry. Co." The men gave the company until June 18, at 3 a.m., to accept the terms, threatening an immediate strike if they were not conceded. As it was found impossible to hold a meeting of the company's directors within that time, the men extended the time for the acceptance of their terms to June 23 at 3 a.m. The directors met on June 22 and decided not to grant the demands and the men struck on June 23 at 3 a.m., the operation of the whole of the company's cars ceasing.

It is important to note that while the men demanded the same rate of wages as paid by the Toronto Civic Ry., they also demanded the Toronto Ry.'s working conditions, not those of the Toronto Civic Ry., and as the company pointed out in an advertisement the wages paid on the civic line, viz., 60c., 62½c. and 66c. an hour, combined with the Toronto Ry.'s extra allowance of time and a quarter for Sunday work, would be equivalent to 82½c. an hour, and combined with time and a half for overtime and holiday work would be equivalent to 99c. an hour, neither of which is paid by the city.

On June 24 the Mayor notified the Toronto Ry. that it had failed to operate its service and demanded that it resume operation. The company's General Manager replied that it was prepared to operate a service immediately, upon receiving the Mayor's assurance that efficient protection would be given, so that the lives of its employes, and its property, would not be endangered. On June 25 the Ontario Railway and Municipal

Board issued the following statement:—"The Board met representatives of the company and of the men at noon, under an appointment issued at the instance of the Toronto Ry. Co. A lengthy discussion took place, and was continued until about 1.30, and a number of proposals and counter proposals were made, none of which, however, was accepted by both parties to the conference. The Board then intimated to the conference that it was prepared to make a proposal, and would do so after the adjournment for lunch. At 3 o'clock the conference resumed, and the Board submitted this proposal: "That the wages payable to the motormen and conductors and other employes on strike should be raised to 55c., 57½c., and 60c. an hour, according to classification. This increase is approximately an increase of 10% upon the wages heretofore paid to them. These terms are to be incorporated in the form of an agreement binding on the men and on the company until the expiry of the company's franchise. The representatives of the men agreed to lay the proposal before a mass meeting of the striking employes tomorrow (June 26). If the proposal is accepted the representatives of the men are of the opinion that the cars could be started on Sunday morning (June 27). The Board assured the representatives of the men that if the proposal is accepted by the striking employes, the Board would enforce performance on the part of the company."

One June 26 the men decided, by a vote of 841 to 333, to return to work on the terms offered by the Board, and the cars resumed running on Sunday morning, June 27, after having been stopped for four days. It is said that the 5c. raise will add about \$375,000 a year to the company's pay roll.

Mainly About Electric Railway People.

Verschoyle Cronyn, who died in London, Ont., June 1, aged 88, was the promoter and principal owner of the original London St. Ry., prior to its electrification.

G. Gordon Gale, Vice President and General Manager, Hull Electric Co., has been appointed chairman of the Canadian Standards Association's sub-committee on wire strand.

Charles Johns, of Cleveland, Ohio, has been appointed Manager, St. Thomas Street Ry., by the city council of St. Thomas, Ont., at \$175 a month.

A. Lacasse, heretofore private secretary to Hon. H. Seguin, of the Quebec Government, is reported to have been appointed Secretary, Montreal Tramways Commission, vice W. R. Beaudry, resigned to resume the Dorval Jockey Club's Secretaryship.

E. L. Milliken, formerly Manager, Cape Breton Electric Co., Sydney, N.S., and subsequently, successively, Manager, Houghton County Traction Co., Houghton, Mich., and Houston Electric Co., Houston, Texas, has been transferred to Stone & Webster's home office at Boston, Mass.

C. U. Peeling, who resigned his position as Manager Cornwall Street Ry., Light & Power Co., Cornwall, Ont., a few months ago, to enter the Illinois Traction Co.'s service at Peoria, Ill., has transferred to the Palmetto Power & Light Co. at Florence, South Carolina.

Marine Department

Canadian Government Merchant Marine, Ltd., Shipbuilding, Operation, Etc.

Steel Supplied for Shipbuilding.—J. H. Sinclair, M.P. for Antigonish and Guysborough, N.S., asked the following questions in the House of Commons recently, the answers being given by the Minister of Marine.

"Referring to an item of expenditure described as steel for shipbuilding to be refunded by contractors, \$3,283,965.05, found on page ZZ42 of the 4th volume of the Auditor General's report, has all this money been refunded?" Answer:—"Not all, because the department has not finally settled with the builders for the ships for which the steel was purchased. The balance outstanding is \$289,252.10."

"If so, when?" Answer:—"By deductions from progress payments during 1918-19, \$861,430.80; 1919-20, \$2,133,282.15."

Keels Laid.—Since Canadian Railway and Marine World for June was issued, we have been advised of the laying of the following keels for steel cargo steamships, for Canadian Government Merchant Marine Ltd.:—

June 5, s.s. Canadian Rover; Marine Department contract 57; builder's yard no. 67; approximately 3,890 d.w. tons; Collingwood Shipbuilding Co., Collingwood, Ont.

June 9, s.s. Canadian Racer; Marine Department contract 54; builder's yard no. 10; approximately 3,890 d.w. tons; Midland Shipbuilding Co., Midland, Ont.

Names of Steamships.—The Marine Department has decided on the name Canadian Harvester for the steel cargo steamship being built by the Port Arthur Shipbuilding Co., Marine Department contract 61; builder's yard no. 45; approximately 3,890 d.w. tons.

Launchings of Steamships.—Since Canadian Railway and Marine World for June was issued, we have been advised of the following launchings of steel cargo steamships, for Canadian Government Merchant Marine Ltd.:—

June 22, s.s. Canadian Victor; Marine Department contract 50; builder's yard no. 77; approximately 8,390 d.w. tons; Canadian Vickers Ltd., Montreal.

Deliveries of Steamships.—In addition to the steamships mentioned in Canadian Railway and Marine World previously, the following deliveries have been made:

June 15, s.s. Canadian Prospector; Marine Department contract 37; builder's yard no. 14; approximately 8,390 d.w. tons; J. Coughlan & Sons, Vancouver, B.C. This ship took a cargo, at Vancouver, for New Zealand and Australia.

June 15, s.s. Canadian Observer; Marine Department contract 47; builder's yard no. 66; approximately 3,990 d.w. tons; Collingwood Shipbuilding Co., Collingwood, Ont. She went to Huron, Pa., for a cargo of coal for Montreal, and will take a general cargo from Montreal to Barbados, Trinidad and Demerara.

Officers of Steamships.—The following officers have been appointed by Canadian Government Merchant Marine Ltd. The first column contains the names of the ships, the second those of the captains, and the third those of the chief engineers.

| | | |
|--------------------|--------------|------------|
| Canadian Aviator | P. J. Murphy | ..... |
| Canadian Gunner | ..... | B. Rogers |
| Canadian Miner | M. Fraser | ..... |
| Canadian Navigator | W. H. Miller | J. Borland |

| | | |
|---------------------|-----------------|----------------|
| Canadian Observer | D. M. Dickson | ..... |
| Canadian Prospector | H. S. Hilton | ..... |
| Canadian Raider | E. C. Sears | ..... |
| Canadian Rancher | ..... | John Still |
| Canadian Sealer | E. Randell | ..... |
| Canadian Signaller | R. D. Maxwell | ..... |
| Canadian Trapper | ..... | C. E. Thompson |
| Canadian Warrior | W. G. McConechy | R. Cook |

Regarding the appointments mentioned above, C. J. Murphy succeeds H. S. Hilton as master of the Canadian Aviator, the latter having been appointed master of the Canadian Prospector; W. H. Miller succeeds E. C. Sears as master of the Canadian Navigator, the latter having been appointed master of the Canadian Raider, succeeding Capt. Watkins; R. D. Maxwell has been appointed master of the Canadian Signaller, succeeding J. E. Faulkner, and W. G. McConechy has been appointed master of Canadian Warrior, relieving C. R. Bissett, who is on leave of absence.

Dominion Marine Association.

President, A. E. Mathews, Managing Director, Mathews Steamship Co., Toronto.

First Vice President, H. W. Cowan, Director of Operation, Canada Steamship Lines, Montreal.

Second Vice President, A. A. Larocque, President, Sincennes-McNaughton Line, Montreal.

Executive Committee, E. H. Beazley, Union Steamship Co. of British Columbia, Vancouver; W. E. Burke, Canada Steamship Lines, Montreal; T. R. Enderby, Montreal Transportation Co., Montreal; L. Henderson, Montreal Transportation Co., Montreal; W. J. McCormack, Algoma Central Steamship Line, Sault Ste. Marie, Ont.; G. J. Madden, George Hall Coal Co. of Canada, Montreal; E. W. Oliver, Niagara, St. Catharines & Toronto Navigation Co., Toronto; W. H. Smith, Ontario Car Ferry Co., Montreal; J. F. Sowards, Sowards Coal Co., Kingston, Ont.; J. F. M. Stewart, Point Anne Quarries Ltd., Toronto; Jno. Waller, Keystone Transportation Co., Montreal; Lorne C. Webster, Webster Steamship Co., Montreal; J. Wilkie, Imperial Oil Ltd., Toronto; A. A. Wright, honorary member, Toronto.

General Counsel, Francis King, M.A., Kingston, Ont.

Official Organ, Canadian Railway and Marine World, Toronto.

Freight Steamships on Inland Waters. J. E. Armstrong, M.P. for East Lambton, Ont., asked in the House of Commons recently:—"Does the government intend to place freight ships built and owned by them on our inland waters during the present season? If so, how many of said vessels will be so placed? If the Canadian Government Merchant Marine organization has the handling of the government owned ships, what reason, if any, do they give for not using some of the vessels under their control in the carrying trade on our Great Lakes?" The Minister of Railways replied:—"Ships owned by the Government through its Government Merchant Marine are being operated by that organization in connection with the Canadian National Rys., as will appear in the public interest. Cannot say at present time what ships may operate on the inland waters during present season."

Extension of Service.—A London, Eng., press dispatch of June 8 states that the Times financial editor indicates the in-

stitution this year by Canadian Government Merchant Marine Ltd. of further cargo service between Canadian Atlantic ports and India, Ceylon and the Far East, via the Mediterranean, and also to South Africa, and from Pacific ports to the Far East and Calcutta. This "information," which originated in Canada in April, and which was published in Canadian Railway and Marine World for May, eventually found its way into English papers, and has apparently been cabled to Canada in June as "news," with special credit to the Times financial editor for perspicacity. We have been further officially advised that the plan which is now being worked on by the C. G. M. M. management covers a service from Atlantic ports the year round to India, Ceylon, Straits Settlements and Java, the ports of call not having yet been settled, but they will be arranged in accordance with the desires of shippers whose traffic will be carried. It is also contemplated to establish a service to China, India and Singapore, but no details have been worked out. The first sailing in the first named service will be towards the end of August by the s.s. Canadian Conqueror, approximately 8,390 d.w. tons, now under construction by Canadian Vickers Ltd., Montreal.

Australian Trade.—C. Harlett, Assistant Canadian Trade Commissioner at Melbourne, Australia, wrote April 28:—"Already two steamships of the Canadian Government Merchant Marine, Ltd., the Canadian Raider and Canadian Importer, have arrived at Sydney and Melbourne. These ships are to be followed by the Canadian Exporter and two other ships of similar size at regular monthly intervals. The Canadian Raider departed from Newcastle for Auckland (with a cargo of coal) to load at the latter port for Eastern Canadian ports. In a few days the Canadian Importer, which has discharged her cargo of lumber, paper, etc., and is now loading cargo for New Zealand and Vancouver to her full capacity at Melbourne, will depart for Wellington and Auckland, where she will complete loading for Vancouver. Apart from filling a long felt want in the shipping facilities between Canada and Australia, these ships, in carrying cargo from the Commonwealth to New Zealand, are relieving considerable congestion existing for some time in Australian ports, and the available space is eagerly sought by shippers of Australian products to both New Zealand and Canada. Upon her arrival in Melbourne the Canadian Importer was visited by a number of prominent Australian shipping men, and most favorable comment was made upon her design, her exceptional clear holds, large hatches and powerful winches for the rapid loading and discharge of cargo."

s.s. Canadian Inventor.—Hon. W. L. Mackenzie King said in the House of Commons June 8: "I have a message sent on behalf of some British Columbia shippers complaining about the delay in sailing of one of the Government Merchant Marine vessels. I will ask the Minister of Marine if he can give any information in regard to the questions asked. The telegram reads: 'Information that steamship Canadian Inventor booked

freights March-April loading has not yet sailed or any indication of sailing. Shippers have had orders cancelled on them with tremendous loss. Understand that this ship held up owing to some dispute between government and contractors over painting boat which means at most few hundred dollars and in any case would not prevent ship going to sea. Owing to falling market, incompetency and delay on part of government has made tremendous loss to shippers here. Suggest you make enquiries in respect to this matter.'

The Minister of Marine replied: "At the moment I have only a slight knowledge of the matter, but I shall be very glad to give a more complete answer tomorrow. The delay is not due to anything that could be avoided by the builders. I understand it is due to the fact that a strike has existed in the shipyards at Vancouver for some time."

On June 10 the Minister said:—"As I stated the other day, one of the causes of the delay was a strike of the painters. Happily, that has been settled. I have also ascertained that J. Coughlan & Sons

arately on Mar. 25, and April 13, would leave there, June 24, in tow for Montreal, to be joined together. The company also advised that the s.s. Canadian Squatter; Marine Department contract 45; builder's yard no. 5; approximately 4,575 d.w. tons, will be launched early in July.

Canadian Vickers Ltd., Montreal, launched the s.s. Canadian Victor; Marine Department contract 50; builder's yard no. 77; approximately 8,390 d.w. tons; June 22, the christening being performed by Mrs. J. W. Norcross, wife of the President and Managing Director, Canada Steamship Lines, and also a director of Canadian Vickers Ltd.

The Canadian Victor is the ninth steamship built by the company for Canadian Government Merchant Marine Ltd., making a total of 68,000 d.w. tons. She was built under the supervision of C. F. M. Duguid, Naval Architect, Marine Department, and W. J. Alderson, representing Lloyd's Registry of Shipping. Her dimensions are,—length over all 413 ft., beam moulded 52 ft., depth moulded 31 ft., draft loaded with 8,400

Collingwood Shipbuilding Co., Collingwood, Ont., delivered the s.s. Canadian Observer, Marine Department contract 47; builder's yard no. 66; approximately 3,990 d.w. tons; for Canadian Government Merchant Marine Ltd., June 15, and laid the keel for the s.s. Canadian Rover, Marine Department contract 57; builder's yard no. 67; approximately 3,890 d.w. tons, for Canadian Government Merchant Marine Ltd., June 5.

The s.s. Canadian Observer's trial runs gave the following results:—Duration of full speed trials, 6 hours; mean speed on 6 runs over measured miles, 11.783 knots; indicated horse power 1,450.

J. Coughlan & Sons, Vancouver, B.C., delivered the s.s. Canadian Prospector; Marine Department contract 37; builder's yard no. 14; approximately 8,390 d.w. tons, to the Marine Department and she was transferred to Canadian Government Merchant Marine Ltd. June 15.

The s.s. Canadian Prospector, which underwent her trial trips early in June, maintained an average of 12.6 knots.

Halifax Shipyards Ltd., Halifax, N.S., which is building four steel cargo steamships for Canadian Government Merchant Marine, two of approximately 8,390 d.w. tons each, and two of approximately 10,500 d.w. tons each, expected to launch the first one, Canadian Mariner; Marine Department contract 21; builder's yard no. 1, on June 21, but advised us June 19 that no work had been done in its yard since June 1, the employes having struck.

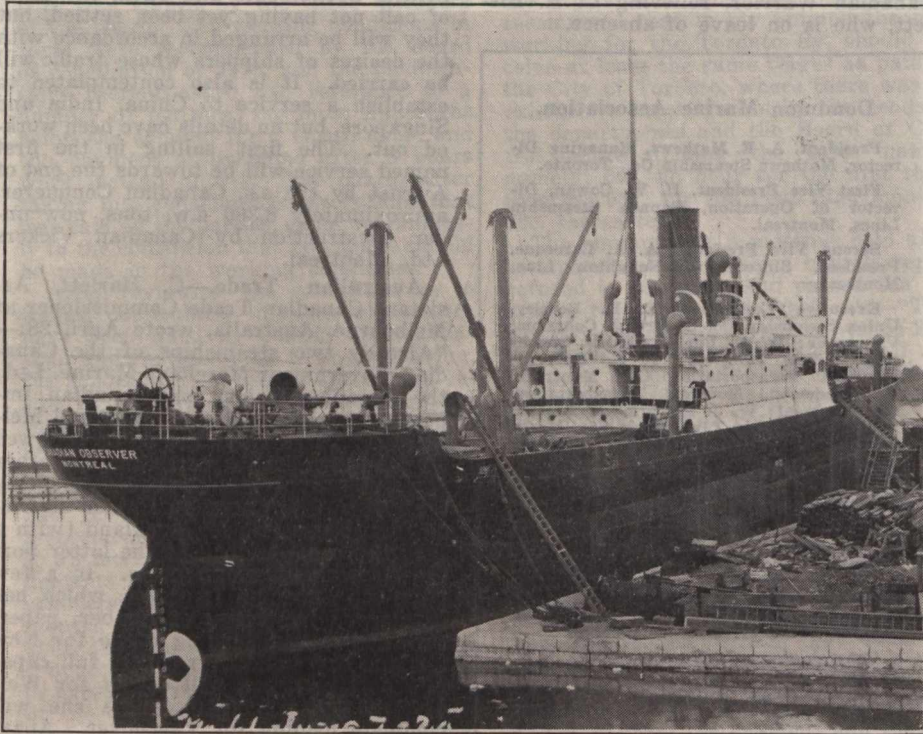
Harbour Marine Co. advised us June 4 that the s.s. Canadian Winner, Marine Department contract 29; builder's yard no. 1; approximately 8,390 d.w. tons, would probably be launched on June 29; and that the s.s. Canadian Traveller; Marine Department contract 30; builder's yard no. 3; approximately 8,390 d.w. tons, would probably be launched about six weeks later. The company states that these are the first steel ships to be built in Victoria, and that nearly all the work on them is being done by returned soldiers, the company employing over 85% of ex-service men and the remaining 15% including boys.

A deputation of the Harbour Marine Co.'s workmen, who went to Ottawa recently, to urge the Minister of Marine to give the company further contracts for steel cargo steamships for Canadian Government Merchant Marine Ltd., was informed that no more orders would be placed.

Midland Shipbuilding Co., Midland, Ont., laid the keel for the s.s. Canadian Racer; Marine Department contract 54; builder's yard no. 10; approximately 3,990 d.w. tons, for Canadian Government Merchant Marine Ltd., June 9.

Port Arthur Shipbuilding Co., Port Arthur, Ont., expected to launch the s.s. Canadian Carrier; Marine Department contract 33; builder's yard no. 44; approximately 4,350 d.w. tons, about May 30, but, owing to a strike on May 15, which lasted until June 8, the launching was delayed, and we were advised on June 16 that it would probably take place on June 26.

Tidewater Shipbuilders Ltd., which is building two out of the four steel cargo steamships, of approximately 5,100 d.w. tons each for which it has contracts from the Marine Department, expected to launch the s.s. Canadian Fisher; Marine Department contract 15; builder's yard no. 7, in June, and the s.s. Canadian Forester; Marine Department contract 16; builder's yard no. 8, in July, advised us June 16 that the launching of the Canadian Fisher had been delayed, owing to lack of steel for 'tween decks.



Steel Cargo Steamship Canadian Observer, approximately 3,990 d.w. tons, built for Canadian Government Merchant Marine Ltd., by Collingwood Shipbuilding Co., Collingwood, Ont.

did not make the ship's shaft according to specifications, and therefore the inspection by Lloyd's and by one of our Marine Department inspectors has been withheld until the shafting has been adjusted. I understand this also has been attended to. The vessel is now in dry dock, owing to her having been in the water since January last. One of the clauses in the specifications provides for the docking of the vessel if the Marine Department finds that is necessary. I do not anticipate that there is anything wrong with the bottom of the ship, but inasmuch as she has to make a very long trip to Australia it was thought wise to have her docked. As far as I can judge at the moment, she ought to be ready to sail within two weeks, and probably less."

British American Shipbuilding Co., Welland, Ont., has advised us June 17, that the two sections of the s.s. Canadian Otter; Marine Department contract 44; builder's yard no. 4; approximately 4,575 d.w. tons, which were launched sep-

tons of cargo, 25¼ ft. She is equipped with triple expansion engines and 3 Scotch boilers with Howden's forced draft. The machinery for handling cargo is fully up-to-date, the cargo winches and windlasses being of Clarke-Chapman design, and the steering gear of the Hastie Wilson-Pirrie type, all manufactured by Canadian Vickers Ltd. The steering is arranged from the navigating bridge by a telemotor of the MacTaggart-Scott type, and there is also a hand steering gear on the poop deck, and the usual complement of mechanical engine room and steering telegraphs, wireless, etc. The accommodation for officers and crew is very complete, and there are two spare cabins and a smoking room for passengers. The engine room equipment includes the Contraflo system of condensing and G. & J. Weir's pumps and other auxiliaries. Refrigerating machinery is being fitted in no. 3, 'tween decks, which will be insulated in the usual manner for perishable cargo.

Orders for Steel Cargo Steamships for Canadian Government Merchant Marine Ltd.

The following is a complete list of steel cargo steamships which the Dominion Marine Department has been authorized, by order in council, to place orders for and which orders are to be carried out. The figures given in the column headed "Long tons d.w." and which are preceded by an asterisk (*) show the total deadweight capacities as determined after the ships have been completed. The other figures in that column, not preceded by an asterisk, show the approximate total deadweights, subject to modification as they may vary above or below the figures given and as may be ascertained after the ships are completed, and of course, the total prices will vary accordingly.

Where the total price does not agree with the finally ascertained deadweight tons multiplied by the price per ton, the extra amount is for changes from specifications, additional equipment, accommodation, etc.

The following contractions are used in the column giving the type of the vessels to be built: s.d., single deck; 2.d., two deck; 3.d., three deck; lake, lake type; p. poop; b., bridge; f'c's'le, forecastle.

| Contract | Contract date | Name | Builder | Yard no. | Long tons d.w. | Price per ton d.w. | Total price | Type | Classification | Speed knots | Keel laid | Launched | Delivered. |
|----------|----------------|----------------------|-------------------------------------|----------|----------------|--------------------|---------------|---------------------------------|----------------|-------------|----------------|----------------|----------------|
| 1 | Mar. 4, 1918 | Canadian Voyageur | Canadian Vickers Ltd. | 66 | *4,575 | 207. | \$ 948,660.75 | S.d., p., b. and f'c's'le..... | Lloyd's | 11 | June 11, 1918 | Nov. 23, 1918 | Feb. 22, 1919 |
| 2 | May 22, 1918 | Canadian Pioneer | " | 67 | *8,408 | 180. | 1,519,459.99 | 2.d., p., b. and f'c's'le..... | " | 11 | July 17, 1918 | Dec. 3, 1918 | May 9, 1919 |
| 3 | May 18, 1918 | Canadian Warrior | Collingwood Shipbldg. Co., C'wood. | 61 | *3,595 | 205. | 819,385.58 | Lake, s.d., p., b. and f'c's'le | Bri. Corp. | 9 | Not stated | Dec. 21, 1918 | Apr. 26, 1919 |
| 4 | Mar. 15, 1918 | Canadian Volunteer | Wallace Shipyards Ltd. | 100 | *4,495 1/4 | 207. | 930,620.25 | S.d., p., b. and f'c's'le..... | Lloyd's | 11 | Oct. 1, 1918 | Apr. 5, 1919 | June 19, 1919 |
| 5 | Nov. 25, 1918 | Canadian Trooper | " | 106 | *4,540 | 217. | 985,180 | S.d., p., b. and f'c's'le..... | " | 11 | Nov. 15, 1918 | May 31, 1919 | Aug. 7, 1919 |
| 6 | Nov. 25, 1918 | Canadian Aviator | " | 101 | *5,100 | 210. | 1,071,000 | S.d., p., b. and f'c's'le..... | " | 11 | Apr. 5, 1919 | Oct. 9, 1919 | Nov. 15, 1919 |
| 7 | Nov. 25, 1918 | Canadian Raider | " | 102 | *5,100 | 210. | 1,071,000 | S.d., p., b. and f'c's'le..... | " | 11 | May 31, 1919 | Dec. 11, 1919 | Jan. 17, 1920 |
| 10 | July 5, 1918 | Canadian Recruit | Collingwood Shipbldg. Co., C'wood. | 62 | *3,964 | 205. | 813,252.07 | Lake, s.d., p., b. and f'c's'le | Bri. Corp. | 9 | Jan. 3, 1919 | May 3, 1919 | Jan. 7, 1919 |
| 11 | Oct. 17, 1918 | Canadian Signaller | " | 63 | *3,975 1/4 | 205. | 814,926.25 | Lake, s.d., p., b. and f'c's'le | " | 9 | Jan. 16, 1919 | June 28, 1919 | Aug. 30, 1919 |
| 12 | Oct. 17, 1918 | Canadian Gunner | " | 64 | *3,978 1/4 | 205. | 815,514.25 | Lake, s.d., p., b. and f'c's'le | " | 9 | Feb. 10, 1919 | Oct. 4, 1919 | Nov. 6, 1919 |
| 13 | Aug. 9, 1918 | Canadian Settler | Tidewater Shipbuilders Ltd. | 5 | 5,100 | 200. | 1,020,000 | S.d., p., b. and f'c's'le..... | Lloyd's | 11 | Jan. 8, 1919 | Sept. 20, 1919 | Dec. 2, 1919 |
| 14 | Aug. 9, 1918 | Canadian Rancher | " | 6 | 5,100 | 200. | 1,020,000 | S.d., p., b. and f'c's'le..... | " | 11 | Jan. 10, 1919 | Nov. 1, 1919 | Dec. 27, 1919 |
| 15 | Jan. 24, 1919 | Canadian Fisher | " | 7 | 5,100 | 200. | 1,020,000 | S.d., p., b. and f'c's'le..... | " | 11 | Sept. 20, 1919 | | |
| 16 | Jan. 24, 1919 | Canadian Forester | " | 8 | 5,100 | 200. | 1,020,000 | S.d., p., b. and f'c's'le..... | " | 11 | Nov. 1, 1919 | | |
| 17 | Sept. 4, 1918 | Canadian Trapper | Davie Shipbuilding & Repairing Co. | 459 | 5,100 | 200. | 1,020,000 | S.d., p., b. and f'c's'le..... | " | 11 | Mar. 11, 1919 | Oct. 9, 1919 | |
| 18 | Sept. 4, 1918 | Canadian Hunter | " | 460 | 5,100 | 200. | 1,020,000 | S.d., p., b. and f'c's'le..... | " | 11 | Mar. 28, 1919 | May 7, 1920 | |
| 19 | Sept. 4, 1918 | Canadian Trader | Port Arthur Shipbuilding Co. | 39 | *3,341 | 205. | 686,762.88 | Lake, s.d., p., b. and f'c's'le | " | 9 | Dec. 9, 1918 | May 5, 1919 | July 18, 1919 |
| 19a | Mar. 1, 1919 | Canadian Adventurer | " | 41 | *3,408 | 210. | 715,652.49 | Lake, s.d., p., b. and f'c's'le | " | 9 | Mar. 31, 1919 | Sept. 8, 1919 | Oct. 29, 1919 |
| 20 | Sept. 4, 1918 | Canadian Sailor | " | 40 | *3,357 | 205. | 690,409.84 | Lake, s.d., p., b. and f'c's'le | " | 9 | Dec. 10, 1918 | May 31, 1919 | Aug. 7, 1919 |
| 20a | Mar. 1, 1919 | Canadian Sower | " | 42 | *3,405 | 210. | 715,649.13 | Lake, s.d., p., b. and f'c's'le | " | 9 | Mar. 31, 1919 | Oct. 9, 1919 | Nov. 18, 1919 |
| 21 | Sept. 13, 1918 | Canadian Mariner | Halifax Shipyards Ltd. | 1 | 8,390 | 195. | 1,636,050 | 2.d., p., b. and f'c's'le..... | " | 10 | Feb. 24, 1919 | | |
| 22 | Sept. 13, 1918 | Canadian Explorer | " | 2 | 8,390 | 195. | 1,636,050 | 2.d., p., b. and f'c's'le..... | " | 10 | Mar. 15, 1919 | | |
| 23 | Oct. 11, 1918 | Canadian Navigator | Canadian Vickers Ltd. | 73 | *4,581 | 215. | 984,915 | S.d., p., b. and f'c's'le..... | " | 11 | Jan. 22, 1919 | Oct. 18, 1919 | Nov. 22, 1919 |
| 24 | Oct. 11, 1918 | Canadian Ranger | " | 68 | *8,382 | 188. | 1,575,816.00 | 2.d., p., b. and f'c's'le..... | " | 11 | Aug. 26, 1918 | Apr. 19, 1919 | May 23, 1919 |
| 25 | Oct. 11, 1918 | Canadian Seigneur | " | 69 | *8,391 | 188. | 1,587,643.15 | 2.d., p., b. and f'c's'le..... | " | 11 | Nov. 30, 1918 | May 7, 1919 | Aug. 14, 1919 |
| 26 | Oct. 11, 1918 | Canadian Miller | " | 70 | *8,390 | 188. | 1,577,320 | 2.d., p., b. and f'c's'le..... | " | 11 | Dec. 2, 1918 | Aug. 16, 1919 | Sept. 24, 1919 |
| 27 | Oct. 11, 1918 | Canadian Spinner | " | 71 | *8,393 | 188. | 1,589,700.00 | 2.d., p., b. and f'c's'le..... | " | 11 | Apr. 23, 1919 | Nov. 8, 1919 | Dec. 6, 1919 |
| 28 | Oct. 11, 1918 | Canadian Planter | " | 72 | *8,393.3 | 188. | 1,579,068.40 | 2.d., p., b. and f'c's'le..... | " | 11 | May 10, 1919 | Nov. 22, 1919 | Dec. 27, 1919 |
| 29 | Jan. 24, 1919 | Canadian Winner | Harbour Marine Co. Ltd. | 1 | 8,390 | 198. | 1,661,220 | 2.d., p., b. and f'c's'le..... | " | 11 | July 14, 1919 | | |
| 30 | Jan. 24, 1919 | Canadian Traveller | " | 2 | 8,390 | 198. | 1,661,220 | 2.d., p., b. and f'c's'le..... | " | 11 | Aug. 9, 1919 | | |
| 31 | Dec. 11, 1918 | Canadian Beaver | Collingwood Shipbldg. Co., Kingston | 15 | 3,750 | 205. | 768,750 | Lake, s.d., p., b. and f'c's'le | Bri. Corp. | 9 | Apr. 7, 1919 | Dec. 10, 1919 | May 11, 1920 |
| 32 | Mar. 1, 1919 | Canadian Runner | Port Arthur Shipbuilding Co. | 43 | 4,350 | 215. | 935,250 | S.d., p., b. and f'c's'le..... | " | 11 | Aug. 29, 1919 | May 8, 1920 | |
| 33 | Mar. 1, 1919 | Canadian Carrier | " | 44 | 4,350 | 215. | 935,250 | S.d., p., b. and f'c's'le..... | " | 11 | Aug. 29, 1919 | | |
| 34 | Nov. 22, 1918 | Canadian Importer | J. Coughlan & Sons | 11 | *8,381 | 198. | 1,659,438 | 2.d., p., b. and f'c's'le..... | Lloyd's | 11 | Apr. 26, 1919 | Dec. 6, 1919 | Feb. 5, 1920 |
| 35 | Nov. 22, 1918 | Canadian Exporter | " | 12 | *8,380 | 198. | 1,659,240 | 2.d., p., b. and f'c's'le..... | " | 11 | May 3, 1919 | Dec. 27, 1919 | Mar. 6, 1920 |
| 36 | Nov. 22, 1918 | Canadian Inventor | " | 13 | 8,390 | 198. | 1,661,220 | 2.d., p., b. and f'c's'le..... | " | 11 | July 24, 1919 | Jan. 24, 1920 | |
| 37 | Nov. 22, 1918 | Canadian Prospector | " | 14 | 8,390 | 198. | 1,661,220 | 2.d., p., b. and f'c's'le..... | " | 11 | Sept. 26, 1919 | Feb. 24, 1920 | June 15, 1920 |
| 38 | Dec. 10, 1918 | Canadian Cruiser | Halifax Shipyards Ltd. | 3 | 10,500 | 197.50 | 2,078,750 | 3.d., p., and f'c's'le..... | " | 12 | Oct. 2, 1919 | | |
| 39 | Dec. 10, 1918 | Canadian Constructor | " | 4 | 10,500 | 197.50 | 2,078,750 | 3.d., p., and f'c's'le..... | " | 12 | Oct. 6, 1919 | | |
| 40 | Mar. 31, 1919 | Canadian Sealer | Nova Scotia Steel & Coal Co. | 5 | *2,776 1/2 | 210. | 583,065 | S.d., p., b. and f'c's'le..... | " | 8 1/2 | Mar. 27, 1919 | Oct. 8, 1919 | Dec. 20, 1920 |
| 41 | Mar. 31, 1919 | Canadian Miner | " | 6 | *2,778 | 210. | 583,380 | S.d., p., b. and f'c's'le..... | " | 8 1/2 | Mar. 31, 1919 | Apr. 3, 1920 | May 7, 1920 |
| 42 | Feb. 21, 1919 | Canadian Reaper | Prince Rupert Dry Dock & Eng. Co. | 1 | 8,390 | 198. | 1,661,220 | 2.d., p., b. and f'c's'le..... | " | 11 | Sept. 27, 1919 | | |
| 43 | Feb. 21, 1919 | Canadian Thrasher | " | 2 | 8,390 | 198. | 1,661,220 | 2.d., p., b. and f'c's'le..... | " | 11 | Oct. 20, 1919 | | |
| 44 | Jan. 23, 1919 | Canadian Otter | British American Shipbuilding Co. | 4 | 4,575 | 215. | 983,625 | S.d., p., b. and f'c's'le..... | Bri. Corp. | 10 | Mar. 29, 1919 | Apr. 13, 1920 | |
| 45 | Jan. 23, 1919 | Canadian Squatter | " | 5 | 4,575 | 215. | 983,625 | S.d., p., b. and f'c's'le..... | " | 10 | July 14, 1919 | | |
| 46 | Sept. 11, 1919 | Canadian Farmer | Collingwood Shipbldg. Co., C'wood. | 65 | 3,990 | 180. | 718,200 | Lake, s.d., p., b. and f'c's'le | Lloyd's | 11 | Sept. 3, 1919 | Dec. 27, 1919 | Apr. 28, 1920 |
| 47 | Sept. 11, 1919 | Canadian Observer | " | 66 | 3,990 | 180. | 718,200 | Lake, s.d., p., b. and f'c's'le | " | 11 | Sept. 12, 1919 | May 8, 1920 | June 15, 1920 |
| 48 | Sept. 2, 1919 | Canadian Pathfinder | Dominion Shipbuilding Co. | 10 | 3,500 | 180. | 630,000 | Lake, s.d., p., b. and f'c's'le | " | 11 | Nov. 8, 1919 | | |
| 49 | Sept. 2, 1919 | Canadian Engineer | " | 11 | 3,500 | 180. | 630,000 | Lake, s.d., p., b. and f'c's'le | " | 11 | Nov. 8, 1919 | | |
| 50 | Sept. 18, 1919 | Canadian Victor | Canadian Vickers Ltd. | 77 | 8,390 | 170. | 1,426,300 | 2.d., p., b. and f'c's'le..... | Lloyd's | 11 | Dec. 10, 1919 | June 22, 1920 | |
| 51 | Sept. 18, 1919 | Canadian Conqueror | " | 78 | 8,390 | 170. | 1,426,300 | 2.d., p., b. and f'c's'le..... | " | 11 | Jan. 17, 1920 | | |
| 52 | Sept. 18, 1919 | Canadian Commander | " | 79 | 8,390 | 170. | 1,426,300 | 2.d., p., b. and f'c's'le..... | " | 11 | | | |
| 53 | Sept. 18, 1919 | Canadian Leader | " | 80 | 8,390 | 170. | 1,426,300 | 2.d., p., b. and f'c's'le..... | " | 11 | | | |
| 54 | Feb. 26, 1920 | Canadian Racer | Midland Shipbuilding Co. | 10 | 3,890 | 182.50 | 709,925 | Lake, s.d., p., b. and f'c's'le | Bri. Corp. | 11 | June 9, 1920 | | |
| 55 | Mar. 18, 1920 | Canadian Highlander | Wallace Shipyards Ltd. | 103 | 8,390 | 167.50 | 1,405,325 | 2.d., p., b. and f'c's'le..... | Lloyd's | 11 | | | |
| 56 | Mar. 18, 1920 | Canadian Skirmisher | " | 104 | 8,390 | 167.50 | 1,405,325 | 2.d., p., b. and f'c's'le..... | " | 11 | | | |
| 57 | Mar. 13, 1920 | Canadian Rover | Collingwood Shipbldg. Co., C'wood. | 67 | 3,890 | 182.50 | 709,925 | Lake, s.d., p., b. and f'c's'le | Lloyd's | 11 | | | |
| 58 | Mar. 13, 1920 | Canadian Coaster | Collingwood Shipbldg. Co., Kingston | 16 | 3,890 | 185.50 | 709,925 | Lake, s.d., p., b. and f'c's'le | " | 11 | May 6, 1920 | | |
| 59 | | | Nova Scotia Steel & Coal Co. | 8 | 2,800 | 190. | 532,000 | 2.d., p., b. and f'c's'le..... | " | 8 1/2 | May 4, 1920 | | |
| 60 | Feb. 2, 1920 | Canadian Challenger | Davie Shipbuilding & Repairing Co. | 476 | 8,390 | 167.50 | 1,405,325 | 2.d., p., b. and f'c's'le..... | " | 11 | | | |
| 61 | Feb. 26, 1920 | Canadian Harvester | Port Arthur Shipbuilding Co. | 45 | 3,890 | 182.50 | 709,925 | Lake, s.d., p., b. and f'c's'le | " | 11 | Mar. 30, 1920 | | |
| 62 | April 7, 1920 | Canadian Transporter | J. Coughlan & Sons | 20 | 8,390 | 167.50 | 1,405,325 | 2.d., p., b. and f'c's'le..... | " | 11 | | | |
| 63 | April 7, 1920 | Canadian Freighter | " | 21 | 8,390 | 167.50 | 1,405,325 | 2.d., p., b. and f'c's'le..... | " | 11 | | | |

388,519 \$72,890,476.03

Senate Committee Report on the Hudson Bay Route and Ports.

The special committee appointed by the Senate to take evidence and report upon the navigability and fishery resources of Hudson Bay and Strait, and of the character of the ports of the bay with regard to their fitness as railway terminals, reported on June 9, over the signature of the chairman, Senator G. W. Fowler. Following are the principal portions of the report:—The committee examined 21 witnesses, drawn from all parts of the country. It had in view acquiring information on the following points:—1. The length of the season during which the bay and strait are reasonably navigable having in view the presence of ice, the occurrence and persistence of snow storms, the advantages to be gained by aids to navigation such as wireless telegraphy, light houses, fog signals and hydroplanes. 2. The style and size of ships to be used for the carrying trade. 3. The relative merits of the two ports, Nelson and Churchill, and the relative cost of the development of each. 4. The fishing resources of the bay and strait and of the rivers emptying into the bay. 5. The mineral resources of the country tributary to the bay. 6. The utilization of the country for the production of meat and furs to be obtained from reindeer and musk ox, which would subsist upon the extremely nutritious grasses grown throughout that part of the country.

A large number of witnesses were called with respect to the length of the season during which the bay and strait can be safely navigated. There was some variation among them regarding the length of the season of navigation, but all agreed that the minimum would under ordinary circumstances be at least four months, while the maximum would not likely exceed five months. Voyages have been made through the strait as early as June 5, and as late as the first part of November, with the ordinary type of ship, without meeting any difficulty, but these were admittedly rather exceptional cases. All were agreed, however, that modern navigating appliances, such as lighthouses, wireless stations, hydroplanes and fog signals, would greatly facilitate navigation in these waters and in a large measure overcome the natural difficulties from ice and snow. In order that the route would be able to compete with the more southerly channels of communication between this country and Europe, it would be necessary to have a type of freighter capable of carrying from 5,000 to 10,000 tons of dead weight, and in the committee's opinion, from the evidence adduced, there would be no difficulty in handling so large a ship on the route, provided it was properly strengthened and protected in the forward part. Of course, heretofore only ships of smaller size have been used, because ships of larger capacity have not been required.

The concensus of opinion is that Hudson Bay remains open all the year through and that the ice does not extend beyond 30 or 40 miles from the shore. The strait is also open for the greater part of the year, and would probably be open all the time, except for the ice which comes down late in the autumn from Fox Channel, and obstructs navigation in the strait. It was generally conceded by the eight witnesses who gave evidence on this point that the aids to navigation which might be installed along the strait would greatly facilitate the passage and considerably extend the season of naviga-

bility.

The committee took a large amount of evidence regarding the relative merits of the two western ports, Churchill and Nelson, and there was a considerable divergence of opinion among the different witnesses as to which of the two should have been selected, having in view the shorter railway haul in the one case and the cheaper construction of the port itself in the other. Churchill was shown to be an absolutely land locked harbor, entirely protected from every wind, no matter from which quarter it should blow, where a few ships could at all times ride at anchor in perfect security. Nelson, on the other hand, has no natural protection from the sea, except such as it receives by reason of its remoteness from the body of the sea, there being a 20 mile stretch of shallows between it and deep water. A narrow channel bordered by wide shallows connects the proposed harbor of Nelson with the open bay. A very large amount has already been expended upon the harbor improvements of Nelson, but a much larger sum is still required before the present plans can be carried out. There seems to be considerable doubt, whether or not, even when the proposed plans are completed, the harbor at Nelson will be an entirely safe one against an easterly gale. To utilize Churchill it would be necessary to build about 80 miles of road across a country which has been described by one witness as very difficult, it having a stretch of 30 miles of morass almost impossible to cross, owing to the difficulty of getting a firm foundation for a road-bed. This was, however, denied by two witnesses, by each of whom the committee was greatly impressed. Both J. B. and J. W. Tyrell testified that there is a perfectly good and comparatively short route from the present route, deflecting at a point some 56 miles from Nelson and going north and east to Churchill. The present harbor of Churchill is rather small, but, accordingly to the evidence of the Messrs. Tyrell, uncontradicted, could easily be enlarged enough to accommodate all the trade likely to offer for many years to come. Beyond the present deep water harbor there is a large basin of shallow water, the bottom of which is composed of hard clay mixed with boulders, which could be easily dredged and the resultant harbor would be of its size one of the finest in the continent. The Tyrell brothers are very familiar with the country around Hudson Bay, having spent several years each in research and in examination of these regions. J. W. Tyrell spent one winter at a station in Hudson Strait taking observations for the Canadian Government, and also looked over the country from Pas to Churchill, on behalf of a company who had some intention of building a railway in that part of the country, a scheme which was afterwards abandoned. He had no hesitation in saying that no difficulty whatever would be found in extending the railway to Churchill. It is the committee's opinion that the government would be well advised if, before expending any more money on the harbor works at Nelson, they were to appoint a committee of expert engineers and railway builders to examine the route to Churchill and ascertain whether or not it is really possible, as the Messrs. Tyrell say, and what would be the cost and advantage of making Churchill the port and terminus of

the Hudson Bay Ry. rather than Nelson. In the meantime, the laying of the rails could be completed to Nelson, and that port could be used for the present in its present state.

While no one was able to speak with certainty as to whether cod fish are plentiful in the bay or not, there is no doubt as to the strait. All the rivers flowing into the bay teem with fish, and walrus and seal are also found in large numbers in the strait. No doubt as soon as the Hudson Bay route is established, a very large and lucrative fishing industry will be established there. Recent discoveries have shown that the country surrounding Hudson Bay is strongly and richly mineralized, particularly so in regard to gold and copper.

Mr. Stefansson, the distinguished Polar explorer, gave evidence before the committee. He is a devout believer in the possibility of utilizing what have always been known as the Barren Lands of the north, and the islands within the Arctic Circle, in the cultivation of reindeer, cariboo and musk ox for the production of meat. He gave evidence as to the splendid quality of the flesh of these animals as food for the people, and as to the cheapness with which it might be produced. He said that the wild lands of the north, which have always been looked upon as worthless, could carry at least 50,000,000 reindeer and 10,000,000 musk ox, and that the cost of handling these huge numbers would be trifling in comparison with the profit to be made. The effect of this upon the world's food supply would be tremendous, and the committee strongly recommend that the matter be energetically taken up by the government.

The committee makes the following findings upon the evidence adduced before it:—

That the Hudson Bay route is feasible and will, probably, in time, be profitable.

That the season of navigation under present conditions is at least four months in length, and may, by improvements in aids to navigation, be considerably increased.

That sufficient care was not taken in the selection of Nelson as the terminus of the railway, and that the government should not make further important expenditures upon this port without first making a new and thorough examination into the relative merits of Churchill and Nelson as a terminus for the railway.

That the waters of the strait and rivers tributary to the bay teem with fish and valuable marine animals, and we believe that the bay is equally well stocked, but there has not yet been sufficient data collected as to the extent of the fisheries of the bay to enable an authoritative statement to be made as to their prospective value.

That the mines already discovered in the Hudson Bay district are of sufficient number and richness to indicate the existence of great potential mineral wealth.

The committee feel that they cannot too strongly endorse the valuable suggestion of Mr. Stefansson as to the cultivation of reindeer and musk ox, and urge upon the government that the Interior Department be empowered to take hold of this matter, earnestly taking advantage of what has been done in this regard by the United States Government.

After considerable debate the report was adopted by the Senate June 18, on a division.

General Shipbuilding Matters Throughout Canada.

B.C. Marine Ltd., Vancouver, B.C.—As mentioned in our last issue, this company is building an auxiliary powered schooner for the Hudson's Bay Co. She will be rigged as a three masted bald headed schooner, with jib headed mizzen and top sail for running purposes, and will carry a large square sail forward, and will also be fitted with a triangular shaped top sail. The total area of fore and aft sails will be about 10,960 sq. ft., and the approximate total of all sails will be 15,610 sq. ft. She will also be equipped with a 350 b.h.p. semi-Diesel engine, for a speed of about 7 knots an hour. Her dimensions will be,—length over all 200 ft., length l.w.l. 188½ ft., beam 36 ft., moulded depth 15 ft., draft loaded 12 ft., deadweight for freight 700 long tons.

B.C. Yacht & Boatbuilders Co., Victoria, B.C.—The Dominion Marine Department has accepted this company's tender for building 2 motor patrol boats for British Columbia coast patrol service, at a total price of \$62,750. The approximate dimensions are,—length over all 75 ft., breadth 17 ft. 8 in. Each boat will be equipped with heavy oil engine of the semi-Diesel type of 100 h.p.

British Empire Shipbuilding Corporation Ltd. has been incorporated under the Dominion Companies Act, with \$100,000 authorized capital, and office at Montreal, to build, own and operate steam and other ships, steamship and railway terminals, dry docks, shipyards, etc., and to conduct business in Canada and elsewhere.

Canadian Concrete Shipbuilding Co., North Sydney, N.S.—The concrete motor ship *Permanencia* was launched by this company in May. She was built under Lloyd's special survey for the highest rating. The hull was practically complete and ready for launching in Dec., 1919, but a fire on board caused damage which necessitated a prolonged delay. She will have a deadweight capacity of from 450 to 500 tons, and sleeping accommodation for 10 passengers in addition to the crew. She is being equipped with a Bolinder crude oil engine of 240 b.h.p., for a speed of from 9 to 10 knots an hour, supplied by the Swedish Steel & Importing Co., Montreal. When completed, she will be operated between Cape Breton, Prince Edward Island and New foundland ports.

Canadian Vickers Ltd., Montreal, launched the s.s. *Loch Tay*, at the end of May, for Norwegian owners. She is a sister ship of the *Tatjana*, the launching of which was announced in our last issue. Her dimensions are,—length over all 413 ft., breadth 52 ft., depth 31 ft. 0½ in., draft when loaded with 8,300 tons of cargo, 25 1/3 ft. She is classed in Norwegian *Veritas*, and is equipped with triple expansion engines and 3 Scotch boilers fitted with forced draft. The cargo handling equipment, etc., which is of the latest type, is all made by the company.

K. Cochrane, Port Greville, N.S., launched the schooner *Frederic H.*, 425 tons, June 5, for the lumber trade.

Collingwood Shipbuilding Co., Collingwood, Ont., advised us June 9 that the 650 d.w. tons ship, which it is building for Standard Oil Co., was then completely plated, and would be launched in July.

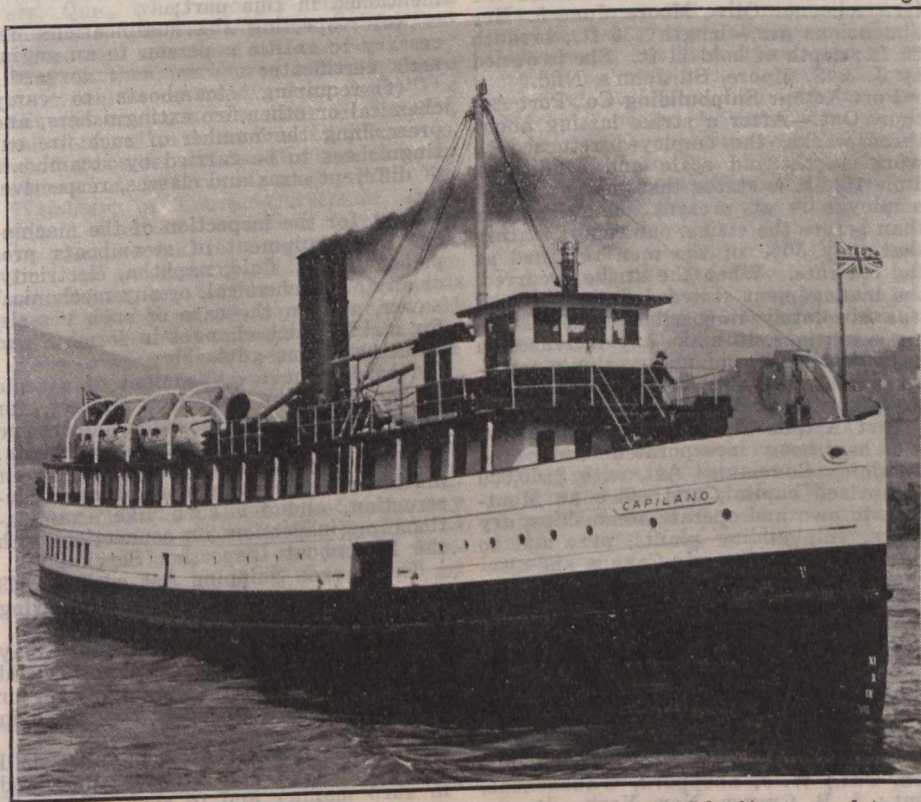
Collingwood Shipbuilding Corporation, Ltd., has been incorporated under the Dominion Companies Act, with \$100,000 au-

thorized capital, and office at Montreal, to build, operate and charter steamships of all kinds, dry docks, shipbuilding yards, etc., to take over any existing business, which it is authorized to do and to carry on its business in Canada and elsewhere.

J. Coughlan & Sons, Ltd., Vancouver, B.C., launched the s.s. *Margaret Coughlan* May 18 for Western Canada Steamships, Ltd., a subsidiary of the building company. She is of the standard 8,800 ton type, steel cargo steamship, of the following dimensions,—length over all 427 ft., breadth moulded 54 ft., depth moulded 29¾ ft., and she is equipped with triple expansion engines, with cylinders 27, 44 and 73 in. diam. by 48 in. stroke, supplied with steam by boilers equipped for burning oil fuel. She has been chartered to carry railway ties from British Columbia to Great Britain. This is stated to be the first steel cargo steamship built

2 vertical inverted direct acting compound surface condensing engines, with cylinders 12 and 24 in. diam. by about 16 in. stroke, turning outboard when going ahead, developing about 275 i.h.p. at 175 r.p.m.

Dominion Shipbuilding Co., Toronto, launched the s.s. *Gonzaba*, June 19, for the Gulf Navigation Co., New Orleans, La. The christening was performed by Miss Abanza, daughter of the owning company's President and General Manager. The ship was designed for ocean service to carry approximately 2,550 d. w. tons, and has the following dimensions,—length over all 261 ft., length between perpendiculars 251 ft., breadth moulded 39½ ft., depth moulded 19 ft. 4 in. She is classed to Lloyd's 100 A1, and equipped with triple expansion engines 950 h.p., and 2 Scotch boilers supplying steam at 180 lbs. A sister ship is under construction for the same com-



Steamship *Capilano*, built recently for Union Steamship Co. of British Columbia, to run between Vancouver, and way ports, to Powell River, B.C.

pany, to be named *Floraba*, and it is expected she will be launched early in July.

Foundation Co., Victoria, B.C.—This company's shipbuilding interests in B.C. are being closed up, and the shipbuilding plant and machinery at the Point Hope and Point Ellice yards are reported to have been sold to private interests. The leases on the yards expired at the end of June. During the war, the company built several wooden steamships for the British Government, under orders from the Imperial Munitions Board, and also built a number of wooden steamships for the French Government, which latter order was completed recently. The Point Ellice yard was operated formerly by Cameron-Genoa Mills Shipbuilders, Ltd., and the land, in both cases, forms part of the old Songhees Indian Reserve, and was leased from the B.C. Government.

Harbour Marine Co., Victoria, B.C.—The steel car ferry tow barge, which this

in Vancouver, for Vancouver interests, and to sail from that port.

Hull 16, which was under construction for Vancouver Steamships Ltd., one of the company's subsidiaries, has been sold to J. A. Sturrock, for Swedish interests. She is of a similar type to the s.s. *Margaret Coughlan*, and it is expected that she will be delivered about the end of July.

Davie Shipbuilding & Repairing Co., Lauzon, Que.—A wooden steamship, one of 12, of 1,500 tons d.w. each, ordered last year by the Anderson Co., New York, for the French Government, was launched at this yard June 3, and christened *Aubernale*. Her dimensions are,—length over all 204½ ft., length between perpendiculars 195 ft. 8 in., beam moulded 39 ft. 8 in., beam extreme 40½ ft., depth moulded 17 ft., depth of hold 15 ft., draft loaded 16 ft. The hull is of Douglas fir, and the propelling machinery consists of

pany, to be named *Floraba*, and it is expected she will be launched early in July.

Foundation Co., Victoria, B.C.—This company's shipbuilding interests in B.C. are being closed up, and the shipbuilding plant and machinery at the Point Hope and Point Ellice yards are reported to have been sold to private interests. The leases on the yards expired at the end of June. During the war, the company built several wooden steamships for the British Government, under orders from the Imperial Munitions Board, and also built a number of wooden steamships for the French Government, which latter order was completed recently. The Point Ellice yard was operated formerly by Cameron-Genoa Mills Shipbuilders, Ltd., and the land, in both cases, forms part of the old Songhees Indian Reserve, and was leased from the B.C. Government.

Harbour Marine Co., Victoria, B.C.—The steel car ferry tow barge, which this

company is to build for the C.P.R., will cost approximately \$200,000. Her dimensions will be, length 270 ft., beam 42 ft., depth moulded 12 ft. She will have a single deck, equipped with three tracks for 18 standard railway cars. When completed she will be placed in service between the mainland and Vancouver Island.

B. M. Melanson, Gilberts Cove, N.S., is building a steamship of the following approximate dimensions,—length over all 150 ft., length on keel 127 ft., breadth 28 ft., depth 11 ft., and approximately 600 d.w. tons. She will be fitted with triple expansion engines with cylinders 12, 19 and 30 in. diam. by 20 in. stroke, 450 i.h.p., supplied with steam by a Scotch boiler at 150 lb., to be supplied by the New Burrell Johnson Iron Co. The ship is being built for general freighting work, but can easily be adapted for sealing. The deck machinery will include powerful steam winches, windlasses, etc., and she will be equipped with all the necessary derricks, etc., for handling cargo.

Nova Scotia Shipbuilding & Transportation Co., Liverpool, N.S., launched the tern schooner Olive Moore, June 5. Her dimensions are,—length 136 ft.; breadth 25 ft.; depth of hold 11 ft. She is owned by J. & S. Moore, St. John's, Nfld.

Port Arthur Shipbuilding Co., Port Arthur, Ont.—After a strike lasting about three weeks, the employes returned to work at the old scale and conditions, June 10. It is stated that the number of employes is at present somewhat less than before the strike, one report stating that only 50% of the men returned at the old rate. When the strike occurred, the management stated definitely that it was absolutely impossible, under existing conditions, to make any increases in pay, or changes in the working conditions, and that if the men ceased work, the plant would have to be closed down.

Port Arthur Shipbuilding Corporation Ltd. has been incorporated under the Dominion Companies Act, with \$100,000 authorized capital, and office at Montreal, to own and operate steamships, dry docks, shipbuilding plants, etc., and to carry on its business in Canada and elsewhere.

St. John Dry Dock & Shipbuilding Co.'s annual meeting was held at St. John, N.B., June 8. The directors are: James Playfair, Midland, Ont., President; D. S. Pratt, Midland, Ont., Vice President and Managing Director; Thomas A. Duff, Toronto, Secretary-Treasurer; D. L. White, Jr., Midland, Ont.; W. E. Phin, Hamilton, Ont.; W. J. Sheppard, Waubashene, Ont.; J. B. Craven, New York. It was announced at the meeting that the company had bought the 24 in. hydraulic dredge Tornado of Canadian register, for work in the St. John harbor.

Victoria (B.C.) Shipowners Ltd., Victoria, B.C.—Considerable progress is reported on the construction of the first of the four wooden barkentines of 2,400 tons each, which are being built at the Cholberg shipyard, under Dominion Government aid. The keel of the first was laid May 1. Thos. McConkey, of the Dominion Marine Department, Ottawa, has been appointed to act as the naval architect in connection with these ships, on the government's behalf.

About the middle of June it was reported that there was some delay in construction work, owing to delayed delivery of certain special lumber, but it was expected that this would be overcome within a few days. Keels for three of the ships have been laid and the first frames are in on hull 4 with the stern posts set.

Act to Amend the Canada Shipping Act (Steamboat Inspection).

A bill introduced in the House of Commons by the Minister of Marine was passed by the House April 28, its provisions being as follows:—

The Canada Shipping Act, Revised Statutes of Canada, 1906, chap. 113, sec. 578, is repealed, and the following is substituted therefor:—

"578. The Governor in Council may make rules and regulations,—

"(a) for the testing of boilers and all matters connected with the construction and working thereof;

"(b) for the inspection of safety valves and boiler cocks and all matters connected with the construction and working thereof;

"(c) for the inspection of hulls and equipment of steamboats;

"(d) respecting boats and life-preservers, fire-buckets, axes and lanterns and other life-saving appliances to be carried by steamboats or by other vessels mentioned in this part;

"(e) respecting the qualifications necessary to entitle a person to an engineer's certificate;

"(f) requiring steamboats to carry chemical or other fire extinguishers, and prescribing the number of such fire extinguishers to be carried by steamboats of different sizes and classes, respectively;

"(g) for the inspection of the machinery and equipment of steamboats propelled by gas, fluid, naphtha, electricity, or any other chemical, or any mechanical power, and, in the case of such vessels, for making such changes in forms S and T as he deems advisable;

"(h) for the establishment of a scale of fees and the collection thereof, for examining plans of the hulls, boilers and machinery and equipment of steamboats; for the inspection of steamboats, their machinery and equipment, during construction, and for such like examinations or inspection in connection with the Steamboat Inspection Service."

The Canada Shipping Act, sections 643 and 644, are repealed, and the following are substituted therefor:—

"643. (1) The Governor in council may from time to time fix a duty to be paid yearly and every year by the owner or master of every steamboat registered in Canada.

"(2) The amount of such duty shall in each case be paid at such times and in such manner and to such officers as

the Governor in council may direct, and such duty shall be paid into the Consolidated Revenue Fund of Canada.

"644. (1) No inspector shall make or deliver a certificate respecting any steamboat under this part, unless,—

"(a) it is established to his satisfaction that the fees and duty payable in respect to such steamboat for the current year have been paid; and,

"(b) he is satisfied by careful examination that all the conditions and requirements of this part and of any regulation made thereunder have been fulfilled and complied with in respect to such steamboat.

"(2) Every inspector shall report to a chief officer of Customs any case of omission to pay such fees or duty, or of any omission to apply for such inspection as aforesaid, for more than one year from the date of the last inspection, or of any refusal to submit to inspection at any time which in any way or at any time comes to his knowledge."

Proposed Government Aid to Shipbuilding.—A deputation consisting of about 40 representatives of shipbuilding companies in the Maritime Provinces, Quebec, Ontario and British Columbia, waited on the Dominion Government at Ottawa, June 10, to urge government aid to shipbuilding in Canada. Two proposals are reported to have been made, one that the government grant a subsidy of \$10 a displacement ton, and \$10 per i.h.p., and another that the government assist the trade by financing foreign shipbuilding contracts. It was stated that a very large shipbuilding contract from a foreign country had actually been offered, provided that the government assist in the financing during the present adverse conditions of exchange. The foreign country concerned, it was said, was willing to put up a large proportion of the amount involved. The Premier promised that the proposals would be given the government's best consideration.

Transportation of Stock and Feed.—The further supplementary estimates, passed by the House of Commons recently, contained two items for transportation of stock and feed under Governor General's warrants as follows:—Aug. 23, 1919, \$375,000; Nov. 24, \$25,000.

Alberta Motor Boat Co., Edmonton, Alta., is building a 40 ft. schooner, equipped with 12 h.p. auxiliary engine, for use on northern waters. It is also building 2 gasoline boats for northern oil exploitation by Imperial Oil Ltd.

Sault Ste. Marie Canals Traffic.

The following commerce passed through the Sault Ste. Marie Canals during May, 1920:

| Articles | Canadian Canal | U.S. Canal | Total |
|-------------------------------|--------------------|------------|------------|
| Lumber | 4,082 | 8 888 | 12,570 |
| Flour | 322,880 | 336,080 | 658,960 |
| Wheat | 2,435,728 | 11,062,267 | 13,497,995 |
| Grain, other than wheat..... | 4,347,845 | 7,557,097 | 11,904,942 |
| Copper | 1,908 | 2,755 | 4,663 |
| Iron Ore | 243,667 | 6,440,153 | 6,683,820 |
| Pig Iron ..... | ..... | ..... | 12,025 |
| Stone | 14,325 | 2,700 | 11,641 |
| General Merchandise | 4,039 | 7,602 | 585 |
| Passengers | 352 | 171 | 531,375 |
| Coal, soft | 31,900 | 499,476 | 202,000 |
| Coal, hard ..... | ..... | 202,000 | 22,064 |
| Iron Ore ..... | ..... | 22,064 | 14,774 |
| Manufactured Iron and Steel.. | 1,077 | 13,697 | 11,190 |
| Salt | 1,570 | 9,620 | 53,046 |
| Oil | 1 | 53,045 | 48,573 |
| Stone ..... | ..... | 48,573 | 54,852 |
| General Merchandise | 26,974 | 27,378 | 614 |
| Passengers | Number 565 | 49 | 2,311 |
| ..... | Number 665 | 1,646 | 7,274,462 |
| Vessel Passages | Net 969,295 | 6,305,167 | 7,488,836 |
| Registered Tonnage ..... | ..... | ..... | 987,374 |
| Freight—Eastbound | Short tons 465,246 | 7,018,590 | 8,421,210 |
| Freight—Westbound | Short tons 61,522 | 875,852 | ..... |
| Total Freight | Short tons 526,768 | 7,894,442 | ..... |

Atlantic and Pacific Ocean.

The International Shipping Conference at Genoa, Italy, is reported to have decided in favor of the principle of a 48 hour week for seamen.

Manchester Liners' s.s. Manchester Division grounded on the mud banks at the mouth of the St. Charles River June 7, being caught by the strong winds when heading for Louise Basin, Quebec. She was released without serious damage.

Furness, Withy & Co. state that they anticipate making sailings from Halifax, N.S., to London, Eng., about every three weeks, during the summer, and to Liverpool, via Newfoundland, also about every three weeks, with occasional sailings to Glasgow and Manchester.

The British Government has appointed an imperial shipping committee to enquire into complaints regarding ocean freights and similar matters and also to survey facilities for inter-empire trade. Sir George Perley, Canadian High Commissioner, will represent Canada.

Early in June, the following four steamships cleared from Montreal simultaneously, carrying well over 4,000 passengers among them: Minnedosa and Tunisian, Canadian Pacific Ocean Services; Cassandra, Anchor-Donaldson Line, and Megantic, White Star-Dominion Line. This is an unusual thing for Canada.

A Halifax press dispatch of June 15 stated that it was reported there that a fast transportation service between Halifax and an English port is contemplated, with especially built modern steamships, equipped with oil fuel burners and having a speed about a knot faster than the s.s. Lusitania, which will necessitate only three nights being spent on board on the trans-Atlantic trip.

The Canadian Robert Dollar Co., which acquired the s.s. War Melody recently, has changed her name to Grace Dollar, and has placed her in its trans-Pacific service. She was delivered to her owners at New York a few weeks ago, and went to the Pacific coast via the Panama Canal, arriving at Bellingham, Wash., June 5, after which she proceeded to Vancouver, B.C., to take on cargo for Japan and China. She was built at Belfast, Ireland, in 1918, and has 4,040 d.w. tons capacity.

The Isthmian Line, controlled by the United States Steel Products Co., is reported to have completed arrangements for the operation of a steamship line between New York and Puget Sound, and British Columbia points, and the steamships Steel Maker and Bantu have already been placed in the service. The ships which are being utilized were operated formerly as the Maple Leaf Line, and calls were made at Victoria, but, on the reorganization, Vancouver is said to have been substituted for Victoria.

It was announced recently that a steamship service was about to be inaugurated between Vancouver and Havre and Calais, France, and that the s.s. Pacific would be ready to load at Vancouver early in July. We have been officially advised that the Johnson Line, of Stockholm, Sweden, will operate the service, which will be opened during the early half of July with the motor ship Pacific, which will load at Seattle, Wash., and Vancouver, and that she will be followed during the latter half of August by the motor ship Kronprinsessan Margareta, and that thereafter there will be regular sailings at intervals of about six weeks.

It has not been decided whether the ships will call at both Havre and Calais, as it is considered that the call at Calais will be sufficient, this port being only 186 miles from Paris, and having the best railway connections with northern French ports, and also being connected by canals with points in France, Belgium and Alsace-Lorraine. C. Gardner Johnson Co., represent the line in Canada, and W. R. Grace & Co., at Seattle and Tacoma, Wash.

Maritime Provinces and Newfoundland.

The harbor revenue at St. John, N.B., for May was \$14,600, an increase of over \$4,000 compared with May, 1919, due, it is stated, to the larger number of steamships handled.

Canada Steamship Lines Ltd. announced the inauguration of a steamship service between Montreal and Prince Edward Island, Sydney, N.S., and St. John's, about June 30, with the s.s. Mapledene.

The St. John Dry Dock & Shipbuilding Co., contractors for the harbor improvement work in Courtenay Bay, St. John, N.B., is reported to have submitted plans to the Dominion Government for a change in the original plans covering the projected improvements, and calling for the erection of four piers at the head of the bay with accommodation for six steamships, and the reclamation of ground for railway yards to some of the piers.

The Newfoundland Government subsidy for the carriage of mails and passengers between Newfoundland and North Sydney, N.S., is stated to have been reduced from \$75,000 to \$35,000 a year, until such time as the Reid Newfoundland Co., which operated the service, shall restore it to its full capacity. The company lost two of its steamships recently and of necessity of the service has been interfered with. It is reported that negotiations are proceeding in England for the purchase of additional ships and it is expected that they will be in operation during this year.

An order in council has been passed authorizing the following pilotage rates for the pilotage district of Miramichi, N.B.:—For steamships a flat rate of \$25 inward and outward and an additional 5c. a registered ton. For sailing ships, up to 300 tons register, a flat rate of \$25 inward and outward, with an additional 6c. a registered ton outward. For sailing ships over 300 tons register and not exceeding 700 tons register, a flat rate of \$25 inward and outward, with an additional 5c. a registered ton inward and outward. For sailing ships over 700 tons

register a flat rate of \$25 inward and outward, with an additional 4½c. a registered ton outward.

Province of Quebec.

The Gulf of St. Lawrence Shipping & Trading Co.'s s.s. Lady Evelyn was considerably damaged by fire at Carcy Point June 9.

Canada Steamship Lines' s.s. Quebec, which went aground at Three Rivers, June 3, during foggy weather, was released June 8, apparently undamaged.

The s.s. Columbia has been bought from U.S. owners by A. A. Larocque, President, Sincennes-McNaughton Lines Ltd., Montreal, and has been transferred to the Canadian register under the name of Dougalmac.

Canada Steamship Lines Ltd. has had a pontoon landing for the use of passengers and freight at its Quebec docks, built by the Davie Shipbuilding & Repairing Co., Lauzon, Que. It is built of Douglas fir, and is 235 ft. long, by 43 ft. wide, by 7 ft. deep.

The Canada Steamship Lines' s.s. Rapids King has, according to a press report, been stationed near Victoria pier, Montreal, to provide for night accommodation for travellers unable to find rooms in hotels or boarding houses in the city.

The barge Cuba, from Quebec to Ogdensburg, N.Y., with pulpwood, foundered in deep water, in the St. Lawrence River, June 8, and became a total loss. She was originally built as a steamship at Kingston, Ont., in 1875, and was owned by the George Hall Coal Co. of Canada. Her dimensions were,—length 168.7 ft., breadth 25.6 ft., depth 11 ft., tonnage, 386 register.

Ontario and the Great Lakes.

A Kingston press dispatch says that, in view of the low water in the harbor there, the Dominion Public Works Department has decided to remove 41,000 yards of material, and that tenders will be called for the work at once.

The Ogdensburg Coal & Towing Co.'s s.s. Nicaragua, westbound June 8, collided with the gates at lock 18 of the Cornwall canal, and dislodged one of the gates. Traffic was delayed for about seven hours. The cause of the accident is given as an engineer's mistake in the signal.

The s.s. H. P. Bigelow, operated as a ferry between Brockville, Ont., and Morristown, N.Y., was destroyed by fire at her slip at Morristown, June 5. She was

Vessels Added to and Deducted From the Canadian Register During March, 1920.

| Added. | Steam.—Tonnage— | | No. | Sailings.—Tonnage— | |
|--|-----------------|--------------------|--------------|--------------------|-----------------|
| | No. | Gross. Registered. | | No. | Gross. Reg. red |
| Built in Canada | 9 | 6,326 | 3,907 | 9 | 1,403 |
| Purchased from foreigners..... | ..... | ..... | ..... | ..... | ..... |
| Transferred from United Kingdom..... | ..... | ..... | ..... | ..... | 299 |
| Transferred from British Possessions ..... | ..... | ..... | ..... | 1 | 365 |
| New registers | 3 | 133 | 96 | ..... | 180 |
| Re-registered after wreck ..... | ..... | ..... | ..... | 1 | 130 |
| Totals | 12 | 6,459 | 4,003 | 11 | 1,898 |
| Deducted. | | | | | |
| Wrecked or otherwise lost..... | 6 | 2,060 | 1,291 | 6 | 558 |
| Broken up or unfit for use..... | 12 | 471 | 273 | 17 | 618 |
| Sold to foreigners..... | 4 | 4,402 | 2,760 | 2 | 619 |
| Transferred to United Kingdom..... | 2 | 512 | 115 | ..... | ..... |
| Transferred to British possessions..... | ..... | ..... | ..... | ..... | ..... |
| New registers ..... | ..... | ..... | ..... | 2 | 69 |
| Totals | 24 | 7,445 | 4,439 | 27 | 1,764 |

of oak, built at Baldwinsville, N.Y., in 1893, and had the following dimensions,—length 60 ft., breadth 14 ft., depth 8½ ft.; tonnage, 46 gross, 36 net.

The George Hall Coal Co. of Canada's claim against the owners of the s.s. Samuel Marshall, for damage caused by the Samuel Marshall colliding with the s.s. Liberty, at Kingston, recently, has been settled out of court, by the payment of approximately \$10,000. The s.s. Liberty is at Kingston drydock undergoing repairs.

The United States Lake Survey reports the stages of the Great Lakes in feet above mean sea level for May, as follows: Superior, 602.40; Michigan and Huron, 580.75; St. Clair, 575.24; Erie, 572.31; Ontario, 245.60. Compared with the average May stages for the past ten years, Superior was 0.44 ft. above; Michigan and Huron 0.17 ft. above; Erie 0.42 ft. below, and Ontario 1.10 ft. below.

The contract for the building of a sea wall at Toronto, which has been awarded by the Dominion Public Works Department to Randolph Macdonald Co., Toronto, as mentioned in our last issue, calls for the construction of a breakwater along the southern shore of the center portion of Toronto Island 1,700 ft. long, on brushwood fascine mattress 60 ft. wide, the base of the breakwater being 47½ ft. wide, and the top 10 ft. wide, there being a slope of 1½:1 on one side, and 1:1 on the other. The height of the breakwater above low water level will be 7 ft.

British Columbia and Pacific Coast.

The Union Steamship Co. of British Columbia has appointed G. Whalen, captain, and P. J. V. Farina, chief engineer of the s.s. Capilano; and J. Findlay, captain, and J. Hogan, chief engineer of the s.s. Chilkoot, for this season.

The contract for dredging and filling on the site of the Ballantyne pier, in Burrard Inlet, is reported to have been awarded by the Vancouver Harbor Commissioners, to Grant & MacDonald, Vancouver, for \$513,121.50.

The C.P.R. s.s. Princess Alice has been withdrawn from the Gulf service and was placed on the Alaska route June 11, in conjunction with the s.s. Princess Mary. The s.s. Princess Royal, which has had additional deck accommodation installed, takes the place of the s.s. Princess Alice on the Gulf route.

The Grand Trunk Pacific Coast Steamship Co.'s s.s. Prince John was returned to service on the Queen Charlotte Islands run, June 4, after having been repaired and overhauled, subsequent to a collision with the same company's s.s. Prince Albert, at Dead Tree Point about the end of March. The repairs were made by Wallace Shipyards Ltd., North Vancouver.

The auxiliary powered schooner Janet Carruthers, which was built by Wallace Shipyards, Ltd., North Vancouver, B.C., in 1917, for Canada West Coast Navigation Co., and which was wrecked on the Copalios Beach over a year ago, was dynamited about the middle of June, after her fittings were salvaged. Her dimensions were,—length 240 ft., breadth 44.1 ft., depth 19.3 ft.; tonnage 1,466 gross, 1,253 net. She was equipped with Diesel engine of 36 h.p., driving a screw.

The British Yukon Navigation Co., White Horse, Yukon, has appointed the following officers for its steamships for this year:—Canadian, C. M. Coghlan,

captain, J. Scotland, chief engineer; Casca, J. O. Williams, captain, J. P. Borne, chief engineer; Selkirk, M. Campbell, captain, W. C. Vey, chief engineer; Tarahne, D. McKay, captain, F. Vey, chief engineer; Tutshi, J. McDonald, captain, J. Lauderdale, chief engineer; White Horse, F. D. Turner, captain, P. Larssen, chief engineer.

Canadian Notices to Mariners.

The Department of Marine has issued the following:—

British Columbia, Strait of Georgia, Fraser River.—Range lights established on Woodward's Islands, Deas Island, Tilbury Island and Annacis Island.

New Brunswick-Bathurst Harbor.—During the past season the Dominion Public Works Department cleaned the dredged channel through the outer bar leur Bay, to a least depth of 15½ ft.; at the entrance to Bathurst Harbor, Chain inside the harbor, on the Ripple, Ballast bar and Seal bar, the channel was cleared to a least depth of 13½ ft., and in the Tetagouche channel, leading to West Bathurst, a section 900 ft. long and 40 ft. wide, was dredged to a least depth of 13 ft., but inside this section the controlling depth is still 10 ft.

New Brunswick-Miscow Island.—Without further notice the steam fog whistle on Birch Point, Miscow Island, Chaleur Bay, will be replaced by a diaphone, operated by air compressed by an oil engine, giving one blast of 3 seconds duration a minute.

Nova Scotia and Newfoundland Radiotelegraph Direction Finding Stations.—The British Admiralty published a circular letter recently relating to these stations at Chebucto Head and Canso, N.S., and at Cape Race, Nfld., calling attention to the immense value of these stations, but indicating that while mariners are beginning to use them more extensively, the advantage does not seem to have become general. The attention of mariners is called to a previous notice early in 1919, which gave the regulations to be used when communicating with the Canadian stations, and it is extremely necessary that both masters and radiotelegraph operators should make themselves fully acquainted with the procedure.

Nova Scotia, Barrington Bay.—Gas and bell buoy to be established without further notice, in position formerly occupied by lightship, in 6 fathoms, ⅓ mile eastward of Wessex ledge; steel cylindrical buoy, surmounted by a steel frame supporting the bell and lantern, painted black with white vertical stripes, showing a white acetylene light, automatically occulted at short intervals.

Ontario, Lake Superior, Port Arthur harbor.—Work will be started in the near future on the extension of the Bare Point breakwater. This extension will leave the south end of the present breakwater, and proceed southwesterly for 1,600 ft. Mariners are warned that they must use caution when in the vicinity.

Ontario, Ottawa River, Chats Lake, Arnprior Island.—On an islet, opposite the town of Arnprior, the 6th order dioptric light will be replaced, without further notice, by an unwatched occulting white acetylene light, automatically occulted at short intervals.

Quebec, Gulf of St. Lawrence.—About June 15, the front range light in Thunder River will be changed in position to 228 ft. southward of its previous posi-

tion in the line of range, and 112 ft. back from the water's edge. The light is at an elevation of 30 ft. on a structure, consisting of a mast 25 ft. high, with wide diamond shaped day mark attached.

Quebec, River St. Lawrence, channel north of Island of Orleans.—Four steel can buoys, painted black and white, have been placed, two on the north side and two on the south side of the channel, between red gas buoy 110B and black can buoy 121B, at the eastern end of the channel, north of the Island of Orleans. These buoys are not to be used as aids to navigation.

Wreck Commissioner's Enquiries and Judgments.

An enquiry has been held and judgment delivered in connection with the following casualty:—

Prince Albert-Prince John Collision.

Enquiry held during May by Capt. J. D. Macpherson, Wreck Commissioner for British Columbia, assisted by Capt. G. E. Budge and J. R. Stewart as nautical assessors, and judgment delivered towards the end of that month, into the collision between the Grand Trunk Pacific Coast Steamship Co.'s steamships Prince Albert and Prince John, off Skidegate, at the end of April. The court found that the collision took place in such a manner and in such unusual circumstances that it could not have been prevented by ordinary skill on the part of those in charge of their vessels, and no blame is therefore imputed to any of the officers concerned. The court expressed the opinion that both masters exercised considerable care and nerve, when they found themselves placed in an unpleasant and difficult situation, and that after the collision had occurred, the conduct of all concerned was worthy of highest commendation, it being the court's opinion that the s.s. Prince John would undoubtedly have foundered, in comparatively deep water, with probable loss of life, had it not been for the presence of mind, resource, energy and coolness displayed by the masters, officers and crews of both steamships.

Steamships Lady Evelyn and Champlain.—Rt. Hon. A. L. Sifton stated, in the House of Commons, recently, that the s.s. Lady Evelyn was sold April 24, 1919, and the s.s. Champlain in March, 1920, to the Gulf of St. Lawrence Shipping & Trading Co. The Lady Evelyn was included with other ships advertised for sale by the Naval Service Department in Feb., 1919. The only tender received was for \$20,000. The s.s. Champlain was also advertised for sale. The Lady Evelyn was sold for \$40,000, and the Champlain for \$61,050. For the Lady Evelyn \$34,000 had been paid to June 16, the balance of \$6,000 being held pending settlement of a claim that the complete equipment was not handed over with the ship. For the Champlain, \$13,102.50 was paid in cash, the balance being secured by endorsed notes, maturing in 3, 6, 9 and 12 months, with interest at 6%.

Marine Public Works Contracts.—The Dominion Public Works Department has let the following contracts: Rubble mound stone breakwater off southern shore of Toronto Island, May 26, Randolph MacDonald Co., Toronto, at schedule of prices; dredging northwest Miramichi River, Que., June 2, Miramichi Dredging Co., Newcastle, N.B., at 54½¢ a cu. yd. scow measure.

Steamship Service Between Canada and West Africa.

Elder Dempster & Co. have issued the following:—Our new service from Canada to West Africa will consist of steamships sailing at about monthly intervals, although at first while the business is in course of development, the regularity and frequency of sailings may be governed by circumstances and the demands.

The first sailing will be the s.s. Melville from Montreal on or about June 10. This will be followed by the s.s. Bassam on or about July 15. Future sailings will be announced later. The Melville will call at the following ports: Dakar, Bathurst, Sierra Leone, Seccondi, Cape Coast Castle, Saltpond, Winnebah, Accra, Lome, Contonou, Lagos, Burutu, and Port Harcourt.

There are a great number of ports on the West Coast of Africa, extending over 2,000 miles, and following the practice adopted by our lines from Liverpool and from New York, the ports of call may vary with each sailing. One month's ship will call at certain ports, and the following ship may omit some of these served by the previous one, and include others instead, but in practically every case each ship will include the principal ports, like Sierra Leone, Seccondi, Accra and Lagos. The other ports will depend upon the cargo that may be offering from time to time. We have advertised the s.s. Bassam for the above ports and are now ascertaining from shippers what other ports they have shipped for, and would like the ship to call at.

This service is intended to be a regular one to and from Canada and the West Coast, and we are just as much interested in bringing back to Canada imports from West Africa, which we are in hope will develop into substantial proportions as the service and opportunities become better known, and we desire to bring to the notice of Canadian importers and manufacturers the opportunities afforded by bringing out by direct steamship, cocoa, palm oil, ground nuts, hides and skins, ginger, piassava, mahogany, ivory, manganese ore, etc.

Our service from West Africa to New York, consisting of steamships about every 10 days, is bringing out full cargoes every voyage, a very large proportion of which consists of cocoa from the Gold Coast, which is producing this article in enormous and ever-increasing quantities, and it seems to us that Canada should be able to import and use quite a large quantity of this West African cocoa, now that it is brought out by direct vessel.

Halifax Dry Dock Expropriation.—The question of the price to be paid by the Dominion Government for the Halifax Graving Dock Co.'s property at Halifax, N.S., came before the Exchequer Court of Canada June 14. The company claims \$5,000,000 for its property, which has been expropriated by the Dominion Government and the government has named \$1,100,000 as the outside price it will pay. The property is now operated under lease by Halifax Shipyards Ltd.

Victoria Drydock.—The Minister of Railways stated in the House of Commons recently that the government had reached a conclusion on the proposal to build a drydock at or near Victoria, B.C., as a government work, that it would be commenced as soon as conditions will justify, and that the cost would be between \$5,000,000 and \$6,000,000.

Trent Canal Construction.

J. A. Campbell, M.P. for Nelson, Man., asked the following questions in the House of Commons recently, the answers being given by the Minister of Railways and Canals:—

"What is the total amount which has been spent by the Government on the Trent canal during the last 25 years?" Answer:—"\$20,049,130.28."

"What amount was spent on this canal last year?" Answer:—"\$1,434,713.49."

"How many persons were permanently employed thereon?" Answer:—"Ninety-three employees permanently employed throughout the year, and 91 employed during the season of navigation only."

"What was the total maintenance cost last year?" Answer:—"428,851.22."

"What was the total revenue derived therefrom during the last fiscal year?" Answer:—"2,954.37, from rentals under hydraulic leases. There are no tolls charged on any canals."

"What amount of freight was transported on said canal during the last fiscal year?" Answer:—"Season of 1919—69,118 tons of freight."

"What is the draft of the canal?" Answer:—"Trenton to Peterborough, 8 ft. 4 in.; Peterborough to Lake Couchiching, 6 ft."

Icebreaking Steamship for the St. Lawrence River.

The Marine Department will, we are officially advised, call for tenders early in July, to be in by Aug. 9, for the construction of an icebreaking steamship for service in the St. Lawrence River and Gulf. The estimates for 1920-1921, details of which have been given in previous issues, contain an appropriation of \$2,000,000 for this purpose. The plans and specifications are being prepared in the Marine Department. The general dimensions will be,—length between perpendiculars 275 ft., breadth moulded 57½ ft., depth moulded 32 ft.; tonnage, 3,520 gross; indicated horse power, 8,000; speed 16 knots. The dimensions are practically the same as those of the icebreaking steamship J. D. Hazen, which was built for St. Lawrence River service, by Canadian Vickers Ltd., in 1914, but which was not finished when the war broke out. At the request of the British Government, the ship was then completed and sold to the Russian Government, for use in the White Sea.

Canadian Pacific Ocean Services to the Far East.

The direct steamship service from Vancouver, B.C., to Singapore, Straits Settlements, which was inaugurated by the Canadian Pacific Ocean Services in Oct., 1919, with the s.s. Methven, is to be augmented by the addition of the s.s. Mattawa, formerly in the Atlantic trade. The Mattawa sailed from Liverpool on April 23 via the Suez canal with a general cargo for Karachi, India, and will load for Vancouver at Karachi, Bombay, Colombo, Singapore, Hong Kong, Shanghai, Kobe, and Yokohama, arriving Vancouver early in July.

The direct Singapore service will be in addition to the regular service to China and Japan ports and Manila, maintained by the C.P.R. for many years with the Empress fleet. Shipments of rubber, tea, tin, etc., originating in the Straits Settlements and Indian ports, can

now be carried on either of the ships direct from Singapore to Vancouver, saving transshipment at Hong Kong.

From Vancouver it is expected a fairly heavy volume of traffic will move in connection with these ships to Singapore, as shipments for such ports as Calcutta, Colombo, Bombay, Rangoon, Madras, Batavia, Samarang, etc., can be transhipped at Singapore at considerably less than via Hong Kong. To these ports a regular weekly service is maintained by local steamship lines.

With the addition of these two ships the Canadian Pacific Ocean Services now has 6 steamships in its Oriental service aggregating 60,000 tons gross, with approximately three sailings a month.

Another feature of this service is the issuance of through bills of lading from shipping points to ultimate destination, thereby eliminating the usual trouble of arranging clearance at the seaboard.

Superintendent of Pilots for Montreal and Quebec District.

The Civil Service Commission has invited applications for the position of Superintendent of Pilots for the Montreal-Quebec pilotage district at an initial salary of \$3,060 a year, which will be increased on recommendation for efficient service, at the rate of \$180 a year, until a maximum of \$3,600 is reached. His duties will be, under direction, to supervise the pilotage service in the Montreal-Quebec district, to call and assign pilots to ships, receive pilotage dues, and make the required reports and returns to the Marine Department, to conduct investigations, when required, into wrecks, collisions and strandings, to make recommendations and handle correspondence in connection with such work and to perform other related work as required. He must hold a master's certificate of competency, must have been actually master of a sea going ship, or a passenger ship in coasting trade, for at least a year, must be thoroughly familiar with all shipping matters, especially those of the Gulf and River St. Lawrence, and have a knowledge of both English and French. While no definite age limit is fixed, age may be a determining factor when the selection is made.

Government Steamships to be Sold.

The Naval Service Department is offering for sale by tender, to Aug. 2, the ships, Niobe, Rainbow, Grilse and Canada, as they lie, the Rainbow at Esquimalt, B.C., and the others at Halifax, N.S. The Niobe is a steel armored cruiser of the Spartiate type, built in 1892, and having a displacement of 11,000 tons. Her dimensions are,—length over all 462½ ft., beam 43¾ ft., draft 27½ ft. The Rainbow is a steel cruiser of the Apollo type, built in 1891, and having a displacement of 3,400 tons. Her dimensions are,—length over all 300 ft., beam 43¾ ft., draft 18 ft., and it is stated that with slight alterations she could be utilized as a cargo ship. The Grilse was built at Glasgow, Scotland, in 1912, of steel, as a pleasure yacht, and is screw driven by turbine engines of 6,000 h.p., using oil fuel, and has a speed of 32 knots an hour. Her dimensions are,—length 202.3 ft., breadth 18.3 ft., depth 9.2 ft., tonnage, 287 gross, 157 net. The Canada was built at Barrow-in-Furness, Eng., in 1904, of steel, and is screw driven by engine of 209 h.p. Her dimensions are,—length 206 ft., breadth 25.1 ft., depth 13.3 ft., tonnage, 411 gross, 185 net.

Welland Ship Canal Construction.

J. A. Campbell, M.P. for Nelson, Man., asked the following questions in the House of Commons recently, the answers being given by the Minister of Railways and Canals.

"When was the work in connection with the new Welland canal scheme started?" Answer:—"Preliminary surveys date back to 1908 and were continued until 1913. Actual construction commenced Sept., 1913."

"When was the work discontinued?" Answer:—"The work of construction actually ceased in April, 1917, but the work of closing up the contractors' estimates, and maintaining government property and plant was carried on until Dec. 31, 1918."

"What was the total cost of the work done during the above period of construction?" Answer:—

| | |
|---|---------------|
| "Preliminary surveys (approx.) | \$ 187,232.15 |
| "Construction work and plant taken over from contractors, as per final estimates for sections 1, 2, 3, 4A, and 5 and materials purchased by department, etc. | 16,550,883.17 |

| | |
|--|-----------------|
| "Total to Mar. 31, 1919 | \$16,738,115.32 |
| "Expenditure incurred between Jan. 1 and Mar. 31, 1919 | 683,315.84 |

"Total expenditure incurred up to Dec. 31, 1918

"When was the work recommenced in 1919, and when did it stop?" Answer:—"Contracts were dated Jan. 17, 1919; work actually commenced in February. Contracts expired Dec. 31, 1919."

"What was the nature of the work done during 1919, and what was the total cost thereof?" Answer:—"Purchase of plant, equipment, plant materials and repairs, and general construction work. The cost for 1919 was as follows:

| | |
|--------------------------------------|----------------|
| "Jan. 1 to Mar. 31, 1919..... | \$ 683,315.84 |
| "Apr. 1, 1919, to Mar. 31, 1920..... | 3,768,760.22 |
| ..... | \$4,453,076.06 |
| "Jan. 1, to Mar. 31, 1920 | 61,449.23 |

"Actual expenditure incurred during calendar year 1919

"How many men were employed thereon during 1919?" Answer:—"The largest number employed at one time was during the last week of July, when the force, including engineering staff, was 2,786. Average monthly force was 1,458.

Merger of Canadian Steel, Coal, Shipping and Shipbuilding Companies.

At the Dominion Steel Corporation's annual meeting, at Montreal, June 18, the President, R. M. Wolvin, who is also officially connected with Canada Steamship Lines Ltd., Montreal Transportation Co., Halifax Shipyards Ltd., etc., stated that a short time ago a proposal had been submitted to the directors to join with various other enterprises in the recently organized British Empire Steel Corporation Ltd., the object of which is to put under single control the largest known deposits of ore and coal, to operate ore and coal mines, steel works, steamships, shipbuilding and repair yards, and other complementary enterprises. This would be the greatest industrial enterprise in Canada and would promise greater economy and efficiency in the production of coal and steel, with much needed shipbuilding and organization for the transportation of raw material and finished products, together with an outlet for ship plates.

Among the enterprises which it is said will be absorbed by the newly organized company are: Dominion Iron & Steel Co.,

Dominion Coal Co., Nova Scotia Steel & Coal Co., Canada Steamship Lines Ltd., Black Diamond Steamship Co., Halifax Shipyards Ltd., Tidewater Shipbuilders Ltd., Three Rivers, Que., Collingwood Shipbuilding Co., Davie Shipbuilding & Repairing Co., Lauzon, Que., Maritime Nail Co., and possibly Canada Foundries & Forgings Ltd., Welland, Ont., and Dominion Shipbuilding Co., Toronto. In addition to the Canadian companies concerned, various British interests will probably join, including those controlled by Viscount Furness and Sir William Beardmore, who are associated with large steel, iron, coal, shipbuilding and shipping companies in Great Britain.

Considerable discussion relative to the projected merger centered round the Dominion Steel Corporation's annual meeting, and at this meeting the election of a new board of directors was taken to be an indication as to the company's policy regarding its future movements in this connection. The directors elected are:—Senator C. P. Beaubien, E. Bristol, K.C., M.P., director of Canada Steamship Lines Ltd.; S. Elkin, M.P., President, Maritime Nail Co., St. John, N.B.; Viscount Furness, head of Furness Withy & Co., and associated with Canada Steamship Lines as member of the London, Eng., Advisory Board; Sir William Mackenzie, ex-President, Canadian Northern Ry.; Sir Newton Moore, London, Eng.; Senator F. Nicholls, President, Canadian General Electric Co.; J. W. Norcross, President and Managing Director, Canada Steamship Lines Ltd., and President, Halifax Shipyards Ltd., etc.; Sir Henry M. Pellatt, Toronto; Sir Wm. D. Reid, ex-President Reid Newfoundland Co.; Sir Clifford Sifton, Toronto; J. F. M. Stewart, director, Canada Steamship Lines Ltd., and Point Anne Quarries Ltd., Toronto; H. B. Smith, President, Collingwood Shipbuilding Co., and Northern Navigation Co., Toronto; B. Talbot, London, Eng., and R. M. Wolvin, Vice President and Managing Director, Halifax Shipyards, Ltd., and President Montreal Transportation Co.

Lighthouse Keepers' and Caretakers' Pay.—In answer to a question in the House of Commons recently, the Minister of Marine gave the following information as to the names and salaries of lightkeepers and lighthouse caretakers on St. Lawrence river from Lake St. Louis to Lancaster, and on the Ottawa river from Lake St. Louis to Point Fortune: Lachine Range, J. B. Malo, \$390; Melochville, E. Julien, \$420; Windmill Point, M. O. Phaneuf, \$100; Caron Point, F. Robert, \$100; Ile Perrot, D. Leduc, \$180; Ste. Anne de Bellevue, E. Pilon, \$220; Ste. Anne de Bellevue locks, S. Brisbois, \$170; Pte. à Cadieux, S. Poirier, \$260; Oka, A. Lacroix, \$140; Oka Wharf, T. Hamelin, \$100; Pte. aux Anglais, A. Labrosse, \$420; Graham Wharf (b), E. Lavigne, \$100; Graham Wharf (f.), A. Bertrand, \$100; Ste. Placide, H. Dubreuil, \$260; Jones Island, J. Charlebois, \$140; Rigaud, O. Mallette, \$220; Argenteuil Bay, J. Giroux, \$140; Knight's Point, W. Sharmon, \$820; McKie's Point, D. Daoust, \$260; St. Anicet Bar, D. McKellop, \$505; Lancaster, J. J. Munroe, \$765.

Canada River Steamship Co. Ltd. has been incorporated as a private company under the Dominion Companies Act with \$1,700,000 authorized capital and office at Kingston, Ont., to build, own and operate steam and other ships, marine railways, drydocks, wharves, elevators, etc., and to carry on a general transportation and forwarding business.

Probable Effect of U.S. Merchant Marine Act.

London, Eng., June 23, copyright cable to Montreal Gazette:—An official of the Ministry of Shipping stated today that Canada will benefit from the forthcoming rate war between British and United States ship owners. A number of U.S. shipping firms carrying on business at San Francisco and Seattle, have applied to be allowed to transfer their headquarters to Vancouver, B.C., and so come under the British regulations, he said. The reason is that the U.S. Merchant Marine Act aims to keep foreign ships out of U.S. ports and thus give a monopoly to the new and vast U.S. mercantile marine, which, by the end of the year, will amount to 7,000,000 tons, against the British 17,000,000 tons. The act imposes a tax on all foreign vessels proportionate to tonnage, and gives preferential railway rates for goods going abroad in U.S. ships.

In connection with the latter, the British Government has instructed Sir Auckland Geddes to make enquiry of the U.S. State Department. The probable outcome will be a big rate war, according to the Ministry of Shipping official. He added: "If the U.S. people, by adopting means laid down in the new law, undercut rates, without doubt the British companies will follow suit immediately, and it must be remembered the U.S. people are novices at ship management compared to the men at the head of our shipping industries. One curious effect is that already U.S. shipping firms in San Francisco have applied to transfer their headquarters to Vancouver. It does not look as though the U.S. people have lost faith in British supremacy."

Fisheries Protection Tugs on Lake Erie.

The Naval Service Department has selected the steam tugs Becancour, Lavaltrie and Laviolette for the Fisheries Protection Service on Lake Erie. They were all built of steel by the Marine Department, at Sorel, Que., and have the following chief details respectively:—

Becancour, built in 1914, length 93 ft., breadth 22.5 ft., depth 9.9 ft., tonnage 213.74 gross, 84 net, equipped with two fore and aft compound engines 48 n.h.p., 450 i.h.p., driving twin screws, speed 11.5 knots an hour. Station, Port Dover.

Lavaltrie, built in 1912, length 84.5 ft., breadth 21.7 ft., depth 10.8 ft.; tonnage 194.99 gross, 84.12 net; equipped with two fore and aft compound engines 40 n.h.p. and 200 i.h.p., driving twin screws, speed 10 knots an hour. Station, Port Stanley.

Laviolette, built in 1912, length 84.2 ft., breadth 21.7 ft., depth 10.8 ft.; tonnage, 213.49 gross, 82.34 net; equipped with two fore and aft compound engines 40 n.h.p., 200 i.h.p., driving twin screws, speed 10 knots an hour. Station, Kingsville.

Miramichi River Services Ltd. has been incorporated under the New Brunswick Companies Act, with \$24,900 authorized capital and office at Chatham, N.B., to own and operate steam and other ships and to carry on a general navigation business between places on the Miramichi River, and ports within the province, on the Gulf of St. Lawrence. The provisional directors are:—Hon. J. P. Burchill, Nelson, N.B., W. B. Snowball, J. K. Logie, G. J. Sproul, and C. Reinsborrow, Chatham, N.B.

Mainly About Marine People.

John Barnsley, heretofore Assistant Manager, Union Steamship Co. of British Columbia, has been appointed acting Manager, consequent on the death of E. H. Beazley, Managing Director, who was killed May 24 in an aeroplane accident. The chief owners of this company, who are in Liverpool, Eng., are being consulted in regard to permanent appointments and changes in the directorate. Mr. Barnsley has been connected with shipping in British Columbia for several years, and was Managing Director of the Boscowitz Steamship Co., Vancouver, when it was absorbed by the Union Steamship Co. of B.C., since when he has been Assistant Manager of the latter company.

E. H. Beazley, Managing Director, Union Steamship Co. of British Columbia, Vancouver, whose death in an aeroplane accident, was mentioned in our last issue, was born at Birkenhead, Eng., in 1876, and entered the shipowning business of Gracie, Beazley & Co., conducted by his father in Liverpool, after completing his education in England and Germany. He later became connected with J. H. Welsford & Co., shipowners, also of Liverpool, and was their outside manager for 10 years, and when that firm obtained control of the Union Steamship Co., he came to Canada as Managing Director in Aug., 1911, which position he retained to the time of his death. He was intimately associated with the business and social life of Vancouver, and was a prominent member of the local board of trade, and President of the Employers Association of British Columbia.

Jos. R. Bennett, wharfinger, and Dock Superintendent, Pickford & Black, Ltd., Halifax, N.S., died there June 8, aged 74. In his younger days he served in the Royal Navy. He was in Pickford & Black service for over 30 years.

George E. Bunting, who has been appointed Representative for Australia and New Zealand, Canadian Government Merchant Marine Ltd., Auckland, New Zealand, entered transportation service with the G.T.R. when 19 years old, and later transferred to the Lehigh Valley Rd. at Buffalo, N.Y., and again to Canada Atlantic Ry. service at Ottawa. He was, subsequent to the absorption of the C. A.R. by G.T.R., Travelling Freight Agent, Allan Line Steamship Co., and in 1913 was appointed General Agent, Chicago, Ill., remaining there until the control of that company passed to the C.P.R. On the organization of C.G.M.M. Ltd. he was appointed Ontario Freight Agent, with office at Toronto, and in Dec., 1919, was sent to Australia and New Zealand to look over the shipping situation generally on behalf of C.G.M.M.

E. L. Cousins, General Manager and Chief Engineer, Toronto Harbor Commissioners, who returned from England recently, after an extended business trip, was entertained to dinner at the Engineers Club, Toronto, May 31, by the commissioners and staff.

Lt. Commander C. P. Edwards, R.N.C. V.R., Director of Radiotelegraph Service, Naval Service Department, Ottawa, has been appointed an officer of the Order of the British Empire, Military Division, for services rendered during the war.

Sir Thomas Fisher, K.B.E., R.N., General Manager, Atlantic Lines, Canadian Pacific Ocean Services, London, Eng., visited Canada during June, for a conference with the executive relative to extensions to the steamship service. This

is his first visit to Canada since his appointment to his present position. He was recently made a Knight of the Order of the British Empire for general services during the war.

Commander Hugh E. Holme, R.C.N., heretofore in command of H.M.C.S. Rainbow, has been appointed Commander in Charge, H.M.C. Dockyard, Esquimalt, B.C., vice Capt. Edward H. Martin, C.M. G., R.N., retired.

A. B. Mackay, who carried on business as steamship manager and agent, at Hamilton, Ont., has leased Kent House, East Cowes, Isle of Wight, which at one time was the Duchess of Kent's home, and was occupied latterly by Prince Louis of Battenburg, who is now known as the Marquis of Milford Haven.

J. T. Mathews, of the Mathews Steamship Co., Toronto, who died May 19, 1919, left an estate valued at \$454,165, the bulk of it being in the company's shares.

J. W. Norcross, President, Canada Steamship Lines, and **H. B. Smith**, President, Northern Navigation Co., accompanied by Sir James McKechnie, Managing Director, Vickers Limited, James Whalen, President, Port Arthur Shipbuilding Co.; **T. P. Phelan**, President Canada Railway News Co.; **H. W. Brown**, President Union Transportation Co., New York; and a number of other prominent men in the Atlantic shipping trade, and several Canada Steamship Lines officials, visited Sarnia, Sault Ste. Marie, Port Arthur, Fort William and Duluth at the end of May, on the Northern Navigation Co.'s s.s. Hamonic. Mr. Norcross entertained at lunch at Sarnia and Port Arthur, about 200 of the prominent business men of each city being present.

George William Roome, C.B.E., whose appointment as Chief Superintendent Engineer, Canadian Pacific Ocean Services Ltd., Liverpool, Eng., was announced in a recent issue, was born in Kent, Eng., Sept. 13, 1865. He entered the Royal Navy as an engineer student in July, 1881, at Keyham College, Devonport, Eng., and subsequently served on the following ships,—1887, Mohawk; 1888, Mersey; 1890, Barham; 1891-92, Euphrates; 1893-95, Hood; 1905-06, Prince George; 1911-12, Indomitable; 1918-19, Tiger. He has also served as assistant in the Royal Dockyards at Devonport and Malta, and as Chief Engineer in the Royal Dockyards at Hong Kong and Pembroke. From 1915 to 1918 he was Engineer Manager at the Rosyth naval base, when the whole of the plant and machine shops were erected and the yard put to the work of repair and refit of the greater part of the Grand Fleet. During 1892 and 1893, he served at the Admiralty, and from 1895 to 1898 and 1906 to 1911, was Instructor at the Royal Naval College, Greenwich, Eng. While on service on the staff of the Admiral commanding a battle cruiser squadron, during the latter part of the war, he was promoted to the rank of Engineer Rear Admiral, and made a Commander of the Order of the British Empire.

J. W. Troup, Manager, British Columbia Coast Service, C.P.R., Victoria, B.C., has applied for naturalization as a Canadian. He was born at Portland, Ore., Feb. 5, 1855, and came to Canada in 1892.

W. F. Wasley, Manager Muskoka Lakes Navigation & Hotel Co., Gravenhurst, Ont., has been re-elected President of the Highland Motor League.

Sorel Government Shipyard Superintendency.

In Dec., 1919, the Civil Service Commission advertised for applications for appointment as Superintendent of the Dominion Government shipyard at Sorel, Que. On May 11, the Commission advised us that the Marine Department had requested that no appointment be made, and that the matter would be held in abeyance for some time. On May 20 the Marine Department advised us of Louis Lacoutre being acting officer in charge. On June 15 the Commission again invited applications for the position, as follows:—

A shipyard superintendent for the Government shipyard at Sorel, Que., at an initial salary of \$3,000 a year, which will be increased upon recommendation for efficient service at the rate of \$180 a year until a maximum of \$3,540 has been reached. This initial salary will be supplemented for the present fiscal year by the bonus provided by law. Duties.—Under executive direction, to have charge of the Sorel shipyard; to be responsible for the design, estimates for costs construction, and repair of ships; to supervise safekeeping of stores and stock and the work of all employes, and to perform other related work as required. Qualifications.—Education equivalent to graduation in engineering from a school of applied science of recognized standing; at least five years of experience in ship design and construction, two years of which shall have been in responsible charge of such work; thorough knowledge of various types of ships and ship machinery and the construction and repair thereof; firmness, tact, good judgment, and ability to manage men. Examination.—Subjects and weights as follows: Education, training and experience, 7; oral interview, if necessary in the opinion of the Commission, 3.

St. John, N.B., Harbor Development.

A St. John, N.B., press dispatch says that important changes are suggested in connection with the harbor development at Courtenay Bay, which is under contract from the Dominion Government to the St. John Dry Dock & Shipbuilding Co., and a very full illustrated description of which appeared in Canadian Railway and Marine World for May. The contract calls for the building of three deep water wharves on the northwest side of the bay, which would narrow the channel considerably, and make it difficult for ships to berth, as the assistance of tugs would be required.

The change proposed is to build four wharves, instead of three, each to be 1,000 ft. long, and to project from Egbert St., straight towards the entrance of the bay. It is claimed that this change would afford a wider channel, and enable ships to dock and leave port without the difficulties which would be encountered under the present plan, as they would go straight to their docks, back out again and turn in the turning basin, thereby avoid the effect of the high tides.

It is also claimed that the change would provide, for the Canadian National Ry., a large acreage of land immediately adjoining their present yards, on which a large number of tracks could be built, which would obviate the present congestion, and avoid the grades, which, under the present plan, would be serious.

Shipbuilding Profits in Great Britain.

According to a statement published in England recently shipbuilding in the United Kingdom has made a very good financial record. Ships built there, it is stated, were turned out at a lower cost than those of other countries, and sold at higher prices. Of the 821 ships ordered by the Ministry, 129 were cancelled after the armistice was signed, 155 were transferred to private owners under the agreement with Lord Inchcape, 120 were transferred on similar terms to their builders, 104 were sold to foreign owners, 156 were sold to British owners direct; while of ships built abroad, 101 were sold to foreign owners and 18 to British owners, while of the total 20 were sunk and 18 are yet unsold. The 260 ships built in the United Kingdom were sold for £47,900,000—a profit of £11,600,000, as compared with their cost of £36,300,000; but the 119 vessels built abroad cost £26,400,000 and realized only £17,200,000—a loss of £9,200,000—leaving a net profit on the whole programme of £2,400,000. Put another way, it may be said that the United Kingdom ships cost an average of £139,615 each and sold for an average of £184,231—a profit of £44,616 a ship; while the ships built abroad cost £221,848 each and sold for £144,538—a loss of £87,310 a ship. This seems to prove pretty conclusively that the shipyards of the United Kingdom are as capable as ever they were of competing economically with those of Canada and the United States.

Shipbuilding in Australia.

The Assistant Canadian Trade Commissioner at Melbourne, Australia, writes:—Some interesting particulars of the cost of shipbuilding in Australia were made public recently by the minister in charge of shipbuilding, who stated that an attempt had been made by the Commonwealth Government to have six steel ships built in Australia of the same type as the five being built in the United Kingdom, but that the Government of New South Wales, after submitting an offer to build three at Walsh Island at £33 (\$160.60) a ton, declined to sign the contract.

These ships are 12,800 tons each, with 350,000 cu. ft. of refrigerator space, and are part of the government's proposals for a fleet of eleven 12,800 ton ships of the latest type which would maintain a two-weekly service between Australia and the United Kingdom. The New South Wales Government afterwards offered to build the six ships at the actual cost of labor and material, plus a percentage for overhead charges and profits, but this was not agreed to by the Commonwealth, which estimated the actual cost at £28 10s. (\$138.70) a ton, at which price the first ship constructed at the Government yards at Williamstown, Victoria, was recently turned out.

It was further stated by the minister, that under an agreement with two private firms in Australia, which are building two 6,000-ton vessels for the Commonwealth, the profit was to be on a graduated basis. If the ships cost £33 (\$160.60) a ton, the firms received no profit, but that the rate of profit increased with each £1 (\$4.87) a ton below £33 that the ships were built for.

It is said that the Commonwealth is prepared to negotiate further with the New South Wales Government in regard to the ships which it desires to have built

in Australia, as the government yards at Wash Island, at Newcastle, and Cockatoo Island, at Sydney, are the only yards in Australia with slips wide enough for the construction of ships of the size required, but any agreement arrived at would have to be on the basis of £33 a ton previously offered.

United States Shipping and Shipbuilding Notes.

Major General G. W. Goethals has resigned the presidency of the American Ship and Commerce Corporation.

The U.S. Shipping Board will, it is stated, obtain, from the charter of 15 ex-German steamships, to the U.S. Mail Steamship Co. for five years, a minimum hire of \$22,054,917.

The U.S. Shipping Board has issued the following statement of ships which it owned and controlled on June 5. Contract steel ships, 956; requisition steel ships, 205; wooden composite ships, 271; concrete ships, 4; bought ships, 24; seized German and Austrian ships, 31; ships chartered from Peru, 2.

The Atlantic Coast Shipbuilders' Association states that U.S. shipyards had orders on hand May 1 for 296 ships of 1,404,698 gross tons, on private account, an increase of 67,253 gross tons, compared with average gain of 198,000 for preceding six months. This is the smallest net increase in steel steam tonnage orders since U.S. shipyards began to take contracts for private account in any quantity.

Lighthouse and Buoy Service Estimates for 1920-1921.

The estimates for the year ending Mar. 31, 1921, submitted to the House of Commons recently contain the following items:—

| | |
|--|-------------|
| Agencies, rents and contingencies | \$198,000 |
| Salaries and allowances to lightkeepers | 650,000 |
| Maintenance and repairs to lighthouses | 750,000 |
| Construction of lights and aids to navigation, including regulation of traffic in Detroit river and such other places as may be found necessary | 400,000 |
| Signal Service | 65,000 |
| Administration of pilotage | 400,000 |
| Maintenance and repairs to wharves.. | 10,000 |
| Breaking ice in Thunder Bay, Lake Superior and other points deemed advisable for good of navigation | 40,000 |
| Pensions to retired pilots | 9,900 |
| Telephones at different points in connection with aids to navigation | 500 |
| Allowance to Harbor Master, Amherstburg, for supervision of lights and buoys on St. Clair river and Lake Erie; and other services in connection with lighthouse service for season of 1920 | 600 |
| Job Bros. for use of wharf at Greenly Island | 375 |
| | \$2,524,375 |

Sale of Montreal Transportation Co.

A special meeting of shareholders of Canada Steamship Lines Ltd. was held at Montreal, June 26, to ratify the purchase of the Montreal Transportation Co.'s property. The price to be paid is stated to be \$3,000,000, \$1,000,000 being paid in cash and the balance by July 1, 1921, at short intervals.

The Montreal Transportation Co. Ltd. is an old established business and until 1903 had an authorized capital of \$300,000. In that year the company reorganized, with an authorized capital of \$1,000,000, the paid up capital early in 1916 being \$913,300, with no bonds outstand-

ing. In addition to other property the company owns the entire capital stock of the Prescott Terminal Co., \$500,000. At the end of 1916 the company's property and assets were acquired by L. L. Henderson, Vice President and Managing Director, and his associates, Mr. Henderson becoming President and Managing Director. In 1918 a number of changes took place, R. M. Wolvin being elected President, L. L. Henderson, Vice President, and T. R. Enderby, Managing Director, and subsequently the authorized capital stock was increased to \$4,000,000, of which \$3,000,000 was issued and paid up. Holders of Montreal Transportation Co.'s stock are asked to deposit it with the Prudential Trust Co. as trustee, and they will receive in return negotiable certificates to the extent of their holdings until the property is fully paid for on July 1, 1921.

The company owns the following steamships: Advance, Alert, Arabian, Atikokan, Cataract, D. G. Thomson, Es-cort, Glenmount, H. F. Bronson, India, Joyland, Manola, Mary P. Hall, McNaughton, Nicaragua, Oatland, R. G. A. Weaver, Simla, Stormount, Valcartier, Vinmount, Westmount, and Windsor, in addition to a number of tugs, barges, etc.

Change in Wavelength at Canadian Direction Finding Stations.

The Director of the Radiotelegraph Branch, Naval Service Department, Ottawa, Lt. Commander C. P. Edwards, has issued the following notice:—The attention of masters of merchant ships fitted with radiotelegraph apparatus is called to the following notice of change in wavelength, at Canadian direction finding stations:—

On and after Aug. 1, 1920, the Canadian radiotelegraph direction finding stations at Chebucto Head, N.S.; Canso, N. S.; and Cape Race, Nfld., will use the wavelength of 800 meters exclusively for transmission and reception.

It will be necessary for all ships to have their transmitters adjusted to transmit on 800 meters if they desire to obtain bearings from the stations named.

All use of the wavelength of 600 meters by Canadian direction finding stations will be discontinued after Aug. 1, 1920.

Vancouver Dry Dock.—J. H. Sinclair, M.P. for Antigonish and Guysborough, N.S., asked in the House of Commons on June 16: "Has an agreement been made by the Government and J. Coughlan & Sons to build a dry dock in Vancouver, under the provisions of the statute relating to the construction of dry docks; what is the date of the agreement; has it been accepted by both parties thereto and if not what is the cause of delay?" The Minister of Railways replied that the form of agreement was submitted to J. Coughlan & Sons legal representatives on May 10, but has not as yet been signed, and returned to the department for completion. There is no information in the department as to the cause of the delay."

The Transportation & Shipping Co. Ltd. has been incorporated under the Quebec Companies Act, with \$48,000 authorized capital and office at Quebec, Que., to own and operate steam and sailing ships, wharves, docks, etc., and to carry on a general freighting business. The provisional directors are:—J. L., J. E., and B. C. Lachance, H. T. Beriau, Quebec, Que., and J. A. Cardinal, Limoilou, Que.

Navigation on Northern Alberta Waters.

The Lamson Hubbard Canadian Co., which acquired the assets of the Peace River Development Co. recently, is operating under the latter name the steamboats D. A. Thomas, Hudson's Hope, Slave River and Distributor, as well as a number of gasoline boats on the northern waters of Alberta. J. H. Boyan is Vice President and General Manager, Edmonton, Alta., and A. Sutcliffe is Transportation Manager, Peace River, Alta.

The D. A. Thomas is a stern steel steamboat of 3,000 tons with accommodation for 250 passengers, and operates a weekly service from Peace River to Vermilion Chutes, a round trip of 700 miles; master, J. A. Hurling, chief engineer, H. J. Hutchinson.

The Hudson's Hope, formerly Northland Call, is of the stern wheel type of 80 tons, with accommodation for 50 passengers, and operates a weekly service from Peace River to Hudson's Hope, a round trip of 500 miles; master, C. Smith, chief engineer, A. Aitkins.

The s.s. Slave River, stern wheel type of 100 tons, with accommodation for 75 passengers, operates a weekly service on Slave River from Vermilion Chutes to Fort Fitzgerald, a round trip of 600 miles; master, —. Alexander, chief engineer, —. Denison.

The Distributor, stern wheel type of 200 tons, with accommodation for 250 passengers, operates from Fort Smith to all points on the Mackenzie River, making two round trips during the season, between June 1 and September. The first sailing will take place from Fort Smith July 1; master, —. McLelan, chief engineer, —. Conevear.

The company also operates two large type gasoline boats on the Athabasca River from McMurray to Fort Fitzgerald, and on Athabasca Lake from Fort Chipewyan to Fond du Lac.

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.

Canadian Fairbanks-Morse Co.—C. J. Brittain, heretofore Managing Director, Toronto, Winnipeg, Saskatoon and Calgary branches, has been appointed Vice President and General Sales Manager, with office at Montreal, succeeding C. Graham Drinkwater, who has been Vice President in charge of sales, for many years, and has joined the banking firm of Aldred & Co., Ltd. Mr. Brittain was one of the first salesmen employed by Canadian Fairbanks-Morse Co. in its early days. Kenneth Forbes, heretofore Manager, St. John, N.B. branch, has been appointed Manager of Winnipeg branch, also of Regina branch, which is under construction; W. J. Hill has been appointed Manager, St. John, N.B. branch; Malcolm Cordell has been appointed Manager Montreal branch; Geo. L. Nies has been appointed Manager Calgary branch; and Archibald Turnbull has been appointed Manager Saskatoon branch.

Davis-Bournonville Co., Jersey City,

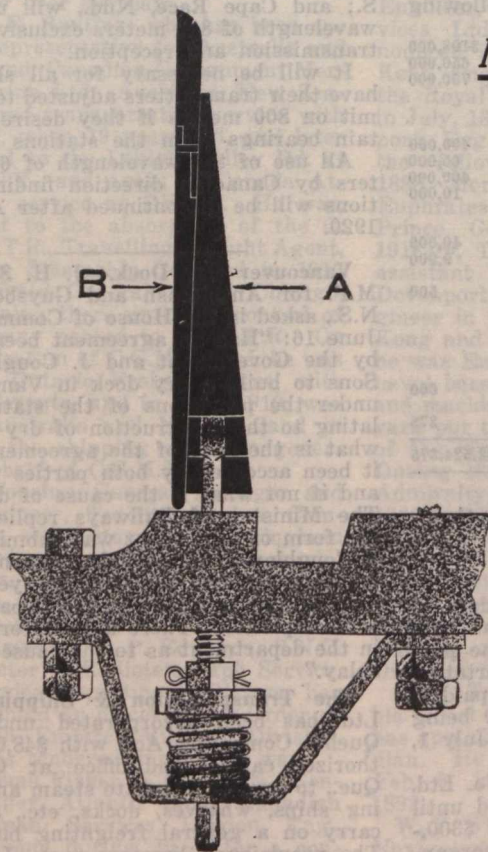
N.J., has issued a catalogue of oxy-acetylene apparatus, acetylene generators, welding and cutting torches, pressure regulators, and portable outfits.

Electric Service Supplies Co., Philadelphia, Pa., has issued to superintendents of motive power, and electrical engineers in the steam railway field, its engineering report 303, "Discussion of golden glow glass reflectors, and their relation to the locomotive headlight question."

Northern Electric Co., Montreal.—A. Dwight Smith has been transferred from the position of Sales Manager, to the General Head Office Sales Department, where he has jurisdiction over sales to railways, marine concerns and fire alarm departments throughout Canada. He was one of the first to study and introduce telephone train dispatching in Canada, as it is today, and was a pioneer in telegraph construction on the later built railways in the west. He is a son of A. B. Smith, who was Manager of Telegraphs, G.T.R. and G.T.P.R., until his retirement, a few years ago, on account of ill health.

Trawler and Drifter Sales.—The Anderson Co. of Canada has sold T.R. 59 to T. M. Kirkwood, Montreal, who has arranged options on a further nine through the Naval Service Department. This ship left Halifax for Montreal early in June. The British Admiralty has arranged for the sale to the Rose Street Foundry & Engineering Co., London, Eng., of 40 drifters and 8 trawlers, and 20 men, under Capt. Munro, have been sent from England to Halifax to take the ships over. Drifters 3, 4 and 81, lying recently at New York, and drifter 5, lying recently at Norfolk, Va., have also been sold by the Anderson Co., New York.

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Franklin Automatic Wedges avoid this uncertainty.

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